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Via Overnight Mail

August 20, 2012

Mr. Jeff Derouen, Executive Director
Kentucky Public Service Commission
211 Sower Boulevard
Frankfort, Kentucky 40602

RECEIVED

AUG 23 2012

PUBLIC SERVICE
COMMISSION

Re: Case No. 2012-00063

Dear Mr. Derouen:

Please find enclosed the original and one (1) paper copy of the attachments to the e-mails provided in KIUC's response to BREC 24-27 that were included on a CD filed with the Commission and all parties on August 8. I also enclose the original and ten (10) copies of KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.'s MOTION TO DEVIATE for filing in the above-referenced matter.

By copy of this letter, all parties listed on the Certificate of Service have been served. Please place these documents of file.

Very Truly Yours,


Michael L. Kurtz, Esq.
Kurt J. Boehm, Esq.
BOEHM, KURTZ & LOWRY

MLKkew
Attachment

cc: Certificate of Service
Quang Nyugen, Esq.
Faith Burns, Esq.
David C. Brown, Esq.

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing was served by electronic mail (when available) and by mailing a true and correct copy by regular, U.S. Mail, unless other noted, this 20th day of August, 2012 to the following



Michael L. Kurtz, Esq.
Kurt J. Boehm, Esq.

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EARTHJUSTICE
NATURAL RESOURCES DEFENSE COUNCIL
156 WILLIAM STREET, SUITE 800
NEW YORK, NEW YORK 10038

**COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION**

In the Matter of:

Application of Big Rivers Electric Corporation)	
for Approval of its 2012 Environmental)	
Compliance Plan, for Approval of its Amended)	
Environmental Cost Recovery Surcharge Tariff,	)	Case No. 2012-00063
for Certificates of Public Convenience and)	
Necessity, and for Authority to Establish a)	
Regulatory Account)	

**MOTION OF KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.
TO DEVIATE FROM RULE GOVERNING FILING OF COPIES**

Kentucky Industrial Utility Customers, Inc. (“KIUC”), by counsel, petitions the Kentucky Public Service Commission (“Commission”) to grant KIUC approval, pursuant to 807 KAR5:001, § 14, to deviate from the requirement that parties file an original and (10) ten complete copies of all data responses and attachments. On August 8, 2012 KIUC filed a CD which contained the attachments to the e-mails provided in response to BREC’s Data Request Nos. 24-27. These attachments contain nearly fifteen hundred pages of attachments. For the sake of economy, KIUC requests that the Commission excuse it from filing the remaining 9 copies required by Commission rules.

Respectfully submitted,



Michael L. Kurtz, Esq.

Kurt J. Boehm, Esq.

BOEHM, KURTZ & LOWRY

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**COUNSEL FOR KENTUCKY INDUSTRIAL UTILITY
CUSTOMERS, INC.**

August 20, 2012

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC)
CORPORATION FOR AN APPROVAL OF ITS)
2012 ENVIRONMENTAL COMPLIANCE PLAN,)
FOR APPROVAL OF ITS AMENDED) CASE NO.
ENVIRONMENTAL COST RECOVERY) 2012-00063
SURCHARGE TARIFF, FOR CERTIFICATES OF)
PUBLIC CONVENIENCE AND NECESSITY, AND)
FOR AUTHORITY TO ESTABLISH A)
REGULATORY ACCOUNT)

RECEIVED

AUG 22 2012

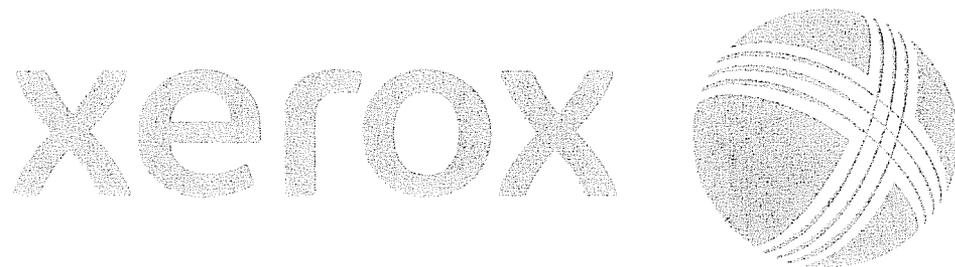
PUBLIC SERVICE
COMMISSION

ADDITIONAL ATTACHMENTS TO
KIUC'S RESPONSES TO
BIG RIVERS ELECTRIC CORPORATION'S
FIRST REQUEST FOR INFORMATION

QUESTION NOS. 24-27

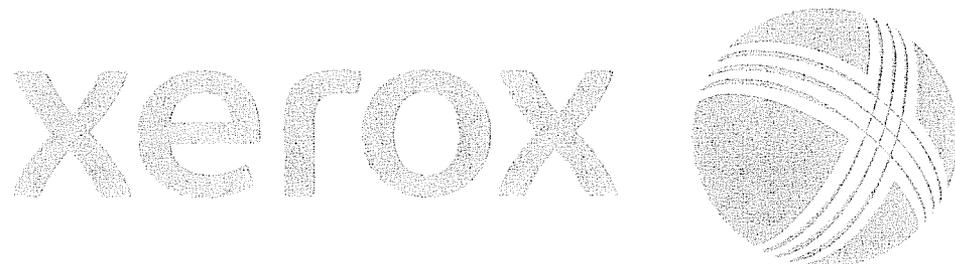
KWalton

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KWalton

 **Copy-BREC Financial Model vs BREC PCM vs A**
 **08/17/12 11:45 AM**

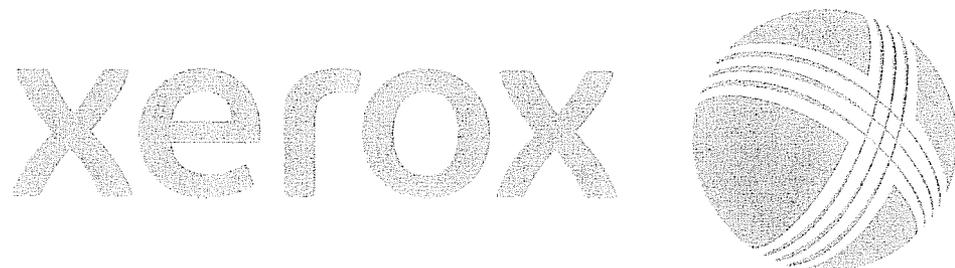


Case	Financial Model	FCM	APM FCM	Scenario 1	Scenario 2
Build	Financial Forecast (2012-2026) Base Case (No Env. Comp.) 02-27-2012	Big Rivers 2012-2026 (CAIR) Base Case exhibits determin (2-2-12)	Big Rivers 15Year CAIR Base Case	CAIR.BaseCase.Gen	CAIR.BaseCase.Pric
Build NO SCR	Financial Forecast (2012-2026) Build No SCR 03-08-2012	Big Rivers 2012-2026 (CSAPR-MATS by equip) sens 2 exhibits determin Rev.1 (2-12-12)	Big Rivers 15Year CSAPR By Equip LowerGreenNoX (2/10/12)	CSAPRByEquip.Gen	CSAPRByEquip.Pric
Buy	Financial Forecast (2012-2026) Buy 03-08-2012	Big Rivers 2012-2026 (CSAPR-MATS by equip) no SCR (2-18-12)	Big Rivers 15Year CSAPR By Equip New (2/18/12)	CSAPRByEquip.GenNoSmelter	CSAPRByEquip.PricNoSmelter
Build NO Smelter	Financial Forecast (2012-2026) Build No Smelter Load 03-08-2012	Big Rivers 2012-2026 (CSAPR-MATS by gen) sens 1 v/limits (2)	Big Rivers 15Year CSAPR By Equip NoLimits	CSAPRByEquip.GenNoLimit	CSAPRByEquip.PricNoLimit
Buy NO Smelter	Financial Forecast (2012-2026) Buy No Smelter Load 03-08-2012	Big Rivers 2012-2026 (CSAPR-MATS by equip) sens 2 exhibits determin Rev.1 no smelts (2-14-12)	Big Rivers 15Year CSAPR By Equip NoSmelters (2/14/12)	CSAPRByEquip.GenNoSmelter	CSAPRByEquip.PricNoSmelter
ACES	Financial Forecast (2012-2026) Build ACES Prices 05-16-2012	Big Rivers 2012-2026 (CSAPR-MATS by gen) sens 1 v/limits exhibits determin no smelts (2-23-12)	Big Rivers 15Year CSAPR By Gen NoLimits NoSmelters	CSAPRByGen.NoLimit.Gen	CSAPRByGen.PricNoLimit
		Big Rivers 2012-2026 (CSAPR-MATS by equip) sens 2 exhibits determin Rev.1 APM energy (5-8-12)	Big Rivers 15Year CSAPR By Equip LowerGreenNoX.CurrentPrices (5/8/12)	CSAPRByEquip.LowerGreenNoX.Gen	Prices-ByEquipNoWilson.ColeGenNoSmelter

Note: "CSAPR-MATS by gen" = sens 1 = CSAPR compliance by reducing annual generation
 Note: "CSAPR-MATS by Equip" = sens 2 = CSAPR compliance by CSAP equipment, etc
 Note: "v/limits" = gen limited upto variability limits
 Note: "rev" is to correct input errors

KWalton

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NON-DISCLOSURE AGREEMENT

This Non-Disclosure Agreement (“Agreement”) is entered into this 21st day of June 2012, by and between Hayet Power Systems Consulting (“Hayet”) and Alliance for Cooperative Energy Services Power Marketing LLC, (“ACES Power Marketing” or “APM”) (each individually referred to as “Party” and collectively as “Parties”).

RECITALS

WHEREAS, APM provides, inter alia, certain modeling services for Big Rivers Electric Corporation (“Big Rivers”) through the use of proprietary software licensed to APM by Ventyx; and

WHEREAS, APM has created a confidential and proprietary database within the licensed proprietary software which contains information used by APM to prepare certain scenarios for use in the Captioned Case (defined below); and

WHEREAS, Hayet is the consultant for certain Intervenors in the Captioned Case and such Intervenors desire that Hayet have access to APM’s confidential and proprietary Database within the Ventyx licensed proprietary software which contains information used by APM to prepare certain scenarios for use in the Captioned Case by Big Rivers; and

WHEREAS, APM, pursuant to a request by Big Rivers and pursuant to conditions established by APM’s license with Ventyx (the owner of the proprietary software), is willing to provide to Hayet the portion of APM’s confidential and proprietary database that pertains to Big Rivers, provided that, Hayet agrees to the terms and conditions expressed herein.

NOW WHEREFORE, in consideration of the promises and covenants herein and for good and valuable consideration, the adequacy and sufficiency of which are hereby acknowledged, the Parties intending to be legally bound do hereby agree as follows:

Section 1. Definitions.

“Authorized Representative” shall mean a person employed by Hayet who has signed a Non-Disclosure Certificate pursuant to this Agreement and who is a licensed user of the Ventyx PaR software under Hayet’s license with Ventyx.

“Captioned Case” shall mean the case currently before the Kentucky Public Service Commission and captioned as “*APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR APPROVAL OF ITS 2012 ENVIRONMENTAL COMPLIANCE PLAN, FOR APPROVAL OF ITS AMENDED ENVIRONMENTAL COST RECOVERY SURCHARGE TARIFF, FOR CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY, AND FOR AUTHORITY TO ESTABLISH A REGULATORY ACCOUNT, CASE NO. 2012-00063.*”

“Database” shall mean the electronic computer file derived from the Ventyx PaR licensed proprietary software that contains certain Big Rivers model data parameters used by APM in developing scenarios for Big Rivers and used in support of the Captioned Case.

“Notes of Protected Materials” means memoranda, handwritten notes, or any other form of information (including electronic information) that copies or discloses Protected Materials. Notes of Protected Materials are subject to the same restrictions provided in this Agreement for Protected Materials except as specifically provided otherwise in this Agreement.

“Protected Materials” shall mean the Database and any other materials provided to Hayet by APM, with such other materials being noted as being confidential by APM, pursuant to the terms of this Agreement.

Section 2. Use of the Database and Protected Materials. This Agreement shall govern the use of the Database provided to Hayet by APM. The Database shall be used exclusively by Hayet for work directly related to the Captioned Case. The Database shall be installed on and accessible through the computer containing Hayet’s licensed Ventyx software. Protected Materials shall be made available under the terms of this Agreement to Hayet solely for its use in the Captioned Case and any appeals from the Captioned Case, and may not be used by Hayet for any commercial, business, or other purpose whatsoever.

Section 3. Duration of Use. Protected Materials shall remain available to Hayet until the sooner of: (a) an order terminating this proceeding becomes no longer subject to judicial review, or (b) the termination of Hayet’s license with Ventyx. If requested to do so in writing after that date, Hayet shall, within fifteen days of such request, return the Protected Materials (excluding Notes of Protected Materials) to APM, or shall destroy the materials, except that copies of filings, official transcripts and exhibits in this proceeding that contain Protected Materials and Notes of Protected Materials may be retained, if they are maintained in accordance with this Agreement. Within such time period, Hayet, if requested to do so, shall also submit to APM an affidavit stating that, to the best of its knowledge, all Protected Materials and all Notes of Protected Materials have been returned or have been destroyed or will be maintained in accordance with this Agreement. To the extent Protected Materials are not returned or destroyed, they shall remain subject to this Agreement.

Section 4. Non-Disclosure Certificate. Hayet shall execute a Non-Disclosure Certificate in the form of the attached Exhibit A certifying its understanding and agreement with the terms of this Agreement. A copy of each Non-Disclosure Certificate shall be provided to APM prior to disclosure of any Protected Materials to Hayet.

Section 5. Protection of Materials. All Protected Materials shall be maintained by Hayet in a secure place. Access to those materials shall be limited to Hayet. Protected Materials shall be treated as confidential by Hayet. Protected Materials shall not be used except as necessary for the conduct of this proceeding, nor shall they be disclosed in any manner to any person except as outlined in Section 6 of this Agreement. Hayet may make notes of Protected Materials, which shall be treated as Notes of Protected Materials if they disclose the contents of Protected Materials. Hayet may use this information for purposes of this proceeding, and may not use

information contained in any Protected Materials obtained through this proceeding to give Hayet or any competitor or potential competitor of APM a commercial advantage or otherwise economically disadvantage APM based on disclosure of the Protected Materials outside of this proceeding.

In the event, APM inadvertently provides confidential information unrelated to the Captioned Case, or otherwise fails to designate materials other than the Database as Protected Materials at the time they are provided to Hayet, APM shall notify Hayet promptly upon discovery of the inadvertent disclosure. Hayet agrees that from the time forward that Hayet has been notified that such materials are deemed confidential, Hayet shall maintain the confidentiality or protection afforded the information, and agrees to: (a) immediately return the privileged information; and (b) to protect the confidential materials as Protected Materials, and to not use any information derived from such inadvertent disclosure in a manner inconsistent with the preservation of the confidential nature of the materials.

Section 6. Disclosure. Only Authorized Representatives shall have access to the Database. In the event that Hayet ceases to be engaged in the Captioned Case, access to Protected Materials by Hayet shall be terminated. Even if no longer engaged in this Captioned Case, Hayet shall continue to be bound by the provisions of this Agreement and the Non-Disclosure Certificate. No other disclosure of the Database shall be permitted. The Parties agree that the output of modeling analyses that may be conducted using the information contained in the Database as well as input assumptions entered into the Database for purposes of modeling analyses will be treated as confidential among any parties who have signed the Confidentiality Agreement in the Captioned Case and are not prohibited from disclosure under this Agreement. Hayet shall take all reasonable precautions necessary to assure that Protected Materials are not distributed to unauthorized persons.

Section 7. Nature of Information. Hayet hereby accepts the representations of APM that the Database is of a special, unique, unusual, extraordinary, and/or intellectual character and that the Parties further accept that the Database is an APM trade secret that is not available to the public, and that, if disclosed, would subject APM to risk of competitive disadvantage or other business injury. APM may be irreparably injured by disclosure of the Database. APM and Hayet acknowledge and agree that money damages would not be a sufficient remedy for any breach of this Agreement, and that in addition to all other remedies, a Party shall be entitled to specific performance and injunctive or other equitable relief as a remedy for any such breach, and the Parties agree to waive any requirement for the securing or posting of any bond in connection with such remedy.

Section 8. Survival of Obligations. The obligations and commitments established by this Agreement shall remain in full force and effect for a period of two (2) years from the conclusion of any right to appeal the proceedings in the Captioned Case.

Section 9. Governing Law. The validity and interpretation of this Agreement and the legal relations of the Parties to it shall be governed by the laws of the State of Indiana. In the event that a court of competent jurisdiction determines that any portion of this Agreement is unreasonable because of its term or scope, or for any other reason, the Parties agree that such

court may reform such provision so that it is reasonable under the circumstances and that such provision, as reformed, shall be enforceable. The Parties further agree that service of any process, summons, notice or document by U.S. certified or registered mail to the Parties' respective executive offices will be effective service of process for any action, suit, or proceeding brought in any such court.

Section 10. Miscellaneous Provisions.

(a) Neither party shall assign this Agreement without the prior written approval of the other party. Nothing in this Agreement, express or implied, is intended or shall be construed to confer upon any person or entity other than the parties hereto any right, remedy or claim under or by reason of this Agreement.

(b) This Agreement sets forth the entire agreement between the parties as to the subject matter of this Agreement and supersedes all prior agreements, commitments, representations, writings and discussions between them, whether written or oral, with respect to the subject matter hereof. Except as otherwise expressly provided in this Agreement, this Agreement may not be amended or terminated except in writing and signed by a duly authorized representative of the Party to be bound thereby.

(c) If any provision of this Agreement or its application to any person or circumstance is adjudged invalid or unenforceable by any court of competent jurisdiction, then the remainder of this Agreement or the application of such provision to other persons or circumstances shall not be affected thereby.

(d) No delay or failure to exercise any right under this Agreement shall operate as a continuing or permanent waiver of such right or preclude the further exercise of that right or any other right. This Agreement shall be binding on the parties and their successors, heirs, affiliates, and assigns. This Agreement may be executed in any number of counterparts, and each such counterpart shall be deemed an original instrument.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed and delivered by their respective duly authorized officers as of the date first written above.

**ALLIANCE FOR COOPERATIVE
ENERGY SERVICES POWER
MARKETING LLC**

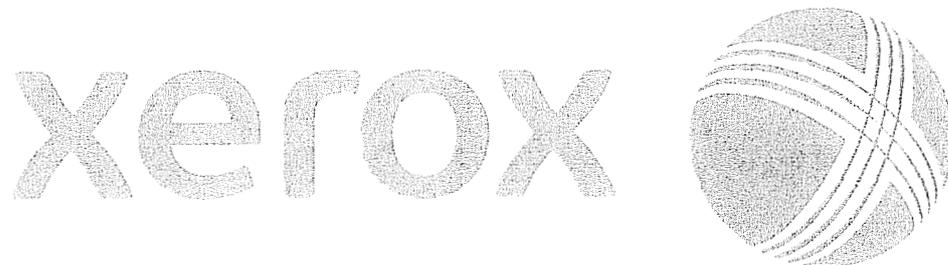
**HAYET POWER SYSTEMS
CONSULTING**

By: Michael T. Steff
Name: Michael T. Steff
Title: SVP & COO

By: Philip Hayet
Name: Philip Hayet
Title: President

KWalton

 **William Steinhurst Direct Testimony - Public Ve**
 **08/17/12 12:02 PM**



COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:)
)
Application of Big Rivers Electric Cooperative for Approval of)
its 2012 Environmental Compliance Plan, Approval of its) CASE NO. 2012-00063
Amended Environmental Cost Recovery Surcharge Tariffs,)
and for the Certificates of Public Convenience and Necessity,)
and the Authority to Establish a Regulatory Account)

**AFFIDAVIT OF DR. WILLIAM STEINHURST FOR DIRECT TESTIMONY
(PUBLIC VERSION)**

State of)
Vermont)
)

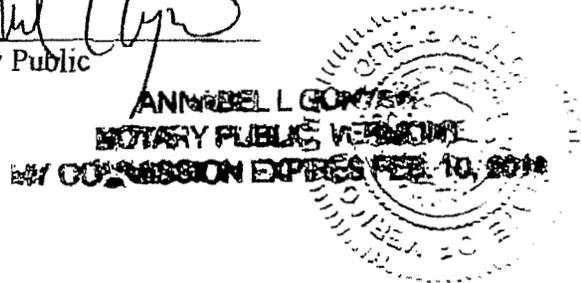
Dr. William Steinhurst, being first duly sworn, states the following: The prepared Direct Testimony (Public Version) and associated exhibits filed on Monday, July 23, 2012 constitute the direct testimony of Affiant in the above-styled cases. Affiant states that he would give the answers set forth in the Direct Testimony, Public Version, if asked the questions propounded therein. Affiant further states that, to the best of his knowledge, his statements made are true and correct.

Dr. William Steinhurst
Dr. William Steinhurst

SUBSCRIBED AND SWORN to before me this 19th day of July 2012.

Annabel L. Gonyea
Notary Public

My Commission Expires:



Commonwealth of Kentucky

Before the Public Service Commission

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC)
CORPORATION FOR APPROVAL OF ITS)
2012 ENVIRONMENTAL COMPLIANCE)
PLAN, FOR APPROVAL OF ITS)
AMENDED ENVIRONMENTAL COST)
RECOVERY SURCHARGE TARIFF, FOR)
CERTIFICATES OF PUBLIC)
CONVIENENCE AND NECESSITY, AND)
FOR AUTHORITY TO ESTABLISH A)
REGULATORY ACCOUNT.)

Case No. 2012-00063

**Direct Testimony of
William Steinhurst**

**On Behalf of
Sierra Club**

Public Version

July 23, 2012

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1 **1. INTRODUCTION AND QUALIFICATIONS**

2 **Q Please state your name, business address, and position.**

3 **A**My name is William Steinhurst, and I am a Senior Consultant with Synapse
4 Energy Economics (Synapse). My business address is 32 Main Street, #394,
5 Montpelier, Vermont 05602.

6 **Q Please describe Synapse Energy Economics.**

7 **A**Synapse Energy Economics is a research and consulting firm specializing in
8 energy and environmental issues, including electric generation, transmission and
9 distribution system reliability, ratemaking and rate design, electric industry
10 restructuring and market power, electricity market prices, stranded costs,
11 efficiency, renewable energy, environmental quality, and nuclear power.

12 Synapse’s clients include state consumer advocates, public utilities commission
13 staff, attorneys general, environmental organizations, federal government and
14 utilities.

15 **Q Please summarize your work experience and educational background.**

16 **A**I have over thirty years of experience in utility regulation and energy policy,
17 including work on renewable portfolio standards and portfolio management
18 practices for default service providers and regulated utilities, green marketing,
19 distributed resource issues, economic impact studies, and rate design. Prior to
20 joining Synapse, I served as Planning Econometrician and Director for Regulated
21 Utility Planning at the Vermont Department of Public Service, the State’s Public
22 Advocate and energy policy agency. I have provided consulting services for
23 various clients, including the Connecticut Office of Consumer Counsel, the
24 Illinois Citizens Utility Board, California Division of Ratepayer Advocates, the
25 D.C. and Maryland Offices of the Public Advocate, Delaware Public Utilities
26 Commission, Regulatory Assistance Project, National Association of Regulatory
27 Utility Commissioners (NARUC), National Regulatory Research Institute
28 (NRRI), American Association of Retired Persons (AARP), The Utility Reform

1 Network (TURN), Union of Concerned Scientists, Northern Forest Council, Nova
2 Scotia Utility and Review Board, U.S. Environmental Protection Agency (EPA),
3 Conservation Law Foundation, Sierra Club, Southern Alliance for Clean Energy,
4 Oklahoma Sustainability Network, Natural Resource Defense Council (NRDC),
5 Illinois Energy Office, Massachusetts Executive Office of Energy Resources,
6 James River Corporation, and Newfoundland Department of Natural Resources.

7 I hold a B.A. in Physics from Wesleyan University and an M.S. in Statistics and
8 Ph.D. in Mechanical Engineering from the University of Vermont.

9 I have testified as an expert witness in over 30 cases on topics including utility
10 rates and ratemaking policy, prudence reviews, integrated resource planning,
11 demand side management policy and program design, utility financings,
12 regulatory enforcement, green marketing, power purchases, statistical analysis,
13 and decision analysis. I have been a frequent witness in legislative hearings, and
14 represented the State of Vermont, the Delaware Public Utilities Commission
15 Staff, and several other groups in numerous collaborative settlement processes
16 addressing energy efficiency, resource planning and distributed resources.

17 I was the lead author or co-author of Vermont's long-term energy plans for 1983,
18 1988, and 1991, as well as the 1998 report *Fueling Vermont's Future:*
19 *Comprehensive Energy Plan and Greenhouse Gas Action Plan*, and also
20 Synapse's study *Portfolio Management: How to Procure Electricity Resources to*
21 *Provide Reliable, Low-Cost, and Efficient Electricity Services to All Retail*
22 *Customers*. In 2008, I was commissioned by the National Regulatory Research
23 Institute (NRRRI) to write *Electricity at a Glance*, a primer on the industry for new
24 public utility commissioners, which included coverage of energy efficiency
25 programs. In 2011, NRRRI commissioned a second edition of that work.

26 A copy of my current resume is attached as Exhibit WS-1.

27 **Q On whose behalf are you testifying in this case?**

28 **A** I am testifying on behalf of Sierra Club.

1 **Q Have you testified previously before the Kentucky Public Service**
2 **Commission?**

3 **A** No, I have not. However, I did prepare prefiled testimony in Kentucky PSC Cases
4 No. 2011-00161 and No. 2011-00162, which were settled.

5 **Q What is the purpose of your testimony?**

6 **A** Big Rivers Electric Corporation (“BREC” or the “Company”) has requested that
7 the Commission issue Certificates of Public Convenience and Necessity
8 (“CPCN”) for certain environmental upgrades at its coal fired power plants. *See*
9 *Berry* prefiled direct at 39 and BREC Exhibit *Berry-2*. I will refer to those
10 projects as the Environmental Retrofits. The purpose of my testimony is to
11 provide an opinion, based on Synapse’s analysis of the Environmental Retrofits
12 and BREC’s studies in support of its Application for the CPCNs, as to whether
13 the proposed Environmental Retrofits are reasonable and cost-effective for
14 complying with the environmental requirements the Company faces and
15 providing least-cost service. Witness Wilson’s accompanying testimony reviews
16 the regulatory requirements and the Company’s economic justifications for the
17 Environmental Retrofits. For that purpose, she reviews the current and expected
18 running costs of the Company’s coal-fired units, and compares these costs to
19 different alternatives. My testimony discusses the resource options BREC
20 evaluated, the range of future scenarios it used to evaluate those resource options,
21 its projection of revenue requirements for each resource option under those future
22 scenarios and its conclusions regarding the merits of its proposed CPCN based
23 upon its projections and analyses.

24 **2. FINDINGS AND OVERVIEW OF TESTIMONY**

25 **Q In your opinion, do the facts and evidence presented in this case support the**
26 **Company’s request for a CPCN for the proposed environmental upgrades?**

27 **A** No. The Company has not demonstrated that its proposed CPCN is reasonable
28 and cost-effective for complying with the environmental requirements the
29 Company is facing. That conclusion is based upon the results of our review

1 which indicates that the Company has not evaluated the full range of resource
2 options available to it, that its projections of revenue requirements for the
3 resource options it did evaluate are not correct, that its evaluation of future
4 scenarios does not include a reasonable projection of carbon prices and that its
5 risk analysis is subjective and flawed As set out in the testimony of witness
6 Wilson, the Company's economic justification for these environmental retrofits
7 did not consider a full range of alternative compliance options and contained
8 several flaws that bias its analysis in favor of installation of emission control
9 retrofit projects. When a number of those errors are corrected, the results show
10 that alternatives to the Environmental Retrofits are less costly and less risky.

11 **Q What is your understanding of the standard for issuance of a CPCN in**
12 **Kentucky?**

13 **A** My understanding is that, before the Commission can grant such a certificate for a
14 facility, it must determine that there is both a need for the facility and that
15 construction of the new system or facility will not result in duplication. This
16 standard requires more than just a showing that there is a need for new generation,
17 as the statutory mandate to avoid "wasteful duplication" logically means that the
18 new system or facility should not represent an excessive investment. Commission
19 decision-making is guided by the overall requirement that utility rates are "fair,
20 just, and reasonable." KRS § 278.030(1); KRS § 278.040. As a policy matter, I
21 view these requirements as equating to the need for a showing that resources are
22 the least-cost means of providing utility service since a resource plan that is not
23 least cost cannot result in just and reasonable rates.

24 **3. EXPECTATION FOR SOUND UTILITY PLANNING**

25 **Q HOW DOES BREC'S DECISION MAKING PROCESS COMPARE WITH**
26 **THE PROCESS A COMPANY WOULD FOLLOW TO INFORM A**
27 **REASONABLE DECISION?**

28 **A** BREC is conducting a business affected with the public interest. It should plan for
29 the provision of utility service in a manner designed and implemented to provide
30 adequate and reliable service consistent with public policy and in a manner

1 designed to minimize long-term cost of service to customers while managing risk
2 to customers in a reasonable way. I have discussed this approach at length
3 elsewhere. (See, for example, *Portfolio Management: Tools and Practices for*
4 *Regulators*, 9/29/2006, attached as Exhibit WS-2.) BREC's planning in regard to
5 the subject matter of this proceeding should be held to that same standard: an
6 assessment of all of its options for meeting customer needs and conducted in a
7 manner that considers all of its options on a level playing field. Specifically,
8 BREC should have done the following:

- 9 1. Identify All Currently Known Regulatory Requirements and Identify
10 Emerging and Reasonably Likely Future Regulatory Requirements
- 11 2. Identify and Evaluate All Alternatives for Compliance and Alternatives to
12 Compliance
- 13 3. Perform Correct Life-Cycle Economic Analyses, Including Sensitivity Cases
14 and other Risk Analysis of All the Alternatives
- 15 4. Make a Decision Based on the Aforementioned Information
- 16 5. Re-Evaluate the Decision as Significant Milestones Are Reached
- 17 6. Balance Cost/Risk In Implementation Method
- 18 7. Actively Manage the Implementation To Assure Budget, Schedule and
19 Performance Compliance

20 Unfortunately, BREC has failed in at least the first four of those requirements as
21 explained below.

22 **4. DESCRIPTION OF WAYS IN WHICH BREC PLANNING IS LACKING**

23 **Q Was BREC's planning and economic analysis for its Environmental Retrofits**
24 **correct? Was it consistent with least cost planning principles and good utility**
25 **management?**

26 **A** BREC's planning and economic analysis for its Environmental Retrofits was not
27 correct, nor was it consistent with least cost planning principles and good utility

1 management. Sierra Club witness Wilson summarizes the errors she identified as
2 follows:

- 3 • The load forecast, which does not include the effects of demand side
4 management (DSM);
- 5 • The input natural gas price forecast from the PACE Global modeling;
- 6 • The use of a carbon dioxide (CO₂) emissions price to determine the energy
7 market prices in the PACE Global modeling, but leaving it out of the
8 ACES production cost modeling and the dispatch of generating units;
- 9 • The resulting output energy prices from the PACE Global modeling/ Use
10 of inflated market prices;
- 11 • The assumption that capacity, heat rates, forced outages and availability
12 factors stay constant over time; and
- 13 • The use of both real and nominal dollars in calculations of net present
14 value revenue requirement (NPVRR) in the BREC financial modeling.

15 Witness Wilson also describes BREC's failure to model all controls, failure to model
16 units individually, and failure to compare to alternatives. Sensitivity analyses were
17 extremely limited and did not cover the range of important input uncertainties. None
18 of these practices is consistent with correct implementation of least-cost planning
19 principles or with good utility management. I will discuss the utility planning
20 implications of BREC's errors below.

21 **a. Piecemeal Approach to Pending and Emerging Regulations**

22 **Q Does correct least-cost planning require treating emerging and reasonably**
23 **expected regulatory requirements in a particular manner?**

24 **A** Yes. Investments necessary to meet emerging and reasonably expected regulatory
25 requirements must be considered as part of the forward going costs of any plant,
26 just as with the investments necessary to meet currently known requirements.
27 Unfortunately, BREC erred in at least two ways on this point by including in its

1 economic modeling the costs of select control technologies rather than the entire
2 suite of controls likely or reasonably expected for future compliance.

3 First, BREC chose to treat some emerging and reasonably expected regulatory
4 requirements as “speculative” and ignored the risk of forward going costs for
5 meeting those requirements. For example, BREC witness Berry states “potential
6 NAAQS [national ambient air quality standards] reductions are not expected to be
7 published until 2016 with compliance possibly due in 2018. At this time,
8 anticipated NAAQS reductions are merely speculative and will be addressed in
9 future environmental compliance plans.” He also takes a similar position
10 regarding “EPA-proposed regulations under §316(b) of the Clean Water Act -
11 Waste Water Intake Impingement Mortality & Entrainment, Waste Water
12 Discharge, and Coal Combustion Residuals (CCR).” Berry prefiled direct at 27-
13 29.

14 Second, BREC failed to treat the alternatives on a level playing field with respect
15 to potential carbon emission costs. BREC burdened market alternatives (mainly
16 natural gas energy purchases) with carbon costs, but failed to similarly burden the
17 forward going costs of the coal plants it proposes for Environmental Retrofits.
18 This is a fundamental error in least cost planning.

19 This piecemeal and biased analysis is inconsistent with the principles of least cost
20 planning and the requirements for a CPCN.

21 **b. Creation of a Bias in Favor of Additional, Future Environmental**
22 **Retrofits**

23 **Q Does BREC’s failure to comprehensively plan for least-cost solutions to its**
24 **regulatory requirements create any other concerns?**

25 **A** Yes. Once the proposed Environmental Retrofits are made, their costs are sunk
26 and not avoidable. Then, any incremental costs imposed by other regulations,
27 such as emerging and reasonably expected regulations, would be evaluated on
28 their incremental economics. However, from today’s point of view that distorts
29 the true economics of decisions about the proposed Environmental Retrofits vs.

1 the alternatives. Again, a piecemeal approach to economic evaluations distorts the
2 economic analysis of alternatives. While some emerging and reasonably expected
3 regulations are in flux and costs may be uncertain, totally ignoring those potential
4 costs biases the analysis in favor of the proposed Environmental Retrofits.

5 **Q As a general matter, how should BREC approach planning for**
6 **environmental regulation?**

7 **A** Under EPA's multi-faceted approach, plant owners can and should
8 comprehensively plan for compliance. While BREC retained Sargent and Lundy
9 to perform the initial steps in a comprehensive plan for compliance, BREC failed
10 to follow through. As an example of this lack of follow through, BREC modeled
11 only the emission control retrofits for Cross State Air Pollution Rule (CSAPR)
12 and Mercury Air Toxics Standard (MATS) and, then only a subset of the controls
13 recommended by Sargent & Lundy to comply with these rules. Also of
14 importance, BREC did not consider forward going costs for compliance with
15 NAAQS revisions, the CCR rule, the Water Intake (316(b)) rule, and new effluent
16 limits despite its expectation that those regulations will drive further capital
17 expenditures. Berry direct prefiled at 27 ff.; DePriest direct prefiled at 10. BREC
18 stated it did not consider costs for compliance with NAAQS revisions simply
19 because they would not need to comply immediately. Berry, *loc. cit.* This position
20 of BREC's in the face of Sargent & Lundy's caution that "In order to achieve
21 compliance with potential NAAQS emission reductions, BMC would need to alter
22 their compliance strategy," is not sound utility planning. S&L report at 6-4.
23 BREC implicitly admits it should use a 20-year planning horizon, but fails to
24 consider reasonably foreseeable costs for future environmental controls during
25 that period. Such shortsighted analysis stacks the deck in favor of the proposed
26 Environmental Retrofits because it only looks at subset of costs needed to go
27 down that road. As a result, its 2012 Environmental Plan fails to deliver a least
28 cost solution to meeting customer needs. Failure to consider all options in a
29 cohesive fashion makes it impossible for the Commission to find that retrofits are
30 least cost.

1 c. Errors

2 **Q** **Did any of the other errors BREC made in its economic analysis of**
3 **compliance options materially affect the outcome of its analysis?**

4 **A** Yes. Among the material errors BREC made were

- 5 • Using a natural gas price forecast that is out of date and higher than current
- 6 forecasts,
- 7 • Using a CO₂ emissions price in the determination of market energy prices, but
- 8 not in unit running costs, and
- 9 • Exclusion of ongoing operating and maintenance (O&M) costs at each of the
- 10 coal units.

11 Others are listed above and in the prefiled direct testimony of witness Wilson.

12 I am also concerned about the limited sensitivity analyses. In response to
13 discovery request KIUC 2-5, Big Rivers states that it relied on a single estimate of
14 fuel costs, market prices, allowance prices, etc., as support for its application to
15 the Commission.

16 Q. Please explain why Big Rivers used a forward energy
17 price forecast from both Pace Global (“Pace”) and APM in the
18 cases studied.

19 A. Pace’s analysis was developed to incorporate a wide
20 range of market uncertainties on key drivers such as fuel prices,
21 electric load growth, carbon compliance costs, and power market
22 prices. This approach provided the context under which Pace
23 developed a reference case hourly price projection for use in
24 further production cost models.

25 The fact that many variations of input assumptions were used to generate one or
26 more of the reference case input assumptions does not immunize that reference
27 case, itself, from uncertainty. Failure to present sensitivity cases showing whether
28 the proposed Environmental Retrofits are appropriately robust is not good utility
29 practice and should lead to the Commission not to put much weight on it the
30 Application as evidence for the retrofits.

1 **d. Failure to Model Retrofits Against Relevant Alternative Options**

2 **Q Did BREC compare the proposed Environmental Retrofits to a full array of**
3 **alternatives?**

4 **A**No, it did not. BREC's cost effectiveness evaluation considered three cases: a
5 Build Case (in which it installed all the Environmental Retrofits); a Partial Build
6 Case (in which it installed all but one of those retrofits) and a Buy Case (in which
7 it installed only MATS retrofits). Hite direct at 6. One of those cases considered
8 market purchases, but only as an alternative to some of the controls, not as an
9 alternative to continued operation of one or more of the coal generating units.
10 Other alternatives, such as new natural gas plant, gas conversions, retirements,
11 purchased power agreements for excess capacity, energy efficiency programs and
12 renewable resources were not modeled.

13 To illustrate the importance of this omission, Synapse compared the Build Case to
14 one of those alternatives—a new natural gas combined cycle (NGCC) unit first
15 using BREC's input assumptions and then using several combinations of more
16 appropriate assumptions. Witness Wilson explains that process and those
17 combinations of assumptions in her prefiled testimony. Those scenarios show
18 that, with reasonable input assumptions and correcting several errors made by
19 BREC in its analyses, replacement of BREC's coal units with natural gas
20 combined-cycle replacement options is more economical on an NPVRR basis
21 than the proposed Environmental Retrofits by between 12 and 20 per cent,
22 depending on the unit, for a fleet-wide savings in excess of one billion dollars
23 NPVRR.

24 **Q Would not reliance on natural gas generation entail some price uncertainty?**

25 **A**Yes, as with many other options, reliance on natural gas as a fuel entails some
26 price volatile over short and mid-term, perhaps somewhat more so than coal.
27 However, natural gas is not necessarily the only alternative that could be included
28 in a diversified portfolio for BREC that should include increased levels of DSM
29 and renewable resources such as wind. Further, those price fluctuations can be

1 hedged over the short- to mid-term, and the coal retrofit case brings its own suite
2 of risks including excess capacity, cost overruns (discussed below), aging plant
3 considerations, future carbon regulation, and more. Furthermore, a resource
4 portfolio so dominated by one technology and one fuel as BREC's is quite brittle
5 compared to a diverse portfolio of multiple fuels, market purchases, energy
6 efficiency, load management and renewables.

7 **Q You mentioned energy efficiency resources as one alternative not considered**
8 **by BREC. Please explain further.**

9 **A** On page 29 of his prefiled direct, witness Berry states that "the magnitude of
10 potential savings from DSM and energy efficiency is insufficient to materially
11 assist Big Rivers in complying with CSAPR and MATS."

12 **Q Are you surprised by that conclusion and do you agree with it?**

13 **A** I do not agree with that conclusion, but am not surprised that BREC would reach
14 it, as the DSM programs being implemented by BREC are nowhere near what is
15 readily achievable by a utility.

16 BREC's assertion is merely conclusory and fails to consider the possibility that
17 DSM and energy efficiency could make a difference to the economics of even one
18 of BREC's many coal units. It is also contrary to the experience of national
19 leaders in energy efficiency who have found it possible to achieve savings in
20 excess of 1% of retail sales per year consistently for a decade or more. However, I
21 am not surprised that BREC should reach such a conclusion, based on its
22 approach to DSM evidenced in its 2010 IRP. For example, on page 7-14 of that
23 IRP, BREC states that, Big Rivers and its three distribution member cooperatives
24 currently primarily provide education about energy efficiency, with the exception
25 being distribution of CFL lighting at no cost to members." In my thirty-some
26 years of experience with the design of DSM programs, I have not seen any utility
27 that took such a stance succeed in achieving substantial savings.

28 Further, In Section 8 of that IRP, BREC presents the projected savings of its future
29 DSM programs, and those savings amount to approximately 0.01% of annual non-

1 smelter sales each year. This is barely a token amount, representing a tiny fraction
2 of the sustained annual savings rate achievable by a vigorous utility DSM
3 program.¹ Such a vigorous program can also be ramped up by committed utility
4 managers within about three years, especially now that effective program designs
5 are well understood.

6 All in all, it is clear that BREC has not considered DSM and energy efficiency
7 seriously and that, if it had, it would have found that energy efficiency resources
8 would have made a difference in its ability to retire existing units and rely on
9 other resources. It is important to note that sustained savings in energy sales of
10 1% per year from DSM programs would result in a load reduction in excess of
11 10% after a decade. This is certainly an amount that can make a difference in the
12 resource needs of BREC and its customers.

13 **e. All or Nothing Alternatives**

14 **Q You mentioned that DSM resources might well have made a difference in the**
15 **economics of at least some of BREC's units. Please explain further the**
16 **modeling of individual units.**

17 **A** As witness Wilson explains in her prefiled direct, BREC's Build Case resource
18 scenario analyzed all its coal units as retrofitted. BREC did not analyze the
19 opportunities to retrofit some units and retire others in favor of alternatives. I am
20 concerned that this distorts the outcome, especially in the Smelter sensitivities. If
21 BREC had done its analysis on a unit-by-unit basis, it is likely that DSM could
22 have offset the need to retrofit or replace some units. This is especially
23 problematic given the Smelter sensitivities. In particular, BREC's assertion that

¹ For example, in 2007, states had utility and public benefit programs that saved electric energy at a rate in excess of 0.5% of retail sales (total retail sales, not excluding large industrial sales as in the above Kentucky example) included Vermont, Connecticut, California, Massachusetts, Minnesota, Washington, Oregon, Rhode Island and Iowa. Dan York, Patti Witte, Seth Nowak and Marty Kushler, *Three Decades and Counting: A Historical Review and Current Assessment of Electric Utility Energy Efficiency Activity in the States*, June 27, 2012, ACEEE Research Report U123, available at <http://aceee.org/research-report/u123>.

1 the Smelter sensitivity showed no change in the least cost strategy should be
2 given no weight due to this analytical defect.

3 **Q Did BREC consider any coal plant retirements or natural gas conversions**
4 **(aside from the Reid plant) in its economic analysis? If not, why not?**

5 **A** Apparently, BREC did not consider any coal plant retirements in its economic
6 analysis. It justified this in the following way in its Response to KIUC 1-26:

7 Because of the significant number of generating units involved and the
8 significant unamortized plant balance of the coal units that are being
9 upgraded, retirement of the coal plants or converting them to natural gas
10 would result in the need to recover, through rates, the Unamortized plant
11 balances of the coal plants in addition to any costs of converting the plants
12 to natural gas. Big Rivers believed that this cost could be avoided by
13 pursuing upgrades that would control emissions and comply with EPA
14 regulations for an average cost of about \$169 per kW compared to an
15 overnight installed cost of \$626 per kW for an advanced combustion
16 turbine and \$917 per kW for a new combined cycle unit (Assumptions to
17 the Annual Energy Outlook for 2011, DOE EIA, p. 97; see attached).
18 These differences were so large that Big Rivers did not consider it
19 necessary to evaluate the option of retiring coal plants or converting them
20 to natural gas.

21 **Q Is that justification sound?**

22 **A** No, it is not. In fact, BREC's excuse is economic nonsense.

23 I do not necessarily agree that, in the event of a coal unit retirement, the
24 unamortized values would be recoverable in rates under traditional ratemaking.
25 However, from a least cost planning point of view it is irrelevant whether the
26 unamortized costs of those plants are recoverable in rates. That is because,
27 whether or not those costs would be recoverable from BREC's ratepayers, they
28 could not "be avoided by pursuing upgrades that would control emissions and
29 comply with EPA regulations." Rather, those costs are sunk and are completely
30 unaffected by any decision regarding the proposed Environmental Retrofits. This
31 fundamental error is compounded by erroneously comparing capital resources on
32 the basis of their overnight installed cost rather than a full life-cycle revenue
33 requirement.

1 The following example should clarify this point. Assume for the sake of argument
 2 that (1) the unamortized cost of BREC's coal plants at this time including the
 3 present value of any carrying charges (TIER, etc.) is \$1 Billion, (2) the life cycle
 4 cost of retrofitting and operating those plants is \$7.4 Billion, (3) the life cycle cost
 5 of retiring those plants and replacing them with NGCC plants is \$6.2 Billion, and
 6 (4) nothing else in BREC's cost of service will change between those two
 7 strategies. Then the cost of service difference (NPVRR) will be:

Strategy	Build Case (Install proposed Environmental Retrofits)	Alternative Case (retire existing plants and replace with NGCC)	Difference
Amortization of existing rate base and carrying costs	\$1 Billion	\$1 Billion	\$0
Capital and operating costs of strategy	\$7.4 Billion	\$6.2 Billion	\$1.2 Billion
Total	\$8.4 Billion	\$7.2 Billion	\$1.2 Billion

8
 9 Clearly, even if we grant BREC the benefit of the doubt on whether the existing rate
 10 base would, in fact, be recoverable from customers under the Alternative Case, the
 11 amount of that existing rate base cancels out and makes no difference in which
 12 strategy is least cost.

13 **5. OTHER CONCERNS WITH THE PROPOSED ENVIRONMENTAL RETROFITS**

14 **Q In considering the cost-effectiveness of BREC's plan, can the Commission be**
 15 **confident that the cost estimates presented for the Environmental Retrofits**
 16 **will not increase?**

17 **A** Not necessarily. First of all, there is the concern already discussed above that the
 18 costs presented do not include all of the environmental upgrade costs that BREC
 19 would need to enable its plants to continue operating, even with the proposed
 20 Environmental Retrofits. Second, as has already been discussed, BREC has not
 21 included a specific estimate of owner's costs for the proposed Environmental
 22 Retrofits and has not accounted for future capital additions that will be needed to

1 keep the plants running. In addition, there is reason to expect the final costs of
2 such retrofits would exceed the estimates typically offered by utilities at this stage
3 of development. A recent example is the case of AEP's Big Sandy retrofit
4 proposal where there was an increase of about 130% in estimated costs from the
5 base engineering, procurement and construction (EPC) cost to total company cost
6 (from \$409 million before escalation and contingency to \$940 million after
7 "associated" costs, the cost of landfill modifications required to accept flue gas
8 desulfurization waste, a 20% contingency, American Electric Power owner costs,
9 and allowance for funds used during construction (AFUDC)). I understood that
10 the BREC cost estimate does include contingency and escalation, but describe this
11 recent experience as an illustration of what may happen to initial estimates.

12 I would also observe that Sargent and Lundy characterizes its capital cost
13 estimates as follows in Sec. 5.1.1 of its report included in the BREC Application:

14 The capital costs do not include; sales taxes, property taxes, license
15 fees and royalties, owner costs, or AFUDC (Allowance for Funds
16 Used During Construction). The costs are based on a minimal-
17 contracts lump-sum project approach. The total installed costs are
18 factored from recent projects and quotes obtained by S&L. No
19 specific quotes or engineering was completed for any of the
20 projected upgrades for the BREC units. The costs provided herein
21 reflect an approximate accuracy of +/-20% and are not indicative
22 of costs that may be negotiated in the current marketplace. These
23 costs should not be used for detailed budgeting or solicitation of
24 pollution control bonds.

25 (I have mentioned owner's costs above.) This suggests some considerable
26 uncertainty. There is some reason to believe that capital costs for such equipment
27 may increase over the next few years due to greater demand. I also note that a
28 20% margin is greater than the margin by which the proposed Environmental
29 Retrofit life cycle costs exceed NGCC life cycle costs, even in the scenarios that
30 assume BREC's input assumptions. (See Wilson Table 1.). Further, in response to
31 SC 2-4, BREC failed to provide the requested information on cost overruns of
32 prior major capital projects.

1 **6. CONCLUSIONS AND RECOMMENDATIONS**

2 **Q. Please summarize the major conclusions and recommendation from your**
3 **review of the Company's request.**

4 **A** My first conclusion is that the Company has not demonstrated that its proposed
5 CPCN for Big Rivers is reasonable and cost-effective for complying with the
6 environmental requirements the Company is facing. That conclusion is based
7 upon the results of our review, which indicates that the Company has not
8 evaluated the full range of resource options available to it, that its projections of
9 revenue requirements for the resource options it did evaluate are not correct, that
10 its evaluation of future scenarios does not include a reasonable projection of
11 carbon prices and that its risk analysis is flawed. My second, related, conclusion is
12 that allowing BREC to recover the costs of installing environmental control
13 equipment on Big Rivers from ratepayers will not result in just and reasonable
14 rates.

15 Based upon those conclusions my recommendation is that the Commission not
16 approve the Company's request for a CPCN for Big Rivers.

17 **Q. Does this complete your Direct Testimony?**

18 **A** Yes.

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PROFESSIONAL EXPERIENCE

Synapse Energy Economics Inc., Cambridge, MA.

Senior Consultant, July 2003 to Present

Consulting services to state and provincial energy regulators and public advocates, state provincial and national energy departments, and non-governmental organizations on regulatory policy, power supply procurement, electric industry restructuring, portfolio management, rate setting and rate design, economic impacts of efficiency and renewable generation programs, and other utility and energy topics. Expert witness services and litigation advice. Co-authored reports, journal articles and conference presentations on portfolio management, energy efficiency programs, and electric reliability.

Vermont Department of Public Service, Montpelier, VT.

Director for Regulated Utility Planning, 1986-2003

Preparation of long range policy plans in the areas of electric utilities, energy and telecommunications, including oversight of research, modeling, public input processes, policy analysis and writing. Development of policy positions and drafting of legislation and rules concerning utility resource planning, power supply acquisition, generation and transmission permitting, environmental costing, energy efficiency and alternative generation, utility restructuring and retail choice, distributed utility planning, rate setting and rate design, mergers, financing and acquisitions, decision analysis, power contract restructuring, Qualifying Facility contracts and permits, net metering, and other critical regulatory issues. Extensive expert testimony on those matters, as well as utility bankruptcy, prudence reviews, and critical utility policy matters. Extensive legislative testimony.

Planning Econometrician, 1981-1986

Energy demand forecasting, economic and demographic projections, economic and policy impact analysis, avoided cost estimates, and other quantitative analysis for utility and energy policy making. Development of State's basic policies regarding least cost planning and resource selection, including methods for evaluation of and program design for generation, transmission and demand-side options. Implementation of utility energy efficiency program requirements.

Vermont Agency of Human Services, Montpelier, VT.

Director of Planning, 1979-1981

Vermont Department of Social and Rehabilitation Services, Waterbury, VT.

Director of Planning and Evaluation, 1977-1979

Acting Deputy Commissioner, 1977

Vermont Department of Corrections, Montpelier, VT.

Director of Planning and Research, 1974-1977

Chief of Research and Statistics, 1973-1974

Pre-2004 Energy Consulting

Illinois Energy Office, 1986.

Massachusetts Executive Office of Energy Resources, 1986.

Northern Technology, Inc., Gorham, NH, 1983-1985.

James River Corporation, Green Bay, WI, 1985.

Newfoundland Department of Natural Resources, 1995

Teaching

University of Vermont, Burlington, Vt., 1977 to 1989

Adelphi University, Garden City, N.Y., 1980 to 1988

University of N. H., Complex Systems Ctr., Grad. Studies Comm., 1992-1994
 Institute of International Education, Least Cost Planning Seminar, 1999
 Community College of Vermont, 2002-2004

Miscellaneous

National Science Foundation Undergraduate Research Grant, 1965.
 Wesleyan University Astronomy Prize, 1967.
 Association for Criminal Justice Research (Northeast/Canada), Director, 1973 to 1981,
 Secretary/Treas., 1973 to 1980.
 University of Vermont Graduate Award in Statistics, May, 1980.
 Contributing Editor, Current Index to Statistics, 1976-1985.
 Chair, Session on Energy Economics, New England Business and Economics Association
 Annual Meeting, 1983.
 Member, Intl. System Dynamics Soc., Tau Beta Pi.
 Northeast International Committee on Energy, New England Governors' Conference/Eastern Canadian Premiers, various
 periods, 1986 to 2003
 Director, Vermont Girl Scout Council, 1989-1991, 2000-2008; Secy., 1991-1997
 3rd Vice President, Girl Scouts of the Green and White Mountains, 2009 to date
 Editor, Intl. System Dynamics Soc. Bibliography, 1990-
 Advisory Group Member, New England Project, MIT Analysis Group for Regional
 Electricity Alternatives, 1991-1995.
 Chair, Steering Committee & Modeling Subcommittee, New England Governors Conf.
 Regional Energy Planning Project, 1991-1995.
 Member, Montpelier School System Technology Steering Committee and Montpelier
 High School Technology Committee, 1992-1993.
 Reviewer, Vermont Experimental Program to Stimulate Competitive Research, 1993-
 Invited Speaker, 3rd Intl. Conf. on Externality Costs, Ladenburg, FDR, 1995.
 Member, Steering Committee, New England Governors Conference, Restructuring/
 Environmentally Sustainable Technologies Project, 1996-1997
 U. S. DOE Distributed Generation Collaborative, 2000-2003
 Justice of the Peace, Montpelier, Vermont, 2007-

EDUCATION

Degrees

B.A., Physics, Wesleyan University, Middletown, CT, 1970
 M.S., Statistics, University of Vermont, Burlington, VT, 1980
 Ph.D., Mechanical Engineering, University of Vermont, Burlington, VT, 1988

Continuing Education

Seminar in Electricity and Telecommunications Demand, 1981
 Advanced Workshop in Regulation and Public Utility Economics, June, 1982 and
 June, 1983, Rutgers University
 Transmission Reliability Assessment, Power Technologies, Inc., 1986
 Regional Forecasting and Simulation Modeling, January, 1991, U. Massachusetts-Amherst

TESTIMONY, EXPERT REPORTS and AFFIDAVITS

Vermont Public Service Board

On behalf of the Vermont Department of Public Service:

Docket 4661 - Green Mountain Power Rate Increase
 Dockets 5009/5112 - Vt. Electric Coop. Rate Increase
 Dockets 5108/5109 - Vt. Marble Co. Small Power Rate
 Docket 5133 - Moretown Hydro Energy Co. Small Power Rate
 Docket 5202 - VPPSA Refinancing
 Docket 5248 - DPS Ontario Hydro Power Purchase

Docket 5270 - Least Cost Planning and Demand-Side Management
Docket 5270-GMP-1 - Highgate Apartments Fuel Switching
Docket 5270-CV-I&3 - Demand-Side Management Preapproval and Ratemaking Principles
Docket 5270-CV-4 - IRP
Docket 5270-VGS-1 - Demand-Side Management Preapproval
Docket 5270-WEC-1 - Demand-Side Management Preapproval
Dockets 5270-BRTN-1, 5270-CUC-3, 5270-HDPK-1, 5270-JHNS-1, 5270-JKSN-1,
5270-LDLW-1, 5270-LYND-1, 5270-MRSV-1, 5270-ORLN-1, 5270-RDSB-1,
5270-ROCH-1, 5270-STOW-1, 5270-SWNT-1, 5270-VMC-1 - IRP's
Docket 5270-VGS-2 - Demand-Side Management Preapproval
Docket 5277 - DPS Ontario Hydro Transactions Agreement
Docket 5330A - Hydro Quebec Power Purchase
Docket 5330E - Hydro Quebec Power Purchase, Waiver and Amendment
Docket 5372 - CVPSC Rate Increase
Docket 5491 - CVPSC Rate Increase
Docket 5630/32 - VEC Debt Restructuring & Rate Increase
Docket 5634 - NET Toll Dialing Plan
Docket 5638 - CVPSC Mack Molding*
Docket 5664 - EPACT Standards
Docket 5810/11/12 - VEC Debt Restructuring & Rate Increase
Docket 5825 - Ludlow IRP - externalities
Docket 5826 - Vermont Marble Electric Division - IRP - externalities
Docket 5832 - Lyndonville IRP - externalities
Docket 5841/5859 - Citizens Utilities Prudence Review & Revocation Petition
Docket 5854 - Electric Restructuring*
Docket 5857 - GMP Rate Increase*
Docket 5971 - VEC Bankruptcy Reorganization*
Docket 5980 - Proposal for Statewide Efficiency Utility
Docket 5983 - GMP Rate Increase (HQ Issues)
Docket 6018 - CVPSC Rate Increase (HQ Issues)
Docket 6107 - GMP Rate Increase (HQ Issues)
Docket 6140 - Electric Industry Restructuring (various presentations)*
Docket 6033/6053/6110/6142/6158/6326/6327/6371/6462/6464 - various municipal electric rate increases*
Docket 6270 - Qualifying facility contract reform
Docket 6290 - Distributed Generation*
Docket 6300 - Sale of Vermont Yankee
Docket 6330 - Petition of CVPSC and GMP on Restructuring (various presentations)*
Docket 6149/6315 - WEC electric rate increases* (HQ and Settlement Issues)
Docket 6460 - CVPSC Rate Increase (HQ Issues)
Docket 6495 - Vermont Gas Systems Rate Increase (Deferral Account and Hedging)

Docket 6565 - Various station service contracts

Docket 6596 - CUC rate Increase (HQ Issues)

Docket 6758 - Fourteen Utilities - Violations of Statutes on Special Contracts and Special Rates—Phases I & II

For consulting clients:

Docket 6958 - Green Mountain Power Rate Design - for AARP

Docket 6958 - Green Mountain Power Rate Design - for Conservation Law Foundation

Docket 6958 - Green Mountain Power Rate Design - for Conservation Law Foundation

Docket 7085 – CVPS Street Lighting Tariff – for Village of Woodstock

Docket 7175 - Green Mountain Power Rate Design – for Conservation Law Foundation and AARP

Docket 7176 - Green Mountain Power Alternative Regulation Plan—for Conservation Law Foundation and AARP

Docket 7336 – CVPS Alternative Regulation Plan – for Conservation Law Foundation*

Docket 7466—Efficiency Utility Structure—for Conservation Law Foundation

Docket 7670—20 Utilities Petition to Purchase Power from Hydro Québec US— for Conservation Law Foundation

Vermont State Environmental Board

Docket 5W0584-EB - Developers Diversified Land Use Permit

Federal Energy Regulatory Commission

Docket Nos. ER95-1586-000 and EL96-17-000 - Citizens Utilities Company **

California Public Utilities Commission

Multi-Stakeholder Study of Alternatives to the Mohave Generating Plant Pursuant to CPUC Decision 04-12-016 - for Southern California Edison (February 2006) *

R.06-02-013 – Long Term Procurement Plans of PG&E, SCE and SDG&E&E – for the Division of Ratepayer Advocates (March 2007)

Connecticut Department of Public Utility Control

Docket No. 03-07-16 - Alternative Transitional Standard Offer (live testimony Dec. 2004, prefiled comments Jan. 2003) *

Delaware Public Service Commission

Docket No. 04-391 – Standard Offer Service – for the Commission Staff (live testimony October 2006)

District of Columbia Public Service Commission

Formal Case 1047 – Investigation into the Structure of the Procurement Process for Standard Offer Service – for the District Office of People’s Counsel (June 2006 to date) **

Florida Public Service Commission

Dockets 080407 through 080413-EG – Commission Review of Numeric Conservation Goals – for the Southern Alliance for Clean Energy and the Natural Resources Defense Council (August 2009)

Illinois Commerce Commission

Docket No. 05-0159 - Commonwealth Edison Basic Utility Service Procurement

Docket No. 05-0160, 0161 and 0162 - Ameren CILCO, AmerenCIPS, and AmerenIP - Basic Utility Service Procurement

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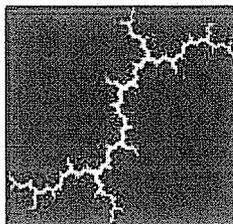
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Portfolio Management: Tools and Practices for Regulators

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1. Introduction and Summary

1.1. Background and Purpose

Ensuring that reliable retail electric service is being provided at reasonable rates is more challenging than ever.

The providers of the generation component of that retail service, regardless of the presence or absence of retail competition, face a host of major uncertainties. These include high and volatile natural gas prices, uncertain wholesale power prices, uncertainty regarding the feasibility and economics of new generation capacity, and a wide range of possible environmental regulation futures, particularly with respect to greenhouse gas emissions. Providers must address those uncertainties when choosing supply strategies, resource mix, and ownership or contracting arrangements.

Regulators are faced with the difficult task of aligning resource plans and procurement strategies with the policy objectives of their particular jurisdiction. Those policy objectives may include enhancing reliability, managing risk, improving the performance of wholesale and retail markets and achieving reasonable rates. In other words, they must determine whether the proposed resource plans and procurement strategies represent “the best” choices from the full range of viable alternative plans and strategies, given their objectives.

Regulators face these challenges both in jurisdictions with retail competition and fully regulated states. Some states, such as Delaware, have recently enacted legislation mandating changes to procurement policies.¹ Others have grappled with these issues in various regulatory proceedings to institute new or updated procurement policies. Examples of recent relevant cases and proceedings in states with, or introducing, retail competition include:

- Illinois—Commerce Commission Docket 05-0159, Commonwealth Edison Auction, Dockets 05-0160, 0161 and 0162, Ameren Utilities
- Delaware—Executive Order No. 82

Examples of recent relevant cases and proceedings in vertically integrated states include:

- California—Rulemakings 01-10-024 and 04-04-003
- Oregon—Public Utility Commission Dockets UM-1056 and UM-1066 regarding IRP Policy
- Montana—Montana Administrative Rules, sub-chapter 20: Least Cost Planning—Electric Utilities. 38.5.2004

The parties to such proceedings must grapple with a number of questions at both a broad and detailed level. Broad questions that arise include:

¹ Electric Utility Retail Consumer Act of 2006, 75 Del. Laws ch. 242 (Apr. 6, 2006)

-
- What level of price volatility is tolerable for customers, taking into account the means at their disposal for managing that risk?
 - How can portfolio management help address public interest concerns regarding the level and stability of electricity prices?
 - Over what timeframe will the proposed strategy apply?
 - What level and stability of prices are expected to result during that time?
 - What are the key assumptions underlying those expectations?
 - How sensitive is the expected level and/or stability of prices to a change in those assumptions?
 - What flexibility is there to modify the strategy in response to changes in demand or supply conditions; at what points in time is that possible; and what is the process for doing so?
 - What alternative strategies were or should be considered, including energy efficiency, demand response, and renewable energy resources?
 - How do those alternative strategies compare in terms of level, stability, and sensitivity of prices to changes in assumptions?

More detailed questions can also arise, such as:

- What quantity of supply should be sought in each procurement and for what contract duration(s)?
- What portions of supply should be acquired through utility-owned generation, short-term purchases (e.g. day ahead markets), short- or long-term fixed price contracts, contracts for output from renewable energy resources, and investments in energy efficiency and demand side management (DSM)?
- When and how often should auctions, RFPs, or other procurements be held?
- How should auctions or procurements be designed to attract bids from providers of energy efficiency and renewable resources in addition to traditional supply side resources?
- Will the proposed strategy limit the ability to respond to carbon emission policies in the future?
- Will the proposed strategy limit the ability to respond to newly available resources, projects, or technologies in the future?
- Will the proposed strategy result in long-term commitments that have a high probability of exposing the provider or its customers to material stranded costs in the future?

The advantage to a portfolio management (PM) approach is that it provides regulators, utilities, and other parties with a systematic process and set of tools to answer such

questions in a transparent manner. Not only can PM reveal input data and assumptions, it can also identify and quantify the trade-offs between objectives under alternative strategies.

The primary purpose of this paper is to provide regulators with an overview of PM tools and practices that could be applied to the procurement of electricity resources to serve retail customers.² As will be seen, these tools and practices are valuable both in the resource planning of vertically integrated (or partially integrated) utilities and in the development and oversight of policies for default service in retail competition jurisdictions. The report only briefly reviews the benefits of PM, as a number of other reports have described the benefits of portfolio management in detail.³ The paper then explains how PM can be implemented in states that are fully regulated as well as in states with retail competition. Finally, it presents a discussion of several key technical aspects of applying PM, including modeling tools, analytical techniques, and necessary expertise.

1.2. What is Portfolio Management?

The term “portfolio management” has a long history in the realms of finance and investment. Under that name and others, the same risk management concepts and techniques have long been applied to procurement of commodities, including electric utility procurement of fuels and purchased power and local distribution company (LDC) procurement of natural gas.⁴ In recent years, the term has begun to be used in the electric industry to describe actual or suggested approaches to default service resource planning and procurement in states that have restructured their electric industry.⁵ However, application of portfolio management concepts need not be confined to retail choice states.

First, interest in development of a set of modern planning and procurement tools for application in the electric industry has been evolving over the last several years. In its 2003 resolution on PM, the National Association of Regulatory Utility Commissioners (NARUC) encouraged state regulatory commissions to

... explore portfolio management techniques that may be applicable to their particular circumstances, under either traditional or restructured markets, and to adopt appropriate regulatory policies to facilitate effective implementation of portfolio management practices by regulated utilities.

² Many electric utilities and load serving entities are familiar with these tools and practices, as noted earlier.

³ See, for example, Bruce Biewald, et al, *Portfolio Management: How to Procure Electricity Resources to Provide Reliable, Low-Cost, and Efficient Electricity Services to All Retail Customers* Synapse Energy Economics, October, 2003. Prepared for the Regulatory Assistance Project and the Energy Foundation. Available at <http://www.synapse-energy.com/Downloads/SynapseReport.2003-10.RAP.Portfolio-Management.03-24.pdf>

⁴ Biewald, et al., and Frank C. Graves, et al., *Resource Planning and Procurement in Evolving Energy Markets*, The Brattle Group, prepared for The Edison Electric Institute, January 31, 2004.

⁵ In retail choice jurisdictions, various names are applied to this concept. Some of those are Basic Generation Service, Standard Offer Service, Provider of Last Resort service or POLR, and Basic Utility Service. Unless discussing the regime in a particular jurisdiction, we will use these terms interchangeably to mean the electric service provided to customers who do not shop.

In a 2004 report on resource planning and procurement in electricity markets sponsored by the Edison Electric Industry (EEI), the authors stated, “A synthesis is needed to meet customer needs for risk management and least-cost planning in the evolving industry structure that is a hybrid of competition and regulation.”⁶

Second, there is increasing interest in meeting future electricity requirements through a diverse mix of cost-effective resources, including energy efficiency, non-traditional renewable resources, and new technologies such as distributed generation, in addition to traditional supply side resources. For example, the Energy Policy Act of 2005 (EPAc) requires consideration of a fuel source diversity standard.⁷ Also, fuel diversity has been a major topic at both the 2005 and 2006 annual “Commissioners Only Summit” sponsored by National Regulatory Research Institute (NRRI). More recently, in July 2006, the President of NARUC and the Chair of EEI introduced a National Action Plan for Energy Efficiency that identifies energy efficiency as a high-priority energy resource.

This interest in applying a modern set of analytical tools to the acquisition of a diverse range of traditional and non-traditional resources is reflected in the following definition of PM, drawn from a 2006 report on clean energy policies and best practices prepared by the United States Environmental Protection Agency (EPA):

Portfolio management refers to energy resource planning that incorporates a variety of energy resources, including supply-side (e.g., traditional and renewable energy sources) and demand-side (e.g., energy efficiency) options. The term "portfolio management" has emerged in recent years to describe resource planning and procurement in states that have restructured their electric industry. However, the approach can also include the more traditional integrated resource planning (IRP) approaches applied to regulated, vertically integrated utilities.

Thus, portfolio management as applied in the electric industry may be seen as an approach to or refinement of traditional utility resource planning, which draws upon integrated resource planning, resource procurement, and risk management.⁸ As such, PM encompasses three distinct components:

- developing a resource plan,
- procuring the portfolio of resources identified in that plan, and
- managing that portfolio of resources on an ongoing basis.

⁶ Graves, p. 3.

⁷ EPAc 2005 Title XII Electricity, Subtitle E, Amendments to PURPA §1251(a).

⁸ Not all concepts, tools and practices from financial markets can be applied directly to electric markets; some may not apply while others may need to be customized. Conversely, many of the products and tools relevant to electricity portfolio management are unique to that industry.

1.3. How Might PM be Applied to Particular Retail Electricity Markets?

PM can be, and is being, applied in a variety of ways. In fact, the spectrum of approaches to implementing PM ranges from a narrow, passive approach at one end of the spectrum to a comprehensive, active approach at the other.

- A narrow, passive approach might be one in which planning considers only a short time frame and few resources, there is a single annual process for purchasing 100% of requirements, and periodic reviews and updates are absent.
- A comprehensive, active approach might be one in which resources are selected from a broad range of resources based on multi-year, long-term scenario analysis, and procured under a variety of ownership and contracting arrangements. Under a comprehensive approach, decision-making would reflect the cost and risk minimization benefits of diversification – diversity of fuels, diversity of technologies, including energy efficiency and renewables, diversity of contract terms and conditions (such as start dates and durations) and diversity of financial instruments for risk management. It would also include active or ongoing management of portfolio resources in response to changes in customer requirements and market conditions from day to day, week to week and month to month.

In any given state, the policy framework and objectives that govern the retail electric market, particularly electricity supply service, will be a key factor in the choice of a PM approach from this spectrum. For example, if the explicit policy objective of a state is to strongly encourage the development of a competitive retail market for all customers, the regulator may choose to support a narrow, passive PM approach for default service so that service will be relatively unattractive or provide maximum scope for retailers to differentiate themselves. On the other hand, if the explicit policy objective is reasonable rates to all customers receiving regulated retail service, the regulator may choose a comprehensive, active PM approach for default service. Similarly, a state's policy framework may assign responsibilities in certain ways, for example relying on an Independent System Operator (ISO) or Regional Transmission Operator (RTO) to ensure reliability. The application of PM must take such divisions of responsibility into account.

Given the variation in policy objectives among the states, it is not surprising that the retail competition states exhibit a range of approaches to portfolio management. Some states have essentially no PM. In other states a narrow, passive approach is being applied to the procurement and management of resources for default service. Appendix A presents key characteristics of default service procurement in the states that we surveyed. That approach typically consists of the following components:

- a procurement strategy using fixed-price, slice-of-load contracts of one or more term lengths up to three years, possibly overlapping in a laddered sequence,⁹

⁹ In some jurisdictions, slightly longer initial term lengths were used to synchronize procurement with ISO or RTO planning and commitment cycles.

-
- procurement via (usually) annual auctions or request for proposals (RFPs), and
 - absence of ongoing resource management between annual auctions.

There is little evidence of quantitative analysis of risks and benefits underlying the design of these procurement strategies. When contract laddering is the sole procurement tool used, it provides only limited portfolio management benefits, which are realizable only over only the length of that ladder, sometimes a very short time frame. Some states are beginning to address this limitation through new laws that explicitly try to obtain low costs over the long-term for their smaller default service customers. A variety of means have been adopted or are under discussion for this purpose. Maine, Delaware, and Maryland have each taken such steps. (See Appendix A of this report for details.) The general goal of the new policies is essentially to achieve reasonable and stable rates for default service. As a result, regulators in those states are beginning to explore ways to move to a more comprehensive, active approach.

The fully regulated states we surveyed had a comprehensive, active approach to portfolio management. Data from this survey is presented in Appendix B. In these states some form of long-term planning, which in some cases might be called "IRP," is required every few years. Procurement is not tied to an annual cycle of auctions, and ongoing management is expected. On the other hand, while planning in most of those jurisdictions included some analyses of uncertainty generally in the form of "sensitivity analyses," extensive quantitative analysis of the risks of various alternatives from a customer or public policy perspective was not the rule.

1.4. Key Conclusions

Our key conclusions are as follows:

- The providers of the generation component of retail electricity service face a host of major uncertainties, including future restrictions on emissions of carbon dioxide and future natural gas prices.
- Portfolio management, as applied to the provision of retail electric service, encompasses development of a resource plan, procurement of the portfolio of resources identified in that plan, and management of that portfolio of resources on an ongoing basis.
- Portfolio management provides regulators, utilities, and other parties with a systematic process and analytical tools for identifying a plan that will result in reliable service at reasonable rates. It offers transparency and tools for dealing with uncertainty and risk.
- Portfolio management can be applied to the generation component of retail service, regardless of the presence or absence of retail competition. Portfolio management approaches can be selected from a continuum ranging from comprehensive and active or narrow and passive.
- A narrow, passive approach to portfolio management may expose retail customers to rates that are higher or more volatile, than a comprehensive, active approach. A

strategy composed of a diverse mix of cost-effective resources, including energy efficiency and non-traditional renewable resources, may provide the best balance of expected cost and stable rates over the long-term.

- The policy framework and objectives that govern the retail electric market in a state influence the choice of an approach to PM in that state. Subject to policy constraints, regulators generally have authority to determine how portfolio management will be applied and by what entity.
- There is a range of computer models available for PM. They include planning models capable of addressing either (1) traditional cost-based engineering optimization analysis of the *expected* costs of *long-range* portfolios of traditional supply-side resources,¹⁰ (2) scenario-based comparisons of *long-range* portfolios of traditional resources for "robustness," or (3) short- to near-term quantitative risk analysis of a wide range of physical resources and financial instruments. Most quantitative risk analysis models are financial tools that analyze risk from the perspective of the supplier rather than retail customers.
- Most of these planning models require special effort in order to include energy efficiency and renewable energy in their evaluation of resources. In addition, these tools would benefit from improving their methodologies for analyzing long-term risks and comparing long-term decisions under uncertainty. For example, some existing optimization models require the representation of system operation to be simplified and limit the number of resources that can be considered in a model run. Such modeling constraints can prevent the long-term costs and benefits to consumers of a diverse mix of resources from being evaluated fully. Regulators may wish to promote research and development on improvements in these areas.
- Multiple modeling tools may be needed to address all three components of PM. However, integrating their results may be challenging.
- It appears that insufficient attention is being paid to development of tools for realistic analysis of long-term risks and long-term comparison of resource options that take uncertainty into account. Regulators may wish to promote research and development of open source algorithms or software in these areas.
- Staffing and resource limitations, as well as general lack of familiarity and acceptance, may be challenges to implementing or overseeing portfolio management at regulatory commissions. Regulators can do much to reduce such barriers over time.
- Portfolio management analysis and implementation will only be as good as the people who carry out and oversee those tasks. Managers and regulators need to consider the skills and abilities for doing so.

¹⁰ Models driven by optimization techniques may also lack fidelity in imperfect markets and situations where decision making and investment practices are suboptimal, as is often the case.

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- It is not clear that the data necessary for portfolio management in the electric utility industry exist in all cases. Where it does exist, the data may be private and confidential. Certainly, some historical data series are publicly available, such as fossil fuel market prices and, more recently, electricity and weather hedge prices. Other data, such as load profiles and volatility, plant outage rates, and heat rates may be less available than in the past due to competitive pressures. Regulators and utilities can begin with data that is available, publicly or under confidentiality arrangements. They also may wish to identify new information that should be developed to maximize the feasibility and usefulness of risk analysis.
 - The application of certain elements of portfolio management in the electric industry is still relatively new. Some fully regulated states and some retail choice states have begun to take action, but there is much room for improvement and certainly room for more states to implement PM. Regulators can play an important role in encouraging further improvements in, and adoption of, these concepts. Regulators may wish to promote the development of portfolio management tools that can address energy efficiency and renewable energy resources to the same degree as traditional supply-side resources at every stage of the process.
 - Screening out or winnowing down major diversification options very early in a planning study or risk assessment can seriously compromise the results. The real value of those options may not become apparent until much later in those studies or assessments, when analyses of risk and uncertainty are prepared.
 - Regulators will likely need to exercise considerably more oversight of risk mitigation, in the future. Unfortunately, clear methods for conceptualizing risk in utility portfolio management are not well developed. Regulators may wish to consider exploratory proceedings to develop and communicate risk management and portfolio management goals and criteria.

2. Portfolio Management: Objectives and Applications

Portfolio management is a process and a set of tools that can be applied in order to achieve objectives specified by the user. It needs to be informed with the goals and values regulators want pursued.

This section presents a brief overview of the public policy objectives that regulators may seek to achieve through the application of portfolio management, as well as the manner in which portfolio management can be applied under various market structures.

2.1. Portfolio Management Can Be Used to Achieve Public Policy Objectives in a Transparent Manner

The broad public policy objective that regulators traditionally sought to achieve with respect to retail electricity markets was reliable service at reasonable rates. This policy objective was typically set out explicitly, either in legislation or regulations. Some states changed these broad objectives when they implemented retail competition. More recently, some states with retail competition have passed new legislation effectively requiring default service to be provided at reasonable rates. For the purposes of this report we will focus on the objectives of reliable service at reasonable rates.

Reliable service at reasonable rates is not a new objective. Regulators have a long history of reviewing utility plans and operations to determine if they satisfy that objective. Out of that history many states have developed explicit, quantitative benchmarks for certain aspects of reliable service against which regulators can assess utility plans and operations. One such benchmark is a loss of load probability (LOLP) of one day in ten years for generating capacity adequacy.

In contrast, there are no generally accepted quantitative benchmarks for “reasonable rates.” Instead, the criteria for reasonable rates vary. This variation is driven by many factors such as differences in the availability of resources and differences in regulatory policy tradeoffs. Regulators consider a number of facts and objectives when making energy policy decisions and in determining whether rates are reasonable. Those facts and objectives vary from state to state, as do the weights that regulators apply to them.

Facts and objectives that regulators in most states consider when assessing whether retail electric service rates are, or will be, reasonable include:

- The resource options commercially available,
- The costs of those resource options,
- Whether the proposed mix of resource options minimizes costs to ratepayers (i.e., minimum rates and bills), and
- Whether the proposed mix of resource options will result in stable costs to ratepayers (i.e., stable rates and bills).

Regulators may also consider fuel diversity targets, renewable energy targets, carbon dioxide targets, other environmental goals, service to low-income customers, impacts on the local economy, and flexibility to respond to major changes in market conditions and public policies over time.

The desire to achieve multiple objectives often complicates the determination of whether rates are reasonable, because the objectives are often conflicting. For example, one strategy might be to minimize costs for the year by purchasing all generation supplies from a spot (e.g., day ahead) wholesale market. This strategy might be premised upon a belief that a strategy that included any multi-month contracts at fixed prices would incur extra risk premium costs on average in the long run. On the other hand, this hypothetical purchasing strategy could result in very volatile costs that would necessitate some sort of routine rate true-up mechanism, and, as a result, lead to highly volatile rates for customers. A second, alternative strategy might be to stabilize rates by acquiring all supplies via long-term fixed price bilateral contracts, say through a single procurement for 100% of requirements. This alternative hypothetical strategy stabilizes rates and simplifies administration, but could result in higher expected costs than the first strategy on average over time if, for example, sellers of fixed price contracts wish to and can obtain a risk premium in return for that price certainty. Neither hypothetical strategy would satisfy both objectives of minimum costs and stable costs. In contrast, a third hypothetical strategy consisting of a mix of spot purchases and fixed price contracts might partially satisfy both objectives in a balanced manner, trading off somewhat higher costs in exchange for somewhat more stable costs, and vice versa (again, assuming that fixed price term contracts require payment of a risk premium).

One major way in which states differ is the timeframe or planning horizon over which they assess the reasonableness of the rate impacts of resource decisions. In some states regulators assess reasonableness over a short-term time frame, one to three years for example. In others regulators consider the implications of the strategy and resource mix underlying the rates over the long-term of five to twenty years, as well as assess the resulting rates expected over the short-term.

Portfolio management provides regulators, utilities, and other parties to these determinations with a process, and set of tools, to select a strategy that will result in reliable service at reasonable rates and to do so in a transparent manner. Not only can it reveal input data and assumptions, it can also identify and quantify the trade-offs between objectives under alternative strategies. That transparency can, in turn, assist regulators in determining the weight to apply to each objective.

2.2. Portfolio Management Can Be Applied under Any Market Structure and Regulatory Framework

The market structures and regulatory frameworks governing electricity supply service to retail customers vary from state to state. For the purposes of this report, those structures can be grouped under one of two broad frameworks – fully regulated or retail competition. For simplicity, this discussion will consider the retail competition framework to be a fully developed one where the provider of default service (usually the distribution company) is not allowed to retain a generation or merchant power function.

One can characterize and distinguish between those two frameworks according to the entity responsible for providing generation service and the entity responsible for ensuring that those rates are reasonable. The distinctions between the two market structures according to those attributes are summarized in Table 2.1, below.

Table 2.1 Key Attributes of Alternative Retail Market Structures		
Market Structure/ Attributes	Fully Regulated	Retail Competition with no Merchant Function
Retail competition	Not Allowed	Allowed
Responsibility for providing generation service	Utility	Competitive market for customers who shop <i>Default service¹¹ for customers who do not shop</i>
Responsibility for monitoring and oversight to ensure that generation service is reliable and reasonably priced	Regulator	Regulator

Portfolio management tools and practices can be applied to the resource decisions that need to be made under either of these frameworks.

2.2.1. Application of Portfolio Management in Fully Regulated Markets

In states with a fully regulated framework, utilities employ some form of portfolio management to select and procure the appropriate resources, implicitly or explicitly. Examples from the states that we surveyed are presented in Appendix B. In these states, portfolio management is usually intertwined with resource planning procedures, such as least cost planning or integrated resource planning, where they exist. Portfolio management may also be a part of the fuel procurement practices for generation-owning utilities.

The specific procedures through which portfolio management is applied vary from state to state. However, the general approach through which the three basic steps in portfolio management are applied are summarized below.

1) Preparation and periodic updates of resource plans

Utilities are required to file a resource plan at least every two to three years. The plans cover a long-term horizon, typically at least ten years. They begin with a projection of customer electricity requirements over that period and then evaluate all options available to meet those projected requirements, including supply-side resources, transmission and distribution investments, demand-side resources and purchased power. In some cases, resource planning may encompass fuel contracting for utility-owned generators, as well as plans or policies governing

¹¹ Also known as Standard Offer Service (SOS), basic generation service (BGS), and Provider of Last Resort service (POLR)

off-system sales of power or disposal of power supply assets. That evaluation considers the reliability, economics and risk attributes of those resource options and may also address their financial, environmental and social attributes. Based upon that analysis the plan identifies a specific mix of resources and/or strategy that the utility believes will result in reliable service at reasonable rates.

Regulators review these filings. In some states, they issue an acknowledgement that the plan satisfies the filing requirements. In other states, the regulator may approve the filing, an act that *may or may not* effectively pre-approve any major new initiatives proposed in the plan, such as construction of new capacity or execution of a new long-term purchased power agreement, depending on that state's laws and practice.

2) Procurement

Utilities execute planned procurements by acquiring assets in the form of capacity and fuel, and then using those assets to meet the requirements of their customers. They do this through periodic investments in generation capacity of their own, routine purchases of fuel, or execution of fuel contracts or hedges for that generation and periodic execution of power purchase agreements. In some cases, wholesale sales of power or hedges, or disposal of power supply assets may be part of this execution phase.

Regulators review the reasonableness of the costs and revenues resulting from these utility decisions. Typically those reviews occur when the utility applies for a change in its base rates. In addition, in states which allow utilities to adjust their base rates for changes in fuel and purchased power costs, those reviews may also occur annually in “fuel adjustment proceedings.”

3) Ongoing management

By ongoing management, we mean the as-needed adjustment of plans and resulting procurement actions reacting to changes in the load requirements and market conditions. As load requirements and market conditions change, the utilities modify their use of owned generation and purchased power assets accordingly. They may increase or decrease off-system sales from capacity that is temporarily not required to serve native load, acquire new supplies, ramp up or down demand-side management programs, or take a variety of other actions.

Regulators review the reasonableness of the costs resulting from these utility decisions in the same forums as the procurement decisions.

2.2.2. Applying PM in Retail Competition Markets

Portfolio management is applicable to the procurement of resources for default generation service in states with retail competition. However, as noted earlier, any decision regarding the scope and nature of portfolio management to be applied to this service is primarily a policy issue. This decision will necessarily flow from the policy framework and objectives that govern the retail electric market in the state.

This policy issue has been the subject of debate since the onset of retail competition. When retail competition was first introduced default service was expected to be either a temporary service during the transition to full competition or a true “default” service that relatively few customers would take, and then only while they were between competitive suppliers. Based upon that expectation, some regulators felt that a basic strategy and an annual procurement would be appropriate for the acquisition of supplies for default service.

Contrary to those initial expectations, most of these states have seen almost all residential customers as well as many small commercial, institutional, and industrial customers remain on default service. Given the number of customers who continue to rely on this service, and the recent sharp increases in the rates for that service resulting from the current acquisition approaches, regulators are now faced with the question of whether to require the use of a more complete and sophisticated portfolio management approach for the acquisition of power needed for default service.

If a regulator in a retail competition state is interested in such an approach, an important first step will likely be a review of the existing legislation, regulations, and orders governing that service. For example, changes may be required in order to assign responsibility for:

- more comprehensive resource planning, in terms of both time frame and a wider range of resources (e.g., energy efficiency, renewable resources);
- more latitude in procurement, including more flexibility in the timing of procurements, the quantities procured and contract duration;
- changes in procurement to encourage bids from providers of energy efficiency and renewable resources; and
- periodic analyses and updates of the acquisition strategy.

These responsibilities can be assigned to the incumbent distribution utilities or to a third party, but what is essential is that the responsibility be assigned to *someone*.

2.3. Portfolio Management Provides a Process and Set of Tools for Examining Complex Resource Planning and Procurement Issues

Resource planning and procurement have become increasingly complex over the past 20 years. Regulators need methods and tools that can be used to determine whether a particular resource plan will result in reliable service at reasonable rates.

To illustrate this challenge, consider each of the major steps involved in developing a resource plan and procuring the necessary resources.

The first step is to choose a planning horizon. Use of a reasonably long-term horizon, e.g., 20 years or more, allows a range of resources and costs to be considered, including new renewable resources that have yet to be built and anticipated carbon dioxide emission regulations. The next step is to forecast the quantity of capacity and generation

required. These requirements can be forecast, but are obviously subject to uncertainty. In addition, the quantities that will be required from hour to hour and day to day are very difficult to forecast because they are so sensitive to weather and economic conditions. In retail competition markets there is additional uncertainty as to what quantity of load will switch to, or from, competitive suppliers.

The third step is to identify the viable resources and associated contracting and hedging options. These may include:

- Demand side management and energy efficiency
- Distributed generation
- Supply side resources (subject to resource availability)
 - Hydro
 - Wind
 - Solar
 - Gas-fired
 - Coal-fired
 - Nuclear
- Physical contracts
 - Spot
 - Term contract
- Financial instruments

The key attributes of each resource need to be projected for the planning horizon, including the quantities available at various points in time and their corresponding costs and volatility.

The fourth step is to then identify the alternative portfolios or strategies, consisting of different mixes of these resource options that could be used to provide reliable service at reasonable rates. This may entail evaluating hundreds of possible candidate plans or portfolios in light of the many potential permutations and combinations of these resources.

This evaluation and selection problem can, in many instances, be solved mathematically using computers by formulating it as an “optimization” problem. Under this approach the computer software is told to find the optimal mix of resources that will minimize risk while minimizing expected cost.¹² As one would expect, there are data and computational limits to solving this problem. For example, the assumptions for volatility and uncertainty in key inputs are notoriously difficult to characterize. Computationally, the vast number of possible resource combinations and timing of those mixes requires simplifying assumptions (such as trimming the available resource options down to a small handful of “typical generating unit types”) to enable the models to run in a reasonable amount of time. Portfolio management provides regulators, utilities, and other parties with a process and set of tools to analyze these complex resource planning and procurement issues. As

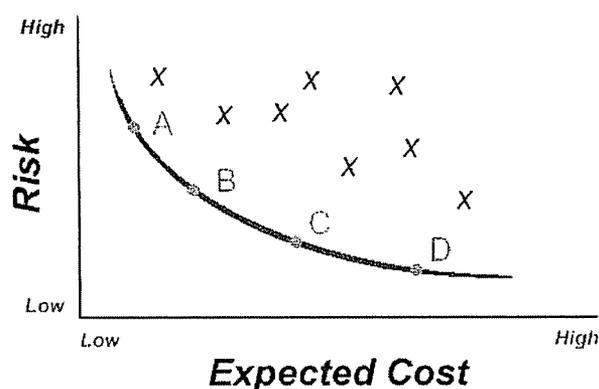
¹² This would generally be a nonlinear optimization model, likely a dynamic, multi-period one.

noted earlier, this approach can help all parties identify the assumptions to which the results are most sensitive and can also identify and quantify the trade-offs between objectives under alternative strategies. That transparency can, in turn, assist in determining the weight to apply to each objective.

Choosing Among Portfolios with Different Costs and Risks

Once candidate portfolios have been identified, their expected costs and variability can be estimated. The figure below can begin to give a sense of how candidate portfolios compare.

Example of Resource Plan Trade-off Curve



Each portfolio is represented by a symbol on the graph. The vertical axis indicates the portfolio's risk/uncertainty and the horizontal axis its expected cost. For a given expected cost, there will be one portfolio with the lowest level of risk, and vice versa. In our illustrative figure, A, B, C, and D mark four portfolios, each of which is the one that is least risky for a particular expected cost. As you move down along the curve connecting those four cases from right to left, there is a trade off in higher expected cost in exchange for less risk, i.e., more stable costs. One would always prefer a portfolio located somewhere along that line, because those portfolios represent the optimal levels of expected cost and risk.

The line connecting these "optimal" portfolios is the tradeoff curve, sometimes called the "efficient frontier." Considering only these two factors (expected cost and some particular measure of uncertainty), there is no economic reason to choose a portfolio above that frontier. However, each portfolio will have many non-economic pros and cons and there are various risk measures to consider, so the choice is never that simple. And, even along the frontier, the choice of a specific portfolio on that line will depend on what the decision-maker considers to be an acceptable tradeoff between the two objectives.

3. Confronting Uncertainty and Risk

This section will consider certain key issues regarding organization and implementation of portfolio management for regulators. The first subsection discusses why and how portfolio management applies in both fully regulated and retail choice jurisdictions. The next subsection addresses questions of organization and readiness for portfolio management approach to risk management. The third subsection highlights the challenge of making and communicating choices about risk management. The last subsection discusses in detail ways to measure and compare the risk of resource options and portfolios.

3.1. Two Contexts for Portfolio Management

As explained in Section 1 of this report, regulators from states with retail competition as well as from states with fully regulated utilities may need to address portfolio management.

Portfolio management has emerged in states that have restructured their electric utilities as an approach for acquiring resources to provide default service. In these states regulators and utilities responsible for implementing and overseeing default service procurement are faced with markets that do not always deliver stable, reasonably priced power in response to simple competitive procurements. Several states are moving towards a long-term view for delivering default service in the public interest.

In states with fully regulated generation service, vertically integrated utilities weigh various utility-owned resource options including new generation, transmission expansion, and DSM programs as well as power purchase contracts. Fully regulated utilities and their regulators now need to enhance resource planning, such as IRP, with more and better analysis and increased consideration of uncertainty and risk. Given the complexity of current markets and market products, traditional scenario analysis will no longer suffice to guide decision-making.

A sampling of some of the major new uncertainties facing regulators and utilities in all of these states help illustrate the complexity of their planning and procurement problems.¹³

- Will RTOs continue to develop?
- How will politics, pressure from the insurance industry, and fuel prices affect climate change regulation? How will "early credit" programs be treated?
- Will transmission companies proliferate and will they be able to generate enough return to gain access to capital for expansion?
- Will consumer interest in "clean power" increase or wane?
- Will the United States continue to be bifurcated into regional markets and territorial markets?

¹³ Adapted from http://www.scottmadden.com/pdfs/ScottMaddenEIUFall04_Full.pdf

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- Will wholesale market power issues cause divestitures, just mitigation activity, or continue to erode competitive pressures?
 - Will capacity expansion be driven regionally and, if so, by what mechanisms?
 - Will renewables development satisfy state targets?
 - Will fuel prices and environmental constraints strand some assets and speed development of new technologies?

Uncertainty and risk are addressed in the context of IRP as well as in financial risk management. Each of those perspectives emphasize detailed, quantitative analysis. IRP practice tends to emphasize refinement of long term expected or most likely cost and performance data for options. This is often supplemented with an engineering type bounding analysis, although in practice such bounding analyses often amount to simply running "plus or minus X%" scenarios or scenarios based on the range of estimates from different experts or studies. In contrast, quantitative analysis of the relative likelihood of various deviations or of how different risks interact to amplify or offset each other are relatively rare. Financial assessments of investment portfolios, on the other hand, currently emphasize detailed modeling the effects of variability and interactions of so-called "stable processes" by considering random variations in performance based on historical data for established products, but rarely consider longer term resource choices.

Given the strengths and weaknesses of the analytical tools and practices of each approach, and the planning and procurement problems in today's markets, we expect to see a gradual convergence of the portfolio management practices for IRP-like jurisdictions and default service procurement jurisdictions. In Section 4 of this report, we show that the current divide between the two approaches is mirrored in the software options available, too. Regulators may wish to push for a synthesis of these approaches, encouraging both rigorous detailed analysis and an understanding of the long range situation. New research and development may be necessary to accomplish this.

A portfolio management approach can also deliver side benefits to all consumers, even those who choose to shop from competitive suppliers. For example, inclusion of long term or even life-of-unit purchases from new renewable generators (or new generators not fueled by natural gas) can not only stabilize the cost of power for default service, but also lower clearing prices for all consumers by promoting new generation construction and reducing price pressure on natural gas at times of peak demand. A portfolio management approach to meeting the power needs of default service is compatible with the development of a vibrant competitive generation industry. In fact, by providing stable long term markets, a portfolio management approach for default service can enhance the health of the currently distressed generation industry by alleviating its dependence on an unfriendly project financing market.

3.2. Integrating IRP and PM Concepts

Portfolio management and integrated resource planning are not irreconcilable concepts. Rather, they are labels that emphasize different aspects of resource planning, all of which should be included in an ideal resource planning process.

Integrated resource planning involves the development of a portfolio of existing and new resources of all types that help achieve the lowest cost for consumers over the life of the plan. Each time an IRP is updated, an essentially new IRP is created, treating resources acquired since the previous update as committed and seeking the best selection of additions to form its new plan. Risks are usually assessed qualitatively or via scenario analysis, trying to find the resource plan that best combines a low cost with a reasonable degree of robustness against uncertainties. While IRPs can include fixed term purchased power contracts or consider disposing of committed resources, the emphasis is usually on permanent acquisition of resources.

On the other hand, portfolio management emphasizes assembling and managing a collection of resources, often entirely fixed-term purchase contracts. Diversification of expiration dates, vendors and, sometimes, term lengths is a typical tool in PM. Carefully designed competitive procurements are often the centerpiece of a PM approach, especially when over the counter markets are not fully developed.

PM has been applied in a narrow, passive manner in some states with retail choice and default service programs. For example, New Jersey, Maryland and Delaware limited procurement for default service generation to laddered two or three year, slice of load contracts obtained via a once-a-year auction or RFP. While such selections are implicit resource plans, they arbitrarily exclude a wide array of viable resources and limit the degree of risk mitigation provided to retail consumers. Conversely, preparing an IRP in which the focus is on identification of the least cost mix of permanent generation acquisitions and there is no assessment of risk would also represent a very limited approach to portfolio management—one with few choice points, limited diversification, and few market force effects.

Clearly, IRP can be improved by harnessing competition, by comparing resource plans using quantitative measures of risk in addition to expected cost, and by subjecting portfolios to active management. Conversely, procurement for default service (or other needs) can be improved by embracing a broad range of resource alternatives, striving for least cost service over time, and focusing on the risks borne by consumers rather than only those borne by the utility.

Applying aspects of portfolio management to the development and implementation of IRPs should be viewed as a challenging but natural enhancement of IRP for vertically integrated utilities. Several states have begun to consider such a move, especially with regard to risk management.

The descriptions of IRP and PM given above are generalizations based on typical practice among the states and may not be implemented identically in every jurisdiction. In fact, various practices can be called IRP or PM and may include some beneficial features of IRP or PM, but not fully realize either concept, much less an integration of the two. In principle, they are two ways of looking at the same problem. Ideally, resources would be planned, procured, and managed in ways that are both “integrated” and reflect “portfolio management.”

3.3. Organizational Issues

Organizational readiness and commitment are seen as critical to successful implementation of risk analysis and risk control through portfolio management.

While no one person at a major utility can (or should) make all decisions regarding portfolio management, it is the chief executive officer (CEO) who ultimately bears this responsibility. The CEO can best achieve portfolio management success by dividing up portfolio management responsibilities amongst the following types of employees: chief financial officer, chief risk officer, internal auditor, accountants (internal and/or external), chief technology officer, and others. In addition, the board of directors plays a key role in helping to define the overall risk tolerance of the organization.

It is interesting to note that, under Sarbanes–Oxley compliance requirements, the CEO is now legally responsible for ensuring that company-related risks are reported to shareholders. Not only is the CEO responsible legally, but from a practical standpoint the CEO plays a critical role in terms of setting the tone for policy implementation throughout the organization. Unless he/she makes portfolio management a key priority for the organization, it will likely be unsuccessful.

Direction and motivation are critical to success in risk management and planning for risk management. The tone for any new direction is usually set by the leadership at the top of the organization. Thus the application of these new tools in the electric industry will benefit if regulators set out clear expectations and if utility management commit to portfolio and risk management.¹⁴

With regard to PM implementation, organizations have options. A utility could choose:

- a narrow approach focused on specific resource planning activities mandated by law or regulation,
- a broad approach focused on risk analysis and management in all aspects of the firm, or
- an "optimally scoped" approach that seeks to strengthen portfolio and risk management in targeted activities, improve processes for that purpose, and establish ongoing monitoring and improvement.

Recently, under the impetus of Sarbanes-Oxley mandates, many firms have considered how best to organize risk assessment and risk control. A number of questions about a firm's readiness for risk assessment and control should be addressed. Some of these are:

- How well has the organization implemented other change efforts?
- Is the executive management supporting the effort, visibly and effectively enough to get buy-in from the entire organization?
- How well does executive management understand the effort required to implement PM and management's role in that implementation?

¹⁴ The following material draws on Anne Marchetti, *Beyond Sarbanes-Oxley Compliance: Effective Enterprise Risk Management*, John Wiley & Sons, 2005.

- Is the organization committed to providing resources (people, time, money) to both the design and implementation of the effort?

Regulators seeking to implement portfolio management and risk assessment at Commissions and utilities should ensure:

- clearly articulated reasons for implementation;
- a clear connection to the strategy of the organization;
- full implementation;
- integration with existing processes and initiatives;
- active, visible leadership;
- commitment of adequate time and resources;
- timely and thorough communication among regulators, advocates, utilities and other stakeholders, as well as throughout the affected portions of the utilities, including feedback and reinforcement;
- routine progress and performance measurement and review of corrective actions; and
- skilled, trained employees at commissions and utilities.

3.4. Making and Communicating Choices about Risk Management

Perhaps the first concept that comes up in a discussion of portfolio management is "diversification." We have devoted considerable discussion to that topic here and elsewhere.¹⁵ A second major concept that comes up in such a discussion is "risk tolerance." Risk tolerance refers to one's willingness to accept the risk of an undesirable outcome when making an investment choice.

It is natural, even traditional, for portfolio planning to determine, and take into consideration, the risk tolerance of an investment portfolio "owner" at an early stage in the process. A much more difficult problem arises in the context of applying PM to an electric utility, where the utility may be the "owner" but the costs will be paid by a large group of customers. It is difficult to express or ascertain the risk tolerance of individual customers in a meaningful way, much less whole classes of customers. While this report does not present a recipe for regulators to use in establishing the level of risk appropriate for the resource portfolio of a fully regulated utility or for a default service provider, this section attempts to clarify the issues that should be considered.

Decisions about risk should not be made in a vacuum or on a hunch. Even the sort of on-line questionnaire designed to guide personal investing decisions takes into consideration objective aspects of the investor's current situation and plans for the future. Risk tolerance discussions for individuals are driven by such life situation factors as age,

¹⁵ Biewald, et al. *Portfolio Management: How to Procure Electricity Resources to Provide Reliable, Low Cost, and Efficient Electricity Services to All Retail Customers*. Synapse Energy Economics, 2003. Available at <http://www.synapse-energy.com/Downloads/SynapseReport.2003-10.RAP.Portfolio-Management.03-24.pdf>

dependents, taxable income and projections thereof, existing assets and liabilities, commitments, fixed expenses, health status, retirement and other plans, and so on.

Regulators have been making risk tolerance judgments on behalf of ratepayers as long as they have been setting rates. Every decision to approve construction or a long term contract accepts certain risks and avoids others. Traditionally, such decisions have been made after careful qualitative and, sometimes, partially quantified consideration of the risks and uncertainties of a project under consideration and (slightly less often) the risks and uncertainties of the alternatives. However, trying to discipline or even quantify those tolerances is unbroken ground for many utilities. In fact, such discussions are typically based on evidence that amounts to the opinions of persons with a stake in the matter. An EEI report expresses the opinion that "The 'right' amount of risk-bearing for customers (in rates) is not self-evident."¹⁶ Moreover, we should not expect this job to be easy. In fact, that study calls on regulators to either specify the risk tolerance to be used or provide guidance to utilities on how it should be measured.

A finance expert might approach this question by asking regulators to name their risk tolerance (presumably something numerical, like "the probability that rates will increase by more than X% in any one year or more than Y% over five years should be less than Z%") and suggest that it would then be straightforward to determine how to deliver that level of certainty and offer to tell regulators what buying that degree of certainty will cost as of a given market day. Perhaps that could be done in theory, but there is no simple answer to the question of risk tolerance of customers. In part, this is because customers are not a homogeneous group and in part because the answer will depend on the methods used for reducing risk and their side effects.

Some would argue that rate stability is not free and all hedging comes with a cost. Others argue that long term hedges simply are not available. However, failing to hedge huge market exposure has external costs, while the absence of long-term, market-based forwards (only one of many ways to hedge risk) may be something of a self-fulfilling prophecy. Shipping companies could buy cargo and hull insurance for hundreds of years before anyone bothered to sell life insurance, but practically as soon as it was offered, life insurance was a huge success. Thus, markets for long term power contracts or other hedges may well develop if there is an adequate demand for them by buyers and sellers.

How and when the risk/cost tradeoff analysis is performed during resource planning and/or procurement processes can be just as critical to sound portfolio management as the metrics used and the preferences applied, especially when assessing longer term resources and risks. For example, as a recent national laboratory study observed,

[utility] resource plans vary considerably in how they define expected risk, and how they balance the expected cost and risk of different candidate portfolios. In selecting a 'preferred' portfolio, a utility would ideally review consumer preferences for cost-risk tradeoffs, and select the candidate portfolio that fits most closely with the risk preferences of the majority of its customers. This approach, however, is rarely used. Instead, in all of the cases we reviewed, the cost-risk

¹⁶ Graves, 2004, p. 21.

tradeoff (if made) is based on the subjective judgment of each utility, informed by any counsel provided by the utility's regulators or external stakeholders.... In other words, the cost/risk tradeoff has often been made – in part based on consideration of fuel price risk – before carbon risk is considered, in which case carbon risk is sometimes relegated to helping to distinguish between a few finalist portfolios.... As a result, some of the “renewables” portfolios in our IRP sample exhibit as much or more exposure to natural gas price risk than other portfolios.... By the time carbon risk is assessed, some renewables portfolios – i.e., those best able to mitigate carbon risk – may have already been weeded out of the process, potentially leaving the model to choose from among a number of sub-optimal portfolios.¹⁷

That study recommends "a more holistic assessment of risk, and approach to the cost/risk tradeoff" rather than a "sequential, winnowing approach." It goes on to point out that

...scenario analysis, and the risks analyzed with that technique, may end up as a mere sideshow to stochastic analysis. Related, a large and varied set of candidate portfolios should be evaluated for their ability to mitigate risks; otherwise, analysis results may be unduly affected by the pre-selection of possible candidate portfolios.

In summary, regulators will likely need to oversee or manage risk mitigation, but clear methods for conceptualizing risk in utility portfolio management are not well developed. Regulators may find it useful to consider exploratory proceedings or alternative input methods, such as deliberative polling, but in the end, regulators will need to develop and communicate risk management and portfolio management goals and criteria to generation service providers, either proactively or in response to utilities' implicit or explicit risk management choices. Further research on this point may be of value and could begin with a systematic effort to review the techniques used by institutional investors and manufacturers dependent on long lead time commodities, followed by analysis of how their methods may or may not be useful in utility planning and its oversight.

3.5. Techniques for Analyzing Risk Exposure and Uncertainty

3.5.1. Measuring Risk and Expected Benefit

Risk and uncertainty are inherent in all enterprises. But risk needs to be balanced against expected benefit. The balancing of risk and expected benefit in utility regulation differs from the balancing that occurs in business or investing. However many of the tools and metrics for measuring risk and expected benefit in business and investing can be, and have been, applied to the electric industry.

¹⁷ Ryan Wiser and Mark Bolinger, "Balancing Cost and Risk: The Treatment of Renewable Energy in Western Utility Resource Plans," *The Electricity Journal*, Feb. 2006; Ryan Wiser and Mark Bolinger, *Balancing Cost and Risk: The Treatment of Renewable Energy in Western Utility Resource Plans*, Lawrence Berkeley National Laboratory, 2005. Available at <http://eetd.lbl.gov/ea/ems/reports/58450-journal.pdf>

Business managers and investors decide how much of a return they require on a prospective investment in exchange for taking on a given level of associated risk. They then make go/no-go decisions on individual projects by measuring, implicitly or explicitly, the risk of a given project and its expected return to see if those criteria meet their investment threshold. Bond ratings are a tool commonly used for this purpose by investors. For example, an investor may choose not to invest in highly-rated corporate bonds unless the bonds bear an interest rate of, say, 3% above the interest rate for U.S. government bonds, because even highly rated firms may fail.¹⁸ The same investor might be willing to invest in the same corporation's common stock only if the expected return is 10% above the interest rate for U.S. government bonds, because common stock is the first type of security to suffer (i.e., to miss dividend payments or lose market value) when a firm is in financial trouble.

Rather than comparing expected return to perceived risk, utility regulators typically want to minimize rates or cost of service or both, while taking into account the degree of risk that ratepayers will face, as well as the risks to investors. Thus there is a need to balance the expected cost of a resource, or a portfolio of resources, with the risk that the actual cost of the resource may be more or less than expected at various times over the planning horizon, thereby introducing volatility into the cost of service during that period. It is also important to consider the risk that a resource choice will fail to provide necessary power (or save power in the case of DSM resources), triggering a need to buy at market rates. Finally one must consider how a given resource plan will impact the ability of the utility to attract capital. While the kinds of benefits and risks that regulators evaluate and balance are not exactly the same as those that businesses and investors consider, many of the tools and metrics available are suitable or may be adapted to either.

It is conceptually simple, but sometimes technically difficult, to compare different portfolios of resources based on their expected costs. Present value life cycle cost is the usual measure employed for that purpose. Unfortunately, there is currently no single, generally agreed upon measure of the risk of a resource portfolio. The accompanying text box on "Random Variables and Portfolio Management" explains portfolio risk in terms of cost uncertainty and the basic concept of comparing the riskiness of two portfolios. Appendix D of this report describes a variety of portfolio risk measures. The rest of this subsection explains a few of those risk measures and presents some key ideas about risk measurement.

¹⁸ U.S. government securities are often used as a proxy for an investment that bears no risk except for the risk that the inflation rate may change.

Random Variables and Portfolio Management

What is a random variable? A *random variable* is a number whose value changes, say over time, in a way that cannot be predicted in advance. Planning risk for utilities is often a result the random variability of weather, inflation, economic growth, power plant availability, the market price of gas and the like. These and similar factors have a big influence on the cost of a portfolio, but forecasts and trends of them are subject to unpredictable fluctuations. Often we are most interested in the long term average cost of a portfolio of resources; that cost, itself, is usually a random variable because it is determined by interaction of the random variables just mentioned and others, too.

What is a probability distribution? We usually know *something* about the behavior of a variable, even if it is random. The high temperature in Chicago on July 4 next year maybe impossible to predict, but we have lots of data about past temperatures. Using that data, we can say with some confidence that the most likely value is the long term average for that place on that day of the year. Using that data, we can also find the *probability* that the temperature will 90° or 101° or any other particular value. If we draw a graph showing temperature values on the horizontal axis and their probability of occurring as the vertical axis, we have a picture of that variable's *probability distribution*. (The figure below shows two examples.) In many cases, the graph may look like a bell curve; for others, it may not. If a variable can have only a few different values, such as yes or no or 0% to 100%, the graph will be a bar chart with one bar for each possible value.

What is an expected value? For a random variable, the *expected value* is the value we expect to see *on average* over time, but not necessarily the single most common value.

How is variability measured? Appendix C to this report describes a number of ways to put a number on the uncertainty of a portfolio's cost, but they are all ways of expressing the width of the probability distribution.

Where do we get probability distributions for resource planning variables? If historical data is exists, such as for weather or fuel market prices, we can rely on that data *if* we are confident that the systems that produced those data will not change. For example, we might believe that a manufacturer's historical data on the availability of the generators of a certain type will be representative of the units we need to model. On the other hand, we may feel that weather data need to be adjusted for the impact of climate change. Finding good data for the probability distributions of resource planning variables is challenging, especially for long-term planning.

How do probability distributions relate to portfolio management? The riskiness of a portfolio of resources is related to the variability or uncertainty of its cost. For example, a portfolio consisting of only two resources, a single generating plant and spot market purchases, would have at least four sources of uncertainty. One is the uncertainty in the plant's fuel cost. Another is the variability in the market price paid for any extra power needed or earned for an excess sold. The third would be variation in the load to be served, because that determines how much power is available to sell on the market or how much extra needs to be bought. Lastly, the availability of the plant helps determine how much market power needs to be bought or sold. If we know (or can assume) the probability distribution of those four variables, we can compute the probability distribution of the portfolio's projected cost. The probability distribution of the cost for this hypothetical portfolio might look like Curve A in the figure in this text box.

How are probability distributions used in comparing portfolios? Suppose we wanted a portfolio with a more stable cost. Then we might consider adding a fixed price purchase contract to cover some of the excess power need. This would reduce variability as some or all of the purchases would be at a known price. We might also purchase options for the generator's fuel. The options would cost us a certain amount whether we exercise them or not, but would ensure that the fuel price does not exceed a certain value and also reduce the variability of the portfolio's cost. We could use this new information to compute the probability distribution of the revised portfolio's projected cost. The distribution of the cost for this revised portfolio might look like Curve B in the figure below.

Curve B is much narrower, illustrating the reduction in uncertainty about portfolio cost, but is shifted to the right, reflecting the extra fixed cost of some of the risk mitigation measures. So, comparing these hypothetical probability distributions, we would have to make what may, or may not, be a difficult decision, i.e., is it worth paying a somewhat higher expected cost to avoid exposure to the possibility of a very high cost. If the differences in costs under the two approaches are minimal the decision may not be difficult. If the differences in costs are large, the decision becomes more difficult. Or, we might decide to look harder for cost effective ways to reduce risk, such as adding less volatile renewable generators or ramping up energy efficiency to reduce the need for market purchases.

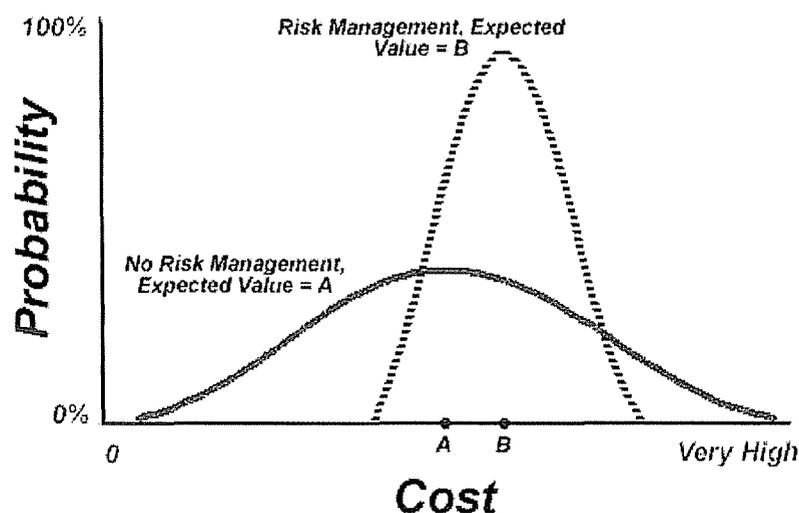


Figure 3.1. One view of the possible impact of hedging on risk exposure for the cost of a portfolio of resources.

One straightforward way to measure the riskiness or robustness of a portfolio is to compare its expected cost to its worst-case cost. Northwest Energy and the Northeast Power Coordinating Council (NPCC) compare portfolios using this type of metric. They measure each portfolio's risk as the difference between its expected cost and an average

of the costs in the last 10% of the high end of its probability distribution, which they consider to be the worst-case cost.¹⁹

Another approach for quantifying risk is to calculate the increase in cost over a given planning horizon (the selected risk level) for a specified probability or risk level. This approach, Value at Risk (VaR), was developed in the financial sector to evaluate the downside risk of an investment. It is always calculated in the context of a risk level and a planning horizon. Value at risk is widely used by banks, securities firms, commodity merchants, energy merchants, and other trading organizations, who often monitor it on a daily basis. In the case of an electricity resource portfolio VaR can be applied to measure the cost increase that has a certain probability (the selected risk level) of occurring over the selected planning horizon. For example, a regulator might be interested in the VaR of a proposed resource portfolio over a one year planning horizon at the 99% risk level. That VaR would tell us the amount of extra cost that would have a 1% chance of occurring over the next year. Or, a VaR at the 90% risk level for a ten year planning horizon would tell us the amount of extra cost that the portfolio has a 10% chance of incurring over the next ten years. Utilities in California compare portfolios using this type of metric and variations on it.²⁰

Value at Risk and estimates of extreme values like the metrics used in Montana are two measures of the risk of a specific portfolio. There are several possible measures of risk available for regulators to consider. These are listed in Table 3.1 and discussed in Appendix D of this report. The goal of monitoring and managing each of these risk measures is to identify sources of and changes to risk and to enable managers and regulators to reduce overall utility risk for both utility customers and shareholders. Consistency and transparency should be considered in choosing a measure to use. It may also be necessary to require validation of the computer models used for this purpose, especially proprietary or in-house models. It is also important to exercise care in the development of the probability distributions used to generate the risk measurements.

¹⁹ Not surprisingly, the mechanics of computing this measure of uncertainty are far from simple. This approach is discussed further in Appendix B of this report and in the *NorthWestern Energy 2005 Electric Default Supply Resource Procurement Plan*, available at <http://www.montanaenergyforum.com/plan.html>

²⁰ See Appendix B of this report and CPUC Energy Division, *Workshop Report on Value at Risk, Cash-Flow at Risk, and Other Measures of Portfolio Risk*. June 6, 2003.

Table 3.1 Possible Measures of Risk

Value at risk	Estimates the likelihood that a given portfolio's losses will exceed a certain amount.
Component value at risk	Measures the marginal contribution to value at risk of each element within the overall portfolio.
Credit value at risk	Measures potential credit exposure on individual transactions as well as the total credit value at risk for the portfolio.
Enterprise-wide risk measures	Aggregates market, operational, credit, and regulatory risk.
Costs at risk	Measures probability that a portfolio's costs will go up or down.
Rates at risk	Measures potential change in end customer's rates as a result of generation supply portfolio.

3.5.2. Considering Risk in the Assessment of Resource Choices

The various parties involved in long-term planning, fuel and purchased power procurement, and ratemaking will have a range of perspectives and goals. From a regulatory perspective the goals may be to achieve a reasonable balance of cost and risk. In order to prepare a quantitative comparison of alternative resource portfolios relative to those goals, a regulator may wish to know the expected retail rates over the next two years *and* the amount by which retail rates could increase over that same period at a 90% risk level for each portfolio. Adaptations of the VaR measure discussed above can be used for this purpose.

Expected cost and value at risk could be used to help evaluate and compare three alternative strategies, e.g., (1) the status quo plus purchased power from the wholesale market, (2) building a particular new generating plant, or (3) a combination of increased DSM and smaller purchases of power from the market. These metrics would allow comparison of the three resource choices on their expected present value revenue requirement (PVRR), the usual measure looked at in IRP, as well as on the risk of rate increases. Regulators have always done such risk assessments mentally or implicitly; now they have tools for making these assessments quantitatively and explicitly.

This notion, of course, is based on the assumption that one can actually quantify the risk. As discussed earlier, future probability distributions are typically estimated based on an analysis of historical data. If the historical data is inadequate or does not represent current or future fundamentals, then the probability distribution will not be accurate. Some types of risk are well represented in historical data, such as interest rate fluctuations, returns on financial investments, and some commodity prices. Other risks are not well represented in historical data. For example, the additional price risk for fossil fuels due to potential carbon regulations would have to be analyzed separately, perhaps through a scenario analysis, and added to the underlying uncertainty in fossil fuel market prices.

There are of course ways to reduce the level of risk identified in any such analysis. For example one might sign a long-term fixed-price contract or purchase commodity futures. That would eliminate, or nearly so, the risk associated with increases in material costs, but it would also eliminate the potential benefits if those costs fell. There are also more sophisticated approaches using call and put options which can limit the downside risks but still capture the upside benefits. The most neutral approach is a “costless collar” in which the purchase and sales costs of the options net to zero. In essence, this is trading some of the upside potential to protect against some of the downside risk.

Thus, to summarize, all of the “at risk” calculations attempt to determine the likelihood and magnitude of the downside risks. The results are based on statistical models, usually reflections of historic performance of a given investment or market, and predict a “loss” threshold at a given probability level over a specified time period. The methodologies are most robust in the short to intermediate term for normal economic conditions. Unusual or new conditions can be factored in through additional analysis, but these require special studies.

3.5.3. Tools for Mitigating Risk

The goal of monitoring and managing each of these risk measures is to identify sources of and changes to risk and to enable managers and regulators to reduce overall utility risk for both utility customers and shareholders.²¹

Many kinds of risk can be protected against with insurance, although there is a usually an increase in the expected cost for doing so. This is true for some resource types, but not all. For example, if one wishes to reduce exposure to the risk of possible climate change mitigation costs or emission permit costs, one could choose renewable resources over fossil fuels as a portfolio addition. At the current time, the expected cost of power from many renewable resource plants may be greater than the expected cost of fossil fuel plants over their respective lives. Hence, choosing that kind of renewable generation insures against a possible future cost at the expense of accepting an increase in the power cost that will occur if those climate change costs do not arise or arise late. However, there are possible “insurance” resources that do not incur extra costs. Many DSM resources are known to be cheaper in terms of lifetime revenue requirement than traditional fossil fuel generation (and the associated transmission costs and line loss costs), but also provide insurance against possible CO₂ emission costs. In addition, reducing a utility’s riskiness by making lower risk portfolio choices may reduce its cost of money and hence its overall cost of service.

²¹ For additional discussion of ways in which portfolio management can address electricity resource risk for regulated service or default service procurement, see Biewald, et al., 2003 cited above.

4. Tools and Data for Portfolio Management

4.1. Overview

Portfolio management activities can be grouped into three major applications or stages, as discussed earlier. These activities as indicated in the Introduction are

- developing a resource plan,
- procuring the portfolio of resources identified in that plan, and
- managing that portfolio of resources on an ongoing basis.

Some of the questions to keep in mind when considering the appropriate tools are:

- Over what timeframe will the proposed strategy apply?
- What level and stability of prices are expected to result during that time?
- What flexibility is there to modify the strategy in response to changes in demand or supply conditions, at what points in time is that possible, and what is the process for doing so?
- What alternative strategies were, or should be, considered?

The nature and scope of each activity may vary according to the entity responsible for portfolio management and its particular objectives, constraints and circumstances. For example:

1. Type of organization, e.g., vertically integrated utility or a load serving entity.
2. Scope of consideration, e.g., total cost of delivered services, generation service cost.
3. Planning objectives, e.g., rate minimization, rate stability, balance of rate minimization and rate stability, rates tied to day ahead prices.
4. Time frame for planning, e.g., decade or more, one to five years, less than a year.
5. Planning constraints, e.g., all new resources to be acquired from wholesale market, renewable energy target.

This section provides an overview of the data and software tools available for each major application and a brief discussion of the issues associated with each.

4.2. Tools Available for Portfolio Management

The software tools that are available come from two different perspectives (1) financial planning and investment and (2) traditional utility supply-side planning. The former flow from a highly developed quantitative practice and focus on the management of various financial instruments such as future contracts, laddering, and options. The software tools

available in this category offer fairly sophisticated methods for evaluating risk. Contrastingly, those models and tools coming from the utility side represent the unique aspects of the electric utility industry, but are *much less sophisticated* in risk analysis. The sections below describe the types of tools and Appendix C describes specific software tools in more detail. Table 4.1 provides an overview.

Table 4.1 Overview of software models for risk analysis and management

Application	Time Horizon	Input Data and Forecasts	Capacity expansion models	Procurement and scheduling models (no capacity expansion)
1. Integrated System Plan (analytics)	10 to 20 years (long-term)	Forecasts of <ul style="list-style-type: none"> • customer load, • price elasticity, • resource availability, • fuel costs, • resource costs, • risk premiums, • fuel price volatility, • reliability requirements and policies, • environmental policies and costs. 	<i>Optimization Models</i> Electric Generation Expansion System (EGEAS) EnerPrise Capacity Expansion <i>Screening, scenario, and risk analysis models</i> PowerBase Suite AURORA RISKMIN	<ul style="list-style-type: none"> • PLEXOS for Power Systems
2. Procurement (Trading and Risk Management)	1 to 3 years (short-term)	Energy and fuel price forecasts and market futures. Load requirements.		BookRunner; Edur Epsilon & Entegrate ICTS Symphony Planning and Risk
3. Management (Generation and Scheduling)	Daily to annually (day ahead or near-term)	Short term load forecasts. Resource and transmission availability Fuel and energy prices Environmental conditions		Monaco Predict! Kiodex Risk Workbench

4.2.1. Load Forecasting

Load forecasting has been done since the beginning of the electric utility industry. The approaches used vary by the time scale involved. Short-term forecasts of a day or less are based on typical hourly load patterns for the season and weather forecasts. Forecasts of a few years are generally derived from recent historic data and extrapolated with

adjustments for weather and simple external drivers such as population growth and planned DSM programs. Common current practice is to incorporate weather variability in computing confidence intervals for peak load levels. The greatest change has occurred with long-range forecasts. The old practice was to plot the historic load values on log graph paper and then draw a straight line into the future. More modern practices look at load growth by customer class and apply econometric methods to develop future values. In some cases the load components are broken down by end-use category. That approach is especially useful for designing and evaluating Demand Side Management (DSM) programs. Over the years, most entities have developed and refined their own custom tools for load forecasting.

4.2.2. Price Forecasting

With the move in recent years to wholesale markets, a number of tools have been developed that integrate load and price forecasting. Some of these are quite sophisticated and consider transmission constraints and locational prices.

There is considerable academic and professional literature on this topic. In recent years most efforts have been focused on short-term forecasting using such techniques as neural networks.

4.2.3. Integrated System Planning

Integrated system planning is about finding the right mix of supply and demand side resources that provide low cost and reliable electricity service, while also minimizing risks. This is much like the Integrated Resource Planning (IRP) that was done by utilities before deregulation. The goals are similar but the available components have changed somewhat.

4.2.4. Risk Analysis

In this category are applications focusing on various aspects of risk. The short-term products look at the more quantifiable risks associated with futures contracts and energy markets. A few of the more utility focused tools try to represent in some way the longer term risks. But that is conceptually a more difficult task since there is much greater uncertainty. For longer-term analysis, a scenario-based approach is most commonly used, but the challenge always is to make those scenarios diverse enough to capture a reasonable range of possibilities.

4.2.5. Managing Financial Resources and Contracts

An important aspect of portfolio management is organizing and managing contract information.

Some of the types of products that could be monitored with software tools include spot purchases, forward contracts, option contracts, and flexibility contracts. Each of these product types offers a different type and degree of pricing and flexibility.

The goal of portfolio management may be thought of as finding the optimal trade-off between price and flexibility through an appropriate mix of low price/low flexibility (long-term contracts), reasonable price but better flexibility (option contracts), or unknown price and supply but no commitment (the spot market.) Varying durations as well as contract types can help create an even mix. The role of software for managing contracts and options is to monitor (perhaps on a daily basis) the cost and risk of the inventory of such products and to analyze purchases and sales that might improve the tradeoff. If a portfolio includes short positions or options, frequent analysis is needed to choose the best time to fill short positions or to exercise options (if at all).

There are many vendors offering various applications for this purpose and below we list a few of fairly wide use in the energy sector. Note also that this category also overlaps some with the risk management tools in the next section.

4.3. Strengths and Deficiencies of Tools for Resource Planning and Procurement

Some points to keep in mind with regard to software tools for IRP and PM:

1. Traditional electric industry tools have a utility cost-based engineering optimization perspective. This is also true of nearly all IRP tools whose goal is to determine the least-cost plan given various fairly fixed expectations about the future.
2. Most traditional planning models are deterministic and do not incorporate uncertainty. Thus their results, while optimal for a specified set of assumptions, may not be so if circumstances change. Traditionally scenario analysis has been used deal with these limitations, but the range of scenarios needs to be wide enough to adequately represent the range of possible futures. There is a general human tendency to expect the future to be a smooth continuation of the present, but a look at the past shows that that is not always the case. One approach is to double the range of what conventional wisdom says. Another approach is to consider some “far out” scenarios as stress testers for the plans that are developed.
3. Short-term uncertainty can be more easily quantified via statistical methods than long-term uncertainty. Thus sophisticated statistically based methods used in trading and risk management tools are more appropriate for shorter terms of up to one or two years, but are harder to apply to long-range analysis and planning, at least at the current state of the art. This is mainly because of the increasing uncertainty of projections as time spans grow.²²

²² The ENERGY 2020 platform takes a somewhat different approach that may be helpful in analyzing the risks of long-term uncertainties and strategies. Originally developed as a premier load forecasting model, it is one of the few end use models commercially available. However, its endogenous and bottom up approach to representing the performance of the utility and its load and resources through time allows it to offer an integrated system for IRP analysis including representation of various supply-side and demand-side options. It does not presume optimal functioning of the utility’s dispatch, or

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4. Most financial tools are focused toward the shareholder/manager perspective and not toward customers. Thus when such tools are used for utility PM there needs to be a refocusing on the implications for customers.
 5. Demand-side options and non-traditional resources (such as wind and solar) are not well represented in most models. Thus *special effort*, depending on the model used, may need to be taken to adequately include these choices.
 6. Societal benefits such as environmental externalities and employment impacts are not generally represented. If they are to be considered, they may have to be calculated externally to the PM models themselves.

It is important to remember what the model was designed to do and what necessary simplifying assumptions are built in to it. Careful review of key input data is always necessary and it is wise to remember that even the best of models fed the best available forecasts can provide only informed approximations of the future.

4.4. Things to Consider Before Selecting Software

Whenever selecting software, it is important first to prioritize the objectives and then to evaluate the available options in that context.²³

- Objectives: How well the software meets the designated goals.
- Involvement: The ultimate users of the software need to be closely involved in its selection.
- Transparency: Are modeling methods and algorithms well documented and visible to users and regulators?
- Software Characteristics:
 - Monitoring capabilities
 - Facilitation and documentation of risk assessment, testing, and remediation
 - Built-in version controls
 - Security and access controls
 - Electronic sign-off functionality
 - Audit trail documentation and traceability
 - Ability to customize input fields, reports, and templates
- Reporting Capabilities: Are the model results available in reports and formats that are easily understood and used?

resource expansion as many models do, but can represent imperfections in planning and their results. For risk analysis, it provides a broad, integrated platform to analyze a wide range of long-term uncertainties via Latin Hypercube sampling (an efficient type of Monte Carlo simulation).
<http://www.energy2020.com/energy.htm>

²³ Some of these criteria are from Anne Marchetti, *Beyond Sarbanes-Oxley Compliance: Effective Enterprise Risk Management*, John Wiley & Sons, 2005.

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- Flexibility: How easily can the software be applied to meet new needs?
 - Support: Does the vendor provide training, fix problems and update the software as needs change?
 - Implementation costs: software, licensing fees, hardware requirements, implementation time, training costs, customization efforts/consulting. Complex models severely tax even high end computer hardware. Investments in the fastest computers and largest storage devices available are likely to result in considerable labor savings and faster, more responsive answers to modeling questions. In summary, regulators considering PM or IRP software acquisition, whether for their own use or by utilities they oversee, should focus on the prioritized goals and be aware that the largest expense is likely to be for the personnel to properly use the software.
 - Staffing Requirements: The biggest investment may actually be in hiring and training people to properly use the software for the desired objectives.

4.5. Data Requirements for PM

Depending on the type of PM activity chosen there will be different data needs. Some of this can be based on historic information, but the essence of PM entails making decisions about a future in the face of uncertainty. Thus, the data used in each PM activity are primarily forecasts or assumptions. Moreover, as with most forecasts, the longer the planning horizon the more uncertain the forecast. In some cases the PM tools may themselves generate these forecasts based on historic data, or other methods and tools may be used. But in either case, the development of the input data is as least as important as the modeling itself and should be carefully scrutinized.

Some major general categories of data required for PM are forecasts of:

- customer load;
- reliability requirement policies;
- customer price elasticity;
- resource availability (including energy efficiency and renewable energy);
- resource costs, both fixed capacity costs and variable operating costs including fuel prices;
- fuel price volatility;
- environmental policies.

Procurement and/or portfolio management decisions that are made in the short- and near-term require more detailed data than resource planning decisions made for the long-term. The types of detailed data required for those short- and near-term decisions are listed in the box below.

Requirements

- Load forecasts
- Customer price elasticity (reduced consumption, switching)
- Capacity requirements

Fuel Markets

- Historical fuel prices and volatility
- Forward market prices

Self- Generation, Efficiency and Renewables

- Production costs from own generation
- Energy efficiency availability and costs
- Renewable energy availability and costs

Wholesale Electricity markets

- Forecast costs of capacity, transmission, and ancillary services
- Forecast costs of congestion and of FTRs to hedge congestion risk
- Historical wholesale electricity prices and volatility in the region of interest—both on and off-peak
- Forward market price data for electricity
- Probability and impact of new environmental regulations, e.g., CO₂ controls
- Probability and impact of new reliability requirements, e.g., RPM policy in PJM

Financial Instruments

- Financial instruments and associated costs

Depending on the specific circumstances not all of these may be required, or other kinds of information may be required. Each situation needs to be analyzed considering the objectives and what data is relevant and available.

5. Expertise and Staffing for Portfolio Management

5.1. Staffing and Expertise for Portfolio Managers

Overall, the expertise of the organization should include the following knowledge, skills, and abilities relating to portfolio management, risk analysis and management, and IRP:

Knowledge:

- Detailed knowledge of the natural gas markets, electricity markets, regional transmission organizations, and FTRs
- Full understanding of the range of available supply and demand options (including renewables, energy efficiency, etc.)
- Working understanding of the engineering and operations functions required to get those supply and demand options on-line
- Full understanding of transmission related options, including RTO/ISO rules and costs
- Working knowledge of relevant accounting rules (including rules for transactions in derivatives and Sarbanes Oxley compliance)
- Full understanding of environmental regulation costs and risks

Technical Skills:

- Ability to develop or select and implement quantitative models for power trading, power marketing, and fuels hedging
- Ability to utilize statistical and modeling tools, which may require programming expertise, as well as standard spreadsheet and database applications
- Ability to perform quantitative analysis of risk exposure on a periodic (possibly daily) basis and a long-term basis regarding both financial and physical positions
- Ability to identify, evaluate, and understand actual and potential changes in markets to assess overall portfolio risks
- Ability to develop and evaluate risk mitigation options
- Ability to take part in financial trades, potentially on a daily basis
- Ability to translate the outcome of the portfolio into utility rates

Other Abilities:

- Ability to communicate complex issues and options to internal staff and external parties (regulators, shareholders, etc.) regarding the overall risks associated with the current portfolio, as well as modifications that can be made to decrease such risks
- Ability to develop and maintain a system to provide detailed, traceable records regarding all trades and risk management strategies

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- Ability to prepare reports regarding the portfolio's valuation
 - Ability to report activities to FASB, the SEC, rating agencies, regulators, shareholders, and the public.

While it is definitely possible, and perhaps preferable, for a utility to take on all of the above responsibilities with regard to portfolio management, there is an alternative solution, which is to outsource the portfolio management function.

5.2. Staffing and Expertise for Regulators

Regulators can and do play multiple roles with regard to portfolio management strategies.

The four major roles, which may not all be performed by a given commission, can be broken down into the following:

1. Design of the portfolio (choice of supply/demand side resources, T&D resources, types of suppliers, types of contracts, hedging mechanisms, etc.)
2. Actual procurement of products (solicitation of contracts, making trades, hedging, etc. and regular oversight of the portfolio)
3. Ongoing oversight and adjustment of the portfolio design and procurement, either as regulator or as implementer of procurement
4. Audit and other regulatory oversight of the utility (or other responsible parties) regarding each of the above.

How involved regulators are in each of the above is state dependent. In Maine, for example, regulators are intimately involved in each of the four roles described above, whereas in other jurisdictions regulators simply oversee the utilities' activities after the fact. Most states with competitive retail procurement fall in between these extremes. For example, in New Jersey, the Board of Public Utilities *approves* the portfolio and procurement plan, as well as the results of procurement, while the utilities execute those plans.

Naturally, the skill set required of regulators involved in electric portfolio management varies considerably with the extent that they are involved in each of the roles. Regulators generally need to be highly analytical, knowledgeable about financial products (hedging instruments, forward markets, etc.), knowledgeable about the range of resources available at any given time and their general cost. As far as timing, the role that regulators play is on-going or cyclical. From first assessing key risk areas to developing options to mitigate that risk to implementing a strategy and monitoring that strategy, regulators play a dynamic role in managing utility risk practices. For a graphic to demonstrate the full range of roles, see Figure 5.1, below.

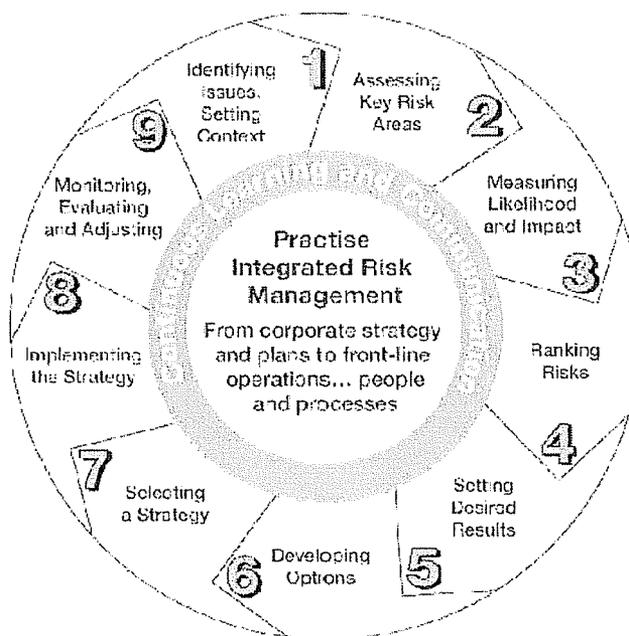


Figure 5.1. The role of the regulator in risk management is dynamic in nature.²⁴

6. Conclusion

Traditionally, utilities performed integrated resource planning by evaluating a wide variety of available (or expected to become available) supply-side and demand-side resources in order to meet current and future needs. The usual emphasis was on finding the combination of resources added gradually over a planning period that was *expected* to meet the need at the lowest present value cost to the utility and its ratepayers over the planning period. While IRP processes have strong similarities from state to state, the detailed requirements specified by utility commissions vary. These differences include details for treatment of energy efficiency programs, whether and how to include treatment of environmental and societal costs, mechanisms for public input, and treatment of the way risk and uncertainty are treated.

Wise investors and commodity purchasers generally employ some kind of portfolio management (PM) and an organized procurement process to choose from the huge variety of products available. Portfolio managers must choose from contracts of various lengths and starting dates, decide whether and how to use options and hedging products, and evaluate many other possible strategies. This task, as a whole, has features in common with the job of a mutual fund manager, who takes responsibility for investing money for others, such as the assets of a retirement fund or an individual investor. In that setting, some of the available choices are cash, stocks of various kinds, bonds of various

²⁴ Lucienne Robillard, "Integrated Risk Management Framework," presented by the President of the Treasury Board, Canada, April 2001.

lengths and maturities from various issues (companies, governments, special purpose entities, etc.), interest rate futures, mutual funds, and so on. State-of-the-art PM uses detailed quantitative analysis to understand the uncertainty of cost and returns from different investment choices. The goal of this quantitative analysis is to assess and manage how different combinations of investments with varied kinds of uncertainty affect the return and risk profile of the portfolio as a whole.

Obviously, this is a very general concept. When applied to electric power procurement, there are specialized constraints and additional options such as building one's own generation or reducing one's need through procurement of DSM options. Up until the mid-1990s, vertically integrated utilities focused on building or buying generation and on DSM programs, so adding PM to IRP would have made a difference only in emphasis. More recently, two things have changed. First, the appearance of market trading in wholesale power and options for power, natural gas, weather, and emission permits have begun to widen the choices a utility can make in its resource planning to look more like the type of PM seen in financial and commodity markets. Indeed, some "vertically integrated" utilities have de-emphasized owning generation and instead concentrate on power purchasing. Secondly, competitive procurement of power for default service has begun to use PM-like features, such as contract laddering and purchasing from purely financial brokers who do not own generation.

A few state PUCs now require utilities to apply portfolio management with the goal of achieving reliable electric service at reasonable rates to customers over the long term, either for vertically integrated service or for default service procurement.

Arguably all electric utilities—vertically integrated and distribution-only—could benefit from placing greater emphasis on PM. The recent developments in the competitive wholesale electricity markets create greater opportunities but also greater pitfalls. A passive or inactive utility is more likely to suffer from the pitfalls than benefit from the new opportunities. Regulatory guidance and oversight will be critical to achieve the goals of portfolio management, and to ensure that all utilities have clear direction regarding their roles as portfolio managers. Utilities, even in states with restructured electricity industries, may need to take another look at how and why to manage resource portfolios.

The great variety of new electricity and electricity-related products and tools available for managing resource portfolios and rapidly changing market conditions means that regulators have an opportunity to reassess their roles and expectations regarding the scope and nature of portfolio management applied in their state, regardless of whether it is a retail choice state or a fully regulated state. This report has reviewed the reasons for this conclusion, explained the key analytical and policy-making challenges, and reviewed the software and skills necessary to perform those functions. It should be emphasized, however, that markets, market rules, and product offerings have shifted and changed frequently for some time now, and show no signs of stabilizing anytime soon. Regulators should continue to monitor such changes and update their policies and practices accordingly.

Most of these planning models discussed in this report require special effort in order to include energy efficiency and renewable energy in their evaluation of resources. In addition, these tools would benefit from improving their methodologies for analyzing

long-term risks and comparing long-term decisions under uncertainty. For example, some existing optimization models require the representation of system operation to be simplified and limit the number of resources that can be considered in a model run. Such modeling constraints can prevent the long-term costs and benefits to consumers of a diverse mix of resources from being evaluated fully. The availability of the data these models require to do sound risk analysis is also problematic in some competitive situations, while the institution of competitive wholesale markets has improved data transparency in others. Regulators may wish to promote research and development on improvements in these areas.

Appendix A: Supply Acquisition Strategies For Default Service In States With Retail Access

A.1. Overview

For this report, we examined competitive processes for procurement of power for default service in several states and the District of Columbia, representing a range of approaches to default service procurement. Specifically, we looked into actions that states are currently taking to manage risk—primarily price risk—for default service customers. The common approach to managing that risk is through defining and overseeing the procurement process used by default service providers (also known as basic service providers and providers of last resort).

States using auction or RFP procurement typically procure different products for different classes of customers. For example, a fixed price, all requirements service, including energy, capacity and ancillary services, might be procured for residential and small commercial default service customers, while large commercial and industrial customers might be served under a procurement for fixed price capacity, with energy billed at spot market prices. In states that procure default service power for small customers under multi-year, fixed-price contracts, power for medium-sized commercial customers may be procured under fixed price, but shorter contracts.

In this Appendix, we focus on procurement approaches for residential and the smallest commercial customers, as such approaches present the most challenging concerns for risk mitigation policies.

A.2. Risk Management Approaches Used in Default Service Procurement

Having surveyed a number of deregulated states, we find that many, but not all, retail access states have adopted one or another form of contract laddering to manage price volatility. Contract laddering means that power is procured in staggered, multi-period contracts, instead of through a single contract, or several contracts, that expire all at once. When such a ladder of contracts is put in place, only a fraction of the total portfolio of electric generation contracts expires each cycle, and only a fraction of the supply needs to be replaced and re-priced. In practice, this means that the majority of a customer's generation rate is already locked in by pre-existing contracts; the full effect of trends or spikes in electric generation prices is buffered for default service customers. In most jurisdictions that use contract ladders, the cycle period is one year, and the most common choice for contract lengths has been three years. Figure A.1 shows a pattern of procurement over time for a simple ladder of three-year contracts with one-third of the load rolled over annually. A contract ladder of this type, whatever the length of its contracts and number of cycles, may require odd contract lengths when being initialized to allow for synchronizing contract expirations and future procurements with ISO or RTO planning years and the like.

Laddering is the main procurement strategy used by a number of states and utilities that pursue competitive procurements for their default service, particularly on the East Coast. Table A.1 presents the specifics of procurement schemes in the jurisdictions studied.

<i>Procurement Year</i>	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>	<i>Year 4</i>	<i>Year 5</i>	<i>Year 6</i>	<i>Year 7</i>	<i>Year 8</i>
1/3 load								
1/3 load								
1/3 load								

Initial 1-year contracts	
Initial 3-year contracts	
Rollover 3-year contracts	
Subsequent 3-year contracts	

Figure A.1. Illustrative 3-year procurement ladder with phase-in. In this example, by Year 3, only 1/3 of the contracts expire and must be replaced each year. In other words, 2/3 of the load prices are locked in earlier years.

Specific laddering terms, such as those described above, are established via commission orders. In many cases, the framework used to establish such terms was a negotiated settlement amongst some of the parties to a rulemaking or other proceeding. Settlements have included varied parties, including some or all of the utilities, wholesale bidders, retail suppliers, regulators, consumer advocacy groups, and others. Generally, once the contract procurement ladder and process is established, adjustments have been made for a period of several years before it is revisited.

A.3. Observations on Procurement Approaches

A.3.1. Procurement Process

A few retail choice states rely primarily or in part on spot market purchases for default service procurement (e.g., Texas and New York). In New York, supply procurement for default customers is essentially a portfolio-based approach where utility supply portfolios typically consist of "legacy hedges" (i.e., long-term contracts entered into at the time the power plants were sold), short-term contracts, spot purchases from the NYISO market, and financial hedges. The majority, however, use either a Request for Proposal (RFP) or an auction format to procure power for default service customers. New Jersey led the way with auctions for default service power, using a descending clock auction to determine final prices. Illinois has recently adopted a similar process, but has not yet executed an auction. A number of other jurisdictions, including Maryland, the District of Columbia, Maine, and Delaware, use RFPs soliciting bids of various lengths for fixed price blocks of default service power.

Table A.1: Competitive procurement strategies for procurement of default service power in selected jurisdictions.

<u>Jurisdiction</u>	<u>Procurement Process Type</u>	<u>Contract Durations</u>	<u>Effective Date of First Procurement</u>	<u>Timing of Procurements</u>	<u>% of Annual Requirements Procured</u>
New Jersey	Auction	3-year	2002	Annually, in February	33%
Maine ¹	RFP	3-year	2005	Annually, in December	33%
Illinois	Auction	3-year	2006 (pending)	Annually, in September	33%
Maryland ²	RFP	Mix of 1,2 and 3-year	2005	Annually, in 3 rounds, approx. 3 weeks apart. Previously began in Dec., but MD, DE and DC expect to reschedule so that bid periods do not overlap.	Varies. Currently 25% annually.
District of Columbia	RFP	Mix of 1,2 and 3-year	2005	Same as Maryland	Varies. Currently 25% annually.
Delaware ³	RFP	3-year	2006	Same as Maryland	33%
Massachusetts ⁴	RFP	1-year	2004 ⁵	Semi-annually, in April and October	50%
Texas	Spot market	N/A	2002	Daily	Actual daily requirement
New York	Utility-specific portfolio approaches along with the use of financial instruments	Varies, some pre-existing long-term contracts, short-term contracts, spot purchases, and financial instruments.	1999	Varies	Varies

¹ New legislation (May 2006: 36 MRSA §3203) establishes the possibility of using longer-term contracts.

² The MD PSC is currently exploring changes to SOS procurement: [case number 9064](#).

³ New legislation (April 2006: [H.B. 6](#)) calls for sweeping changes, including integrated resource planning, consideration of both short- and long-term contracts, owning and operating generation facilities, and demand side management program to serve default service customers. At least 30% of the requirements are to be procured competitively from the regional wholesale market. IRP aspects of this bill will be implemented over time, but a proceeding is under way to consider revisions to the RFP procurement process (PSC Docket No. 04-391).

⁴ While Massachusetts has revisited contracting mechanisms multiple times over the last several years, most of the state's basic service providers continue to procure 50% of their load every 6 months, using 1-year contracts. However, in a December 2005 settlement, NSTAR agreed to begin using a mix of 1, 2, and 3-year contracts for its generation contracts going forward.

⁵ Effective date of semi-annual procurements. Standard offer service began in 1998.

Advantages and disadvantages are claimed for each approach. State regulators or default service providers who utilize RFPs can readily adjust the RFPs annually to address specific needs or concerns over time. Smaller jurisdictions perceive an advantage in the RFP format due to reduced transaction costs and shorter lead times, viewing a more formal auction process as burdensome. Meanwhile, advantages of the auction include a perception of greater transparency, especially since bidders receive feedback about the level of interest expressed in each round of bidding as the price descends from round to round. To date, there is not enough data to clearly indicate which approach is better from either the generator or consumer perspective. Theoretical arguments have been offered about which one, if either, will produce the lowest prices, greatest bidder participation, etc., but, in practice, each approach has been able to attract a sufficient number of bidders to satisfy the various commissions that monitor the processes.

Some states (e.g., New Jersey, Maine, Illinois) have a single annual procurement to replace expiring contracts. Maryland, the District of Columbia, and Delaware each spread the annual procurement over three separate bid dates, spaced approximately three weeks apart in time. This is perceived to reduce the risk that a temporary market disruption will dominate the overall result. On the other hand, the smaller size of each procurement might make the RFP marginally less attractive to bidders and slightly increases the administrative cost.

The different approaches have advantages or disadvantages for both the buyers and suppliers, but there is not enough data available to reach firm conclusions on which approaches are better and under what circumstances. Clearly, however, timing plays an important role in the outcome of procurements. Default service procurements are typically scheduled farther in advance and are not easily moved. Market events and the timing of their procurements hit the 2006 generation contracts in Maryland, the District of Columbia, and Delaware particularly hard. These jurisdictions each held the first of their three intra-year procurements in December 2005, when natural gas price futures were at an all time high. Even a six week delay would have resulted in prices on the order of 20% lower. In this regard, New Jersey was fortunate, because its last procurement was held in February 2006, at which point natural gas prices (and electricity futures) had already begun to subside. Thus, the specific timing of procurement processes can significantly affect generation rate outcomes. Jurisdictions attempting to initialize a multi-year laddered procurement are particularly vulnerable. Whether results can be improved by introducing flexibility in the timing of procurements is a recent topic of controversy.

A.3.2. Contract durations in default service procurement

We see that not all states have chosen to implement the same contract laddering terms. New Jersey, Illinois, Delaware, and Maine have chosen a simple 3-year contract laddering approach.⁶ The District of Columbia and Maryland use a combination of one-

⁶ New Jersey began with unladdered one-year contracts and began phasing in a three-year ladder with its 2003 procurement. In its 2005 RFP, Maine began to phase in a three-year ladder, but did so by procuring separately priced contracts for each off years one, two and three of the ladder, rather than single, flat-priced bids for the whole three years.

two- and three-year bids in their 2005 and 2006 RFPs. Meanwhile, Massachusetts utilizes only 1-year contracts in overlapping procurements every six months. In New York, some utilities use the laddering approach for a portion of their supply portfolios with the remainder of their portfolios consisting of longer-term contracts and spot purchases. Texas relies on spot markets.

The duration of contracts and the number of overlapping contracts in a laddered portfolio has a major affect on the degree to which customers are protected from price fluctuations; those procurements using spot market purchases or unladdered contracts (100% of contracts expire together) expose customers to greater price volatility than laddered procurements. Contracts for longer periods of time protect customers from price fluctuations longer, but if they are not laddered to roll over, create the risk of larger price jumps when they do expire.

In general, jurisdictions that use a three-year ladder with annual roll over of one-third of the supply have chosen to optimize their ladder to provide protection against fluctuations of price ranging from short-term spikes to highs and lows of up to a few years. With regard to the longer-term risks (say, price trends over five to ten years or longer), a ladder of three years or less is inadequate to mitigate those risks for customers. A three-year ladder results in generation rates that are, in effect, a three-year moving average of market prices. So, if generation prices gradually rise over ten years or if a market change results in a sudden long- term shift in prices, the risk mitigation obtained from early procurements fades out after three years and the full force of those market trends or events is fed into rates at that time. Price risks due to long-term trends or sudden permanent market shifts may be mitigated only with correspondingly long-term procurements (or other types of long-term hedging). In order to accommodate longer-term stabilization goals, a long-term ladder or longer-term resources would be needed.

It is important to note that a *single* long-term purchase stabilizes rates for the life of the contract, but at the risk that the contract may turn out to be higher than market prices that actually occur in the future *and* at the expense of total exposure to market conditions prevailing at the end of that purchase. Alternatively, the aspect of laddering that produces *risk mitigation* as well as *price stability* is that it divides the supply up into small increments, each of which is priced separately at a different time and only one of which expires at any given date.

It is also important to highlight the fact that states may have different policy objectives with regard to portfolio management. For example, states that have chosen contract laddering may have a goal of trying to stabilize prices for customers who do not switch to a competitive supplier or they may anticipate that small customers are unlikely to switch to a competitive energy supplier.

New York specifically desires to encourage development of competitive retail markets but requires utilities to provide stable prices for mass market customers until volatility mitigated products are available from the competitive market. The NY PSC's 2004 policy statement requires that utilities that provide default service, at least for the present, should "prepare plans to foster the development of retail markets" and "continue to maintain a

balanced contract portfolio for residential customer commodity" in the "near term."⁷ Pricing of default commodity service varies by utility and by customer class. Some utilities pass through average monthly NYISO spot prices in the supply charge but with an offsetting adjustment to delivery charges based on the "value" of hedges, so that, on average, the utility's commodity price is based on its overall portfolio cost.⁸ Texas has chosen a similar strategy to encourage competition. Most deregulated states, however, have opted to focus procurement policy on the needs of customers who do not shop.

A.4. Beyond Laddering

When contract laddering is the sole procurement tool used, it provides only limited portfolio management benefits, which are realizable only over the length of that ladder – sometimes a very short time frame. Some states are beginning to address this limitation through new laws that explicitly try to obtain low costs over the *long-term* for their smaller default service customers. A variety of means have been adopted or are under discussion for this purpose.

Maine is one state that has taken this approach. The Maine Legislature recently enacted legislation requiring the PSC to “adopt by rule a long-term plan for electric resource adequacy for this State to ensure grid reliability and the provision or availability of electricity to consumers at the lowest cost.” The new legislation allows the Commission to include in that plan "cost-effective demand-side measures" as part of the supply of standard-offer service. It authorizes the Commission to enter into various standard-offer service contract lengths and terms for residential and small commercial customers and directs the Commission to consider developing one or more demand response programs for medium nonresidential customers.”⁹

Delaware now also requires expanded portfolio management practices embracing full scale integrated resource planning for default service including energy efficiency, renewables, and the option of utility construction of new generation units.

On or after May 1, 2006, it is the policy of the State that Electric Distribution Companies subject to the oversight of the Commission and as part of their obligation to be Standard

⁷ Quotations from pages 48, 52 and 28-29 of the *Statement* cited in this footnote, respectively. However, the Commission also declined to provide for further acquisition of hedges for medium to large commercial and industrial customer service as existing hedges expire. *Statement* at 32. Further, the Commission ordered that, "When new rate cases or rate plan extensions are filed, the utilities will be expected to include specific proposals to encourage migration of customers and to otherwise further the development of retail competitive markets.... We are not endorsing the New Jersey [auction] model because it unnecessarily prolongs the utilities' commitment to multi-year wholesale contracts and their role as a commodity supplier. ... The sooner customers experience pricing variations, the sooner competitive markets will provide alternatives, including fixed-price options and peak and off-peak pricing, possibly accompanied by interval metering." NY PSC Case 00-M-0504, Proceeding on Motion of the Commission Regarding Provider of Last Resort Responsibilities, the Role of Utilities in Competitive Energy Markets and Fostering Development of Retail Competitive Opportunities. *Statement of Policy on Further Steps toward Competition in Retail Energy Markets*, August 25, 2004.

⁸ Personal communication, Raj Addepalli, NY PSC, 7/30/2006

⁹ 36 MRSA §3203, enacted May 2006.

Offer Service Suppliers shall engage in Integrated Resource Planning for the purpose of evaluating and diversifying their electric supply options efficiently and at the lowest cost to their customers. . . . As part of the initial IRP process, to immediately attempt to stabilize the long-term outlook for Standard Offer Supply in the DP&L service territory, DP&L shall file on or before August 1, 2006 a proposal to obtain long-term contracts. The application shall contain a proposed form of request for proposals (“RFP”) for the construction of new generation resources within Delaware for the purpose of serving its customers taking Standard offer Service. Such proposed RFP shall include a proposed form of output contract. . . , which contract shall have a term of no less than ten (10) years and no more than twenty-five (25) years. Such RFP shall also set forth proposed selection criteria based on the cost-effectiveness of the project in producing energy price stability, reductions in environmental impact, benefits of adopting new and emerging technology, siting feasibility and terms and conditions concerning the sale of energy output from such facilities.¹⁰

Similarly, Maryland is considering modifications to its standard offer service policy. Objectives and strategies are currently being considered in Commission Case Number 9064: a major policy review proceeding covering the provision of standard offer service (“SOS”) to residential and small commercial customers.

In sum, some states that deregulated electric generation and adopted retail competition in the last decade are returning to an IRP-type of portfolio management, as opposed to relying solely on contract laddering with terms of one to a few years. This may provide a more robust form of portfolio management than is currently being utilized.

A.5. Resources on state procurement practices

For more information on the basic service procurement processes and results in the states that use a competitive process for procurement of their default service, see:

- NJ: www.bgs-auction.com
- DE: http://www.state.de.us/delpsc/documents/dp_sos_022806.pdf
<http://www.state.de.us/delpsc/documents/vantage030106.pdf>
- MD: <http://www.psc.state.md.us/psc/AboutUs/Press/SOS2004.htm>
http://webapp.psc.state.md.us/Intranet/Casenum/NewIndex3_VOpenFile.cfm?ServerFilePath=C%3A%5CCasenum%5C8900-8999%5C8908%5C462.pdf
- ME: http://www.maine.gov/mpuc/industries/electricity/standard_offer/closed_so_solicitations.html
- MA: <http://www.mass.gov/dte/restruct/competition/defaultservice.htm#Fixed%20Default%20Service%20Prices>

¹⁰ Electric Utility Retail Customer Supply Act of 2006, HB 6, enacted April 2006.

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- <http://www.mass.gov/dte/restruct/competition/index.htm>
 - DC: http://www.dcpsec.org/pdf_files/hottopics/PEPCO_Press_Release_030306.pdf
http://www.dcpsec.org/pdf_files/hottopics/Q&A_PEPCO_New_Price.pdf
 - IL: ICC Final Order Dockets 05-0159 through 0162, January 2006.
<http://www.illinois-auction.com/index.cfm?fa=bid.reginfo>
 - NY: PSC Case 00-M-0504. Proceeding on Motion of the Commission Regarding Provider of Last Resort Responsibilities, the Role of Utilities in Competitive Energy Markets and Fostering Development of Retail Competitive Opportunities. *Statement of Policy on Further Steps toward Competition in Retail Energy Markets*, August 25, 2004.
[http://www3.dps.state.ny.us/pscweb/WebFileRoom.nsf/Web/0717FE125899AD1985256EFB006253F2/\\$File/201b.00m0504.pdf?OpenElement](http://www3.dps.state.ny.us/pscweb/WebFileRoom.nsf/Web/0717FE125899AD1985256EFB006253F2/$File/201b.00m0504.pdf?OpenElement)

Appendix B: Integrated Resource Planning Practices in Regulated States

In contrast to the practices seen in the deregulated states covered in Appendix A, the fully regulated states we surveyed generally had an integrated, active approach to portfolio management.¹ Frequently these processes consider many factors affecting the need for electric resources, such as generation and transmission siting, system reliability, efficiency and renewable energy, rate design, and fuel diversity.

California, Montana, Washington, and Oregon, for example, explicitly require consideration of price or environmental risk management in planning and procurement. However, each state's approach to regulating risk management practices differs. More than any other state in the survey, California prescribes how utilities treat regulatory (environmental and cost recovery) and price risk in utility resource plans and is actively involved in utilities' decisions about risk metrics and models. California is also the only state we interviewed that explicitly defines consumer risk tolerance in the context of procurement planning. With both regulated and deregulated utilities, Montana is an interesting case study of how risk management policy can translate from one regulatory construct (vertically integrated) to another (deregulated). Washington and Oregon require utilities to consider risk, but they leave risk management squarely in the hands of the utilities. Because cost recovery depends in part on the company's risk management practices, utilities have a large incentive to keep up with developments in risk management theory and methods. In Oregon, specific regulations concerning risk are currently unfolding. Although Washington has generally taken a hands-off approach to risk management policy, incentives to account for risk in procurement planning and acquisition processes have spurred extensive and sophisticated modeling of stochastic variables, providing a solid foundation for least-cost/least-risk decision making.

B.1. California

In 2003, following a tumultuous two-year period of testing customer choice in retail markets, the California Public Utilities Commission (CPUC) ordered the state's investor owned utilities to resume planning and procuring resources to meet consumers' electric load. The state's Long-Term Procurement Planning process (LTPP) is one part of overall resource planning, which is being coordinated and integrated with previously separate processes under the following headings: Community Choice Aggregation, Demand Response, Distributed Generation, Energy Efficiency, Qualified Facilities, Renewable Portfolio Standards (RPS), Transmission Assessment and Planning proceedings and Resource Adequacy requirements. Every two years, utilities are required to submit LTPPs detailing their projections of demand and laying out how they propose to meet

¹ For this survey, we reviewed background literature, regulations, and legislation on risk management practices and policies in fifteen US states and one Canadian province. We contacted the state public utility commission where we found indications that the state makes some explicit consideration of price or environmental risk management in its planning and procurement processes. In all, we contacted eleven and interviewed eight commission staff members.

that demand over a 10-year horizon.² Analysis underlying and presented in the plans must include sensitivity analyses for load growth as well as for gas and market prices,³ and the proposed resource mix must meet the criterion of least cost–best fit.⁴

California requires utilities to consider environmental factors, including the cost of future carbon reduction regulations, in their long-term planning and resource comparisons. Utilities are instructed to add \$8 per ton of CO₂ to the cost of fossil-fired resources for planning purposes (i.e., the adder is not used in ratemaking) to reflect the cost of climate change to California and to incorporate some of these resources' financial, regulatory, and environmental risks into resource decisions.⁵ The goal of this requirement is to reduce California's dependence on fuel sources that pose considerable and increasing environmental risks.

Also addressing the environmental externalities and regulatory risk associated with fossil fuels, California directs utilities to prioritize demand-side and renewable resources in the planning process. Utilities are to follow the "loading order" established in the state's Energy Action Plan (EAP), which seeks to optimize energy conservation and resource efficiency while reducing per capita demand.⁶ The EAP established the following priority list:

1. Energy efficiency and demand response
2. Renewable energy (including renewable DG)
3. Clean fossil-fueled DG and clean fossil-fueled central-station generation

The state and its utilities are meeting their goals for energy efficiency, suggesting that the planning process and loading order may have had some affect on procurement decisions. For example, SCE requested an additional \$38 million for efficiency programs, to meet an anticipated energy shortfall. However, goals for demand response and renewables have been somewhat elusive, in part due to perceived increased risk of contract failure by

² Liz Baldwin, *Regulatory Assistance Project Electric Resource Long-range Planning Survey: California*, May 20, 2005.

³ Demand forecasts must include three levels of demand, with a high load forecast that is set at the 95th percentile. Scenario analysis of energy and gas costs is likewise to be evaluated at the 95th percentile. (CPUC, *Ruling and Scoping Memo 37116 in Rulemaking 04-04-003*, Jun 4, 2004)

⁴ Liz Baldwin, *op. cit.*

⁵ U.S. EPA. *Clean Energy-Environment Guide to Action: Policies, Best Practices, and Action Steps for States*, April 2006. Available at <http://epa.gov/cleanenergy/stateandlocal/guidetoaction.htm>.

⁶ State of California. *2003 Energy Action Plan*. May 8, 2003.
http://www.energy.ca.gov/energy_action_plan/2003-05-08_ACTION_PLAN.PDF

The loading order originates in the 2003 *Energy Action Plan*, proposed by a joint subcommittee of the California Energy Commission, the CPUC, and another agency that is now defunct. These agencies approved the final plan, which required the State Energy Resources Conservation and Development Commission to conduct assessments to address public-interest energy strategies including "identification of policies that would permit fuller realization of the potential for energy efficiency, either through direct programmatic actions or facilitation of the market." The *Energy Action Plan* was required under SB 1389 (Signed Sep 14, 2002. Available at http://www.leginfo.ca.gov/pub/01-02/bill/sen/sb_1351-1400/sb_1389_bill_20020915_chaptered.html, accessed July 12 2006).

renewables, as well as transmission development and cost recovery risks. In part to address these problems, the CPUC combined long-term RPS planning with its general procurement planning proceeding (R.04-04-003). Also, it directed utilities to identify and conduct contingency planning addressing impediments towards meeting the RPS.⁷

Procurement plans are required to incorporate one or more procurement process features that, if adhered to, reduce the utility's risk of cost disallowances. These features include a competitive procurement process,⁸ a benchmark-driven incentive mechanism,⁹ and a pre-established set of criteria on the acceptability and eligibility of procurement contracts for rate recovery.¹⁰

Taking into account the parties' positions, the CPUC analyzes each plan and may approve, modify, or reject the plans. The Commission may require compliance filings to resolve any deficiencies in the plans. Inclusion of an element in an approved LTPP does not constitute pre-approval, per se; the IOUs must get separate authorization for turn-key projects, self-build, and supply contracts of five years or longer.¹¹

Procurement strategy is overseen by utility-specific Procurement Review Groups (PRG), which comment on (but neither approve nor disapprove) the details of each utility's proposed procurement processes and contracts (prior to their submission to the PUC for expedited review). PRG members include the PUC Energy Division, Office of Ratepayer Advocates staff, and interested parties who are not market participants, all subject to a non-disclosure agreement.¹² The Commission monitors procurement decisions via quarterly reports submitted by the companies. Utilities must also file monthly risk reports assessing consumer exposure to market risk.¹³

Guidance on specific risk measures evolved from the time of the energy crisis. Citing VAR's widespread use in financial markets, in commercial software, and in utility holding companies' annual reports, the CPUC adopted SDG&E and PG&E's

⁷ U.S. EPA, op. cit.; Center for Resource Solutions Team, *Achieving a 33% Renewable Energy Target*, Nov. 1, 2005. Prepared for the California Public Utilities Commission. Available at http://www.cpuc.ca.gov/word_pdf/misc/Achieving_33_Percent_RPS_Report.pdf, accessed July 12, 2006.

⁸ The Commission, not the utility, specifies the format of that procurement process, as well as criteria to ensure that the auction process is open and adequately subscribed. If purchases are in compliance with the authorized process, they will be recovered in rates. (California SB 1037. Signed Sept. 6, 2005. Available at http://info.sen.ca.gov/pub/bill/sen/sb_1001-1050/sb_1037_bill_20050929_chaptered.html, accessed July 12, 2006.)

⁹ If approved, this incentive mechanism would authorize the utility to procure from the market, depending on how the company performs relative to commission-authorized benchmark(s). The incentive mechanism should be clear and achievable. In addition, it should contain quantifiable objectives and contain balanced risk and reward incentives. (California SB 1037, op. cit.)

¹⁰ Under this mechanism, the CPUC will conduct an expedited review of the proposed transaction's compliance with the approved procurement plan. (California SB 1037, op. cit.)

¹¹ Liz Baldwin, op. cit.

¹² CPUC, Decision 02-08-071 in Rulemaking 01-10-024, Aug. 22, 2002; CPUC, Resolution E-3857, ID# 2979, Dec. 18, 2003.

¹³ U.S. EPA, op. cit.

recommendation for reporting portfolio cost risk using TEVAR, the value at risk to expiration.¹⁴ Further, it required that the utilities file monthly portfolio risk reports reflecting estimated portfolio risk for each month on a rolling 12 month basis, on a quarterly basis for months 13-24, and on an annual basis for months 25-60. Seeking transparency and consistency in risk management reporting, the CPUC required validation of SCE's proprietary, in-house portfolio risk model.^{15,16}

Consumer risk tolerance, defined as the price that an average consumer would be willing to pay to reduce the risk of higher prices in the future, is specifically addressed in the context of procurement planning. For example, PG&E set a consumer risk tolerance level, measured by portfolio TEVAR, at one-cent per kWh over a rolling 12 month period in its 2004 short-term procurement plan.¹⁷

More recently, SB 1037 emphasized the role of risk management in procurement plans. Objectives of the plans were clarified and redefined to include providing an appropriate balance of price stability and price level in rates, and to allow utilities to enter into financial and other electricity-related product contracts for the purpose of moderating price risk associated with serving retail customers. This law requires utilities to assess their portfolio price risk and risk management policy, strategy, and practices, including specific measures of price stability, and to include these assessments in their proposed procurement plans.¹⁸ Furthermore, the utility must demonstrate that the procurement plan

¹⁴ VAR stands for Value at Risk, a measure of the uncertainty of the value of resource portfolio. VAR is discussed in Section 3.5 and Appendix C of this report. TEVAR, or Value at Risk to Expiration, is a measure of risk over the entire holding period of the positions. It is of some interest that the confidence levels (e.g., 95% or 99%) to be used in these analyses were controversial. The CPUC has ultimately approved use of 85% levels on the understanding that more extreme confidence levels may be beyond the ability of the existing data to estimate in a stable manner.

¹⁵ The Commission stated, "while we continue to believe that it is unwise to be overly prescriptive in directing utility risk management practices, we need to balance our preference for an "even-handed" treatment on procurement policy with an emphasis on transparency and consistency in risk management reporting. We recognize the importance of standardized risk reporting in order to measure ratepayer risk on an "apples-to-apples" basis and to ensure that utility procurement decisions will benefit all IOU ratepayers in an equitable and unbiased manner. Establishing a common benchmark is one way of ensuring that California's ratepayers, regardless of utility, are equally protected from adverse risk, and thereby can reap the benefits of reliable energy at low and stable rates." (CPUC Interim Decision D.03-12-062, in R 01-10-024, Dec. 18, 2003)

¹⁶ The CPUC allowed SCE to use its model temporarily, contingent on the Company reporting on the methodology, assumptions, and formulas of the model. Validation would require an independent audit. If the model did not receive an unqualified model certification, SCE would be required to use a commercially available risk measurement model. SCE later questioned the ability of an independent reviewer to assess the internal validity of its model but was overruled. The Commission clarified that certification required a determination that all the features of the model work as advertised, that the model is mathematically sound, and that the assumptions utilized by the model are reasonable. (Interim Decision D.03-12-062 in R 01-10-024, Dec. 18, 2003)

¹⁷ PG&E's STPP was essentially subsumed into its LTPP. (CPUC, Resolution E-3951. Sept. 22, 2005)

¹⁸ A portfolio should include "any utility-retained generation, existing power purchase and exchange contracts, and proposed contracts or purchases under which an electrical corporation will procure electricity, electricity demand reductions, and electricity-related products and the remaining open

will “create or maintain a diversified procurement portfolio consisting of both short-term and long-term electricity and electricity-related and demand reduction products.” SB 1037 also allows the commission to use funding to obtain independent consulting services to evaluate risk management and strategy.¹⁹

B.2. Montana

In 1992, the Montana Public Service Commission (MPSC) enacted IRP guidelines that encourage electric utilities to develop and implement least cost planning. Five years later, restructuring legislation established customer choice and mandated the functional break up of Montana Power Company. Montana Power Company was later purchased by NorthWestern Energy (NWE), which became the default supply utility (DSU) in most of the state. The other major investor-owned utility, Montana-Dakota Utilities (MDU), which provides power in eastern Montana, was exempted from restructuring and remained a vertically integrated utility.²⁰ In 2003, the PSC enacted guidelines on long-term portfolio planning, management, and resource procurement for default service electricity supply. As a result, there are two separate planning processes applying to the two major service territories: traditional integrated resource planning (applicable to MDU) and electricity resource planning and procurement for default service customers (applicable to NWE).

IRP guidelines

Montana’s IRP guidelines provide a fairly comprehensive framework for conducting least cost planning and addressing a variety of costs and risk factors. The guidelines place strong emphasis on managing and reducing risks associated with resource choices in a manner that addresses environmental, societal, and ratepayer risks as well as risks to shareholders. The IRP rules require that utilities consider all available resource options, including DSM, and evaluate these options based on a broad range of resource attributes. Using “best available” methodology, resource plans should explicitly evaluate quantifiable and non-quantifiable environmental externalities, including the uncertainty and risk associated with future environmental regulations, uncertainty regarding the size and importance of external environmental costs, and environmental costs associated with continued operation of existing resources.

Although utilities determine the sources of risk using their own techniques and judgment, the IRP guidelines suggest that utilities consider these potential sources of risk:

- resource lead-time,
- water availability,
- future load growth,

position to be served by spot market transactions.” (California SB 1037, signed Sept. 29, 2005. http://info.sen.ca.gov/pub/bill/sen/sb_1001-1050/sb_1037_bill_20050929_chaptered.html)

¹⁹ California SB 1037, op. cit.

²⁰ PacifiCorp was also affected by restructuring. PacifiCorp sold its Montana service territory to Flathead Electric Cooperative. Rural electric cooperatives opted not to open their territories to competition.

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- shortcomings of various forecasting methods,
 - performance and useful lives of existing resources,
 - costs and performance of future demand- and supply-side resources,
 - the rate of technological change,
 - future fuel availability and price,
 - the existence and social evaluation of environmental externalities, and
 - the future sociopolitical and regulatory environment.

The IRP guidelines also present a list of potential planning techniques for utilities to consider for managing risks associated with the above sources:

- assessing the risk of resource alternatives,
- developing resource options that increase scheduling flexibility,
- developing small, short lead-time resources that better match loads with resources and reduce the amount of, and period over which, capital must be invested to meet future load growth,
- diversifying the resource portfolio to allow adaptation to a range of future outcomes,
- managing loads to increase utility control over resource requirements,
- encouraging the acquisition of resources through competitive processes,
- incorporating consumer response to rate design into forecasting models,
- providing for public involvement and education in resource decisions, and
- maintaining a transparent integrated least cost resource planning and acquisition process (i.e., one which produces resource plans that can be reasonably understood by the public and the commission).²¹

The guidelines require that demand-side resources be given special consideration in resource evaluation.²² Utilities are required to weight and rank existing and potential

²¹ Montana Administrative Rules, sub-chapter 20: Least Cost Planning – Electric Utilities. 38.5.2004

²² The IRP guidelines also include provisions on sizing and evaluating demand side resource options. The impact of price-induced conservation (i.e. conservation undertaken by customers in the absence of any utility-sponsored program) should be accounted for either in the load forecast or as part of the total available resource. The revenue impacts of decreased sales resulting from demand-side resources are not added to cost of acquiring such resources. Also, in considering demand-side resources, until a point at which there are no market barriers or market failures that may interfere with investment in demand-side resources, as opposed to supply-side resources, demand-side resources are considered cost-effective up to 115% of the utility's long-term avoided cost. The total societal cost test and the total resource cost test are required elements of an IRP. (Montana Administrative Rules , sub-chapter 20: Least Cost Planning – Electric Utilities. 38.5.2004; Liz Baldwin, *Regulatory Assistance Project Electric Resource Long-range Planning Survey: Montana*. Sept. 29, 2005)

resources on the basis of, in part, their environmental impacts. In evaluating potential resource options, utilities should recognize protected areas and any areas inhabited by protected wildlife. Utilities are encouraged to recognize the positive externalities associated with resources that correct or reduce existing environmental damage. Furthermore, utilities should conduct sensitivity analyses to determine if more environmentally benign resource alternatives can provide equivalent benefits at a lower societal cost.²³

Special attention is given to consistency between the IRP and rate making processes in the IRP guidelines. The importance of this consistency is particularly emphasized for rate stability. In addition, IRPs must explicitly recognize rate design opportunities to develop demand-side resources.

While the determination of how to assess environmental externalities and risk factors is left to the utility, the guidelines do require that the utility clearly and thoroughly document the decision process for choosing resource options.

Default electric supplier procurement guidelines

Montana's largest restructured IOU, NorthWestern Energy, is subject to Montana's default electric supplier procurement guidelines.²⁴ These guidelines were developed with the following stated objectives:

- Provision of adequate, reliable default supply services, stably and reasonably priced, at the lowest long-term total cost
- Pricing that is both equitable and promotes rational, economically-efficient consumption and retail choice decisions
- A balanced, environmentally-responsible portfolio of power supply and demand-side management resources, coordinated with economically-efficient cost allocation and rate design
- Diversity with respect to resource types and contract durations
- Dissemination of information to customers regarding the mix of resources in the supply portfolio and corresponding level of emissions and other environmental impacts

²³ The screening process in Montana's IRP guidelines requires that the cost assigned to each resource reflect all relevant attributes. Attributes generally include those that influence utility costs as well as long-term societal costs, including risk and uncertainty. Other attributes to be considered are environmental externalities, the overall efficiency with which the resource produces energy services, administrative costs of acquisition programs, the cost effectiveness of the resource within the context of the utility system, reliability, and associated transmission costs. (Montana Administrative Rules, sub-chapter 20: Least Cost Planning – Electric Utilities. 38.5.2004)

²⁴ In NorthWestern Energy's territory, there is currently no competitive supply available for residential and small business customers. A statutory change in 2005 will allow entities to aggregate residential and small business customers, subject to regulatory approval. The Commission lacks authority to adopt portfolio rules for aggregators, but it may be approving some sort of planning guidelines in the future.

Each DSU is required to develop an Electric Default Supply Procurement Plan (EDSPP) to comply with these objectives. This plan is based on a comprehensive resource needs assessment, considering all aspects of customer load, resource availability, and product type availability. The plan must assess the resource diversity and flexibility of the existing portfolio, as well as the effect of cost allocation and rate design on future resource needs. To evaluate these factors independently of resource options, DSUs must employ rigorous computer modeling and analysis in the portfolio management and resource procurement processes. Analyses must also be used to develop least-cost scenarios and conduct risk sensitivity analyses for the various options. Table B.2.1 shows the risk factors that DSUs are required to consider.

Table B.2.1. Sources of risk that should be considered in prudent default supply resource planning and procurement (MT 38.5.8219)

Underlying Risk Factor	Price Uncertainty Risk	Load Uncertainty Risk
Fuel prices and price volatility	X	X
Environmental regulations & taxes (including carbon regulation)	X	X
Default supply rates	X	
Competitive suppliers' prices	X	
Transmission constraints	X	
Weather	X	X
Supplier capabilities	X	X
Supplier creditworthiness	X	
Contract terms and conditions	X	X

DSUs must apply cost-effective resource planning and acquisition techniques to manage and mitigate the risks posed by the factors shown in Table B.2.1, above. Such techniques include contingency planning, portfolio diversification, and transparency in the planning and procurement process. These utilities must balance environmental responsibility with other portfolio objectives, including lowest long-term total cost, reliability, and price stability.

The guidelines require DSUs to develop methods for incorporating portfolio objectives into the resource procurement, for example by weighting resource attributes and ranking bids in competitive solicitation processes. The guidelines suggest that weights may be given to reflect, among other things, contributions to achieving optimal resource diversity; project feasibility (and risk) with respect to engineering, development, and financing; supplier creditworthiness (counterparty risk); and fuel source, associated price volatility, and regulatory risk (including regulations on carbon emissions).

A default service provider should evaluate the performance of alternative resources under various loads and resource combinations through scenario, portfolio, sensitivity, and risk

analyses. As an example of these modeling efforts, for its 2005 EDSPP, NWE conducted a 20-year horizon resource planning analysis involving the following steps:

1. Define the load obligation
2. Accumulate data on resource options and model inputs, including expected carbon costs and gas and electricity price forecasts
3. Create portfolios of resources that are representative of the feasible possibilities that NWE could pursue
4. Conduct intrinsic analysis²⁵ of the portfolios to identify key risk drivers, and employ scenario analysis for gas and electricity prices, load, and CO₂ regulations²⁶
5. Select the most robust portfolios, considering the major risk factors inherent in the portfolios
6. Conduct the final screening of the most robust portfolios using stochastic analysis using thousands of simulations
7. Select the best portfolios based on their placement on a risk-adjusted mean efficiency frontier²⁷
8. Conduct qualitative analysis of the best portfolios
9. Create an Action Plan outlining how the selected resource characteristics will be acquired over the time frame of the Plan

NWE ran PCI GenTrader®, an energy supply portfolio modeling and generation dispatch model, for steps four, six, and seven (listed above).²⁸

For approval of a power purchase and sale agreement, NWE employed somewhat different methodology. NWE used GenTrader® to model both the current portfolio of resources and the best portfolio mix going forward. Also, it evaluated portfolio performance by a different measure of portfolio risk measure, calculated by adding 70

²⁵ Intrinsic analysis employs fixed market prices and static resource assumptions. (NorthWestern Energy, *2005 Electric Default Supply Resource Procurement Plan*)

²⁶ The analysis considers the potential implementation of a CO₂ tax using forecasts of medium, high, and zero taxes. The expected case (medium) was drawn from NPCC's estimate of a 67% chance of a \$6.00/ton-CO₂ charge starting in 2010 and rising to \$14/ton in 2017. *Ibid.*

²⁷ For step seven, NWE employed a risk metric that compares the expected outcome (the mean) to the difference between the mean and the average of the worst 10% of stochastic draws. NPCC also uses this metric. *Ibid.*

²⁸ GenTrader® is a "widely used" tool that evaluates complex power portfolios of both generators and energy contacts. In the MPSC's Comments, it noted that other models might be more useful in this context—for analyzing and evaluating dynamic resource portfolios—because it does not employ iterative modeling techniques. *Ibid.*

percent of the stochastic mean portfolio cost to 30 percent of the 95 percent confidence level portfolio cost.²⁹

The default electric supplier procurement guidelines also address staffing and tools for risk management and mitigation, but only briefly. They recommend that utilities seek upfront and substantive input from an independent advisory committee of technical and public policy experts, for the purpose of mitigating risk and optimizing resource procurement outcomes relative to portfolio objectives. The guidelines also advise utilities to employ “adequate” staffing and technical resources for risk management; other suggested tools include using diversity (fuels, technology, contract terms) and contingency planning. Transparent planning and procurement process is also considered a cost-effective resource planning and acquisition technique for managing and mitigating risks.

As a requirement of providing default electric supply service, a default supplier is required to also provide customers with the option of choosing a “green” product composed of or supporting power from certified environmentally preferred resources such as wind, biomass, solar, or geothermal resources. Further promoting resource diversity, the Montana PSC recently adopted a rule establishing a Renewable Energy Resource Standard.

The Montana PSC is not required to explicitly “approve” resource plans filed by restructured or traditional utilities, therefore recoverable costs associated with an implemented plan are not guaranteed in rate cases.

B.3. Washington

The Washington Utilities and Transportation Commission (UTC or Commission) considers utility portfolio and risk management practices in three interrelated processes: integrated resource planning (IRP), competitive resource acquisition, and, more tangentially, in cost recovery.

In 1987, Washington implemented an IRP process with filings required every 24 months. As a part of the IRP process, utilities must conduct a “detailed and consistent” analysis considering, at a minimum, resource cost, dispatchability, and effect on system operation; market-volatility and risks imposed on ratepayers; uncertainties regarding demand-side resources; regulation or policy change at the state and federal level; and environmental policy risks, including the cost of CO₂ emissions.³⁰ The Commission does not require that IRPs consider externalities explicitly, although these issues may be considered in other proceedings.³¹

²⁹ MTPSC Docket 2004-3-45, Order 6557c.

³⁰ WAC 480 100 238.

³¹ Utilities that have service areas in other states that require consideration of externalities generally include these factors in their Washington IRPs. Liz Baldwin, Regulatory Assistance Project, *Electric Resource Long-range Planning Survey: Washington*. Sep 2005. Available at <http://www.raponline.org/>.

In the IRP process, utilities must consider a wide range of commercially available, conventional and non-conventional supply- and demand-side options.³² This directive for an inclusive review of resources, together with risk evaluation requirements, spurred utilities to begin conducting extensive simulation analyses of many different resource portfolios, each over many different futures. For their IRPs, utilities compare the performance of these portfolios, allowing selection of one with minimal cost and risk for a given price and risk tolerance.

Although utilities are not specifically required to include DSM in resource portfolios, they have begun to do sophisticated analyses to more accurately represent the cost reduction and risk mitigation benefits that DSM brings to a portfolio.³³ For example, in its 2005 IRP, Avista analyzed conservation measures using hourly avoided costs (as opposed to the more common use of annual figures), load shifting, and on-peak versus off-peak value.³⁴

Risk management practices in Washington have improved greatly in the last five years, due to use of stochastic (and other) models and the availability of computing power to produce more robust results. Generally, the present value of revenue requirements is computed over many trials (200-300 iterations), and the mean of the variants provides a measure of risk.³⁵ For example, Puget Sound runs an enterprise-wide database management tool—KW3000 by Kiindex—as its core risk management software that is used to run large numbers of scenarios and to evaluate the firm's position.³⁶ While many risk factors, including weather and price variability, are evaluated using stochastic analysis, some risk factors are generally not considered stochastically; potential policy changes, for example, are generally evaluated using scenario analysis.³⁷

The purpose of the IRP is largely for dissemination of information within the company and to the UTC, ratepayers, investors, and other stakeholders. If the Commission finds

³² Although transmission and distribution are not explicitly evaluated in IRP, they are generally considered if they are impact or are impacted by other measures. Liz Baldwin, *op. cit.*

³³ The risk mitigation benefits that energy efficiency, other DSM, or renewable resources provide are accounted for in the IRP through a "consistent" comparison of all resources and extensive analysis of the performance of portfolios with different resource mixes under varying conditions. Washington does not confer special status to these resources in the resource planning and acquisition processes on the ground that their effects on risk vary. For example, while renewable resources may provide an excellent hedge against the price of fuel, they may have less value in terms of reliability, price, supply, and strategic risk mitigation. Phone interview, Hank McIntosh, WA Utilities and Transportation Commission, Integrated Resource Planning. Jan. 27, 2006.

³⁴ Linda Anderson, "Avista Utilities aims high on efficiency," *nwcurrent*. Nov 29, 2005. <http://www.nwcurrent.com/efficiency/industrial/1978117.html>

³⁵ Phone interview, Hank McIntosh, WA Utilities and Transportation Commission, Integrated Resource Planning. Jan. 27, 2006. See also Northwest Power and Conservation Council. (NWPCC) 2003. *Power Supply Adequacy Forum: State IRP Requirements and Issues*. Available at <http://www.nwcouncil.org/energy/powersupply/adequacyforum/>

³⁶ Possibly relating to the large number of scenarios, the software has been cumbersome and slow in practice. Moreover, it needs a lot of input and time. (Phone interview, Hank McIntosh, WA Utilities and Transportation Commission, Integrated Resource Planning. Jun. 28, 2006.)

³⁷ Liz Baldwin, Sep 2005(b), *op. cit.*

that an IRP is consistent with its rule, it issues an acknowledgment during a public, non-litigated process. This formal acknowledgment does not, however, represent a determination that a plan is reasonable, nor does it reduce the utility's regulatory risk in future proceedings, *per se*. Utilities are expected to justify resource procurement decisions in rate cases in light of any new opportunities or conditions that occurred after the IRP was issued.

Utilities are given a great deal of leeway in the methodology and assumptions used in developing their IRPs. A utility may, for example, choose the planning horizon (although long-run and short-run components are required), the assumed cost of compliance with CO₂ regulations, and acceptable levels of reliability and price escalation risks.³⁸ Utilities can choose to reject Staff's technical advice on modeling methods³⁹ but rarely do so. To the extent that decisions subject to prudence review are founded on the IRP, it is in the utility's interest that Staff and other interested parties understand the proposed plan, including underlying modeling and assumptions, sufficiently well to participate in the plan's development. For this reason, the utility usually involves these parties the plan's development and may revise the plan multiple times based on their feedback.

While risk over the long term is generally dealt with in the context of the IRP, short term risk may be considered in other ways. At Avista, risk management policies focus on an 18-month horizon, consistent with available product terms and the uncertainty associated with hydro conditions.⁴⁰

Following submission of its IRP, the utility submits a draft request for proposals (RFP), consistent with the resource needs and preferences identified in the IRP but open to all resources, as well as a set of bid evaluation criteria for Commission approval or suspension. The evaluation criteria and ranking process for proposals must also be consistent with the stated goals of the IRP and include consideration of a resource's cost, dispatchability, and effect on system operation. In addition, RFP evaluation should consider risks to both shareholders and ratepayers with, for example, criteria for credit and financial risk, price volatility, climate change regulatory risk, and resource preference under federal or state policy. Finally, ranking criteria must consider unique risks posed by different technologies, fuel sources, financing arrangements, and contract provisions.⁴¹

Bidder response to the RFP provides data for verifying the accuracy of resource cost and availability models and assumptions used in the IRP, such that these models and assumptions can be improved for future planning purposes.⁴² The RFP data inform the utility's decisions going forward, and the Commission may use this information when evaluating utility performance during rate cases.⁴³

³⁸ WUTC General Order No. R-526, Jan. 4, 2006, Docket UE-030311.

³⁹ Liz Baldwin, *Ibid*.

⁴⁰ Phone interview, Rich Stevens, Director of Corporate Risk Management, Avista. Jun. 30, 2006.

⁴¹ WAC 480-107-015, -025, -035

⁴² The results of the RFP are also used to determine the utility's avoided cost, which serves as the price to be paid to qualifying facilities under PURPA.

⁴³ WAC 480-107-015, -025, -035

Risk and risk management policy are also considered during prudence reviews. Utilities bear the full weight of their decisions regarding risk and price-risk tradeoffs, and they must later defend these choices during prudence review. There is no pre-approval.⁴⁴ Utilities have risk management policies, but they are voluntary⁴⁵ and produced within the companies. For example, Avista's risk management policy is written and approved by its portfolio management committee, comprised of upper management at Avista. Avista shares risk management policies with certain regulators subject to the confidentiality agreements. Although regulators provide comments, they have taken a hands-off approach to the development of these policies.⁴⁶

B.4. Oregon

Since 1989, Oregon has required investor-owned gas and electric utilities to file individual integrated resource plans with the Oregon Public Utilities Commission (OPUC) every two years.⁴⁷ The primary goal of Oregon's IRP process is to acquire resources at the least cost to the utility and ratepayers in a manner consistent with the public interest. These resource plans must consider risk and cost-risk tradeoffs. Utilities have employed risk factors such as price volatility, weather, and the costs of current and potential federal regulations, including regulations that address CO₂ emission standards.^{48,49} In recent years, the utilities have considered non-quantifiable issues that impact planning, such as potential changes in market structure, the establishment of renewable portfolio standards, changes in transmission operation and control, and the effect of PacifiCorp's multi-state process on regulation and cost-recovery.⁵⁰

⁴⁴ NWPCC 2003

⁴⁵ Phone interview, Hank McIntosh, WA Utilities and Transportation Commission, Integrated Resource Planning. Jan. 27, 2006.

⁴⁶ Phone interview, Rich Stevens, Director of Corporate Risk Management, Avista. Jun. 30, 2006.

⁴⁷ The original IRP order, No. 89-507, was modified in 1993 in Order No. 93-695, which set out guidelines for utilities to quantify external societal costs. In 93-695, the PUC found that mandating consideration of externalities was outside of its jurisdiction unless these costs are likely to be internalized in the future. Accordingly, the guidelines recommend that utilities incorporate cost adders to account for potential federal-level carbon regulations.

⁴⁸ In its most recent IRP, PacifiCorp looks at four primary risks: load variation, natural gas and electric price variation, hydro variation, and forced outage rates. It also conducts scenario analysis for some "what if?" risks. For example, CO₂ risk was considered in a scenario analysis, which employs simpler models than are used for analysis of the primary risks. (Phone interview, Maury Galbraith, OPUC Energy Division. Feb. 3, 2006)

⁴⁹ Although Oregon is covered by the federally-mandated Northwest Power and Conservation Council (NWPCC) plan, Oregon utilities only consider this analytically sophisticated plan peripherally in the IRPs. Northwest electric power and conservation plans are available at <http://www.nwccouncil.org/library/Default.htm>.

⁵⁰ U.S. EPA. *Clean Energy-Environment Guide to Action: Policies, Best Practices, and Action Steps for States*, April 2006. Available at <http://epa.gov/cleanenergy/stateandlocal/guidetoaction.htm>.

In docket UM 1056, the OPUC is currently considering changes to its IRP requirements and guidelines. The most recent proposal, put forth by Staff in docket UM 1056 includes these requirements and guidelines, in part:⁵¹

- Utilities should evaluate all supply- and demand-side resources on a consistent and comparable basis, using consistent, clearly defined assumptions and methods for evaluation of all resources. Utilities should provide a comparison of resource fuel types, technologies, lead times, in-service dates, durations, and locations in portfolio risk modeling. Demand side resources should be evaluated on par with supply side resources, and any potential savings in distribution system costs from these resources should be identified.
- Uncertainty and risk must be considered in the IRP. At a minimum, utilities should address uncertainty due to load requirements, hydroelectric generation, plant forced outages, natural gas prices and electricity prices. Utilities should identify in the plan any additional sources of uncertainty. The analysis should recognize the historical variability of these factors as well as future scenarios. Discussions on specific risk evaluation metrics are ongoing.⁵²
- The primary goal is the selection of a portfolio of resources with the best combination of expected costs and associated risks and uncertainties for the utility and its ratepayers.⁵³ To this end, utilities should consider all costs with a reasonable likelihood of being included in rates over the long term, which extends beyond the planning horizon and the life of the resource. The plan should include analysis of current and estimated future costs for all long-lived resources (such as power plants) as well as short-lived resources (such as short-term power purchases) for a planning horizon of at least 20 years. Utilities are required to address risk by analyzing resource alternatives using measures of cost-variability and the severity of bad outcomes, and by evaluating portfolios for a range of discount rates. These plans must analyze the effect of potential compliance costs related to global warming on costs and risks for the resource portfolios under consideration, as well as risk mitigation strategies.⁵⁴ The plans should also consider how costs and risks are affected by the use of physical and financial hedges.

⁵¹ Staff's Reply Comments, filed Sept. 30, 2005 in docket UM 1056 (Public Utility Commission of Oregon)

⁵² Currently, the risk techniques employed in IRP are not consistent with those used in ratemaking processes. That could change in the future. Staff and PGE are investigating whether IRP tools could be used to normalize costs for ratemaking purposes. Phone interview, Maury Galbraith, OPUC Energy Division. Feb. 3, 2006 and Jun. 28, 2006.

⁵³ To achieve the best combination of resources, utilities trade off cost and risk, with the understanding that it might be worth it to pay more for a portfolio that displays less volatility. (Phone interview, Maury Galbraith, Jun. 28, 2006. Op. cit.)

⁵⁴ Utilities are including a CO₂ adder as a base-case assumption, in addition to running CO₂ cost scenarios for a range of prices (\$0 to \$40/ton, 1990\$). In its 2006 planning cycle, PacifiCorp is looking at phase-in strategies where the CO₂ adder ramps up over time.

Additionally, the Staff's proposal continues the requirement that the public be allowed adequate involvement in development of the plan.

A parallel docket, UM 1182, is updating competitive bidding guidelines for resources above a certain size, including how bids should be evaluated and how bidding should mesh with IRP processes and criteria. Price-risk tradeoffs are also at issue in yet another open docket, UM 1066, which is reviewing whether the Commission should modify its requirement that all new generating resources go into rates at market price (undefined), rather than in the utility's rate base at cost. The current rules include a waiver process.

Currently, the Commission reviews the filed IRP—including its treatment of risk—and either acknowledges it, in whole or in part, or sends it back to the utility for modification and resubmission. Although the OPUC does consider IRPs in future rate-case proceedings, a formal acknowledgment of an IRP does not ensure favorable rate-making treatment for costs associated with resource acquisition.^{55,56} The significance of acknowledgment for future prudence review has been raised in UM 1056.⁵⁷

Risk is also considered during rate cases on power costs, and adherence to companies' risk policies has made an impact on rate treatment. For example, the OPUC determined that PGE imprudently deviated from its risk policy when it contracted for power before forward markets demonstrated liquidity. The OPUC disallowed the difference between

⁵⁵ Oregon PUC Order No. 89-507 set forth the Commission's role in reviewing and acknowledging a utility's least-cost plan. The Commission reviews the plans submitted by utilities and either acknowledges them, in whole or in part, or returns them for modification, based on its assessment of the plans' adherence to the principles set forth in this and more recent orders. Legally, the Commission is required to reserve judgment on rate-making issues. However, the Commission considers the IRP and ratemaking processes to be linked. In ratemaking proceedings, the Commission gives weight to actions that are consistent with an acknowledged IRP, and utilities are expected to explain actions that are inconsistent with acknowledged plans. (OPUC Staff Report. April 18, 2003. Docket No. LC 33. <http://www.oregon.gov/PUC/meetings/pmemos/2003/050703/reg3.pdf>)

⁵⁶ Acknowledgment of specific risk management practices have been proposed. For example, PGE's Action Plan Supplement in case LC 33 requested acknowledgment of PGE's continued reliance upon ratemaking tools, including internal insurance, reserve funds, and deferred accounting, for managing risks that have a low probability but a high cost to insure externally. Staff opposed acknowledging this practice, because "different risk mitigation tools are appropriate for different resource acquisition strategies," further stating that Staff "cannot assess how PGE should mitigate risk because it will not be requesting acknowledgement of specific resource acquisition actions until it files its Final Action Plan." PGE later withdrew this request. (OPUC Staff Report. Op. cit.; OPUC, Partial Plan Acknowledgment, Order No. 03-461, Aug. 1, 2003)

⁵⁷ In UM 1056, Staff initiated discussion on the significance of acknowledgment for a prudence hearing or rate case regarding an investment or purchase. Both PGE and PacifiCorp (and other parties, including Idaho Power) submitted comments. PacifiCorp maintained that what is known or knowable by the utilities is appropriately considered in the IRP planning cycle and asked the Commission to clarify that it won't revisit what was known or knowable at the time the IRP was acknowledged in later proceedings. (PacifiCorp's Opening Comments. Sept. 9, 2005. Docket UM 1056, p. 21-22) Staff opposes PacifiCorp's proposal. (Staff's Reply Comments, filed Sept. 30, 2005, in OPUC docket UM 1056.)

the actual purchased power costs and what costs would have been, had PGE followed its purchasing guidelines.⁵⁸

Although Oregon does not require utilities to have risk management policies, all investor-owned utilities (Idaho Power Co., PGE, and PacifiCorp) have them. Generally these policies are developed and approved by risk management committees consisting of company staff.

Risk metrics employed vary from utility to utility, although value at risk (VAR) and the variance of portfolios' PVRP is commonly used for resource planning. In its 2004 IRP, PacifiCorp evaluated resource portfolios using the following measures of PVRP variability: stochastic average PVRP (stochastic variable costs plus the deterministic fixed cost), upper tail PVRP (average of five worst results), and standard deviation and variance. As with metrics, risk management software also varies from utility to utility. Portland General Electric has just begun using Aurora for resource planning models. PacifiCorp uses Planning & Risk by Global Energy Decisions and adds on internally-developed, system-specific models for its IRP.⁵⁹

Formal treatment of risk allocation between shareholders and ratepayers generally occurs during rate cases. In these proceedings, a company's recovery of costs hinges on the prudence of its decisions based on information reasonably available to it on, among other things, the risk those decisions pose to consumers.⁶⁰ In theory, rate cases deal with risk to shareholders through the rate of return, but in practice this relationship is not specifically modeled. In recent filings, some intervenors argue that there should be reduction in the rate of return if the companies are granted purchase cost adjustment eligibility or other measures that reduce utility risk.

Most staff members at the Commission who deal with energy risk management are economists, with skills and experience in economic and financial analysis, return on equity, and cost of capital.⁶¹

⁵⁸ OPUC Order 02-772. Oct 30, 2002. Case docket UE-139.

⁵⁹ Our respondent has not used Planning & Risk but notes that the training provided by the software developer was excellent. (Phone interview, Maury Galbraith, June 28, 2006)

⁶⁰ Allocation of risk was also considered in docket UE 165, specifically with respect to PGE's request for a power cost adjustment mechanism (PCAM) to help it deal with the fluctuations in earnings due to hydro availability and power market prices. Under a rejected stipulation, the PCAM would have created an asymmetrical band around System Dispatch Cost Variance, in which consumers would have been charged for these costs in excess of \$15 million, whereas shareholders would return excess earnings greater than \$7.5 million to ratepayers. Among other things, this stipulation would have required PGE to obtain consultation services for analyzing the statistical distribution of net power costs as well as the variability and correlations between hydro generation, electricity prices, natural gas prices, system load, and forced outages. In its order rejecting elements of the stipulation, the Commission cited the stipulating parties' failure to provide analysis on how often the PCAM would likely be triggered and that it would be revenue-neutral. (Order No. 05-1261, Dec. 21, 2005).

⁶¹ Cathie Murray, Regulatory Assistance Project, *Electric Resource Long-range Planning Survey: Oregon*. September 2003. Available at <http://www.raonline.org/>.

Appendix C: Models and Tools for Portfolio Management

C.1. Overview

This appendix discusses several computer models for portfolio management and some practical issues concerning the selection and use of such models. The particular models presented are some of the better known ones, but an exhaustive list is beyond the scope of this report.

In considering available tools for portfolio management in the context of electricity, several factors must be considered:

1. Type of organization, e.g. integrated utility or a load serving entity
2. Time frame for planning, e.g. less than a year, several years, decade or more
3. Scope of consideration, e.g. management of energy and fuel contracts or total cost of delivered services
4. Perspective, e.g. shareholders, customers, or society—or a combination thereof

The tools that are available come from two different perspectives (1) finance/investment and (2) traditional utility planning. The former flow from a highly developed quantitative practice and focus on the management of various financial instruments such as future contracts, laddering, and options. The software tools available in this category offer fairly sophisticated methods for evaluating risk. Contrastingly, those models and tools coming from the utility side tend to focus on fully representing the unique aspects of the electric utility industry, but are generally much less sophisticated in risk analysis.

Regulators should keep in mind what the model was designed to do and what necessary simplifying assumptions are built in to it. Careful review of key input data is always necessary and it is wise to remember that even the best of models fed the best available forecasts can provide only informed estimates of future results.

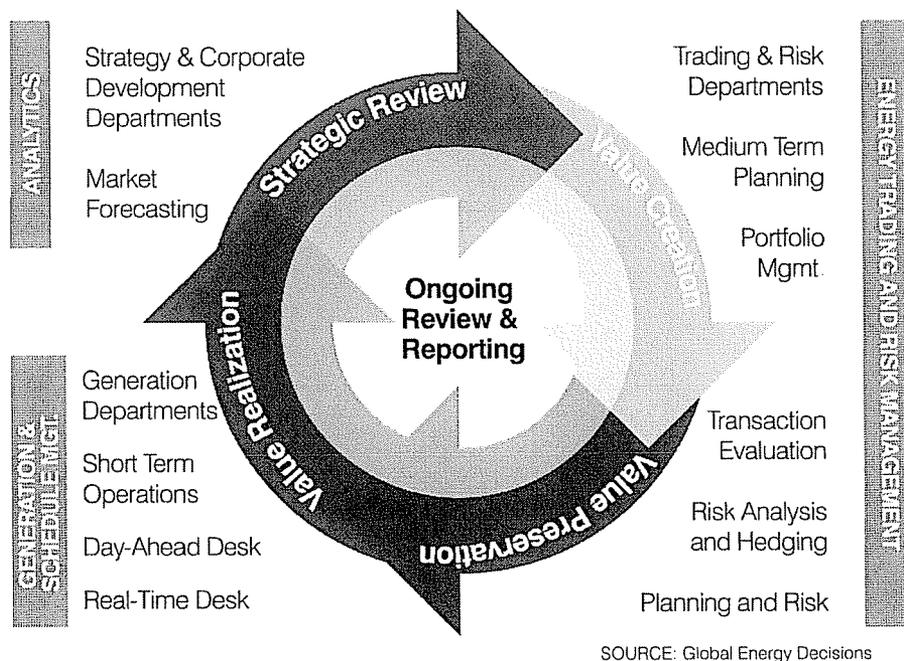
To give some idea of the range of tools for different aspects of electricity portfolio management, we reproduce in Fig. C.1 the product diagram from Global Energy Decisions showing their products and their applicability.¹

New Energy Associates also offers a suite of products that breaks out the process in a slightly different way. (See Table C.2.)²

¹ <http://www.globalenergy.com/solutions.asp>

² <http://www.newenergyassoc.com/products/>

Fig. C.1. Conceptual Approach of a Sample Portfolio Management Software System (Global Energy Decisions)



Global Decisions graphic, used by permission

Table. C.1. Conceptual Approach of a Sample Portfolio Management Software System (Global Energy Decisions)

Global Energy Decisions Tools by Category		
<u>Analytics</u>	<u>Energy</u>	<u>Operations</u>
Market Analytics	Front Office Solutions	Generation Management
Market Analytics LMP	Middle Office Solutions	ISO Management
Planning & Risk	Back Office Solutions	Load Forecasting
Capacity Expansion		Plant Management
Strategic Planning		Maintenance Scheduling
		Tariff Analysis

Table. C.2. Conceptual Approach of a Sample Portfolio Management Software System (New Energy Associates)

Strategy and Planning	Trading and Market Operations
PowerBase Suite	Monaco
PROMOD IV Strategist MarketPower	MarketManager Retail Office NOSTRADAMUS
IMPACT	
SENDOUT	Generation Management
	Cockpit

C.2. Load and Price Forecasting

Load forecasting has been done since the beginning of the electric utility industry. The approaches used vary by the time scale involved. Short term forecasts of a day or less are based on typical hourly load patterns for the season and weather forecasts. Forecasts of a few years are generally derived from recent historic data and extrapolated with adjustments for weather and simple external drivers such as population growth and planned DSM programs. Common current practice is to incorporate weather variability in computing confidence intervals for peak load levels. The greatest change has occurred with long range forecasts. The old practice was to plot the historic load values on log graph paper and then draw a straight line into the future. More modern practices look at load growth by customer class and apply econometric methods to develop future values. In some cases the load components are broken down by end-use category. That approach is especially useful for designing and evaluating Demand Side Management (DSM) programs. Over the years most entities have developed and refined their own custom tools for load forecasting.

With the move in recent years to wholesale markets, a number of tools have been developed with integrate load and price forecasting. Some of these are quite sophisticated and consider transmission constraints and locational prices.

There is considerable academic and professional literature on this topic. In recent years most efforts have been focused on short-term forecasting using such techniques as neural networks.

Other sources of information

NERC Load Forecasting Working Group: www.nerc.com/~pc/lfwg.html

Electric Power Research Institute: www.epri.com

Spatial Electric Load Forecasting by H. Lee Willis, Marcel Dekker, Inc.

Table. C.3. Load Forecasting Models

Model	Description	Company
TRM	Time Related Modeling System for time series data in a deregulated market.	Economic Sciences Corporation www.econsci.com
LOADCASTER	Comprehensive load analysis, modeling, forecasting, and settlement software system.	
ESM - ENERGY SERVICES MANAGER	Prospect load analysis, cost of service estimation, bid pricing. DSM project valuation and planning.	
EnerPrise Load Forecasting	Short to mid-term load forecasts for scheduling resources, communicating commitments with an ISO, and planning energy purchases/sales.	Global Energy Decisions www.globalenergy.com
NOSTRADAMUS	A neural network-based short-term demand and price forecasting system	New Energy – Siemens www.newenergyassoc.com
MetrixND	Forecasting techniques, such as neural networks, multivariate regression, ARIMA and exponential smoothing.	Itron www.itron.com
AURORA Price Forecasting	Electric market forecasting tool that captures dynamics and economics of energy markets. Short and long-term forecasts.	EPIS www.epis.com

C.3. Integrated System Planning

Integrated system planning is about finding the right mix of supply and demand side resources that provide low cost and reliable electricity service, while also minimizing risks. This is much like the integrated resource planning that was done by utilities before deregulation. The goals are similar but the available components have changed somewhat.

Table. C.4. Integrated System Planning Models

Model	Description	Company
Electric Generation Expansion System (EGEAS)	Least cost capacity expansion analysis.	Electric Power Research Institute www.epri.com
PowerBase Suite	Power supply and transmission planning with market and risk analysis.	New Energy – Siemens www.newenergyassoc.com
EnerPrise Capacity Expansion	Screening and evaluation of generation capacity expansion, transmission upgrades, strategic retirement, and other resource alternatives. It is an economic optimization model that considers resource expansion investments and external market transactions.	Global Energy Decisions www.globalenergy.com
AURORA	Price forecasting, portfolio analysis, capacity expansion, risk and uncertainty analysis.	EPIS www.epis.com
PLEXOS for Power Systems	Operational issues such as scheduling power, optimized unit commitment, transaction and risk evaluation, power station valuation, market analysis, transmission analysis.	Plexos www.plexossolutions.com
Energy 2020	The ENERGY 2020 model is an integrated multi-region energy model that provides complete and detailed all-fuel demand and supply sector simulations.	www.energy2020.org

C.4. Managing Forward Prices & Contracts

An important aspect of portfolio management is organizing and managing market and contract information.

Some of the types of products that could be monitored with software tools include:

Spot purchases involve paying market price on the day that the commodity is needed. Spot market pricing can be quite volatile, but requires no commitments. Spot market reliance protects against both falling demand and falling prices, but exposes the portfolio to risks from rising demand or prices.

Forward contracts: agreements between buyers and suppliers to trade a specific amount of a commodity at a pre-agreed upon price at a given time or times.³ Payment is on the delivery date. Forward contracts avoid exposure to spot market volatility, but accept the risk that market prices may fall, that the counter-party may default, and that demand may fall.

Option contract: the buyer prepays a (relatively) small *option fee* up front in return for a commitment from the supplier to reserve a certain quantity of the good for the buyer at a pre-negotiated price called the “strike price.” The cost of the option may increase the total price compared to the price (offered at *that time*) of a long-term contract, but one does not need to commit to buying a specific quantity. Typically, the option is *exercised* only when the spot price (on the date of need) exceeds the strike price of the option. This type of option contract is known as a “call” option; a similar option contract that gives the buyer the right to sell a certain quantity of the good to the seller (of the option) at a pre-negotiated price is known as a “put” option.

Flexibility contracts: like a forward contract, but the amount to be delivered and paid for can differ based on a formula, but by no more than a given percentage determined upon signing the contract. Flexibility contracts are equivalent to a combination of a long-term contract plus an option contract. (Simchi-Leve 2002)

Each of these product types offers a different type and degree of pricing and flexibility. The goal of portfolio management may be thought of as finding the optimal trade-off between price and flexibility through an appropriate mix of low price-low flexibility (long-term contracts,) reasonable price but better flexibility (option contracts) or unknown price and supply but no commitment (the spot market.) Varying durations as well as contract types can help create an even mix. The role of software for managing contracts and options is to monitor (perhaps on a daily basis) the cost and riskiness of the inventory of such products and to analyze purchases and sales that might improve the

³ The term or time period of a forward contract can be of whatever length the parties choose. It often begins sometime in the future. For example, power contract can be for one month, one year or for the life of a generator and may start immediately on signature, the next month, or one or more years into the future. Forward contracts for less than one year are often called “short-term” contracts. To be “long” in a futures contract means that one has the obligation to buy at a later date, thus coming out ahead if the asset price goes up. To be “short” in a futures contract means that one has an obligation to sell at a later date, thus coming out ahead if the asset price goes down.

tradeoff. If a portfolio includes short positions or options, frequent analysis is needed to choose the best time to fill short positions or to exercise options (if at all).

Many vendors offer applications for this purpose. Table C.5 lists a few fairly widely used in the energy sector. Note also that this category also overlaps some with the risk management tools in the next section.

Table C.5. Software for Forward Price and Contract Management

Model	Description	Company
BookRunner	Analysis for various transaction types and all energy commodities including oil, natural gas, and electricity.	Risk Advisory www.riskadvisory.com
Edur	Application for trading, risk management and operations needs in various commodity markets.	OpenLink www.olf.com/energy/
Epsilon & Entegrate	Integrated risk management, trading and physical commodities scheduling system.	SunGard www.sungard.com
ICTS Symphony	Comprehensive transaction management system to capture, manage, track and process all over-the-counter and exchange traded instruments.	Trade Capture www.tradecapture.com
GasBuyer	Price analysis and decision support tool used for purchasing and hedging natural gas.	Planalytics Inc. www.planalytics.com

C.5. Risk Analysis

In this category are applications focusing on various aspects of risk. The short-term products look at the more quantifiable risks associated with futures contracts and energy markets. A few of the more utility focused tools try to represent in some way the longer term risks. But that is conceptually a more difficult task since there is much greater uncertainty. For longer-term analysis, a scenario-based approach is most commonly used, but the challenge always is to make those scenarios diverse enough to capture a reasonable range of possibilities.

Table C.6. Software for Risk Management

Model	Description	Company
RISKMIN	Least cost capacity expansion analysis.	Electric Power Research Institute www.epri.com
Planning and Risk	Portfolio management to analyze, report, and actively manage assets, including power plants, customer loads, fuels and contractual positions.	Global Energy Decisions www.globalenergy.com
Monaco	Deal capture, advanced risk analytics, multi-commodity portfolio management, real-time credit monitoring and analysis.	New Energy – Siemens www.newenergyassoc.com
Predict!	Database application for recording and managing risks, opportunities, issues and mitigation strategies	Risk Decisions www.riskdecisions.com
Kiodex Risk Workbench	Commodity risk management software.	Sungard Kiodex www.sungard.com/kiodex
NWPCC Portfolio Model	An Excel based model that calculates energy and costs associated with meeting regional requirements for electricity. The model evaluates the cost and risk relationships for a number of alternatives.	Northwest Power and Conservation Council www.nwcouncil.org

C.6. Selecting software:

C.6.1. Selection issues

When selecting software, it is important first to prioritize the objectives and then to evaluate the available options in that context.⁴

- Objectives: How well the software meets the designated needs of the user.
- Involvement: The ultimate users of the software need to be closely involved in its selection and committed to its use.
- Transparency: Are modeling methods and algorithms well documented and visible to users and regulators?
- Software Characteristics:

⁴ Some of these criteria are from Marchetti, Anne, [Beyond Sarbanes-Oxley Compliance: Effective Enterprise Risk Management](#), John Wiley & Sons, 2005.

-
- Monitoring capabilities
 - Facilitation and documentation of risk assessment, testing, and remediation
 - Built-in version controls
 - Security and access controls
 - Electronic sign-off functionality
 - Audit trail documentation and traceability
 - Ability to customize input fields, reports, and templates
- Implementation Costs: software, licensing fees, hardware requirements, implementation time, training costs, customization efforts/consulting.
 - Reporting Capabilities: Are the model results available in reports and formats that are easily used and understood?
 - Flexibility: How easily can the software be applied to meet new needs?
 - Support: Does the vendor provide training, fix problems, and update the software as needs change?

C.6.2. Non-Software Cost Considerations

Staffing Costs

When implementing software systems for portfolio management, the biggest cost may very well be labor and training costs for staff using the software. Portfolio management presents a trio of staffing requirements: information technology demands; ability to understand and apply complex economic, statistical, and financial concepts relating to risk management; and understanding any specialized characteristics relating to the electric industry. That last category is quite broad, encompassing, for example, power supply needs, specialized energy products and markets, ISO/RTO requirements, and utility cost recovery or ratemaking. Careful attention to budgeting for staff, staff training (and regular update training), and startup time will be critical.

Hardware Costs

Our experience is that complex models severely tax even high end computer hardware. Investments in the fastest computers and largest storage devices available are likely to result in considerable labor savings and faster, more responsive answers to modeling questions. Attention should be paid to backup hardware, as well; large capacity RAID storage devices with hot-swappable drives for off-site backup appear to be the most cost effective solution at this time for high volume data storage. For team use, network attached storage and high speed networking are helpful. The costs for these items are very small compared to the labor and software expenses, but shortchanging them can waste considerable staff time and put critical work at risk.

In summary, regulators considering PM or IRP software acquisition, whether for their own use or by utilities that they oversee, should focus on the prioritized goals and be aware that the largest expense is likely to be for the personnel to properly use the software.

C.7. Model Summary Table

Application	Time Horizon	Input Data and Forecasts	Capacity Expansion Models	Procurement and Scheduling Models (No Capacity Expansion)
1. Integrated System Plan (analytics)	10 to 20 years (long-term)	Forecasts of <ul style="list-style-type: none"> • customer load, • price elasticity, • resource availability, • fuel costs, • resource costs, • risk premiums, • fuel price volatility, • reliability requirements and policies, • environmental policies and costs. 	Optimization Models <ul style="list-style-type: none"> • Electric Generation Expansion System (EGEAS) • EnerPrise Capacity Expansion Screening/scenario/risk analysis models <ul style="list-style-type: none"> • PowerBase Suite • AURORA • RISKMIN 	<ul style="list-style-type: none"> • PLEXOS for Power Systems
2. Procurement (Trading and Risk Management)	1 to 3 years (short-term)	Energy and fuel price forecasts and market futures Load requirements		<ul style="list-style-type: none"> • BookRunner • Edur • Epsilon & Entegrate • ICTS Symphony • Planning and Risk
3. Management (Generation and Scheduling)	Daily to annually (day ahead, near-term)	Short term load forecasts Resource and transmission availability Fuel and energy prices Environmental conditions		<ul style="list-style-type: none"> • Monaco • Predict! • Kiindex Risk Workbench

Appendix D: Risk Measures

Perhaps the most commonly used family of risk measure in portfolio management is Value at Risk and related measures discussed in Section 3 of this report. Others that have been used and which may be of value are summarized in Table 3.1 and explained further here. All depend on development of probability distributions for the cost of the portfolio.

COEFFICIENT OF VARIATION (CV)—This measure is the ratio of the distribution's standard deviation to its mean. It is one way to measure risk relative to return, or in this case, variation in price relative to mean price, measured over a defined period. Tolerance bands can be established around CV.

BETA—Beta is a measure of the systematic risk of a single instrument or an entire portfolio and describes the sensitivity of an instrument or portfolio to broad market movements. A portfolio with a large beta will tend to benefit or suffer from broad market moves more strongly than the market overall, while one with a small beta will swing less violently than the broad market. It is defined as the ratio of the portfolio's covariance with the market divided by the market's variance or $\text{Covariance}(\text{portfolio, market}) / \text{Variance}(\text{market})$. Beta is used to measure volatility of stock returns relative to an index like S&P 500 returns, and one could consider measuring volatility of a resource portfolio's cost relative to volatility of spot market prices. However, it must be remembered that beta does not capture specific risk (the riskiness of the portfolio itself, irrespective of market risk). A portfolio can have a low beta but still be very volatile if its variations are simply not correlated with those of the market.

EXTREME VALUE MEASURES—We use this term as a catch-all for a variety of conceptually straightforward measures of portfolio riskiness. In general, this type of measure is the difference in cost between a portfolio's expected cost and some estimate of its worst-case cost. For example, Northwest Energy and the NPCC measure portfolio riskiness by the difference between its expected cost and average of the worst 10% of its cost's probability distribution.¹

VALUE AT RISK (VaR)—A traditional approach for quantifying risk of investment portfolios.² VaR measures the downside risk of a portfolio. It is always calculated in the context of a risk level and a planning horizon. In the case of an electricity resource portfolio, VaR would be a measure of the dollar cost increase that has a certain probability (the selected risk level) of occurring over a certain time period (the selected planning horizon). For example, a regulator might be interested in the VaR of a proposed resource portfolio over a one year planning horizon at the 99% risk level. That VaR would tell us the amount of extra cost that would have a 1% chance of occurring over the next year. Or, a VaR at the 90% risk level for a ten year planning horizon would tell us the amount of extra cost that portfolio has a 10% chance of incurring over the next ten

¹ NorthWestern Energy 2005 Electric Default Supply Resource Procurement Plan, available at <http://www.montanaenergyforum.com/plan.html>

² Harry M. Markowitz, "Portfolio selection," *Journal of Finance*, 7(1), 77-91, 1952.

years. Utilities in California compare portfolios using this type of metric and variations on it.³

REVENUE AT RISK (RAR)—Related to VaR, RaR considers a firm that needs a resource to produce a product over the next year. If the cost of that resource increases dramatically and the firm cannot pass on that cost increase to its customers, say because the price had already been agreed upon, then the net revenues could take a big hit. Because of the cost uncertainty of that resource, they have Revenue at Risk (RaR). This firm might want to study the historical price volatility of the resource in question. Suppose this examination of history shows that the one-year 10% RaR is equal to the maximum amount of extra resource cost that the manufacturer can afford to pay without severe damage to its finances, it might choose to purchase a (long) forward contract for all its anticipated resource need for the next year at today's futures price, giving up possible extra profit that would be earned if the commodity price drops, but eliminating that 10% chance of grave damage. Alternatively, the firm might purchase a call option for its resource needs with a strike price that leaves it in the black. The purchase price for that option would be the "insurance premium" for eliminating this risk.

COMPONENT VALUE AT RISK — This measures the marginal contribution to value at risk of each element within the overall portfolio. For a utility's purposes, this could mean the risk that each additional coal plant, for example, adds to environmental regulation risks. This approach can be especially valuable as a way to provide insight into the risk analysis analogue of avoided cost analysis.

STRESS EXPOSURES — While value at risk might tell a company how much they could lose under the kind of random market fluctuations that make up the broad history of their industry, stress tests help a company understand the larger risks they may also face. (This type of analysis must take into account volatility and correlation spikes.) In general, there are two approaches used. First, one can test the portfolio relative to shocks that have been observed historically and see how the portfolio being considered might fare under a similar shock. The second approach is to brainstorm extreme scenarios and test their affect on the portfolio. The problem with these approaches is that history is unlikely to repeat itself exactly, and nobody can predict the future. Nonetheless, stress testing allows the portfolio manager to better understand how much loss might occur during a catastrophic event. It could be especially informative if there are certain large events identified that may or may not occur. An example of a stress exposure would be to test the expected cost and riskiness of various strategies with and without implementation of a proposed market reform or with and without implementation of CO₂ emission limits.

LIQUIDATION VALUE AT RISK — One question many companies wish to answer is the total potential loss that could occur if an asset had to be liquidated. For instance, a utility might try to determine what would happen if it were forced to retire an old coal plant.

MARGIN AT RISK — This measure helps companies understand what margin requirements they may need to provide due to margining agreements. This is important for cash flow management.

³ CPUC Energy Division, *Workshop Report on Value at Risk, Cash-Flow at Risk, and Other Measures of Portfolio Risk*. June 6, 2003.

CREDIT VALUE AT RISK — A firm's potential credit exposure on individual transactions is the cost of complying with changes to the amount of credit security the firm must supply to creditors. This can be affected by individual transactions or by external conditions that affect the credit obligations of the firm as determined by its total portfolio. For example, long-term contracts that utilities enter can be viewed as liabilities on their books. A credit value at risk calculation can be done to determine how different transactions might affect the utility's return on equity, for instance.

ENTERPRISE-WIDE RISK MEASURES — This is a measure that appropriately aggregates market, credit, regulatory and operational risk for the firm as a whole. Enterprise risk management seeks a balance amongst the various risk components.

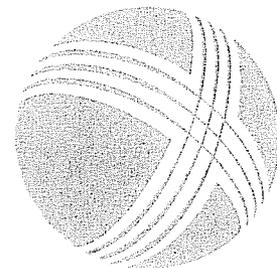
COSTS AT RISK – This measures the probability that a portfolio's costs will go up or down by certain amounts over certain time periods. It is of particular interest from a consumer protection perspective.

RATES AT RISK — This measures the potential change in the retail customer's rates as a result of how external fluctuations affect the cost of generation supply portfolio as a whole. This measure, too, is of particular interest from a consumer protection perspective.

KWalton

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COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF:

APPLICATION OF BIG RIVERS ELECTRIC	)	CASE NO. 2012-00063
CORPORATION FOR APPROVAL OF ITS)	
2012 ENVIRONMENTAL COMPLIANCE)	
PLAN, FOR APPROVAL OF ITS AMENDED)	
ENVIRONMENTAL COST RECOVERY)	
SURCHARGE TARIFF, FOR CERTIFICATES)	
OF PUBLIC CONVENIENCE AND)	
NECESSITY, AND FOR AUTHORITY TO)	
ESTABLISH A REGULATORY ACCOUNT)	

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.'s
THIRD SET OF DATA REQUESTS TO
BIG RIVERS ELECTRIC CORPORATION

Dated: June 27, 2012

DEFINITIONS

1. "Document(s)" is used in its customary broad sense and includes electronic mail and all written, typed, printed, electronic, computerized, recorded or graphic statements, memoranda, reports, communications or other matter, however produced or reproduced, and whether or not now in existence, or in your possession.
2. "Study" means any written, recorded, transcribed, taped, filmed, or graphic matter, however produced or reproduced, either formally or informally, a particular issue or situation, in whatever detail, whether or not the consideration of the issue or situation is in a preliminary stage, and whether or not the consideration was discontinued prior to completion whether preliminary or final, and whether or not referred to in Big Rivers' direct testimony.
3. If any document requested herein was at one time in existence, but has been lost, discarded or destroyed, identify such document as completely as possible, including the type of document, its date, the date or approximate date it was lost, discarded or destroyed, the identity of the person (s) who last had possession of the document and the identity of all persons having knowledge of the contents thereof.
4. "Person" means any natural person, corporation, professional corporation, partnership, association, joint venture, proprietorship, firm, or the other business enterprise or legal entity.
5. A request to identify a natural person means to state his or her full name and residence address, his or her present last known position and business affiliation at the time in question.
6. A request to identify a document means to state the date or dates, author or originator, subject matter, all addressees and recipients, type of document (e.g., letter, memorandum, telegram, chart, etc.), number or code number thereof or other means of identifying it, and its present location and custodian. If any such document was, but is no longer in the Company's possession or subject to its control, state what disposition was made of it.
7. A request to identify a person other than a natural person means to state its full name, the address of its principal office, and the type of entity.
8. "And" and "or" should be considered to be both conjunctive and disjunctive, unless specifically stated otherwise.
9. "Each" and "any" should be considered to be both singular and plural, unless specifically stated otherwise.
10. Words in the past tense should be considered to include the present, and words in the present tense include the past, unless specifically stated otherwise.
11. "You" or "your" means the person whose filed testimony is the subject of these interrogatories and, to the extent relevant and necessary to provide full and complete answers to any request, "you" or "your" may be deemed to include any person with information relevant to any interrogatory who is or was employed by or otherwise associated with the witness or who assisted, in any way, in the preparation of the witness' testimony.
12. "BREC" means Big Rivers Electric Corporation and/or any of their officers, directors, employees, or agents who may have knowledge of the particular matter addressed.

INSTRUCTIONS

1. If any matter is evidenced by, referenced to, reflected by, represented by, or recorded in any document, please identify and produce for discovery and inspection each such document.
2. These interrogatories are continuing in nature, and information which the responding party later becomes aware of, or has access to, and which is responsive to any request is to be made available to Kentucky Industrial Utility Customers. Any studies, documents, or other subject matter not yet completed that will be relied upon during the course of this case should be so identified and provided as soon as they are completed. The Respondent is obliged to change, supplement and correct all answers to interrogatories to conform to available information, including such information as it first becomes available to the Respondent after the answers hereto are served.
3. Unless otherwise expressly provided, each interrogatory should be construed independently and not with reference to any other interrogatory herein for purpose of limitation.
4. The answers provided should first restate the question asked and also identify the person(s) supplying the information.
5. Please answer each designated part of each information request separately. If you do not have complete information with respect to any interrogatory, so state and give as much information as you do have with respect to the matter inquired about, and identify each person whom you believe may have additional information with respect thereto.
6. In the case of multiple witnesses, each interrogatory should be considered to apply to each witness who will testify to the information requested. Where copies of testimony, transcripts or depositions are requested, each witness should respond individually to the information request.
7. The interrogatories are to be answered under oath by the witness(es) responsible for the answer.
8. Responses to requests for revenue, expense and rate base data should provide data on the basis of Total Company as well as Intrastate data, unless otherwise requested.

**THIRD SET OF DATA REQUESTS OF
KENTUCKY INDUSTRIAL UTILITY CUSTOMERS. INC.
BIG RIVERS ELECTRIC CORPORATION
Case No. 2012-00063**

- Q3.1 Please explain the reason why the following inputs were selected/set using the values that ACES selected and entered in the PAR Model Execution Run Definition Screen and the Simulation Setting screen. Reliance on defaults is also a selection of an input, so please also explain why the default was selected.
- a. Iterations (run definition screen)
 - b. Dispatch (simulation setting screen)
 - c. Monte Carlo (simulation setting screen)
 - d. Draws per week (simulation setting screen)
- Q3.2 Does Big Rivers or ACES admit or deny that the results that were produced by ACES on ACES' computer (using its large database) were different than the results that Ventyx produced on its computer using the "stripped down" database by more than a usual amount associated with rounding, when considered on a monthly or an annual basis?
- Q3.3 One reason for the discrepancy discussed in the prior question could be due to the possibility that the order units have been placed in the databases may not be the same in both databases. This can be checked by comparing the Prosym text files (ex .DAT files) that the EPM Tool writes to disk before submitting runs. Could ACES check this, or alternatively, please produce and supply the .dat files for each of the 6 runs that ACES developed and that were reported in Mr. Hite's testimony?
- Q3.4 The Big River's database has several Transmission Areas. Please explain what all of the transmission areas are used for, and in the case that some areas are not used, please explain why those areas were included in the database.
- Q3.5 Please explain why Big Rivers relied on a single estimate of fuel costs, market prices, allowance prices, etc as support for its application to the Commission. Why didn't it include in its application additional analyses/support based on conducting any sensitivity cases?
- Q3.6 In each PCM file that Big Rivers supplied that are related to the Corporate Financial Models, there are rows at the bottom of the following Monthly Sources and Uses and the Annual Sources and Uses worktabs that have been either pasted in or refer to spreadsheets that still have not been supplied. Please provide the workpapers in electronic format, with all spreadsheets active, that were used to create the pasted in values on the Monthly Sources and Uses and the Annual Sources and Uses worktab for

every financial model/PCM file already supplied. Or provide the spreadsheets that were referenced on those worktabs that have not been supplied (Example, the base case has pasted in values, and the Build ACES Prices Sensitivity case that ACES ran in its test of the Ventyx data (Big Rivers 2012-2026 (CSAPR-MATS by equip) APM energy (5-8-12).xlsx) referenced external spreadsheets. Again, please check all of the PCM files and supply the requested information.

- Q3.7 Recently, ACES supplied another excel spreadsheet that was used as an intermediary file to format results that are incorporated into the PCM files that are then used by the Corporate Financial models. The file supplied was a 42 MB pivot table. Are any other such intermediary files used that have not been supplied? For example, were any other pivot table processing files used associated with any of the other PCM worktabs such as the Monthly/Annual Sources and Uses worktabs, or the Monthly/Annual Resources Report? If there were please supply those. If not please explain the process that was used to enter data into the necessary format required by the PCM file from the PAR model output.
- Q3.8 For each of the PCM spreadsheet worktabs that contain PAR model output results (ex Monthly Sources and Uses), please identify the names of the PAR model presets that ACES used to create the data that went into the worktab.
- Q3.9 Please supply all workpapers associated with the development of all unit characteristics modeled in the PAR model for each generating unit. If none exist, please explain how the unit characteristics were derived. Please supply this electronically, with all formulas included.
- Q3.10 Please provide all workpapers for the derivation of the emergency power price used in the database. If none exist, please explain how the price was derived. Please supply this electronically, with all formulas included.
- Q3.11 Please provide all workpapers for the derivation of the transmission limit that was used between Big Rivers and the markets that were modeled in the database. If none exist, please explain how the transmission limit was derived. Please supply this electronically, with all formulas included.
- Q3.12 ACES supplied approximately 15 sensitivity cases other than the cases that were incorporated in analyses that were used in Mr. Hite's testimony. Please identify which of the cases included ACES own market price forecasts (as opposed to PACE Globals), and provide all analyses used to develop those forecasts (both inputs and outputs) electronically, with all formulas included. Also, indicate what allowance prices SO₂, CO₂, NO_X, Hg were assumed in the analysis, if in fact these costs were included.
- Q3.13 If CO₂ costs were not used in the analysis discussed in the prior question, please discuss why not.

Respectfully submitted,

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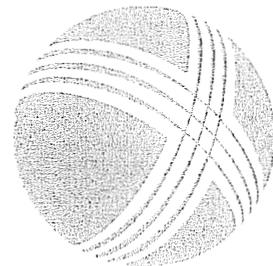
**CO-COUNSEL FOR ALCAN PRIMARY PRODUCTS
CORPORATION**

June 27, 2012

KWalton

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**COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION**

IN THE MATTER OF:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR APPROVAL OF ITS 2012 ENVIRONMENTAL COMPLIANCE PLAN, FOR APPROVAL OF ITS AMENDED ENVIRONMENTAL COST RECOVERY SURCHARGE TARIFF, FOR CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY, AND FOR AUTHORITY TO ESTABLISH A REGULATORY ACCOUNT)	CASE NO. 2012-00063
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**KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.'s
SUPPLEMENTAL SET OF DATA REQUESTS TO
BIG RIVERS ELECTRIC CORPORATION**

Dated: June 22, 2012

DEFINITIONS

1. "Document(s)" is used in its customary broad sense and includes electronic mail and all written, typed, printed, electronic, computerized, recorded or graphic statements, memoranda, reports, communications or other matter, however produced or reproduced, and whether or not now in existence, or in your possession.
2. "Study" means any written, recorded, transcribed, taped, filmed, or graphic matter, however produced or reproduced, either formally or informally, a particular issue or situation, in whatever detail, whether or not the consideration of the issue or situation is in a preliminary stage, and whether or not the consideration was discontinued prior to completion whether preliminary or final, and whether or not referred to in Big Rivers' direct testimony.
3. If any document requested herein was at one time in existence, but has been lost, discarded or destroyed, identify such document as completely as possible, including the type of document, its date, the date or approximate date it was lost, discarded or destroyed, the identity of the person (s) who last had possession of the document and the identity of all persons having knowledge of the contents thereof.
4. "Person" means any natural person, corporation, professional corporation, partnership, association, joint venture, proprietorship, firm, or the other business enterprise or legal entity.
5. A request to identify a natural person means to state his or her full name and residence address, his or her present last known position and business affiliation at the time in question.
6. A request to identify a document means to state the date or dates, author or originator, subject matter, all addressees and recipients, type of document (e.g., letter, memorandum, telegram, chart, etc.), number or code number thereof or other means of identifying it, and its present location and custodian. If any such document was, but is no longer in the Company's possession or subject to its control, state what disposition was made of it.
7. A request to identify a person other than a natural person means to state its full name, the address of its principal office, and the type of entity.
8. "And" and "or" should be considered to be both conjunctive and disjunctive, unless specifically stated otherwise.
9. "Each" and "any" should be considered to be both singular and plural, unless specifically stated otherwise.
10. Words in the past tense should be considered to include the present, and words in the present tense include the past, unless specifically stated otherwise.
11. "You" or "your" means the person whose filed testimony is the subject of these interrogatories and, to the extent relevant and necessary to provide full and complete answers to any request, "you" or "your" may be deemed to include any person with information relevant to any interrogatory who is or was employed by or otherwise associated with the witness or who assisted, in any way, in the preparation of the witness' testimony.
12. "BREC" means Big Rivers Electric Corporation and/or any of their officers, directors, employees, or agents who may have knowledge of the particular matter addressed.

INSTRUCTIONS

1. If any matter is evidenced by, referenced to, reflected by, represented by, or recorded in any document, please identify and produce for discovery and inspection each such document.
2. These interrogatories are continuing in nature, and information which the responding party later becomes aware of, or has access to, and which is responsive to any request is to be made available to Kentucky Industrial Utility Customers. Any studies, documents, or other subject matter not yet completed that will be relied upon during the course of this case should be so identified and provided as soon as they are completed. The Respondent is obliged to change, supplement and correct all answers to interrogatories to conform to available information, including such information as it first becomes available to the Respondent after the answers hereto are served.
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5. Please answer each designated part of each information request separately. If you do not have complete information with respect to any interrogatory, so state and give as much information as you do have with respect to the matter inquired about, and identify each person whom you believe may have additional information with respect thereto.
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7. The interrogatories are to be answered under oath by the witness(es) responsible for the answer.
8. Responses to requests for revenue, expense and rate base data should provide data on the basis of Total Company as well as Intrastate data, unless otherwise requested.

**SUPPLEMENTAL SET OF DATA REQUESTS OF
KENTUCKY INDUSTRIAL UTILITY CUSTOMERS. INC.
BIG RIVERS ELECTRIC CORPORATION
Case No. 2012-00063**

- Q2.1 With respect to Big Rivers' current arbitration with HMPL, please provide the following:
- a. The current status of the arbitration proceedings or appeals;
 - b. A copy of the arbitration award or opinion;
 - c. The short and long term financial impact of this decision on Big Rivers;
 - d. What is the projected impact on the arbitration award or opinion on Big Rivers' margins in 2012-15?
 - e. What is the effect of this decision on any of the models that support Big Rivers' Application in this case?
- Q2.2 With respect to the dam repair work that will permit full resumption of energy purchases from SEPA, please provide the following:
- a. the current status of the repair work;
 - b. When does Big Rivers expect to receive its full allocation of energy from SEPA?
 - c. Has Big Rivers included the full availability and price of SEPA energy in its modeling for this Application? Please explain. If not, why not?
- Q2.3 Please provide all documents and other communications provided to Cobank and CFC since the filing of Big Rivers' responses to KIUC's Initial Request for Information. Please note this is a continuing request requiring updated information.
- Q2.4 Please describe Big Rivers' current plans for the proposed bridge financing and later permanent financing of the construction projects proposed in this Application, including anticipated terms and conditions.
- Q2.5 When does Big Rivers plan to release and file its 2011 Annual Report? Please provide a copy when available.
- Q2.6 Please reference the Direct Testimony of Mark Hite, page 7, lines 20-22, which states that Big Rivers acquired forward pricing data (hourly energy prices, monthly coal prices, monthly natural gas prices and monthly allowance prices) from PACE Global which data were used by ACES in running the production cost model. Please also reference Big Rivers' Response to Item 32 of KIUC's Initial Request for information which states that Big Rivers relied on ACES and PACE Global for input assumptions surrounding commodity prices including emission allowances, fuel and wholesale energy market pricing. Please provide in narrative form and without reference to previously filed data disks an explanation whether the ACES production cost model used only

PACE Global assumptions or a combination of PACE Global and other projections with respect to the following forward pricing:

- a. wholesale energy prices;
- b. fuel prices;
- c. emission allowances,
- d. natural gas prices.

In your response, please provide by month, day or hour, the specific ACES data or data from any other non-PACE Global source actually used in the production cost model in a manner than can be compared with the PACE global data not used.

- Q2.7 Refer to the Company's response to KIUC 1-2(d). Please provide an electronic version of the exhibit attached to the response with cell formulas intact.
- Q2.8 Refer to the Company's response to AG 1-47(a) and the statement that "The financial analysis was performed by Big Rivers with input from ACES Power marketing and PACE Global."
- a. Please describe each step of the financial analysis and the role and activities performed by ACES, PACE, and Big Rivers, respectively.
 - b. Please identify each person, the person's employer, and the specific responsibilities of each person in each step of the financial analysis described in response to part (a) of this question.
- Q2.9 Refer to the Company's response to AG 1-47(c) and the statement that "ACES Power Marketing provided the planning models for these [sensitivity] scenarios" used to assess the "economic impact of two compliance options with regard to a loss in Smelter load" described by Mr. Berry in his Direct Testimony at 15.
- a. Please identify the "planning models" provided to Big Rivers by ACES for this purpose.
 - b. Please distinguish between the "planning models" provided to Big Rivers by ACES for this purpose and the Big Rivers model that was used for this purpose and described by Mr. Hite in his Direct Testimony at 7 as follow: "Big Rivers developed a financial model to determine the net present value of revenue requirements ("NPVRR") over the 2012 - 2026 (15-year) study period."
- Q2.10 Does Mr. Hite personally possess the expertise and knowledge to run the Ventyx PAR model used by ACES Power Marketing?
- a. If so, then: i) describe his expertise and knowledge, ii) specifically describe his experience in production cost modeling in general and the PAR model in particular, and iii) his personal involvement in running the Ventyx PAR model to quantify the production costs and any other amounts used in the "financial analysis" and/or in the "financial model" to assess the scenarios and sensitivity studies in this proceeding.

- b. If not, then please identify the witness supporting the production cost modeling and the quantification of the production costs used in the “financial analysis” and/or in the “financial model” to assess the scenarios and sensitivity studies in this proceeding. If there is no such witness, then please so state.

Q2.11 Refer to the Company’s response to PSC 1-1.

- a. Please provide the support for the estimates for each vendor, including, but not limited to, all workpapers, engagement letters, purchase orders, and correspondence (internal and external) and describe how the Company developed the estimates from these source documents. In addition, please identify the person(s) who developed these estimates and provide their name(s), company affiliation, and position (title).
- b. Please provide a copy of the service agreement with APM and any special agreements related specifically to the Company’s ECR application in this proceeding.
- c. Does the service agreement with APM allow APM to bill Big Rivers for work that it performs for Big Rivers?

Q2.12 Refer to the Company’s response to PSC 1-7. Please update this response for the current status of the Station 2 review being conducted by HMP&L. Identify the approvals, if any, that HMP&L needs to provide in order for Big Rivers to proceed and describe the status and future timing of each such approval.

Q2.13 Refer to the Company’s response to PSC 1-9 and the potential effects of compliance with the EPA regulation on coal combustion residuals and EPA rules relating to impingement mortality and entrainment.

- a. Please address whether, and if so, the manner in which, the Company could comply with these rules through constrained operation of its generating units. Please provide a copy of and a narrative description of all analyses that the Company or outside advisors on behalf of the Company have performed.
- b. If constrained operation is a viable compliance option, then please provide a sensitivity study against the base case and against the Partial Build scenario to quantify the effects of this option.

Q2.14 Refer to the Company’s response to PSC 1-22 and the conclusion that “It is believed that EPA will likely overcome challenges to the rule and will ultimately prevail.”

- a. Please provide a copy of all analyses and all supporting documents relied on for this conclusion.
- b. What is the likely effective compliance date if EPA overcomes the challenges? Please provide a copy of all analyses and all supporting documents relied on for your response.

Q2.15 Refer to the Company’s response to PSC 1-24 and the conclusion that “Big Rivers found it unnecessary to make assumptions about Smelter rates well beyond the 2023 time horizon because longer periods of time would only serve to improve the “Build Case.”

- a. Please describe in more detail why the Company believes that this conclusion is correct. In your response, address the fact that the NPV of the revenue requirements associated with the Build Case after the 15 years would increase the cost of the Build Case, not reduce it.
- b. Please provide a copy of all quantitative analyses that supports this conclusion.

Q2.16 Refer to the Company's response to PSC 1-26 and the statement that the sensitivity where the Company loses the load of one smelter, "the remaining smelter is assumed in the model to shoulder its proportionate share of the cost increase associated with the departure of the other smelter."

- a. Please explain the basis for this assumption and provide a copy of all documents relied for the assumption or used to test the validity of this assumption.
- b. Please confirm that in base rate proceedings, the Commission uses the off-system sales margins as a reduction to the revenue requirement. If the Company cannot confirm this statement, then please describe how the Company believes that the Commission uses the off-system sales margins in the revenue requirement. Please cite to and provide copies of all source documents relied on for your response.
- c. Please identify where this assumption is reflected in the sensitivity where the Company loses the load of one smelter.

Q2.17 Refer to the Company's response to AG 1-21. Please update this response with the current status of the engineering and design process. Be specific.

Q2.18 Please describe in detail how the Company's accounting for its fuel and purchased power costs changed after it joined MISO to reflect the fact that the Company bids all of its resources and load into MISO, if at all. In addition, please describe in detail the related effects on the costs included in its revenue requirement, including clause recoveries.

Q2.19 Please refer to the market prices shown on line 8 on the Risk spreadsheet in the Excel workbooks provided in response to KIUC's Motion to Dismiss for each of the scenarios.

- a. Provide the source(s) of these market prices and all analyses used to develop these prices, including all input sources, adjustments, assumptions, and electronic spreadsheets with formulas intact, including, but not limited to, the conversion of hourly or other data into the average annual rates reflected in this spreadsheet. Describe each step in the analytical process that led to the use of these specific market prices and make sure that each step is documented with all input, computations, and output files.
- b. Please provide a narrative description of these market prices, i.e., what do they represent, e.g., MISO energy prices averaged across all hours.
- c. Please confirm that the market prices include capacity costs. Describe how the changes in the MISO capacity auction process have been reflected in the market prices, if at all. If the changes have not been reflected in the market prices, then please provide a description of how these changes will be reflected in future market prices.

- Q2.20 Refer to the Company's response to KIUC 1-17, which included a confidential chart labeled Forward Power Price Comparison. The chart compared the forward power prices obtained from Pace, APM, and IHS.
- a. Please describe how this comparison was used and by whom to develop the market prices shown on line 8 on the Risk spreadsheet in the Excel workbooks provided in response to KIUC's Motion to Dismiss for each of the scenarios, if at all.
 - b. Please provide the data reflected on this chart in an electronic spreadsheet and provide all source documents used to obtain the data shown on this chart, including, but not limited to, all spreadsheets used to average projected hourly prices.
 - c. Please provide another version of this chart that includes the market prices that were used for each of the Company's scenarios.
- Q2.21 Refer to the Company's response to AG 1-46 and the attached copy of the January 19, 2012 and February 21, 2012 presentations to the Board.
- a. Please confirm that the January presentation indicated that capital expenditures to comply with CSAPR and MATS would total \$213.5 million and the February presentation increased the expenditures to \$283.5 million.
 - b. Please provide a detailed explanation why the capital expenditures reflected in the February BOD presentation, and the Application in this proceeding, are significantly more than the January 19, 2012 estimate presented to the Board. Provide a copy of all quantitative comparisons, electronically, that explain the significant increase in capital expenditures during the 4 week period between the January and February BOD meetings.
- Q2.22 Refer to the Company's response to AG 1-67.
- a. Please describe how the Company will reflect the retirement of the Wilson scrubber in the ECR. Address each of the following components: i) gross plant, ii) accumulated depreciation, iii) net salvage, iv) changes in operating costs.
 - b. Does the Company's estimate of capital expenditures for the Wilson scrubber include any costs to remove the existing scrubber? If not, then where are the removal costs reflected in the Company's financial models used to evaluate the various scenarios?
 - c. Please provide the Company's estimate of costs to remove the existing scrubber.
 - d. Please describe how the Company plans to track the costs to remove the existing scrubber to ensure that the costs are not included in the ECR?
 - e. Please describe how the Company plans to recover the net book value and the costs to remove the existing scrubber.
- Q2.23 Refer to the Company's response to AG 1-70. Please confirm that the Company's capital expenditure estimate in this proceeding is net of HMP&L's share of the costs to retrofit HMP&L

Units 1 & 2. Please describe where the Company has reflected this reduction in the Excel financial models of each of the scenarios.

- Q2.24 Refer to the last paragraph of the Company's response to KIUC 1-33, which states that "it was obvious that there were some significant differences between the two projections."
- a. Please provide a detailed description of the concern and why the Big Rivers believed it was necessary to acquire a third set of forward power prices from IHS Global.
 - b. Please describe each of the steps taken by Big Rivers and/or its advisors to address the "significant differences" between the two projections.
 - c. Please describe the resolution of this review and how this was reflected in the scenarios presented in this proceeding.
 - d. Please identify, describe, and provide a copy of each sensitivity study using the APM or HIS forward price curves. Provide all supporting input files and output reports as well as the CFM workbooks. In addition, please describe what attempts were made to ensure that the forward power prices and natural gas prices used in each sensitivity were consistent and provide a copy of all documentation that addresses the consistency of these assumptions.
- Q2.25 With regard to Big Rivers' response to AG 1-46, please provide all analyses, including electronic spreadsheets with formulas intact and supporting workpapers, included in the February 21, 2012 "Big Rivers Environmental Surcharge (ES) Rate Formula" presentation to the Big Rivers' Board and the "Environmental Surcharge (ES) Update – Rate Formula" presentation of March 16, 2012.
- Q2.26 Regarding data found in the file - PACE_Big Rivers Data Request Inputs_120524.xlsx
- a. Is it correct, that this is one of just two files that PACE developed and was produced based on a KIUC request (the other being PACE_Big Rivers Data Request Outputs_120524.xlsx)?
 - b. The file contains natural gas prices, coal prices, load forecast, CO2 costs, and Capital Cost Recovery Target Inputs for New Regional Expansion units. For all of these categories of data, PACE supplied 200 sets of data (200 iterations). Please provide a detailed explanation of the process, methodology, and assumptions used by PACE in creating the 200 iterations worth of data for each of these categories of data. Be sure to explain what was done to create this large number of iterations.
 - c. How has the 200 iterations of data factored into any analyses that were discussed in any of Big Rivers' witnesses testimony?
 - d. Please provide the revenue requirements model that led to the calculation of the Capital Cost Recovery Target Inputs for New Regional Expansion for each resource CC, CT and Wind.
 - e. Why did PACE supply coal prices for only the Illinois Basin region, when its market price analysis clearly must have included a forecast of coal prices in other regions?

Q2.27 Regarding the Reference data found in the file - PACE_Big Rivers Data Request Inputs_120524.xlsx

- a. Please provide documentation describing the process, methodology and assumptions used by PACE in developing the Reference natural gas price inputs that were then used by ACES in its modeling that led to the results filed in any Big Rivers witness' testimony.
- b. Provide the same information for the Reference Illinois Basin coal prices.
- c. Provide the same information for the Reference Capital Cost Recovery Target inputs.
- d. Provide the same information for the Reference CO2 prices. Also, please confirm that these CO2 inputs were not used in any analysis that ACES performed to develop results that were included in its modeling that led to the results filed in any Big Rivers witness' testimony.

Q2.28 Regarding data found in the file - PACE_Big Rivers Data Request Outputs_120524.xlsx.

- a. What are the hours included in the on-peak and off-peak periods for each month?
- b. In the worktab Output Stochastic Energy Prices, there are 200 iterations worth of annual average on-peak, off-peak and all hours market price data for each year between 2012 and 2030. Please provide a detailed explanation of the process, methodology, and assumptions used by PACE in creating the 200 iterations worth of data. Be sure to explain what was done to create this large number of iterations.
- c. How has the 200 iterations of market price data factored into any analyses that were discussed in any of Big Rivers' witnesses testimony?
- d. In that same worktab there is no reference case market price data. Is that because the data found in the Output Hourly Energy Prices worktab is the reference case? Please explain.
- e. Why weren't emissions allowance prices included in the files that PACE supplied?

Q2.29 Please provide documentation describing the process, methodology and assumptions and all worksheets developed in constructing the data assumptions (e.g. natural gas price forecasts, environmental cost assumptions, etc.) used by ACES in developing any sensitivity cases that it performed. In doing, please describe all sensitivity cases performed by ACES.

Q2.30 In the 20 scenarios that ACES supplied, only 5 included an Assumptions folder. Please explain why 15 scenarios did not contain that folder, and if this was an oversight, please provide the missing folders.

Q2.31 Was it the case that Big Rivers did not develop financial analyses/NPV analyses of all of the 20 cases that ACES performed? If not, why not, and if so please explain why Big Rivers has not supplied that information. If corporate financial analyses were developed for the sensitivity cases, please supply those, electronically, and in the same format as has been provided for the other financial models that the Company has supplied.

Q2.32 If any additional cases have been performed by PACE/ACES/Big Rivers to date, that have not already been provided, please provide:

- a. A narrative description of the case.

- b. Explain why the Company or its consultant has decided to continue developing new cases.
- c. Provide all spreadsheets, workpapers, analyses, production cost model input databases in native database format (fully populated database), output results, etc, to the same extent that the Company has supplied for previous cases it has provided.

Q2.33 In the base case folder that ACES supplied containing Assumptions, there is a file containing what appears to be generic assumptions, List.xls. Please explain the purpose of the data included in the file. For example, that data includes startup data, forced outages, scheduled outages, etc, but no indication of any unit that the data applies to.

Q2.34 Two files were supplied in the ACES folder related to the Base Case Assumptions, MidOffice Emission Curve 1-30-2012.xlsx and PCM (1-18-12) nominal.xlsx. Please explain in detail what was the information found in each of the files was used for in ACES analyses.

Q2.35 Regarding the files, Load Shape Data.xlsx and Price Shape Data.xlsx, please explain how they were created and what they were used for. If they were used in the analysis that ACES performed, please supply any other workpapers, electronically, used in the creation of the files.

Q2.36 Refer to the response to KIUC-1-14. Please supply all workpapers that contains S&L's derivation of upgrade costs used in this study. Mr. DePriest indicates that costs were derived from other sources, and this request is that the input assumptions and calculations be provided electronically with all formulas included. If the workpapers have been supplied, please provide a map between where the upgrade costs have been developed and have been input into corporate financial model net present value analysis.

Q2.37 Refer to the response to KIUC-1-24. Has the excel spreadsheet referred to in Mr. Miller's May 18, 2012 email been supplied. If so please state the name and where it may be found, if not, please supply the spreadsheet any referenced spreadsheets in excel format, with all formulas active.

Q2.38 Refer to the response to KIUC-1-25.

- a. Please explain in additional detail why the ACES model (Planning Model) does a better job reflecting market interaction between dispatching generating units versus buying power from the market?
- b. What did ACES mean by "creating a least cost solution". Does that mean least cost in the sense of creating an expansion plan, or a least cost dispatch/commitment process which interacts with a market price profile?
- c. The response indicates that the ACES model has the ability to run to show risks in cost-to-serve. What that capability used in any analyses presented in testimony in this case. If so, please explain how, and if not please explain why not.

Q2.39 Refer to the response to KIUC-1-32. Was any analysis performed by Big Rivers or any of its consultants to determine whether the production cost results produced in the current studies were consistent with results developed in the most recent IRP published in 2010? If not, please explain why not, if so, please discuss the findings of that review, and supply any written documentation of that process or consideration of that process.

Q2.40 Refer to the response to KIUC-1-33.

- a. What did Big Rivers mean when it said "analyses of the same size and scope"?
- b. Is that the explanation why it was reasonable for PACE to have included CO2 costs in its analysis while ACES did not include CO2 costs in its analysis?

Q2.41 In the work that PACE performed,

- a. Please provide a detailed explanation of how coal retirements were determined in the MISO market, and please supply any workpapers or documents of any type that were developed analyzing the coal retirement issue in MISO.
- b. Please explain how environmental regulations were incorporated in the analysis PACE performed, and supply any workpapers or documents of any type that were developed analyzing the environmental regulations, and how those regulations should be incorporated in the modeling that PACE performed.
- c. Please discuss the findings of how coal retirements and environmental regulations factored into the analysis that PACE conducted, and how those impacted the market price results that PACE produced.

Q2.42 In the work that ACES performed developing market price forecasts,

- a. Please provide a detailed explanation of how coal retirements were determined in the MISO market, and please supply any workpapers or documents of any type that were developed analyzing the coal retirement issue in MISO.
- b. As it relates to the market price forecasts that ACES created for any purpose associated with this study, please explain how environmental regulations were incorporated in the analysis, and supply any workpapers or documents of any type that were developed analyzing the environmental regulations, and how those regulations should be incorporated in the modeling that ACES performed.
- c. As it relates to the market price forecasts that ACES created for any purpose associated with this study, please discuss the findings of how coal retirements and environmental regulations factored into the analysis that ACES conducted, and how those impacted the market price results that ACES produced.

Q2.43 Refer to KIUC-1-34. Was anything other than nominal energy market prices from PACE Global used in the analysis that was presented in Mr. Hite's testimony. If so please explain how it was used, if not why not?

Q2.44 In its June 1, 2012 filing of confidential material, Big Rivers filed a draft document entitled "Load Concentration Analysis and Mitigation Plan" dated May 2012 ("Draft Mitigation Plan"). In connection with the Draft Mitigation Plan, please respond to the following:

- a. Who or what group within Big Rivers prepared or participated in the preparation of the Draft Mitigation Plan? Please state the names of those persons.
- b. Why is the Draft Mitigation Plan in draft form? Has the Draft Mitigation Plan been reviewed or approved by the Big Rivers Board of Directors? When does Big Rivers expect to finalize the Draft Mitigation Plan?
- c. Please provide all prior drafts of the Draft Mitigation Plan.

- d. When did work begin on the Draft Mitigation Plan and when was the current draft completed?
- e. Did Big Rivers engage any consultant(s) to assist in preparation of the Draft Mitigation Plan?
- f. Have any consultants reviewed the Draft Mitigation Plan or given input to Big Rivers? If so, please identify all consultants.
- g. Please provide all internal emails regarding preparation of the Draft Mitigation Plan since January 1, 2012.
- h. Please provide all documents and communications between Big Rivers and third parties regarding preparation of the Draft Mitigation Plan since January 1, 2012.
- i. To whom or to what third party has the Draft Mitigation Plan been circulated outside Big Rivers (other than to the Commission and Intervenors in this docket)?

Q2.45 On Page 4, Paragraph 3, the Draft Mitigation Plan states that Big Rivers used both the PACE Global price curve and a more conservative ACES forward price curve in its preparation. Please state whether both the PACE Global price curve and a more conservative ACES forward price curve were also used in the production cost modeling prepared by ACES and later included in the Big Rivers financial model? If the answer is Yes, please explain how this was done and provide which hourly data were used for the period of the modeling study. If the answer is No, please explain why Big Rivers chose to use only one price curve in the modeling and multiple price curves in preparing the Draft Mitigation Plan.

Q2.46 On Page 8, Paragraph 3, the Draft Mitigation Plan states that benchmarking data indicates Big Rivers' generation costs currently rank better than more than half of similar utilities. Please provide all data and documents supporting and demonstrating that statement. In your answer please include the names of all utilities in this statement, identifying those utilities that are "similar."

Q2.47 On Page 8, following Paragraph 3, the Draft Mitigation Plan contains five bullets, the first indicating that to reduce market risks, Big Rivers will evaluate the option of executing forward bilateral sales with counterparties and wholesale sales agreements. Please provide the names of all perspective counterparties which Big Rivers has contacted regarding bilateral sales or wholesale sales agreements and the status of those discussions. Please state whether Big Rivers has entered into a confidentiality agreement with any such perspective counterparties. If so, please identify the counterparty and the status of those discussions.

Q2.48 On Page 9, first literary paragraph, the Draft Mitigation Report indicates long-term approaches will include executing long-term wholesale agreements.

- a. Please state whether Big Rivers has commenced any such investigations and, if so, state the identity of those counterparties.
- b. Please describe all steps taken to date in pursuance of this approach.

Q2.49 On Page 9, first literary paragraph, the Draft Mitigation Report indicates long-term approaches will include existing load expansion.

- a. Please state whether Big Rivers has commenced any such investigations and, if so, state the identity of those parties.
- b. Please describe all steps taken to date in pursuance of this approach.

Q2.50 On Page 9, first literary paragraph, the draft Mitigation Report indicates long-term approaches will include load expansion by increasing the existing industrial load and by attracting new industries.

- a. Please state whether Big Rivers has commenced any such investigations and, if so, state the identity of those parties.
- b. Please describe all steps taken to date in pursuance of this approach.

Q2.51 On Page 9, first literary paragraph, the draft Mitigation Report indicates long-term approaches will include load expansion by attracting new Members.

- a. Please state whether Big Rivers has commenced any such investigations and, if so, state the identity of those parties.
- b. Please describe all steps taken to date in pursuance of this approach.
- c. Please state your understanding of the notice period in the contracts between TVA and the five Kentucky cooperatives in Kentucky being served by TVA.

Q2.52 On Page 10, Final Paragraph, the Draft Mitigation Plan discusses the additional option of laying-up individual generating units or entire generating stations. Scenarios 3, 4, 6 and 7 include this option.

- a. Please describe the extent to which Big Rivers has investigated this option.
- b. Please provide copies of all studies and documents prepared in connection with same.

Q2.53 On Page 11, First Paragraph, the Draft Mitigation Plan discusses the additional option of liquidating generating stations.

- a. Please describe the extent to which Big Rivers has investigated this option.
- b. Please provide copies of all studies and documents prepared in connection with same.

Q2.54 On Page 10, Final Paragraph, the Draft Mitigation Plan discusses the additional option of a (i) merger with another G&T cooperative, (ii) acquisition of Big Rivers by another G&T cooperative or (iii) acquisition of Big Rivers by an Investor-Owned Utility.

- a. Please describe the extent to which Big Rivers has investigated this option and provide copies of all studies and documents prepared in connection with same.
- b. If Big Rivers would consider the three options listed above after smelter closure, would Big Rivers consider investigating either of those options before smelter closure to determine if such options would prevent smelter closure and be beneficial to Big Rivers, the smelters and save the Western Kentucky jobs. If your answer is No, please explain fully.

Q2.55 Refer to page 8 of the Load Concentration Analysis and Mitigation Plan, which states, "Benchmarking data indicates Big River's generation costs currently rank better than more than half of similar unit's costs, thus Big Rivers should be able to market a significant amount of its excess power."

- a. Please supply the benchmarking data and any analysis performed or reports written associated with that data.
- b. What parties has Big Rivers entered into discussions with concerning marketing its excess power, and what discussions were held? Please supply any written communication of any form that went back and forth between Big Rivers and that party?

Q2.56 On page 9 (Load Concentration Analysis), Big Rivers states that many entities were short of generating capacity prior to the economic downturn and will likely return to the same situation when the economy strengthens. Please supply any analysis or support of any kind that the Company possesses that it based that statement on.

Q2.57 On page 9 (Load Concentration Analysis), Big Rivers also states that it has "a cost competitive advantage over many of its peers because it has a lower cost generating fleet than most which has largely already been retrofitted with pollution controls."

- a. Does this mean that Big Rivers generating fleet is lower in cost because Big Rivers has not already been retrofitted with pollution controls, while the others have? Please explain.

Q2.58 Referring to the Load Concentration Analysis. Once the requested environmental upgrades have been made, will Big Rivers generating fleet still be lower in cost than the others? Please explain.

Q2.59 Concerning Scenarios 1 through 8 of the Load Concentration Analysis, did ACES perform the modeling work using the PAR model? If not, who performed the modeling work and what production cost model was used?

Q2.60 Concerning Scenario 1 of the Load Concentration Analysis:

- a. Was that scenario the same scenario as the Build, No Smelter Scenario in the Company's ECP filing? If not, please explain the differences (process, data assumptions, etc).
- b. Other than the market price forecast, did PACE Global supply any other data that was used in the analysis. If so, please provide all information, documentation, etc, that PACE supplied for the production cost analysis.
- c. If this scenario is different than the Build, No Smelter Scenario in the Company's ECP filing, provide a list of all assumptions that differentiated this case from the Build, No Smelters case in the ECP filing. Also, provide a fully populated, input database to the production cost model that was used to conduct the analysis and provide all results electronically from the production cost model used to develop that case. In addition, provide the input assumptions for the production cost model in excel spreadsheet format as the Company did for other cases supplied.
- d. Finally, provide all models, workpapers, analyses, etc that were created and used to develop the results that are found on page 13 of the report. These models should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.

- e. Provide all models, data assumptions, workpapers, analyses, etc. that were created to perform an economic analysis (Net Present Value or similar analysis). These models should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.

Q2.61 Concerning Scenario 2 of the Load Concentration Analysis:

- a. Was that scenario the same scenario as the Buy, No Smelter Scenario in the Company's ECP filing? If not, please explain the differences (process, data assumptions, etc).
- b. Other than the market price forecast, did PACE Global supply any other data that was used in the analysis. If so, please provide all information, documentation, etc, that PACE supplied for the production cost analysis.
- c. If this scenario is different than the Buy, No Smelter Scenario in the Company's ECP filing, provide a list of all assumptions that differentiated this case from the Build, No Smelters case in the ECP filing. Also, provide a fully populated, input database to the production cost model that was used to conduct the analysis and provide all results electronically from the production cost model used to develop that case. In addition, provide the input assumptions for the production cost model in excel spreadsheet format as the Company did for other cases supplied.
- d. Finally, provide all models, workpapers, analyses, etc that were created and used to develop the results that are found on page 14 of the report. These models should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.
- e. Provide all models, data assumptions, workpapers, analyses, etc. that were created to perform an economic analysis (Net Present Value or similar analysis). These models should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.

Q2.62 Concerning Scenario 3 of the Load Concentration Analysis:

- a. Please provide the ACES market price forecast (referred to as lower market prices), and all models, assumptions, documentation, etc, used or produced in developing the market price forecast. Please supply all models and spreadsheets electronically, with all formulas active.
- b. Provide a list of all assumptions that differentiated this case from the Buy, No Smelters case in the ECP filing. Also, provide a fully populated, input database to the production cost model that was used to conduct the analysis and provide all results electronically from the production cost model used to develop that case. In addition, provide the input assumptions for the production cost model in excel spreadsheet format as the Company did for other cases supplied.
- c. Finally, provide all models, workpapers, analyses, etc that were created and used to develop the results that are found on page 15 of the report. These models should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.
- d. Provide all models, data assumptions, workpapers, analyses, etc. that were created to perform an economic analysis (Net Present Value or similar analysis). These models

should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.

Q2.63 Concerning Scenario 4 of the Load Concentration Analysis:

- a. Provide a list of all assumptions that differentiated this case from Scenario 3 of the Load Concentration Analysis. Also, provide a fully populated, input database to the production cost model that was used to conduct the analysis and provide all results electronically from the production cost model used to develop that case. In addition, provide the input assumptions for the production cost model in excel spreadsheet format as the Company did for other cases supplied.
- b. Finally, provide all models, workpapers, analyses, etc that were created and used to develop the results that are found on page 16 of the report. These models should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.
- c. Provide all models, data assumptions, workpapers, analyses, etc. that were created to perform an economic analysis (Net Present Value or similar analysis). These models should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.

Q2.64 Concerning Scenario 5 of the Load Concentration Analysis:

- a. Provide a list of all assumptions that differentiated this case from Scenario 1 of the Load Concentration Analysis. Also, provide a fully populated, input database to the production cost model that was used to conduct the analysis and provide all results electronically from the production cost model used to develop that case. In addition, provide the input assumptions for the production cost model in excel spreadsheet format as the Company did for other cases supplied.
- b. Finally, provide all models, workpapers, analyses, etc that were created and used to develop the results that are found on page 17 of the report. These models should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.
- c. Provide all models, data assumptions, workpapers, analyses, etc. that were created to perform an economic analysis (Net Present Value or similar analysis). These models should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.

Q2.65 Concerning Scenario 6 of the Load Concentration Analysis:

- a. Provide a list of all assumptions that differentiated this case from Scenario 4 of the Load Concentration Analysis. Also, provide a fully populated, input database to the production cost model that was used to conduct the analysis and provide all results electronically from the production cost model used to develop that case. In addition, provide the input assumptions for the production cost model in excel spreadsheet format as the Company did for other cases supplied.
- b. Finally, provide all models, workpapers, analyses, etc that were created and used to develop the results that are found on page 18 of the report. These models should be

supplied electronically, with all referenced spreadsheets attached, and all formulas active.

- c. Provide all models, data assumptions, workpapers, analyses, etc. that were created to perform an economic analysis (Net Present Value or similar analysis). These models should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.

Q2.66 Concerning Scenario 7 of the Load Concentration Analysis:

- a. Provide a list of all assumptions that differentiated this case from Scenario 6 of the Load Concentration Analysis. Also, provide a fully populated, input database to the production cost model that was used to conduct the analysis and provide all results electronically from the production cost model used to develop that case. In addition, provide the input assumptions for the production cost model in excel spreadsheet format as the Company did for other cases supplied.
- b. Finally, provide all models, workpapers, analyses, etc that were created and used to develop the results that are found on page 19 of the report. These models should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.
- c. Provide all models, data assumptions, workpapers, analyses, etc. that were created to perform an economic analysis (Net Present Value or similar analysis). These models should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.

Q2.67 Concerning Scenario 8 of the Load Concentration Analysis:

- a. Provide a list of all assumptions that differentiated this case from Scenario 1 of the Load Concentration Analysis. Also, provide a fully populated, input database to the production cost model that was used to conduct the analysis and provide all results electronically from the production cost model used to develop that case. In addition, provide the input assumptions for the production cost model in excel spreadsheet format as the Company did for other cases supplied.
- b. Finally, provide all models, workpapers, analyses, etc that were created and used to develop the results that are found on page 20 of the report. These models should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.
- c. Provide all models, data assumptions, workpapers, analyses, etc. that were created to perform an economic analysis (Net Present Value or similar analysis). These models should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.

Q2.68 In the ECP filing production cost analyses, ACES used a single reference case fuel forecast, market price forecast, allowance price forecast from PACE Global even though PACE supplied 200 iterations.

- a. In the Load Concentration Study, was the same approach used in which a single reference case forecast for market prices, fuel costs, and allowance prices were used?

- b. If not, please explain why it was appropriate to conduct the studies differently?
- c. If so, please explain why single forecasts were used when PACE created multiple iterations.

Q2.69 On page 23 of the Load Concentration Study report, it states that Big Rivers will continue to conduct analyses. What analyses have been conducted since the Draft Report has been produced, or will be conducted? Please provide a detailed description of what have been or will be conducted.

Q2.70 Concerning the LMP Impact Study – Loss of Smelter Load

- a. Please explain how results of this study factored into any results filed in the Company's ECP filing, or factored into any of the Scenarios 1 – 8 of the Load Concentration Analysis.
- b. Please provide all outputs from the LMP Impact Study that were treated as inputs to any study discussed in part a of this question.
- c. Why wasn't the PROMOD model used to conduct the studies discussed in part a of this question?

Q2.71 Regarding the PACE Global MISO Power Price Assessment dated January 12, 2012

- a. Are the reference price forecasts the same as what were used in the ACES analyses for the ECP Filing (Base Case, Build Case, etc)?
- b. Please provide an explanation of how the forecasts found on page 4 relate to the 200 iteration forecasts found in PACE_Big Rivers Data Request Outputs_120524.xlsx. Explain the difference in the way that the forecasts were created, and the difference in the way that the forecasts were used in any studies.
- c. Please supply all models, input data assumptions, spreadsheets, and documentation of any type, used in creating the data found on page 4 (HH Gas Prices), page 5 (coal prices), page 7 (CO2 prices), page 10 – 12 (market prices), and results found on pages 13 – 15. Also spreadsheets and models, should be provided electronically, with all formulas included. The spreadsheets and models for the data found on these pages should also be provided.
- d. Page 17 indicates that PACE Global would supply detailed data on MISO power price projections. Please supply the detailed data that PACE Global supplied to Big Rivers. This should be provided electronically, and all spreadsheets and models should have all referenced spreadsheets included and all formulas included.

Respectfully submitted,

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**CO-COUNSEL FOR ALCAN PRIMARY PRODUCTS
CORPORATION**

May 21, 2012



Ventyx Consulting Agreement

This Consulting Agreement ("Agreement") is by and between Ventyx Inc., whose office is located at 400 Perimeter Center Terrace, Suite 500, Atlanta, Georgia 30346 ("Ventyx") and Hayet Power Systems Consulting, whose office is located at 215 Huntcliff Terrace, Atlanta, GA 30350 ("Client"), effective upon execution of both parties. Ventyx will provide the services set forth herein:

1. Consulting Services. Ventyx will make available the services of Ventyx personnel to perform certain short-term consulting services ("Services") as generally described in one or more Statement of Work ("SOW") under this Agreement. Successive Statements of Work shall be identified by number and each shall reference this Agreement.
2. Payments. Client will pay Ventyx for the Services as set forth the applicable SOW. In addition, Client will pay, or reimburse Ventyx for, (i) all taxes based upon the charges in this Agreement (ii) all Services-related and reasonable travel and travel-related expenses. If the payment terms are not specified in the applicable SOW, Ventyx will invoice Client on a monthly basis for all charges payable hereunder, which shall be due within 30 days from invoice receipt date. Any sum not paid when due will bear interest until paid at the maximum rate of interest allowed by applicable law.
3. Confidentiality. The parties recognize that in the course of performing the Services, both parties may have access to confidential or proprietary information belonging to the other and each agrees that any such confidential and proprietary information shall remain confidential and shall not be disclosed to any third party. Each party agrees that, for a period of two (2) years from receipt of information from the other party hereunder, such party will use the same means it uses to protect its own confidential proprietary information, but in any event not less than reasonable means, to prevent the disclosure and to protect the confidentiality of both (i) written information received from the other party which is marked or identified as confidential, and (ii) oral or visual information ("Confidential Information"). The foregoing will not prevent either party from disclosing Confidential Information which belongs to such party or is (i) already known by the recipient party without an obligation of confidentiality, (ii) publicly known or becomes publicly known through no unauthorized act of the recipient party, (iii) rightfully received from a third party without breaching any confidentiality or non-disclosure obligations to any third party, (iv) independently developed by the recipient party without use of the other party's Confidential Information, (v) disclosed without similar restrictions to a third party by the party owning Confidential Information, (vi) approved by the other party for disclosure, or (vii) required to be disclosed pursuant to a requirement of a governmental agency or law so long as the disclosing party provides the other party with notice of such requirement prior to any such disclosure and reasonably cooperates with the other party in connection with obtaining any protective order limiting such disclosure.
4. Proprietary Rights. The parties acknowledge and agree that: (a) Ventyx owns all right, title and interest in and to all Ventyx Confidential Information (and the media containing such Confidential Information) including, without limitation, the Work Product and all patent, trademark, copyright, trade secret, and other intellectual property rights related thereto; and (b) Client owns all right, title and interest in and to all of Client's Confidential Information (and the media containing such Confidential Information) including, without limitation, the patent, trademark, copyright, trade secret, and other intellectual property rights related thereto, as well as engagement-specific reports delivered by Ventyx except with respect to the Ventyx Confidential Information or Work Product contained in such reports. All Work Product, and all patent, trademark, copyright, trade secret, and other intellectual property rights related thereto, is the property of Ventyx and is licensed nonexclusively to Client, at no additional license fee, pursuant to the terms of the license for software contained in a License Agreement and subject to the terms of this Agreement. To the extent Client acquires any rights in the Work Product Client hereby assigns such rights to Ventyx. Client shall give Ventyx all reasonable assistance and execute all documents necessary to assist or enable Ventyx to perfect, preserve, register and/or record such assignment and Ventyx's rights in any Work Product.
5. Termination. Either party may terminate this Agreement in whole, but not in part, for any reason upon providing sixty days prior written notice to the other party. Upon termination of this Agreement for any reason, Ventyx will cease to

perform the Services hereunder for Client and Client will pay to Ventyx: (a) for Services performed on a time and materials basis, all sums due including reimbursable expenses to Ventyx as a result of Services performed prior to such termination; or (b) for Services performed on a fixed fee basis, for all milestones initiated at the effective date of the termination.

6. Warranty Disclaimer and Limitation on Liability. VENTYX MAKES NO REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, AND HEREBY EXPRESSLY DISCLAIMS ANY AND ALL SUCH WARRANTIES, REGARDING ANY MATTER INCLUDING THE MERCHANTABILITY, SUITABILITY, ORIGINALITY, FITNESS FOR A PARTICULAR USE OR PURPOSE, OR RESULTS TO BE DERIVED FROM THE USE OF ANY MATERIALS OR SERVICES PROVIDED UNDER THIS AGREEMENT. IN NO EVENT SHALL VENTYX BE LIABLE FOR ANY LOST PROFITS, LOSS OF GOODWILL, OR FOR SPECIAL, EXEMPLARY, PUNITIVE, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR ANY OTHER DAMAGES. THE SERVICES PERFORMED UNDER THIS AGREEMENT ARE ASSOCIATED WITH THE VENTYX SOFTWARE LICENSED BY CLIENT AND CLIENT ACKNOWLEDGES THAT THEY ARE NOT CONSIDERED ACCOUNTING SERVICES. SUBJECT TO THE FOREGOING LIMITATION OF LIABILITY VENTYX'S LIABILITY UNDER THIS AGREEMENT SHALL NOT EXCEED THE AMOUNT PAID BY CLIENT TO VENTYX UNDER THE SOW GIVING RISE TO THE LIABILITY.
7. Relationship of Parties. Ventyx in furnishing the Services to Client under this Agreement is acting only as an independent contractor.
8. Agreement. This Agreement constitutes the entire agreement between the parties with respect to the subject matter of this Agreement. No change, waiver or discharge will be valid unless in writing and signed by an authorized representative of the party against whom such change, waiver or discharge is sought to be enforced. This Agreement will be governed by and construed in accordance with the laws, other than choice of law rules, of the State of Georgia.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first set forth below and further represent and warrant that the individuals signing below have the corporate power and authority to enter into this Agreement and to carry out the transactions contemplated in this Agreement.

ACCEPTED:
Hayet Power Systems Consulting

ACCEPTED:
Ventyx Inc.

Authorized Signature: _____

Authorized Signature: _____

Printed Name: _____

Printed Name: _____

Title: _____

Title: _____

Date: _____

Date: _____

Authorized Signature: _____

Printed Name: _____

Title: _____

Date: _____



EPM Planning and Risk Training Hayet Power Systems Consulting Statement of Work (SOW)

18th June, 2012 – V1.1

SOW Reference: SOW-ADV-NA-120476

This Statement of Work ("SOW") is effective as of _____ ("Effective Date") by and between Ventyx Inc., located at 400 Perimeter Center Terrace, Suite 500, Atlanta, Georgia 30346 ("Ventyx") and Hayet Power Systems Consulting, whose office is located at 215 Huntcliff Terrace, Atlanta, GA 30350 ("Client").

This SOW is entered into under the Consulting Agreement between the Parties dated _____ ("Contract"). In the event of any conflict in the terms between this SOW and the Contract, the terms of this SOW shall prevail. All capitalized terms not otherwise defined herein shall have the same meaning as in the Contract.

Ventyx Sales Executive

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Client Project Manager

Name: Phil Hayet
Address: 215 Huntcliff Terrace
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Phone: 770-587-5402
Fax: 877-862-0734
E-mail: philhayet@concentric.net

Client "Bill to" Contact/Dept.:

Name: Phil Hayet
Address: 215 Huntcliff Terrace
Atlanta, GA 30350
Phone: 770-587-5402
Fax: 877-862-0734
E-mail: philhayet@concentric.net

PO # :

1 INTRODUCTION AND OBJECTIVES

Client has entered into a consulting engagement with another party that licenses the Ventyx EPM Planning and Risk software for the purposes of performing certain analyses on their behalf. Client has agreed to license the Ventyx Planning and Risk software but as a new user will require assistance with the installation and use of the product.

1.1 Understanding the Requirements

Client has requested training on the Ventyx EPM Planning and Risk (PaR) module, which they have licensed on a limited-term basis for the purposes of performing work on a consulting engagement. Client has indicated that only a limited scope use of PaR would be needed to facilitate the scope of work they are to perform and would not require a complete understanding of all the main features and functions of software. Therefore the Client has requested only a 1-day training session as opposed to the typical 3-4 days of training required for most new PaR users.

1.2 References

- EPM 5.3 Minimum Data Model Requirements
- EPM 5.3 Certified Environments

2 SCOPE OF WORK

2.1 Task 1 – Provide EPM Planning and Risk Overview Training

Ventyx will provide a 1-day EPM Planning and Risk overview training session. This training will provide a working knowledge of the EPM interface and cover basic data editing concepts, run setup and execution, and basic output reporting methods.

2.2 Task 2 – Provide Additional Consulting Support

Ventyx will provide an estimated 1-week of additional consulting support to assist the Client with any software installation or modeling issues that are encountered during the engagement period. Such support will include review of the Client's hardware to ensure that it meets the minimum requirements, assistance with the installation and setup of any prerequisite software such as MS SQL Server, and any Ventyx-specific software such as the EPM Core, Application Management, and Prosym,, setup and formatting of SQL Server databases, and assistance with any post-training issues associated with the use of Planning and Risk.

3 ESTIMATED SCHEDULE & DELIVERABLES

The following estimated schedule and deliverables have been identified within this Statement of Work (SOW).

3.1 Estimated Schedule of Work

The estimated schedule of work will be agreed to upon acceptance of the Statement of Work (SOW) by both parties.

3.2 Deliverables from Ventyx

Ventyx will deliver the following items under the Statement of Work (SOW):

- Basic EPM Planning and Risk overview training (1 day)
- Additional consulting support to assist the Client with any software installation or modeling issues (estimated 1 week)

3.3 Deliverables from Client

The Client will deliver the following items to support the activities for this Statement of Work (SOW):

- None.

3.4 Assumptions

The following assumptions have been made when producing this Statement of Work (SOW):

- Client will procure all prerequisite software as specified by the EPM 5.3 Certified Environments document referenced in Section 1.2, namely a certified version of SQL Server. Ventyx will assist Client with the procurement and installation of all prerequisite software.
- All Ventyx software is to be delivered electronically.
- Training will be provided at Ventyx's Atlanta office, unless an alternative mutually agreed upon location is decided at the time of the training.
- The Ventyx project manager will provide a single point of contact between Client and Ventyx with regard to scope, schedule, and resources assigned to accomplish the Ventyx services.
- Client will have the appropriate computer hardware and technical environment in place, and will provide all required access, prior to the Ventyx consultants commencing work.
- Client computer hardware and software will meet the minimum requirements as specified in the References noted in Section 1.2 of this SOW.
- Any other additional services beyond the scope as stated in Section 2 of this SOW will be billed at the attached rate schedule.

4 CHARGES

4.1 Fee Summary

The fee for this training is an estimated \$14,000 and will be performed on a Time and Materials basis, exclusive of expenses and taxes. The estimates provided below are intended to be an estimate for budgetary and Ventyx resource scheduling purposes only.

All fees presented in the SOW are expressed in US Dollars unless stated otherwise.

Task	Estimated Effort	Estimated Duration	Resources	Day Rate	Fee
Provide EPM Planning and Risk Overview training	1 day	1 day	Training Consultant	2,000	2,000
Provide Optional Consulting Support	1 week	4 weeks	Lead Consultant	2,400	12,000

4.2 Travel Expenses

Travel expenses for this SOW are estimated to be \$0.

4.3 Payment Terms

Ventyx will invoice monthly in arrears and Client agrees to pay Ventyx thirty (30) days from date of invoice.

6 SIGNATURE OF ACCEPTANCE

Pricing is subject to change at Ventyx's sole discretion if not signed by Hayet Power System Consulting and returned to Ventyx on or before 30 June 2012.

IN WITNESS WHEREOF, the parties have caused this SOW to be executed by their duly authorized representatives.

Hayet Power Systems Consulting

By: _____

Name: _____

Title: _____

Date: _____

Ventyx Inc.

By: _____

Name: _____

Title: _____

Date: _____

By: _____

Name: _____

Title: _____

Date: _____

To indicate approval, please return a signed PDF version of the entire PSO SOW via email or fax to:

*Tencia DeLuke, tencia.deluke@ventyx.abb.com
Fax +1-770-206-2279*

If your company requires an original hard copy, please mail two signed sets to:

*Tencia DeLuke
Ventyx Inc.
400 Perimeter Center Terrace, Suite 500,
Atlanta Georgia 30346
Tel: +1-678-825-1445*

**VENTYX
2012 RATE SCHEDULE - CONSULTING SERVICES**

Rate Group	Hourly Fee US \$
Sr. Vice President	420
Vice President, Subject Matter Expert / Expert Witness	400
Director	370
Principal Consultant	315
Lead Consultant	300
Project Manager	265
Senior Consultant	230
Consultant	210
Associate Consultant	185
Technical and Administrative Professionals	145

15% Adder for Work for Litigation / Regulatory Proceedings

Support Service Charges. In addition to payment for professional services, all reasonable and necessary expenses incurred in connection with the performance of professional services will be billed at cost. Such expenses include, but are not limited to, outside reproduction costs, artwork, airline travel, meals, lodging, postage, freight, telephone, and travel related expenses. Mileage is charged at the prevailing Standard Mileage Rate as determined by the Internal Revenue Service.

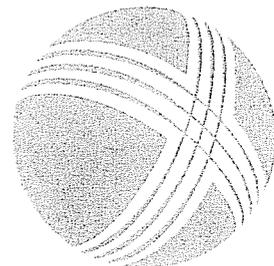
Insurance Provisions. Where a Client requires that it or other entities be named as additional insured with regard to company insurance policies, any cost to Ventyx of such provisions shall be billed to the Client.

Fee Schedule Revision. This schedule is effective commencing January 1, 2012, and may be revised periodically by Ventyx.

KWalton

 Scenarios needed for Big Rivers Cases.v1.xlsx
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Base Case

Build

Build No SCR

Buy

Build no smelter

Buy no smelter

APM PCM

Big Rivers.15Year.CAIR Base Case

Big Rivers.15Year.CSAPR By Equip [2/9/12]

Big Rivers.15Year.CSAPR By Equip.LowerGreenNOx [2/10/12]

Big Rivers.15Year.CSAPR By Equip New [2/18/12]

Big Rivers.15Year.CSAPR by Gen.Colemanout [2/8/12]

Big Rivers.15Year.CSAPR by Gen.VarLimit [2/22/12]

Big Rivers.15Year.CSAPR By Equip.NoSmelters [2/14/12]

Big Rivers.15Year.CSAPR By Gen.NoSmelters [2/15/12]

Big Rivers.15Year.CSAPR By Gen.VarLimits NoSmelters

Big Rivers.15Year.CSAPR By Equip.NoSmelters.CurrentPrices [2/26/12]

Big Rivers.15Year.CSAPR By Equip.NoWilsonColemanSmelters.CurrentPrices [3/19/12]

Big Rivers.15Year.CSAPR By Equip.NoWilsonColemanSmelters.CurrentPrices.2014start [4/4/12]

Big Rivers.15Year.CSAPR By Gen.NoWilsonColemanSmelters.CurrentPrices.2014start [4/14/12]

Big Rivers.15Year.CSAPR By Equip.NoWilson.NoAlcan.CurrentPrices [4/5/12]

Big Rivers.15Year.CSAPR By Equip.NoColeman.NoCentury.CurrentPrices [3/19/12]

Big Rivers.15Year.CSAPR By Equip.NoColeman.NoCentury.CurrentPrices.2014start [4/4/12]

Big Rivers.15Year.CSAPR By Gen.NoColemanCentury.CurrentPrices.2014start [5/4/12]

Big Rivers.15Year.CSAPR By Gen.NoWilsonCentury.CurrentPrices.2014start [5/4/12]

Big Rivers.15Year.CSAPR By Gen.NoColemanCentury.CurrentPrices.2014start.VarLimit [5/14/12]

Big Rivers.15Year.CSAPR By Equip.LowerGreenNOx.CurrentPrices [5/8/12]

Scenario 1

CAIR.BaseCase.Gen
CSAPR.ByEquip.Gen
CSAPR.ByEquip.Gen
CSAPRByEquip.GenNoSmelter
CSAPR.ByGen.Gen
CSAPRByGen.PriceVarLimit
CSAPRByEquip.GenNoSmelter
CSAPRByGen.GenNoSmelter
CSAPRByGenVarLimitGen.NoSmelter
CSAPRByEquipPriceNoSmelter.CurrentPrices
Equip.NoColeNoCentury.CurrentPrices
ByEquipNoWilson.ColeGenNoSmelter.CurrentPrices
CSAPRByGen.NoSmelter.SetDispatch
Prices-ByEquipNoWilson.ColeGenNoSmelter
Prices-ByEquipNoWilson.ColeGenNoSmelter
Prices-ByEquipNoWilson.ColeGenNoSmelter
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CSAPRByGen.NoWilsonCentury.CurrentPrices
CSAPR.ByGen.VarLimitGen
CSAPRByEquip.LowerGreenNox.Gen

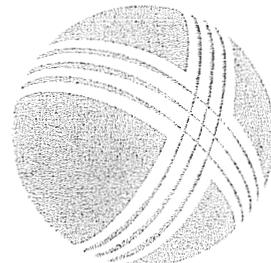
Scenario 2

CAIR.BaseCase.Price
CSAPR.ByEquip.Price
CSAPR.ByEquip.Price
CSAPRByEquip.PriceNoSmelter
CSAPR.ByEquip.Price
CSAPR.ByGen.VarLimitGen
CSAPRByEquip.PriceNoSmelter
CSAPRByGen.PriceNoSmelter
CSAPRByGen.PriceVarLimit
CSAPRByEquipGenNoSmelter.CurrentPrices
Prices-ByEquipNoWilson.ColeGenNoSmelter
Prices-ByEquipNoWilson.ColeGenNoSmelter
Prices-ByEquipNoWilson.ColeGenNoSmelter
Equip.NoWilsonNoAlcan.CurrentPrices
ByEquipNoWilson.ColeGenNoSmelter.CurrentPrices
Equip.NoColeNoCentury.CurrentPrices
Prices-ByEquipNoWilson.ColeGenNoSmelter
Prices-ByEquipNoWilson.ColeGenNoSmelter
Prices-ByEquipNoWilson.ColeGenNoSmelter
Prices-ByEquipNoWilson.ColeGenNoSmelter

KWalton

 **Response to Motion to Compel.pdf**
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xerox



SULLIVAN, MOUNTJOY, STAINBACK & MILLER PSC
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June 8, 2012

Via Federal Express

Jeff DeRouen
Executive Director
Public Service Commission
211 Sower Boulevard, P.O. Box 615
Frankfort, Kentucky 40602-0615

Re: *In the Matter of: Application of Big Rivers Electric Corporation
for Approval of its 2012 Environmental Compliance Plan,
for Approval of its Amended Environmental Cost Recovery
Surcharge Tariff, for Certificates of Public Convenience and
Necessity, and for Authority to Establish a Regulatory Account,
P.S.C. Case No. 2012-00063*

Dear Mr. DeRouen:

Enclosed for filing are an original and ten copies of Big Rivers Electric Corporation's response to the intervenors' joint motion to compel. A copy of this letter and a copy of this response have been served on each of the persons listed on the enclosed service list.

Sincerely,



Tyson Kamuf

TAK/ej
Enclosures

cc: Mark A. Bailey
Albert Yockey

Telephone (270) 926-4000
Telexcopier (270) 683-6694

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745 N. 24th St.
Philadelphia, PA 19130

1 COMMONWEALTH OF KENTUCKY
2 BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY
3
4

5 In the Matter of:

6
7 Application of Big Rivers Electric Corporation)
8 for Approval of its 2012 Environmental)
9 Compliance Plan, for Approval of its Amended)
10 Environmental Cost Recovery Surcharge Tariff,) Case No. 2012-00063
11 for Certificates of Public Convenience and)
12 Necessity, and for Authority to Establish a)
13 Regulatory Account)
14

15
16 **RESPONSE OF BIG RIVERS ELECTRIC CORPORATION TO JOINT MOTION TO**
17 **COMPEL OR TO ISSUE A SUBPOENA DUCES TECUM**
18

19 Kentucky Industrial Utility Customers, Inc. (“KIUC”), Ben Taylor, Sierra Club, and the
20 Kentucky Attorney General (collectively, the “Intervenors”) have filed a joint motion (“Motion
21 to Compel”) asking the Kentucky Public Service Commission (“Commission”) to either (i)
22 require Big Rivers Electric Corporation (“Big Rivers”) to request and require the production of a
23 database from ACES Power Marketing (“ACES”) that ACES used in its planning models for this
24 case, or (ii) issue a subpoena duces tecum requiring ACES to produce the database. For its
25 response to the Motion to Compel, Big Rivers states as follows:

26 Before addressing the substance of the Motion to Compel and the numerous disingenuous
27 allegations made by the Intervenors in their Motion to Compel, Big Rivers would like to reiterate
28 that it recognizes the time constraints placed on the Commission and the Intervenors. In that
29 regard, Big Rivers has cooperated with the Intervenors’ requests to discuss their asserted needs,
30 and has made a concerted effort to provide information the Intervenors have sought in this
31 proceeding on an expedited basis. In fact, Big Rivers provided a substantial amount of model-

1 related data, including data related to the ACES model, even before it was required to file its
2 responses to the Commission Staff's and the Intervenor's requests for information:

3 1. On April 26, 2012, Big Rivers filed a CD containing input and output data from financial
4 models used in its cost effectiveness evaluation and PACE Global price curve data for
5 energy prices, fuel prices, and allowance prices;

6 2. On May 24, 2012, Big Rivers filed a CD containing input and output data and input
7 assumptions from the approximately 20 runs of the planning model that ACES performed
8 for this case;

9 3. On May 29, 2012, Big Rivers filed one CD containing input and output data from
10 additional financial model runs and another CD containing input and output data from the
11 PACE Global model; and

12 4. On May 30, 2012, Big Rivers filed a CD containing input and output data from the
13 Sargent & Lundy model.

14 Big Rivers then responded to hundreds of requests for information (over 500 if subparts are
15 counted) on June 1, 2012, and the same day, it provided the price and load shape data that ACES
16 used. Also, when KIUC raised concerns about its ability to run the ACES model, Big Rivers and
17 ACES participated in a conference call with the Intervenor's in an attempt to address those
18 concerns. And Big Rivers has held numerous discussions with ACES over the past few weeks
19 seeking resolution of disclosure issues that have prevented ACES from providing information at
20 the level requested by Intervenor's.

21 The Intervenor's Motion to Compel is presumably based on an alleged failure of Big
22 Rivers to properly respond to a request for information. However, none of the requests for
23 information actually asks for the database, or even uses the term "database." The requests for

1 information cited in the Motion to Compel ask for “all models and spreadsheets developed
2 containing input assumptions and output results,”¹ “all written reports, memos, emails or
3 documentation of any type that” ACES produced,² “all of the production cost modeling
4 (including input and output files) and workpapers...generated by ACES Power Marketing,”³
5 “any and all inputs that were chosen,”⁴ and documents transferred between Big Rivers and
6 ACES.⁵ Big Rivers’ responses to those requests for information are fully responsive. The CDs
7 referenced above contain all of the relevant models and spreadsheets with input assumptions and
8 output results, and all of the relevant input and output data and files, and Big Rivers’ responses
9 to the requests for information contain all other documents transferred between Big Rivers and
10 ACES.

11 The database is not an input file and was not transferred between Big Rivers and ACES.
12 Moreover, the terminology used in the requests for information makes it clear that none of the
13 requests for information asks for a fully-populated, functioning database. For example, Item 53
14 of Ben Taylor and the Sierra Club’s Initial Requests for Information requests “input and output
15 files” and “any changes to the input files that may be required to reproduce the modeling,” which
16 implies that the Intervenors are not asking for a populated database but rather expect to populate
17 their own database by processing the input data files, along with any changes to them that are
18 needed. None of that information would be required if the intent of the Intervenors was to
19 simply acquire a fully-populated, functioning database. Big Rivers provided all of the
20 information requested in the items cited by the Intervenors in their Motion. Thus, the

¹ See Item 21 of KIUC’s First Set of Data Requests.

² See Item 22 of KIUC’s First Set of Data Requests.

³ See Item 53 of Ben Taylor and the Sierra Club’s Initial Requests for Information.

⁴ See Item 15 of the Attorney General’s Initial Data Requests.

⁵ See Items 4 and 20 of KIUC’s First Set of Data Requests.

1 Intervenor have not shown that Big Rivers has failed to properly and reasonably respond to any
2 request for information.

3 Not only have the Intervenor failed to show that Big Rivers did not properly respond to a
4 request for information, they also have not shown a legitimate need for the database they seek.
5 The CDs referenced above contain all of the input data and input assumptions ACES used in its
6 models and all of the output data. In fact, the CDs contain all of the input data that was available
7 to ACES in the format provided to ACES. With that information and the software ACES used
8 (the Ventyx/ABB Planning and Risk model), a modeler competent with the Ventyx/ABB model
9 would have everything needed to run the models and to validate ACES' results. The
10 Intervenor's statements in their Motion to Compel that without the database, "there is no way for
11 the parties or the Commission to recreated the modeling performed by ACES;"⁶ that without the
12 database it would be "impossible for the Commission to determine with certainty whether Big
13 Rivers' Application meets the standards set forth in KRS 278.020 and KRS 278.183;"⁷ that
14 without the database, the Ventyx/ABB model is "useless;"⁸ and that without the database,
15 "Intervenor cannot run the Ventyx model"⁹ are simply untrue. It is Big Rivers' understanding
16 that the information it has provided is similar to the information provided by Louisville Gas and
17 Electric Company and Kentucky Utilities Company in their recent environmental compliance
18 plan cases in that they provided input data files and control parameters, but the intervenors were
19 on their own to process those files and populate a database using their own licensed versions of
20 the STRATEGIST software.

⁶ See Motion to Compel at 4.

⁷ See Motion to Compel at 2.

⁸ See Motion to Compel at 5.

⁹ See Motion to Compel at 5.

1 The Intervenors' real complaint is that the information Big Rivers has provided is
2 "formatted differently" than the database format.¹⁰ The Intervenors have the inputs that ACES
3 had, and they can have a competent modeler put the inputs into the proper format. Thus, the
4 ACES database is superfluous because the necessary input data required to populate such a
5 database has been provided. The fact that the Intervenors do not want to have to do work¹¹ or to
6 pay a modeler to do the work to populate the database with inputs the Intervenors already have is
7 insufficient to justify ordering Big Rivers to somehow require ACES to produce the database.

8 Nevertheless, while Big Rivers and ACES certainly do not agree that the Intervenors
9 have any entitlement to the database, due to the time constraints of this proceeding, Big Rivers
10 has been working constantly with ACES since Monday to overcome obstacles to ACES
11 providing the Big Rivers database to the qualifying Intervenors. Contrary to the assertions of
12 Intervenors, this process is quite complex. ACES is willing to provide the database (subject to
13 the conditions listed below); however, ACES has no right under its license with Ventyx/ABB to
14 produce the database. Also, the ACES database contains highly sensitive information from a
15 number of utilities that ACES cannot give to the Intervenors, and at this time, ACES believes
16 that only Ventyx/ABB can strip out the non-Big Rivers information. Given those two
17 impediments, ACES is willing to provide the Big Rivers information contained in the database,
18 subject to certain conditions, including but not limited to conditions such as:

- 19 1. The Intervenors will have to agree to withdraw their Motion to Compel and to pay for
20 any services that ACES provides to or on behalf of the Intervenors and all other costs
21 associated with the Intervenors' request for the database, including Ventyx/ABB's costs
22 of stripping out of the database the non-Big Rivers information.

¹⁰ See Motion to Compel at 4.

¹¹ See Motion to Compel at 6.

- 1 2. ACES will then provide its database to Ventyx/ABB for Ventyx/ABB to strip out the
2 non-Big Rivers information.
- 3 3. Ventyx/ABB must agree to strip out the non-Big Rivers information and to supply the
4 stripped-down database to ACES for ACES to confirm that only the Big Rivers
5 information remains in the database.
- 6 4. An Intervenor that wants the database must obtain all approvals and licenses from
7 Ventyx/ABB necessary for ACES to provide the stripped-down database to a modeler for
8 the Intervenor on terms that are consistent with the licenses of ACES and the modeler;
9 and the Intervenor and the Intervenor's modeler must sign appropriate agreements with
10 ACES, including a confidentiality agreement and an agreement limiting the use of the
11 database to this proceeding, requiring the Intervenor to destroy the database and all
12 derivatives of the database upon the conclusion of this proceeding, and allowing ACES to
13 claw back any information it inadvertently produces that is outside the scope of this
14 proceeding.
- 15 5. ACES will then supply (or have Ventyx/ABB supply) the stripped-down database to a
16 modeler for the Intervenor.

17 Given ACES' willingness to provide the database under these reasonable conditions, the
18 Commission should deny the Intervenors' Motion to Compel as moot.

19 In their Motion to Compel, the Intervenors alternatively ask the Commission to issue a
20 subpoena duces tecum pursuant to KRS 278.320 to require ACES to produce the database. KRS
21 278.320 provides, in pertinent part, that the "[C]ommission and each of the commissioners may
22 issue subpoenas, tecum, and all necessary process in proceedings brought before commission,

1 and such process shall extend to all parts of the state.¹² ACES has no office or agent in the
2 Commonwealth of Kentucky. As such, the Intervenor's request for the Commission to issue a
3 subpoena duces tecum to ACES should be denied.

4 Finally, the Motion to Compel is replete with false or baseless allegations that Big Rivers
5 is compelled to address. The Intervenor's imply or state a number of times in the Motion to
6 Compel that Big Rivers has not been transparent because Big Rivers has not produced the
7 database.¹³ However, as explained above, in the CDs referenced above, Big Rivers provided a
8 substantial amount of information and data to the Intervenor's *even before Big Rivers' responses*
9 *to the requests for information were due*, including inputs and outputs from Big Rivers' financial
10 model, inputs and outputs from Sargent & Lundy's model, inputs and outputs from PACE
11 Global's model, and inputs and outputs from ACES' model. Moreover, Big Rivers provided all
12 the information that a modeler competent with the Ventyx/ABB model would need to run the
13 model and verify ACES' results.

14 Similarly, the Intervenor's allege that Big Rivers somehow failed to properly respond to
15 Item 4 of KIUC's First Set of Data Requests.¹⁴ The Intervenor's have not justified this statement
16 and have pointed to no information that Big Rivers failed to provide and that is responsive to the
17 request (noting that the ACES database is not responsive to this request). The Intervenor's also
18 imply that Big Rivers' alleged failure to produce information shows Big Rivers is trying to
19 obstruct the Intervenor's from running the Ventyx/ABB model. This is patently incorrect. As
20 noted previously, Big Rivers has been making a concerted and on-going effort since April to
21 provide information to the Intervenor's, including information aimed at helping the Intervenor's to
22 acquire and run the Ventyx/ABB model. Most recently, on the June 4 conference call, Big

¹² KRS 278.320 (emphasis added).

¹³ See Motion to Compel at 2, 3, 4, 5, 6, 7.

¹⁴ See Motion to Compel at 6, n. 3.

1 Rivers offered to assist the Intervenor with any technical questions they had about the
2 Ventyx/ABB model. Additionally, Big Rivers and ACES have been working continuously since
3 the call to resolve obstacles to providing additional material to assist the Intervenor. This effort
4 has resulted in ACES formulating the conditions, listed above, under which it can provide the
5 Big Rivers database without violating its legal obligations to others.

6 The Intervenor also allege that Big Rivers' responses to the Intervenor's requests for
7 information were "obstructive and evasive."¹⁵ The only basis for this statement is that Big
8 Rivers "has failed to require or request ACES to produce the" ACES database.¹⁶ However, Big
9 Rivers did in fact ask ACES if ACES would produce the database. Also, contrary to the
10 Intervenor's allegation that Big Rivers should be able to require ACES to produce the model
11 because Big Rivers and ACES are affiliates,¹⁷ Big Rivers and ACES are not affiliates, and Big
12 Rivers has neither the ability nor the authority to require ACES to turn over its database.
13 Although Big Rivers did not previously provide the database, Big Rivers did provide (in the CDs
14 referred to above) all of the data that a modeler competent with the Ventyx/ABB model would
15 need to run the model and to verify ACES' results. Big Rivers and ACES even participated on a
16 conference call with the Intervenor earlier this week in an attempt to address their concerns.
17 Clearly, Big Rivers' actions are not "obstructive and evasive."

18 There are additional areas of the Motion to Compel where the Intervenor wrongly imply
19 that Big Rivers has not provided sufficient information. For example, on page 2 of the Motion to
20 Compel, the Intervenor suggest that they need (and thus imply that they do not have):

21 (1) the company's estimate (or bid) for their environmental upgrade and the
22 estimate (or bid) for replacement capacity; (2) a logically structured modeling
23 analysis in which the Commission or interveners may examine both input

¹⁵ See Motion to Compel at 2.

¹⁶ See Motion to Compel at 2.

¹⁷ See Motion to Compel at 4 ("ACES is not an unaffiliated entity...").

1 assumptions and output results; (3) sensitivity analyses that demonstrate robust
2 conclusions, including explicit sensitivity inputs and outputs; (4) a clearly defined
3 analytical framework for comparing the results of model runs; and (5) a
4 justification of the project based on model results.¹⁸
5

6 However, Big Rivers has provided all of that information in Big Rivers' application filed in this
7 proceeding and in the CDs referenced above. Later on page 2 of the Motion to Compel, the
8 Intervenors state that they need "information regarding input and output results, the modeling
9 and analytical structure utilized, which sensitivities were used, including inputs and outputs, and
10 how those sensitivities were selected."¹⁹ Big Rivers has also provided this information, in its
11 application filed in this matter, in the CDs referenced above, and in a number of its responses to
12 the Commission Staff's and the Intervenors' initial requests for information, including but not
13 limited to Items 2, 9, 11, 13, 15, 16, 17, 19, 20, 24, 25, 26, 29, 39, and 40 of the Commission
14 Staff's First Request for Information; Items 6, 7, 14, 17, 24, 25, 26, 29, 32, 33, 34, 36, 37, 43, 47,
15 and 54 of KIUC's First Set of Data Requests; Items 1, 4, 5, 7, 13, 17, 18, 22, 23, 35, 39, 47, 50,
16 51, 55, 56, 58, 59, 65, 66, 67, 68, 76, 84, 92, 94, and 96 of the Attorney General's Initial Data
17 Requests; and Items 2, 9, 10, 16, 19, 20, 21, 23, 26, 27, 28, 29, 30, 31, 35, 36, 38, 41, 46, 47, 50,
18 51, 52, and 55 of Ben Taylor and the Sierra Club's Initial Requests for Information.

19 Lastly, on page 7 of the Motion to Compel, the Intervenors state, "The continued lack of
20 critical data necessary to this case is a result of Big Rivers' failure to provide [a witness to
21 provide information regarding assumptions used by ACES]."²⁰ There is no lack of data because
22 Big Rivers has provided it all on the CDs referenced above, just not in the format the Intervenors
23 complain about. Also, Big Rivers has provided a witness to discuss ACES' work (Brian
24 Azman), and he did so in Big Rivers' responses to the initial requests for information.

¹⁸ See Motion to Compel at 2.

¹⁹ See Motion to Compel at 2.

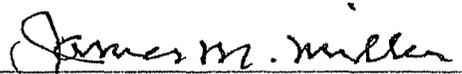
²⁰ See Motion to Compel at 7.

1 The Intervenors have not shown that Big Rivers has failed to properly and reasonably
2 respond to any request for information or that there is any information they need to run the
3 Ventyx/ABB model that they do not have. They just do not have it in the format they want, and
4 instead of paying a modeler to put the information in the proper format, they want to force ACES
5 to give them ACES' product for free. Those are more than sufficient grounds for the
6 Commission to deny the Motion to Compel; however, since ACES has agreed to provide the
7 database subject to the conditions noted herein, the Motion to Compel should be denied as moot.

8 WHEREFORE, Big Rivers respectfully requests that the Commission deny the Motion to
9 Compel as moot.

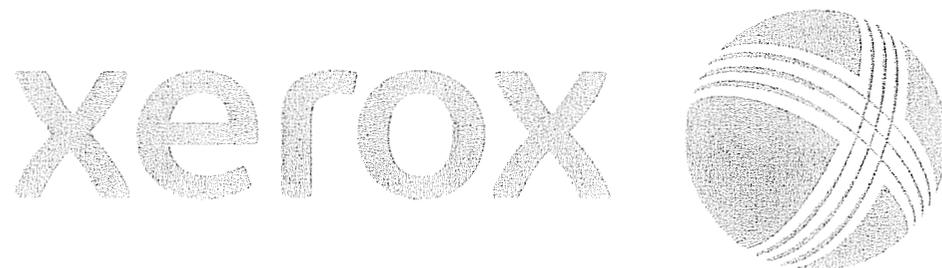
10 On this the 8th day of June, 2012.

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21


James M. Miller
Tyson Kamuf
SULLIVAN, MOUNTJOY, STAINBACK
& MILLER, P.S.C.
100 St. Ann Street
P. O. Box 727
Owensboro, Kentucky 42302-0727
(270) 926-4000
Counsel for Big Rivers Electric Corporation

KWalton

 Microsoft Word - Redlined NDA - Between Haye
 08/17/12 12:02 PM



NON-DISCLOSURE AGREEMENT

This Non-Disclosure Agreement (“Agreement”) is entered into this 21st day of June 2012, by and between Hayet Power Systems Consulting (“Hayet”) and Alliance for Cooperative Energy Services Power Marketing LLC, (“ACES Power Marketing” or “APM”) (each individually referred to as “Party” and collectively as “Parties”).

RECITALS

WHEREAS, APM provides, inter alia, certain modeling services for Big Rivers Electric Corporation (“Big Rivers”) through the use of proprietary software licensed to APM by Ventyx; and

WHEREAS, APM has created a confidential and proprietary database within the licensed proprietary software which contains information used by APM to prepare certain scenarios for use in the Captioned Case (defined below); and

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NOW WHEREFORE, in consideration of the promises and covenants herein and for good and valuable consideration, the adequacy and sufficiency of which are hereby acknowledged, the Parties intending to be legally bound do hereby agree as follows:

Section 1. Definitions.

“Authorized Representative” shall mean a person who has signed a Confidentiality Agreement with Big Rivers in Case No. 2012-00036.~~employed by Hayet who has signed a Non-Disclosure Certificate pursuant to this Agreement and who is a licensed user of the Ventyx PaR software under Hayet’s license with Ventyx.~~

“Captioned Case” shall mean the case currently before the Kentucky Public Service Commission and captioned as “*APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR APPROVAL OF ITS 2012 ENVIRONMENTAL COMPLIANCE PLAN, FOR APPROVAL OF ITS AMENDED ENVIRONMENTAL COST RECOVERY SURCHARGE TARIFF, FOR CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY, AND FOR AUTHORITY TO ESTABLISH A REGULATORY ACCOUNT, CASE NO. 2012-00063.*”;

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“Notes of Protected Materials” means memoranda, handwritten notes, or any other form of information (including electronic information) that copies or discloses Protected Materials. Notes of Protected Materials are subject to the same restrictions provided in this Agreement for Protected Materials except as specifically provided otherwise in this Agreement.

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Section 6. Disclosure. Only ~~Authorized Representatives~~ Hayet shall have access to the Database. For work directly related to the Captioned Case, Hayet may discuss Input Assumptions with Authorized Representatives. In the event that Hayet ceases to be engaged in the Captioned Case, access to Protected Materials by Hayet shall be terminated. Even if no longer engaged in this Captioned Case, Hayet shall continue to be bound by the provisions of this Agreement and the Non-Disclosure Certificate. No other disclosure of the Database shall be permitted. The Parties agree that the output of modeling analyses that may be conducted using the information contained in the Database is not covered under this Agreement. Hayet shall take all reasonable precautions necessary to assure that Protected Materials are not distributed to unauthorized persons.

Section 7. Nature of Information. Hayet hereby accepts the representations of APM that the Database is of a special, unique, unusual, extraordinary, and/or intellectual character and that the Parties further accept that the Database is an APM trade secret that is not available to the public, and that, if disclosed, would subject APM to risk of competitive disadvantage or other business injury. APM may be irreparably injured by disclosure of the Database. APM and Hayet acknowledge and agree that money damages would not be a sufficient remedy for any breach of this Agreement, and that in addition to all other remedies, a Party shall be entitled to specific performance and injunctive or other equitable relief as a remedy for any such breach, and the Parties agree to waive any requirement for the securing or posting of any bond in connection with such remedy.

Section 8. Survival of Obligations. The obligations and commitments established by this Agreement shall remain in full force and effect for a period of two (2) years from the conclusion of any right to appeal the proceedings in the Captioned Case.

Section 9. Governing Law. The validity and interpretation of this Agreement and the legal relations of the Parties to it shall be governed by the laws of the State of Indiana. In the event that a court of competent jurisdiction determines that any portion of this Agreement is unreasonable because of its term or scope, or for any other reason, the Parties agree that such court may reform such provision so that it is reasonable under the circumstances and that such provision, as reformed, shall be enforceable. The Parties further agree that service of any process, summons, notice or document by U.S. certified or registered mail to the Parties' respective executive offices will be effective service of process for any action, suit, or proceeding brought in any such court.

Section 10. Miscellaneous Provisions.

(a) Neither party shall assign this Agreement without the prior written approval of the other party. Nothing in this Agreement, express or implied, is intended or shall be construed to confer upon any person or entity other than the parties hereto any right, remedy or claim under or by reason of this Agreement.

(b) This Agreement sets forth the entire agreement between the parties as to the subject matter of this Agreement and supersedes all prior agreements, commitments, representations, writings and discussions between them, whether written or oral, with respect to the subject matter hereof. Except as otherwise expressly provided in this Agreement, this Agreement may not be amended or terminated except in writing and signed by a duly authorized representative of the Party to be bound thereby.

(c) If any provision of this Agreement or its application to any person or circumstance is adjudged invalid or unenforceable by any court of competent jurisdiction, then the remainder of this Agreement or the application of such provision to other persons or circumstances shall not be affected thereby.

(d) No delay or failure to exercise any right under this Agreement shall operate as a continuing or permanent waiver of such right or preclude the further exercise of that right or any other right. This Agreement shall be binding on the parties and their successors, heirs, affiliates, and assigns. This Agreement may be executed in any number of counterparts, and each such counterpart shall be deemed an original instrument.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed and delivered by their respective duly authorized officers as of the date first written above.

**ALLIANCE FOR COOPERATIVE
ENERGY SERVICES POWER
MARKETING LLC**

**HAYET POWER SYSTEMS
CONSULTING**

By: _____

By: _____

Name: _____

Name: _____

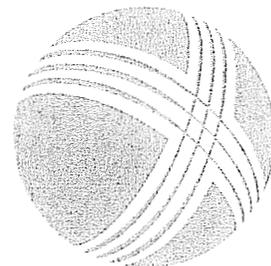
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NON-DISCLOSURE AGREEMENT

This Non-Disclosure Agreement (“Agreement”) is entered into this ___ day of June 2012, by and between Hayet Power Systems Consulting (“Hayet”) and Alliance for Cooperative Energy Services Power Marketing LLC, (“ACES Power Marketing” or “APM”) (each individually referred to as “Party” and collectively as “Parties”).

RECITALS

WHEREAS, APM provides, inter alia, certain modeling services for Big Rivers Electric Corporation (“Big Rivers”) through the use of proprietary software licensed to APM by Ventyx; and

WHEREAS, APM has created a confidential and proprietary database within the licensed proprietary software which contains information used by APM to prepare certain scenarios for use in the Captioned Case (defined below); and

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“Authorized Representative” shall mean a person who has signed a Confidentiality Agreement with Big Rivers. ~~the attached Non-Disclosure Certificate and who is also a consultant or expert for one of the Intervenors in the Captioned Case and is currently licensed to use the Ventyx PaR software.~~

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Section 5. Protection of Materials. All Protected Materials shall be maintained by Hayet in a secure place. Access to those materials shall be limited to ~~Authorized Representatives~~ Hayet. Protected Materials shall be treated as confidential by Hayet and the Authorized Representatives. Protected Materials shall not be used except as necessary for the conduct of this Proceeding, nor shall they be disclosed in any manner to any person except as outlined in Section 6 of this Agreement. ~~an Authorized Representative who is engaged in the conduct of this Proceeding and who needs to know the information in order to carry out that person's responsibilities in this Proceeding.~~ Authorized Representative Hayet may make notes of Protected Materials, which shall be treated as Notes of Protected Materials if they disclose the contents of Protected Materials. ~~Authorized Representatives~~ Hayet may use this information for purposes of this proceeding, and may not use information contained in any Protected Materials obtained through this Proceeding to give Hayet or any competitor or potential competitor of APM a commercial advantage or otherwise economically disadvantage APM based on disclosure of the Protected Materials outside of this proceeding.

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ENERGY SERVICES POWER
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**HAYET POWER SYSTEMS
CONSULTING**

By: _____

By: _____

Name: _____

Name: _____

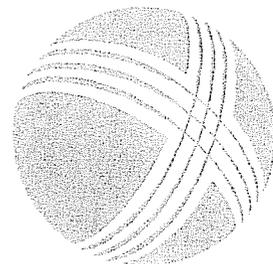
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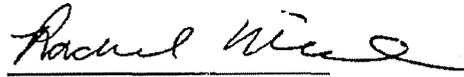
COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:)
)
Application of Big Rivers Electric Cooperative for Approval of)
its 2012 Environmental Compliance Plan, Approval of its) CASE NO. 2012-00063
Amended Environmental Cost Recovery Surcharge Tariffs,)
and for the Certificates of Public Convenience and Necessity,)
and the Authority to Establish a Regulatory Account)

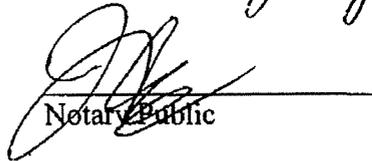
AFFIDAVIT OF RACHEL S. WILSON FOR DIRECT TESTIMONY
(PUBLIC VERSION)

Commonwealth of)
Massachusetts)
)

Rachel S. Wilson, being first duly sworn, states the following: The prepared Direct Testimony (Public Version) and associated exhibits filed on Monday, July 23, 2012 constitute the direct testimony of Affiant in the above-styled cases. Affiant states that she would give the answers set forth in the Direct Testimony, Public Version, if asked the questions propounded therein. Affiant further states that, to the best of her knowledge, her statements made are true and correct.


Rachel S. Wilson

SUBSCRIBED AND SWORN to before me this 19 day of July 2012.


Notary Public

My Commission Expires:

 **JANICE CONYERS**
Notary Public
Commonwealth of Massachusetts
My Commission Expires
July 27, 2018

Commonwealth of Kentucky

Before the Public Service Commission

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC)
CORPORATION FOR APPROVAL OF ITS)
2012 ENVIRONMENTAL COMPLIANCE)
PLAN, FOR APPROVAL OF ITS)
AMENDED ENVIRONMENTAL COST)
RECOVERY SURCHARGE TARIFF, FOR)
CERTIFICATES OF PUBLIC)
CONVIENENCE AND NECESSITY, AND)
FOR AUTHORITY TO ESTABLISH A)
REGULATORY ACCOUNT.)

Case No. 2012-00063

**Direct Testimony of
Rachel S. Wilson**

**On Behalf of
Sierra Club**

Public Version

July 23, 2012

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1 **1. INTRODUCTION AND QUALIFICATIONS**

2 **Q Please state your name, business address, and position.**

3 **A** My name is Rachel S. Wilson and I am an associate with Synapse Energy
4 Economics, Inc. (Synapse). My business address is 485 Massachusetts Avenue,
5 Suite 2, Cambridge, Massachusetts 02139.

6 **Q Please describe Synapse Energy Economics.**

7 **A** Synapse Energy Economics is a research and consulting firm specializing in
8 energy and environmental issues, including electric generation, transmission and
9 distribution system reliability, ratemaking and rate design, electric industry
10 restructuring and market power, electricity market prices, stranded costs,
11 efficiency, renewable energy, environmental quality, and nuclear power.

12 Synapse's clients include state consumer advocates, public utilities commission
13 staff, attorneys general, environmental organizations, federal government, and
14 utilities.

15 **Q Please summarize your work experience and educational background.**

16 **A** At Synapse, I conduct research and write testimony and publications that focus on
17 a variety of issues relating to electric utilities, including: integrated resource
18 planning; federal and state clean air policies; emissions from electricity
19 generation; environmental compliance technologies, strategies, and costs;
20 electrical system dispatch; and valuation of environmental externalities from
21 power plants.

22 I also perform modeling analyses of electric power systems. I am proficient in the
23 use of spreadsheet analysis tools, as well as optimization and electricity dispatch
24 models to conduct analyses of utility service territories and regional energy
25 markets. I have direct experience running the Strategist, Promod, Prosym/Market
26 Analytics, and Plexos models, and have reviewed input and output data for a
27 number of other industry models.

1 Prior to joining Synapse in 2008, I worked for the Analysis Group, Inc., an
2 economic and business consulting firm, where I provided litigation support in the
3 form of research and quantitative analyses on a variety of issues relating to the
4 electric industry.

5 I hold a Master of Environmental Management from Yale University and a
6 Bachelor of Arts in Environment, Economics, and Politics from Claremont
7 McKenna College in Claremont, California.

8 A copy of my current resume is attached as Exhibit RSW-1.

9 **Q On whose behalf are you testifying in this case?**

10 **A** I am testifying on behalf of Sierra Club.

11 **Q Have you testified previously before the Kentucky Public Service
12 Commission?**

13 **A** Yes. On September 16, 2011, I filed direct testimony in the joint application of
14 Kentucky Utilities Company/Louisville Gas & Electric for Certificates of Public
15 Convenience and Necessity (CPCN) in Case Numbers 2011-00161 and 2011-
16 00162. I also filed direct testimony on March 12, 2012 in the application of
17 Kentucky Power for CPCN in Case Number 2011-00401.

18 **Q What is the purpose of your testimony?**

19 **A** My testimony reviews the regulatory requirements and economic justifications of
20 specific environmental retrofits made by Big Rivers Electric Corporation
21 (“BREC” or the “Company”), for which capital recovery is requested in this case.
22 I review the current and expected running costs of the Company’s coal-fired units,
23 and compare these costs to different alternatives. I conclude that the Company’s
24 economic justification for these environmental retrofits, in the form of its
25 financial modeling analysis, did not consider a full range of alternative
26 compliance options and contained several flaws that bias its analysis in favor of
27 installation of emission control retrofit projects.

1 **Q Please identify the documents and filings on which you base your opinion**
2 **regarding the Company’s analysis of the environmental compliance costs**
3 **affecting its fleet of coal plants.**

4 **A** In addition to the application, Company witness testimonies, and discovery
5 responses in this case, I have reviewed the Sargent & Lundy input assumptions
6 and calculations relating to environmental retrofit options, the PACE Global input
7 and assumptions and resulting market prices, the ACES Planning and Risk model
8 inputs and outputs, and the BREC financial modeling calculations.

9 **2. CONCLUSIONS AND OVERVIEW OF TESTIMONY**

10 **Q In your opinion, do the facts and evidence presented in this case support the**
11 **Company’s request for CPCN?**

12 **A** No, they do not. There are a number of assumptions in the modeling presented by
13 the Company in this docket that are incorrect, which bias the Company’s results
14 in favor of the installation of pollution control retrofits and the continued
15 operation of the BREC coal fleet. These include, but are not limited to: 1)
16 modeling of only some of the controls expected for future regulatory compliance
17 rather than the entire suite of anticipated controls; 2) a natural gas price forecast
18 that is out-of-date and higher than current forecasts; 3) use of a carbon dioxide
19 (CO₂) emissions price in the determination of market energy prices, but not in unit
20 running costs; 4) exclusion of ongoing capital expenditures and operating and
21 maintenance (O&M) costs at each of the coal units; 5) failure to examine the
22 forward going costs of each of the BREC units on an individual basis; and 6)
23 failure to model any alternative options (e.g. natural gas combined-cycle (NGCC),
24 energy market purchases, etc.) for comparison to the retrofit case.

25 Synapse created a cash flow model that calculates the forward going costs of each
26 of the BREC units on a stand-alone basis, and discounts those costs to determine
27 the total net present value revenue requirement (NPVRR) of the retrofits selected
28 by the Company for each unit individually. The “Retrofit” option is then
29 compared to a natural gas combined-cycle replacement option.

1 The scenario used in our cash flow model represents what I believe is most likely
 2 to occur and includes the entire suite of pollution controls that are expected to
 3 bring the BREC coal units into compliance with both existing and expected U.S.
 4 Environmental Protection Agency (EPA) regulations. Second, it updates the
 5 Company's natural gas price forecast and instead uses the U.S. Energy
 6 Information Administration's (EIA) natural gas forecast from the *2012 Annual*
 7 *Energy Outlook*. Third, the CO₂ emissions price used by BREC's consultant
 8 PACE Global in modeling market energy prices is added in to the analysis of the
 9 future cost of operating BREC's generating units, as are the ongoing capital
 10 expenditures and O&M costs at each of the units. NPVRR at each of the units is
 11 then calculated under these revised assumptions for the "Retrofit" option. We then
 12 compare these results to the NPVRR associated with a natural gas combined-
 13 cycle replacement option.

14 The results of this case – the "Synapse Recommended Case" – are shown in Table
 15 1 (also in Exhibit RSW-2), below. These results indicate that all of the BREC coal
 16 units are uneconomic when compared to a natural gas replacement option and
 17 should be considered for retirement.

18 **Table 1. Comparison of Natural Gas Combined Cycle (NGCC) Replacement to BREC Unit**
 19 **Retrofits. Includes all pollution control retrofits, the AEO 2012 natural gas price forecast,**
 20 **and the PACE CO₂ price forecast (millions 2012\$).**

	NGCC Replacement 2015 minus Retrofit	% Difference from Retrofit
Wilson	(\$259)	-13.88%
Green 1	(\$204)	-18.53%
Green 2	(\$213)	-19.83%
HMPL 1	(\$82)	-12.47%
HMPL 2	(\$107)	-15.56%
Coleman 1	(\$108)	-15.84%
Coleman 2	(\$90)	-13.74%
Coleman 3	(\$103)	-14.92%
Total	(\$1,165)	-15.73%

21

1 The next sections of my testimony describe in more detail the errors that I believe
2 were made by BREC in its modeling analysis and the scenarios modeled by
3 Synapse in our cash flow analysis.

4 3. CHARACTERISTICS OF UNITS THAT AFFECT THEIR RUNNING COSTS

5 **Q Please describe the characteristics of electric generating units that affect**
6 **their running costs.**

7 **A** Running costs of electric generating units are made up of two components – fixed
8 and variable costs. Fixed costs include investment capital, property taxes, and
9 fixed O&M expenses. Variable costs include fuel costs, emissions costs, and
10 variable O&M expenses.

11 Characteristics unique to individual generating units affect their running costs, in
12 particular generating unit size, age, heat rate, and installed pollution controls. Unit
13 heat rate is a measure of the efficiency of the plant, with lower heat rates
14 indicating that a generating unit is converting heat input (in the form of fuel) to
15 energy output at a more efficient rate. Heat rate is related to age, and tends to
16 degrade over time as units get older. It is also related to size, as smaller units tend
17 to operate less efficiently than larger units. Higher heat rates, indicating a lower
18 efficiency, lead to increased fuel and emissions costs, and increase the running
19 costs of a generating unit.

20 As units get older, component parts degrade and require replacement. These
21 replacements represent ongoing capital expenditures, which may increase as units
22 age.

23 Pollution control technologies affect the running cost of a unit in various ways.
24 First, they require investment capital and increase the fixed costs at a unit in a
25 given year. Size of the unit matters when installing pollution controls due to
26 economies of scale; smaller units are more expensive to retrofit on a \$/kW
27 (dollar/kilowatt) basis. Emission control equipment requires electricity to run,
28 lowering the net output of a generating unit, which is called “parasitic load,”
29 meaning that the same fuel and emissions costs are incurred but result in less

1 electricity output. Many emission controls also require the use of a reagent, the
2 cost of which increases variable O&M.

3 **4. ENVIRONMENTAL REQUIREMENTS FACING THE BREC COAL FLEET**

4 **Q What are the recent and emerging EPA requirements with which the**
5 **Company's coal fleet will have to comply?**

6 **A** The EPA has recently proposed a number of rules to protect human health and the
7 environment. These rules are in various states of promulgation and, taken
8 together, may have a significant economic implications for coal-fired generation.
9 There are six rules that will have an effect on the coal-fired units in the United
10 States, and the units in the BREC fleet:

- 11 A. Cross-States Air Pollution Rule (CSAPR)
- 12 B. Mercury and Air Toxics Standards (MATS)
- 13 C. National Ambient Air Quality Standards (NAAQS)
- 14 D. Coal Combustion Residuals (CCR)
- 15 E. Cooling Water Intake Rule (316(b))
- 16 F. Effluent limitation guidelines

17 In addition, regulation of CO₂ through federal legislation or EPA rulemaking will
18 have a significant impact on the economics of coal-fired units.

19 **Q Were all of these rules described sufficiently in Company witness testimony?**

20 **A** No. Company witness Thomas Shaw describes CSAPR, MATS, CCR, and 316(b)
21 rules. He does not discuss the NAAQS or the Effluent Limitation Guidelines, nor
22 does he discuss the possibility of a CO₂ emissions allowance price.

23 **Q Please briefly describe the purpose and impact of NAAQS.**

24 **A** NAAQS set maximum air quality limitations that must be met at all locations
25 across the nation. Compliance with the NAAQS can be determined through air
26 quality monitoring stations, which are located in various cities throughout the

1 U.S., or through air quality dispersion modeling. If, upon evaluation, states have
2 areas found to be in “nonattainment” of a particular NAAQS, states are required
3 to set enforceable requirements to reduce emissions from sources contributing to
4 nonattainment such that the NAAQS are attained and maintained. EPA has
5 established NAAQS for six pollutants: sulfur dioxide (SO₂), nitrogen oxides
6 (NO_x), carbon monoxide, ozone, particulate matter, and lead. EPA is required to
7 periodically review and evaluate the need to strengthen the NAAQS if necessary
8 to protect public health and welfare. For example, EPA is currently evaluating the
9 NAAQS for ozone and particulate matter. Utilities are expecting new compliance
10 requirements stemming from these anticipated NAAQS revisions as early as
11 2016, but no later than 2018. Sargent & Lundy confirms this in Table ES-3 of
12 Exhibit DePriest-2, which lists a NAAQS compliance window of 2016-2018.

13 **Q Please briefly describe the purpose and impact of the expected Effluent**
14 **Limitation Guidelines.**

15 **A** Following a multi-year study of steam-generating units across the country, EPA
16 found that coal-fired power plants are currently discharging a higher-than-
17 expected level of toxic-weighted pollutants. Current effluent regulations were last
18 updated in 1982 and do not reflect the changes that have occurred in the electric
19 power industry over the last thirty years, and do not adequately manage the
20 pollutants being discharged from coal-fired generating units. Coal ash ponds and
21 flue gas desulfurization (FGD) systems used by such power plants are the source
22 of a large portion of these pollutants, and are likely to increase in the future as
23 environmental regulations are promulgated and pollution controls are installed.
24 No new rule has yet been proposed, but EPA intends to issue the proposed
25 regulation in November 2012 and a final rule in April 2014.¹ New requirements

¹ See U.S. Environmental Protection Agency website. Accessed July 20, 2012. Available at:
http://water.epa.gov/scitech/wastetech/guide/steam_index.cfm

1 will be implemented in 2014-2019 through the 5-year National Pollutant
2 Discharge Elimination System (NPDES) permit cycle.²

3 **Q Please describe the purpose and impact of regulation of emissions of CO₂.**
4 While there is not currently a federal law or proposed rulemaking requiring a
5 control technology, cap-and-trade program, or tax on emissions of CO₂,
6 discussions at the EPA and at the Congressional level are ongoing. The most
7 recent legislative proposal to reduce emissions of CO₂ has taken the form of a
8 Clean Energy Standard (CES), as introduced by Senator Bingaman on March 1,
9 2012. A CES encourages the use of low-carbon power through the allocation of
10 clean energy credits to those generation technologies that emit less CO₂, which
11 generation owners would consider in their dispatch decisions. In Senator
12 Bingaman's bill, credits are determined based on individual power plant
13 emissions and generating sources are given a certain number of credits based on
14 their carbon profile, with lower emitting sources rewarded with a larger number
15 of clean energy credits. In any given year, electric utilities would be required to
16 hold a certain number of clean energy credits for a specific percentage of their
17 sales.

18 **Q Have there been any third-party analyses that evaluate the economic effect of**
19 **the rules listed above on the U.S. coal fleet?**

20 Yes, there have been several. The studies evaluate different combinations of the
21 rules listed above. Study authors include the following organizations:

- 22 A. Investment and research firms (Credit Suisse and Bernstein Research)
23 B. Consulting firms (MJ Bradley, Charles River Associates, Brattle Group,
24 and NERA Economic Consulting)

² See U.S. Environmental Protection Agency. *Steam Electric ELG Rulemaking*. UMRA and Federalism Implications: Consultation Meeting. October 11, 2011. <http://water.epa.gov/scitech/wastetech/guide/upload/Steam-Electric-ELG-Rulemaking-UMRA-and-Federalism-Implications-Consultation-Meeting-Presentation.pdf>

1 C. Government and industry groups (North American Electric Reliability
2 Corporation (NERC)), Edison Electric Institute (EEI), Electric Power
3 Research Institute (EPRI), U.S. Department of Energy, and Bipartisan
4 Policy Center)

5 **Q Can you draw any conclusions about the effect of the EPA rules on coal**
6 **economics based on the results of these studies?**

7 Yes. There are two very important conclusions that one can draw when looking at
8 the results of these studies. The first is that the forward-going economics of the
9 coal fleet changes based on the number of rules that are taken into consideration
10 when doing the analysis. A coal unit might still be economic to run when retrofit
11 with controls that would allow it to comply with CSAPR and MATS, but if costs
12 for compliance with the CCR rule are added, the forward-going costs of that same
13 unit may at that point be higher than a natural gas or market alternative. In a 2010
14 study presented by ICF Consulting for the Edison Electric Institute (EEI) entitled
15 *EEI Preliminary Reference Case and Scenario Results*, three scenarios are
16 examined. The first looks at the effects of MATS, the second looks at the
17 combined effect of MATS, CCR and 316(b), and the third scenario looks at the
18 effects of those three rules with the addition of a CO₂ emissions price. A copy of
19 this study is provided as Exhibit RSW-3.

20 Table 2, below, shows the number of expected gigawatts (GW) retired under the
21 draft EPA rules as reported by ICF under the three scenarios.

22 **Table 2. Coal Retirements in the ICF/EEI Analysis.**

Scenario	Coal Retired (GW)	
	Low Estimate	High Estimate
MATS	25	50
MATS, CCR, 316(b)	30	60
MATS, CCR, 316(b), CO ₂	70	120

23

24 As seen in Table 2, when regulations are examined in combination rather than
25 independently, the effect on coal unit retirements is greater. The high estimate

1 goes up by 10 GW when CCR and 316(b) are considered along with MATS. That
2 estimate doubles with the addition of CO₂ regulation. As costs of emission control
3 retrofits are compounded to comply with the EPA rules, the forward-going costs
4 of running previously cost-effective coal units increase to the point at which they
5 are uneconomic when compared to replacement options.

6 The second conclusion that one can draw when reviewing these studies is that
7 lower natural gas prices lead to more coal retirements. As natural gas prices fall,
8 the costs of operating natural gas-fired replacement generation decline, causing
9 natural gas replacement capacity to look more favorable when compared to coal
10 units with installed emission controls. EPRI's 2012 study, entitled *Analysis of*
11 *Current and Pending EPA Regulations on the U.S. Electric Sector* evaluates the
12 number of coal retirements/repowerings resulting from the combination of the
13 CSAPR, MATS, ozone and haze, SO₂ NAAQS, CCR, and 316(b) rules at five
14 different forecasts of natural gas prices. A copy of this study is provided as
15 Exhibit RSW-4.

16 Table 3, below, shows the number of coal retirements/repowerings that might be
17 expected at each natural gas forecast. EPRI's Reference case natural gas price
18 forecast begins at approximately \$5.90/mmBtu in 2010 and rises to approximately
19 \$7.30/mmBtu in 2035 (2009\$).

20 **Table 3. Coal Retirements/Repowerings in EPRI's 2012 Analysis.**

Scenario	Coal Retired/Refueled (GW)
Gas Plus \$2	30
Gas Plus \$1	50
Reference	57
Gas Minus \$1	75
Gas Minus \$2	120

21

22 As shown in Table 3, a lowering of the natural gas forecast has a more dramatic
23 effect on the number of coal retirements/repowerings than does an increase in the
24 natural gas price forecast. The Gas Plus \$2 scenario causes the number of

1 retirements/repowerings to drop by 27 GW from the Reference case, while the
2 Gas Minus \$2 scenario increase coal retirements/repowerings by 63 GW.
3 Similarly, the Gas Plus \$1 scenario causes the number of retirements/repowerings
4 to drop by 7 GW from the Reference case, while the Gas Minus \$1 scenario
5 increase coal retirements/repowerings by 18 GW. Natural gas price is therefore a
6 significant determinant of the number of coal plant retirements that will occur as a
7 result of EPA rules.

8 **5. EFFECT OF EPA REGULATIONS ON BREC UNITS**

9 **Q Which of the EPA regulations were considered by BREC when the Company**
10 **determined which environmental retrofits were necessary to install on its**
11 **units?**

12 **A** In the 2012 Environmental Compliance Plan submitted in this docket, BREC
13 plans to install environmental retrofits that would bring its coal-fired units into
14 compliance with CSAPR and MATS only. Sargent & Lundy made
15 recommendations for technologies intended to also bring the units into
16 compliance with the NAAQS revisions, the CCR, 316(b), and Effluent rules, but
17 these recommendations were ignored by BREC in its analysis.

18 **Q Do you agree with the Company's assessment of CSAPR and the control**
19 **technologies needed to bring its units into compliance with the rule?**

20 **A** Yes, generally. I do have some issues of concern, however. First, according to
21 page 9 of Mr. Berry's direct testimony, BREC is assuming that the new FGD
22 system that it intends to install at the Wilson unit will have 99% SO₂ removal
23 efficiency, but in Response to Data Request Sierra Club 2-23a, the Company
24 states that it's the overall control efficiency included in its permit application is
25 98%. The Wilson plant is able to meet its CSAPR SO₂ limits, but the Company
26 may be assuming that the extra 1% in control efficiency may result in additional
27 allowances that could be used at another one of its units, and if control efficiency
28 of 98% occurs, these bonus allowances may not materialize.

1 Additionally, Sargent & Lundy recommended advanced low NO_x burners at the
2 Coleman units, as shown on page 15 of the direct testimony of Mr. DePriest, in
3 order to provide BREC with a degree of margin in its NO_x compliance strategy
4 and to reduce the NO_x burden until the selective catalytic reduction technology
5 (SCR) at Green comes online in 2015. Advanced low NO_x burners could be
6 installed at a capital cost of \$5.94 million per unit, according the Sargent & Lundy
7 workbook entitled “Capital and O&M.xls,” provided by the Company on June 14
8 as part of the folder entitled “Sargent and Lundy Production to Big Rivers.”
9 BREC elected not to install the advanced low NO_x burners, and instead plans to
10 rely on the allowance market. There is some degree of risk involved in reliance on
11 the allowance market, as the availability of allowances depends on whether or not
12 other utilities install control technologies that gives them the ability to sell excess
13 allowances into the market. It also assumes that these allowances will be available
14 at a reasonable price. Historically, allowances of SO₂ and NO_x have been subject
15 to some price volatility³ and it is possible that future prices may rise above what
16 BREC has estimated for future compliance.

17 **Q Do you agree with the Company’s assessment of MATS and the control**
18 **technologies needed to bring its units into compliance with the standards?**

19 **A No.** The Company provided “limited available stack test data”⁴ to Sargent &
20 Lundy, and this data was used by S&L to develop the MATS compliance
21 recommendations. In the Company’s Response to Sierra Club Data Request 1-36,
22 BREC states that the stack test was performed at operational loads with pollution
23 control equipment in service. A single stack test, however, represents nothing
24 more than a snapshot, often taken under optimal operating conditions, that tells
25 little about the emissions from that unit when the stack test is not occurring. This
26 is especially true during periods of startup and shutdown, when control equipment

³ See U.S. Environmental Protection Agency. *Allowance Market Assessment: A Closer Look at the Two Biggest Price Changes in Federal SO₂ and NO_x Allowance Markets*. White Paper. April 23, 2009. Available at: <http://www.epa.gov/airmarkt/resource/docs/marketassessmnt.pdf>

⁴ Exhibit DePriest-2. Page 2-4.

1 may not be fully operational. Emissions, therefore, are likely higher than indicated
2 by the stack test. Installation of Continuous Emissions Monitors (CEMs) would
3 determine whether or not the limited stack test data is truly representative of unit
4 emissions.

5 On page 28, lines 7-18 of Mr. DePriest's testimony and on page 4-12 of Exhibit
6 DePriest-2, it is stated that retrofitting the BREC units with ACI and/or DSI
7 technologies for MATS compliance will lead to additional loading of particulate
8 matter, and upgrades of existing electro static precipitators (ESPs) may be
9 required for units to remain in compliance with the rule. BREC has yet to conduct
10 the testing necessary to determine if ESP upgrades are necessary. As the
11 Company states in its Response to Sierra Club Data Request 2-10, if these
12 upgrades are required, BREC would return to the Commission in early 2013 to
13 seek CPCN and rate recovery for these controls. It is possible that installation of
14 the combination of ACI, DSI and ESP upgrades may still not bring some or all of
15 BREC's units into compliance with MATS. As the Company states in its
16 Response to Sierra Club Data Request 2-10, it would then evaluate polishing
17 baghouse (and full baghouse technologies, if necessary) retrofits, and would again
18 return to seek CPCN and rate recovery in early 2013.

19 In its workbook entitled "Capital and O&M.xls," provided by the Company on
20 June 14 as part of the folder entitled "Sargent and Lundy Production to Big
21 Rivers," Sargent & Lundy gives the capital and annual O&M costs for the ESP
22 upgrades that are shown in Table 4, below.

23

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Table 4. Estimated Capital and Annual O&M Costs for ESP Upgrades.

	Capital Cost (\$M)	Annual O&M (\$M)
Coleman Unit 1	2.72	0.09
Coleman Unit 2	2.72	0.09
Coleman Unit 3	2.72	0.09
Wilson Unit 1	4.54	0.17
Green Unit 1	3.34	0.07
Green Unit 2	3.34	0.07
HMP&L Unit 1	2.5	0.08
HMP&L Unit 2	2.5	0.08

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Sargent & Lundy also gave capital cost estimates for baghouse technologies, shown on page 5-5 of Exhibit DePriest-2, if they were to be required. Those estimates are shown in Table 5.

6

Table 5. Estimated Capital Costs for Baghouse Technologies.

	Per Unit Capital Cost (\$M)
Green 1/2	75
HMPL 1/2	51

7

8 **Q**

Do you agree with the Company’s assessment of the NAAQS revisions and the control technologies needed to bring its units into compliance with the expected standards?

9

10 **A**

No. In Table ES-2 of Exhibit DePriest-2, Sargent & Lundy presents a table of recommended NAAQS compliance retrofits, including an SCR at Unit 1 of the R.D. Green plant. BREC, however, chose to leave this SCR out of its 2012 Environmental Compliance Plan. The Company states in its Response to Sierra Club Data Request 2-7 that it expects that the ozone NAAQS will be finalized in 2013 and that states will be given three years from that date to comply with the revised limits. Thus, compliance with the revised NAAQS could occur as early as 2016. On page 19, lines 18-21 of Mr. Berry’s direct testimony, he states that the expected in-service date of the SCR at Green 2 is July 1, 2015. Depending on when in 2013 the NAAQS revisions are finalized, the Company may return to this Commission as early as six months from now to seek CPCN and rate recovery for an SCR at Green 1 to comply with these rules. Given the recommendation from

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1 Sargent & Lundy as well as the time frame for compliance, BREC should
2 certainly include this additional SCR at Green 1 in its Environmental Compliance
3 Plan and current financial analysis. In its workbook entitled “Capital and
4 O&M.xls,” provided by the Company on June 14 as part of the folder entitled
5 “Sargent and Lundy Production to Big Rivers,” Sargent & Lundy states that the
6 capital cost of the SCR is \$81 million and O&M costs are \$2.16 million annually.

7 **Q Do you agree with the Company’s assessment of the CCR rule and the**
8 **control technologies needed to bring its units into compliance with the**
9 **expected standards?**

10 **A** No, as BREC does not include the compliance options associated with the
11 expected rule in its financial analysis. Mr. Shaw states on page 19 of his direct
12 testimony that “the alternatives under consideration by the EPA are of such
13 substantially different form that Big Rivers believes an immediate response to the
14 proposal would not be appropriate.” However, BREC does have some expectation
15 of what compliance under the CCR rule might look like for its units. In the BREC
16 presentation of its 2012 Environmental Compliance Plan at the Kenergy Board
17 Meeting on May 8, 2012 (provided in Response to Sierra Club Data Request 1-
18 57), slide 17 states that BREC is “not expecting the worst case.”

19 BREC also has recommendations from Sargent & Lundy about the retrofits that
20 might be expected for compliance. The Company need not move forward with
21 plans to retrofit its units in order to comply with the CCR rule at this time, but it
22 should include some assumption about expected costs of the rule in its financial
23 analysis. In its workbook entitled “Capital and O&M.xls,” provided by the
24 Company on June 14 as part of the folder entitled “Sargent and Lundy Production
25 to Big Rivers,” Sargent & Lundy gives the capital costs for CCR compliance that
26 are shown in Table 6, below.

27

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Table 6. Estimated Capital Costs for CCR Compliance Technologies.

	S&L Recommended Tech	Capital Cost (\$M)
Coleman Unit 1	Dry Bottom Conversion - Remote SSC & Fly Ash Conversion to Dry Pneumatic	38
Coleman Unit 2		
Coleman Unit 3		
Green Unit 1	Dry Bottom Conversion - Remote SSC	28
Green Unit 2		
HMP&L Unit 1	Dry Bottom Conversion - Remote SSC	28
HMP&L Unit 2		

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Q Do you agree with the Company’s assessment of the 316(b) rule and the control technologies needed to bring its units into compliance with the expected standards?

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No, as BREC does not include the compliance options associated with the expected rule in its financial analysis. Again, Mr. Shaw states on page 20 of his direct testimony that “the alternatives described in this proposal are of such substantially different form that Big Rivers believes an immediate response to the proposal would not be appropriate.” On slide 16 of that same May 8, 2012 presentation to the Kenergy Board, BREC states that the 316(b) rules could require a cooling tower at Coleman and modifications for intake structures at Reid/HMPL. Sargent & Lundy’s recommendations for compliance are less stringent than these. On page 6-8 of Exhibit DePriest-2, Sargent & Lundy states that the intake screens at Coleman and Sebree are inadequate and recommends rotating circular intake screens with fish pumps to meet the expected impingement mortality reductions. BREC should, at a minimum, include the costs associated with these recommendations in its financial modeling. In its workbook entitled “Capital and O&M.xls,” provided by the Company on June 14 as part of the folder entitled “Sargent and Lundy Production to Big Rivers,” Sargent & Lundy gives the capital and annual O&M costs for 316(b) compliance that are shown in Table 7, below.

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Table 7. Estimated Capital Costs for CCR Compliance Technologies.

316(b)	S&L Recommended Tech	Capital Cost (\$M)	Annual O&M (\$M)
Coleman Unit 1	Replacement Intake Screen	1.33	0.25
Coleman Unit 2	Replacement Intake Screen	1.33	0.25
Coleman Unit 3	Replacement Intake Screen	1.33	0.25
Green Unit 1	Replacement Intake Screen	2.05	0.37
Green Unit 2			
HMP&L Unit 1			
HMP&L Unit 2			
Reid Unit 1			
Reid Unit RT			

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3 **Q Do you agree with the Company’s assessment of the Effluent Limitations**
4 **Guidelines and the control technologies needed to bring its units into**
5 **compliance with the expected standards?**

6 **A** No, as BREC does not include the compliance options associated with the
7 expected rule in its financial analysis. On page 2-9 of Exhibit DePriest-2, Sargent
8 & Lundy states that for the Coleman, Wilson, and Sebree units, “it may become
9 necessary to install advanced wastewater treatment/removal systems for mercury
10 and other metals.” An estimate of potential costs of advanced wastewater
11 treatment and removal should have been provided, and BREC should have
12 included these costs in its financial modeling.

13 **Q Do you agree that an emissions price for CO₂ should have been omitted from**
14 **the BREC financial analysis?**

15 **A** No. At a minimum, the presence of a CO₂ emissions price in the PACE Global
16 output energy prices should have led the Company to also include a CO₂ price in
17 the dispatch of its units in the ACES Planning and Risk (PaR) modeling, and in its
18 financial modeling calculations.

19 While the future of CO₂ regulations is still somewhat unknown, an emissions
20 allowance price, when it begins, will have a significant effect on coal-fired
21 generation. Other utilities are planning for this by including a CO₂ allowance
22 price in their optimization and dispatch modeling. Synapse has collected 21
23 different utility IRP and CPCN docket documents from 2010-2012 from utilities

1 operating across the US. Nineteen of those utilities assume a price per ton for
2 CO₂, and all but three of those reference CO₂ price forecasts are higher than the
3 forecast used by PACE Global in its modeling. Figure 1 shows the range of utility
4 forecasts as compared to the PACE Global forecast. The utilities included in this
5 Figure are listed in Exhibit RSW-5.

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11 [CONFIDENTIAL FIGURE REMOVED]
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19 **6. DESCRIPTION OF COMPANY MODELING**

20 **Q Please describe the modeling methods used by BREC in this docket.**

21 **A** It is my understanding that three different modeling methodologies were used to
22 support the BREC analysis. First, PACE Global used the Aurora model to
23 determine hourly energy prices using input forecasts of coal prices, natural gas
24 prices, CO₂ emissions, load, and capital costs for CC, CT, and wind generation
25 technologies.

1 Those hourly energy prices were then given to ACES Power Marketing for use in
2 production cost modeling using the PaR model. ACES did not use an input CO₂
3 emissions price in its dispatch when running the PaR model. Outputs from ACES
4 production cost modeling included unit generation, capacity factor, fuel used and
5 cost, emissions and emissions cost, and variable O&M. The PaR model also
6 output wholesale market purchases and off-system sales.

7 BREC took the unit and system outputs from the ACES modeling and used them
8 as inputs in its own spreadsheet financial model. The financial model calculates
9 the NPVRR by first summing the production costs in a given year (start-up costs,
10 fuel costs, costs for reagents, allowance purchases, purchased power, and off-
11 system sales) with the fixed cost of capital in a given year (debt service, debt
12 issuance cost, property tax, property insurance, and labor) to arrive at the revenue
13 requirements in each of the years in the study period. The net present value of this
14 stream of revenue requirements was then calculated.

15 BREC used this financial modeling methodology to calculate an NPVRR for three
16 different scenarios: 1) a “Build” case, in which all of the emission control
17 technologies deemed necessary for compliance with CSAPR and MATS are
18 installed on the BREC units; 2) the “Partial Build” case, in which the same set of
19 emission controls are installed as in the “Build” case, with the exception of the
20 SCR on Green Unit 2; and 3) the “Buy” case, in which only MATS emission
21 controls are installed, unit generation is curtailed to meet the CSAPR emissions
22 limits, and power is purchased in the wholesale market to meet the remaining
23 electricity demand.

24 7. CONCERNS WITH THE BREC FINANCIAL MODELING INPUT ASSUMPTIONS

25 **Q Did you identify any problems with the Company’s financial modeling?**

26 **A** Yes, I have five major areas of concern with the BREC financial modeling. The
27 first area of concern is that several of the Company’s input assumptions are
28 flawed, which I will address in this section. The remaining four areas of concern
29 will be addressed in the next section.

1 **Q Which of the Company’s input assumptions do you believe are flawed?**

2 **A** I believe that several of the Company’s input assumptions are flawed, including:

- 3 A. The load forecast, which does not include the effects of DSM;
- 4 B. The input natural gas price forecast from the PACE Global modeling;
- 5 C. The use of a CO₂ emissions price to determine the energy market prices in
- 6 the PACE Global modeling, but leaving it out of the ACES production
- 7 cost modeling and the dispatch of generating units;
- 8 D. The resulting output energy prices from the PACE Global modeling/Use
- 9 of inflated market prices;
- 10 E. The assumption that capacity, heat rates, forced outages, and availability
- 11 factors stay constant over time;
- 12 F. The use of both real and nominal dollars in calculations of NPVRR in the
- 13 BREC financial modeling.

14 **A. LOAD FORECAST**

15 **Q Why do you believe the load forecast used in the BREC analysis is incorrect?**

16 **A** In its Response to Sierra Club Data Request 2-27, the Company essentially admits

17 that its load forecast is overstated because it fails to account for various demand

18 side management (DSM) efforts. In part c, subpart iv of the response, BREC

19 states that the savings from energy efficiency programs that are currently being

20 implemented in 2012 are not included in the load forecast used in its analysis.

21 While level of participation and actual impacts are currently unknown, the

22 Company should at the very least include a conservative estimate of the impacts

23 of energy efficiency, or include a “low load” sensitivity analysis that reflects these

24 impacts. The Company goes on to say in part c, subpart v, that the load forecast

25 also does not explicitly include projected impacts of federal efficiency standards

26 or programs, but only indirectly includes them to the extent they impact historical

27 load data and economic forecast data. Overstating the load would likely cause the

1 BREC units to run more often than they otherwise would in the production
2 simulation modeling, possibly improving the economics of those units as they are
3 subject to fewer starts and less unit cycling. It might also lead to an overestimate
4 of the size of any replacement energy needed if the coal units were to retire, either
5 in the form of a NGCC replacement options, or market energy replacement.

6 **B. NATURAL GAS PRICE FORECAST**

7 **Q Why do you believe the natural gas price forecast used by PACE Global is**
8 **incorrect?**

9 The natural gas price forecast used by PACE Global to develop market energy
10 prices appears to be higher than other natural gas prices developed in 2011 and
11 2012. Figure 2 shows the PACE forecast compared to the EIA's natural gas price
12 forecast from its *Annual Energy Outlook* for the years 2010, 2011, and 2012.

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[CONFIDENTIAL FIGURE REMOVED]

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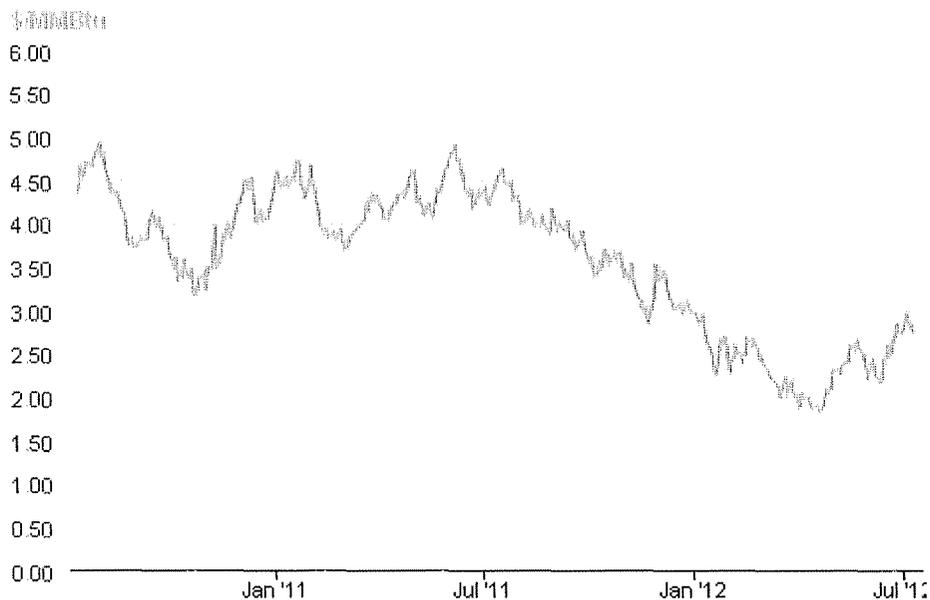
22

23

1 While the EIA forecast from 2010 is higher than the forecast from PACE Global,
2 the forecasts from 2011 and 2012 are both lower than that used by PACE in its
3 modeling.

4 In the near term, even the AEO 2012 natural gas price forecast is too high. The
5 natural gas price at Henry Hub has been less than \$3/mmBtu for all of 2012 thus
6 far, as shown in Figure 3, below.

Natural gas spot prices (Henry Hub)



7

8 **Figure 3. Natural gas spot prices at Henry Hub (\$/mmBtu).⁵**

9 Sources indicate that the drop in forecasts for both short and long-term natural gas
10 prices represent a fundamental shift in the industry rather than a temporary
11 anomaly, and are a result of recent growth in natural gas production due to shale
12 gas and the related sale of natural gas liquids. In EPA's proposed New Source
13 Performance Standards rule, the agency states that "technological developments
14 and discoveries of abundant natural gas reserves have caused natural gas prices to

⁵ U.S. Energy Information Administration. *Natural Gas Weekly Update*. For week ending July 11, 2011. Accessed July 18, 2012. Available at: <http://205.254.135.7/naturalgas/weekly/>

1 decline precipitously in recent years and have secured those relatively low prices
2 for the near future.”⁶

3 **C. CO₂ EMISSIONS PRICE FORECAST**

4 **Q How was a CO₂ emissions price used in the modeling performed in this**
5 **docket?**

6 **A** In its determination of hourly market prices, one of the inputs used by PACE
7 Global was a CO₂ emissions price beginning in 2018. In the 200 Aurora iterations
8 run by PACE, that CO₂ price was applied at varying levels in any given year to
9 the emissions from all of the coal and natural gas generating units in MISO,
10 raising the variable costs of operation accordingly, and thus raising the hourly
11 bids of each generator into the MISO market. PACE’s hourly energy prices are in
12 fact the market clearing price in a given hour. All generator bid prices and
13 associated generation are stacked from lowest to highest cost, and the market
14 clearing price is the price of the last generator needed to meet the forecasted load
15 in a given hour.

16 Those output market energy prices were then given to ACES for use in the PaR
17 model, which dispatches each of the generating units on an hourly basis and
18 calculates the resulting production costs. A CO₂ price is one of the variables that
19 can be included as an operating cost of a generating unit, and if it is present, will
20 affect the dispatch of that unit. It is my understanding, confirmed in the
21 Company’s Response to Sierra Club Data Request 3-17, that in the production
22 cost runs produced by ACES and used by BREC in its financial modeling, a CO₂
23 emissions price was present in the market prices against which the generating
24 units were dispatched, but was not present in the costs of generation at each unit.

25 **Q Is this an appropriate way to account for likely future cost of CO₂ emissions?**

26 **A** No. Because a CO₂ price was included in the PACE output market prices, it also
27 should have been included in the ACES production cost modeling.

⁶ 77 Fed. Reg. 22,392, 22,394-22,395 (April 13, 2012)

1 **Q Why should a CO₂ emissions price be used in both the PACE modeling and**
2 **the ACES production cost modeling?**

3 **A** In the ACES production cost modeling, the CO₂ price has exerted an upward
4 effect on market prices, but because the CO₂ price is not incorporated in the
5 generating units' running costs, the units appear comparatively less expensive to
6 run and thus run more hours of the day than they would otherwise.

7 **D. MARKET ENERGY PRICES**

8 **Q Why are market energy prices important in this analysis?**

9 **A** Market energy prices are important for three reasons. First, because BREC bids its
10 generation into the MISO market, the market energy prices have an effect on the
11 units' dispatch. The higher the market prices, the more electricity output the
12 BREC units will produce. Secondly, the market energy prices affect the "Buy"
13 case that the Company modeled. BREC retrofits its units to comply with MATS,
14 runs the units only enough so that they remain in compliance with CSAPR
15 emissions limits, and buys the remainder of the energy necessary to meet load
16 from the market. The higher the market prices in the "Buy" case, the more
17 expensive the option. Third, market energy prices affect the calculation of a
18 market replacement option, where one or more coal units retire and the generation
19 from those units is replaced with market energy purchases.

20 **Q In other cases that have come before this Commission in the past year, both**
21 **utilities and intervenors have done a calculation of the costs of a market**
22 **replacement option. Why did you not present this calculation in your**
23 **analysis?**

24 **A** I attempted to present a calculation of the costs of a market replacement option
25 using the PACE energy prices, but in doing so, found that it always resulted in
26 higher costs than that of an NGCC replacement option. In my experience in the
27 past year, utility evaluations of a market replacement option have almost always
28 resulted in a lower NPVRR than the NGCC replacement. The fact that in this
29 case, the market option was coming out much higher indicated to me that the
30 market price forecast was inaccurate.

1 **Q Do you have any other reason to believe that the output market prices from**
2 **the PACE Global modeling are incorrect?**

3 **A** Yes. Coal and natural gas are typically the fuel types that are on the margin in any
4 given hour in MISO. Thus fuel price has an effect on the market price, as does a
5 CO₂ emissions price in later years. Using the Aurora output provided by PACE,
6 one is able to remove the effect of the natural gas price and CO₂ emissions price
7 on the hourly market price forecast. Removing these effects leaves you with the
8 marginal emissions rate for the generating unit that is on the margin in a given
9 hour. Coal-fired generators have a marginal emissions rate of about 1.0 – 1.1 tons
10 CO₂/MWh. Natural gas-fired generators have a marginal emissions rate of about
11 0.6 – 0.7 tons CO₂/MWh. When the effects of natural gas and CO₂ prices were
12 removed for the PACE forecast of market prices, the results suggested a marginal
13 emissions rate of 1.8 tons CO₂/MWh (megawatt hour) in later years, which is not
14 indicative of any type of generating unit that I know to be on the margin.

15 **E. CAPACITY, HEAT RATE, FORCED OUTAGES, AND AVAILABILITY**

16 **Q What does BREC assume in its modeling about the capacity of its units over**
17 **time?**

18 **A** BREC assumes that the capacity of its units stays constant. On page 24 of his
19 direct testimony, Mr. Berry states that “the S&L study did not include calculating
20 actual auxiliary power consumption for the recommended compliance strategies.

21 **Q Is it correct for BREC to assume a constant capacity rating over time?**

22 **A** No. Pollution control technologies require electricity to run. A portion of the
23 electricity generated at a unit thus will go toward providing that electricity to run
24 its emissions controls. This is known as parasitic load, and typically results in a
25 capacity derating of a particular unit. This derating is important because it means
26 that a smaller number of megawatts (MW) is then available to provide electricity
27 to serve load.

1 **Q What does BREC assume in its modeling about unit heat rates over time?**

2 **A** In its Response to Sierra Club Data Request 2-5 part e, the Company states that it
3 expects that unit heat rates will stay constant over time.

4 **Q Is it correct for BREC to assume a constant heat rate over time?**

5 **A** No. Heat rates often vary over time as generating unit component parts degrade
6 and are replaced. Heat rates might be expected to rise gradually (units become
7 less efficient) as components age, and then drop slightly when those aging parts
8 are replaced (unit efficiency increases). Heat rate is important because it reflects
9 the efficiency at which the generating unit converts fuel into electricity. A decline
10 in unit heat rate over time means that it is producing fewer megawatt hours
11 (MWh) of electricity over that period.

12 **Q What does BREC assume in its modeling about unit forced outages and**
13 **availability over time?**

14 **A** In its Response to Sierra Club Data Request 2-5 parts a-d, the Company states that
15 it expects that unit forced outages and availability will stay constant over time.

16 **Q Is it correct for BREC to assume constant forced outages and availability**
17 **over time?**

18 **A** No. In its Response to PSC 2-5, BREC gives the historic availability of its units
19 over the past five years. Availability varies from unit-to-unit and from year-to-
20 year due to the number of outages in any given year. Unit outages can be planned,
21 as when a unit undergoes routine maintenance or is taken offline for pollution
22 control installations, or unplanned, as when a component part fails unexpectedly.
23 Availability is the amount of time a generating unit is able to produce electricity
24 in a given period. Outages might increase as units age, or as they require
25 additional equipment replacement or retrofit, which would lead to a decrease in
26 availability. Outages and availability are important because if a plant is offline, it
27 is unable to generate electricity.

1 **F. REAL VERSUS NOMINAL DOLLARS**

2 **Q Does the BREC financial modeling use both real and nominal dollars?**

3 **A**Yes. The estimates of emission control capital and O&M costs developed by
4 Sargent & Lundy are presented in Exhibit DePriest-2 in 2011 dollars. The PaR
5 model used by ACES outputs the generation and operating costs for each of the
6 BREC units in nominal dollars. The BREC financial modeling uses each of these
7 values without converting them to the same base year dollars.

8 **Q Why is this incorrect?**

9 **A**BREC uses a discount rate of 7.93%, which I assume is a nominal discount rate
10 and implies that the analysis was done in nominal dollars. Unit operating costs
11 output by the PaR model are included in the BREC financial modeling in nominal
12 dollars, which account for the effects of inflation over time. Estimates from
13 Sargent & Lundy are in real 2011 dollars, and do not contain any effects of
14 inflation. BREC does not spend all of the capital required for the emissions
15 retrofits in 2011, but rather incurs it over time at some future start date. These
16 2011 dollar estimates should thus be multiplied by an inflation rate in order to
17 determine how much an investment incurred in a future year will cost in that
18 year's dollars. BREC does not convert these capital expenditures incurred in a
19 future year into that future year's dollars. These capital expenditures are thus
20 understated in the BREC financial modeling.

21 **8. ADDITIONAL CONCERNS WITH THE BREC FINANCIAL MODELING**

22 **Q Please describe your additional concerns with the BREC financial modeling.**

23 **A**My additional concerns with the financial modeling include the following: 1) that
24 BREC does not model the full set of controls that will be required under the EPA
25 rules; 2) that BREC does not model its units individually, but rather as a block,
26 choosing to retrofit all of the units together rather than examining the economics
27 of each unit on a standalone basis; 3) that the BREC financial modeling evaluates
28 a selection of future costs associated with the retrofits rather than the actual

1 forward going running costs of the units; and 4) that BREC does not model the
2 emission control retrofits against a reasonable set of alternative options, including
3 but not limited to: a natural gas-fired combustion turbine or combined cycle
4 replacement, a replacement with market purchases, or a replacement with some
5 combination of energy efficiency, renewables resources, natural gas units, and
6 market purchases. I will address each of these concerns in turn.

7 **Q Please explain what you mean when you say that BREC does not model the**
8 **full set of controls required under the EPA rules.**

9 **A** BREC models only the emission control retrofits that will be required under
10 CSAPR and MATS, and includes only a subset of the controls recommended by
11 Sargent & Lundy to comply with these rules. In addition to those technologies
12 chosen by the Company, Mr. DePriest states on page 20, lines 9-16 that Sargent &
13 Lundy recommended low NO_x burners on Coleman units 1-3 for CSAPR
14 compliance. As I mention above, in section 5 of my testimony, it is possible, and
15 even likely, that one or more of the BREC units will require additional retrofits to
16 comply with MATS, whether in the form of ESP upgrades, a polishing baghouse,
17 or a full baghouse.

18 In addition, Mr. Shaw and Mr. DePriest state in their direct testimonies that
19 BREC will also be subject to the NAAQS revisions, the CCR rule, the Water
20 Intake (316(b)) rule, and new limits on effluent. While the rules have yet to be
21 finalized, BREC expects that capital expenditures will be necessary to bring their
22 units into compliance. On page 19, lines 12-19 and page 20, lines 20-22 in the
23 direct testimony of Thomas Shaw, Mr. Shaw states that the alternatives under
24 consideration by the EPA for both the CCR and 316(b) rules are of such
25 substantially different form that “an immediate response to the proposal would
26 not be appropriate.” It is correct that the Company cannot be expected to seek
27 CPCN and begin construction of environmental projects before knowing what is
28 required by the final rules. However, Sargent & Lundy made recommendations
29 for those retrofits that it believes will bring the units into compliance with each of
30 the rules in their expected final form. BREC could have easily incorporated those

1 recommended capital expenditures associated with Sargent & Lundy's
2 recommendations into an economic analysis of its coal-fired units. BREC uses a
3 20 year planning horizon, and to assume that these upcoming rules will have no
4 effect on the capital expenditures or running costs at its coal units is unrealistic
5 and favors a retrofit scenario.

6 As I mention above, third-party analyses of the EPA rules predict more coal
7 retirements when all of the rules are considered together, as the cumulative capital
8 additions cause the running costs of additional generating units to be higher than
9 costs of a natural gas or market replacement option. Once BREC makes capital
10 investments for the emission controls necessary for compliance with CSAPR and
11 MATS, those costs are sunk and are no longer considered in the calculation of the
12 units' forward going running costs when additional emission control retrofits are
13 considered. By looking at the EPA regulations on a piecemeal basis as they
14 become final, BREC is not considering the real forward economics of its coal
15 units.

16 **Q Please explain what you mean when you say that BREC models its units as a**
17 **block and not individually.**

18 **A** Compliance with CSAPR allows for allowance trading, with units that are not
19 able to meet their emissions limits able to purchase SO₂ and NO_x allowances from
20 the market. BREC models emissions compliance based on total fleet emissions,
21 rather than installing retrofits such that each unit meets its individual emissions
22 limit. This is an acceptable modeling practice.

23 When considering actual running costs of coal unit, however, it is not acceptable
24 to model the BREC coal fleet as a whole instead of modeling each unit on a
25 standalone basis. Larger, more efficient units may be less expensive and thus
26 more economic to run, while smaller, less efficient units may be clearly
27 uneconomic to run. Modeling the units individually would reveal this difference
28 in running costs between the units. Modeling the units as a block would likely
29 mask this difference, as the efficiencies of the larger unit would compensate
30 somewhat for the poor economics of the smaller plant.

1 Certain units may also require additional capital expenditures to bring them into
2 compliance with environmental regulations, and older units may face the need for
3 more capital investments to continue operating. Taking all of the coal units as a
4 whole spreads these capital expenditures over the entire fleet, hiding the fact that
5 certain units require more investment capital and might be a candidate for
6 retirement rather than retrofit.

7 **Q Please explain what you mean when you say that BREC models a selection of**
8 **future costs associated with the retrofits rather than the actual forward going**
9 **running costs of the units. Why is this an error?**

10 **A** As I mentioned above, the BREC financial modeling calculates revenue
11 requirements based on the production costs in a given year (start-up costs, fuel
12 costs, costs for reagents, allowance purchases, purchased power, and off-system
13 sales) with the fixed cost of capital in a given year (debt service, debt issuance
14 cost, property tax, property insurance, and labor) to arrive at the revenue
15 requirements in each of the years in the study period.

16 The BREC financial modeling fails to take into account the ongoing capital costs
17 associated with routine maintenance at each of the units, which the Company
18 provided in its Confidential Response to Sierra Club Data Request 2-1 a. [REDACTED]

19 [REDACTED]
20 [REDACTED] Costs have only been provided through 2015, but these costs will
21 continue through the study period, and may increase as the units age.

22 **Q Please explain what you mean when you say that BREC does not model unit**
23 **retrofits against alternative options.**

24 **A** BREC examines three options, but they are all variations on its “Build” case. In
25 evaluating the economics of coal units with emission control retrofits, other
26 utilities have evaluated the costs of the retrofits against replacement alternatives.
27 These alternatives might include a NGCC replacement unit, replacement with
28 market purchases, or a combination replacement option that looks at increased
29 levels of energy efficiency, renewable energy, and some gas and market
30 purchases. Without looking at such options for replacing any or all of BREC’s

1 coal units, there is simply no basis to conclude that retrofitting each such unit
2 represents the least-cost option.

3 The Commission has seen in previous cases that the retrofit of a coal unit is often
4 compared to the construction of a replacement natural gas-fired combined cycle
5 unit, to the purchase of an existing NGCC, or to the cost of entering into a
6 purchase power agreement (PPA) with the operator of an existing NGCC. BREC
7 did not explore any of these options, as stated by the Company in Response to
8 Data Request Sierra Club 1-50. Data from the EIA *2012 Annual Energy Outlook*
9 (attached as Exhibit RSW-6) suggests that capacity factors for oil and natural gas
10 generation are projected to be less than 20% through the BREC study period,
11 indicating that it is highly likely that BREC could have entered into a long-term
12 PPA for energy and capacity in MISO. A spreadsheet with this EIA data is
13 attached to my testimony as Exhibit RSW-7.

14 The Commission has also seen in previous cases that utilities typically examine
15 the cost of a coal unit retrofit against the cost of buying replacement power for
16 that unit on the market, and that this option typically results in a lower NPVRR
17 under current market conditions. The Company did not examine a market
18 replacement scenario, and the fact that its “Buy” case results in a much higher
19 NPVRR than its “Build” case suggests an error in its analysis.

20 Finally, the Company could have examined a combination replacement option.
21 Had BREC done an energy efficiency market potential study, it could be currently
22 achieving a high amount of savings. The Company then could have issued RFPs
23 for a lower amount of replacement energy, and examined renewable energy
24 sources as well natural gas and market energy purchases.

25 **9. DESCRIPTION AND RESULTS OF SYNAPSE ENERGY ECONOMICS FINANCIAL**
26 **MODELING**

27 **Q Did you perform any of your own financial modeling for this docket?**

28 **A** Yes. Synapse created a cash flow model that calculates the forward going costs of
29 each of the BREC units on an annual basis, and discounts this stream of costs to

1 determine the total NPVRR of the suite of retrofits included in the analysis for
2 each of the units on a standalone basis. The “Retrofit” option is then compared to
3 a natural gas combined-cycle replacement option. Certain input assumptions are
4 allowed to vary in the cash flow model and the user can create a number of
5 scenarios to examine.

6 **Q Please explain how you created your model and the inputs you used.**

7 **A** The cash flow model was designed to compare the revenue requirements
8 associated with the BREC 2012 Compliance Plan to a natural gas-fired combined
9 cycle replacement option that provides similar rated capacity and generation. The
10 model was created using as many of the inputs and assumptions found in
11 modeling performed by the Company, ACES Power Marketing, and PACE
12 Global as was possible. Any input that was not taken directly from BREC was
13 taken from a public source, and where possible was a source referenced by the
14 Company, e.g. the Energy Information Administration (EIA). The source for each
15 input assumption is documented in the model.

16 The cash flow analysis creates the nominal revenue requirements for each
17 environmental retrofit using the capital costs of the projects, AFUDC, book and
18 tax depreciation, income and deferred taxes, return on rate base, property taxes
19 and insurance costs. These capital revenue requirements are then combined with
20 generating unit-specific, on-going non-environmental capital expenditures,
21 generating unit-specific production costs (fuel costs, start costs, fixed and variable
22 O&M costs, emissions costs), and environmental retrofit project-specific O&M
23 costs, which sum to provide the nominal revenue requirements for each year, for
24 each generating unit. These nominal revenue requirements are then summed and
25 put in present value terms using the BREC nominal discount rate.

26 In calculating the NPVRR for the NGCC replacement option, we assumed
27 retirement of the BREC units at the end of 2015 and assumed installation of the
28 NGCC at the beginning of 2016. Similar to the calculation for the retrofit option,
29 the NPVRR calculation for the NGCC option includes capital costs with AFUDC

1 and unit production costs (fuel costs, fixed and variable O&M costs, emissions
2 costs). The NPVRR of the retrofit option was then compared to the NPVRR for
3 the NGCC replacement option on a unit-by-unit basis.

4 The cash flow spreadsheet model enables the creation of different scenarios
5 through the use of certain different input values, e.g. natural gas price, CO₂
6 emissions price, and selection of additional environmental compliance retrofit
7 technologies for each of the BREC units. The user can create different scenarios
8 by selecting variations on each of these inputs.

9 **Q What are the results of your financial modeling?**

10 **A** The difference in NPVRRs between the coal retrofit and NGCC replacement
11 option in the “Synapse Recommended Case” are shown in Table 4, below.
12 Negative values in the “NGCC Replacement” column indicate that building a
13 natural gas-fired unit is cheaper than installing pollution control retrofits on the
14 BREC coal units. The results in Table 8 (also in Exhibit RSW-2) indicate that all
15 of the BREC coal units are uneconomic when compared to a natural gas
16 replacement option and should be considered for retirement.

17 **Table 8. Synapse Recommended Case - Comparison of NGCC Replacement to BREC Unit**
18 **Retrofits (millions 2012\$).**

	NGCC Replacement 2015 minus Retrofit	% Difference from Retrofit
Wilson	(\$259)	-13.88%
Green 1	(\$204)	-18.53%
Green 2	(\$213)	-19.83%
HMPL 1	(\$82)	-12.47%
HMPL 2	(\$107)	-15.56%
Coleman 1	(\$108)	-15.84%
Coleman 2	(\$90)	-13.74%
Coleman 3	(\$103)	-14.92%
Total	(\$1.165)	-15.73%

19

20 The Synapse Recommended Case includes the controls in the BREC 2012
21 Environmental Compliance Plan, and also includes those controls recommended
22 by Sargent & Lundy for compliance with the revised NAAQS, the CCR rule, and

1 the 316(b) rule. Costs of compliance with the Effluent Limitations Guidelines
 2 were also included, and were taken from the *2010 EPRI Cost Assessment of Coal*
 3 *Combustion Residuals* and the *2011 EEI Potential Impacts of Environmental*
 4 *Regulation*.

5 **Q How does your Recommended Case compare to the BREC analysis?**

6 **A** We put the input assumptions used by BREC (the BREC natural gas price
 7 forecast, a CO₂ emissions price of \$0 in all years, and only those retrofits in the
 8 Company’s 2012 Environmental Compliance Plan) into our cash flow model and
 9 got the results shown in Table 9 (also in Exhibit RSW-8) – the “Big Rivers Build
 10 Case.”

11 **Table 9. Company Case - Comparison of NGCC Replacement to BREC Unit Retrofits**
 12 **(millions 2012\$).**

	NGCC Replacement 2015 minus Retrofit	% Difference from Retrofit
Wilson	\$152	10.06%
Green 1	\$69	8.12%
Green 2	\$4	0.50%
HMPL 1	\$82	16.22%
HMPL 2	\$65	12.27%
Coleman 1	\$43	7.85%
Coleman 2	\$61	11.73%
Coleman 3	\$50	8.89%
Total	\$527	8.91%

13
 14 The results from the BREC Build Case show that retrofitting the units with select
 15 CSAPR and MATS compliance technologies only, under the Company’s gas and
 16 CO₂ input assumptions, result in positive benefits of varying amounts for each of
 17 the units. Benefits of the Green 2 retrofits are smallest, at \$4 million NPVRR and
 18 benefits of the Wilson retrofits are highest at \$152 million NPVRR.

19

1 **Q How do the results from your cash flow analysis go from a net benefit of \$527**
2 **million under the BREC Build Case to a net cost of more than \$1 billion in**
3 **the Synapse Recommended Case when compared to an NGCC alternative?**

4 **A** In order to help answer this question, I've prepared several tables that vary the
5 input assumptions one at a time as I move between the BREC Build Case and the
6 Synapse Recommended Case.

7 First, simply changing the CO₂ emissions price to be consistent throughout the
8 BREC modeling⁷ causes Green Unit 2 to become uneconomic to run, as shown in
9 Table 10. It also causes the total net benefit of retrofitting the coal fleet to drop by
10 \$359 million. Table 10 is also attached as Exhibit RSW-9.

11 **Table 10. Comparison of Company Build Case with and without CO₂ (millions 2012\$).**

	Company Build Case	Company Build + CO ₂
	Zero CO ₂ Price, BREC NG price, ECP Retrofits	BREC CO ₂ Price, BREC NG price, ECP Retrofits
Wilson	\$151.56	\$55.89
Green 1	\$69.35	\$21.46
Green 2	\$4.44	(\$43.48)
HMPL 1	\$82.38	\$53.14
HMPL 2	\$65.29	\$31.36
Coleman 1	\$43.18	\$8.48
Coleman 2	\$60.88	\$26.58
Coleman 3	\$49.72	\$13.57
Total	\$526.81	\$167.00

12
13 Changing the PACE/BREC natural gas price forecast to the most up-to-date EIA
14 AEO 2012 forecast has an even more dramatic effect on the economics of the
15 retire and replace scenario. Five of the eight BREC units are now uneconomic to
16 run under an updated natural gas price forecast, and the net benefits of retrofitting
17 the entire fleet are now negative. These results are shown in Table 11, and also in
18 Exhibit RSW-10.

⁷ Of the 21 electric utilities we surveyed that have a public CO₂ price forecast, the PACE Global price forecast is the third lowest of the Reference cases.

1 **Table 11. Comparison of Company Build Case with PACE/BREC and EIA 2012 Natural**
 2 **Gas Price Forecasts (millions 2012\$).**

	Company Build Case	Company Build, AEO NG
	Zero CO2 Price, BREC NG price, ECP Retrofits	Zero CO2 Price, AEO NG price, ECP Retrofits
Wilson	\$151.56	(\$16.88)
Green 1	\$69.35	(\$25.73)
Green 2	\$4.44	(\$86.20)
HMPL 1	\$82.38	\$22.71
HMPL 2	\$65.29	\$3.80
Coleman 1	\$43.18	(\$15.52)
Coleman 2	\$60.88	\$2.70
Coleman 3	\$49.72	(\$12.22)
Total	\$526.81	(\$127.35)

3
 4 Changing the CO₂ and natural gas prices together yields even more dramatic
 5 results, shown in Table 12 (attached as Exhibit RSW-11) in the first and third
 6 columns, changing \$526 million in net benefits in the Company Build Case to
 7 \$487 million in net cost in the “Company Build + CO₂, AEO NG” scenario.

8 **Table 12. Comparison of Company Build Case with Changed Input Scenarios (millions**
 9 **2012\$).**

	Company Build Case	Company Build + CO2	Company Build + CO2, AEO NG	All Retrofits but Effluent + CO2, AEO NG	Synapse Recommended
	Zero CO2 Price, BREC NG price, ECP Retrofits	BREC CO2 Price, BREC NG price, ECP Retrofits	BREC CO2 Price, AEO NG price, ECP Retrofits	BREC CO2 Price, AEO NG price, All Retrofits but Effluent	BREC CO2 Price, AEO NG price, All Retrofits
Wilson	\$151.56	\$55.89	(\$112.55)	(\$116.10)	(\$259.04)
Green 1	\$69.35	\$21.46	(\$73.62)	(\$135.37)	(\$203.80)
Green 2	\$4.44	(\$43.48)	(\$134.12)	(\$144.63)	(\$213.05)
HMPL 1	\$82.38	\$53.14	(\$6.54)	(\$15.10)	(\$81.54)
HMPL 2	\$65.29	\$31.36	(\$30.13)	(\$38.69)	(\$106.72)
Coleman 1	\$43.18	\$8.48	(\$50.22)	(\$63.94)	(\$108.28)
Coleman 2	\$60.88	\$26.58	(\$31.60)	(\$45.33)	(\$89.67)
Coleman 3	\$49.72	\$13.57	(\$48.38)	(\$62.10)	(\$103.34)
Total	\$526.81	\$167.00	(\$487.16)	(\$621.25)	(\$1,165.44)

10
 11 Adding in the costs of compliance with expected EPA regulations causes the
 12 economics of the fleet retrofits to look even worse. Compliance with the revised
 13 NAAQS, CCR, and 316(b) rules in addition to CSAPR and MATS would have a

1 net total cost of \$621 million. Finally, adding in Effluent Limitation Guidelines
2 compliance costs leads to a net total cost of more than \$1 billion when compared
3 to a NGCC replacement option.

4 **10. CONCLUSIONS**

5 **Q Please summarize your conclusions.**

6 **A** Based on my review, I conclude that the errors present in the BREC modeling
7 causes the Company to understate the costs associated with the continued
8 operations of its coal fleet. Using corrected input assumptions and adding in the
9 costs of compliance with expected EPA regulations causes the costs of coal unit
10 retrofits to increase dramatically. When the complete retrofit scenario is compared
11 to a NGCC replacement scenario, we see that the NGCC scenario is more than \$1
12 billion cheaper than continued operation of the BREC coal fleet.

13 **Q Does this conclude your direct testimony?**

14 **A** Yes.

Rachel Wilson

Associate

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PROFESSIONAL EXPERIENCE

Synapse Energy Economics Inc., Cambridge, MA. Associate, 2010 – present, Research Associate, 2008 – 2010.

- Performs consulting, conducts research, and assists in writing testimony and reports on a wide range of issues relating to electric utilities, including: federal and state clean air policies; emissions from electricity generation; environmental compliance technologies, strategies, and costs; integrated resource planning; valuation of environmental externalities from power plants; and the nexus between water and energy.
- Uses optimization and electricity dispatch models, including Strategist, PROMOD, PROSYM/Market Analytics, and PLEXOS to conduct analyses of utility service territories and regional energy markets.

Analysis Group, Inc., Boston, MA. Associate, Energy Practice, 2007 - 2008.

- Supported an expert witness asked to opine on various topics in the electric industry as they applied to merchant generators and provided incentives for their behavior in the late 1990s and early 2000s.
- Analyzed data related to coal production on Indian land and contractual royalties paid to the tribe over a 25 year period to determine if discrepancies exist between these values for the purposes of potential litigation.
- Examined Canadian policies relating to carbon dioxide, and assisted with research on linkage of international tradable permit systems.
- Managed analysts' work processes and evaluated work products.

Senior Analyst Intern, Energy Practice, 2006 - 2007.

- Supported an expert witness in litigation involving whether a defendant power company could financially absorb a greater investment in pollution control under its debt structure while still offering competitive rates. Analyzed impacts of federal and state clean air laws on energy generators and providers. Built a quantitative model showing the costs of these clean air policies to the defendant over a 30 year period. Built a financial model calculating impacts of various pollution control investment requirements.
- Researched the economics of art; assisted in damage calculations in arbitration between an artist and his publisher.

Yale Center for Environmental Law and Policy, New Haven, CT. Research Assistant, 2005 – 2007.

- Gathered and managed data for the Environmental Performance Index, presented at the 2006 World Economic Forum. Interpreted statistical output, wrote critical analyses of results, and edited report drafts.
- Part of the team that produced *Green to Gold*, an award-winning book on corporate environmental management and strategy. Managed data, conducted research, and implemented marketing strategy.

CERES, Boston, MA. Student Consultant, Spring 2006.

- As part of a four-person team, made strategic recommendations on all aspects of messaging and engagement to encourage corporate directors to act on the issue of climate change. First strategic recommendation was sustainable governance forums, which were profiled in New York Times article “Global Warming Subject for Directors at Big Companies” on September 21, 2006.

Marsh Risk and Insurance Services, Inc., Los Angeles, CA. Risk Analyst, Casualty Department, 2003 – 2005.

- Evaluated Fortune 500 clients’ risk management programs/requirements and formulated strategic plans and recommendations for customized risk solutions.
- Supported the placement of \$2 million in insurance premiums in the first year and \$3 million in the second year.
- Utilized quantitative models to create loss forecasts, cash flow analyses and benchmarking reports.
- Completed a year-long Graduate Training Program in risk management; ranked #1 in the western region of the US and shared #1 national ranking in a class of 200 young professionals.

EDUCATION

Yale School of Forestry & Environmental Studies, Master of Environmental Management, New Haven, Connecticut, 2007.

Concentration in Law, Economics, and Policy with a focus on energy issues and markets.

Claremont McKenna College, Bachelor of Arts in Environment, Economics, Politics (EEP) Claremont, California, 2003.

cum laude and EEP departmental honors.

School for International Training Quito, Ecuador. Spring 2002.

Semester abroad studying Comparative Ecology. Microfinance Intern – Viviendas del Hogar de Cristo in Guayaquil, Ecuador.

SKILLS AND ACCOMPLISHMENTS

Microsoft Office Suite, Lexis-Nexis, Platts Energy Database, Strategist, PROMOD, PROSYM/Market Analytics, and PLEXOS, some SAS and STATA.

Competent in oral and written Spanish.

Hold the Associate in Risk Management (ARM) professional designation.

PUBLICATIONS AND PRESENTATIONS

- Fagan, R., M. Chang, P. Knight, M. Schultz, T. Comings, E. Hausman, and R. Wilson. *The Potential Rate Effects of Wind Energy and Transmission in the Midwest ISO Region*. Prepared for the Energy Future Coalition. May 22, 2012.
- Wilson, R. *Comments Regarding MidAmerican Energy Company Filing on Coal-Fired Generation in Iowa*. Prepared for the Iowa Office of the Consumer Advocate. December 15, 2011.
- Johnston, L., and R. Wilson. *Global Best Practices: Strategies for Decarbonizing Electric Power Supply*. Prepared for Regulatory Assistance Project (RAP). December 14, 2011.
- Hausman, E., T. Comings, R. Wilson, and D. White. *Electricity Scenario Analysis for the Vermont Comprehensive Energy Plan 2011*. Prepared for the Vermont Department of Public Service. September 2011.
- Hornby, R., P. Chernick, C. Swanson, D. White, J. Gifford, M. Chang, N. Hughes, M. Wittenstein, R. Wilson, and B. Biewald. *Avoided Energy Supply Costs in New England: 2011 Report*. Prepared for the Avoided-Energy-Supply-Component (AESC) Study Group. July 21, 2011.
- Wilson, R. and Paul Peterson. *A Brief Survey of State Integrated Resource Planning Rules and Requirements*. Prepared for the American Clean Skies Foundation. April 28, 2011.
- Johnston, L., E. Hausman., B. Biewald, R. Wilson, and D. White. *2011 Carbon Dioxide Price Forecast*. February 11, 2011.
- Fisher, J., R. Wilson, N. Hughes, M. Wittenstein, and B. Biewald. *Benefits of Beyond BAU: Human, Social, and Environmental Damages Avoided Through the Retirement of the US Coal Fleet*. Prepared for the Civil Society Institute. January 25, 2011.
- Peterson, P., V. Sabodash, R. Wilson, and D. Hurley. *Public Policy Impacts on Transmission Planning*. Prepared for Earthjustice, December 21, 2010.
- Fisher, J., S. Levy, Y. Nishioka, P. Kirshen, R. Wilson, M. Chang, J. Kallay, and C. James. *Co-Benefits of Energy Efficiency and Renewable Energy in Utah*. Prepared for the State Energy Office of Utah, March 2010.
- Wilson, R. "The Energy-Water Nexus: Interactions, Challenges, and Policy Solutions." Presented at the National Drinking Water Symposium 2009, October 2009.
- Fisher, J., C. James, L. Johnston, D. Schlissel, R. Wilson, *Energy Future: A Green Alternative for Michigan*. Prepared for Natural Resources Defense Council and Energy Foundation, August 2009.
- Schlissel, D., R. Wilson, L. Johnston, D. White, *An Assessment of Santee Cooper's 2008 Resource Planning*. April 2009.
- Schlissel, D., A. Smith, R. Wilson, *Coal-Fired Power Plant Construction Costs*. July 2008.

TESTIMONY

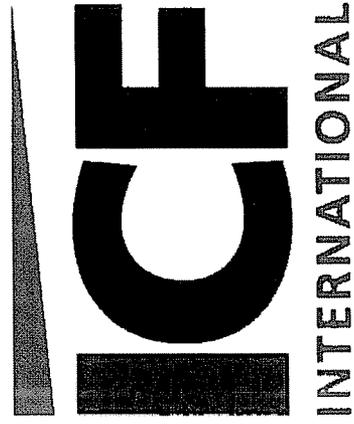
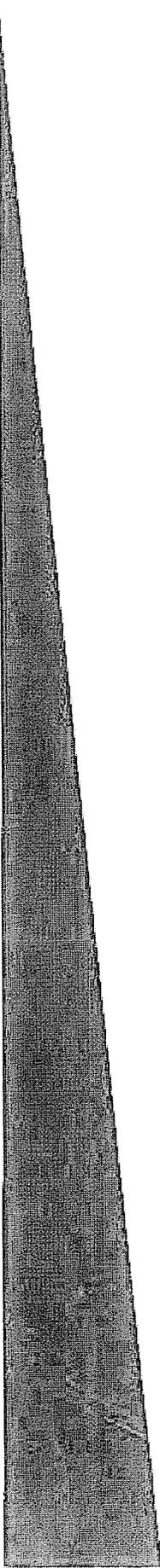
Kentucky Public Service Commission. Direct testimony before the Commission on behalf of the Sierra Club. Testimony included discussion of STRATEGIST modeling relating to the application of Kentucky Power Company for a Certificate of Public Convenience and Necessity, and for approval of its 2011 environmental compliance plan and amended environmental cost recovery surcharge.

Kentucky Public Service Commission. Direct testimony before the Commission on behalf of Sierra Club and Natural Resources Defense Council. Testimony included discussion of STRATEGIST modeling relating to the applications of Kentucky Utilities Company, and Louisville Gas and Electric Company for Certificates of Public Convenience and Necessity, and approval of its 2011 compliance plan for recovery by environmental surcharge. September 16, 2011.

Minnesota Public Utilities Commission. Rebuttal testimony before the Commission on behalf of Izaak Walton League of America, Fresh Energy, Sierra Club, and Minnesota Center for Environmental Advocacy. Testimony described STRATEGIST modeling performed in the docket considering Otter Tail Power's application for an Advanced Determination of Prudence for BART retrofits at its Big Stone plant. September 7, 2011.

Resume dated June 2012.

	NGCC Replacement 2015 minus Retrofit	% Difference from Retrofit
Wilson	(\$259)	-13.88%
Green 1	(\$204)	-18.53%
Green 2	(\$213)	-19.83%
HMPL 1	(\$82)	-12.47%
HMPL 2	(\$107)	-15.56%
Coleman 1	(\$108)	-15.84%
Coleman 2	(\$90)	-13.74%
Coleman 3	(\$103)	-14.92%
Total	(\$1,165)	-15.73%

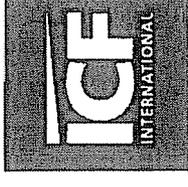


EEl Preliminary Reference Case and Scenario Results

May 21st, 2010

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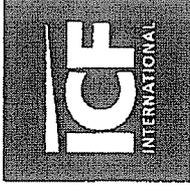
Updated Reference Case



- Nuclear build limits – from NEI
 - Hard-wired units (5,500 MW)
 - Candidate units (4,300 MW) – allowed to be built on or after specified date, but only if deemed economic
 - Economic units – including 8 units above, up to 45 units by 2030 on national basis, regional limits based on existing brownfield sites
- Run year mapping
- Capacity credit update (10%) for wind
- Calibrated coal prices to AEO 2010
 - Minemouth prices calibrated to AEO 2010
 - Transportation prices based on EPA

MODELING ASSUMPTIONS

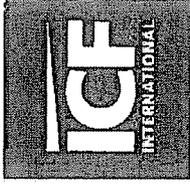
EEI Master Assumptions Matrix – Reference Case



	EPA ARRA Analysis	EEI Base Case
Electric Demand – National Annual Average	EPA/AEO2009	EPA/AEO2009
Electric Demand -Regional	EPA/AEO2009	EPA/AEO2009
Electric Demand Elasticity	na	na
Natural Gas Supply Curves (Henry Hub)	EPA	EPA
Natural Gas Basis Differentials	EPA	EPA
Coal Price Supply Curves and Coal Transportation Costs	EPA	AEO2010/EPA
Biomass Supply Curves	EPA/AEO2009	EPA/AEO2009
New Build Capital Costs	EPA	EIA AEO/2010
Retrofit Capital Costs	EPA	EVA/NERC
Mercury and HAP Retrofit Structure	EPA	EVA/NERC
Technology Limits	EPA	EPA/NEI
Financing Assumptions – New Builds	EPA	EPA
Financing Assumptions – Retrofits	EPA	EPA for regulated EIA for merchant
3P Policy	CAIR w/ 1.6 million ton bank carryover into 2012	CAIR plus state mercury limits
Carbon	None	None

MODELING ASSUMPTIONS

EEI Reference Case Regulations



	SO ₂ Program	NO _x Program	Mercury Program	CO ₂ Program
	25 States + DC	Annual	Ozone Season	
CAIR Phase I (2010 -2014)	2010 retirement ratio: 2:1 Existing Title IV for unaffected states 25 States + DC	25 States + DC 1.522 million tons	25 States + DC 0.568 million tons	State Level Regulations CT, CO, DE, GA, IL, MA, MD, ME, MI, MN, MT, NC, NH, NJ, NM, NY, OR, WA, WI None
CAIR Phase II (2015+)	Retirement ratio: 2.86:1 Existing Title IV for unaffected states	25 States + DC 1.268 million tons	25 States + DC 0.485 million tons	

- BART is included for all BART effected units not included in CAIR for SO₂ and NO_x and WRAP for SO₂.
- WRAP SO₂ is included.
- All existing state regulations for NO_x, SO₂, Hg and CO₂ are included.

MODELING ASSUMPTIONS

EEl Scenario Descriptions



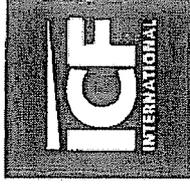
Scenario	Description
HAPS (Scenario 1)	<p>All coal units required to have SCR, scrubber, ACI and fabric filter by 2015</p> <p>Ash (2015): All units with wet fly ash disposal and/or wet bottom ash disposal are required to convert to dry handling and install a landfill and wastewater treatment facility. Cost components are as follows:</p> <ul style="list-style-type: none"> • Conversion to dry fly ash handling - \$15 million per unit • Conversion to dry bottom ash handling - \$20 million per unit • New Landfill - \$30 million per facility • New wastewater treatment facility - \$120 million per facility
HAPS+Ash+Water (Scenario 2)	<p>Costs applied to units with ponds for fly ash and/or bottom ash based on EIA-923 Schedule 8A, 2008.¹</p> <p>Water (2015): All fossil and nuclear facilities that have at least one once-through cooling unit and would have been classified as a Phase II Facility under the remanded Phase II rule are required to install cooling towers. This does not apply to facilities that are completely closed-cycle cooling even if they use more than 50 million gallons per day. However, it does include some facilities that use helper towers to cool the thermal discharge during portions of the year. The costs are as follows:</p> <ul style="list-style-type: none"> • Nuclear - \$454/gpm (avg. \$220/kW) • Fossil - \$330/gpm (avg. \$215/kW) <p>Costs are applied to units described above based on EPRI's database of electric generating facilities.²</p> <p>CO₂ price consistent with EIA's August 2009 analysis of HR 2454 (Waxman-Markey). Prices start in 2012 at \$17/ton and increase to \$60/ton in 2030 (2008\$).</p>
HAPS+Ash+Water+CO2 (Scenario 3)	

1 "20100507_Fly Ash and Bottom Ash Summary_Roewer.xls" received on May 7th, 2010

2 "Master List 4-29-10 Working Draft to EEl_calcV1.xls" received on May 5th 2010.

MODELING ASSUMPTIONS

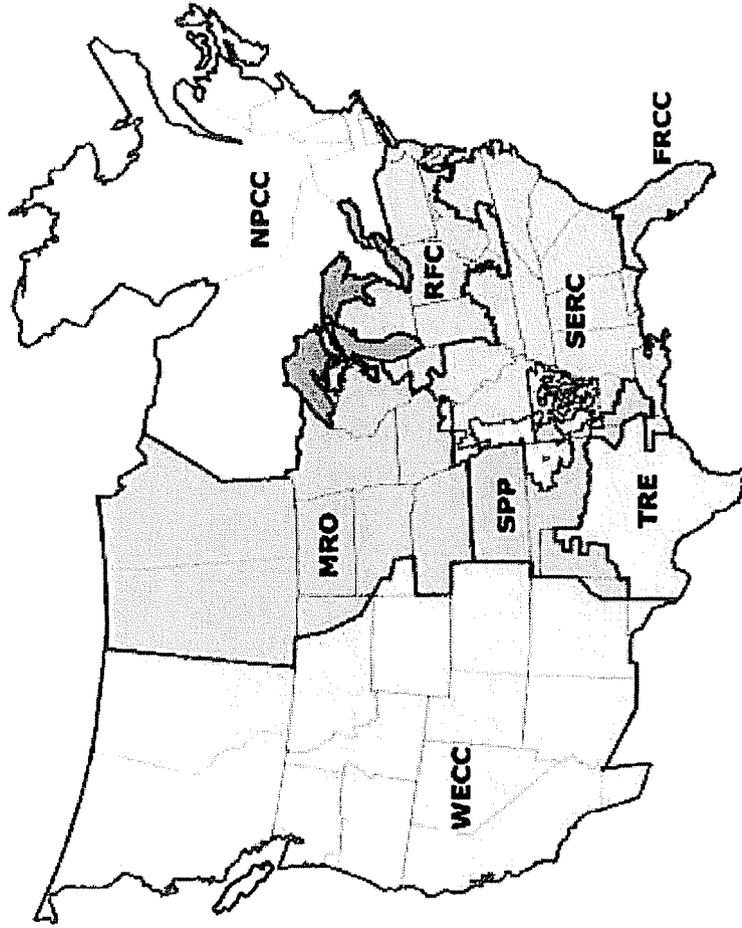
Run Year Structure



EPA Run Year	EPA Mapped Years	EEI Run Year	EEI Mapped Years
2012	2012-2013	2010	2010
2015	2014-2017	2011	2011
2020	2018-2022	2012	2012
2025	2023-2027	2013	2013
2032	2028-2035	2014	2014
		2015	2015
		2016	2016
		2017	2017
		2018	2018
		2019	2019
		2020	2020-2022
		2025	2023-2027
		2032	2028-2035

MODELING ASSUMPTIONS

NERC Region Map

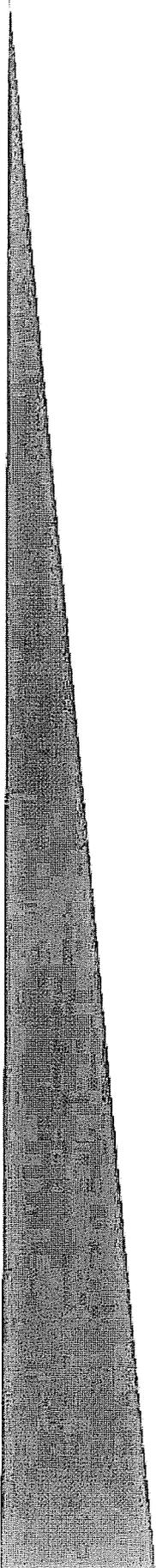


FRCC – Florida Reliability Coordinating Council	SERC –SERC Reliability Corporation
MRO – Midwest Reliability Organization	SPP – Southwest Power Pool, RE
NPCC – Northeast Power Coordinating Council	TRE – Texas Regional Entity
RFC – Reliability First Corporation	WECC – Western Electricity Coordinating Council
Note: NERC regional results shown in this presentation include the US only	

Source: <http://www.nerc.com>

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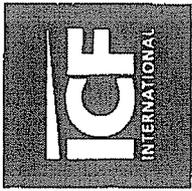


EEI Reference Case - National Level Results Compared to EPA ARRA 2009 Reference Case

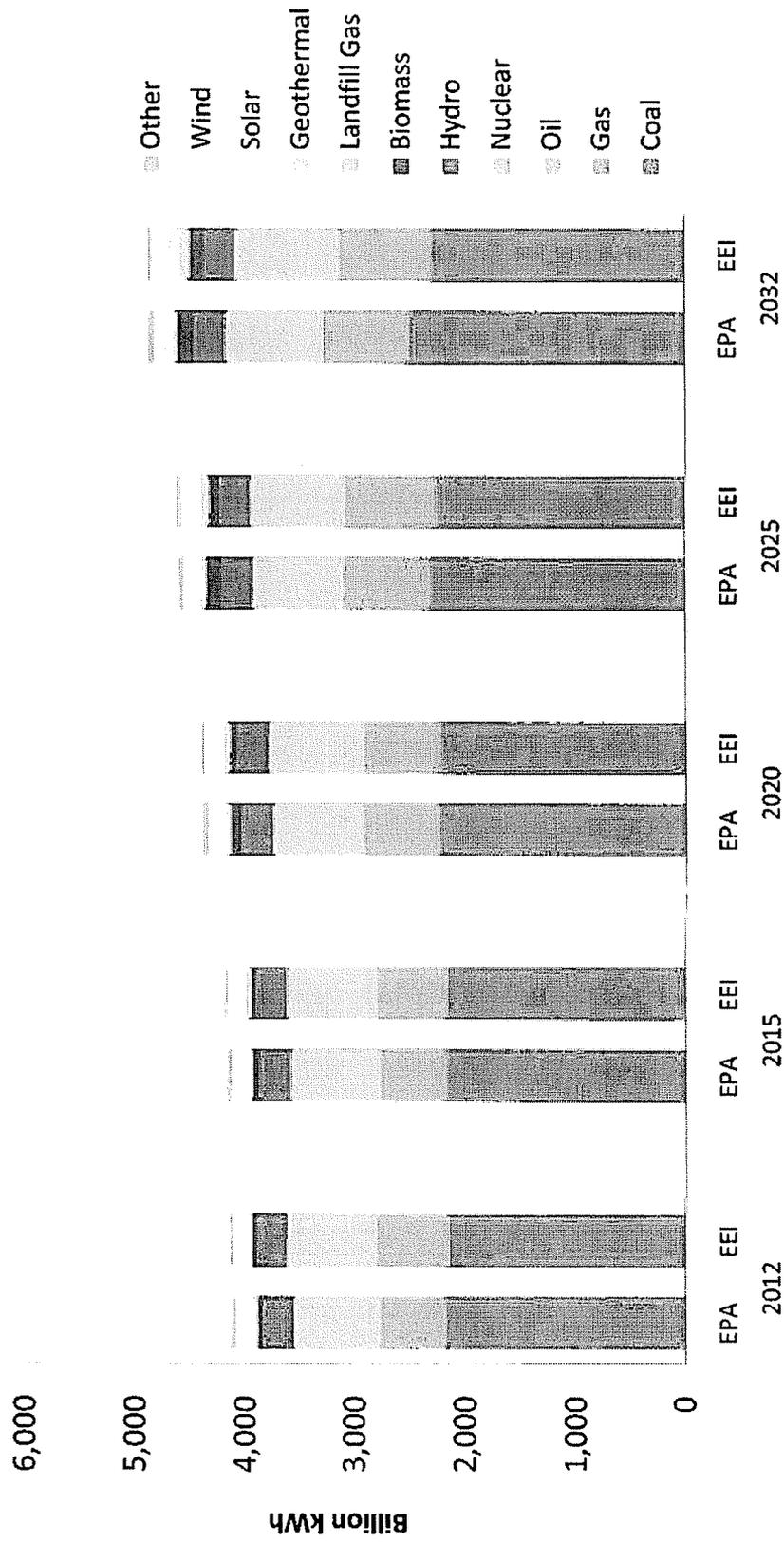
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NATIONAL RESULTS COMPARISON

National Generation By Type



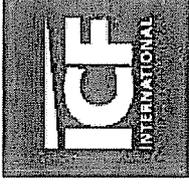
National Generation



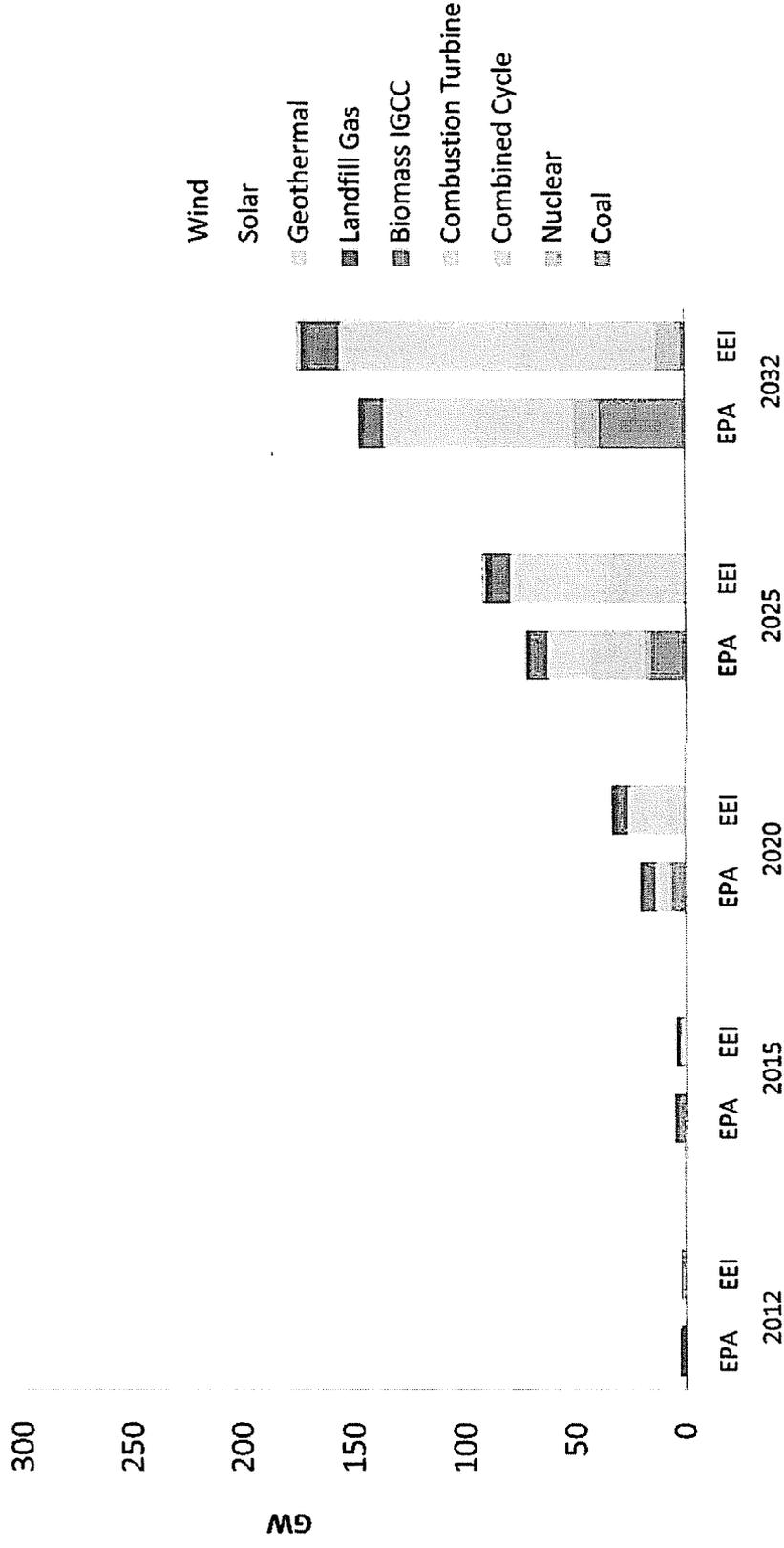
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NATIONAL RESULTS COMPARISON

National Cumulative Capacity Additions

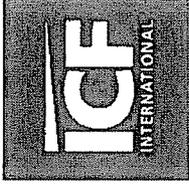


National Cumulative Capacity Additions

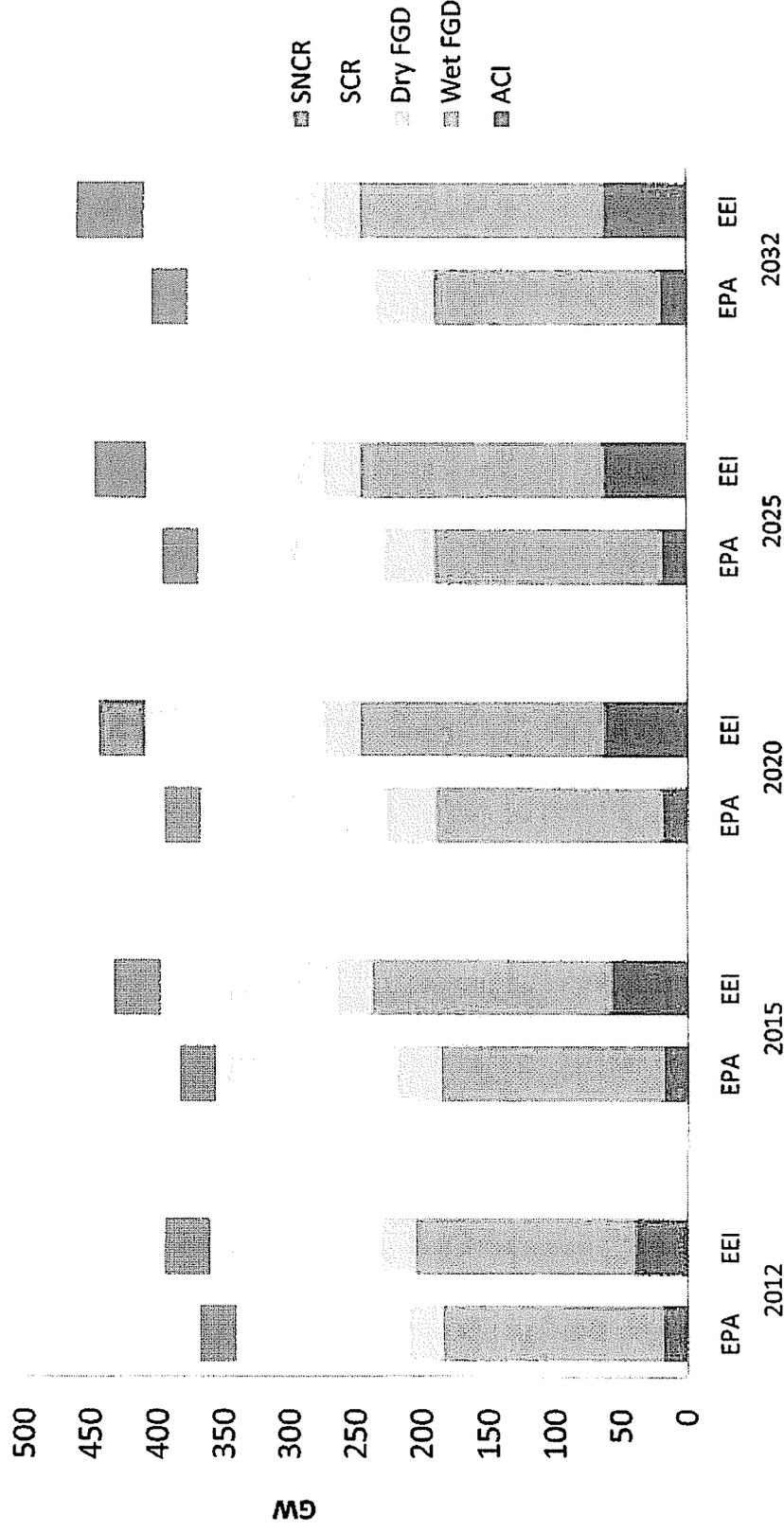


NATIONAL RESULTS COMPARISON

National Cumulative Pollution Control Installations (Existing + Firm + Economic)



National Cumulative Pollution Control Retrofit Installations

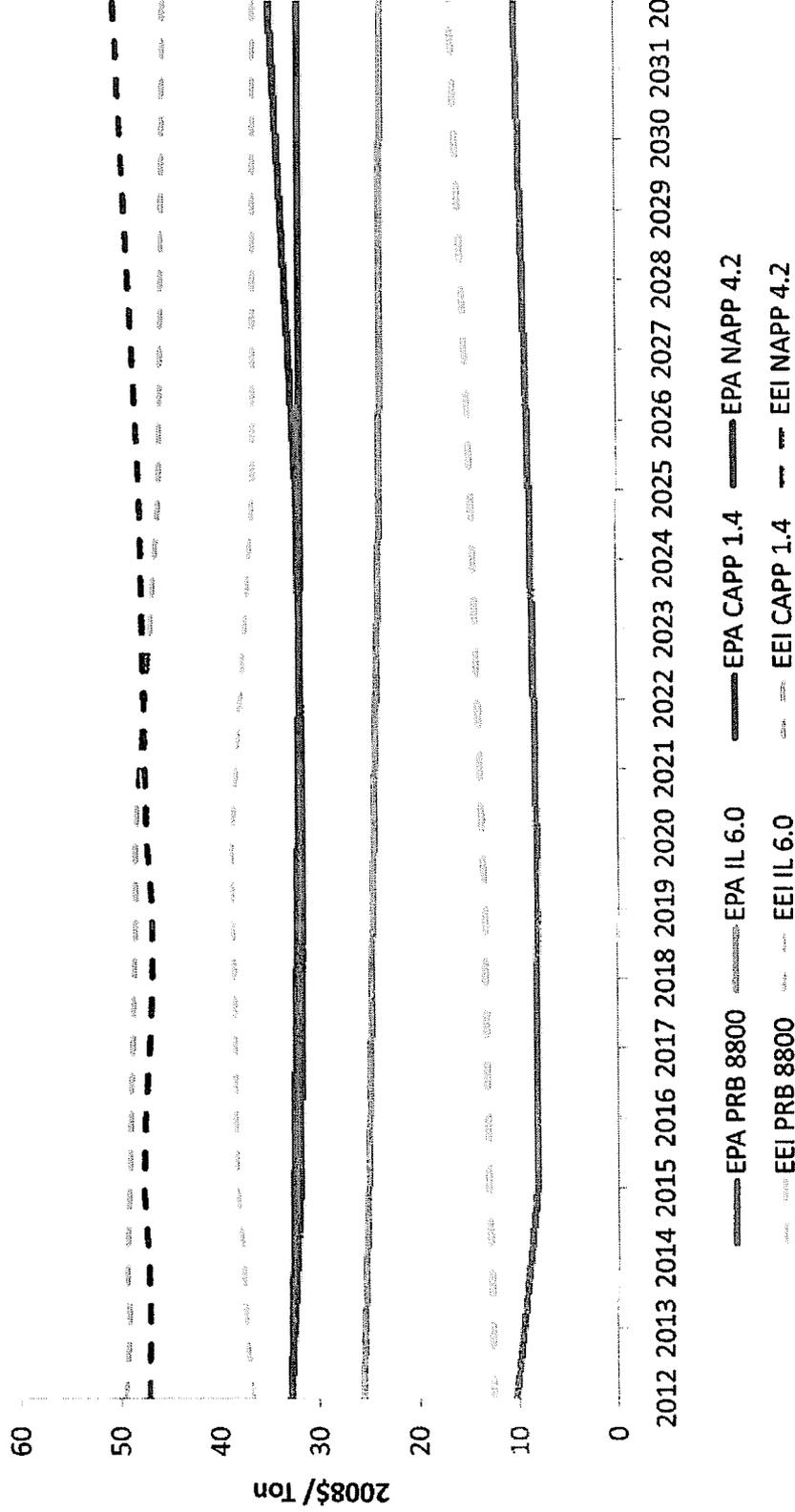


NATIONAL RESULTS COMPARISON

Minemouth Coal Prices



Minemouth Coal Prices

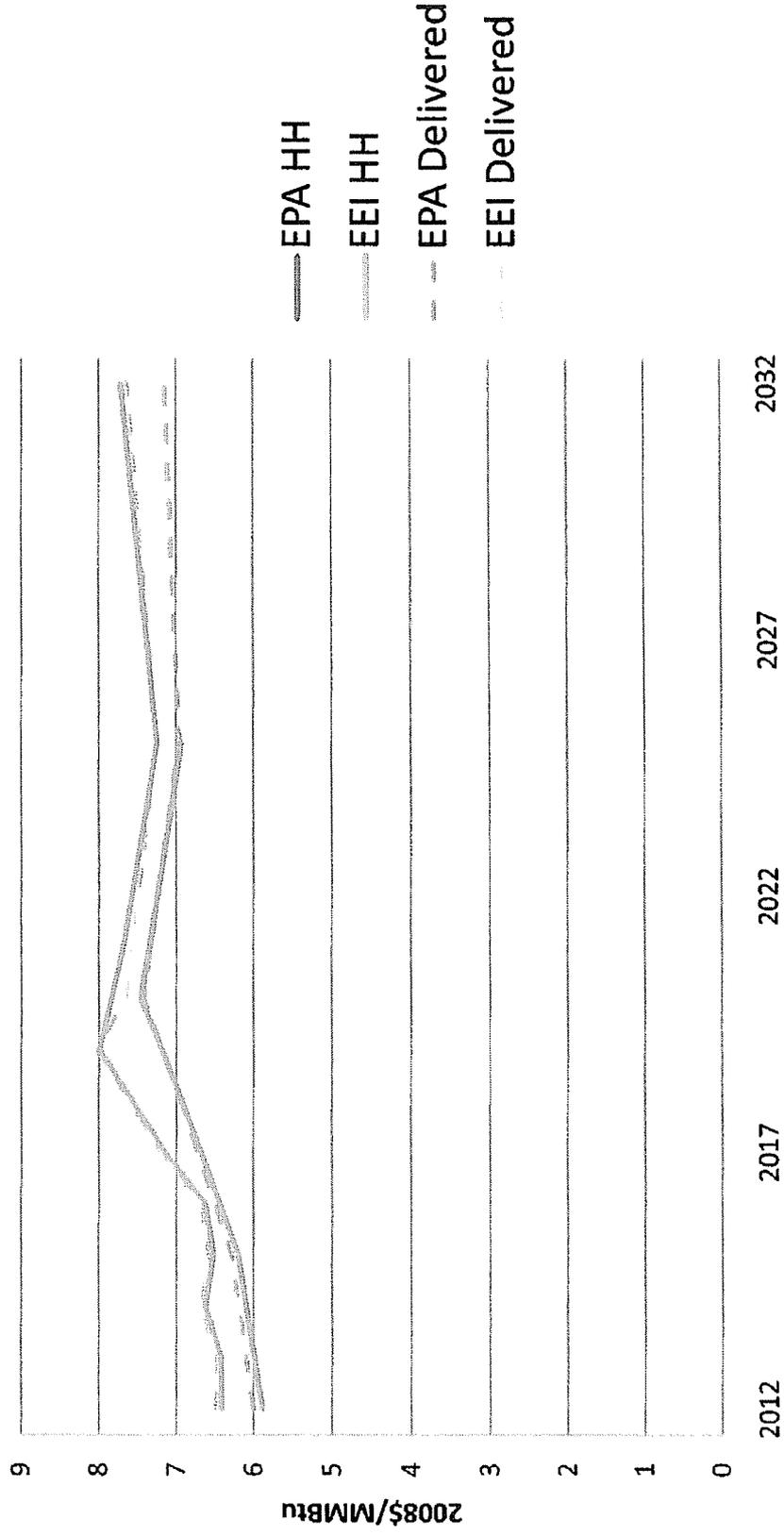


NATIONAL RESULTS COMPARISON

Henry Hub and Delivered Natural Gas Prices

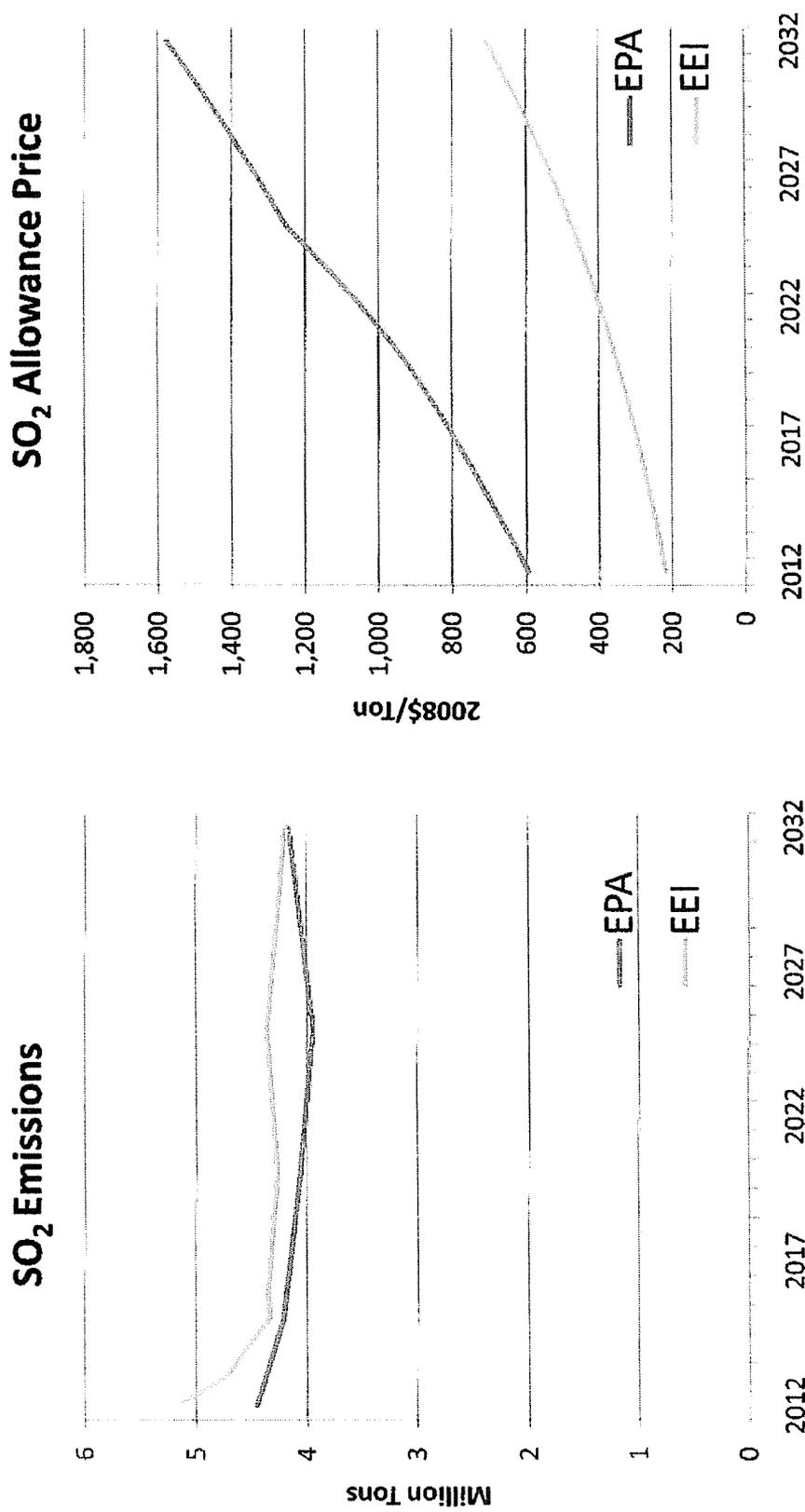
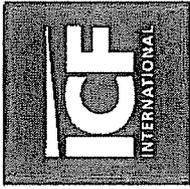


Henry Hub and Delivered Natural Gas Prices



NATIONAL RESULTS COMPARISON

SO₂ Allowance Prices and Emissions



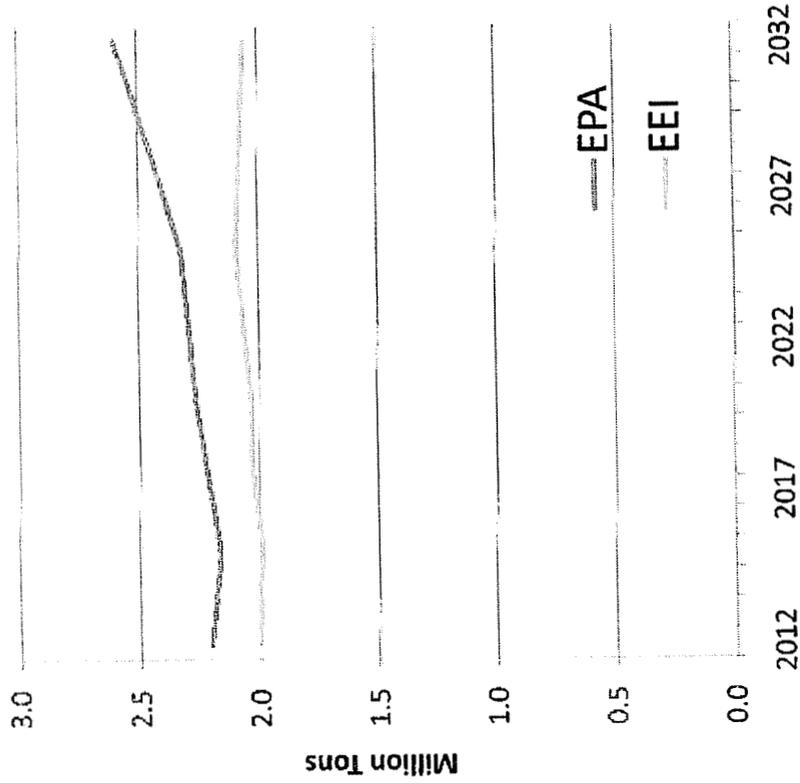
Note: The SO₂ price is the \$/ton price for units in a CAIR affected state. The \$/allowance prices can be derived by dividing by 2 in 2010-2014 and 2.86 in 2015 and beyond.

NATIONAL RESULTS COMPARISON

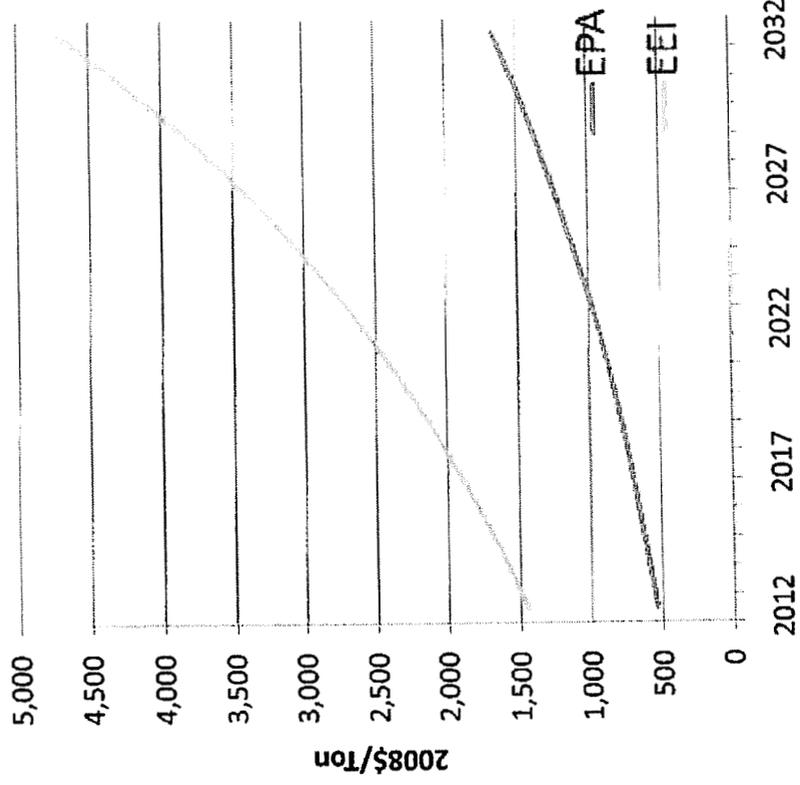
NO_x Allowance Prices and Emissions



National NO_x Emissions



CAIR Annual NO_x Allowance Price

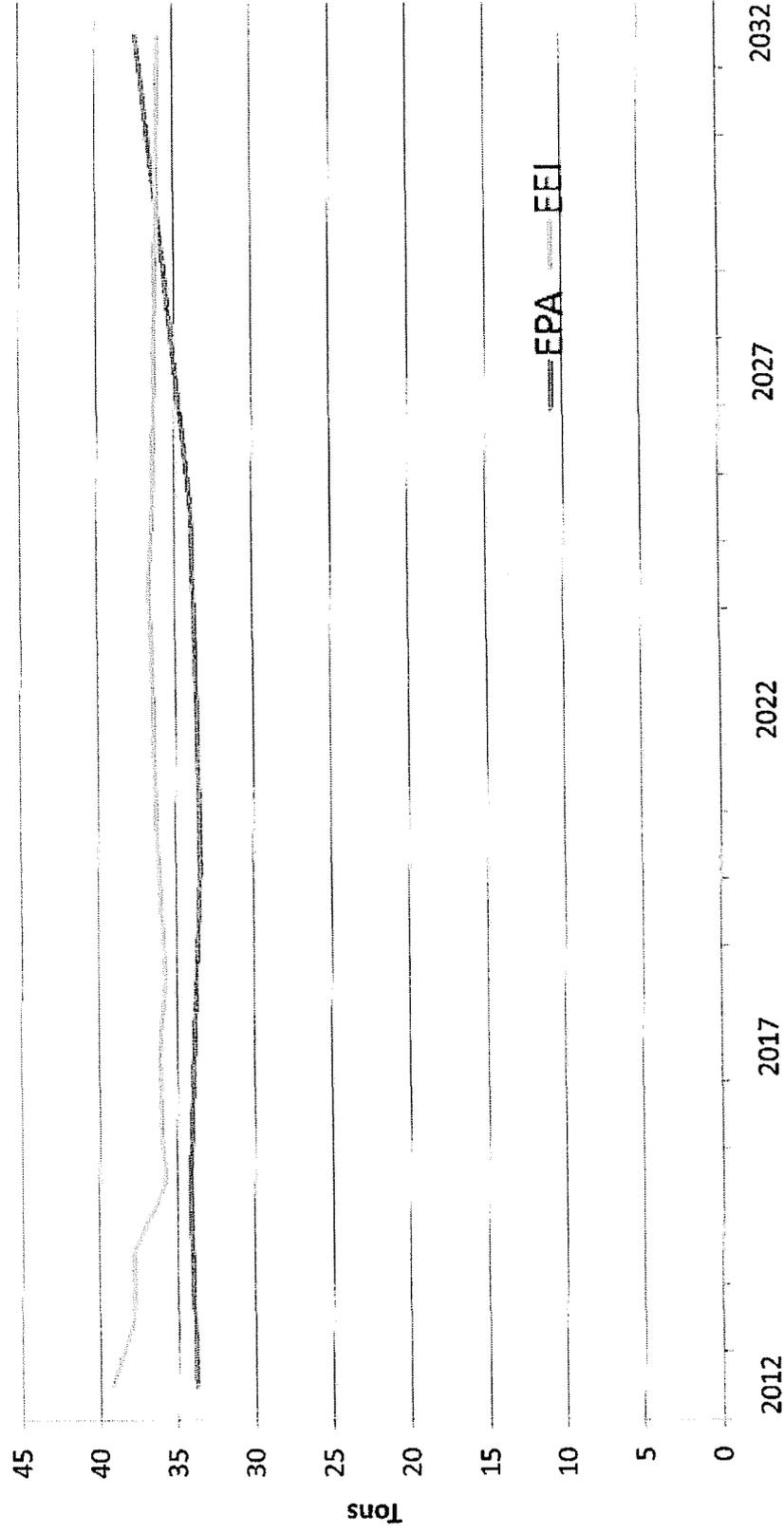


NATIONAL RESULTS COMPARISON

National Mercury Emissions



National Mercury Emissions

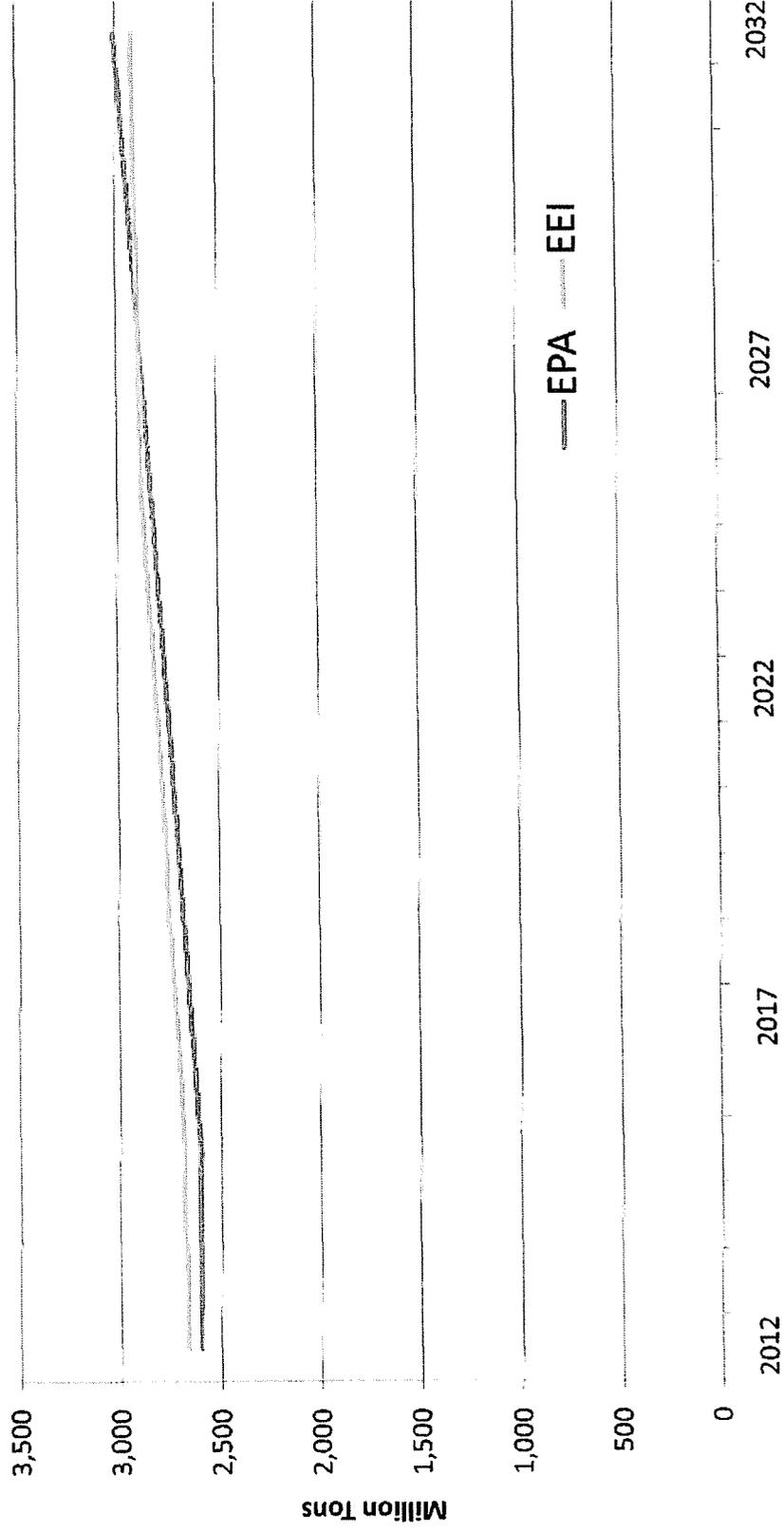


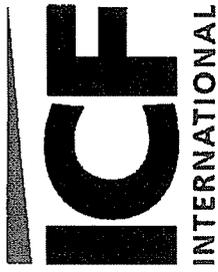
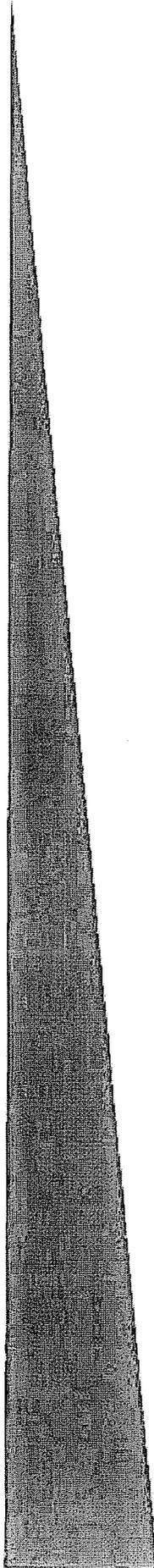
NATIONAL RESULTS COMPARISON

National CO₂ Emissions



National CO₂ Emissions



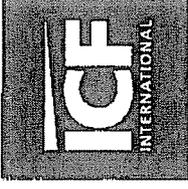


EEI Scenario Results

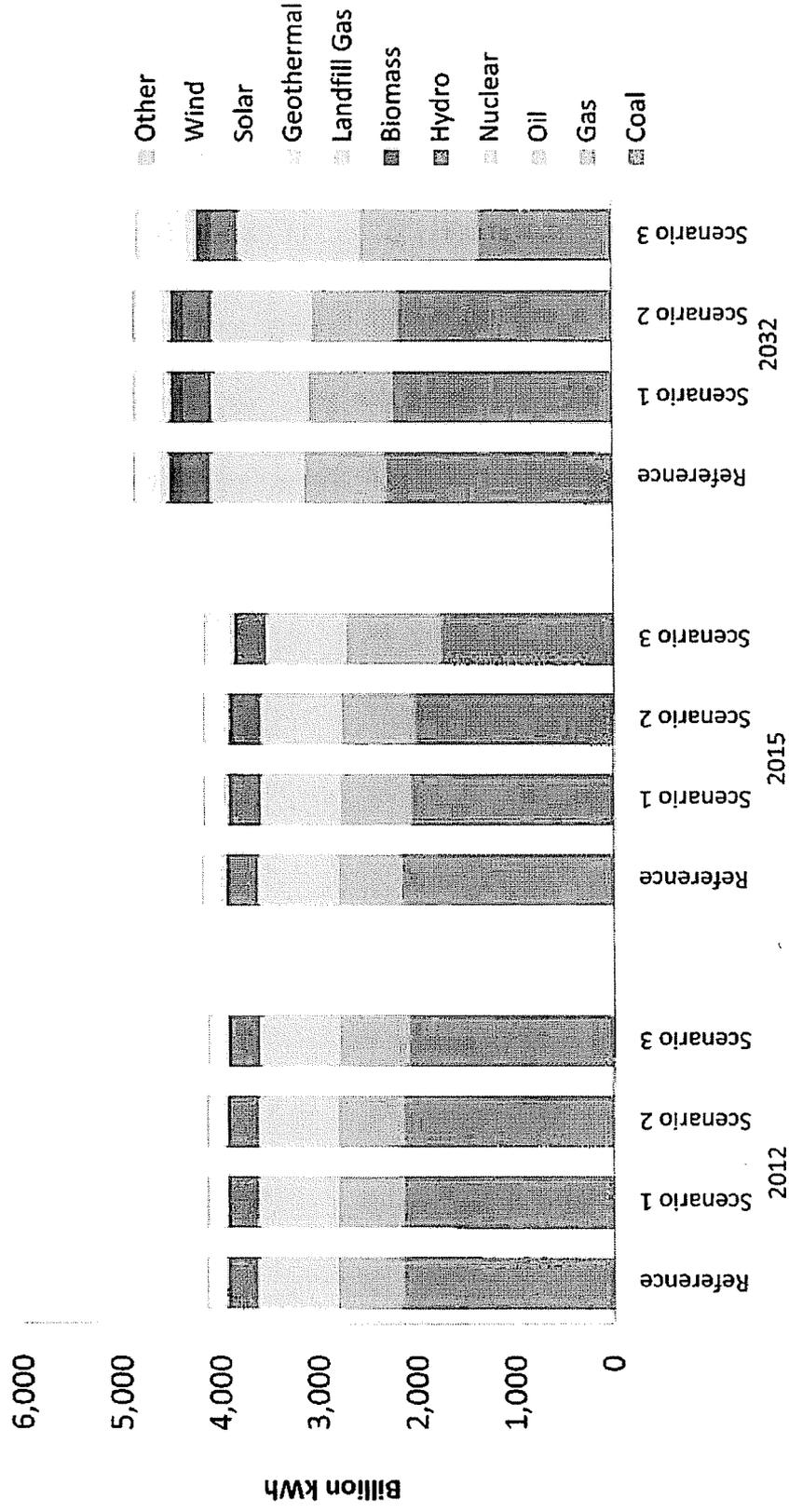
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NATIONAL RESULTS COMPARISON

National Generation By Type



National Generation

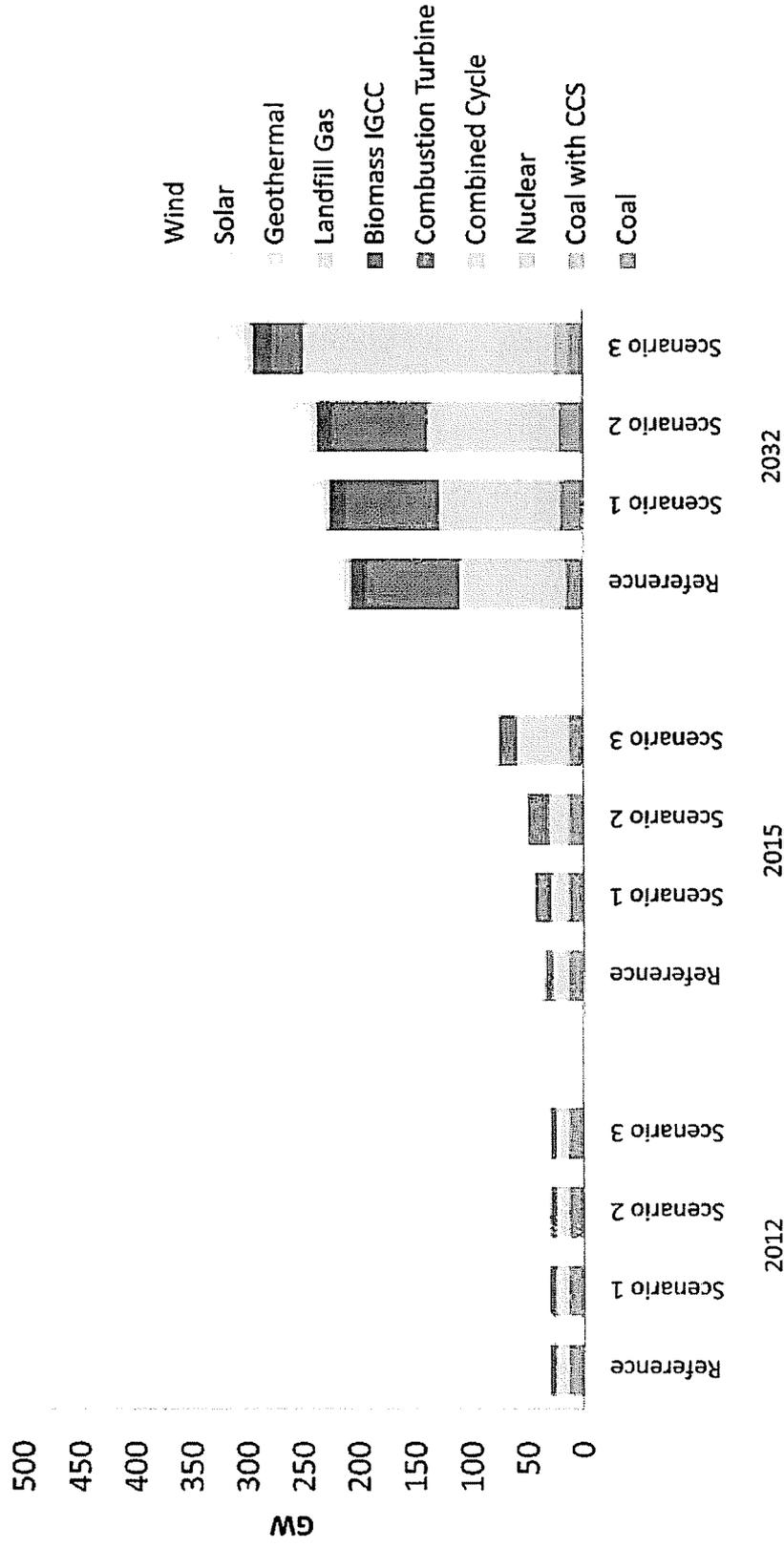


NATIONAL RESULTS COMPARISON

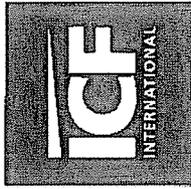
National Cumulative Capacity Additions by Scenario (Firm + Economic)



National Capacity Additions

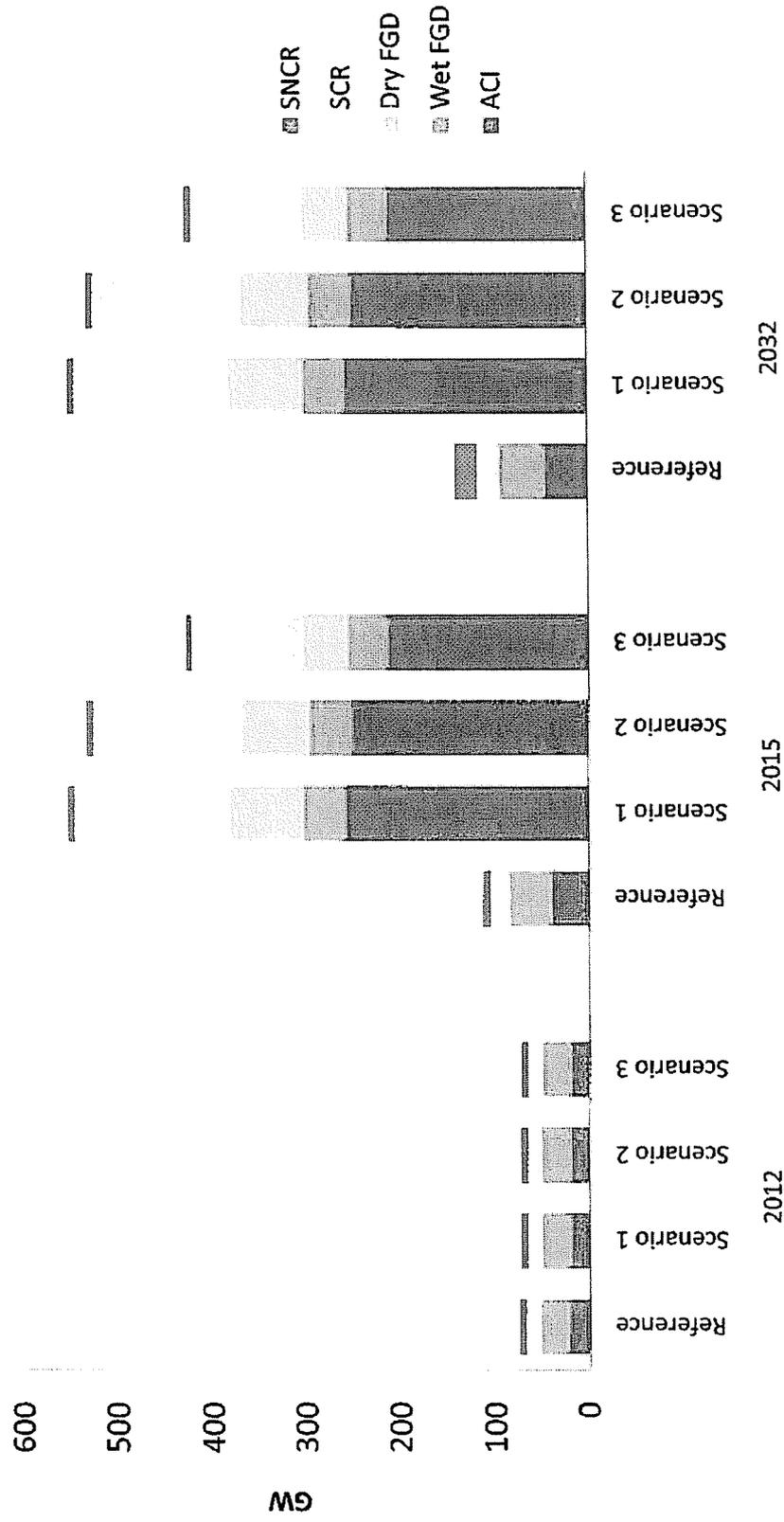


NATIONAL RESULTS COMPARISON



National Cumulative Pollution Control Installations by Scenario (Firm + Economic)

National Cumulative Pollution Control Installations



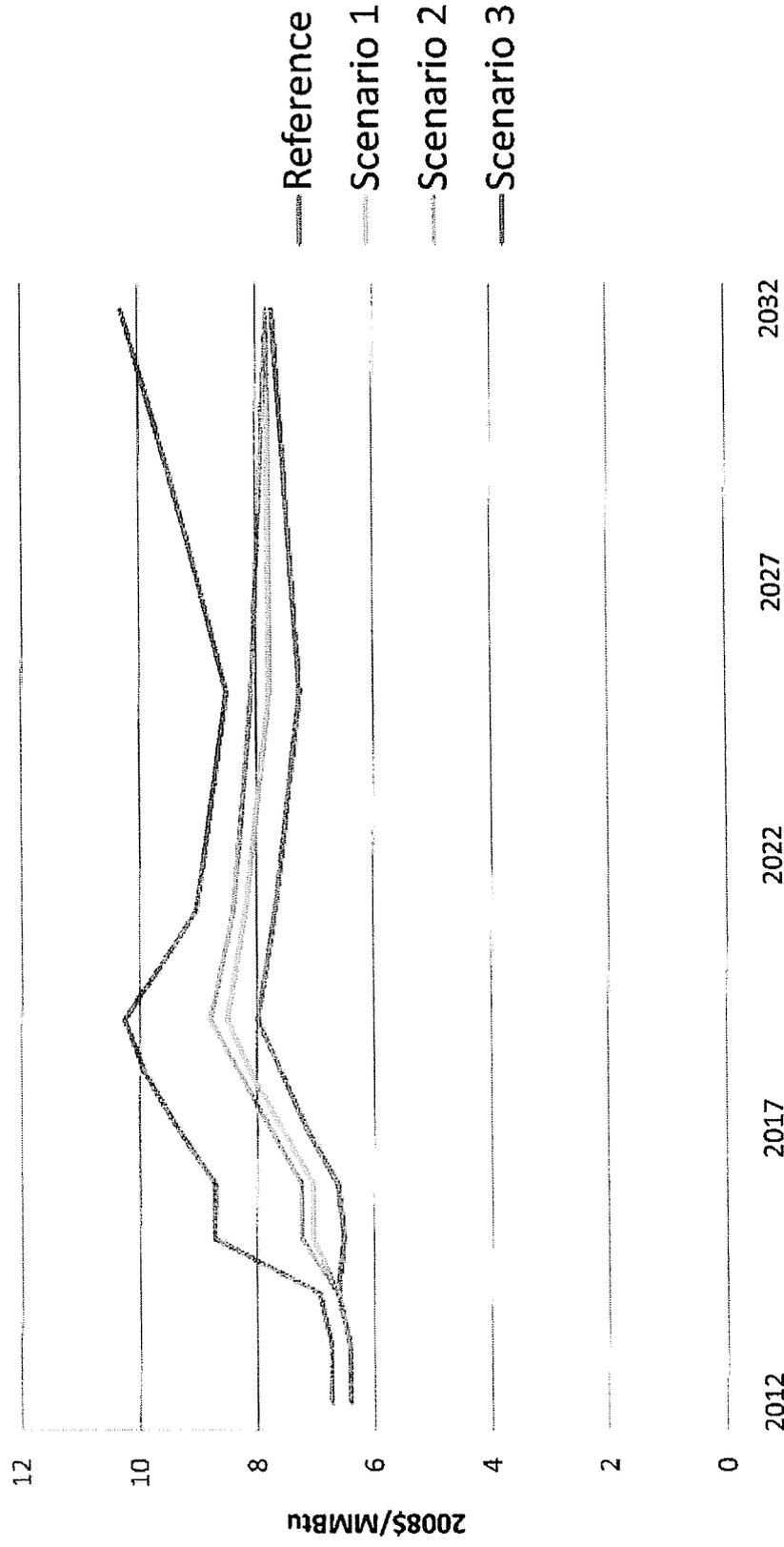
Note: Units may install more than one control and their capacity will be reported separately for each control.

NATIONAL RESULTS COMPARISON

Henry Hub Natural Gas Prices



Henry Hub Natural Gas Prices

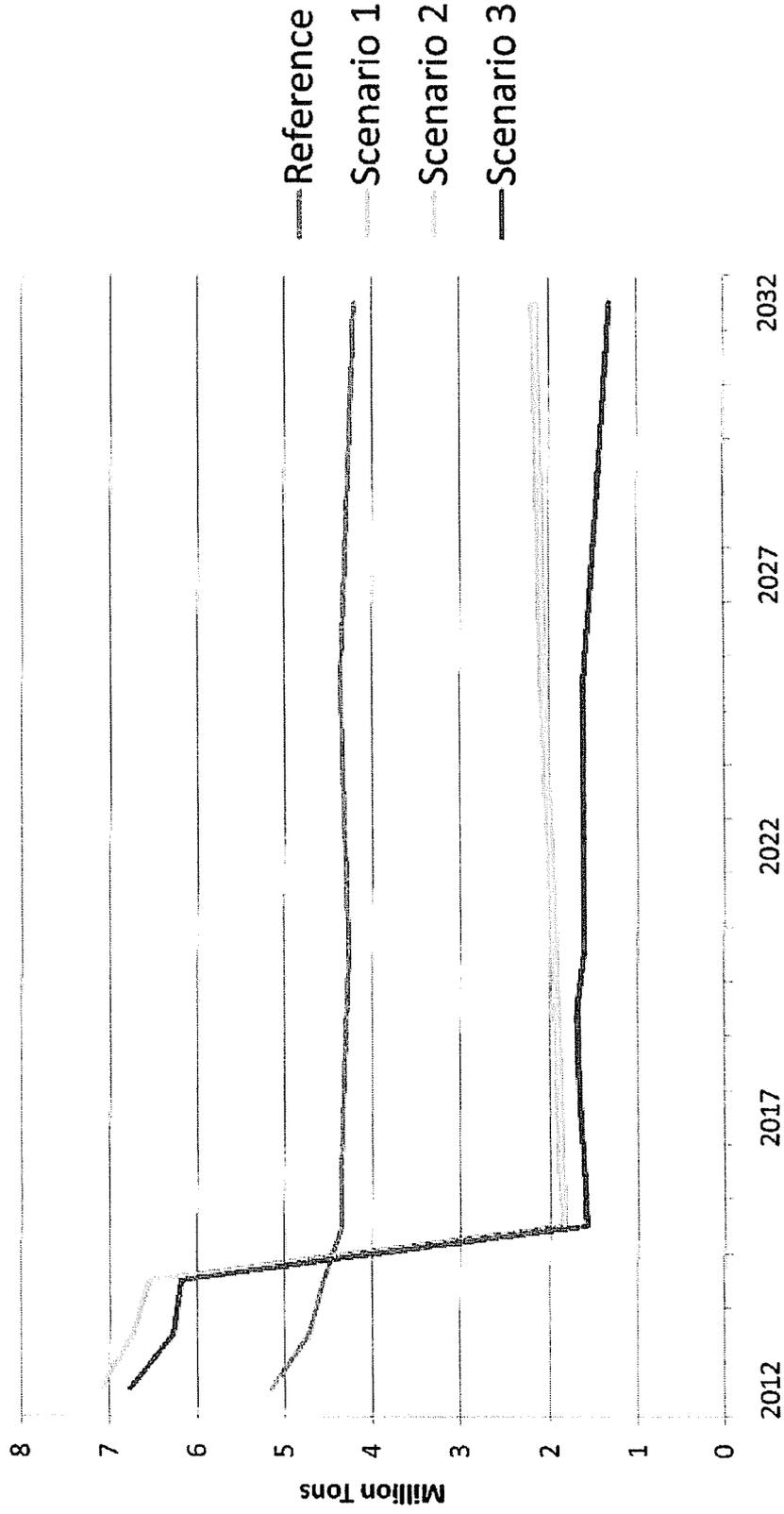


NATIONAL RESULTS COMPARISON

SO₂ Emissions



National SO₂ Emissions

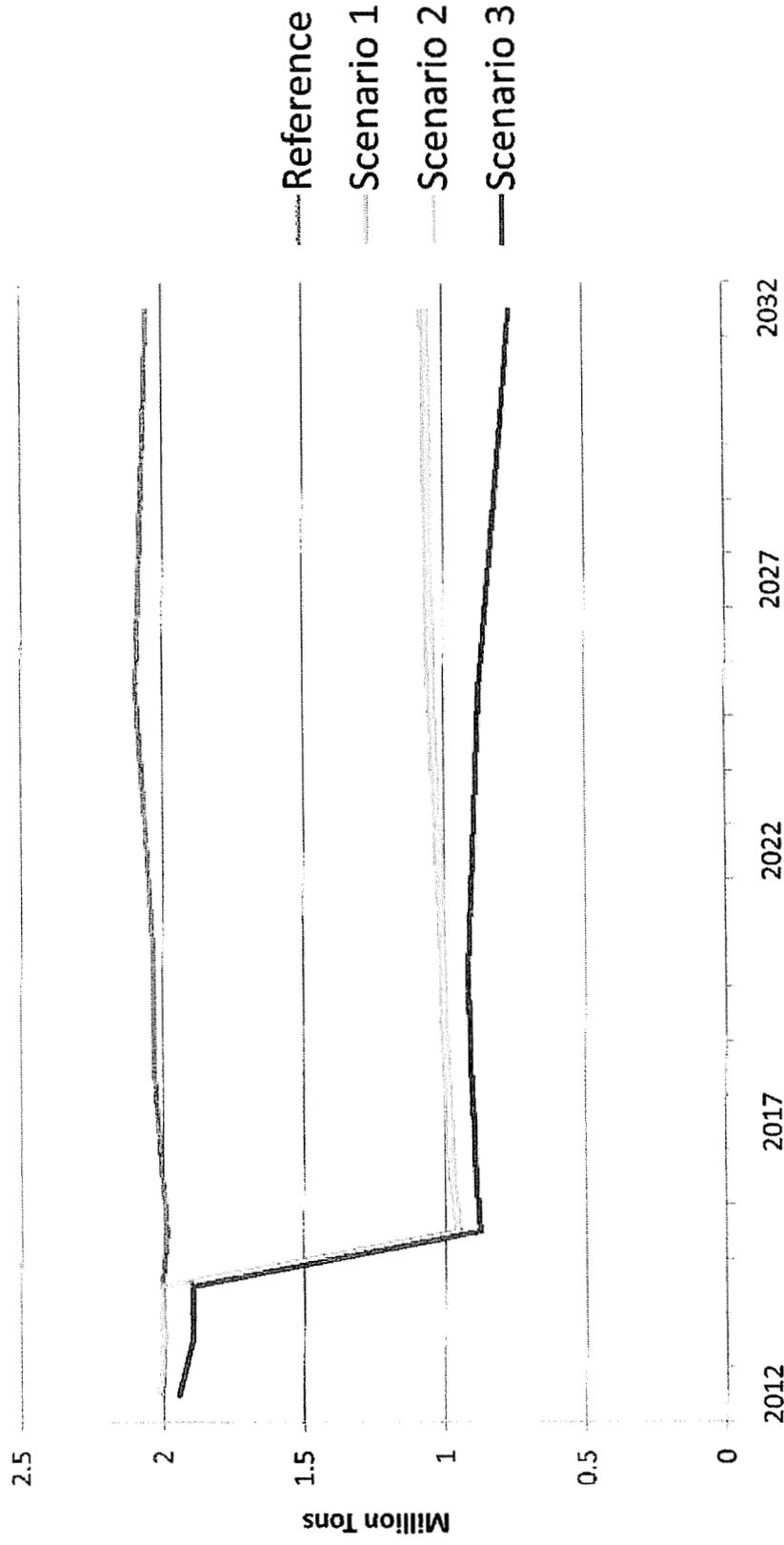


NATIONAL RESULTS COMPARISON

NO_x Emissions

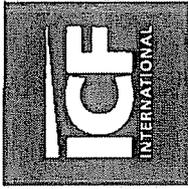


National NO_x Emissions

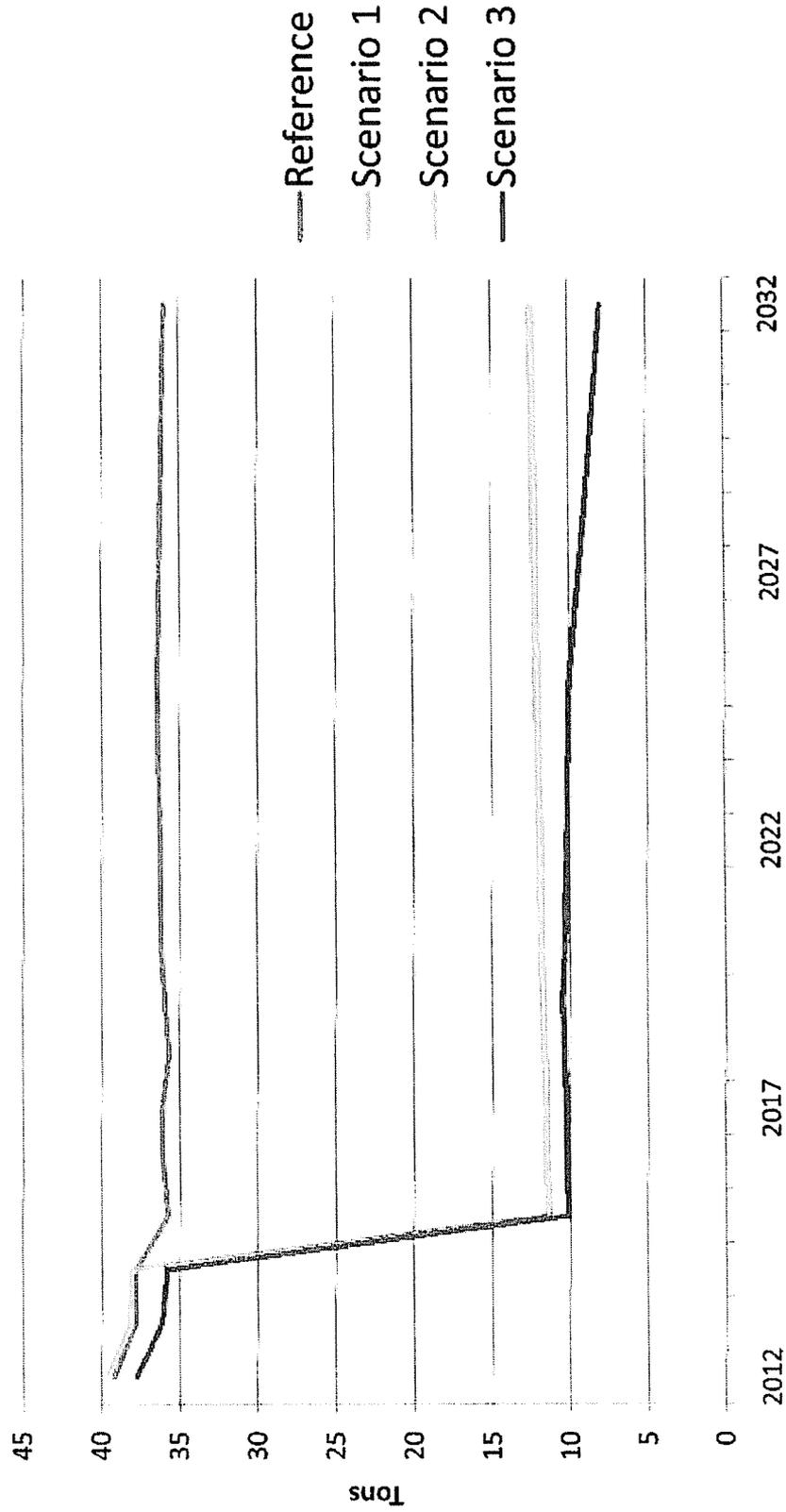


NATIONAL RESULTS COMPARISON

National Mercury Emissions

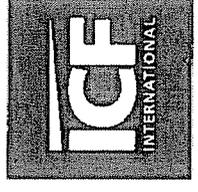


National Mercury Emissions

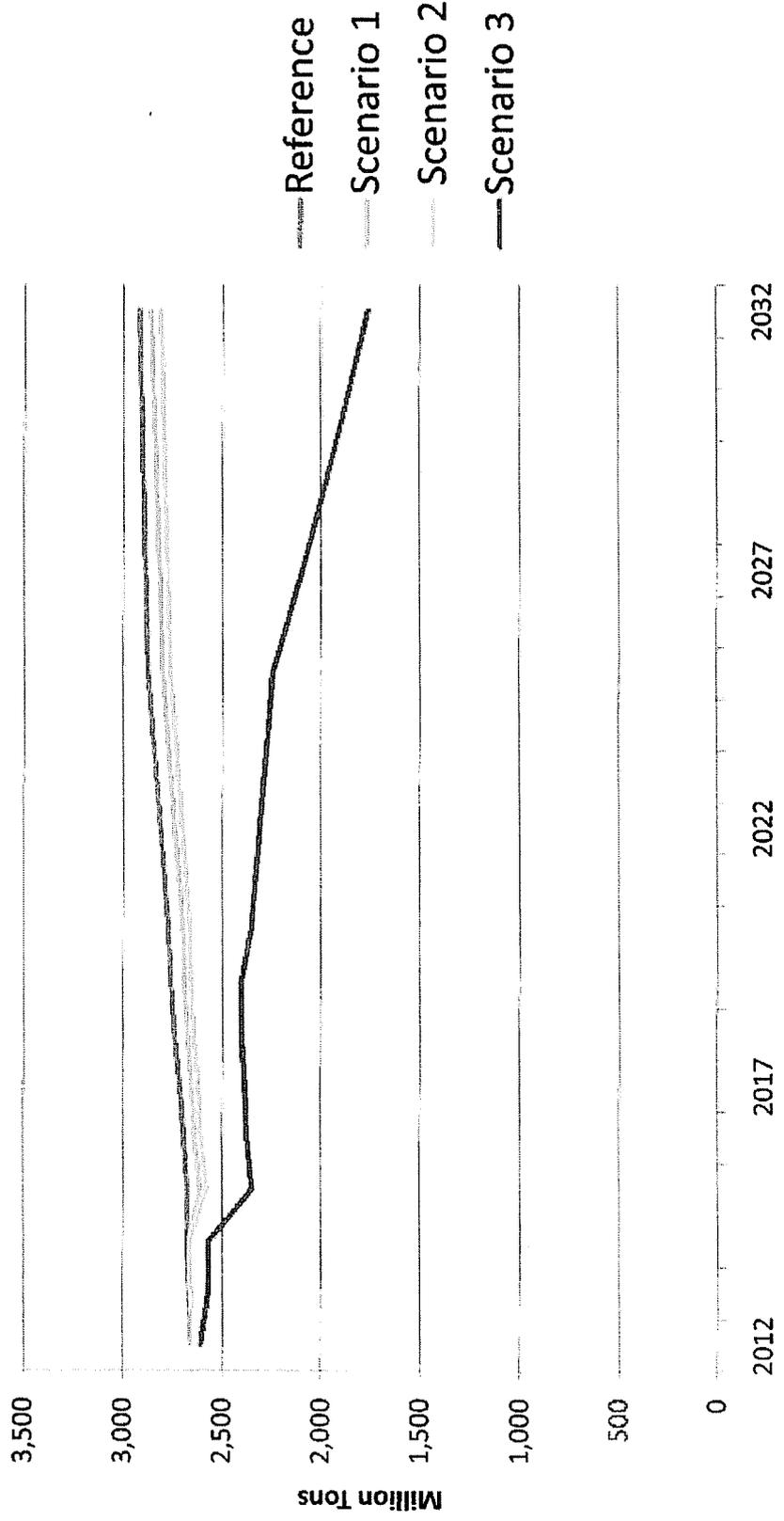


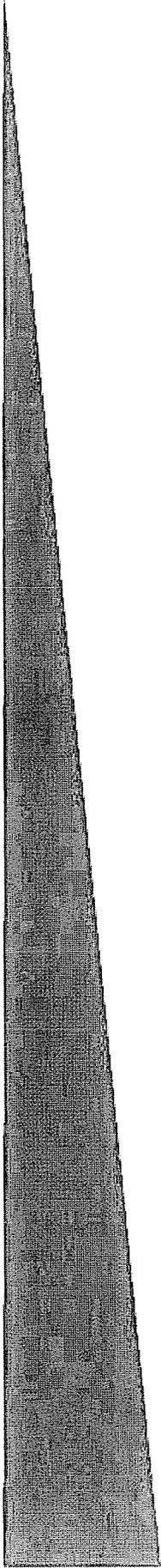
NATIONAL RESULTS COMPARISON

National CO₂ Emissions



National CO₂ Emissions



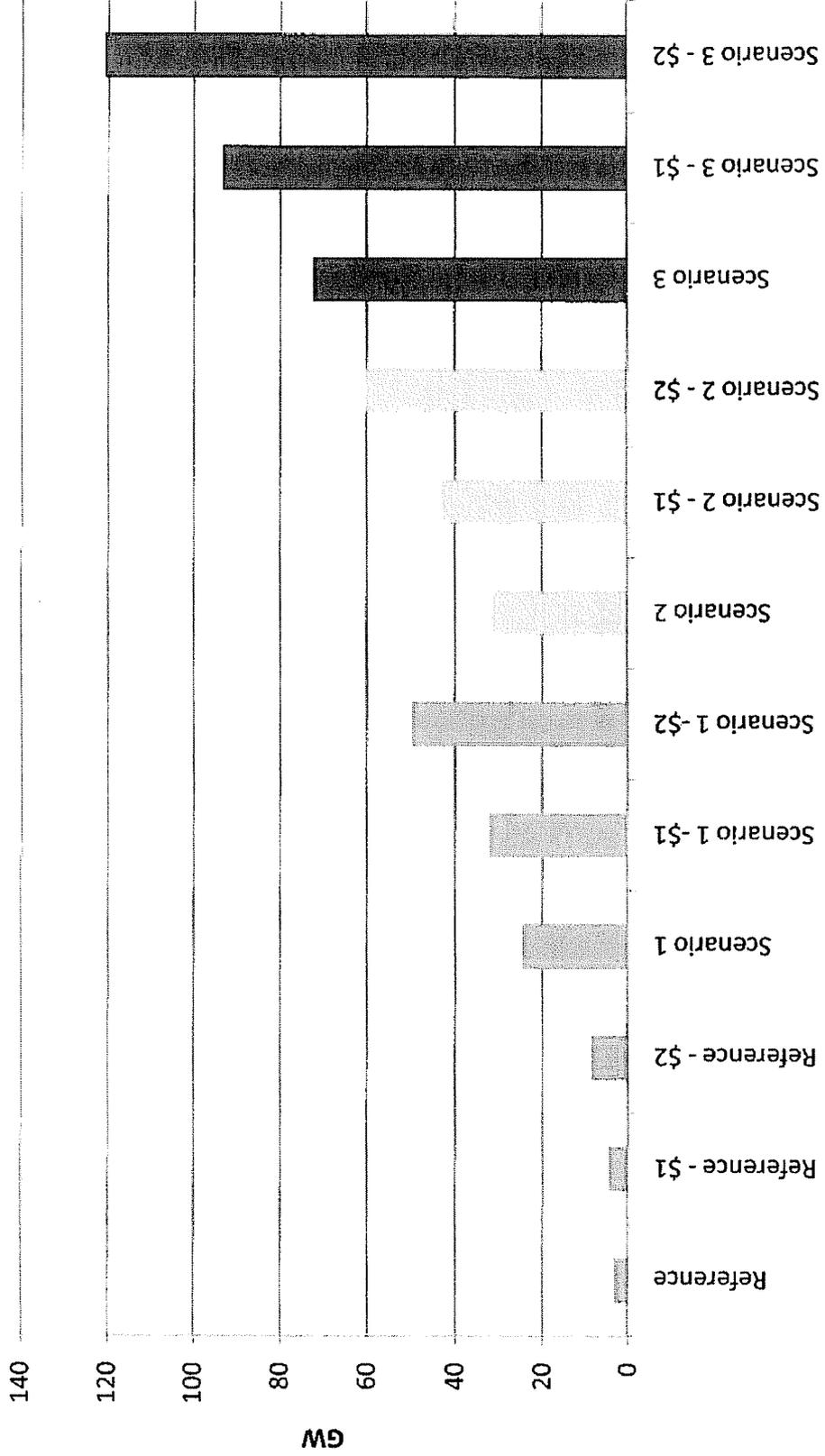


Retirements

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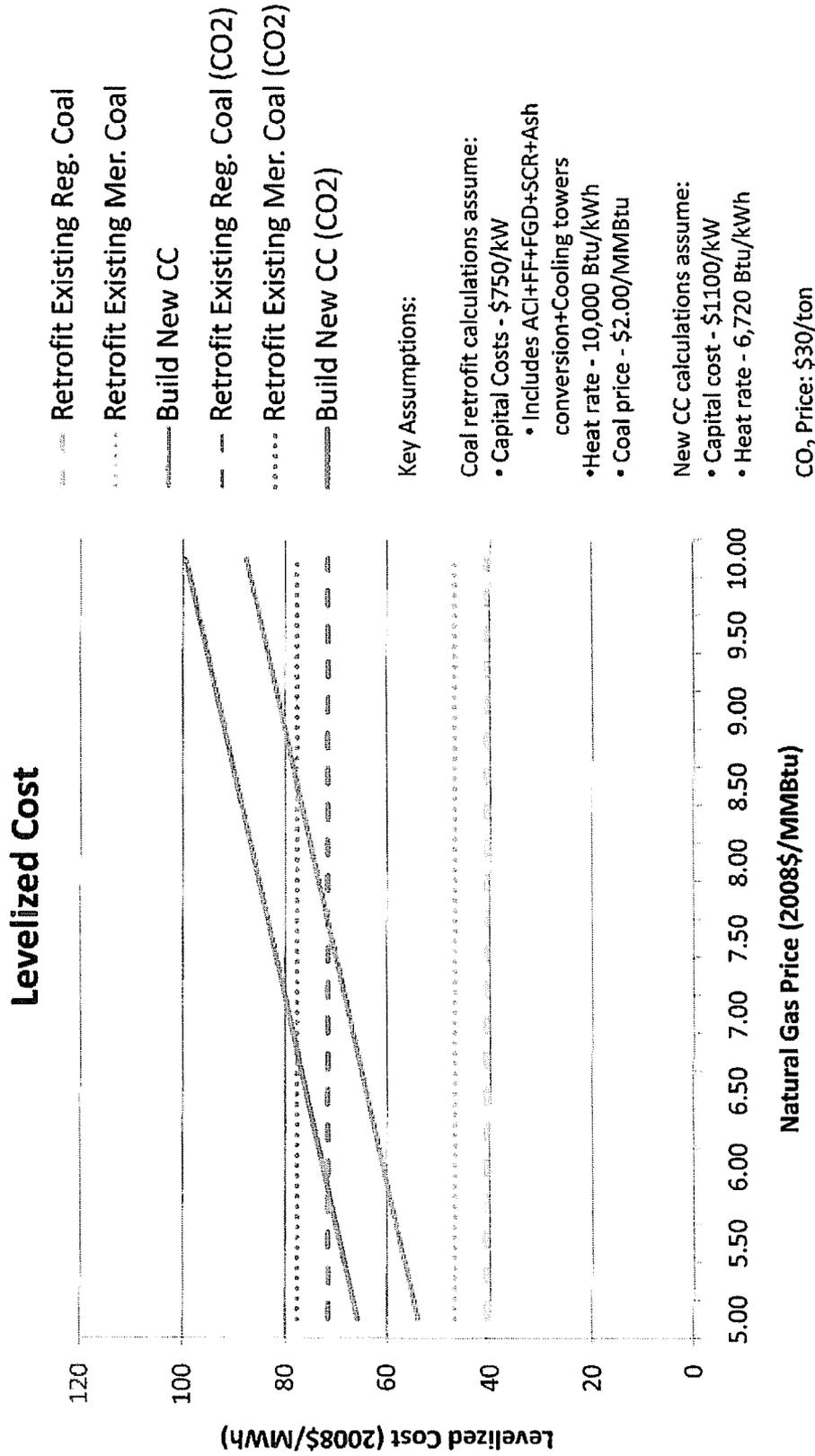
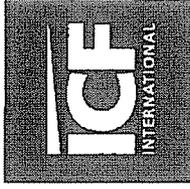
RETIREMENTS

Gas Price Sensitivities - Cumulative Coal Retirements through 2015



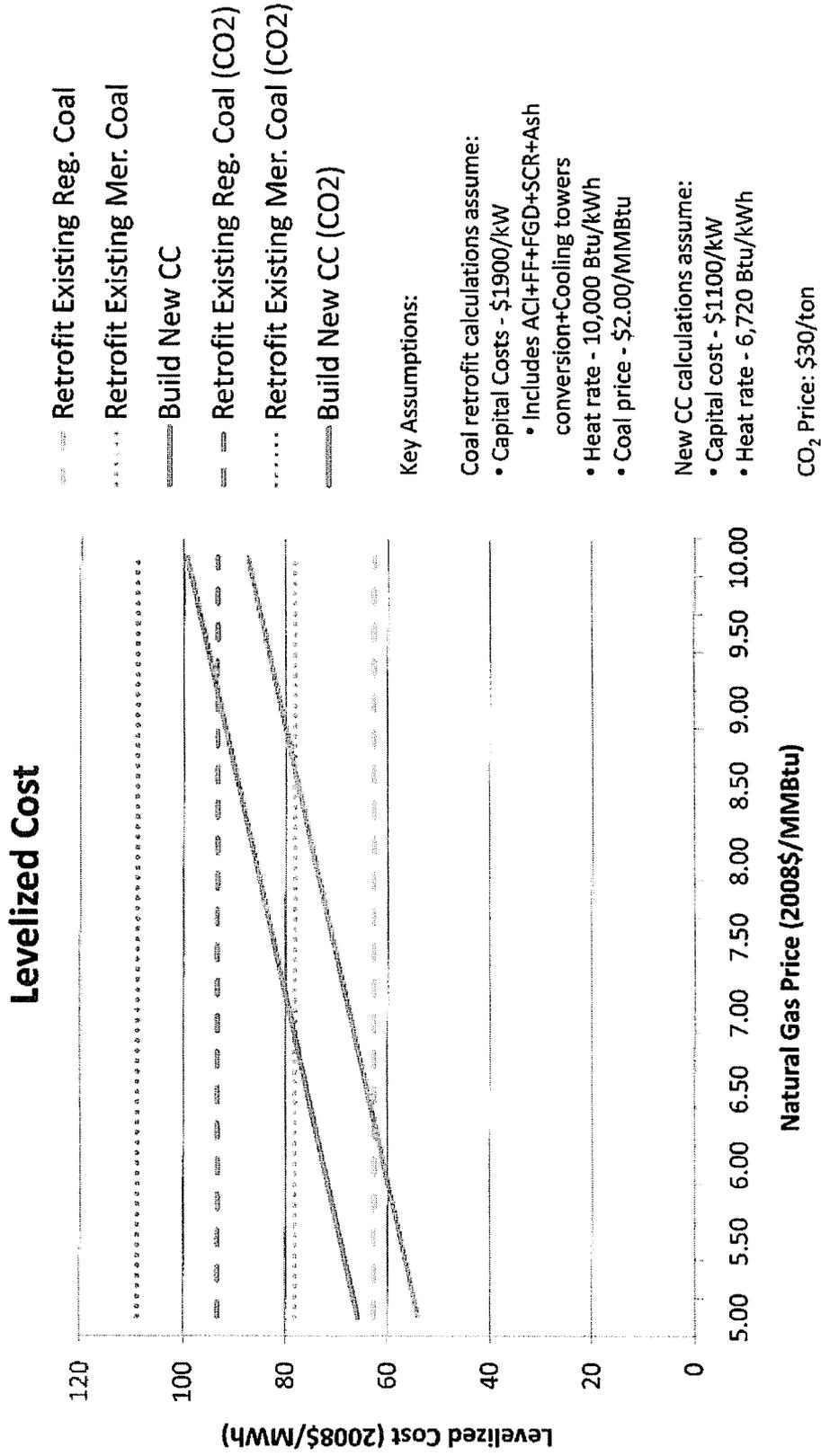
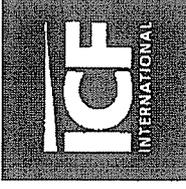
RETIREMENTS

Natural Gas Prices Impact the Economics of Retrofitting Existing Coal vs. Building New – Avg. Compliance Cost



RETIREMENTS

Natural Gas Prices Impact the Economics of Retrofitting Existing Coal vs. Building New – High Compliance Cost

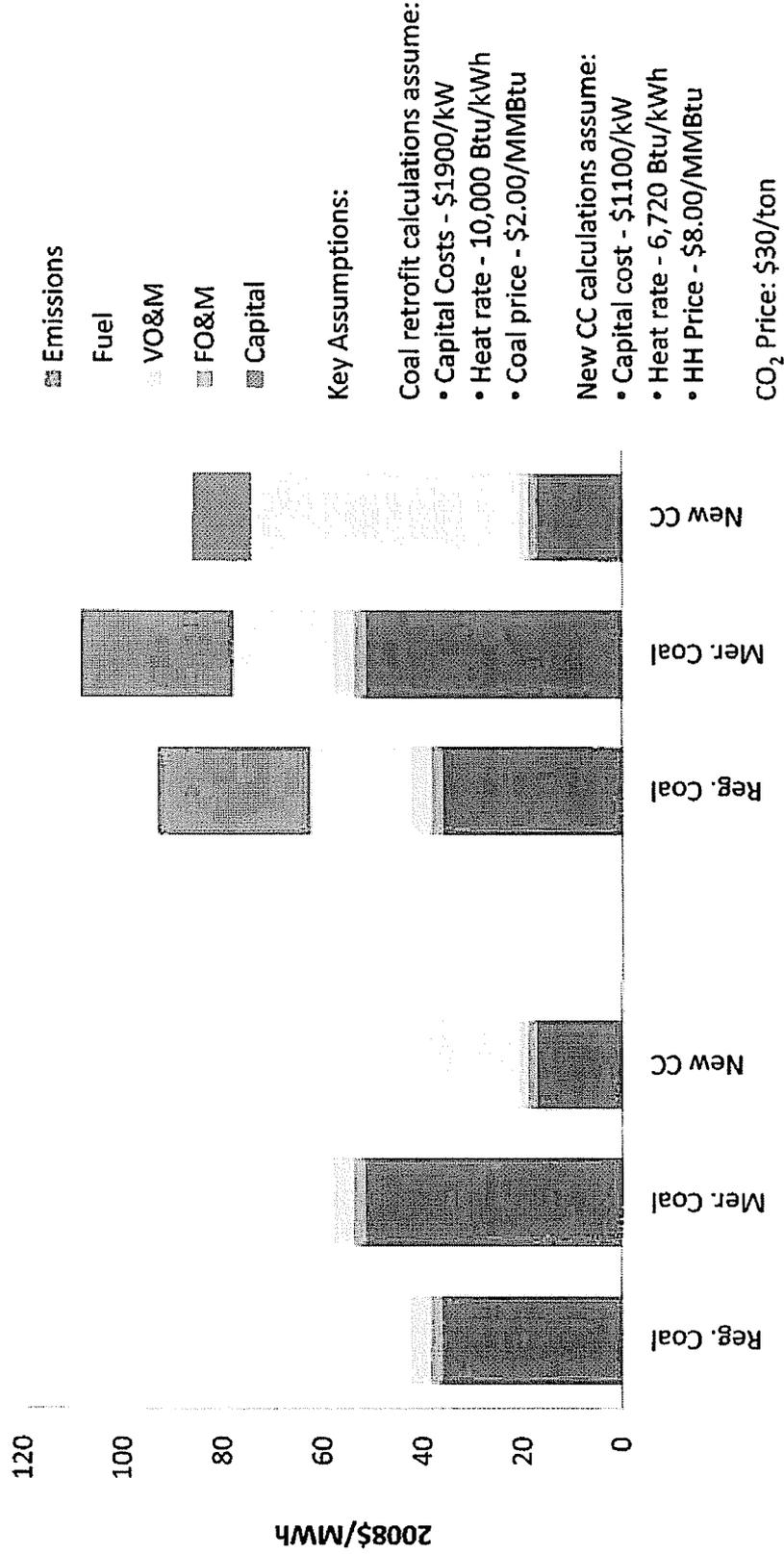


RETIREMENTS

Coal vs. CC Levelized Cost Components



Levelized Cost Components

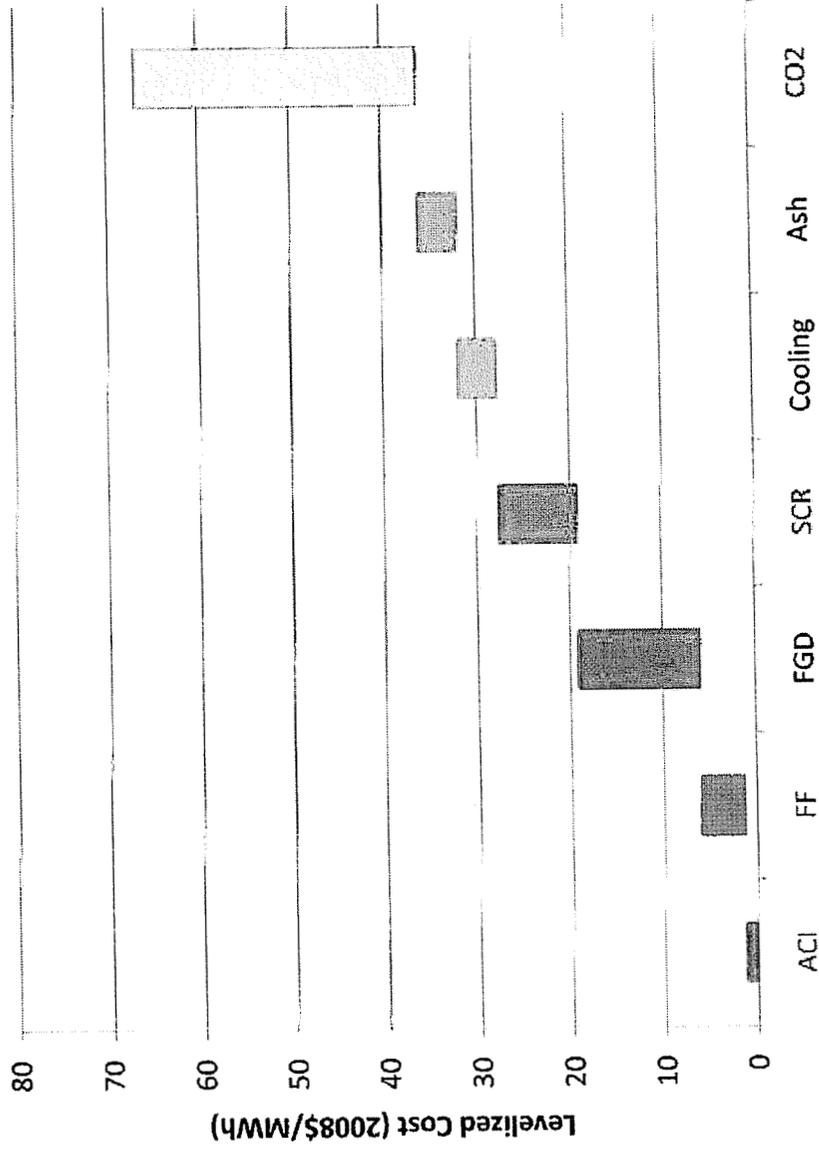


RETIREMENTS

Levelized Regulated Coal Unit Compliance Costs



Levelized Cost

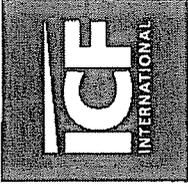


Key Assumptions:

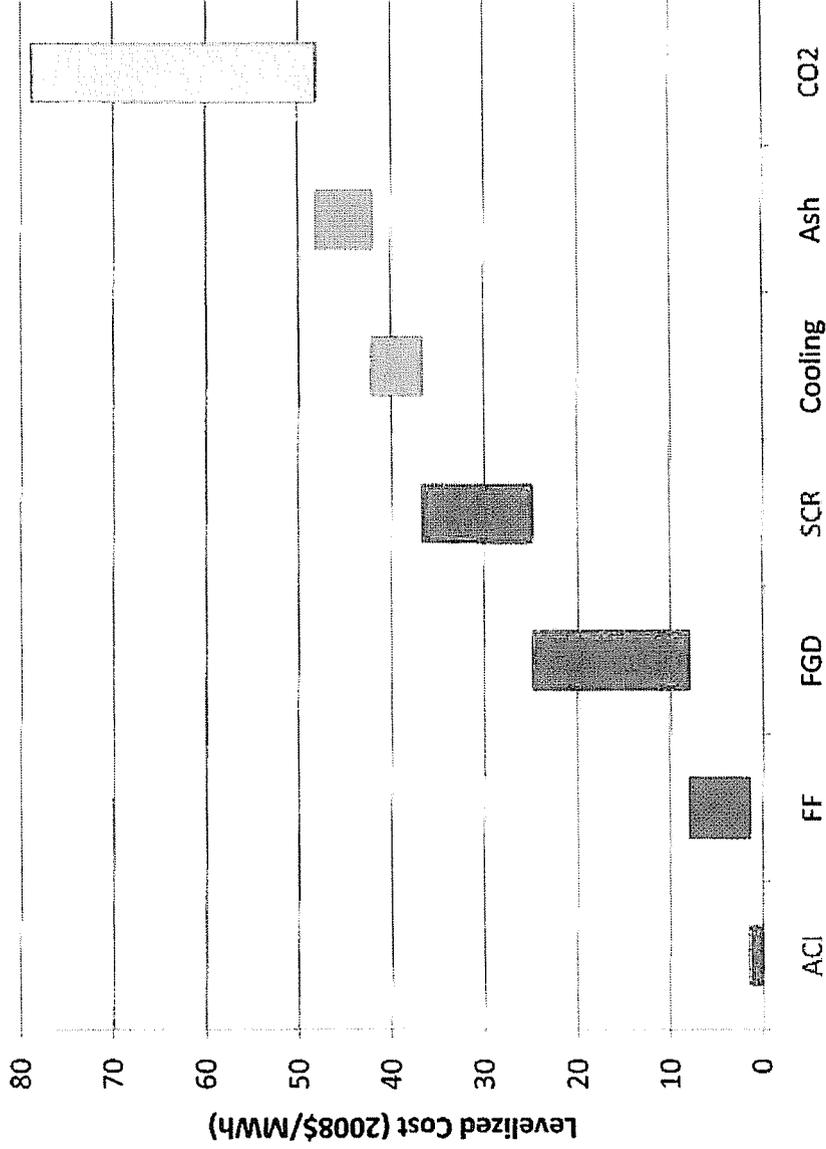
- Capacity – 500 MW
- Heat Rate – 10,000 Btu/kWh
- CO₂ Price - \$30/ton
- Regulated Unit

RETIREMENTS

Levelized Merchant Coal Unit Compliance Costs

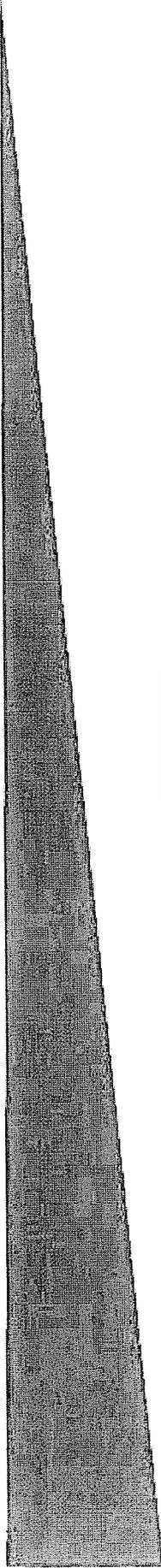


Levelized Cost



Key Assumptions:

- Capacity – 500 MW
- Heat Rate – 10,000 Btu/kWh
- CO₂ Price - \$30/ton
- Merchant Unit



Appendix

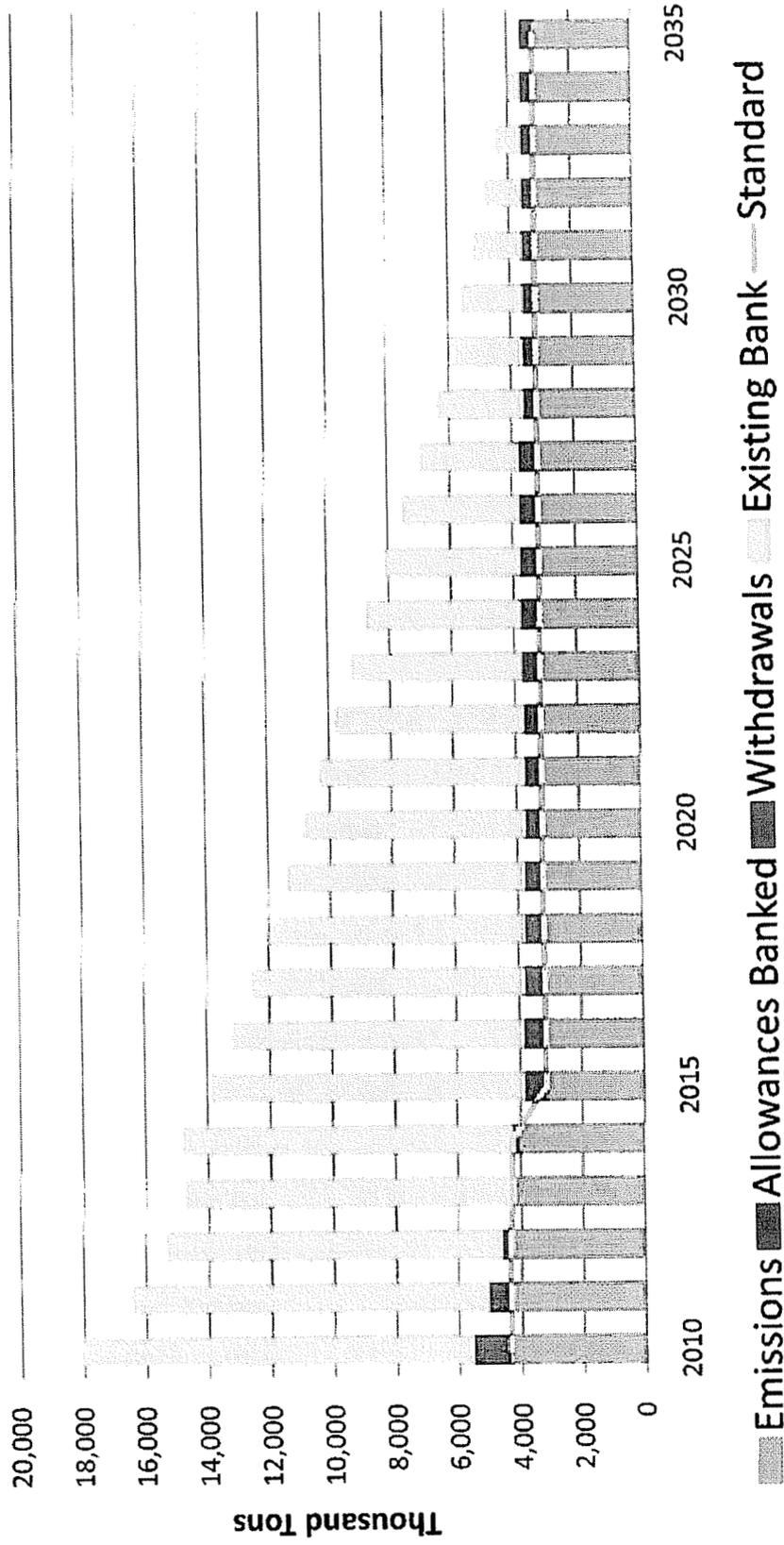
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NATIONAL RESULTS COMPARISON

Reference Case SO₂ Banking and Withdrawals



SO₂ Banking and Withdrawals

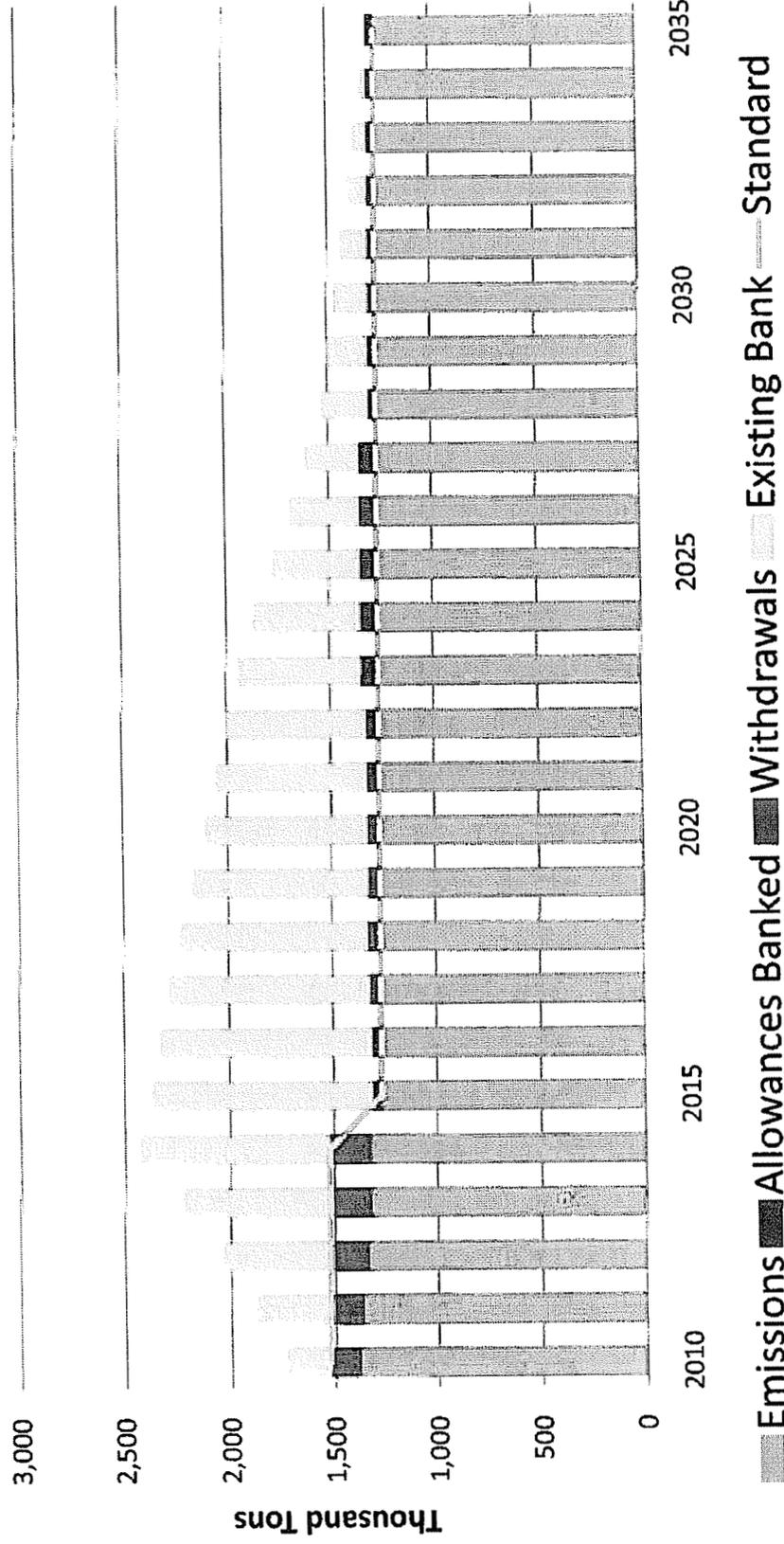


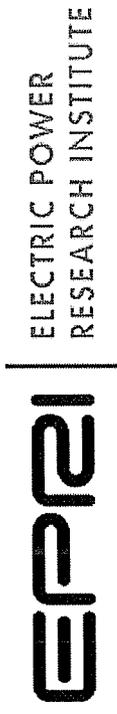
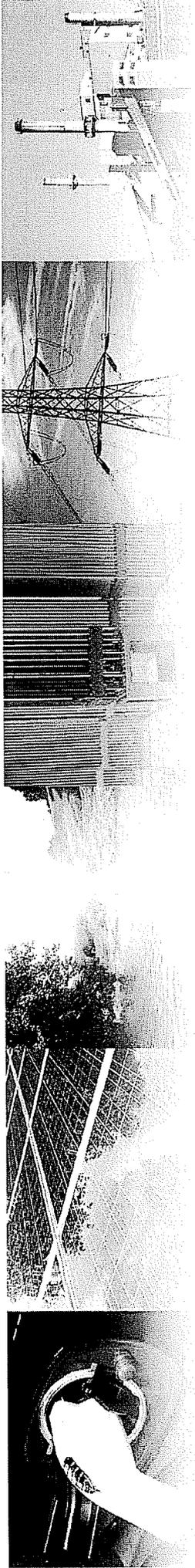
NATIONAL RESULTS COMPARISON

Reference Case NO_x Banking and Withdrawals



NO_x Banking and Withdrawals





Analysis of Current and Pending EPA Regulations on the U.S. Electric Sector

May 31, 2012

PRISM 2.0: Regional Energy and Economic Model Development and Initial Application

Develop a new energy-economy model of the U.S. with a special focus on the electric power sector:

U.S. Regional Economy, Greenhouse Gas, and Energy (US-REGEN) model (completed)

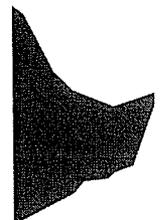
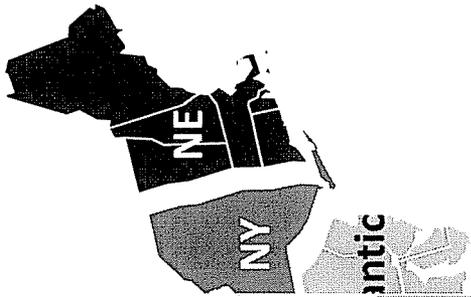
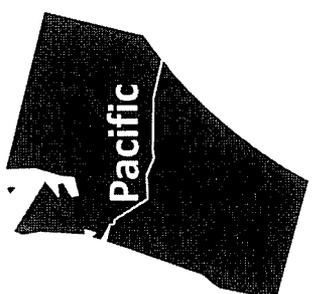
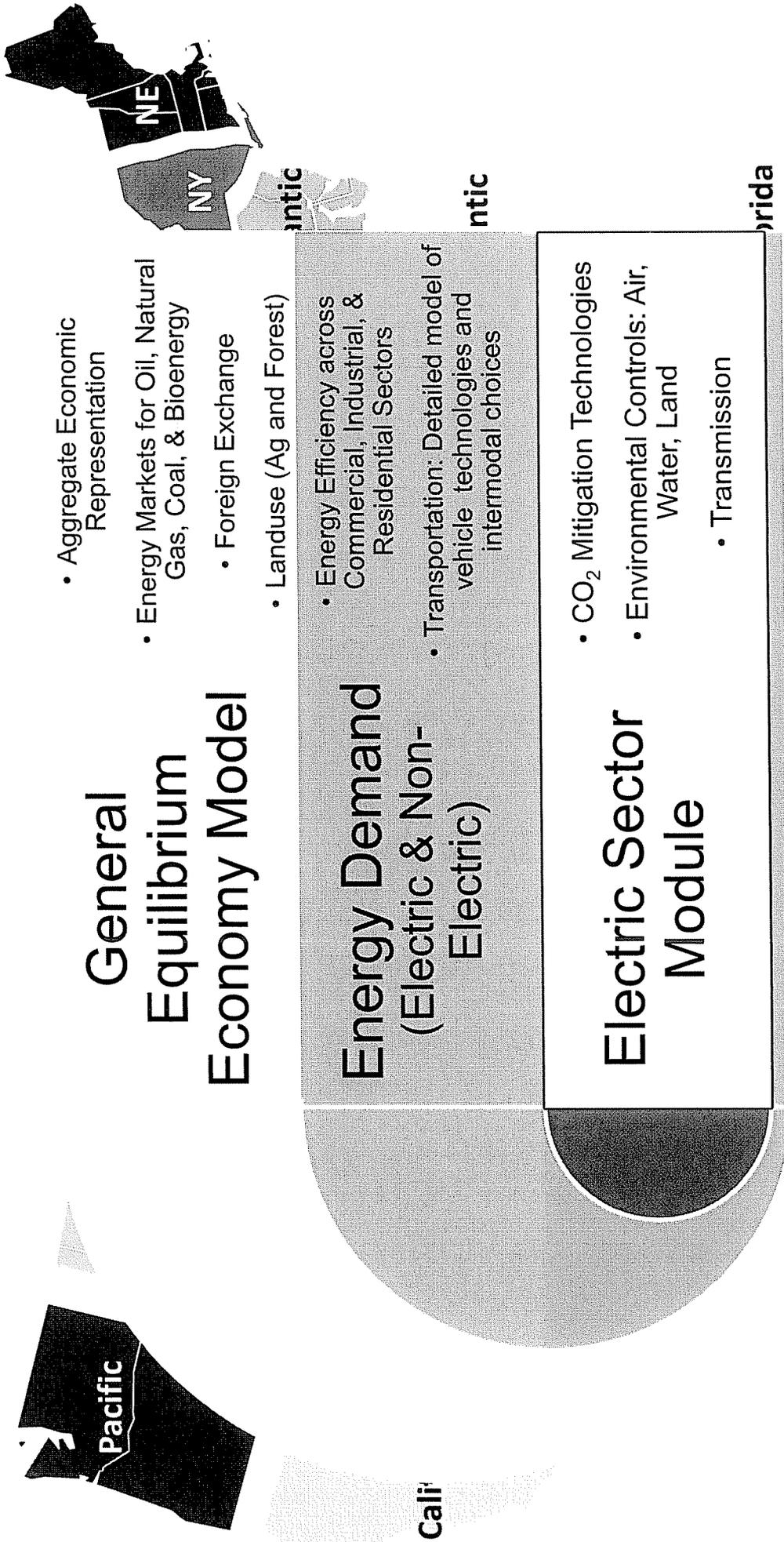
Develop appropriate sectoral data and detail in electric power production and in energy demand, taking into account regional differences in generating costs and resources, especially for renewables, carbon capture and storage, and land use

Perform detailed analysis:

- 1st Phase – Current and Pending Environmental Controls (completed)
- 2nd Phase – Clean Energy Standard proposals (Summer 2012)
- 3rd Phase – preliminary analysis on the Impact of CO₂ Constraints on the Electric Power Sector (Fall 2012)

Communicate results at on-site member briefings and via public reports and presentations

US-REGEN Model Description



Key Messages

- The confluence of multiple environmental control requirements requiring retrofits on existing coal-fired power plants has significant implications for asset management and generation planning decisions, and substantial effects on electricity generation costs
- Decisions about whether to retrofit or retire existing coal-fired power plants are complex, with multiple uncertainties, interactions, and implications for electricity generators and the broader economy
- With phased compliance more time can facilitate testing and application of new and existing lower-cost technologies with significant savings, and with little change in overall emission reductions

Baseline Scenario

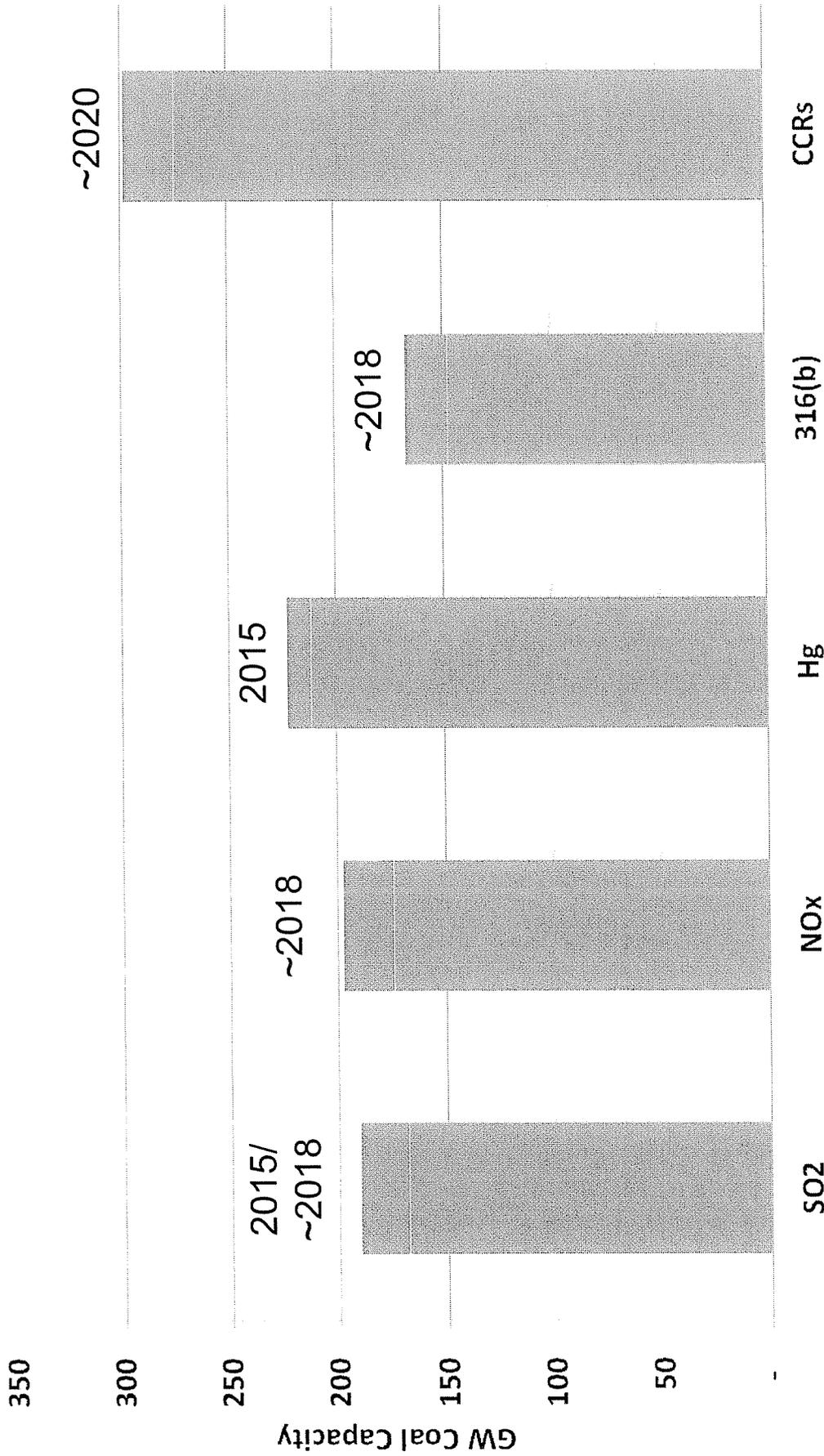
- Economic growth and energy supply and demand based on EIA's Annual Energy Outlook 2011
- Economic and electric power unit data based on 2009 and 2010 datasets, respectively, 2010 is the model's base year
- Electric sector policies, and assumptions:
 - Include state RPS Programs
 - State (CA, RGGI) or federal (CAA) GHG regulations not included
 - Include Cross-State Air Pollution Rule (CSAPR) by 2015 Aims to Reduce SO₂ emissions by 73 percent and NOx emissions by 54 percent from 2005 levels. Final rule.
 - New coal additions limited to units currently under construction

Reference (Environmental Controls) Scenario

- Starting from the Baseline Scenario, then adding
- Electric Sector Policies
 - Mercury and Air Toxics Standard (MATs) Rule by 2015, more stringent SO₂, and SO₃ control by 2018) (Dry/wet scrubbing with increased particulate control)
 - Ozone and haze regulations by 2018 (Stringent NOx control with SCRs for all coal)
 - SO₂ NAAQS, haze regulations by 2018
 - Clean Water Act (CWA) 316(b) Controls by 2018 (closed-cycle cooling on facilities with intake flow > 125)
 - Coal Combustion Residuals (CCRs) Controls by 2020 (RCRA Subtitle D “non-hazardous”)

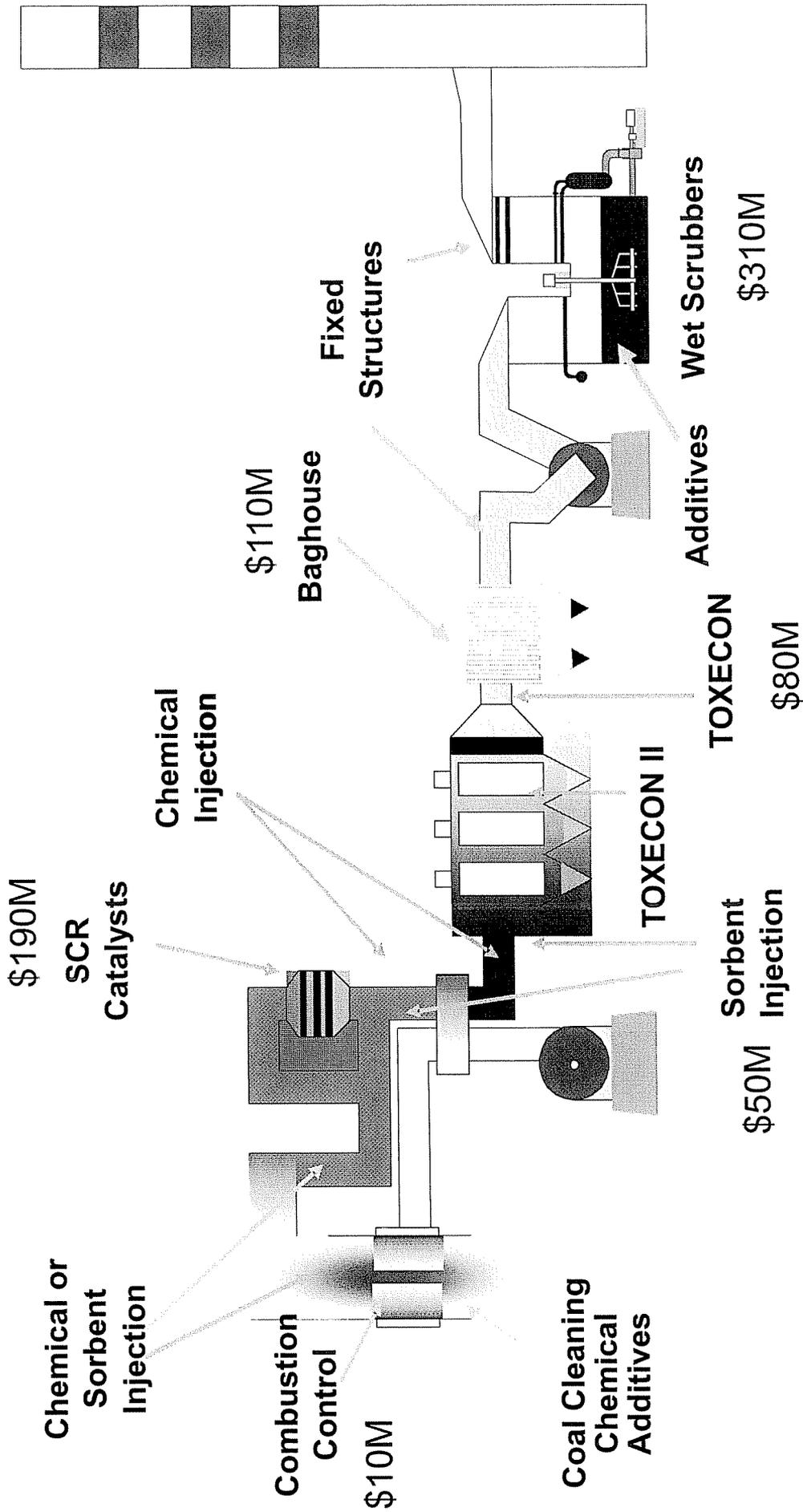
Hundreds of GW of Existing Coal Units Facing Multiple Compliance Obligations by 2015

Reference Case Capacity Requiring Retrofits



Controlling Emissions from Power Plants

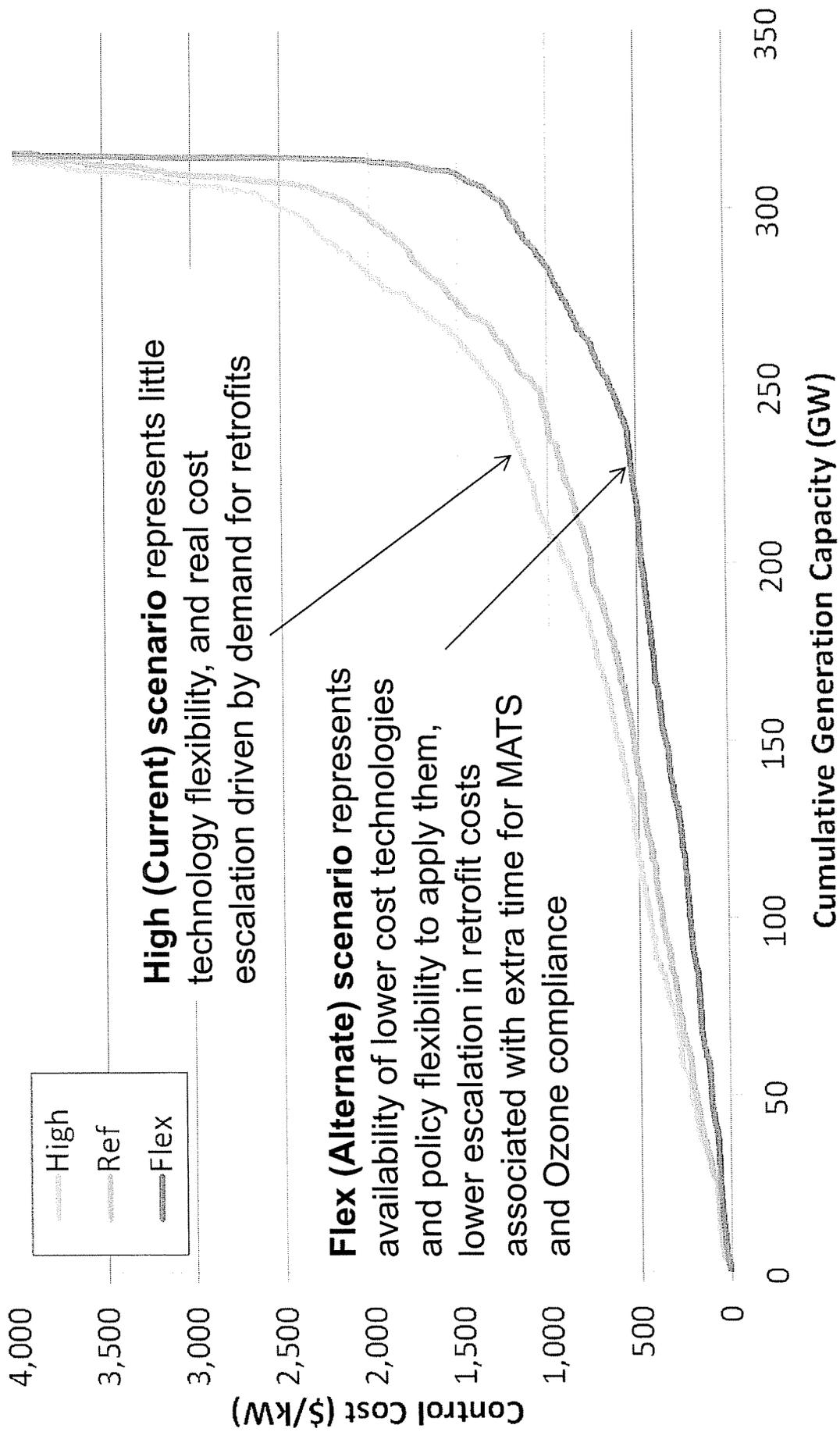
Example Costs – 400 MW, Bituminous Coal



Integrated Analysis of Retrofit Decision in Light of Full Set of Air (non-GHG), Water, Ash Policies

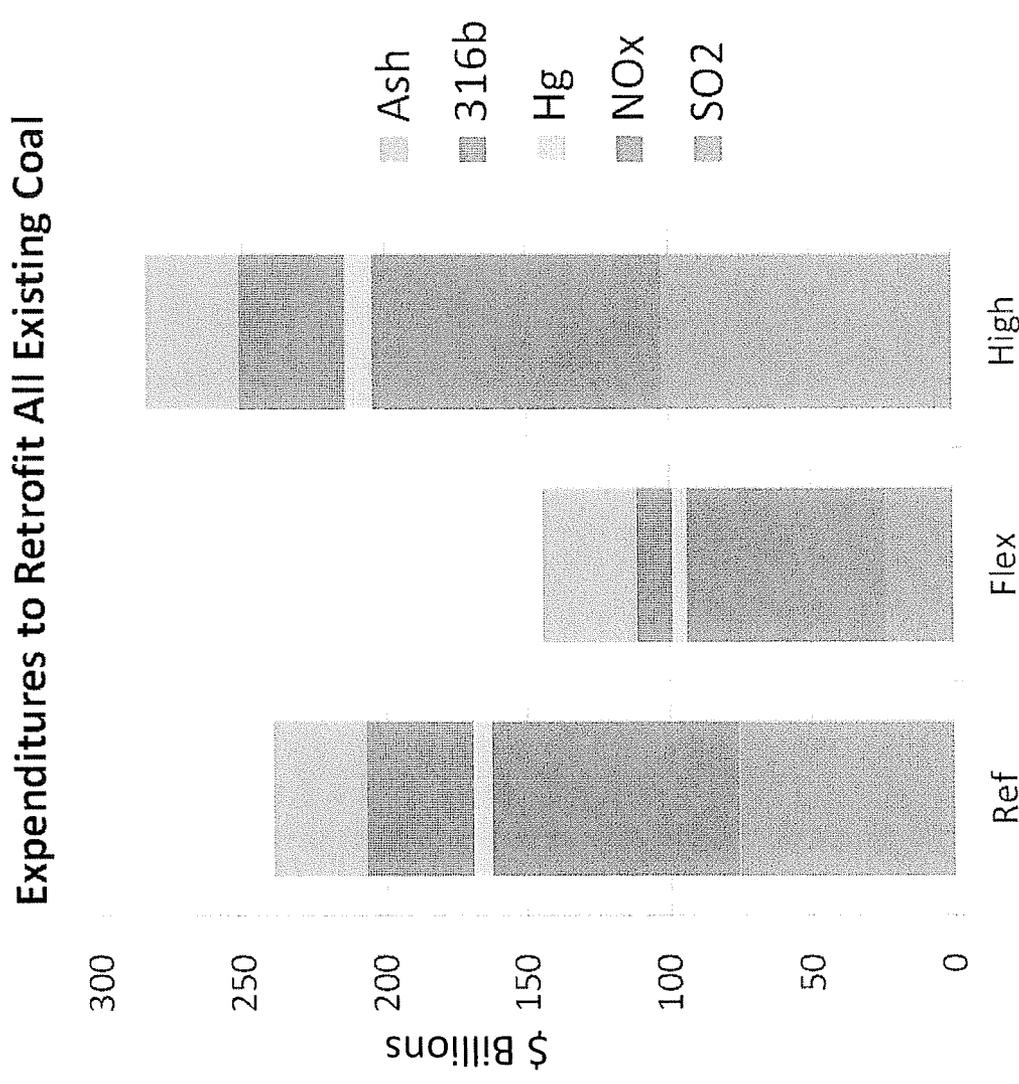
- Full Control policy defined as stringent control of SO₂, NO_x, Hg, entrainment (316b), and coal combustion residuals (CCRs) but not recent proposed CO₂ performance standards.
- Assume asset owner make single retrofit-retire decision in 2015 based on full mix of requirements.
- Retrofit cost scenarios reflect broad cost and policy uncertainty:
 - Ref uses reference costs
 - Flex has lower costs, less stringent aquatic entrainment controls, less retrofit cost escalation, and additional time for compliance for SO₂ and NO_x to allow for newer control technology options
 - High costs with less policy flexibility to choose low-cost technologies and higher retrofit cost escalation to meet stringent deadlines

Scenarios Represent Uncertainty Ranges in Costs for Technology, Policy, and Escalation



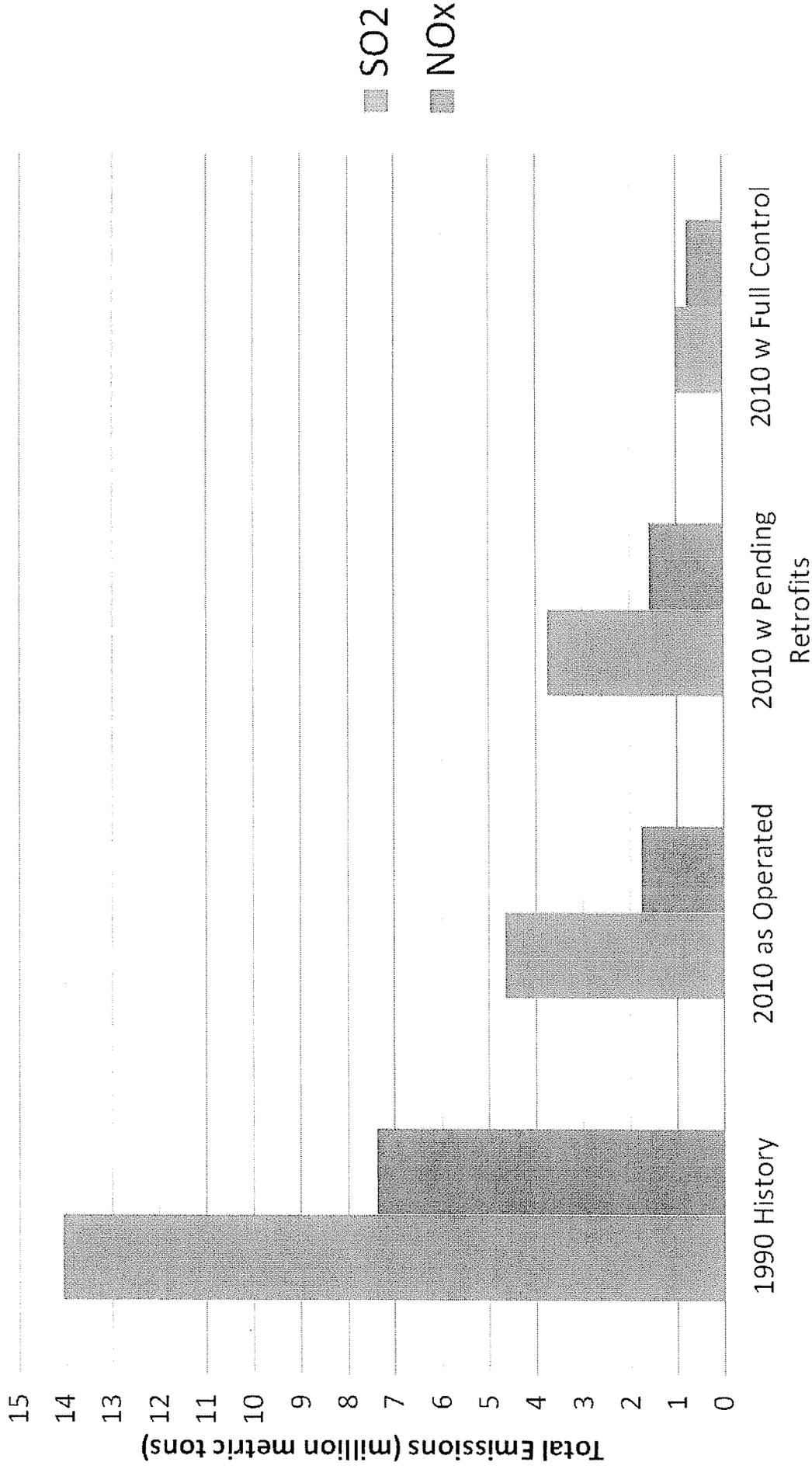
Cost to Retrofit Entire Fleet Uncertain but Several \$100 Billions

- Chart show investment cost to retrofit entire existing fleet (sum of unit costs input to model)
- Existing coal
 - 316 GW
 - 40% of electric supply
 - 1,100 generating units
 - Diverse size/age mix
- Age, size, and market impact retrofit/retire decisions
- Many units poor candidates for environmental retrofits
- ~ 40 GW of coal retirements announced to date

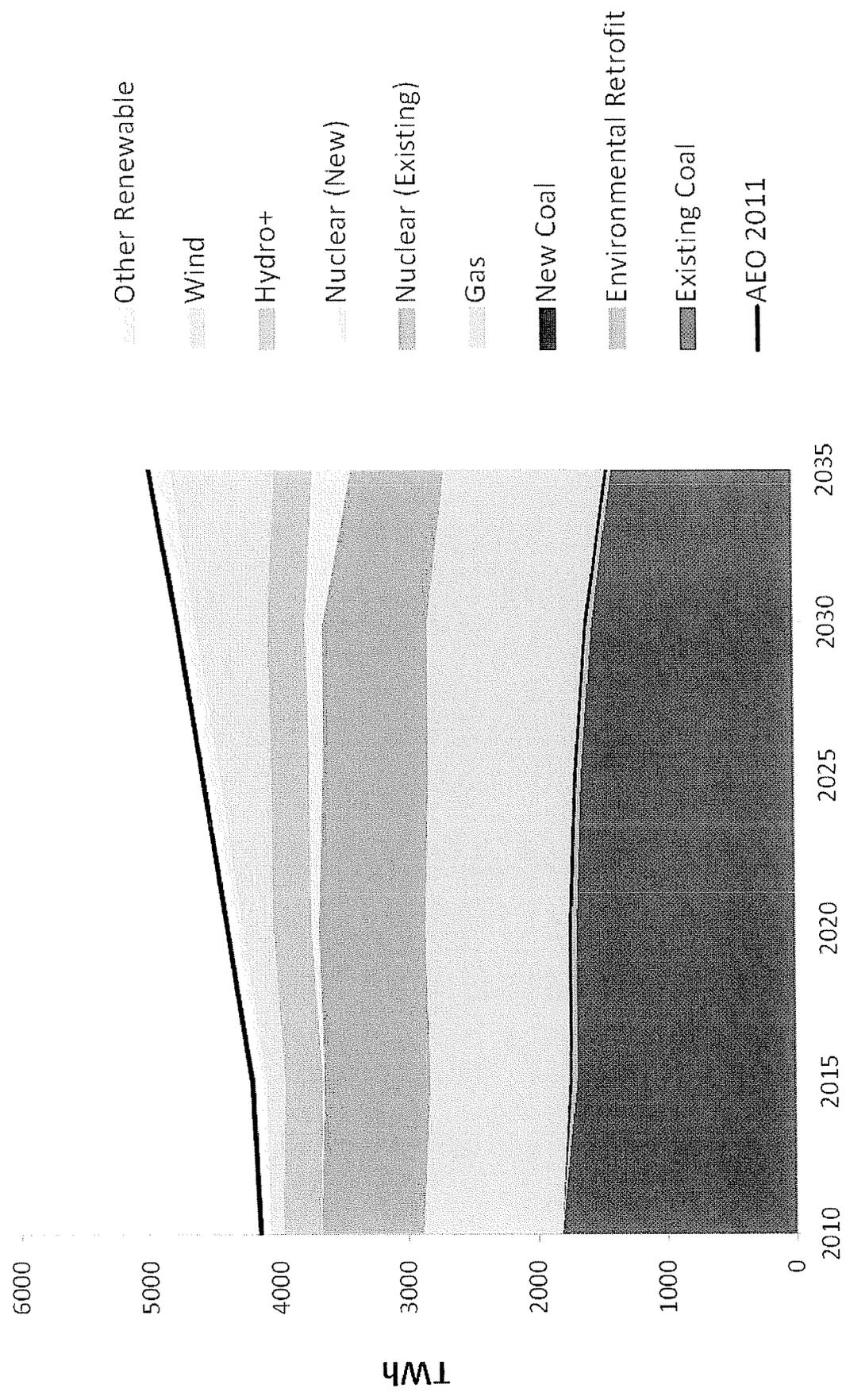


Comparisons Show How Retrofits Will Cut Emissions

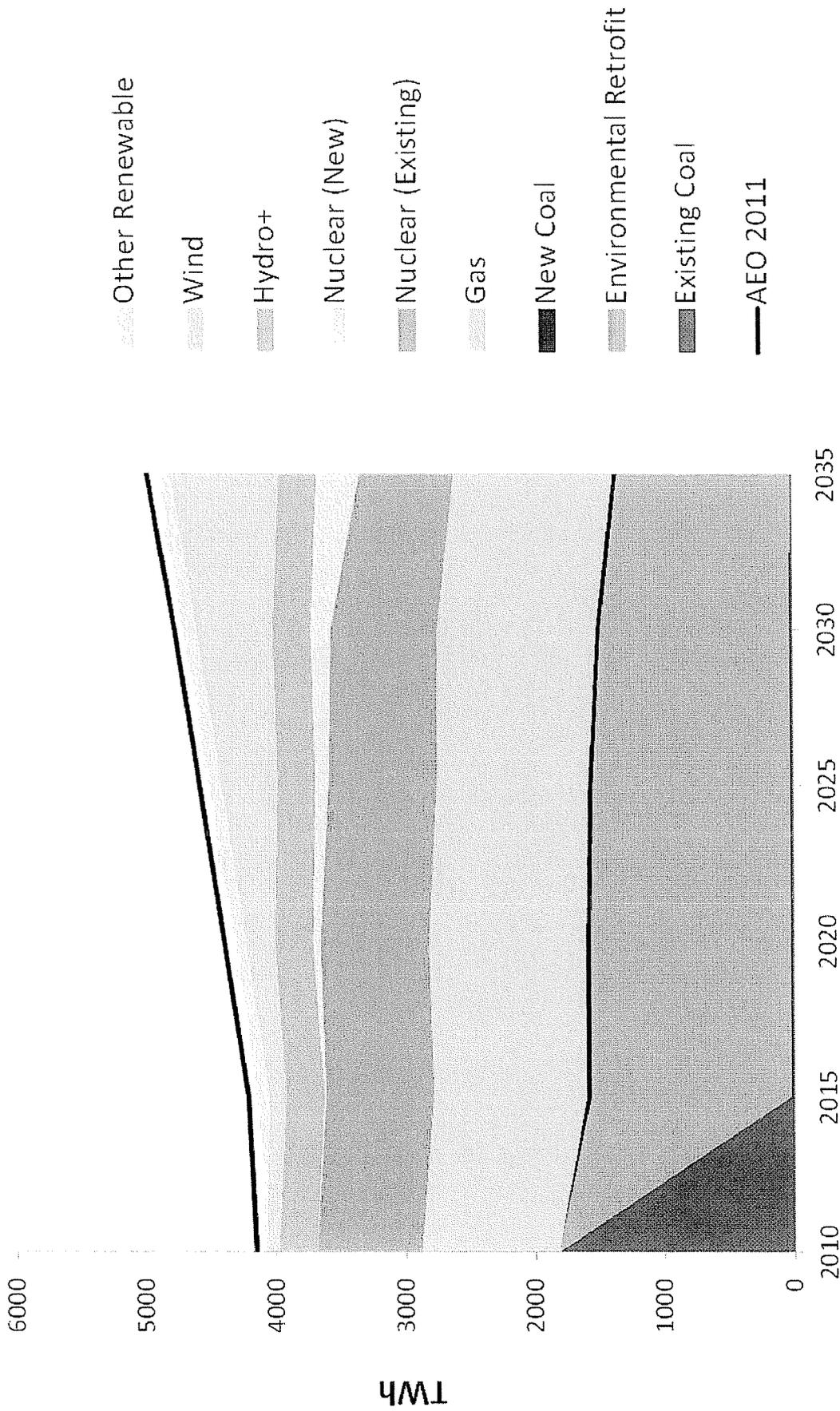
Comparison of Emissions by Level of Retrofits - High Scenario



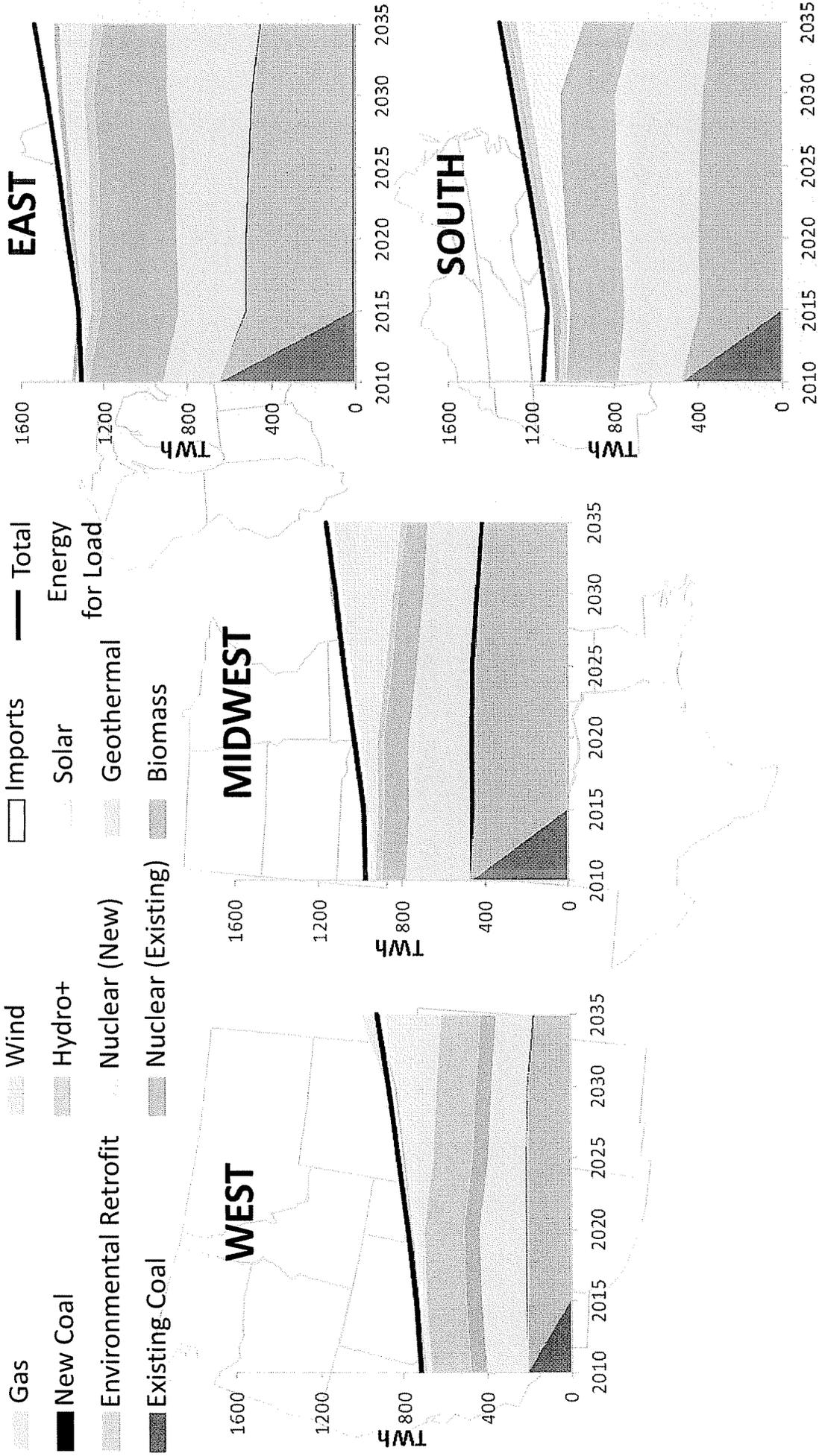
U.S. Electric Generation in Baseline



U.S. Electric Generation in Controls (Ref)



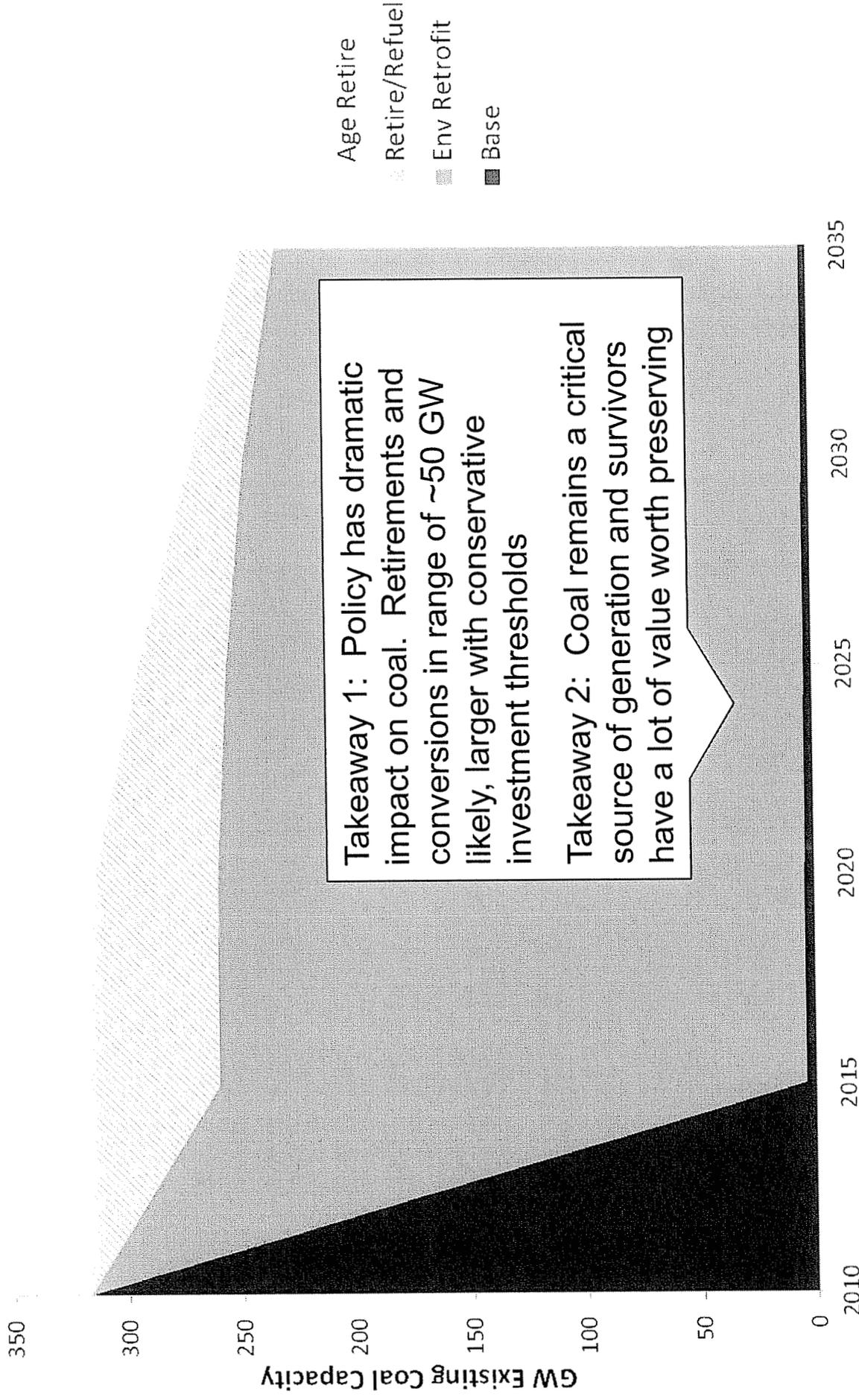
Regional Generation in Controls (Ref)



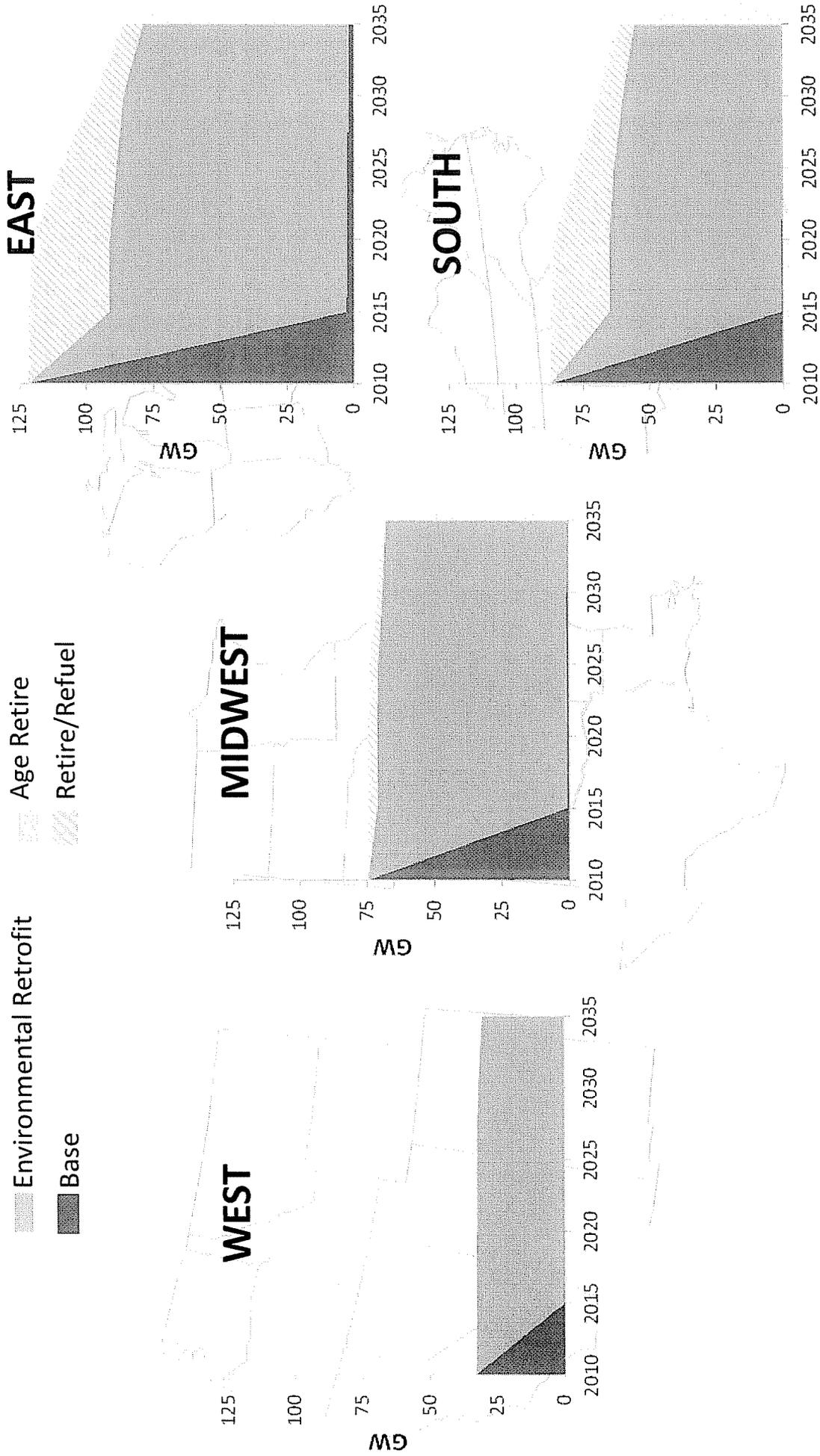
Coal Units May Cease to Operate Coal Due to Retirements as Well as Conversions to Gas

- Economics to retire or convert to gas or biomass can be very close
- Conversions can buy cheap capacity
- Capacity value depends on regional capacity needs and operating limitations of converted capacity
- Cost of conversion to gas can vary widely with distance to gas lines
- Many economically viable gas conversions may prove infeasible (e.g., siting, access to gas)
- As consequence we group units that cease to operate as coal into a Retire/Refuel category

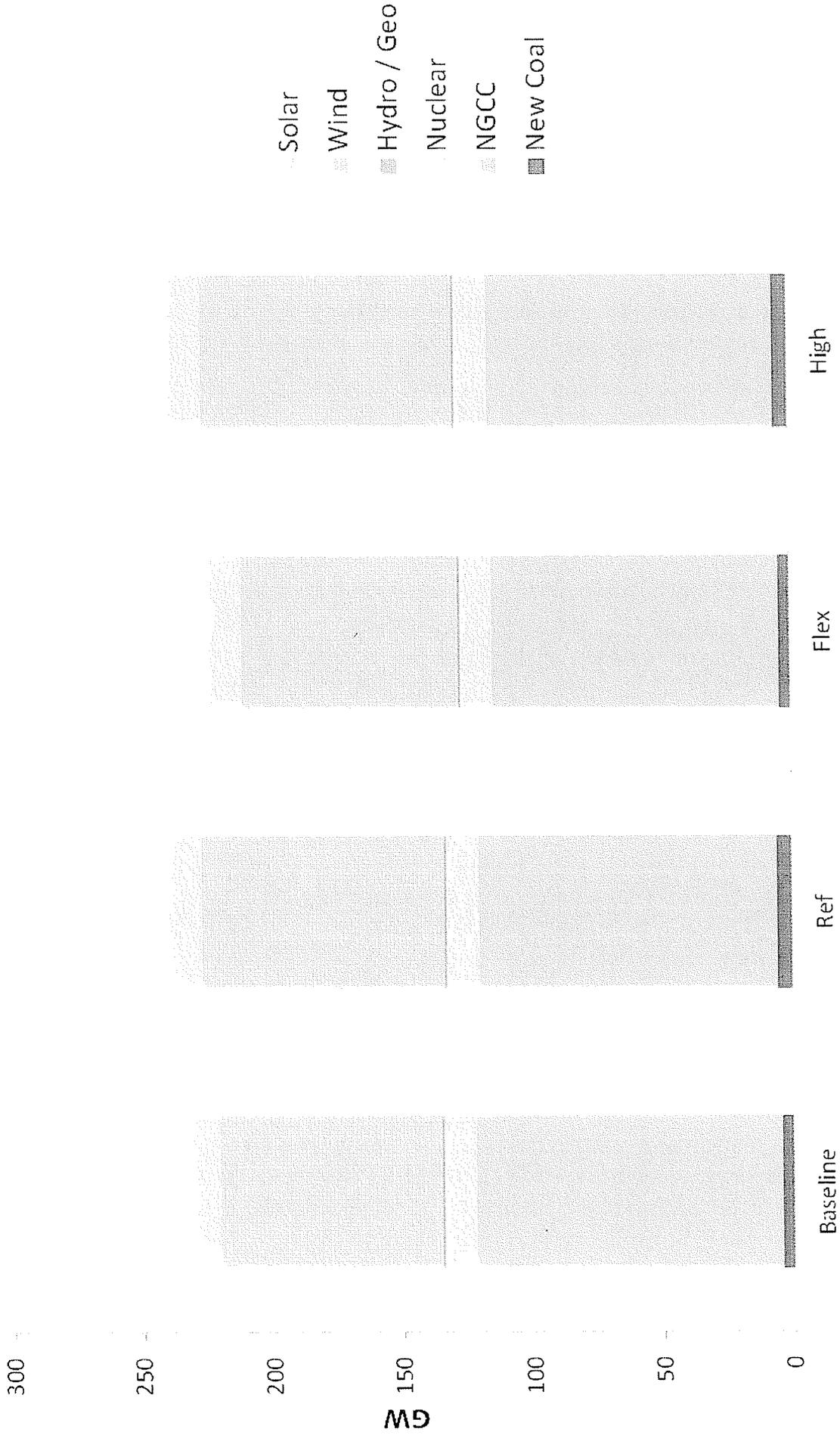
Existing Coal Disposition in Controls (Ref)



Regional Coal Disposition in Controls (Ref)

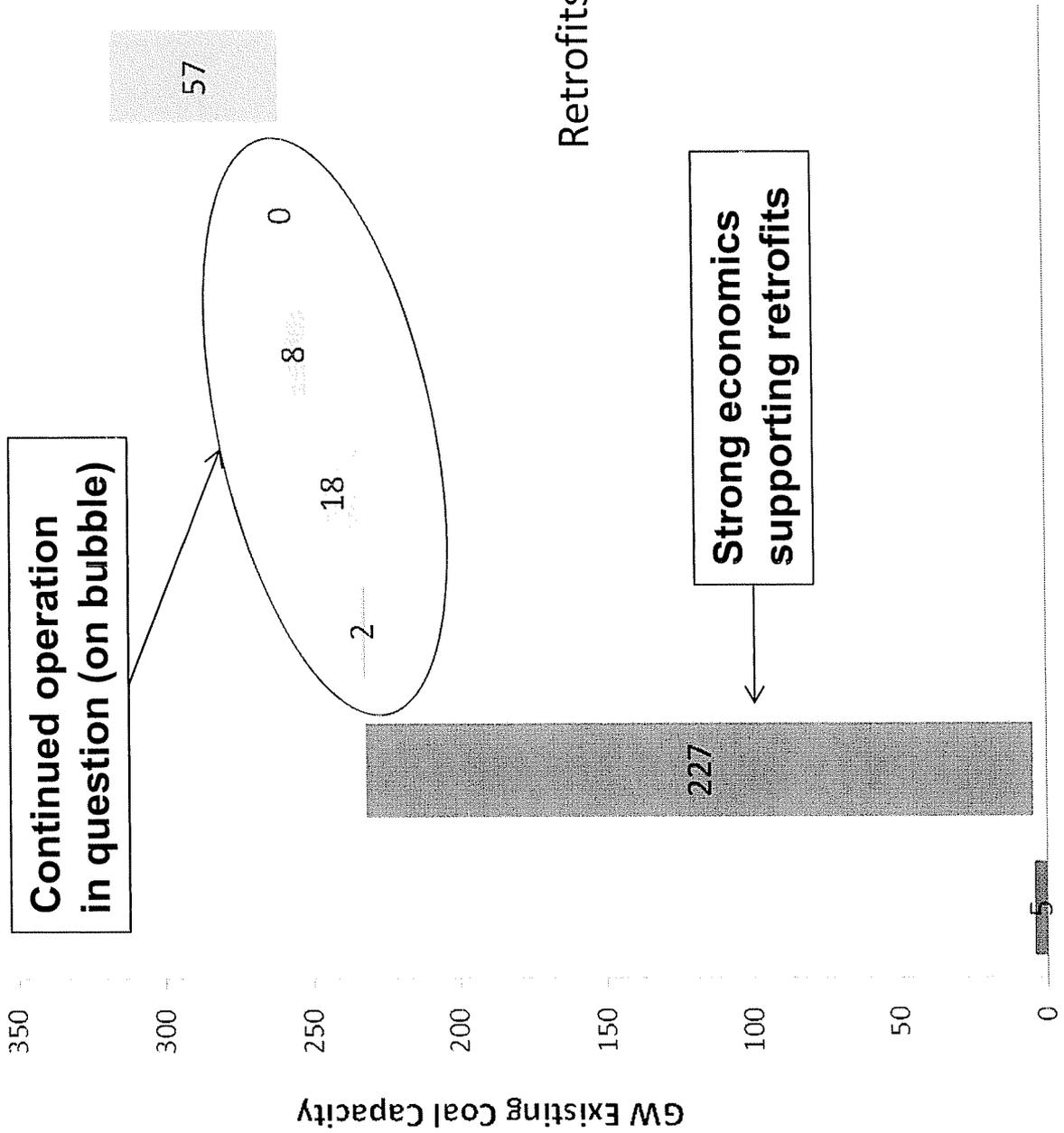


New Capacity Additions Through 2025

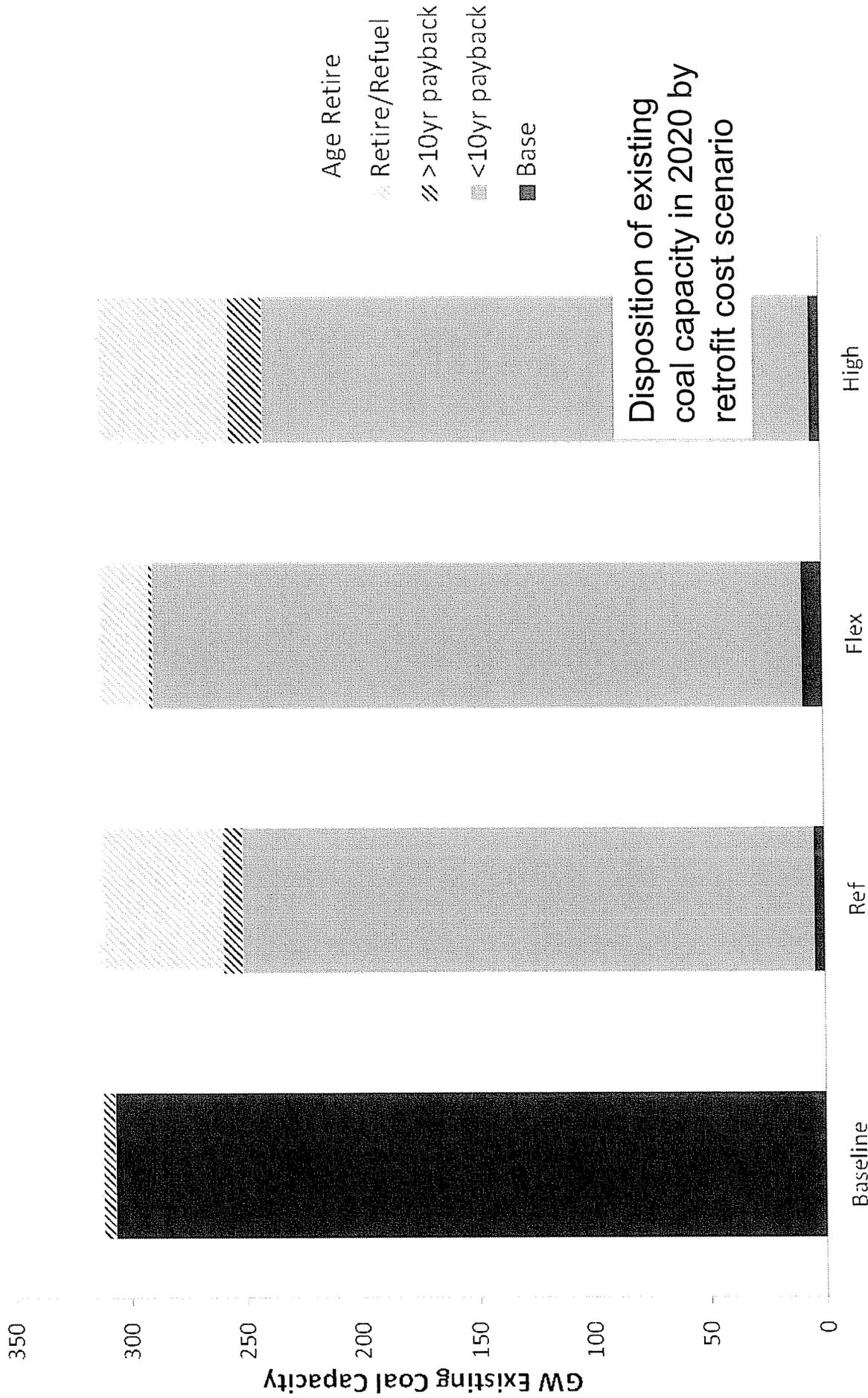


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Broad Distribution of Pay-offs for Retrofits of Existing Coal (Ref)

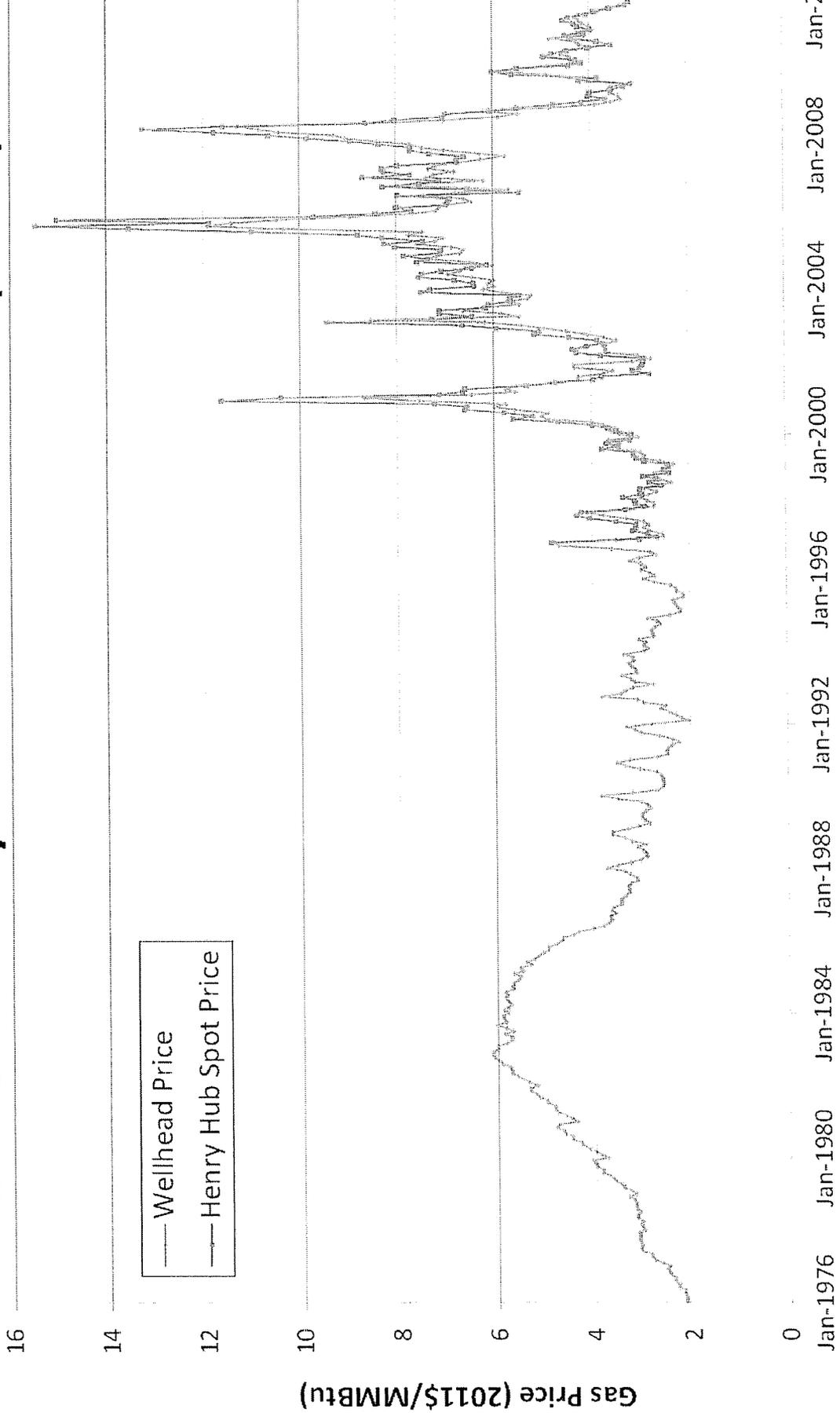


Potentially Large Fraction of Existing Coal Fleet May Retire or Refuel with Bio Energy or Gas

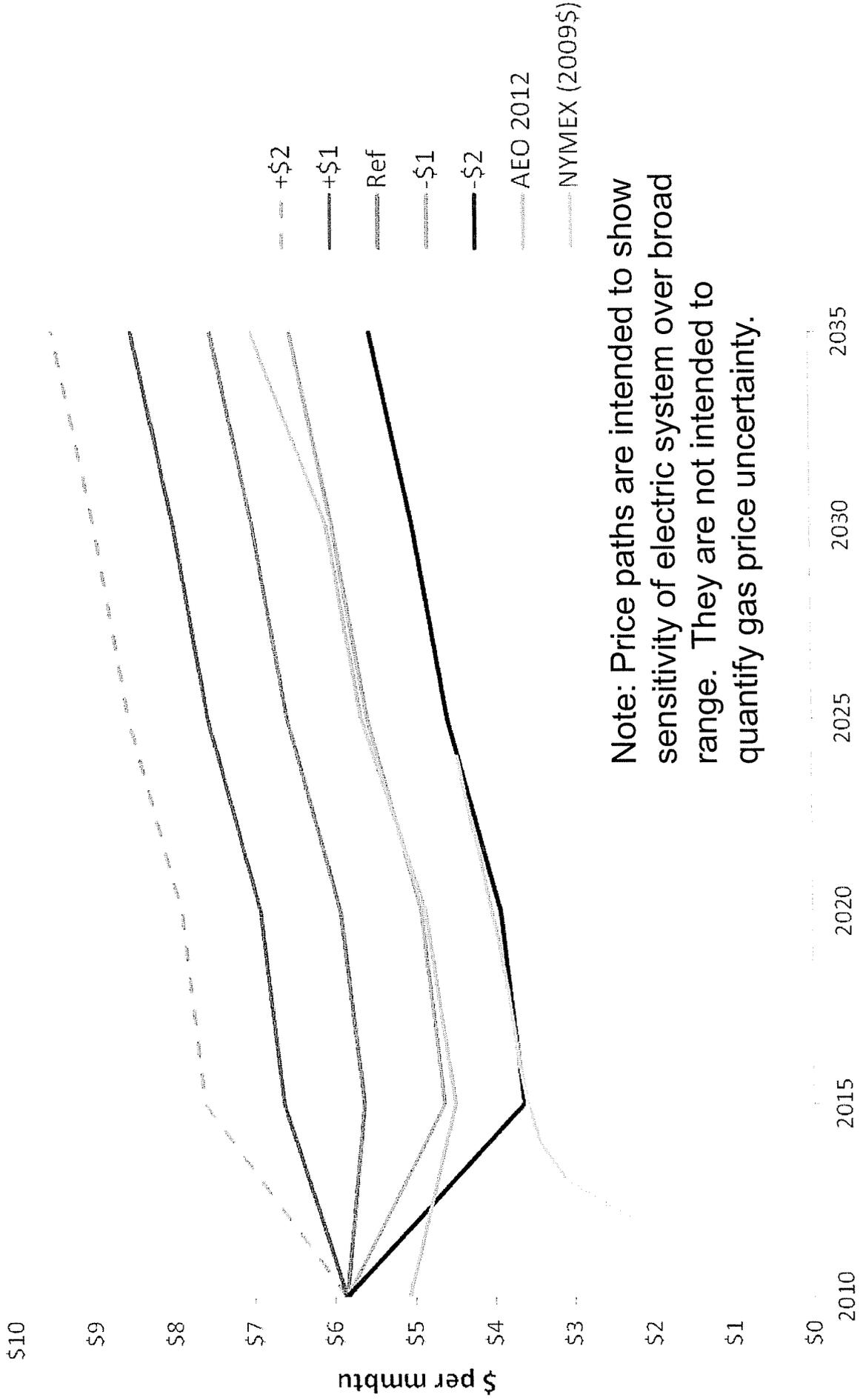


Long-term History of Natural Gas Prices Shows High Level of Variability

Historical Monthly U.S. Natural Gas Prices (2011\$)

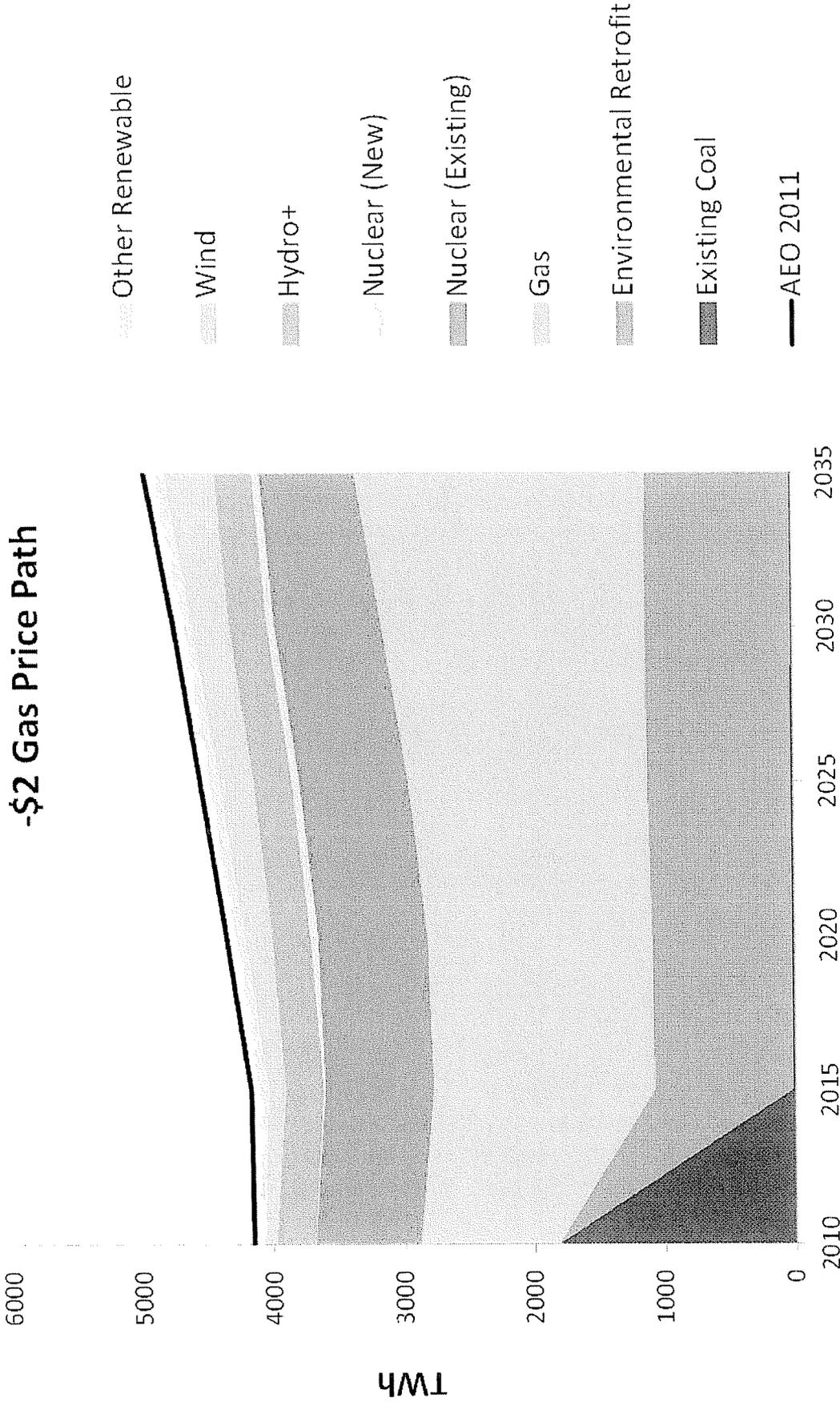


Sensitivity Analysis on Natural Gas Prices

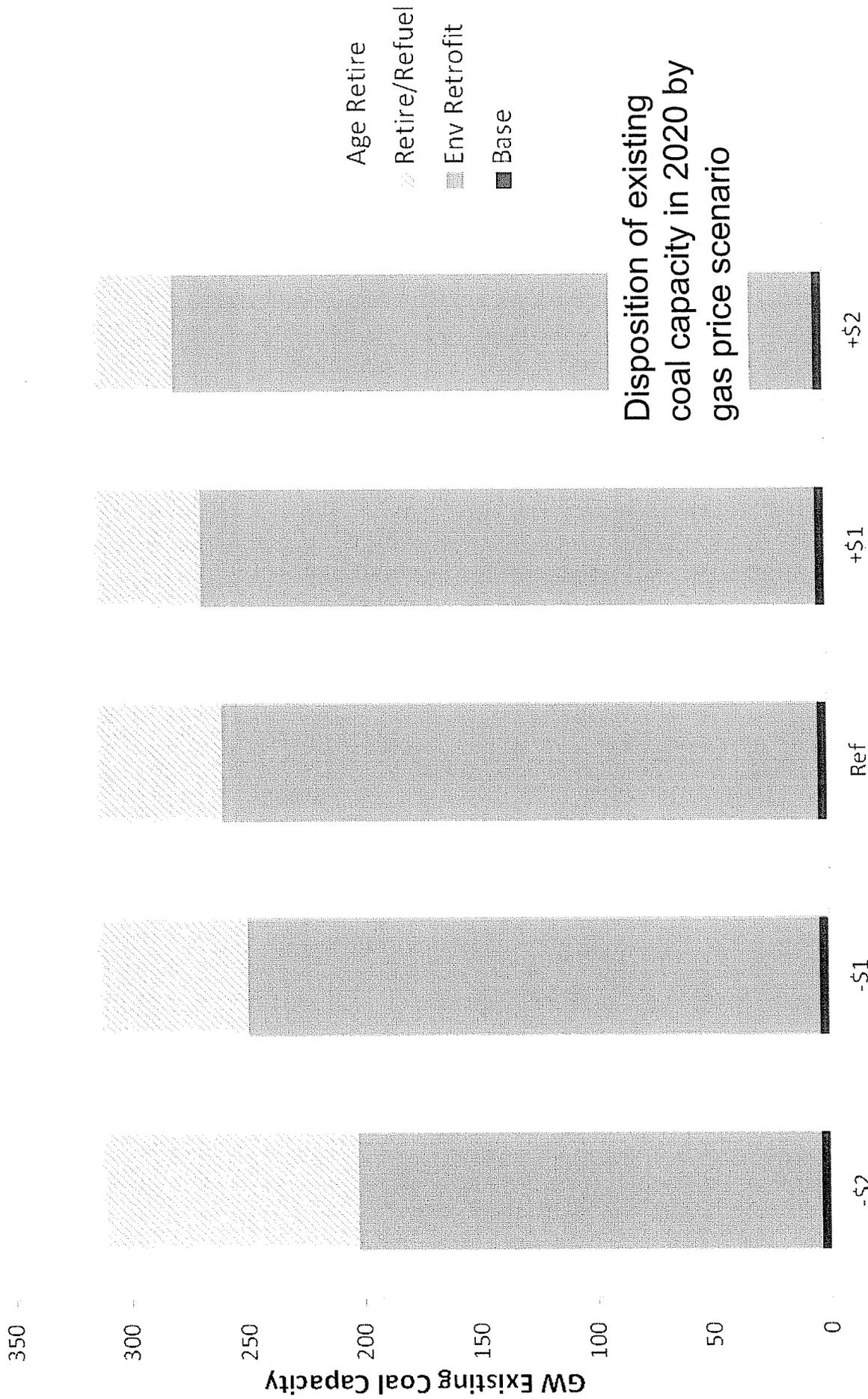


Note: Price paths are intended to show sensitivity of electric system over broad range. They are not intended to quantify gas price uncertainty.

Generation with low gas prices



Gas Price Scenarios Show Critical Role of Gas Price Expectations for How Much Coal Survives



Natural Gas Price is the Dominant Uncertainty

Uncertainty level is very high

- Price range over last decade shows over 5 to 1 ratio
- Are NYMEX futures and AEO 2012 projections going to continue to decline?

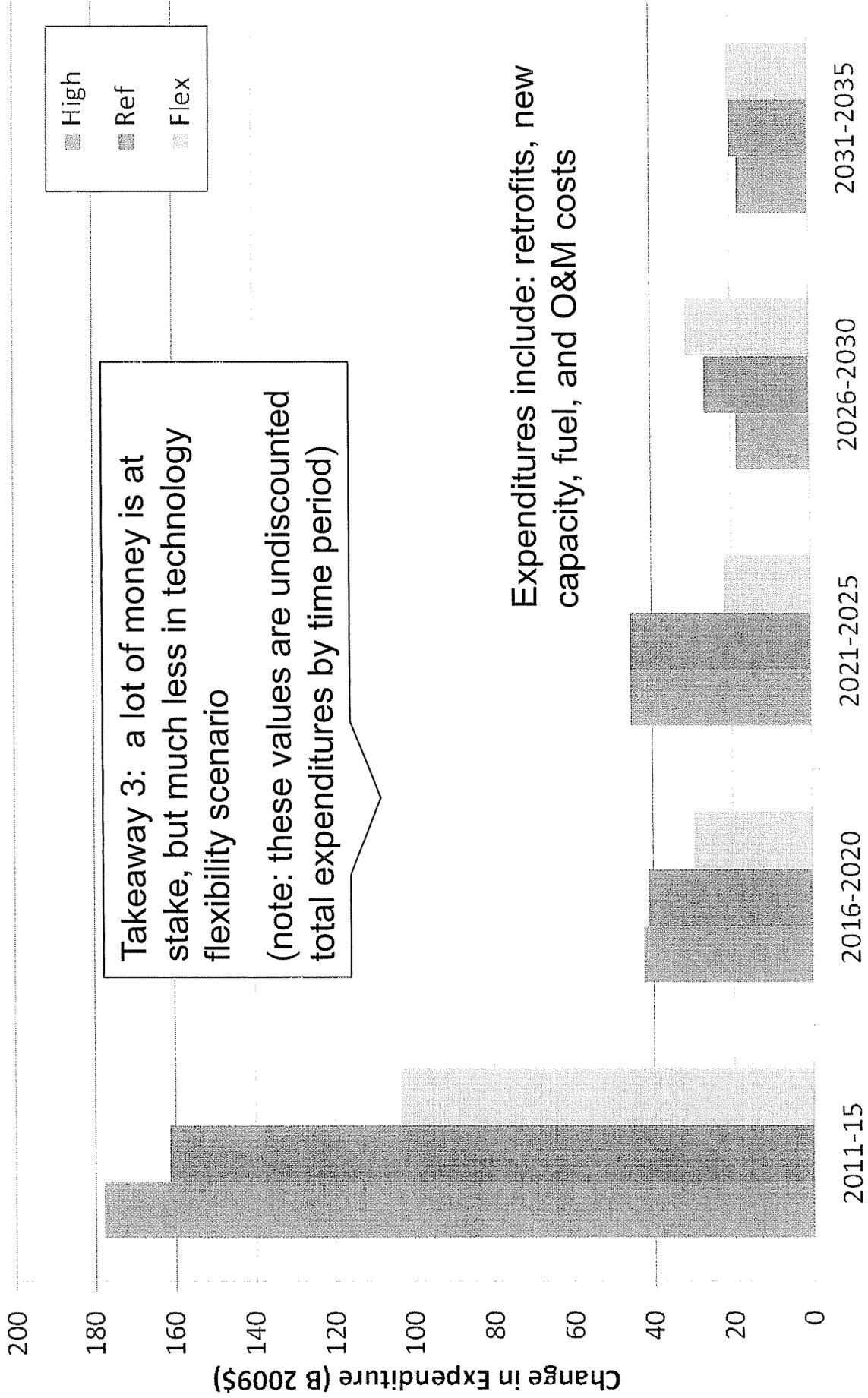
Dramatic consequences

- Average power prices show ~\$6/MWh swing for each \$1 change in gas prices
- Low price paths have particularly large impact on retrofit vs. retire/refuel decisions

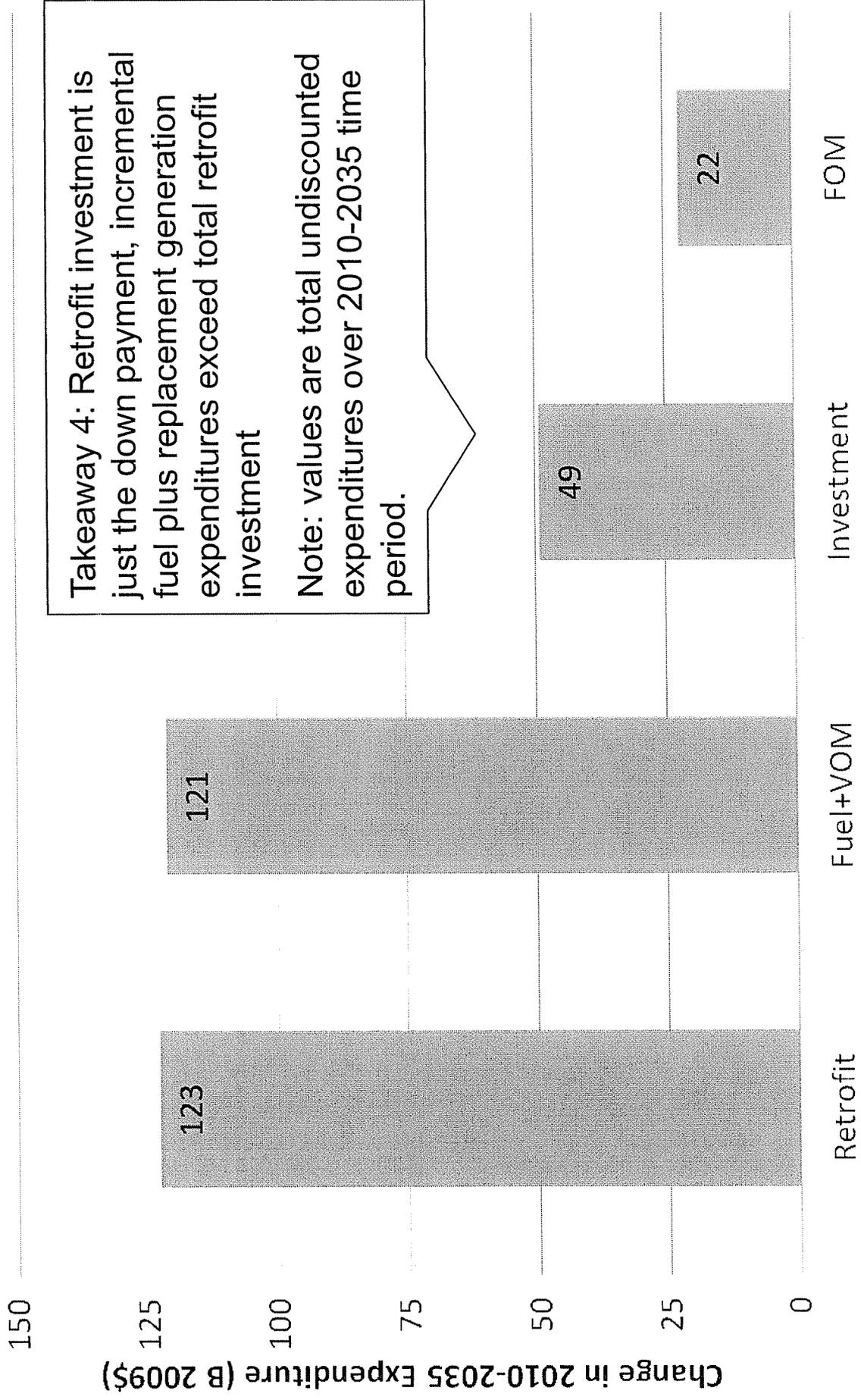
Implications for decisions

- Flexible compliance strategies with lower fixed costs (despite higher operating costs) reduce risk or regrets

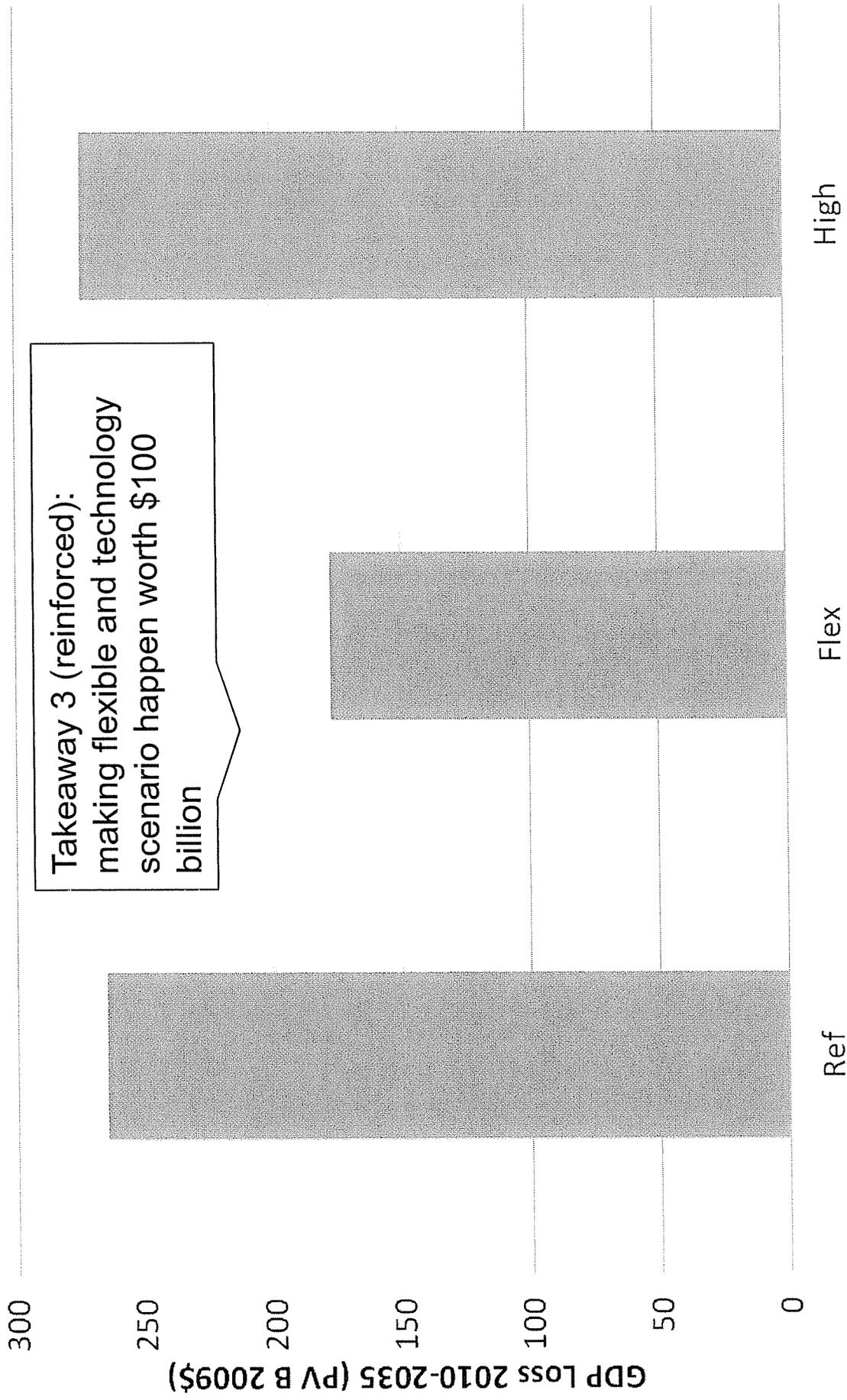
100's of Billions of Dollars in Possible Electric Sector Expenditures



Retrofit Investment is Only Part of Policy Expenditure Costs (Ref)

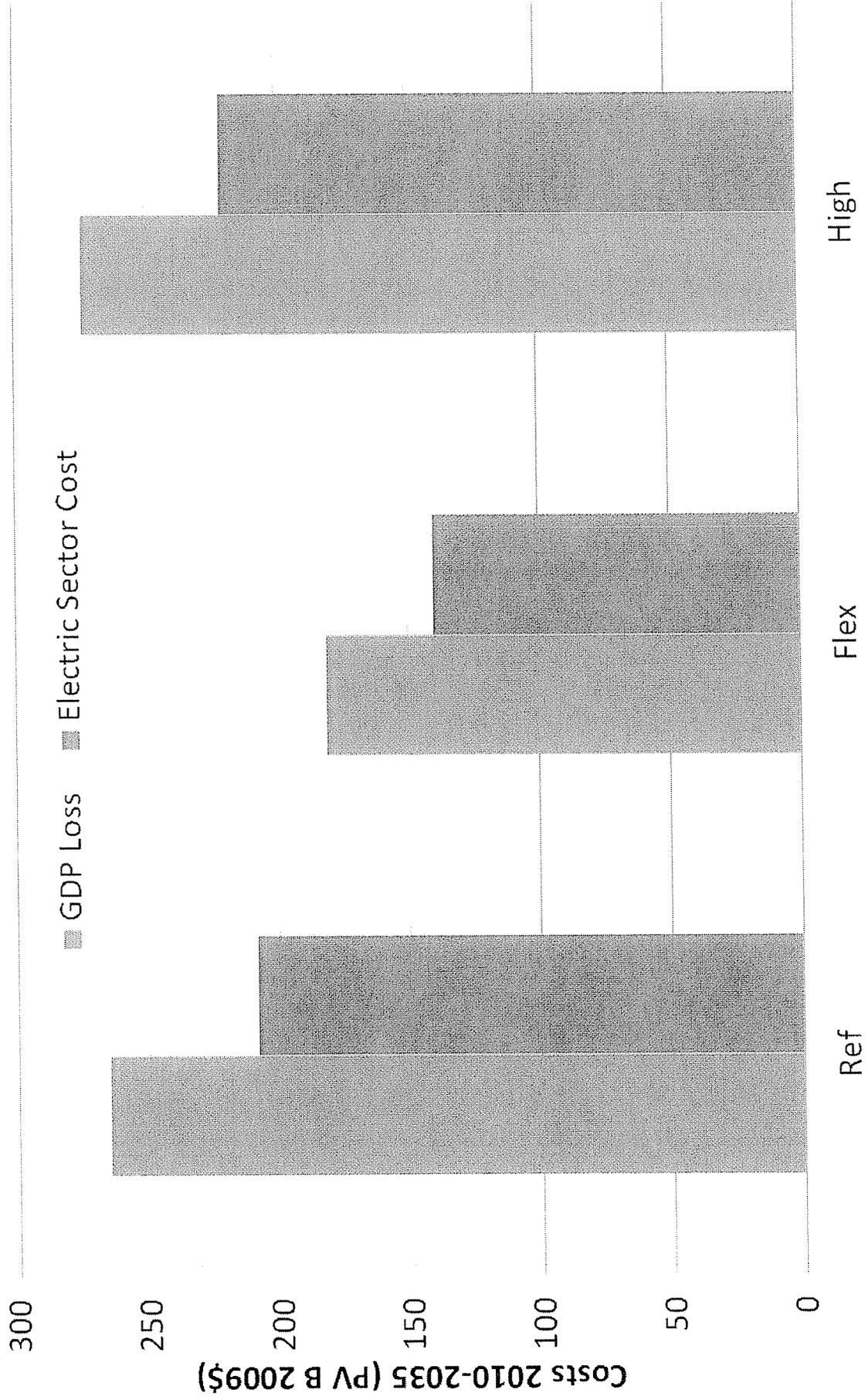


GDP Impacts Show Magnitude of Costs and Opportunity in Flexibility

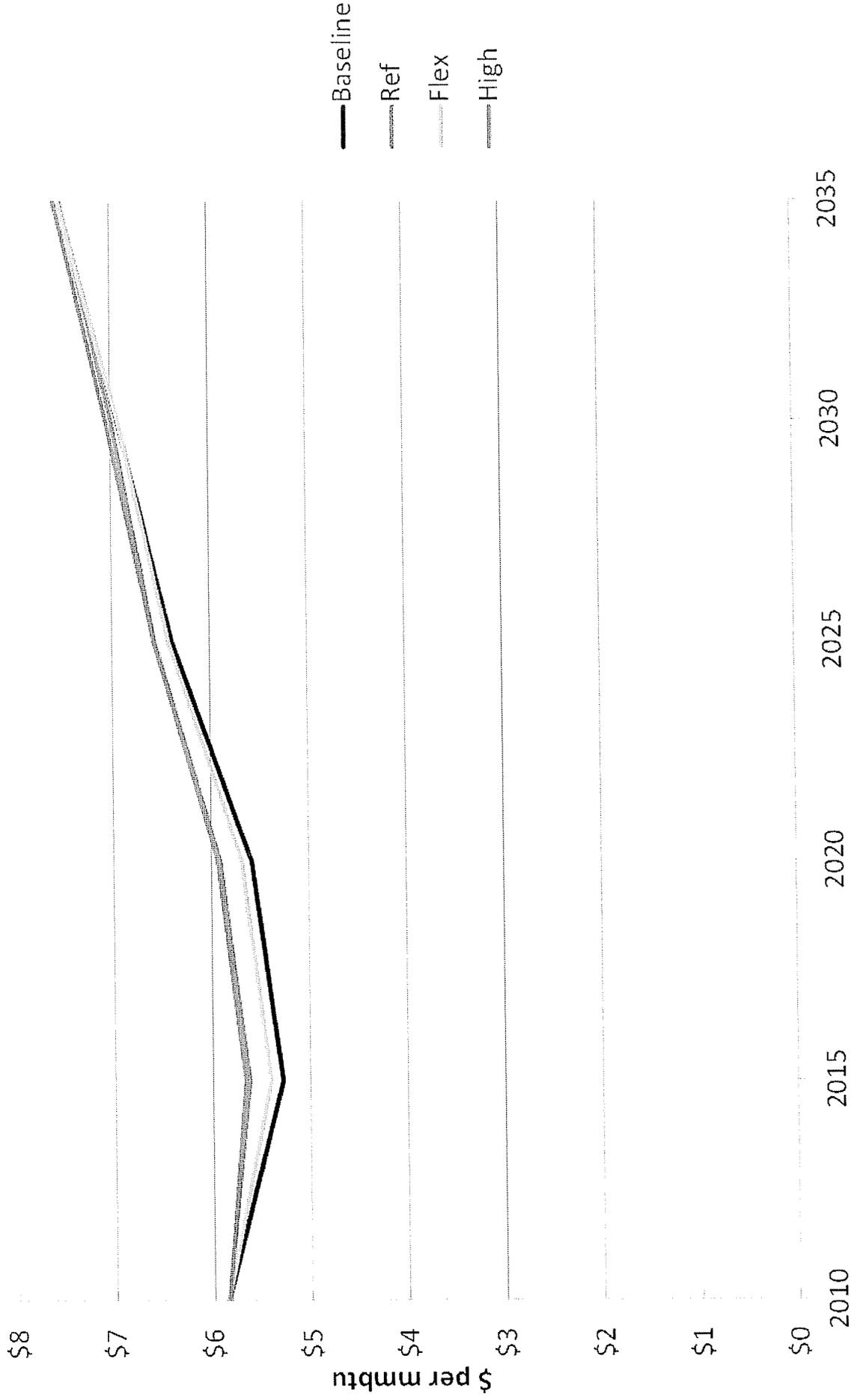


Takeaway 3 (reinforced):
making flexible and technology
scenario happen worth \$100
billion

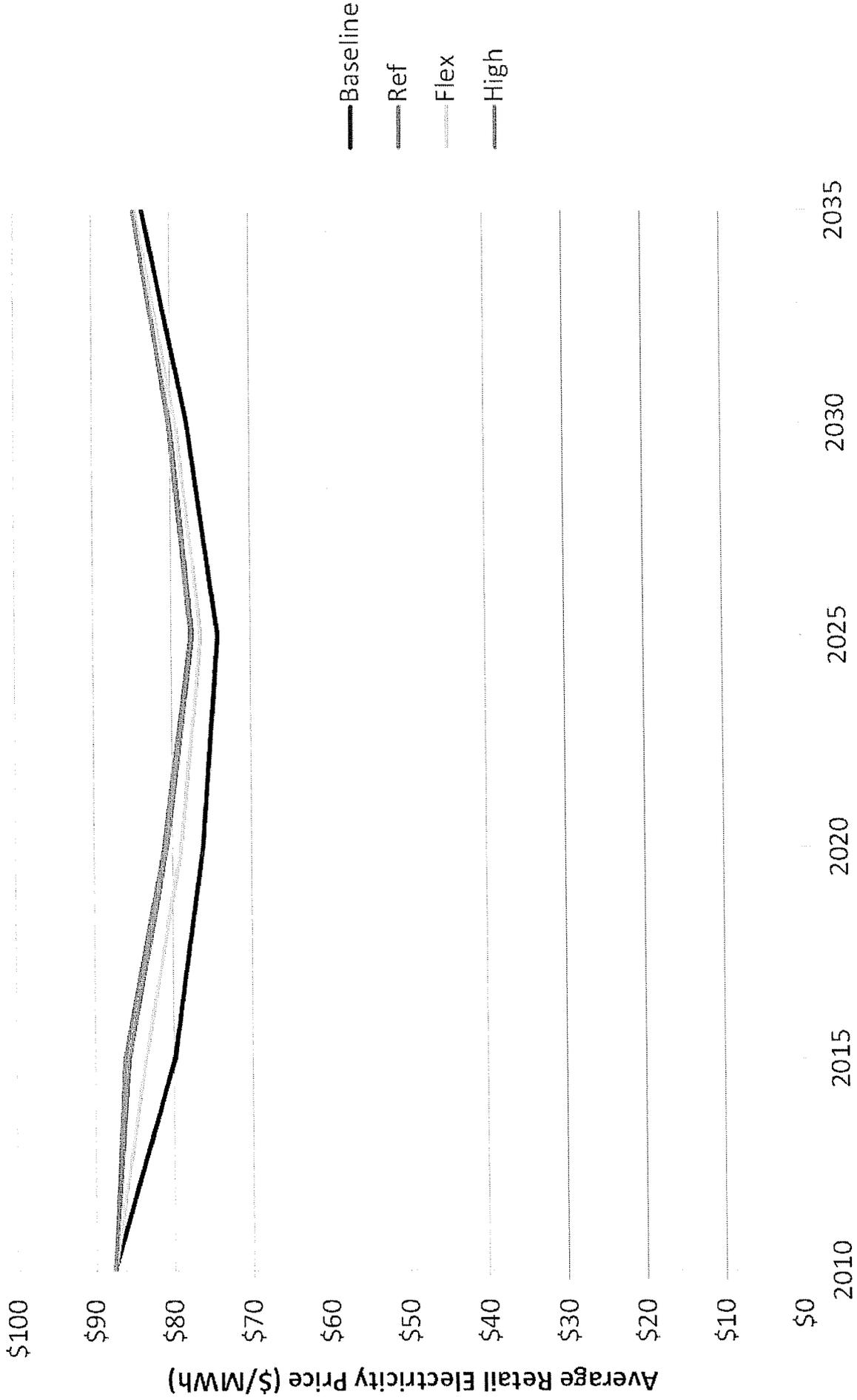
Note That Total GDP Impacts ~25% Greater Than Increased Cost to Electric Sector



U.S. Average Power Producers' Gas Price

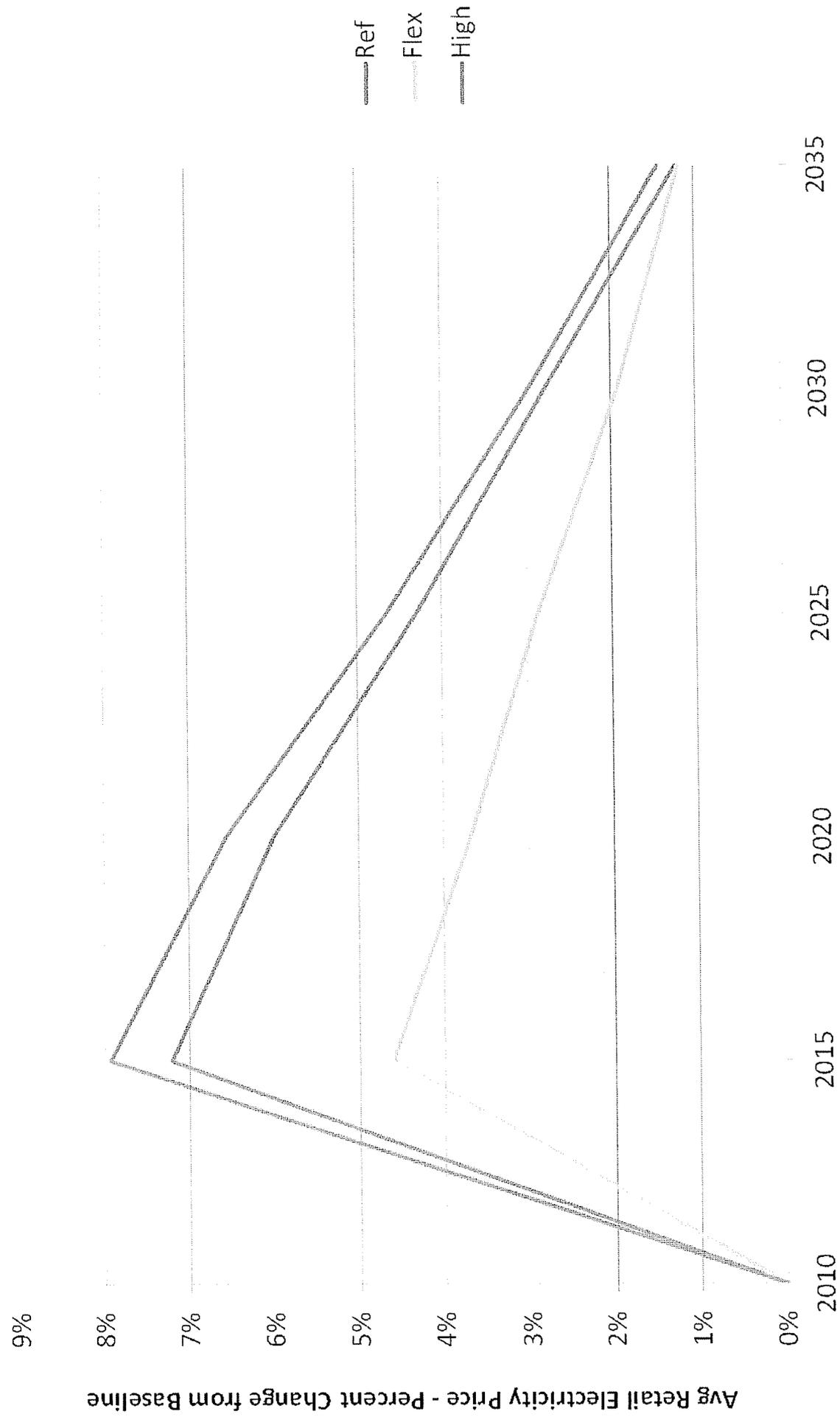


U.S. Average Retail Electricity Price

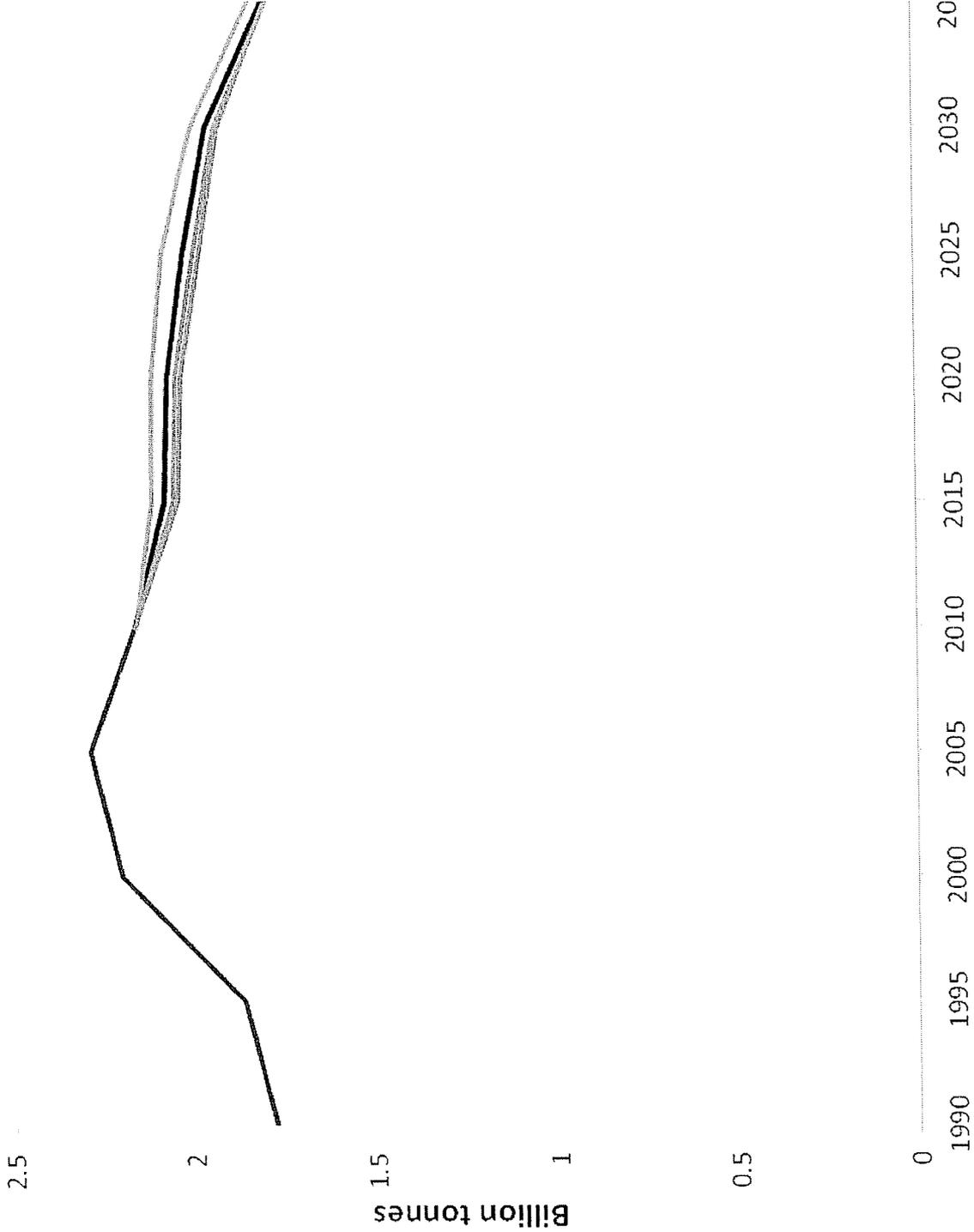


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U.S. Average Retail Electricity Price - Percent Change from Baseline



U.S. Electric Sector CO₂ Emissions



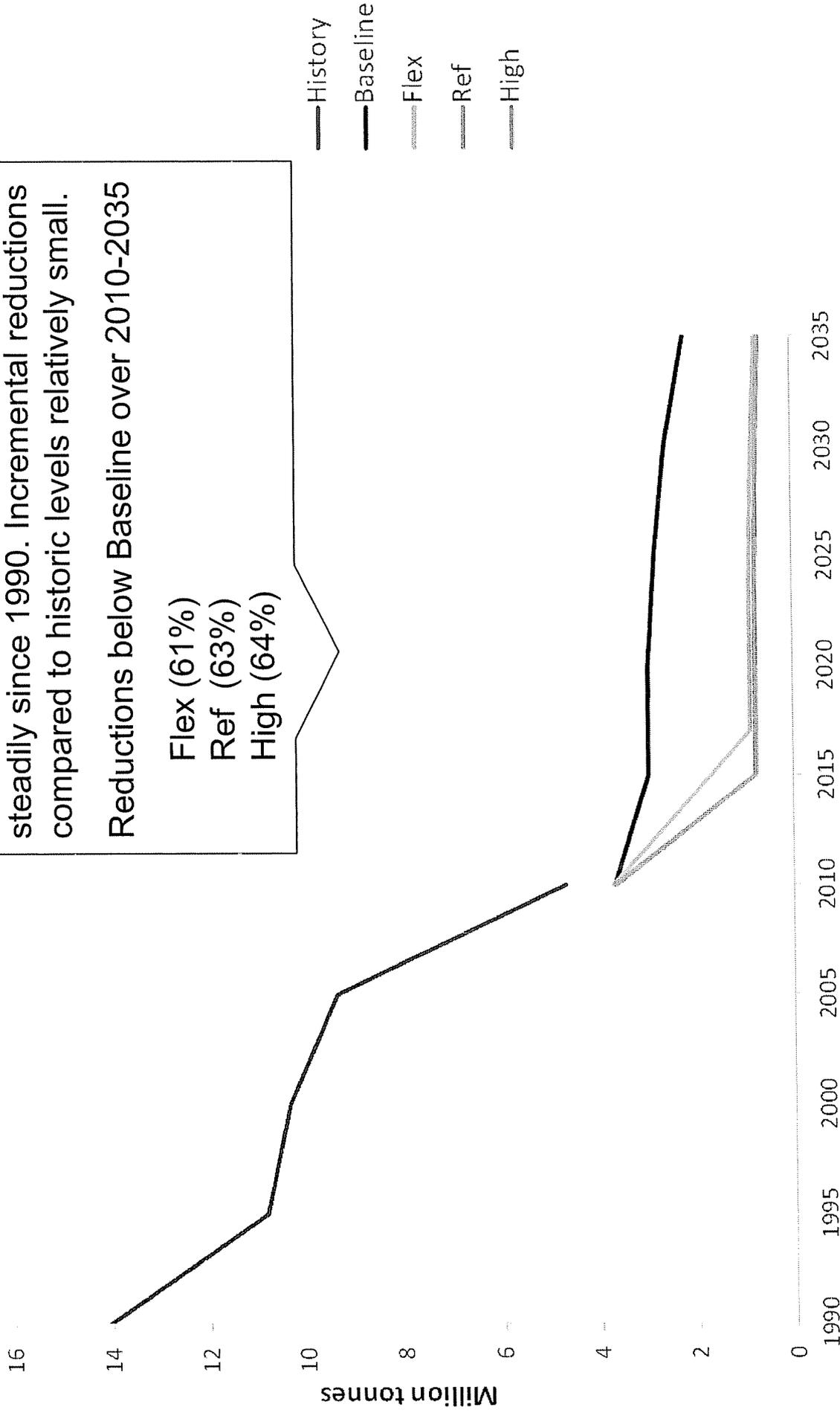
- History
- Baseline
- Flex
- Ref
- High

U.S. Electric Sector SO₂ Emissions

Takeaway 5: Emissions have declined steadily since 1990. Incremental reductions compared to historic levels relatively small.

Reductions below Baseline over 2010-2035

- Flex (61%)
- Ref (63%)
- High (64%)

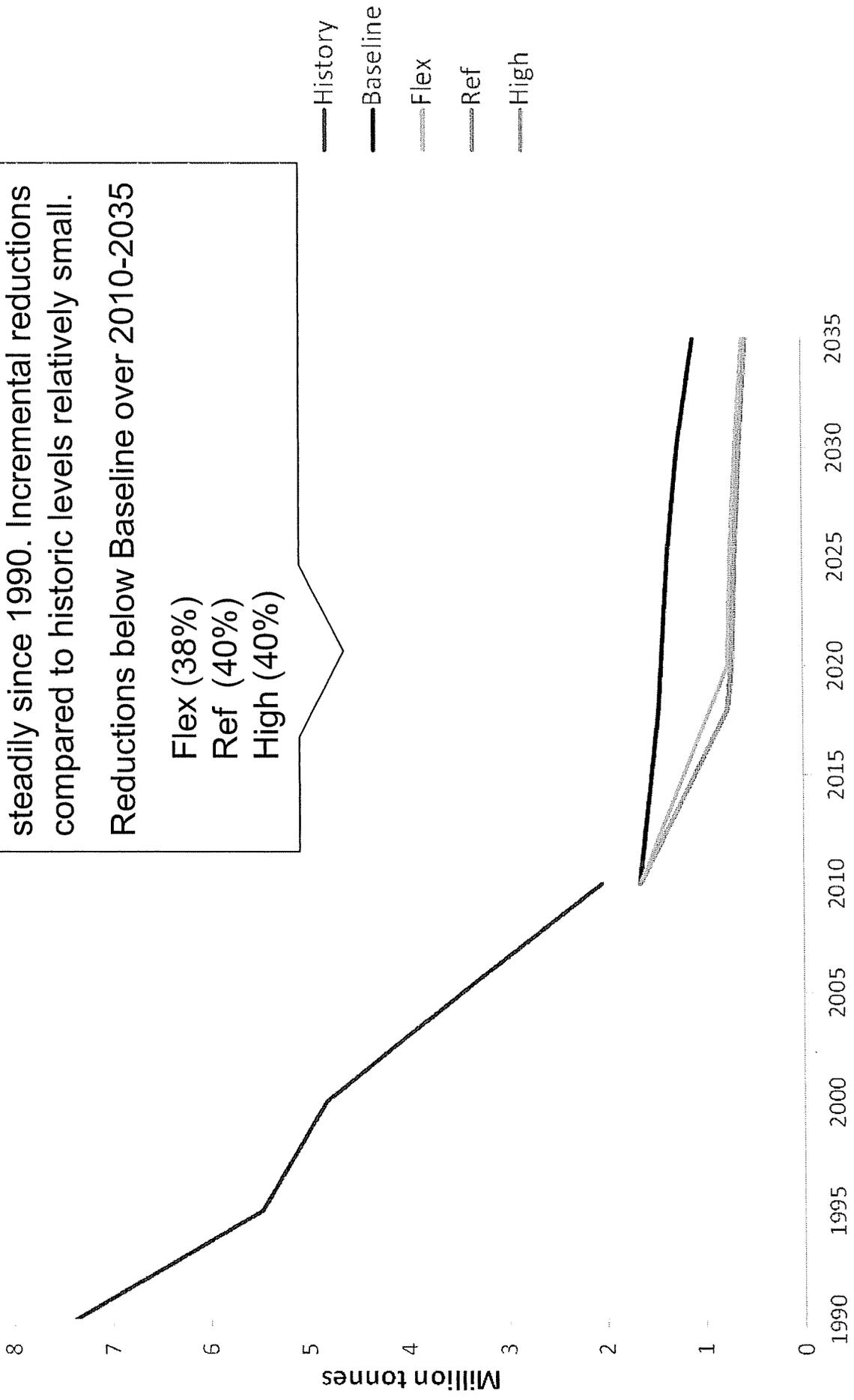


U.S. Electric Sector NO_x Emissions

Takeaway 5: Emissions have declined steadily since 1990. Incremental reductions compared to historic levels relatively small.

Reductions below Baseline over 2010-2035

- Flex (38%)
- Ref (40%)
- High (40%)



Concluding Observations

- Economic cost of full control policy is \$175B to \$275B (PV 2010-2035)
- Cost range driven by ability to deploy low-cost technologies, which may require policy flexibility and extra time to assess
- Cost impacts greatest in high-coal regions
- Compliance decisions dependent on gas price expectations
- 50 to 100+ GW of coal may retire or convert fuels
- Most of existing coal continues to play key role
- SO₂/NOx emissions drop to less than 30% of 2010 levels
- If emission reductions phased in over an extra two years the relative impact on cumulative emissions is modest

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Together... Shaping the Future of Electricity

Utility CO₂ Price References

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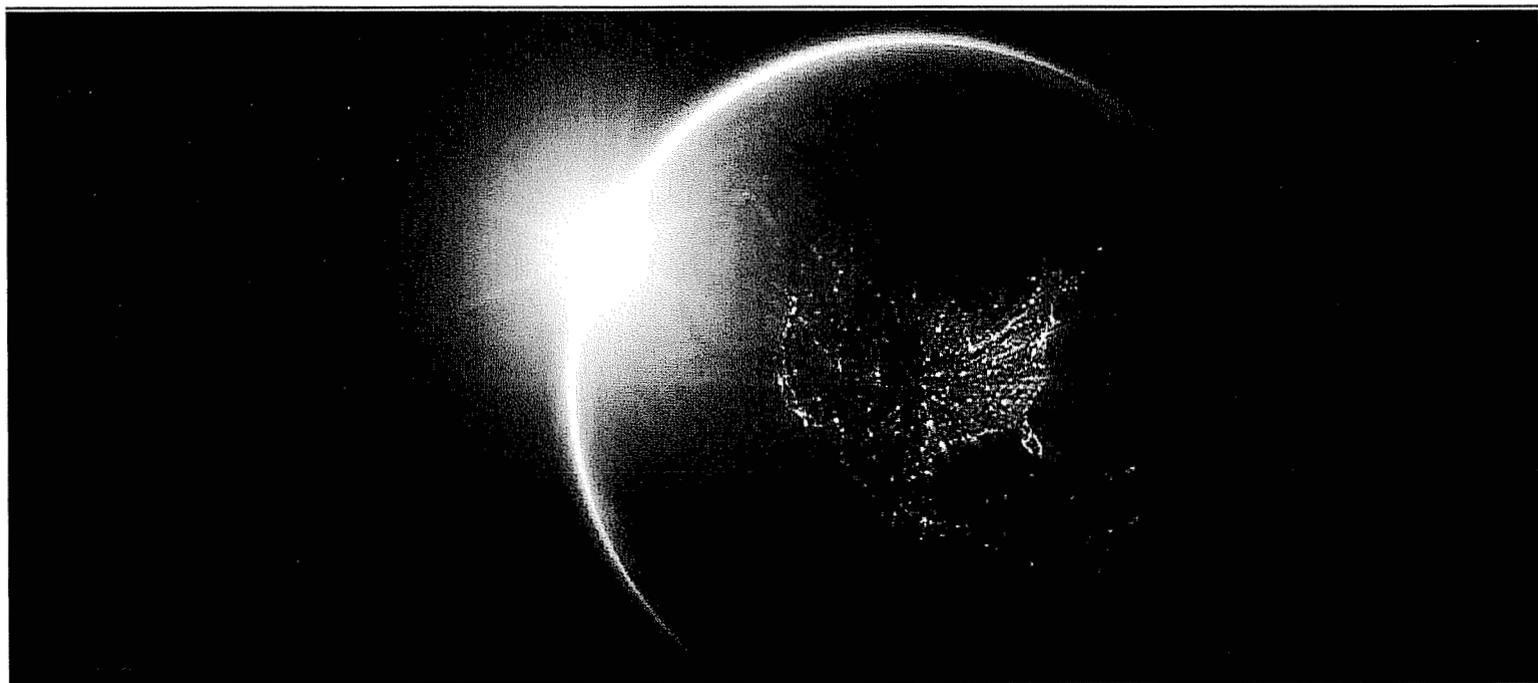
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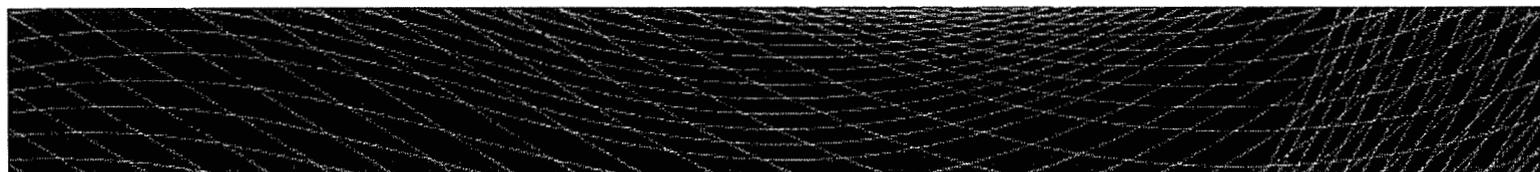
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Annual Energy Outlook 2012

with Projections to 2035



Department of Energy
U.S. Energy Information
Administration



For further information . . .

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The *Annual Energy Outlook 2012* is available on the EIA website at www.eia.gov/forecasts/aeo. Assumptions underlying the projections, tables of regional results, and other detailed results will also be available, at www.eia.gov/forecasts/aeo/assumptions. Model documentation reports for the National Energy Modeling System are available at website www.eia.gov/analysis/model-documentation.cfm and will be updated for the *Annual Energy Outlook 2012* during 2012.

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Annual Energy Outlook 2012

With Projections to 2035

June 2012

U.S. Energy Information Administration
Office of Integrated and International Energy Analysis
U.S. Department of Energy
Washington, DC 20585

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Preface

The *Annual Energy Outlook 2012* (AEO2012), prepared by the U.S. Energy Information Administration (EIA), presents long-term projections of energy supply, demand, and prices through 2035, based on results from EIA's National Energy Modeling System (NEMS). EIA published an "early release" version of the AEO2012 Reference case in January 2012.

The report begins with an "Executive summary" that highlights key aspects of the projections. It is followed by a "Legislation and regulations" section that discusses evolving legislative and regulatory issues, including a summary of recently enacted legislation and regulations, such as: the Mercury and Air Toxics Standards (MATS) issued by the U.S. Environmental Protection Agency (EPA) in December 2011 [1]; the Cross-State Air Pollution Rule (CSAPR) as finalized by the EPA in July 2011 [2]; the new fuel efficiency standards for medium- and heavy-duty vehicles published by the EPA and the National Highway Traffic Safety Administration (NHTSA) in September 2011 [3]; and regulations pertaining to the power sector in California Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006 [4].

The "Issues in focus" section contains discussions of selected energy topics, including a discussion of the results in two cases that adopt different assumptions about the future course of existing policies: one case assumes the extension of a selected group of existing public policies—corporate average fuel economy (CAFE) standards, appliance standards, production tax credits, and the elimination of sunset provisions in existing energy policies; the other case assumes only the elimination of sunset provisions. Other discussions include: oil price and production trends in the AEO2012; potential efficiency improvements and their impacts on end-use energy demand; energy impacts of proposed CAFE standards for light-duty vehicles (LDVs), model years (MYs) 2017 to 2025; impacts of a breakthrough in battery vehicle technology; heavy-duty (HD) natural gas vehicles (NGVs); changing structure of the refining industry; changing environment for fuel use in electricity generation; nuclear power in AEO2012; potential impact of minimum pipeline throughput constraints on Alaska North Slope oil production; U.S. crude oil and natural gas resource uncertainty; and evolving Marcellus shale gas resource estimates.

The "Market trends" section summarizes the projections for energy markets. The analysis in AEO2012 focuses primarily on a Reference case, Low and High Economic Growth cases, and Low and High Oil Price cases. Results from a number of other alternative cases also are presented, illustrating uncertainties associated with the Reference case projections for energy demand, supply, and prices. Complete tables for the five primary cases are provided in Appendixes A through C. Major results from many of the alternative cases are provided in Appendix D. Complete tables for all the alternative cases are available on EIA's website in a table browser at www.eia.gov/otia/aeo/tablebrowser.

AEO2012 projections are based generally on Federal, State, and local laws and regulations in effect as of the end of December 2011. The potential impacts of pending or proposed legislation, regulations, and standards (and sections of existing legislation that require implementing regulations or funds that have not been appropriated) are not reflected in the projections. In certain situations, however, where it is clear that a law or regulation will take effect shortly after the AEO is completed, it may be considered in the projection.

AEO2012 is published in accordance with Section 205c of the U.S. Department of Energy (DOE) Organization Act of 1977 (Public Law 95-91), which requires the EIA Administrator to prepare annual reports on trends and projections for energy use and supply.

Projections by EIA are not statements of what will happen but of what might happen, given the assumptions and methodologies used for any particular scenario. The Reference case projection is a business-as-usual trend estimate, given known technology and technological and demographic trends. EIA explores the impacts of alternative assumptions in other scenarios with different macroeconomic growth rates, world oil prices, and rates of technology progress. The main cases in AEO2012 generally assume that current laws and regulations are maintained throughout the projections. Thus, the projections provide policy-neutral baselines that can be used to analyze policy initiatives.

While energy markets are complex, energy models are simplified representations of energy production and consumption, regulations, and producer and consumer behavior. Projections are highly dependent on the data, methodologies, model structures, and assumptions used in their development. Behavioral characteristics are indicative of real-world tendencies rather than representations of specific outcomes.

Energy market projections are subject to much uncertainty. Many of the events that shape energy markets are random and cannot be anticipated. In addition, future developments in technologies, demographics, and resources cannot be foreseen with certainty. Many key uncertainties in the AEO2012 projections are addressed through alternative cases.

EIA has endeavored to make these projections as objective, reliable, and useful as possible; however, they should serve as an adjunct to, not a substitute for, a complete and focused analysis of public policy initiatives.

Updated *Annual Energy Outlook 2012* Reference case (June 2012)

The *Annual Energy Outlook 2012* (AEO2012) Reference case included as part of this complete report, released in June 2012, was updated from the Reference case released as part of the AEO2012 Early Release Overview in January 2012. The Reference case was updated to incorporate modeling changes and reflect new legislation or regulation that was not available when the Early Release Overview version of the Reference case was published. Major changes made in the Reference include:

- The Mercury and Air Toxics Standards (MATS) issued by the EPA in December 2011 was incorporated.
- The long-term macroeconomic projection was revised, based on the November 2011 long-term projection from IHS Global Insights, Inc.
- The Cross-State Air Pollution Rule (CSAPR), which was included in the Early Release Reference case, was kept in the final Reference case. In December 2011, a District Court delayed the rule from going into effect while in litigation.
- The California Low Carbon Fuel Standard (LCFS) was removed from the final Reference case, given the Federal court ruling in December 2011 that found some aspects of it to be unconstitutional.
- Historical data and equations for the transportation sector were revised to reflect revised data from NHTSA and FHWA.
- A new cement model was incorporated in the industrial sector.
- Photovoltaic capacity estimates for recent historical years (2009 and 2010) were updated to line up more closely with Solar Energy Industries Association (SEIA) and Interstate Renewable Energy Council (IREC) reports.
- Gulf of Mexico production data were revised downward to reflect data reported by the Bureau of Ocean Energy Management more closely.
- Data in the electricity model were revised to reflect 2009 electric utility financial data (electric utility plant in service, operations and maintenance costs, etc.) and refine the breakdown of associated costs between the generation, transmission, and distribution components.
- Higher capital costs for fabric filters were adopted in the analysis of MATS, based on EPA data.
- Reservoir-level oil data were updated to improve the API gravity and sulfur content data elements.
- The assumed volume of natural gas used at export liquefaction facilities was revised.

Future analyses using the AEO2012 Reference case will start from the version of the Reference case released with this complete report.

Endnotes for Preface

Links current as of June 2012

1. U.S. Environmental Protection Agency, "Mercury and Air Toxics Standards," website www.epa.gov/mats.
2. U.S. Environmental Protection Agency, "Cross-State Air Pollution Rule (CSAPR)," website epa.gov/airtransport.
3. U.S. Environmental Protection Agency and National Highway Traffic Safety Administration, "Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles; Final Rule," *Federal Register*, Vol. 76, No. 179 (September 15, 2011), pp. 57106-57513, website www.gpo.gov/fdsys/pkg/FR-2011-09-15/html/2011-20740.htm.
4. California Environmental Protection Agency, Air Resources Board, "Assembly Bill 32: Global Warming Solutions Act of 2006," website www.arb.ca.gov/cc/ab32/ab32.htm.

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Executive summary

The projections in the U.S. Energy Information Administration's (EIA's) *Annual Energy Outlook 2012 (AEO2012)* focus on the factors that shape the U.S. energy system over the long term. Under the assumption that current laws and regulations remain unchanged throughout the projections, the *AEO2012* Reference case provides the basis for examination and discussion of energy production, consumption, technology, and market trends and the direction they may take in the future. It also serves as a starting point for analysis of potential changes in energy policies. But *AEO2012* is not limited to the Reference case. It also includes 29 alternative cases (see Appendix E, Table E1), which explore important areas of uncertainty for markets, technologies, and policies in the U.S. energy economy. Many of the implications of the alternative cases are discussed in the "Issues in focus" section of this report.

Key results highlighted in *AEO2012* include continued modest growth in demand for energy over the next 25 years and increased domestic crude oil and natural gas production, largely driven by rising production from tight oil and shale resources. As a result, U.S. reliance on imported oil is reduced; domestic production of natural gas exceeds consumption, allowing for net exports; a growing share of U.S. electric power generation is met with natural gas and renewables; and energy-related carbon dioxide emissions remain below their 2005 level from 2010 to 2035, even in the absence of new Federal policies designed to mitigate greenhouse gas (GHG) emissions.

The rate of growth in energy use slows over the projection period, reflecting moderate population growth, an extended economic recovery, and increasing energy efficiency in end-use applications

Overall U.S. energy consumption grows at an average annual rate of 0.3 percent from 2010 through 2035 in the *AEO2012* Reference case. The U.S. does not return to the levels of energy demand growth experienced in the 20 years prior to the 2008-2009 recession, because of more moderate projected economic growth and population growth, coupled with increasing levels of energy efficiency. For some end uses, current Federal and State energy requirements and incentives play a continuing role in requiring more efficient technologies. Projected energy demand for transportation grows at an annual rate of 0.1 percent from 2010 through 2035 in the Reference case, and electricity demand grows by 0.7 percent per year, primarily as a result of rising energy consumption in the buildings sector. Energy consumption per capita declines by an average of 0.6 percent per year from 2010 to 2035 (Figure 1). The energy intensity of the U.S. economy, measured as primary energy use in British thermal units (Btu) per dollar of gross domestic product (GDP) in 2005 dollars, declines by an average of 2.1 percent per year from 2010 to 2035. New Federal and State policies could lead to further reductions in energy consumption. The potential impact of technology change and the proposed vehicle fuel efficiency standards on energy consumption are discussed in "Issues in focus."

Domestic crude oil production increases

Domestic crude oil production has increased over the past few years, reversing a decline that began in 1986. U.S. crude oil production increased from 5.0 million barrels per day in 2008 to 5.5 million barrels per day in 2010. Over the next 10 years, continued development of tight oil, in combination with the ongoing development of offshore resources in the Gulf of Mexico, pushes domestic crude oil production higher. Because the technology advances that have provided for recent increases in supply are still in the early stages of development, future U.S. crude oil production could vary significantly, depending on the outcomes of key uncertainties related to well placement and recovery rates. Those uncertainties are highlighted in this *Annual Energy Outlook's* "Issues in focus" section, which includes an article examining impacts of uncertainty about current estimates of the crude oil and natural gas resources. The *AEO2012* projections considering variations in these variables show total U.S. crude oil production in 2035 ranging from 5.5 million barrels per day to 7.8 million barrels per day, and projections for U.S. tight oil production from eight selected plays in 2035 ranging from 0.7 million barrels per day to 2.8 million barrels per day (Figure 2).

Figure 1. Energy use per capita and per dollar of gross domestic product, 1980-2035 (index, 1980=1)

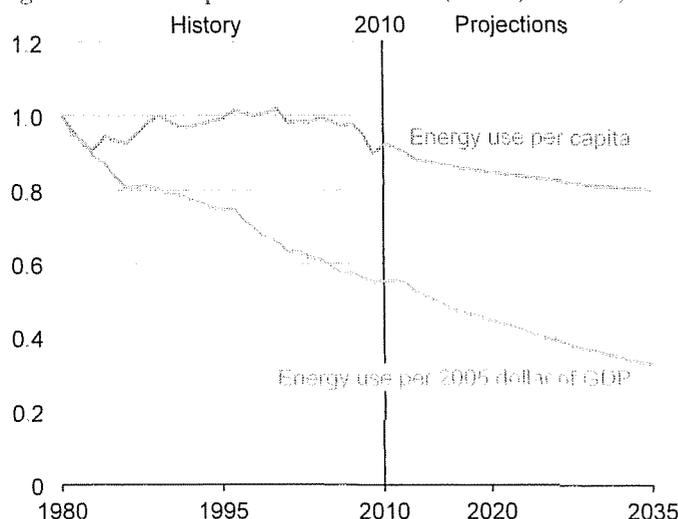
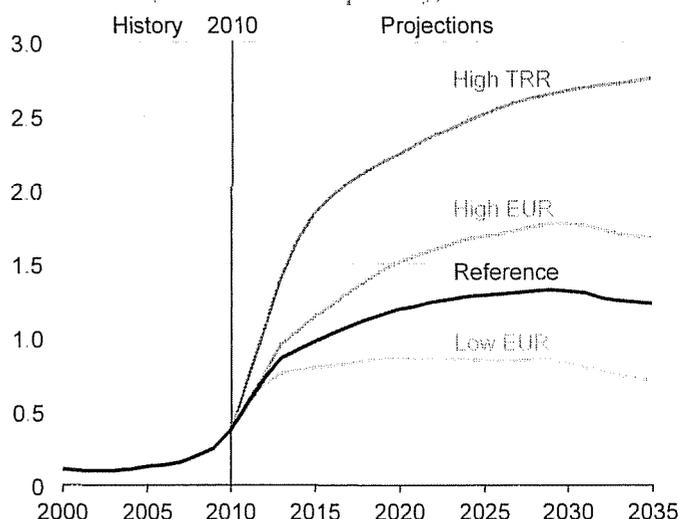


Figure 2. U.S. production of tight oil in four cases, 2000-2035 (million barrels per day)



With modest economic growth, increased efficiency, growing domestic production, and continued adoption of nonpetroleum liquids, net imports of petroleum and other liquids make up a smaller share of total U.S. energy consumption

U.S. dependence on imported petroleum and other liquids declines in the AEO2012 Reference case, primarily as a result of rising energy prices; growth in domestic crude oil production to more than 1 million barrels per day above 2010 levels in 2020; an increase of 1.2 million barrels per day crude oil equivalent from 2010 to 2035 in the use of biofuels, much of which is produced domestically; and slower growth of energy consumption in the transportation sector as a result of existing corporate average fuel economy standards. Proposed fuel economy standards covering vehicle model years (MY) 2017 through 2025 that are not included in the Reference case would further reduce projected need for liquid imports.

Although U.S. consumption of petroleum and other liquid fuels continues to grow through 2035 in the Reference case, the reliance on imports of petroleum and other liquids as a share of total consumption declines. Total U.S. consumption of petroleum and other liquids, including both fossil fuels and biofuels, rises from 19.2 million barrels per day in 2010 to 19.9 million barrels per day in 2035 in the Reference case. The net import share of domestic consumption, which reached 60 percent in 2005 and 2006 before falling to 49 percent in 2010, continues falling in the Reference case to 36 percent in 2035 (Figure 3). Proposed light-duty vehicles (LDV) fuel economy standards covering vehicle MY 2017 through 2025, which are not included in the Reference case, could further reduce demand for petroleum and other liquids and the need for imports, and increased supplies from U.S. tight oil deposits could also significantly decrease the need for imports, as discussed in more detail in "Issues in focus."

Natural gas production increases throughout the projection period, allowing the United States to transition from a net importer to a net exporter of natural gas

Much of the growth in natural gas production in the AEO2012 Reference case results from the application of recent technological advances and continued drilling in shale plays with high concentrations of natural gas liquids and crude oil, which have a higher value than dry natural gas in energy equivalent terms. Shale gas production increases in the Reference case from 5.0 trillion cubic feet per year in 2010 (23 percent of total U.S. dry gas production) to 13.6 trillion cubic feet per year in 2035 (49 percent of total U.S. dry gas production). As with tight oil, when looking forward to 2035, there are unresolved uncertainties surrounding the technological advances that have made shale gas production a reality. The potential impact of those uncertainties results in a range of outcomes for U.S. shale gas production from 9.7 to 20.5 trillion cubic feet per year when looking forward to 2035.

As a result of the projected growth in production, U.S. natural gas production exceeds consumption early in the next decade in the Reference case (Figure 4). The outlook reflects increased use of liquefied natural gas in markets outside North America, strong growth in domestic natural gas production, reduced pipeline imports and increased pipeline exports, and relatively low natural gas prices in the United States.

Power generation from renewables and natural gas continues to increase

In the Reference case, the natural gas share of electric power generation increases from 24 percent in 2010 to 28 percent in 2035, while the renewables share grows from 10 percent to 15 percent. In contrast, the share of generation from coal-fired power plants declines. The historical reliance on coal-fired power plants in the U.S. electric power sector has begun to wane in recent years.

Figure 3. Total U.S. petroleum and other liquids production, consumption, and net imports, 1970-2035 (million barrels per day)

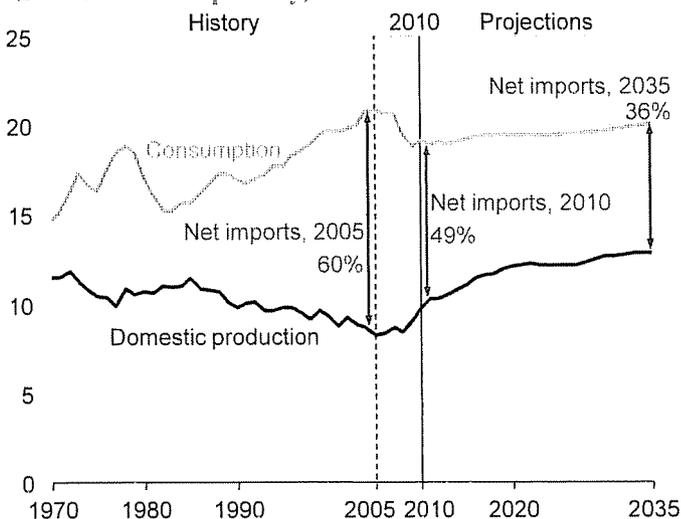
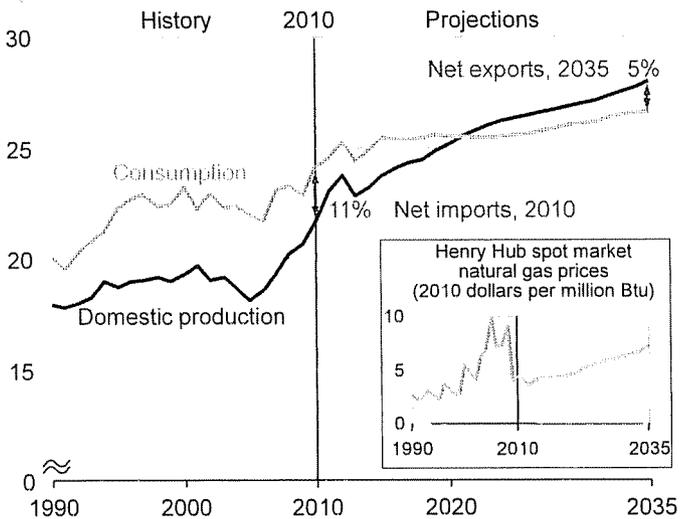


Figure 4. Total U.S. natural gas production, consumption, and net imports, 1990-2035 (trillion cubic feet)



Over the next 25 years, the share of electricity generation from coal falls to 38 percent, well below the 48-percent share seen as recently as 2008, due to slow growth in electricity demand, increased competition from natural gas and renewable generation, and the need to comply with new environmental regulations. Although the current trend toward increased use of natural gas and renewables appears fairly robust, there is uncertainty about the factors influencing the fuel mix for electricity generation. *AEO2012* includes several cases examining the impacts on coal-fired plant generation and retirements resulting from different paths for electricity demand growth, coal and natural gas prices, and compliance with upcoming environmental rules.

While the Reference case projects 49 gigawatts of coal-fired generation retirements over the 2011 to 2035 period, nearly all of which occurs over the next 10 years, the range for cumulative retirements of coal-fired power plants over the projection period varies considerably across the alternative cases (Figure 5), from a low of 34 gigawatts (11 percent of the coal-fired generator fleet) to a high of 70 gigawatts (22 percent of the fleet). The high end of the range is based on much lower natural gas prices than those assumed in the Reference case; the lower end of the range is based on stronger economic growth, leading to stronger growth in electricity demand and higher natural gas prices. Other alternative cases, with varying assumptions about coal prices and the length of the period over which environmental compliance costs will be recovered, but no assumption of new policies to limit GHG emissions from existing plants, also yield cumulative retirements within a range of 34 to 70 gigawatts. Retirements of coal-fired capacity exceed the high end of the range (70 gigawatts) when a significant GHG policy is assumed (for further description of the cases and results, see "Issues in focus").

Total energy-related emissions of carbon dioxide in the United States remain below their 2005 level through 2035

Energy-related carbon dioxide (CO₂) emissions grow slowly in the *AEO2012* Reference case, due to a combination of modest economic growth, growing use of renewable technologies and fuels, efficiency improvements, slow growth in electricity demand, and increased use of natural gas, which is less carbon-intensive than other fossil fuels. In the Reference case, which assumes no explicit Federal regulations to limit GHG emissions beyond vehicle GHG standards (although State programs and renewable portfolio standards are included), energy-related CO₂ emissions grow by just over 2 percent from 2010 to 2035, to a total of 5,758 million metric tons in 2035 (Figure 6). CO₂ emissions in 2020 in the Reference case are more than 9 percent below the 2005 level of 5,996 million metric tons, and they still are below the 2005 level at the end of the projection period. Emissions per capita fall by an average of 1.0 percent per year from 2005 to 2035.

Projections for CO₂ emissions are sensitive to such economic and regulatory factors due to the pervasiveness of fossil fuel use in the economy. These linkages result in a range of potential GHG emissions scenarios. In the *AEO2012* Low and High Economic Growth cases, projections for total primary energy consumption in 2035 are, respectively, 100.0 quadrillion Btu (6.4 percent below the Reference case) and 114.4 quadrillion Btu (7.0 percent above the Reference case), and projections for energy-related CO₂ emissions in 2035 are 5,356 million metric tons (7.0 percent below the Reference case) and 6,117 million metric tons (6.2 percent above the Reference case).

Figure 5. Cumulative retirements of coal-fired generating capacity, 2011-2035 (gigawatts)

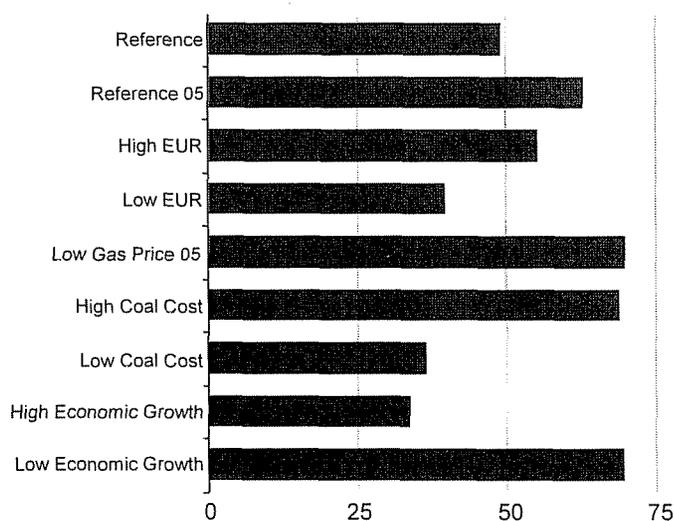
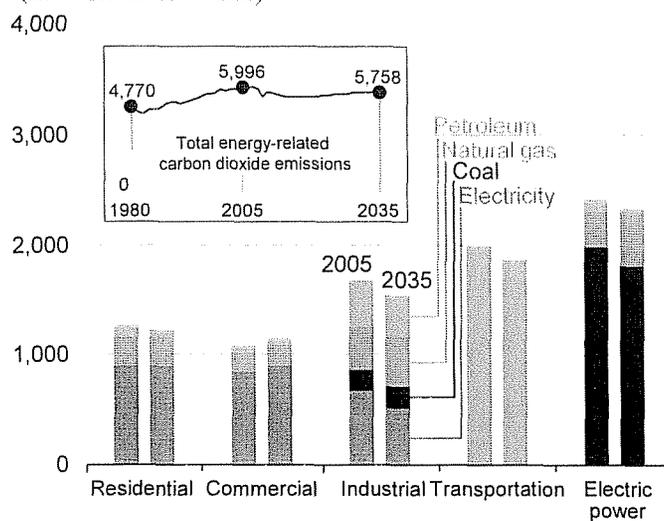


Figure 6. U.S. energy-related carbon dioxide emissions by sector and fuel, 2005 and 2035 (million metric tons)



Legislation and regulations

Introduction

Introduction

The *Annual Energy Outlook 2012* (AEO2012) generally represents current Federal and State legislation and final implementation regulations available as of the end of December 2011. The AEO2012 Reference case assumes that current laws and regulations affecting the energy sector are largely unchanged throughout the projection period (including the implication that laws that include sunset dates do, in fact, become ineffective at the time of those sunset dates) [5]. The potential impacts of proposed legislation, regulations, or standards—or of sections of legislation that have been enacted but require funds or implementing regulations that have not been provided or specified—are not reflected in the AEO2012 Reference case, but some are considered in alternative cases. This section summarizes Federal and State legislation and regulations newly incorporated or updated in AEO2012 since the completion of the *Annual Energy Outlook 2011*.

Examples of recently enacted Federal and State legislation and regulations incorporated in the AEO2012 Reference case include:

- New greenhouse gas (GHG) emissions and fuel consumption standards for medium- and heavy-duty engines and vehicles, published by the U.S. Environmental Protection Agency (EPA) and the National Highway Transportation Safety Administration (NHTSA) in September 2011 [6]
- The Cross-State Air Pollution Rule (CSAPR), as finalized by the EPA in July 2011 [7]
- Mercury and Air Toxics Standards (MATS) rule, issued by the EPA in December 2011 [8].

There are many other pieces of legislation and regulation that appear to have some probability of being enacted in the not-too-distant future, and some laws include sunset provisions that may be extended. However, it is difficult to discern the exact forms that the final provisions of pending legislation or regulations will take, and sunset provisions may or may not be extended. Even in situations where existing legislation contains provisions to allow revision of implementing regulations, those provisions may not be exercised consistently. Many pending provisions are examined in alternative cases included in AEO2012 or in other analyses completed by the U.S. Energy Information Administration (EIA). In addition, at the request of the Administration and Congress, EIA has regularly examined the potential implications of proposed legislation in Service Reports. Those reports can be found on the EIA website at www.eia.gov/oiaf/service_rpts.htm.

1. Greenhouse gas emissions and fuel consumption standards for heavy-duty vehicles, model years 2014 through 2018

On September 15, 2011, the EPA and NHTSA jointly announced a final rule, called the HD National Program [9], which for the first time established GHG emissions and fuel consumption standards for on-road heavy-duty trucks with a gross vehicle weight rating (GVWR) above 8,500 pounds (Classes 2b through 8) [10] and their engines. The AEO2012 Reference case incorporates the new standards for heavy-duty vehicles (HDVs).

Due to the tremendous diversity of HDV uses, designs, and power requirements, the HD National Program separates GHG and fuel consumption standards into discrete vehicle categories within combination tractors, vocational vehicles, and heavy-duty pickups and vans (Table 1). Further, the rule recognizes that reducing GHG emissions and fuel consumption will require changes to both the engine and the body of a vehicle (to reduce the amount of work demanded by an engine). The final rule sets separate standards for the different engines used in combination tractors and vocational vehicles. AEO2012 represents standard compliance among HDV regulatory classifications that represent the discrete vehicle categories set forth in the rule.

The HD National Program standards begin for model year (MY) 2014 vehicles and engines and are fully phased in by MY 2018. The EPA, under authority granted by the Clean Air Act, has issued GHG emissions standards that begin with MY 2014 for all engine and body categories. NHTSA, operating under regulatory timelines mandated by the Energy Independence and Security Act [11], set voluntary fuel consumption standards for MY 2014 and 2015, with the standards becoming mandatory for MY 2016 and beyond, except for diesel engine standards, which become mandatory for MY 2017 and beyond. Standards reach the most stringent levels for combination tractors and vocational vehicles in MY 2017, with subsequent standards then holding constant. Heavy-duty pickup and van standards are required to reach the highest level of stringency in MY 2018. AEO2012 includes the HD

Table 1. HD National Program vehicle regulatory categories

Category	Description	GVWR
Combination tractors	Combination tractors are semi trucks designed to pull trailers. Standards are set separately for tractor cabs and their engines. There are no GHG or fuel consumption standards for trailers.	Class 7 and 8 (26,001 pounds and above)
Vocational vehicles	Vocational vehicles include a wide range of truck configurations, such as delivery, refuse, utility, dump, cement, fire, and tow trucks, school buses, and ambulances. The rulemaking defines vocational vehicles as all heavy-duty trucks that are not combination tractors or heavy-duty pickups or vans. Vocational vehicle standards are set separately for chassis and engines.	Class 2b through 8 (8,501 pounds and above)
Heavy-duty pickups and vans	Pickup trucks and vans are primarily 3/4-ton or 1-ton pickups used on construction sites or 12- to 15-person passenger vans.	Class 2b and 3 (8,501 to 14,000 pounds)

see table 2 and table 3

National Program standards beginning in MY 2014 as set by the GHG emissions portion of the rule, with standards represented by vehicle, including both the chassis and engine. AEO2012 assumes that vehicle chassis and engine manufacturers comply with the voluntary portion of the rule covering the fuel consumption standard. AEO2012 does not model the chassis and engine standards separately but allows the use of technologies to meet the HD National Program combined engine and chassis standards.

Although they are not modeled separately in AEO2012, GHG emission and fuel consumption standards for combination tractors are set for the tractor cabs and the engines used in those cabs separately in the HD National Program. Combination tractor cab standards are subdivided by GVWR (Class 7 or 8), cab type (day or sleeper), and roof type (low, mid, or high). Combination tractor engine standards are subdivided into medium heavy-duty diesel (for use in Class 7 tractors) and heavy heavy-duty diesel (for use in Class 8 tractors) (Table 2). Each tractor cab and engine combination is required to meet the GHG and fuel consumption standards for a given model year, unless they are made up by credits or other program flexibilities.

Again, although they are not modeled separately in AEO2012, GHG emission and fuel consumption standards for vocational vehicles are set separately in the HD National Program for the vehicle chassis and the engines used in the chassis. Vocational vehicle chassis standards are subdivided in the rule by GVWR (Classes 2b to 5, Classes 6 and 7, and Class 8). Vocational vehicle engine standards are subdivided into light heavy-duty diesel (for use in Classes 2b through 5), medium heavy-duty diesel (for use in Classes 6 and 7), heavy heavy-duty diesel (for use in Class 8), and spark-ignited (primarily gasoline) engines (for use in all classes) (Table 3). Each vocational vehicle chassis and engine combination is required to meet the GHG and fuel consumption standard for a given model year, unless made up by credits or other program flexibilities.

Standards for heavy-duty pickups and vans are based on the “work factor”—a weighted average of the vehicle’s payload and towing capacity, adjusted for four-wheel drive capability. The standards for heavy-duty pickups and vans are different for diesel

Table 2. HD National Program standards for combination tractor greenhouse gas emissions and fuel consumption (assuming fully compliant engine)

Roof type	Day cab		Sleeper cab
	Class 7	Class 8	Class 8
2014 GHG emissions standards (grams CO ₂ per ton-mile)			
Low roof	107	81	68
Mid roof	119	88	76
High roof	124	92	75
2014-2016 voluntary fuel consumption standards (gallons per 1,000 ton-miles)			
Low roof	10.5	8.0	6.7
Mid roof	11.7	8.7	7.4
High roof	12.2	9.0	7.3
2017 GHG emissions standards (grams CO ₂ per ton-mile)			
Low roof	104	80	66
Mid roof	115	86	73
High roof	120	89	72
2017 fuel consumption standards (gallons per 1,000 ton-miles)			
Low roof	10.2	7.8	6.5
Mid roof	11.3	8.4	7.2
High roof	11.8	8.7	7.1

Table 3. HD National Program standards for vocational vehicle greenhouse gas emissions and fuel consumption (assuming fully compliant engine)

Standard	Light heavy-duty (Classes 2b-5)	Medium heavy-duty (Classes 6-7)	Heavy heavy-duty (Class 8)
2014 GHG emissions standard (grams CO ₂ per ton-mile)	388	234	226
2016 fuel consumption standard (gallons per 1,000 ton-miles)	38.1	23.0	22.2
2017 GHG emissions standards (grams CO ₂ per ton-mile)	373	225	222
2017 fuel consumption standard (gallons per 1,000 ton-miles)	36.7	22.1	21.8

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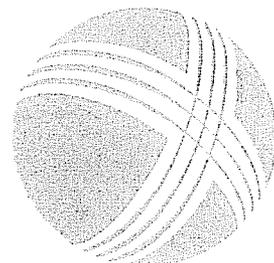


EXHIBIT A

**NON-DISCLOSURE CERTIFICATE
RELATED TO THE
NON-DISCLOSURE AGREEMENT BETWEEN HAYET POWER SYSTEM
CONSULTING AND ACES POWER MARKETING LLC**

I hereby certify my understanding that access to Protected Materials is provided to me pursuant to the terms and restrictions of the Non-Disclosure Agreement between Hayet Power Systems Consulting (“Hayet”) and Alliance for Cooperative Energy Services Power Marketing LLC, (“ACES Power Marketing” or “APM”) and for use in the case currently before the Kentucky Public Service Commission and captioned as “*APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR APPROVAL OF ITS 2012 ENVIRONMENTAL COMPLIANCE PLAN, FOR APPROVAL OF ITS AMENDED ENVIRONMENTAL COST RECOVERY SURCHARGE TARIFF, FOR CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY, AND FOR AUTHORITY TO ESTABLISH A REGULATORY ACCOUNT, CASE NO. 2012-00063*”.

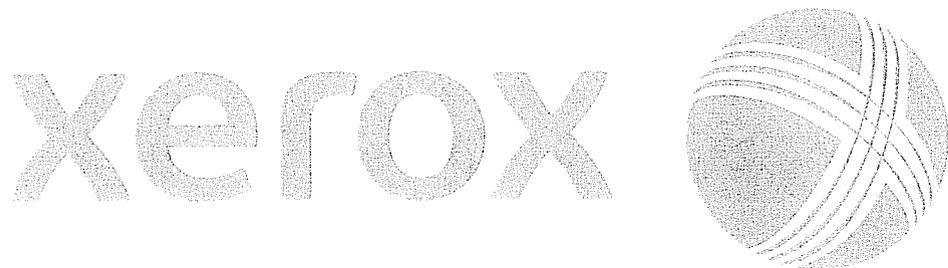
I certify that I have been given a copy of and have read the Non-Disclosure Agreement, and that I agree to be bound by it. I understand that the contents of the Database, Protected Materials, any notes or other memoranda, or any other form of information that copies or discloses Protected Materials shall not be disclosed to anyone other than in accordance with that Protective Agreement, and will be used only for the purposes of this Captioned Case.

Print and Sign Name

Address

KWalton

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NON-DISCLOSURE AGREEMENT

This Non-Disclosure Agreement (“Agreement”) is entered into this ___ day of June 2012, by and between Hayet Power Systems Consulting (“Hayet”) and Alliance for Cooperative Energy Services Power Marketing LLC, (“ACES Power Marketing” or “APM”) (each individually referred to as “Party” and collectively as “Parties”).

RECITALS

WHEREAS, APM provides, inter alia, certain modeling services for Big Rivers Electric Corporation (“Big Rivers”) through the use of proprietary software licensed to APM by Ventyx; and

WHEREAS, APM has created a confidential and proprietary database within the licensed proprietary software which contains information used by APM to prepare certain scenarios for use in the Captioned Case (defined below); and

WHEREAS, Hayet is the consultant for certain Intervenors in the Captioned Case and such Intervenors desire that Hayet have access to APM’s confidential and proprietary Database within the Ventyx licensed proprietary software which contains information used by APM to prepare certain scenarios for use in the Captioned Case by Big Rivers; and

WHEREAS, APM, pursuant to a request by Big Rivers and pursuant to conditions established by APM’s license with Ventyx (the owner of the proprietary software), is willing to provide to Hayet the portion of APM’s confidential and proprietary database that pertains to Big Rivers, provided that, Hayet agrees to the terms and conditions expressed herein.

NOW WHEREFORE, in consideration of the promises and covenants herein and for good and valuable consideration, the adequacy and sufficiency of which are hereby acknowledged, the Parties intending to be legally bound do hereby agree as follows:

Section 1. Definitions.

“Authorized Representative” shall mean a person who has signed the attached Non-Disclosure Certificate and who is also a consultant or expert for one of the Intervenors in the Captioned Case and is currently licensed to use the Ventyx PaR software.

“Captioned Case” shall mean the case currently before the Kentucky Public Service Commission and captioned as “*APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR APPROVAL OF ITS 2012 ENVIRONMENTAL COMPLIANCE PLAN, FOR APPROVAL OF ITS AMENDED ENVIRONMENTAL COST RECOVERY SURCHARGE TARIFF, FOR CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY, AND FOR AUTHORITY TO ESTABLISH A REGULATORY ACCOUNT, CASE NO. 2012-00063*”.

“Database” shall mean the electronic computer file derived from the Ventyx PaR licensed proprietary software that contains certain Big Rivers model data parameters used by APM in developing scenarios for Big Rivers and used in support of the Captioned Case.

“Notes of Protected Materials” means memoranda, handwritten notes, or any other form of information (including electronic information) that copies or discloses Protected Materials. Notes of Protected Materials are subject to the same restrictions provided in this Agreement for Protected Materials except as specifically provided otherwise in this Agreement.

“Protected Materials” shall mean the Database and any other materials provided to Hayet by APM pursuant to the terms of this Agreement.

Section 2. Use of the Database and Protected Materials. This Agreement shall govern the use of the Database provided to Hayet by APM. The Database shall be used exclusively by Hayet for work directly related to the Captioned Case. The Database shall be installed on and accessible through the computer containing Hayet’s licensed Ventyx software. Protected Materials shall be made available under the terms of this Agreement to Hayet solely for its use in the Captioned Case and any appeals from the Captioned Case, and may not be used by Hayet for any commercial, business, or other purpose whatsoever.

Section 3. Duration of Use. Protected Materials shall remain available to Hayet until the sooner of: (a) an order terminating this proceeding becomes no longer subject to judicial review, or (b) the termination of Hayet’s license with Ventyx. If requested to do so in writing after that date, Hayet shall, within fifteen days of such request, return the Protected Materials (excluding Notes of Protected Materials) to APM, or shall destroy the materials, except that copies of filings, official transcripts and exhibits in this proceeding that contain Protected Materials and Notes of Protected Materials may be retained, if they are maintained in accordance with this Agreement. Within such time period, Hayet, if requested to do so, shall also submit to APM an affidavit stating that, to the best of its knowledge, all Protected Materials and all Notes of Protected Materials have been returned or have been destroyed or will be maintained in accordance with this Agreement. To the extent Protected Materials are not returned or destroyed, they shall remain subject to this Agreement.

Section 4. Non-Disclosure Certificate. Each Authorized Representative shall execute a Non-Disclosure Certificate in the form of the attached Exhibit A certifying their understanding and agreement with the terms of this Agreement. A copy of each Non-Disclosure Certificate shall be provided to APM prior to disclosure of any Protected Materials to an Authorized Representative.

Section 5. Protection of Materials. All Protected Materials shall be maintained by Hayet in a secure place. Access to those materials shall be limited to Authorized Representatives. Protected Materials shall be treated as confidential by Hayet and the Authorized Representatives. Protected Materials shall not be used except as necessary for the conduct of this Proceeding, nor shall they be disclosed in any manner to any person except an Authorized Representative who is engaged in the conduct of this Proceeding and who needs to know the information in order to carry out that person’s responsibilities in this Proceeding. Authorized Representative may make notes of Protected Materials, which shall be treated as Notes of Protected Materials if they

disclose the contents of Protected Materials. Authorized Representatives may not use information contained in any Protected Materials obtained through this Proceeding to give Hayet or any competitor or potential competitor of APM a commercial advantage or otherwise economically disadvantage APM based on disclosure of the Protected Materials.

In the event, APM inadvertently provides confidential information unrelated to the Captioned Case, or otherwise fails to designate materials other than the Database as Protected Materials at the time they are provided to Hayet, APM shall notify Hayet promptly upon discovery of the inadvertent disclosure. Hayet agrees that such inadvertent disclosure does not waive the confidentiality or protection afforded the information, and agrees to: (a) immediately return the privileged information; and (b) to protect the confidential materials as Protected Materials, and to not use any information derived from such inadvertent disclosure in a manner inconsistent with the preservation of the confidential nature of the materials.

Section 6. Disclosure. Any Authorized Representative may disclose Protected Materials to any other Authorized Representative as long as the disclosing Authorized Representative and the receiving Authorized Representative have both executed a Non-Disclosure Certificate. In the event that any Authorized Representative to whom the Protected Materials are disclosed ceases to be engaged in the Captioned Case, access to Protected Materials by that person shall be terminated. Even if no longer engaged in this Captioned Case, every person who has executed a Non-Disclosure Certificate shall continue to be bound by the provisions of this Agreement and the Non-Disclosure Certificate. No other disclosure shall be permitted. Hayet shall take all reasonable precautions necessary to assure that Protected Materials are not distributed to unauthorized persons.

Section 7. Nature of Information. Hayet hereby accepts the representations of APM that the Database is of a special, unique, unusual, extraordinary, and/or intellectual character and that the Parties further accept that the Database is an APM trade secret that is not available to the public, and that, if disclosed, would subject APM to risk of competitive disadvantage or other business injury. APM may be irreparably injured by disclosure of the Database. APM and Hayet acknowledge and agree that money damages would not be a sufficient remedy for any breach of this Agreement, and that in addition to all other remedies, a Party shall be entitled to specific performance and injunctive or other equitable relief as a remedy for any such breach, and the Parties agree to waive any requirement for the securing or posting of any bond in connection with such remedy.

Section 8. Survival of Obligations. The obligations and commitments established by this Agreement shall remain in full force and effect for a period of two (2) years from the conclusion of any right to appeal the proceedings in the Captioned Case.

Section 9. Governing Law. The validity and interpretation of this Agreement and the legal relations of the Parties to it shall be governed by the laws of the State of Indiana. In the event that a court of competent jurisdiction determines that any portion of this Agreement is unreasonable because of its term or scope, or for any other reason, the Parties agree that such court may reform such provision so that it is reasonable under the circumstances and that such provision, as reformed, shall be enforceable. The Parties further agree that service of any process, summons, notice or document by U.S. certified or registered mail to the Parties'

respective executive offices will be effective service of process for any action, suit, or proceeding brought in any such court.

Section 10. Miscellaneous Provisions.

(a) Neither party shall assign this Agreement without the prior written approval of the other party. Nothing in this Agreement, express or implied, is intended or shall be construed to confer upon any person or entity other than the parties hereto any right, remedy or claim under or by reason of this Agreement.

(b) This Agreement sets forth the entire agreement between the parties as to the subject matter of this Agreement and supersedes all prior agreements, commitments, representations, writings and discussions between them, whether written or oral, with respect to the subject matter hereof. Except as otherwise expressly provided in this Agreement, this Agreement may not be amended or terminated except in writing and signed by a duly authorized representative of the Party to be bound thereby.

(c) If any provision of this Agreement or its application to any person or circumstance is adjudged invalid or unenforceable by any court of competent jurisdiction, then the remainder of this Agreement or the application of such provision to other persons or circumstances shall not be affected thereby.

(d) No delay or failure to exercise any right under this Agreement shall operate as a continuing or permanent waiver of such right or preclude the further exercise of that right or any other right. This Agreement shall be binding on the parties and their successors, heirs, affiliates, and assigns. This Agreement may be executed in any number of counterparts, and each such counterpart shall be deemed an original instrument.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed and delivered by their respective duly authorized officers as of the date first written above.

**ALLIANCE FOR COOPERATIVE
ENERGY SERVICES POWER
MARKETING LLC**

**HAYET POWER SYSTEMS
CONSULTING**

By: _____

By: _____

Name: _____

Name: _____

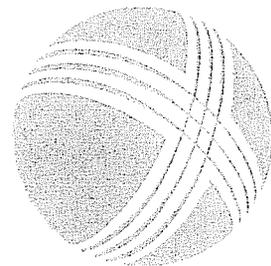
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“Protected Materials” shall mean the Database provided to Hayet by APM.

Section 2. Use of the Database and Protected Materials. This Agreement shall govern the use of the Database provided to Hayet by APM. The Database shall be used exclusively by Hayet for work directly related to the Captioned Case. The Database shall be installed on and accessible through one (1) computer. Protected Materials shall be made available under the terms of this Agreement to Hayet solely for its use in the Captioned Case and any appeals from the Captioned Case, and may not be used by Hayet for any commercial, business, or other purpose whatsoever.

Section 3. Duration of Use. Protected Materials shall remain available to Hayet until an order terminating this proceeding becomes no longer subject to judicial review. If requested to do so in writing after that date, Hayet shall, within fifteen days of such request, return the Protected Materials (excluding Notes of Protected Materials) to APM, or shall destroy the materials, except that copies of filings, official transcripts and exhibits in this proceeding that contain Protected Materials and Notes of Protected Materials may be retained, if they are maintained in accordance with this Agreement. Within such time period, Hayet, if requested to do so, shall also submit to APM an affidavit stating that, to the best of its knowledge, all Protected Materials and all Notes of Protected Materials have been returned or have been destroyed or will be maintained in accordance with Paragraph 7 below. To the extent Protected Materials are not returned or destroyed, they shall remain subject to this Agreement.

Section 4. Protection of Materials. All Protected Materials shall be maintained by Hayet in a secure place. Access to those materials shall be limited to Authorized Representatives. Protected Materials shall be treated as confidential by Hayet and the Authorized Representatives in accordance with the certificate executed pursuant to this Paragraph. Protected Materials shall not be used except as necessary for the conduct of this Proceeding, nor shall they be disclosed in any manner to any person except an Authorized Representative who is engaged in the conduct of this Proceeding and who needs to know the information in order to carry out that person’s responsibilities in this Proceeding. Authorized Representative may make notes of Protected Materials, which shall be treated as Notes of Protected Materials if they disclose the contents of Protected Materials. Authorized Representatives may not use information contained in any Protected Materials obtained through this Proceeding to give Hayet or any competitor or potential competitor of Kentucky Power a commercial advantage or otherwise economically disadvantage Kentucky Power based on disclosure of the Protected Materials.

Section 5. Access to Protected Materials. An Authorized Representative shall not be permitted to inspect, participate in discussion regarding, or otherwise be permitted access to

Protected Materials unless that Authorized Representative has first executed the attached Non-Disclosure Certificate, provided that if an attorney qualified as an Authorized Representative has executed such a certificate, the paralegals, secretarial and clerical personnel under the attorney's instruction, supervision or control need not do so. Attorneys qualified as Authorized Representatives are responsible for ensuring that persons under their supervision or control comply with this order. A copy of each Non-Disclosure Certificate shall be provided to Kentucky Power prior to disclosure of any Protected Materials to an Authorized Representative.

Section 6. Disclosure. Any Authorized Representative may disclose Protected Materials to any other Authorized Representative as long as the disclosing Authorized Representative and the receiving Authorized Representative have both executed a Non-Disclosure Certificate. In the event that any Authorized Representative to whom the Protected Materials are disclosed ceases to be engaged in these proceedings, access to Protected Materials by that person shall be terminated. Even if no longer engaged in this Proceeding, every person who has executed a Non-Disclosure Certificate shall continue to be bound by the provisions of this Agreement and the Non-Disclosure Certificate. No other disclosure shall be permitted. Hayet shall take all reasonable precautions necessary to assure that Protected Materials are not distributed to unauthorized persons. If the Hayet is requested or required by oral questions, interrogatories, requests for information or documents, subpoena, civil investigative demand, regulatory proceeding or similar legal or other administrative or regulatory process to disclose any Protected Materials supplied to Hayet by the APM, then Hayet shall provide APM with prompt notice of such request(s) so that APM may seek a protective order or other appropriate remedy and/or waive compliance with the terms of this Agreement.

Section 7. Nature of Information. Hayet hereby accepts the representations of APM that the Database is of a special, unique, unusual, extraordinary, and/or intellectual character and that the Parties further accept that the Database is an APM trade secret that is not available to the public, and that, if disclosed, would subject APM to risk of competitive disadvantage or other business injury. APM may be irreparably injured by disclosure of the Database. APM and Hayet acknowledge and agree that money damages would not be a sufficient remedy for any breach of this Agreement, and that in addition to all other remedies, a Party shall be entitled to specific performance and injunctive or other equitable relief as a remedy for any such breach, and the Parties agree to waive any requirement for the securing or posting of any bond in connection with such remedy.

Section 8. Survival of Obligations. The obligations and commitments established by this Agreement shall remain in full force and effect for a period of two (2) years from the conclusion of any right to appeal the proceedings in the Captioned Case.

Section 9. Governing Law. The validity and interpretation of this Agreement and the legal relations of the Parties to it shall be governed by the laws of the State of Indiana. In the event that a court of competent jurisdiction determines that any portion of this Agreement is unreasonable because of its term or scope, or for any other reason, the Parties agree that such court may reform such provision so that it is reasonable under the circumstances and that such provision, as reformed, shall be enforceable. The Parties further agree that service of any process, summons, notice or document by U.S. certified or registered mail to the Parties'

respective executive offices will be effective service of process for any action, suit, or proceeding brought in any such court.

Section 10. Miscellaneous Provisions.

(a) Neither party shall assign this Agreement without the prior written approval of the other party. Nothing in this Agreement, express or implied, is intended or shall be construed to confer upon any person or entity other than the parties hereto any right, remedy or claim under or by reason of this Agreement.

(b) This Agreement sets forth the entire agreement between the parties as to the subject matter of this Agreement and supersedes all prior agreements, commitments, representations, writings and discussions between them, whether written or oral, with respect to the subject matter hereof. Except as otherwise expressly provided in this Agreement, this Agreement may not be amended or terminated except in writing and signed by a duly authorized representative of the Party to be bound thereby.

(c) If any provision of this Agreement or its application to any person or circumstance is adjudged invalid or unenforceable by any court of competent jurisdiction, then the remainder of this Agreement or the application of such provision to other persons or circumstances shall not be affected thereby.

(d) No delay or failure to exercise any right under this Agreement shall operate as a continuing or permanent waiver of such right or preclude the further exercise of that right or any other right. This Agreement shall be binding on the parties and their successors, heirs, affiliates, and assigns. This Agreement may be executed in any number of counterparts, and each such counterpart shall be deemed an original instrument.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed and delivered by their respective duly authorized officers as of the date first written above.

**ALLIANCE FOR COOPERATIVE
ENERGY SERVICES POWER
MARKETING LLC**

**HAYET POWER SYSTEMS
CONSULTING**

By: _____

By: _____

Name: _____

Name: _____

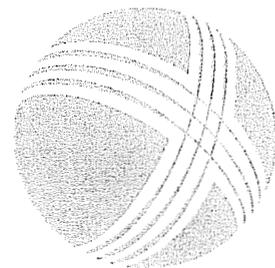
Title: _____

Title: _____

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**COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION**

IN THE MATTER OF THE:

APPLICATION OF BIG RIVERS ELECTRIC	)	CASE NO. 2012-00063
CORPORATION FOR APPROVAL OF ITS)	
2012 ENVIRONMENTAL COMPLIANCE)	
PLAN, FOR APPROVAL OF ITS AMENDED)	
ENVIRONMENTAL COST RECOVERY)	
SURCHARGE TARIFF, FOR CERTIFICATES)	
OF PUBLIC CONVENIENCE AND)	
NECESSITY, AND FOR AUTHORITY TO)	
ESTABLISH A REGULATORY ACCOUNT)	

MOTION TO STAY PROCEDURAL SCHEDULE

Kentucky Industrial Utility Customers, Inc. (“KIUC”), Ben Taylor and Sierra Club and the Attorney General (collectively, “Intervenors”) hereby move the Kentucky Public Service Commission (“Commission”) to enter an Order staying the procedural schedule in this docket until such time that Big Rivers Electric Corporation (“Big Rivers”) provides a full response to the Intervenors’ initial sets of information requests. Specifically, Intervenors move that all supplemental requests for information to Big Rivers be due twelve days after Big Rivers has completed its responses to initial data requests. All subsequent dates in the procedural schedule should be rescheduled accordingly. This request is necessitated by the fact that Big Rivers has failed to provide the database used in the production cost modeling that the company used to support its application, and that some of the files produced by Big Rivers in response to discovery from KIUC were corrupted. While Intervenors are attempting to expeditiously resolve these matters with Big Rivers, these matters will not be resolved in time to provide Intervenors with a fair opportunity to submit supplementary data requests unless a stay is granted.

MEMORANDUM IN SUPPORT

The procedural schedule set forth in the Commission's April 30, 2012 Order provides that Big Rivers shall file responses to initial requests for information no later than June 1, 2012. The Commission's Order gives Intervenors twelve days after receiving Big Rivers' responses to their initial information requests before the second set of information requests to Big Rivers are due on June 13, 2012. Unfortunately, Big Rivers failed to provide complete responses to the Intervenors initial requests on June 1, and has not provided full responses as of this filing.

As set forth in the Intervenors' Joint Motion to Compel filed on June 6, 2012, the Intervenors seek production of the database and input files that ACES developed and fed into the production cost modeling upon which Big Rivers' April 2, 2012 Application is based. The Commission should not proceed to determine whether Big Rivers' Application is reasonable and cost-effective without an examination of the accuracy of the modeling results that form the basis for Big Rivers' Application for an Environmental Cost Recovery Surcharge Tariff. The database and input files were not provided as part of Big Rivers' responses to initial information requests on June 1, 2012. Since June 1, 2012 Intervenors have diligently tried to obtain this information from Big Rivers through both informal communications and through the Joint Motion to Compel filed on June 6, 2012. Big Rivers' Response to the Joint Motion to Compel sets out a proposed course of action for ~~KIUC~~ and the Intervenors to obtain this information, but there are several conditions that need to be worked out between Big Rivers and ~~KIUC~~ Intervenors before that process can move forward (See Big Rivers' Response pp. 5-6). Additionally, Big Rivers' proposed plan to provide the requested information is to "strip down" the ACES database of

non-Big Rivers data before it is provided to the Intervenors and to have the Intervenors pay the cost of this process.¹ (Big Rivers' Response p. 6). If Big Rivers/ACES had not used a database that contains non-Big Rivers information there would be no need for the time-consuming step of purging this information from the database prior to providing it to the Intervenors.

KIUC has also discovered that there are several files in the CDs provided by Big Rivers in response to KIUC's First Set of Data Requests that are missing and/or corrupted. KIUC is working informally with Big Rivers to rectify this problem. However, it is unlikely that correct and valid files will be provided prior to June 13, 2012.

In sum, it is clear from Big Rivers' Response to the Joint Motion to Compel that obtaining the requested information will require a process of undetermined duration and will certainly not be concluded by June 13, 2012 when supplemental information requests are due. Intervenors should not be required to submit supplemental information requests before they have received a response to their initial information requests when the delay in providing a complete response is due to factors in Big Rivers control and was not the fault of the Intervenors. To do so would greatly prejudice the Intervenors and would contravene the intent of the Commission's April 30, 2012 Order which contemplates that the Intervenors be afforded the opportunity to examine Big Rivers' responses to initial data responses prior to submitting supplemental responses.

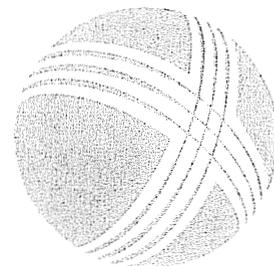
¹ The Intervenors intend to file a Reply to Big Rivers' Response to the Joint Motion to Compel that will, among other things, dispute Big Rivers' proposal that an Intervenor must pay the costs of "stripping down" the database of non-Big Rivers data.

WHEREFORE, Intervenors respectfully request that the Commission enter an Order staying the procedural schedule in this docket until such time that Big Rivers provides a full response to the Intervenors initial set of information requests. The Intervenors request that all supplemental requests for information to Big Rivers be due twelve days after Big Rivers has completed its responses to initial data requests and that all subsequent due dates in the procedural schedule should be postponed by the same number of days.

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**COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION**

IN THE MATTER OF THE:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR APPROVAL OF ITS 2012 ENVIRONMENTAL COMPLIANCE PLAN, FOR APPROVAL OF ITS AMENDED ENVIRONMENTAL COST RECOVERY SURCHARGE TARIFF, FOR CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY, AND FOR AUTHORITY TO ESTABLISH A REGULATORY ACCOUNT)	CASE NO. 2012-00063
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completed its responses to initial data requests and that all subsequent due dates in the procedural schedule should be postponed by the same number of days.

MEMORANDUM

To: Michael Early, Esq.
Donald P. Seberger, Esq.
Jeremy Jenkins

Copy: David R. Brown, Esq.

From: Michael L. Kurtz, Esq.
Boehm, Kurtz & Lowry

Re: Big Rivers Negotiations

Date: July 2, 2012

This Memorandum responds to your request that I provide you with my advice concerning certain aspects of the ongoing discussions between and among Big Rivers Electric Corporation ("Big Rivers"), Century Aluminum Kentucky LLC ("Century Aluminum"), and Alcan Primary Products Corporation, a wholly-owned affiliate of Rio Tinto Alcan Inc. ("Rio Tinto Alcan"). This Memorandum recognizes that I am covered by the Confidentiality Agreements signed by Big Rivers and each of the Smelters respecting these ongoing discussions.

You have advised me that Big Rivers, in a rate proposal to Century Aluminum and Rio Tinto Alcan (the "Smelters") and in discussions with the Smelters and representatives of the Governor's Office and the Economic Development Cabinet (the "Cabinet"), made certain statements regarding the jurisdiction of the Kentucky Public Service Commission (the "Commission") and certain "reserves" that were established or approved by the Commission in the 2009 Unwind Order. Specifically, in a letter dated June 25, 2012, to the Smelters, Mr. Bailey stated that Big Rivers' proposal, which would eliminate the subsidy paid by the Smelters and the non-cost-based contract charges, is as far as Big Rivers could legally go and it does

not have the ability to provide any further rate relief. In a conversation with Century's representatives on June 25, 2012, the Governor's staff attributed to Big Rivers the assertion that the Commission has no authority to grant any rate relief beyond that which Big Rivers has offered. Further, in an email to Smelter representatives from Holland Spade of the Cabinet dated June 27, 2012, she also attributes to Big Rivers the view that certain reserve funds could not be reallocated to reduce a rate increase to other customers to offset reduced revenues from the Smelters because "other use of those two reserve funds would absolutely create an unmet obligation to those for whom the reserves were intended." We believe that neither of these contentions is consistent with Kentucky law.

1. **The Commission Has Broad Ratemaking Authority To Ensure That Rates Are Fair, Just And Reasonable.**

Contrary to the assertions of Big Rivers that there are legal prohibitions that restrict the authority of the Commission to set different Smelter rates, the Supreme Court of Kentucky recently affirmed the Commission's plenary authority to ensure that rates are fair, just and reasonable.

"The broad role of the PSC in regulating and investigating utilities to ensure that utilities comply with state law is set forth in KRS 278.040... Because utilities are allowed to charge consumers only 'fair, just, and reasonable rates' under KRS 278.030(1), the PSC must ensure that utility rates are fair, just, and reasonable to discharge its duty under KRS 278.040 to ensure that utilities comply with state law.

In sum, we agree with the view that the PSC had the plenary authority to regulate and investigate utilities and to ensure that rates charged are fair, just, and reasonable under KRS 278.030 and KRS 278.040.

We conclude that, because the statutes generally recognize a duty to establish 'fair, just, and reasonable' rates without necessarily requiring a particular procedure to deal with isolated ratemaking issues, the Hope doctrine that '[it is]

the result reached rather than the method employed which is controlling' [footnote omitted] is applicable." Kentucky Public Service Com'n v. Com. ex rel. Conway, Supreme Court of Ky., 324 S.W. 3d 373 (2010).

In the rehearing phase of the pending Big Rivers rate case, the Commission has made clear its plenary authority over the rates charged by Big Rivers.

"It is clear from the Court's March 8, 2012 Order that both KIUC and Big Rivers have disputes over the Rate Order, and that the Commission is the agency with jurisdiction over all of the rate matters in dispute. Pursuant to KRS 278.040(2) and KRS 279.210(1), the Commission has exclusive jurisdiction over the rates of Big Rivers. In addition, KRS 278.260(1) empowers the Commission with original jurisdiction over complaints as to the rates of Big Rivers, and the Commission can make such investigation of those rates as it deems necessary or convenient, either upon a complaint in writing or on its own motion. Further, pursuant to KRS 278.390, the Rate Order continues in force until revoked or modified by the Commission, unless the Order is suspended or vacated in whole or in part by order or decree of a court of competent jurisdiction, while, under KRS 278.270, the Commission is authorized to prescribe a just and reasonable rate to be charged prospectively after conducting an investigation under KRS 278.260(1).

These statutes grant the Commission plenary authority to expand the scope of our investigation in this rehearing to include the disputed issues raised at the Franklin Case No. 2011-00036 Circuit Court by KIUC, now that all of the Court actions have been remanded to the Commission. We find that, on our own motion, a full and thorough investigation should be conducted of all the disputed rate issues in one forum at the same time, and that this will result in administrative efficiencies, conserve the scarce resources of all the parties and the Commission, and lead to an expedited resolution of the disputed issues and the correction of actual errors, if any." In Application of Big Rivers Electric Corporation for a General Adjustment in Rates, Case No. 2011-00036, April 12, 2012 Order at 3.

The fact that the Smelters operate under Commission approved special contracts in no way diminishes the Commission's plenary authority. The Smelter contracts are "rates" under KRS 278.010(12). The Commission has firmly held that special rate contracts will be treated no differently than tariffs of general applicability.

"The Commission is not persuaded by NAS's legal arguments that the issue of rate retroactivity should be decided on the basis of contract law, rather than

under the provisions of KRS Chapter 278. Neither the statutes nor legal precedent cited by NAS supports a finding that special contracts can be treated differently from generally available rate tariffs. KRS Chapter 278 sets forth a comprehensive scheme for the regulation of utilities. More specifically, KRS 278.040(1) provides that, 'The Public Service Commission shall regulate utilities and enforce the provisions of this chapter,' and KRS 278.040(2) provides that, 'The commission shall have exclusive jurisdiction over the regulation of rates and service of utilities....' In Board of Education of Jefferson County. Kentucky v. Dohrman, 620 S.W.2d 328 (Ky. App. 1981), a utility customer receiving service under a special contract claimed that its rates could only be changed in accordance with the terms of its special contract. The Court, citing the Commission's exclusive jurisdiction to regulate rates under KRS 278.040(2), rejected the customer's claim, declaring that, 'Strictly speaking, the Commission had the right and duty to regulate rates and services, no matter what a contract provided.'" In Kentucky Utilities Company Revised Special Contract with North American Stainless, LP., Case No. 2003-00137, October 19, 2005 Order at 7.

Finally, in a 1990 Court of Appeals case involving approval of the electric rate for National Southwire (the predecessor owner of the Century facility) that fluctuated with the world-wide price of aluminum, the court ruled: "*Kentucky law generally holds utility contracts are subject to rate changes ordered by the PSC, no matter what the contracts provide.*" National-Southwire v. Big Rivers Elec., Ky. App., 785 S.W. 3d 503, 517.

These precedents establish the legal principle that if the Commission concludes based upon sufficient record evidence that the current Smelter rates are no longer fair, just and reasonable and that lower rates are necessary in order to keep the Smelters viable and therefore protect the Kentucky economy and the interests of other ratepayers, those new lower rates would be sustained. This is true regardless of what the Smelter contracts provide. We believe that such a record can be established to the satisfaction of the Commission.

If such new lower Smelter rates were below Big Rivers' cost-of-service, then, depending on the particular facts and circumstances, such rates would not be unduly preferential under KRS 278.260. When a new steel company located in Kentucky, the Commission approved

rates for it at the utility's out-of-pocket variable cost of production plus ten percent. The Commission has approved market pricing for up to ten industrial customers in an experimental tariff, even when market pricing was below the utility's cost-of-service. For many years the Smelters paid electric rates that changed based upon the world-wide price of aluminum. These examples point out the rate flexibility the Legislature has conferred upon the Commission to address unique situations.

2. **There Is No Legal Prohibition Against Using Reserve Funds To Facilitate A Short Term Solution.**

The Economic Reserve ("ER"), which currently stands at approximately \$94 million, was carved out of cash received by Big Rivers from the E.ON Entities at the Unwind closing. The Unwind Order does not contain an ordering paragraph relating to the ER, only a commitment in the Appendix to the Order requiring Big Rivers to fund the ER at no less than \$157 million. The Member Rate Stability Mechanism (MRSM) is the tariff vehicle that distributes the ER to the non-Smelter customers to mitigate increased rates due to fuel, environmental and other cost increases.

The Rural Economic Reserve Fund ("RER") which now contains approximately \$64 million was not negotiated by Big Rivers as part of the Unwind. Instead, it was ordered by the Commission from the E.ON Entities as a condition of approving the Unwind. Case No. 2007-00455 at page 25. In this sense it was an unsolicited benefit afforded by the Commission to the residential and commercial customers of Big Rivers. As set forth in the Unwind Order, the RER was originally to be used over a 24 month period upon the expiration of the Economic Reserve Fund. However, in the 2011 rate case, Big Rivers proposed, and the Commission approved, a change in the MRSM as to how the RER is to be used: RER funds would be distributed under

the MRSM on the same basis as ER except only to Rural Customers. Case No. 2011-00036 November 17, 2011 Order at 35. In the currently pending environmental surcharge case (Case No. 2012-00063) Big Rivers has proposed yet another change to the manner in which the RER is to be used: to offset environment costs to the Rural class. Currently, the RER remains at the full \$64 million level and has not been accessed.

Also in the Unwind Order, again using E.ON funds, the PSC approved a \$35 million Transition Fund available to offset revenue loss to BREC if a Smelter closed. BREC has used these funds to prepay RUS but with a "claw back" provision.

Therefore, it is clear from this history, and consistent with the Commission's plenary authority over rates and tariffs, that the use of these reserves is subject to the Commission's discretion and could be used to help facilitate a short term solution that avoids Smelter closures. This is not to suggest that the reserves be directly provided to the Smelters. Instead, an agreed upon Smelter rate reduction could be funded by an increase to the Rural Class, with the impact off-set by the reserves in such amounts and at such times as the Commission may determine in the exercise of its regulatory discretion.

3. **An Agreed Upon Resolution Of The Smelter Issue Will Improve Big Rivers' Credit Rating And Provide It Financing Flexibility**

Big Rivers currently has the lowest credit rating that qualifies as investment grade. In their July 2011 ratings reports, both S&P and Moody's listed the Smelter loads as the number one credit risk to Big Rivers. Loss of one or both of its Smelters from its customer portfolio could result in the loss of Big Rivers' investment grade credit rating and could trigger many negative implications for Big Rivers, including having to file for a rate increase.

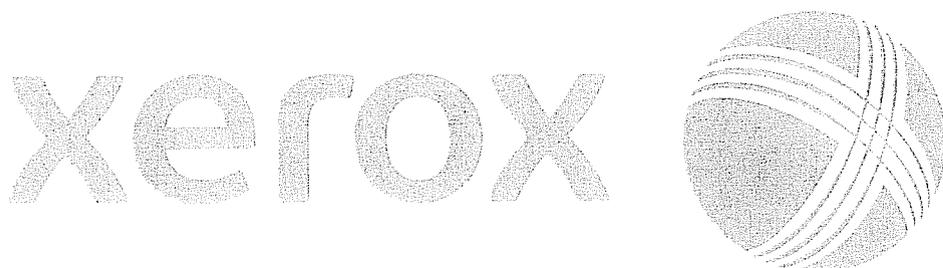
Big Rivers' \$50 million line of credit with CoBank expires in July, 2012. By October 1, 2012 Big Rivers must make a \$60 million principal payment to the RUS. These credit issues were to be addressed and resolved by the \$537 million refinancing package that was approved by the Commission. However, On June 25, 2012, Big Rivers informed the Commission that the refinancing has been postponed with no rescheduled closing date because of "uncertainties and risks created by recent smelter communications and activities."

Without access to capital on reasonable terms, the ability of Big Rivers to provide adequate service under KRS 278.030 may come into question. Further, Rivers is proposing a \$286 million environmental compliance plan to meet new EPA rules. BREC's ability to raise these funds at reasonable interest rates, in addition to having sufficient funds to continue operating its coal fired generation and meet its day-to-day expenses, would be more certain if lenders knew the Smelter situation was resolved.

For these reasons, an improvement in the financial condition of the Smelters through a lower Smelter rate, even on a short term basis, should improve Big Rivers' access to capital on reasonable terms for the benefit of all consumers. Conversely, the absence of a reduction in the Smelter rates, could exacerbate Big Rivers' credit problems. These considerations could be taken into account by the Commission in setting fair, just and reasonable rates.

KWalton

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BOEHM, KURTZ & LOWRY

ATTORNEYS AT LAW
36 EAST SEVENTH STREET
SUITE 1510
CINCINNATI, OHIO 45202
TELEPHONE (513) 421-2255
TELECOPIER (513) 421-2764

Via Electronic Mail

May 11, 2012

James M Miller, Esq.
Sullivan, Mountjoy, Stainback & Miller, PSC
100 St. Ann Street
P.O. Box 727
Owensboro, Kentucky 42302-0727

Re: Big Rivers 2012 Environmental Compliance Plan, KPSC Docket No. 2012-00063

Dear Jim:

KIUC has retained J. Kennedy and Associates, Inc. and Hayet Power System Consulting to review the Company's environmental compliance options and its proposed projects in this proceeding. They will review the data and analyses performed by Sargent & Lundy, the data and projections developed by Pace Global Insight, the Big Rivers plant data, the data used and the projections developed by Aces Power Marketing, and the Company's selection and modeling of various options and sensitivities.

The short time frame of this proceeding requires that we obtain access to this data and the models used and developed by both your consultants/contractors and Company personnel, as soon as possible. To the extent that we will need to obtain licenses or sign confidentiality or other agreements with the Company's consultants/contractors, we would like to complete that process as soon as possible, even before we issue discovery on May 21, 2012 or wait for the responses.

In the interest of expediting this process, we would appreciate your cooperation in obtaining following information and access to the various models (inputs, outputs and models) that were used in support of the Company's proposed projects:

Pace Global

Mark Hite's testimony at page 7 states, "Big Rivers acquired forward pricing data from Pace Global..." With regard to Pace Global data we would like the following items:

- The input data assumptions and all supporting documents associated with the development of the input data assumptions.
- The actual model that Pace Global used, as well as all input files that went into the model at the time the runs were performed and output files, as well as any other documents that Pace Global generated based on the output results.
- Any documentation concerning requirements to install the Pace Global model on our own computers and a copy of the User's Manual.

ACES Power Marketing

At page 7, Mr. Hite stated, "This data, along with Big Rivers' plant specific data was supplied to ACES Power Marketing ("ACES"), who ran all of the production cost models for this evaluation." We would like to obtain the following information:

- The input data assumptions, and all supporting documents associated with the development of the input data assumptions
- The actual production cost model that ACES used, as well as all input files that went to the model at the time the runs were performed.
- All output files, as well as any other documents that ACES developed based on the output results.
- Documentation concerning requirements to install the ACES model on our own computers.
- A copy of the User's Manual.

Sargent & Lundy

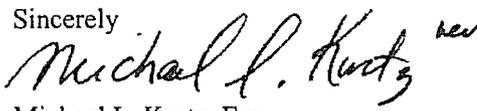
At page 13 of Mr. DePriest's testimony, he stated, "S&L used models and worksheets developed in-house to generate the capital and O&M cost estimates used in the compliance study." We would like to obtain the same input information, models, and output information as described in the bullets above regarding the S&L models.

"Build", "Partial Build" and "Buy" Cases

Finally, at pages 6-7, Mr. Hite described the Company's development of a financial model to evaluate various options (scenarios) that the Company considered. You previously provided that model to the parties. In addition to the model and the related files, we would like to obtain the input assumptions and all supporting documents associated with the development of the input assumptions.

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Since there will be various processes required to go through to obtain these models and the relevant information used for and produced by these models, we would appreciate your cooperation and immediate attention to our request. We can arrange to have a conference call with Company and/or consultant/contractor personnel to expedite this process.

Sincerely

Michael L. Kurtz, Esq.
BOEHM, KURTZ & LOWRY

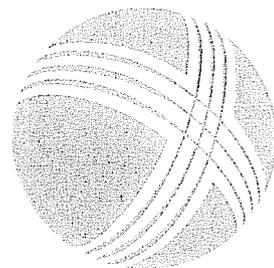
MLKkew

cc: David C. Brown, Esq.
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Dennis Howard, Esq.
Larry Cook, Esq.
Joe Childers, Esq.
Kristin Henry, Esq.
Quang Nyugen, Esq.
Faith Burns, Esq.

KWalton

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BOEHM, KURTZ & LOWRY

ATTORNEYS AT LAW
36 EAST SEVENTH STREET
SUITE 1510
CINCINNATI, OHIO 45202
TELEPHONE (513) 421-2255
TELECOPIER (513) 421-2764

Via Electronic Mail

May 11, 2012

James M Miller, Esq.
Sullivan, Mountjoy, Stainback & Miller, PSC
100 St. Ann Street
P.O. Box 727
Owensboro, Kentucky 42302-0727

Re: Big Rivers 2012 Environmental Compliance Plan, KPSC Docket No. 2012-00063

Dear Jim:

KIUC has retained J. Kennedy and Associates, Inc. and Hayet Power System Consulting to review the Company's environmental compliance options and its proposed projects in this proceeding. They will review the data and analyses performed by Sargent & Lundy, the data and projections developed by Pace Global Insight, the Big Rivers plant data, the data used and the projections developed by Aces Power Marketing, and the Company's selection and modeling of various options and sensitivities.

The short time frame of this proceeding requires that we obtain access to this data and the models used and developed by both your consultants/contractors and Company personnel, as soon as possible. To the extent that we will need to obtain licenses or sign confidentiality or other agreements with the Company's consultants/contractors, we would like to complete that process as soon as possible, even before we issue discovery on May 21, 2012 or wait for the responses.

In the interest of expediting this process, we would appreciate your cooperation in obtaining following information and access to the various models (inputs, outputs and models) that were used in support of the Company's proposed projects:

Pace Global

Mark Hite's testimony at page 7 states, "Big Rivers acquired forward pricing data from Pace Global..." With regard to Pace Global data we would like the following items:

- The input data assumptions and all supporting documents associated with the development of the input data assumptions.
- The actual model that Pace Global used, as well as all input files that went into the model at the time the runs were performed and output files, as well as any other documents that Pace Global generated based on the output results.
- Any documentation concerning requirements to install the Pace Global model on our own computers and a copy of the User's Manual.

ACES Power Marketing

At page 7, Mr. Hite stated, "This data, along with Big Rivers' plant specific data was supplied to ACES Power Marketing ("ACES"), who ran all of the production cost models for this evaluation." We would like to obtain the following information:

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Sargent & Lundy

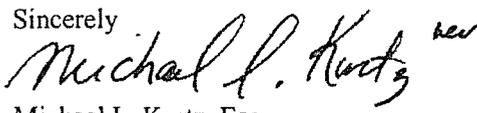
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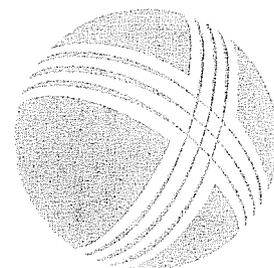
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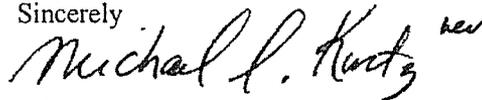
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BOEHM, KURTZ & LOWRY

MLKkew

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Joe Childers, Esq.
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Quang Nyugen, Esq.
Faith Burns, Esq.

SULLIVAN, MOUNTJOY, STAINBACK & MILLER PSC
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Jesse T. Mountjoy
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Michael A. Fiorella
Allen W. Holbrook
R. Michael Sullivan
Bryan R. Reynolds*
Tyson A. Kamuf
Mark W. Starnes
C. Ellsworth Mountjoy
Mary L. Moothouse

July 26, 2012

Via Federal Express

Jeff DeRouen
Executive Director
Public Service Commission
211 Sower Boulevard, P.O. Box 615
Frankfort, Kentucky 40602-0615

*Also Licensed in Indiana

Re: *In the Matter of: Application of Big Rivers Electric Corporation for Approval of its 2012 Environmental Compliance Plan, for Approval of its Amended Environmental Cost Recovery Surcharge Tariff, for Certificates of Public Convenience and Necessity, and for Authority to Establish a Regulatory Account, P.S.C. Case No. 2012-00063*

Dear Mr. DeRouen:

This letter is written on behalf of Big Rivers Electric Corporation ("Big Rivers") to advise the Public Service Commission ("Commission") and intervenors that Mark Hite, Big Rivers current Vice President Accounting and Interim CFO is retiring effective tomorrow, July 27, 2012, to accept another position. Because Mr. Hite has filed testimony in this case, and has responsibility for several data request responses, Big Rivers has reassigned responsibility for those items to existing and new witnesses. For the convenience of the Commission and the intervenors, Big Rivers has prepared a table of items for which Mr. Hite had responsibility, and identified in the table the witness who is assuming responsibility for each item at the hearing.

Ralph Ashworth, Director Finance, and Travis Siewert, Senior Staff Accountant, are new witnesses who will be assuming responsibility for some of Mr. Hite's work in this case. Summaries of their education and experience are attached. When they take the stand at the hearing, they will adopt as their own the testimony and data request responses for which they have assumed responsibility.

Mr. Hite's successor is Billie Richert. She has been an employee of Big Rivers for approximately two years.

Telephone (270) 926-4000
Telecopier (270) 683-6694

100 St. Ann Building
PO Box 727
Owensboro, Kentucky
42302-0727

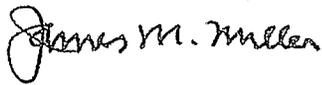
www.westkylaw.com

SULLIVAN, MOUNTJOY, STAINBACK & MILLER PSC

Jeff DeRouen
July 26, 2012
Page 2

I certify that a copy of this letter and attachment have been served upon each of the persons shown on the attached service list. Please feel free to contact me with any questions.

Sincerely yours,

A handwritten signature in cursive script that reads "James M. Miller".

James M. Miller

JMM/ej
Enclosures

cc: Albert Yockey

Service List
PSC Case No. 2012-00063

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Vantage Energy Consulting LLC
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Cudjoe Key, Florida 33042

Chuck Buechel
10 Eagleview Lane
Fort Thomas, KY 41075

Mike Boismenu
3 Lotus Bay Estate Drive
Irving, NY 14081

Witness Substitution Table
 Big Rivers Electric Corporation
 PSC Case No. 2012-00063

Source	Item	Witness
<i>Testimony</i>		
Direct	III	Travis Siewert
	IV	Ralph Ashworth
	V	Ralph Ashworth
	VI	John Wolfram
<i>Data Requests</i>		
PSC 1	1	Robert W. Berry
	12	Ralph Ashworth
	24	Travis Siewert
	25	Travis Siewert
	26b	Travis Siewert
	27	Ralph Ashworth
	29	Ralph Ashworth
	30	John Wolfram
	31	John Wolfram
	32	John Wolfram
KIUC 1	1	Travis Siewert
	2	Travis Siewert
	5	Travis Siewert
	6	Travis Siewert
	8	Travis Siewert
	12	Travis Siewert
	32	Travis Siewert
	37	Travis Siewert
	42	Ralph Ashworth
	44	Ralph Ashworth
	45	Ralph Ashworth
	46	Robert W. Berry
	47	Robert W. Berry
	49	Travis Siewert
	50	Ralph Ashworth
	51	Ralph Ashworth
	52	Ralph Ashworth
53	Ralph Ashworth	
54	Travis Siewert	
SC 1	1b	Ralph Ashworth
	15	John Wolfram
	32	Ralph Ashworth
	33	Ralph Ashworth
	34	Ralph Ashworth
	51	Travis Siewert
	52	Travis Siewert
	55	Travis Siewert
	56	Ralph Ashworth
57	Ralph Ashworth	

Witness Substitution Table
 Big Rivers Electric Corporation
 PSC Case No. 2012-00063

Source	Item	Witness
AG 1	1	Ralph Ashworth
	2	Ralph Ashworth
	3	Ralph Ashworth
	6	John Wolfram
	12	Robert W. Berry
	13	Ralph Ashworth
	17	Travis Siewert
	18	Travis Siewert
	19	Ralph Ashworth
	24	Ralph Ashworth
	25	Ralph Ashworth
	28	Ralph Ashworth
	29	Ralph Ashworth
	30	Robert W. Berry
	31	Ralph Ashworth
	32	Ralph Ashworth
	33	Ralph Ashworth
	34	Ralph Ashworth
	35	Travis Siewert
	36	Ralph Ashworth
	37	Ralph Ashworth
	38	Travis Siewert
	42	John Wolfram
	45	John Wolfram
	51	John Wolfram
	57	Ralph Ashworth
	59	Travis Siewert
	60	Travis Siewert
	63	Travis Siewert
	64	Ralph Ashworth
	65	Travis Siewert
	66	Ralph Ashworth
	67	Ralph Ashworth
	69	Ralph Ashworth
	70	Travis Siewert
	71	Ralph Ashworth
72	Ralph Ashworth	
73	Ralph Ashworth	
74	Robert W. Berry	
77	John Wolfram	
78	John Wolfram	
81a	Ralph Ashworth	
83	John Wolfram	
84	Travis Siewert	
86	John Wolfram	

Witness Substitution Table
 Big Rivers Electric Corporation
 PSC Case No. 2012-00063

Source	Item	Witness
PSC 2	1	Travis Siewert
	4	Travis Siewert
	15	Ralph Ashworth
AG 2	1	Ralph Ashworth
	2	Ralph Ashworth
	4	Ralph Ashworth
	5	Ralph Ashworth
	6	Ralph Ashworth
	7	Ralph Ashworth
	9	Travis Siewert
	11	Ralph Ashworth
	14	Travis Siewert
	16	Ralph Ashworth
	17	Ralph Ashworth
	20	Travis Siewert
	22	John Wolfram
27	Travis Siewert	
KIUC 2	3	Ralph Ashworth
	4	Ralph Ashworth
	5	Ralph Ashworth
	7	Travis Siewert
	8	Travis Siewert
	9	Travis Siewert
	10	Brian J. Azman
	11	Robert W. Berry
	15	Travis Siewert
	16 b,c	John Wolfram (b), Travis Siewert (c)
	18	Ralph Ashworth
	22	Ralph Ashworth
	23	Travis Siewert
	25	Travis Siewert
43	Travis Siewert	

Witness Substitution Table
 Big Rivers Electric Corporation
 PSC Case No. 2012-00063

Source	Item	Witness
SC 2	3d	Ralph Ashworth
	11	Robert W. Berry
	12	Robert W. Berry
	16	Travis Siewert
	17 a,b	Travis Siewert
	18b	Ralph Ashworth
	20	Ralph Ashworth
	21	Travis Siewert
	22	Ralph Ashworth
28	Ralph Ashworth	
KIUC 3	6	Travis Siewert
SC 3	3	Travis Siewert
	7	Travis Siewert
	8	Travis Siewert
	9	Travis Siewert
	11b	Travis Siewert
	12	Travis Siewert
	14	Travis Siewert
	15	Travis Siewert
	17a-c	Travis Siewert
	19	Travis Siewert
	20	Ralph Ashworth
	22	Travis Siewert

Professional Summary

Ralph A. Ashworth
Director, Finance
Big Rivers Electric Corporation
201 3rd Street
Henderson, Kentucky 42420
(270) 844-6131

Professional Experience

Big Rivers Electric Corporation 1977 to present

Director, Finance

Manager of Accounting

Acting Manager of Financial Services

Budgets Supervisor

Accountant, Budgets

Accountant, Plant Accounting

Owensboro National Bank 1973 - 1977

Accounting Supervisor

Accountant

Education

Master of Business Administration

Murray State University

Bachelor of Science in Accounting

University of Kentucky

Professional Summary

Travis Siewert, CPA, CMA
Senior Staff Accountant
Big Rivers Electric Corporation
201 3rd Street
Henderson, Kentucky 42420
(270) 844-6130

Professional Experience

Big Rivers Electric Corporation 2003 to present

Senior Staff Accountant

Financial Forecasting and Economic Analysis

Cash Management and Fixed Assets

Education

Masters of Science in Accountancy

University of Southern Indiana, Evansville, Indiana, May 2003

Bachelors of Science in Accounting (Magna Cum Laude)

Kentucky Wesleyan College, Owensboro, Kentucky, May 2002

Certifications

Certified Public Accountant – CPA

Certified Management Accountant – CMA

Professional Organizations

Kentucky Society of Certified Public Accountants

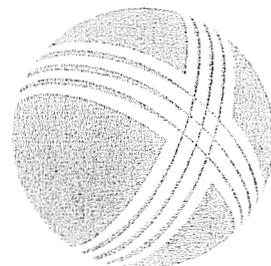
Institute of Management Accountants

American Institute of Certified Public Accountants

KWalton

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COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS)	
ELECTRIC CORPORATION FOR)	
APPROVAL OF ITS 2012 COMPLIANCE)	
PLAN, FOR APPROVAL OF ITS)	
AMENDED ENVIRONMENTAL COST	)	CASE NO. 2012-00063
RECOVERY SURCHARGE TARIFF,)	
FOR CERTIFICATES OF PUBLIC)	
CONVENIENCE AND NECESSITY, AND)	
FOR AUTHORITY TO ESTABLISH A)	
REGULATORY ACCOUNT)	

DIRECT TESTIMONY
AND EXHIBITS
OF
LANE KOLLEN

ON BEHALF OF THE
KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.

J. KENNEDY AND ASSOCIATES, INC.
ROSWELL, GEORGIA

July 2012

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BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

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REGULATORY ACCOUNT)	

DIRECT TESTIMONY OF LANE KOLLEN

I. QUALIFICATIONS AND SUMMARY

1

2 **Q. Please state your name and business address.**

3 A. My name is Lane Kollen. My business address is J. Kennedy and Associates, Inc.
4 ("Kennedy and Associates"), 570 Colonial Park Drive, Suite 305, Roswell,
5 Georgia 30075.

6

7 **Q. Please state your occupation and employer.**

8 A. I am a utility rate and planning consultant holding the position of Vice President
9 and Principal with the firm of Kennedy and Associates.

10

1 **Q. Please describe your education and professional experience.**

2 A. I earned a Bachelor of Business Administration in Accounting degree and a
3 Master of Business Administration degree from the University of Toledo. I also
4 earned a Master of Arts degree from Luther Rice University. I am a Certified
5 Public Accountant (“CPA”), with a practice license, and a Certified Management
6 Accountant (“CMA”).

7 I have been an active participant in the utility industry for more than thirty
8 years, as a consultant in the industry since 1983 and as an employee of The
9 Toledo Edison Company from 1976 to 1983. I have testified as an expert witness
10 on planning, ratemaking, accounting, finance, and tax issues in proceedings
11 before regulatory commissions and courts at the federal and state levels on more
12 than two hundred occasions, including proceedings before the Kentucky Public
13 Service Commission (“Commission”). I have testified in several Big Rivers
14 Electric Corporation (“BREC” or “Company”) proceedings before the
15 Commission. My qualifications and regulatory appearances are further detailed in
16 my Exhibit___(LK-1).

17

18 **Q. On whose behalf are you testifying?**

19 A. I am testifying on behalf of the Kentucky Industrial Utility Customers, Inc.
20 (“KIUC”), a group of large customers taking electric service on the Big Rivers
21 Electric Corporation system.

22

23 **Q. What is the purpose your testimony?**

1 A. The purpose of my testimony is to summarize the KIUC recommendations in
2 response to the Company's request for approval of its proposed 2012
3 environmental compliance plan ("ECP"), certificates of public convenience and
4 necessity, amended environmental cost recovery ("ECR") tariff, and for authority
5 to establish a regulatory asset for the costs related to this proceeding.

6

7 **Q. Please summarize your testimony.**

8 A. The Commission should reject the Company's proposed ECP projects 4
9 (replacement of Wilson scrubber) and 5 (addition of Green 2 SCR) included by
10 the Company in its "Build" case.¹ The Company has not met its burden of proof
11 that these projects are reasonable and cost-effective. To the contrary, the
12 Company initially failed to provide any quantitative support for its proposed ECP
13 and the alternatives and sensitivities it presented in summary form on a single
14 page exhibit.

15 Through an unnecessarily arduous and time-consuming process, KIUC
16 ultimately obtained the models used by the Company and its consultants.
17 Consequently, KIUC was able to review the Company's assumptions and data,
18 run the models used by ACES Power Marketing ("ACES") and Big Rivers, and
19 review the Company's analyses in a more detailed manner, as well as develop its

¹ KIUC does not oppose the Company's proposed ECP projects 6 (convert Reid 1 to natural gas), 7 (install recycle pump and new motors on ID fans at HMP&L 1 and 2), 8 (install activated carbon injection, dry sorbent injection and monitors at Coleman 1, 2, and 3), 9 (install activated carbon injection, dry sorbent injection and monitors at Wilson), 10 (install activated carbon injection, dry sorbent injection and monitors at Green 1 and 2), and 11 (install particulate monitors at HMP&L 1 and 2).

1 own analyses using the Company's models. KIUC witness Mr. Philip Hayet of
2 Hayet Power Systems Consulting describes this process in greater detail.

3 Based on our review, we conclude that the Company's quantitative
4 analyses are unreliable and do not support the Company's conclusion that the
5 Build case is the least cost alternative. In our review, we found that the
6 Company's quantitative analyses are replete with errors and unreasonable
7 assumptions and data. These problems significantly affect the net present value
8 of the Company's alternatives, the ranking of those alternatives, and mask the
9 catastrophic effects of the Smelter load loss sensitivities. I subsequently describe
10 the problems that we identified with the Company's financial model that it used to
11 quantify the net present value of its alternatives and sensitivities. Mr. Hayet
12 describes the problems that we identified with the Company's production cost
13 modeling, which include the following:

- 14 • Build Case. DB Wilson Emissions Removal Rate. DB Wilson's upgrade
15 will not be completed until 2016. ACES had the emissions reduction rate
16 change beginning January 2015.
- 17 • Build Case. The Build Case has the HMPL 1&2 environmental upgrade
18 project completed January 1, 2014. According to Exhibit Berry-2 page 1
19 of 2, it should be 2015.
- 20 • Build Case. VO&M at Green 2 is the same in the Build and Buy cases,
21 although it should be different once the Green 2 SCR is added in 2015.
22 Incremental O&M is indicated to be \$1.58 million beginning in 2015 due
23 to the addition of the SCR per Exhibit Berry-2 page 2 of 2.
- 24 • Build Case. HMPL 1&2 has the same VO&M in the Build and Buy
25 Cases. Exhibit Berry-2 indicates that the Build Case should be higher by
26 approximately \$800,000 per year.

- 1 • Buy Case. DB Wilson VO&M is higher in the Buy Case than the Build
2 Case. By 2026, it is as much as 13.6% higher than the Build Case.
- 3 • Buy Case. Coleman 1, 2 & 3. Even though compliance with CSAPR
4 won't begin until 2016, Big Rivers has begun to constrain the dispatch of
5 the Coleman units as early as 2013. It should be changed to begin in
6 2016.
- 7 • Buy Case. Coleman 1, 2 & 3. Given that the units will now be shut down
8 for multi-month periods of time to limit emissions, it may not be necessary
9 to schedule maintenance during a different period of time. The
10 maintenance should be changed to occur at the same time that the unit is
11 taken offline.
- 12 • Build and Buy Cases. No consideration of CO2 constraints or costs on
13 Big Rivers' generation, even though PACE Global market price forecasts
14 based on assumptions of CO2 constraints and costs. Assuming that CO2
15 requirements will dramatically increase market prices but not Big Rivers'
16 generation costs is a fundamental inconsistency that biased the study in
17 favor of the Build option.
- 18 • Build and Buy Cases. PACE Global market prices are excessive
19 compared to other projections developed by ACES and HIS Global. One
20 factor is that PACE Global market prices based on assumptions of CO2
21 constraints and costs.
- 22 • Build and Buy Cases. Coleman 2 having hundreds of startups per year. It
23 turned out that the database had two inputs reversed. The mean time to
24 repair input was switched and input as the average time to repair at the
25 Coleman 2 unit.
- 26 • Build and Buy Cases. HMPL 1&2 VO&M costs - The Costs that the
27 Company used in its financial analysis do not match what the Company
28 indicates should have been used in the production cost model.
- 29 • Build No Smelter Case. The Company input VO&M at Green 1 at a
30 significantly higher amount in the Build No Smelter Case than in the Buy
31 No Smelter Case.
- 32 • Buy No Smelter Case. HMPL 1&2 - The Buy No Smelter Case has higher
33 VO&M than all of the other cases.
- 34

1 Based on our review, we conclude that the Build and Buy cases are
2 approximately equivalent on a net present value basis when the various modeling
3 problems are corrected, even though the Buy case net present value is slightly less
4 than the Build case when the fixed maintenance expense is reduced.² In our
5 analyses, Mr. Hayet identified and corrected various production modeling errors
6 and replaced unreasonable assumptions and data, which he describes in his
7 testimony. Mr. Hayet presents the results of our analyses using the Company's
8 "to-go" net present value construct, an analytical framework that considers only
9 variable expenses and revenues on a total Company basis and without specific
10 consideration of the effect on the member revenue requirements. I present the
11 results of our analyses using the "all-in" member revenue requirement construct,
12 an analytical framework that considers the effects of all variable and fixed
13 revenues and expenses in a comprehensive manner on the member revenue
14 requirements. In our analyses, we did not attempt to fix every problem that we
15 identified in the Company's modeling or replace every unreasonable assumption
16 or all unreasonable data given the Company's burden of proof and the procedural
17 time constraints of this proceeding.

18 We also conclude that the Commission should do everything possible to
19 retain the Smelter load, especially because the Smelter margins are greater than
20 those the Company can achieve through sales into MISO, at least in the near term.

² The Build case includes projects 4 and 5 and projects 6-11 as described in the Company's Application. The Buy case does not include projects 4 and 5, but does include projects 6-11. KIUC does not oppose projects 6-11.

1 The Company’s Smelter load loss sensitivities are flawed and mask the
2 catastrophic effects on rural and large industrial customers if the Smelters
3 terminate their contracts. The Company’s analyses result in rate increases to the
4 rural and large industrial customers ranging from 68% to 84%. Alternatively, if
5 the rate increases are not approved, Big Rivers would face bankruptcy and
6 perhaps liquidation. In that event, Big Rivers likely would be required to sell its
7 assets and the member cooperatives would have to obtain a different supplier.

8 The following tables provide a summary of the net present value of the
9 “all-in” member revenue requirements comparing the Company’s results to the
10 KIUC results on the Build and Buy cases and the two Smelter load loss
11 sensitivities. Mr. Hayet presents the “to-go” results for all the KIUC studies,
12 including intermediate studies that he performed to assess the impact of correcting
13 various errors and changing various assumptions or data.

14

BIG RIVERS ELECTRIC CORPORATION ENVIRONMENTAL COMPLIANCE SCENARIOS
COMPARISON OF TOTAL CUSTOMER REVENUES, EXCLUDING MARKET SALES - NPV

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
Big Rivers Build	520 02	506 55	483 14	472 65	436 13	411 49	383 18	363 93	340 68	322 24	300 80	290 70	274 66	268 59	5,374.76
Big Rivers Buy	550 07	532 80	514 18	496 42	482 27	468 68	447 33	423 55	403 61	377 66	355 27	338 93	332 24	318 66	6,041.88
Big Rivers Build Smelter Load Loss	520 02	256 86	223 46	203 02	143 05	111 72	100 35	81 21	59 39	46 20	19 24	15 60	13 30	24 67	1,818.10
Big Rivers Buy Smelter Load Loss	526 98	282 89	262 82	256 54	186 67	175 42	166 25	132 60	125 66	119 07	75 01	72 17	69 14	65 63	2,516.86

15

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BIG RIVERS ELECTRIC CORPORATION ENVIRONMENTAL COMPLIANCE SCENARIOS CORRECTED BY KIUC
COMPARISON OF TOTAL CUSTOMER REVENUES, EXCLUDING MARKET SALES - NPV

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
KIUC Build	529 29	512 01	493 69	487 50	461 08	434 42	411 33	389 68	368 34	347 82	330 47	315 49	301 82	286 06	5,669.00
KIUC Buy	530 16	509 79	491 07	481 12	460 59	441 04	420 64	397 85	375 65	355 64	336 76	321 12	307 38	292 99	5,721.80
KIUC Build Smelter Load Loss	518 12	256 06	245 93	246 07	255 36	230 77	222 25	210 13	199 54	184 72	171 90	163 37	160 21	147 28	3,211.69
KIUC Buy Smelter Load Loss	530 16	278 34	262 09	255 39	249 78	233 23	223 50	212 75	200 49	186 28	171 80	163 92	160 86	150 06	3,278.67

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Finally, given the approximate equivalence of the Build and Buy cases when corrected, we conclude that the Commission should reject the proposed ECP projects 4 and 5 based on *qualitative* factors that maximize the flexibility and minimize the risk to the Company, its customers, and its creditors. The following qualitative factors weigh against ECP projects 4 and 5 included in the Build case, but not in the Buy case, particularly given the flexibility to revisit projects 4 and 5 in the future, the need to minimize rate increases for as long as possible, and the need to retain the Smelter load:

- the relative inexperience of the Big Rivers management team in large scale construction projects,
- the greater risk to Big Rivers and the members of the Build alternative compared to the Buy alternative due to the magnitude of the capital expenditures,
- the uncertainty of timing, scope, and cost of the CSAPR compliance requirements, particularly given the pending stay of the CSAPR regulations,
- the potential for cost overruns under the Build alternative, given the preliminary nature of the engineering design and related cost estimates presented by the Company,
- the effect on member rates if there are Smelter load losses and the costs of the Build alternative are imposed on the remaining customers and load,
- the potential for significant additional environmental compliance costs due to other pending and potential environmental legislation and regulations, including the effects of the proposed Coal Combustion Residuals regulation, potential carbon legislation and/or regulations, and changes to the National Ambient Air Standards, among others,
- the ability of the Company to finance the Build case capital expenditures and the cost of that financing if it is available, and

- 1 • the flexibility that the Buy case affords the Commission to subsequently revisit
2 the Build alternative if the economics support such a decision in the future.³
3

4 In the next section of my testimony, I address various flaws in the
5 Company's modeling and assessment of the available options that impact the
6 viability, nominal revenue requirements and net present value economics of the
7 Company's scenarios, and the production costs and margins from sales to other
8 wholesale customers in lieu of the Smelters in the event that one or both of the
9 Smelters terminate their contracts.

10 I then address various qualitative factors that affect the Company's
11 analyses and the Company's failure to address these factors. Among these
12 qualitative factors are the Company's failure to consider increases in capital
13 expenditures compared to the preliminary estimates reflected in its three scenarios
14 and two sensitivities; the failure to include costs for additional environmental
15 requirements and compliance costs; and the availability and cost of financing
16 capital expenditures.

17
18 **II. THE COMPANY'S QUANTITATIVE ANALYSES ARE FUNDAMENTALLY**
19 **FLAWED AND UNRELIABLE**

³ The Company does not propose to include construction work in progress in "rate base" in the proposed ES tariff, according to Exhibit Wolfram – 2. The proposed tariff defines environmental rate base as electric plant in service less accumulated depreciation. The Company's qualitative analyses are consistent with the proposed ES tariff and capitalized interest during construction. There is no effect included in the revenue requirement of the capital expenditures until the assets are completed and placed in service. This proposal reduces the NPV of the Build and Build Smelter load loss sensitivity cases compared to the Buy cases because it defers any recovery related to the capital expenditures in the Build and Build Smelter load loss sensitivity cases until 2016, or year five of the 15 year analysis period.

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Description of Company’s Quantitative Analyses in Financial Model

Q. Please generally describe the Company’s quantitative analyses.

A. In general, the Company obtained market prices, coal prices, natural gas prices, and monthly allowance prices from PACE Global, which it, in turn, provided to ACES Power Marketing. The Company also provided other generating unit data to ACES. ACES performed all production cost modeling using the Ventyx Planning and Risk (“PaR”) model. The production cost model output was subjected to post-processing analyses and the results then were input into the Company’s financial model. The FM was used to develop the NPV results presented by Mr. Hite for the Base case, Build case, Partial Buy case, Build case Smelter load loss sensitivity, and the Buy case Smelter load loss sensitivity. Although not presented by the Company either in its Build, Partial Build, Buy cases, or as sensitivities, the Company subsequently obtained market prices from ACES and from IH Gobal for use in a Load Concentration Study performed in May 2012, nearly two months after it completed the analyses reflected in its filing in this proceeding. The ACES and IH Global market prices were significantly lower than the PACE Global market prices used by ACES and then used by Big Rivers in the alternatives and sensitivities it presented in this proceeding. The PACE market price forecast assumed CO2 emission costs, while the ACES market price forecast did not.

1 **Q. Are there problems with the Company's production cost modeling?**

2 A. Yes. These problems are addressed by Mr. Hayet. In addition, Mr. Hayet has re-
3 run the production cost model to correct modeling errors and unreasonable
4 assumptions and data. He presents the results of the corrected quantitative
5 analyses in his testimony on a "to-go" basis. I present the results of the corrected
6 quantitative analyses on an "all-in" basis.

7

8 **Q. Are there problems with the Company's quantitative analyses reflected in**
9 **the financial model?**

10 A. Yes. I first will describe how the Company uses the FM, then address the various
11 flaws in the Company's methodology, and then address the flaws in the
12 Company's Smelter load loss sensitivities.

13

14 **Q. Please describe the Company's Financial Model.**

15 A. The Company's FM is an Excel-based workbook with multiple interrelated
16 spreadsheets. The FM simulates the Company's accounting and ratemaking
17 processes over a projected 15 year period, from 2012 through 2026. The FM
18 includes the following interrelated spreadsheets:

- 19 • Trial Bal (trial balance by RUS account)
- 20
- 21 • Charts (computes financial and rate metrics)
- 22
- 23 • Risk (scales market power prices)
- 24
- 25 • NPV (computes net present value of "to-go" costs of compliance plan
- 26 alternatives)
- 27

- 1 • ECP (compliance plan alternative capex, expenses, ECR rate effect)
- 2
- 3 • Bud Adj (adjusts various budget items)
- 4
- 5 • Stmts RUS (develops financial statements in RUS format)
- 6
- 7 • Rates (develops rates, member and market revenues, solves for revenue
- 8 deficiencies and surplus to achieve 1.24 TIER)
- 9
- 10 • Rates – Cash (computes member rates on cash method)
- 11
- 12 • FAC, PPA, ES, SC (computes surcharge rates)
- 13
- 14 • Regulatory Charge (computes regulatory deferral and amortization
- 15 expense)
- 16
- 17 • Fuel (fuel purchases and expense by generating unit)
- 18
- 19 • PCM (production costs)
- 20
- 21 • Interest (computes interest on reserves)
- 22
- 23 • O&M (primarily fixed O&M and A&G by RUS account)
- 24
- 25 • Capex & Depr (non-environmental capex and depreciation)
- 26
- 27 • UW Transaction (unwind transaction)
- 28
- 29 • Debt (detail on debt issuances and interest expense)
- 30
- 31 • Pat. (patronage capital and dividends)
- 32

33 **Q. Please describe how the Company calculated the net present value of the**
34 **various compliance alternatives and sensitivities in the Financial Model.**

35 A. The Company calculated the net present value of the various compliance
36 alternatives and sensitivities in the financial model on the “NPV” spreadsheet. It
37 employed a “to-go” construct in which it used only the variable costs and
38 revenues that it determined were affected by the alternative, including the so-

1 called “fixed costs” of interest and principal repayments on debt issued for the
2 alternative. The “to-go” expenses and revenues were determined on a total
3 Company basis, not on a member revenue requirements basis, even though the
4 FM also computes the effects on an “all-in” member revenue requirement basis,
5 which it builds by computing base rates and surcharge rates by customer class.
6 The Company’s “to-go” construct assumed that there would be no other changes
7 in expenses or revenues. More specifically, the Company’s construct uses only
8 the following expenses/costs and revenues:

9 Production Costs

- 10 • fuel expense,
11 • variable environmental O&M expense,
12 • purchased power expense,
13 • emission allowance expense,
14 • off-system or market revenues (reflected as a negative
15 offset to the expenses)

16 Fixed Cost of Capital

- 17 • debt service (interest expense and principal maturities),
18 • debt issuance cost amortization expense,
19 • property tax expense,
20 • property insurance expense,
21 • labor expense

22 In general, the “to-go” production expenses and market revenues were
23 developed by ACES using the production cost model, subjected to “post-
24 processing analyses,” and then input by Big Rivers into its financial model,
25 primarily into the PCM spreadsheet in the financial model. The production
26 expenses and market revenues developed by ACES relied on market prices that
27 were developed by PACE Global at Big Rivers’ request. In general, the Company

1 directly modeled the incremental debt and related debt service and the other fixed
2 costs of capital within the FM itself. All of these amounts are reflected on an
3 annual nominal dollar basis in the NPV spreadsheet and then discounted in that
4 spreadsheet to 2012 net present value dollars. The discounting is performed on an
5 annual basis using the Company's weighted cost of debt grossed-up for the
6 contract TIER of 1.24 to an overall discount rate of 7.93%.

7
8 **The Company's Quantitative Analyses Are Replete with Errors**

9
10 **Q. Are there problems with the Company's NPV analyses that affect all of the**
11 **scenarios and sensitivities?**

12 A. Yes. There are multiple problems. First, the Company's NPV analyses fail to
13 reflect the effects on member revenue requirements on an "all-in" basis and
14 instead focus only on the net present value to the Company of the "to-go"
15 expenses and revenues of the alternatives. Although the Company's FM develops
16 the "all-in" member revenue requirements, the Company chose to use the "to-go"
17 metric. The "to-go" metric, in and of itself, does not disqualify the Company's
18 analyses, but it appears to have contributed to the other problems that I
19 subsequently address. It also is important to recognize that the Company's net
20 present value amounts using the "to-go" metric are not meaningful in absolute
21 dollars of revenue requirement due to the exclusion of other revenue requirement
22 components that are included in the "all-in" revenue requirement, but rather are
23 meaningful only for the purposes of ranking the various scenarios and quantifying

1 the differences between them.

2 Second, the Company's NPV analyses fail to include the TIER on the
3 interest expense, which understates the net present value of the debt service
4 expense included in the various alternatives. For ratemaking purposes, the
5 Company recovers not only the interest on its debt from customers through the
6 revenue requirement, but also recovers a margin that adds another 24% of the
7 interest to the revenue requirement. The Company's NPV analyses ignore the
8 TIER effect on the member revenue requirement. The failure to include the TIER
9 on the interest expense also is methodologically inconsistent with the Company's
10 use of a discount rate that is grossed-up for the TIER. This error has the greatest
11 effect in the Build case because it has the greatest interest expense among the
12 alternatives.

13 Third, the Company's NPV analyses assume that the debt service is
14 levelized over 30 years,⁴ a methodology that is similar to a lease or home
15 mortgage and assumes a uniform annual debt service. However, this
16 methodology is inconsistent with the ratemaking process, which assumes that the
17 Company's interest expense and the related member revenue requirement are the

⁴ Typically, a utility's debt service is at the maximum level when the assets that were financed enter commercial operation. As the asset is depreciated and the debt principal is repaid, the revenue requirement declines. Under a levelized approach, the debt service is converted into an annuity, similar to a lease or home mortgage, so that there are equal annual requirements. If the two data series were plotted against each other, the typical annual revenue requirement would decline annually from the first year through the last year of the asset's life and the related repayment of the debt principal. In contrast, the levelized annual revenue requirement would remain the same each year and would be less than the typical revenue requirement in the early years, then crossover and be more than the typical revenue requirement in the latter years.

1 greatest when construction of the assets is completed and then decline as the
2 assets are depreciated and the debt is reduced. The Company's methodology and
3 significantly reduces the expenses in the early years of the Company's 15 year
4 analysis period compared to the actual annual revenue requirement and recoveries
5 based on declining debt and the related interest expense over time. Although this
6 does not have a significant effect on the net present value over the 15 year
7 analysis period, it does affect the annual nominal and present value amounts.

8

9 **Q. Is there a problem with the Company's NPV analyses that affects only**
10 **certain of the scenarios and sensitivities?**

11 A. Yes. The Company failed to include the economic effects of the costs to remove
12 the existing scrubber at Wilson in conjunction with ECP project 4 in the Build
13 case, the Partial Build case, and the Build case Smelter load sensitivity. This
14 problem does not affect either the Buy case or the Buy case Smelter load loss
15 sensitivity because Project 4 is not included in those cases.

16 This error understates the net present value of the Build, Partial Build and
17 Build Smelter load loss sensitivity cases in comparison to the Buy and Buy
18 Smelter load loss sensitivity cases by ignoring the depreciation expense (or debt
19 principal repayments), interest expense, and the TIER margin on the removal
20 costs and the related debt financing. I am not able to estimate the effect of the
21 Company's error because the Company not only failed to include the cost of
22 removal, it also failed to estimate the cost itself, according to its response to
23 KIUC 2-22. The Company claims that the cost of removal isn't an issue because

1 it will be offset by salvage income. However, that claim appears to have been
2 developed after the fact and is without any support whatsoever. I have attached a
3 copy of the Company's response as my Exhibit ___(LK-2).

4

5 **Q. Are there other problems with the Company's NPV analyses that affect only**
6 **certain of the scenarios and sensitivities?**

7 A. Yes. The Company's NPV analyses fail to reflect any reduction in non-fuel
8 production operation and maintenance expense, other than changes in variable
9 environmental O&M expense, in the Partial Build or Buy cases or the Buy case
10 Smelter load loss sensitivity. In other words, even though the Company
11 constrains and substantially reduces the operation of the generating units in those
12 cases, it still assumes that it will incur the same non-environmental operation and
13 maintenance expense. In the real world, the Company would reduce its
14 maintenance expense to reflect reductions in maintenance requirements, and
15 possibly would reduce its operation expense, especially in the Buy case and the
16 Buy case Smelter load loss sensitivity, but it failed to reflect any reductions in
17 these expenses in its analyses in this proceeding.

18 The Company included the same fixed production maintenance expense in
19 all three cases and the two sensitivities as follows:

20

BIG RIVERS ELECTRIC CORPORATION
FIXED MAINTENANCE EXPENSE
(\$ Million)

2012	49.89
2013	46.20
2014	56.83
2015	52.02
2016	53.78
2017	55.40
2018	57.06
2019	58.77
2020	60.53
2021	62.35
2022	64.22
2023	66.15
2024	68.13
2025	70.17
2026	72.28

1

2

If these fixed maintenance expenses alone were reduced by 25% in the Buy and the Buy Smelter load loss sensitivity cases to reflect reductions in maintenance requirements, then the net present value for those cases would be reduced by \$133 million, both on a “to-go” basis and on an “all-in” basis. Thus, a change in this assumption alone would improve the ranking of the Buy case and the related Smelter load loss sensitivity compared to the Build case and the related Smelter load loss sensitivity.

9

10 **The Company’s Smelter Load Loss Scenarios Are Erroneous and Misleading**

11

12 **Q. Are there also problems with the Company’s NPV analyses that affect only**
13 **the Smelter load loss sensitivities?**

1 A. Yes. The Company’s NPV analyses of the Build case and Buy case Smelter load
2 loss sensitivities are flawed. This is evident from even a cursory review of the
3 results of these analyses reported on Exhibit Hite-4 attached to Mr. Hite’s Direct
4 Testimony as summarized in the table below:

5

BIG RIVERS ELECTRIC CORPORATION COMPARISON OF BIG RIVERS CASES (\$ MILLION)																
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
Build Case	301.93	285.91	277.08	265.34	258.98	234.16	220.82	202.97	195.61	181.68	173.31	158.82	158.14	146.15	149.48	3,210.39
Partial Build Case	301.93	285.28	281.85	271.50	267.63	247.94	240.12	220.07	214.04	200.73	191.88	177.15	176.78	164.60	168.87	3,410.36
Buy Case	317.24	315.37	303.91	293.87	288.84	290.07	281.29	270.92	255.51	250.18	226.09	216.80	204.72	209.28	196.70	3,920.79
Build Smelter Load Loss	301.93	286.15	31.80	12.62	(10.68)	(58.57)	(79.18)	(79.68)	(87.20)	(99.00)	(102.92)	(121.44)	(117.84)	(114.40)	(95.61)	(334.06)
Buy Smelter Load Loss	317.24	310.99	49.75	36.93	14.46	(13.39)	(28.21)	(22.51)	(36.32)	(40.74)	(57.85)	(72.42)	(77.96)	(60.57)	(54.71)	264.68

6

7

8 More specifically, the Company’s results for the Build case Smelter load
9 loss sensitivity show a cumulative net present value of *negative* \$334.10 million.
10 In other words, the “to-go” costs for this sensitivity actually will be income, not a
11 net cost, according to the Company’s analysis. If the Company’s results are
12 correct, then the costs of the Build case, the loss of the Smelter revenues, and the
13 increase in market revenues would result in “to-go” income. According to these
14 results, the loss of Smelter revenues and the replacement with market revenues
15 would convert the Build case from a “to-go” net present value *cost* of \$3,210
16 million to *income* of \$334 million, an improvement of \$3,544 million. The
17 Company would become primarily a merchant generator and would be subject to
18 the risk of market pricing for all generation that is not sold to rural and large
19 industrial customers.

1 Similarly, the Company's results for the Buy case Smelter load loss
2 sensitivity show a net present value of \$264.70 million, a fraction of the net
3 present value cost of the Build case itself, or an improvement of \$2,945 million.
4 As with the Build Smelter load loss sensitivity, the Company would become
5 primarily a merchant generator and its generation subject to market pricing.

6 Taken at face value, the Company's studies suggest that the Commission
7 should choose the Build case and everyone should hope and pray that the
8 Smelters reduce or terminate their operations. However, the computations both
9 ignore the fact that if the Smelter load is lost, there will be no more smelter
10 revenues. More specifically, the Company's NPV analyses incorrectly assume
11 that the Smelter revenues will continue (or be recovered in their entirety from the
12 remaining rural and large industrial customers through huge rate increases) while
13 the Company also sells the power into the market that no longer will be supplied
14 to the Smelters. This is a flaw in the Company's analyses because the Smelters
15 will not pay Big Rivers for power that they do not buy from Big Rivers. The
16 Company's NPV analyses also assume that the PACE market prices will be
17 reality and will increase to more than \$100 per mWh over the next 15 years. The
18 PACE very high market price forecast includes an assumption that CO2
19 restrictions will be imposed, yet Big Rivers inconsistently assumes that its
20 generation costs will not increase because of CO2 restrictions. Mr. Hayet
21 addresses this assumption compared to the ACES and IH Global market price
22 projections.

23 The following tables show the components of the Company's NPV

1 analyses for the Build case and the Smelter load loss sensitivity and then the Buy
2 case and the Smelter load loss sensitivity.

3

BIG RIVERS ELECTRIC CORPORATION BUILD CASE

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
<u>Production Cost Model</u>																
Fuel (Including Start-Up)	266 47	285 35	298 78	309 40	321 62	337 02	340 29	364 03	366 26	373 15	378 75	394 72	396 10	418 69	409 91	5,260.56
Variable Environmental O	28 96	32 62	38 56	39 60	53 37	56 65	58 07	62 50	64 10	65 82	68 07	70 41	73 05	77 30	76 67	865.77
Purchased Power	42 46	37 10	36 14	32 34	31 36	29 18	29 67	23 46	31 75	30 31	38 42	32 20	44 93	35 15	53 47	527.93
Allowance Purchases	0 03	0 48	0 79	0 93	(0 43)	1 49	0 02	2 30	0 35	2 71	0 87	3 47	0 63	3 27	0 10	17.01
Off-System Sales	(35 99)	(49 40)	(58 81)	(62 32)	(75 79)	(103 01)	(100 63)	(127 66)	(123 95)	(132 62)	(136 09)	(154 88)	(141 34)	(162 06)	(126 90)	(1,591.46)
<u>Fixed Cost of Capital</u>																
Debt Service		2 31	7 19	13 15	20 08	20 08	20 08	20 08	20 08	20 08	20 08	20 08	20 08	20 08	20 08	243.49
Debt Issuance Cost		0 12	0 12	0 12	0 12	0 12	0 12	0 12	0 12	0 12	0 12	0 12	0 12	0 12	0 12	1.72
Property Tax		0 00	0 00	0 00	0 15	0 44	0 43	0 42	0 41	0 40	0 39	0 38	0 37	0 36	0 35	4.13
Property Insurance		0 00	0 00	0 18	0 54	0 56	0 58	0 59	0 61	0 63	0 65	0 67	0 69	0 71	0 73	7.14
Labor		0 00	0 00	0 20	0 40	0 42	0 43	0 44	0 45	0 47	0 48	0 50	0 51	0 53	0 54	5.36
Revenue Requirement	301 93	308 59	322 77	333 60	351 43	342 94	349 06	346 28	360 19	361 07	371 74	367 67	395 15	394 14	435 08	5,341.63
PV of Revenue Requirem€	301 93	285.91	277 08	265 34	258 98	234 16	220 82	202 97	195 61	181 68	173 31	158 82	158 14	146 15	149 48	3,210.39

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BIG RIVERS ELECTRIC CORPORATION BUILD SMELTER LOAD LOSS SENSITIVITY

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
<u>Production Cost Model</u>																
Fuel (Including Start-Up)	266 47	285 35	283 98	301 20	316 14	335 01	339 14	362.13	365 42	371.72	377 27	392 12	394 50	415.47	406 74	5,212.66
Variable Environmental O	28 96	32 62	35 96	38 04	52 16	56 34	57 92	62 25	64 08	65 71	67 98	70 19	73 03	77 18	76 54	858.97
Purchased Power	42 46	37 10	12 89	13 16	13 22	13 91	13 99	14 05	14 79	14 86	14 96	15 77	15 81	15 89	16 71	269.55
Allowance Purchases	0 03	0 48	0 50	0 76	(1 37)	1 38	(0 99)	2 17	(0 73)	2 53	(0 39)	3 15	(0 83)	2 77	(1 62)	7.86
Off-System Sales	(35 99)	(49 40)	(303 86)	(351 00)	(415 54)	(513 63)	(556 42)	(597 76)	(625 36)	(672 79)	(701 83)	(783 63)	(798 22)	(841 10)	(797 95)	(8,044.48)
<u>Fixed Cost of Capital</u>																
Debt Service		2 31	7 19	13 15	20 08	20 08	20 08	20 08	20 08	20 08	20 08	20 08	20 08	20 08	20 08	243.49
Debt Issuance Cost		0 12	0 12	0 12	0 12	0 12	0 12	0 12	0 12	0 12	0 12	0 12	0 12	0 12	0 12	1.72
Property Tax		0 00	0 00	0 00	0 15	0 44	0 43	0 42	0 41	0 40	0 39	0 38	0 37	0 36	0 35	4.13
Property Insurance		0 00	0 00	0 18	0 54	0 56	0 58	0 59	0 61	0 63	0 65	0 67	0 69	0 71	0 73	7.14
Labor		0 25	0 25	0 25	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0.75
Revenue Requirement	301 93	308 84	37 04	15.86	(14 49)	(85 79)	(125 16)	(135 94)	(160 57)	(196 75)	(220 76)	(281 15)	(294 45)	(308 52)	(278 29)	(1,438.21)
PV of Revenue Requirem€	301 93	286 15	31 80	12 62	(10 68)	(58 57)	(79 18)	(79 68)	(87 20)	(99 00)	(102 92)	(121 44)	(117 84)	(114 40)	(95 61)	(334.06)

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BIG RIVERS ELECTRIC CORPORATION BUY CASE

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
<u>Production Cost Model</u>																
Fuel (Including Start-Up)	216.73	193.37	216.94	231.00	245.51	242.05	247.83	252.03	269.22	262.70	284.04	287.27	304.95	298.62	315.80	3,868.05
Variable Environmental O	23.24	22.67	27.34	30.39	41.12	42.05	42.91	44.60	48.09	48.02	52.22	52.71	57.41	57.38	59.92	650.09
Purchased Power	89.56	136.62	127.85	131.45	143.19	185.97	187.07	204.22	193.38	232.93	207.20	231.65	219.89	275.14	253.30	2,819.43
Allowance Purchases	0.00	0.00	0.00	0.00	(0.87)	(0.96)	(0.99)	(0.14)	0.50	0.16	0.76	0.66	0.97	0.39	1.39	1.88
Off-System Sales	(12.28)	(12.35)	(19.10)	(26.06)	(41.67)	(49.06)	(36.98)	(43.32)	(45.53)	(51.47)	(64.13)	(75.26)	(76.60)	(72.07)	(62.81)	(688.68)
<u>Fixed Cost of Capital</u>																
Debt Service		0.06	0.97	2.47	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	49.01
Debt Issuance Cost		0.01	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.34
Property Tax		0.00	0.00	0.00	0.00	0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.07	0.07	0.82
Property Insurance		0.00	0.00	0.00	0.11	0.11	0.12	0.12	0.13	0.13	0.13	0.14	0.14	0.15	0.15	1.43
Labor		0.00	0.00	0.20	0.40	0.42	0.43	0.44	0.45	0.47	0.48	0.50	0.51	0.53	0.54	5.36
Revenue Requirement	317.24	340.38	354.03	369.47	391.95	424.83	444.64	462.21	470.49	497.20	484.95	501.91	511.52	564.38	572.53	6,707.71
PV of Revenue Requireme	317.24	315.37	303.91	293.87	288.84	290.07	281.29	270.92	255.51	250.18	226.09	216.80	204.72	209.28	196.70	3,920.79

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BIG RIVERS ELECTRIC CORPORATION BUY SMELTER LOAD LOSS SENSITIVITY

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
<u>Production Cost Model</u>																
Fuel (Including Start-Up)	216.73	205.34	206.63	213.75	234.59	239.89	246.17	249.68	268.02	260.34	282.30	284.74	302.77	295.79	312.46	3,819.19
Variable Environmental O	23.24	23.40	24.51	27.27	38.98	41.66	42.70	44.25	47.94	47.76	52.02	52.46	57.23	57.29	59.70	640.41
Purchased Power	89.56	119.23	14.53	15.68	16.75	18.43	14.20	16.50	16.27	17.34	18.96	16.75	16.89	16.90	17.43	425.42
Allowance Purchases	0.00	0.00	0.00	0.00	(2.44)	(2.67)	(2.70)	(1.93)	(1.47)	(1.96)	(1.40)	(1.70)	(1.69)	(2.44)	(1.55)	(21.94)
Off-System Sales	(12.28)	(12.37)	(188.72)	(212.95)	(272.94)	(321.72)	(349.76)	(351.73)	(402.46)	(409.30)	(480.82)	(524.77)	(574.90)	(535.80)	(552.21)	(5,202.73)
<u>Fixed Cost of Capital</u>																
Debt Service		0.06	0.97	2.47	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	49.01
Debt Issuance Cost		0.01	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.34
Property Tax		0.00	0.00	0.00	0.00	0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.07	0.07	0.82
Property Insurance		0.00	0.00	0.00	0.11	0.11	0.12	0.12	0.13	0.13	0.13	0.14	0.14	0.15	0.15	1.43
Labor		0.00	0.00	0.20	0.40	0.42	0.43	0.44	0.45	0.47	0.48	0.50	0.51	0.53	0.54	5.36
Revenue Requirement	317.24	335.65	57.95	46.43	19.62	(19.62)	(44.59)	(38.41)	(66.87)	(80.97)	(124.08)	(167.65)	(194.81)	(163.36)	(159.24)	(282.70)
PV of Revenue Requireme	317.24	310.99	49.75	36.93	14.46	(13.39)	(28.21)	(22.51)	(36.32)	(40.74)	(57.85)	(72.42)	(77.96)	(60.57)	(54.71)	264.68

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As I described previously, the Company's NPV analyses assume no changes in expenses or revenues other than those reflected in the "to-go" amounts. However, this is an invalid assumption when the Smelter revenues are lost in their entirety and replaced with market revenues. In the Company's NPV analyses, it includes the replacement market revenues, but, as the preceding tables demonstrate, the Company did not increase the "to-go" expenses (or show the lost Smelter revenues as expenses) for the lost Smelter revenues even though those revenues no longer will exist under the two sensitivity cases.

1

2 **Q. In reality, what will be the effect on the “all-in” member revenue**
3 **requirements from the Smelter load loss sensitivities?**

4 A. In reality, the Smelter load loss would be catastrophic to the rural and large
5 industrial customers and Big Rivers would be forced to seek immediate and
6 drastic rate increases starting in 2014 and continuing through future years until
7 market prices rise sufficiently to replace the margins that were lost on the Smelter
8 sales. *More specifically, under the Build case in the event that the Smelters*
9 *terminate their contracts, the Company itself estimates that the necessary rate*
10 *increases for the rural and large industrial customer classes will average 69%.*
11 *Under the Buy case in the event that the Smelters terminate their contracts, the*
12 *Company estimates that the necessary rate increases for the rural and large*
13 *industrial customers classes will average 84%.*

14 Despite increases of those magnitudes on rural and large industrial
15 customers, the Company assumed that there would be no reductions in the rural or
16 large industrial sales due to the drastic rate increases. That assumption is highly
17 unlikely and the Company has performed no studies to support the assumption
18 that there is no elasticity of demand, according to its responses to AG 1-22 and
19 Staff 2-14. To the contrary, it is highly likely that there would be significant
20 conservation by rural customers and reductions in large industrial usage, as well
21 as possible plant closures and loss of jobs. If there is a substantial reduction in
22 sales to these remaining rural and large industrial customers, the rate increases
23 necessary to replace the lost Smelter margins easily could spiral upward and

1 exceed 100%. I have attached a copy of the Company’s responses to AG 1-22
2 and Staff 2-14 as my Exhibit ___(LK-3).

3 The following table shows the annual “all-in” non-Smelter revenue
4 requirements for the rural and large industrial customer classes that I obtained
5 from the “Rates” spreadsheet of the FM for the Company’s two Smelter load loss
6 sensitivities:⁵

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BIG RIVERS ELECTRIC CORPORATION															
REVENUE BY CUSTOMER CLASS UNDER SMELTER LOAD LOSS SENSITIVITIES															
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Build Case Smelter Load Loss															
Rural Revenue	105,378	110,320	187,25	173,78	168,92	154,07	129,51	125,60	109,41	85,68	71,38	29,55	25,30	22,81	50,67
Large Industrial Revenue	35,772	37,230	62,57	69,94	68,11	51,28	42,98	41,43	35,95	28,27	23,63	10,87	9,62	8,91	16,98
Smelter Revenue	376,163	380,758	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Market Revenue	35,990	49,403	303,86	351,00	415,54	513,63	556,42	597,76	625,36	672,79	701,83	783,63	798,22	841,10	797,95
Buy Case Smelter Load Loss															
Rural Revenue	107,318	116,243	214,37	206,81	194,57	181,96	187,14	196,49	177,75	171,47	142,98	114,49	100,03	133,18	141,47
Large Industrial Revenue	36,487	39,405	72,36	76,50	75,91	66,89	61,99	64,50	57,94	55,40	46,12	37,04	32,45	41,93	43,92
Smelter Revenue	386,529	404,337	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Market Revenue	12,285	12,372	188,72	212,95	272,94	321,72	349,76	351,73	402,46	409,30	480,82	524,77	574,90	535,80	552,21

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10 **Q. What conclusions should the Commission draw from the Smelter load loss**
11 **sensitivities?**

12 **A.** The most important conclusion is that the Commission should take all necessary
13 steps to ensure that the Smelters do not terminate their contracts. The loss of
14 Smelter load and revenues would be immediate and catastrophic to rural and large
15 industrial customers because the margins on the market sales will be insufficient

⁵ These comparisons are based on the Company’s versions of the Build case Smelter load loss and Buy case Smelter load loss sensitivities, which indicate greater impact under the Buy case compared to the Build case. However, the KIUC versions show that the impact is approximately the same under either the Build or Buy cases.

1 to replace the margins on the Smelter sales that will be lost. Despite Big Rivers'
2 rosy projections based on the PACE market price projections to the contrary, the
3 rural and large industrial members may never recover from the rate effects of
4 Smelter load losses if future market prices do not rise to the levels reflected in the
5 Company's studies.

6
7 **Q. Have you prepared a table showing the "all-in" annual member revenue**
8 **requirements resulting from KIUC's corrected Smelter load loss**
9 **sensitivities?**

10 **A. Yes. The following table shows the "all-in" non-Smelter member revenue**
11 **requirements for each Smelter load loss sensitivity compared to the KIUC**
12 **corrected versions of the Build and Buy cases.**

BIG RIVERS ELECTRIC CORPORATION ENVIRONMENTAL COMPLIANCE SCENARIOS CORRECTED BY KIUC
COMPARISON OF TOTAL CUSTOMER REVENUES, EXCLUDING MARKET SALES - NOMINAL AND NPV

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
KIUC Build															
Total Revenue	590.20	624.96	653.39	693.45	713.19	729.05	756.14	763.43	776.41	780.37	800.51	799.21	825.22	839.09	
Add: Revenue to Achieve 1 24 TIER	12.05	6.80	3.35	8.38	11.78	10.81	13.32	18.04	17.52	22.01	25.11	33.92	43.16	49.78	
Less: Market Revenue	31.00	35.32	36.05	40.30	49.69	53.18	67.70	63.94	61.90	56.32	60.55	44.83	54.43	56.24	
Total Customer Revenue	571.26	596.44	620.70	661.53	675.28	686.69	701.76	717.54	732.04	746.05	765.07	788.30	813.95	832.63	9,909.23
NPV Total Customer Revenue	529.29	512.01	493.69	487.50	481.08	434.42	411.33	389.68	368.34	347.82	330.47	315.49	301.82	286.06	5,669.00
KIUC Buy															
Total Revenue	601.21	630.42	646.35	677.12	702.47	719.04	733.68	742.97	756.85	767.29	784.06	796.80	829.55	850.74	
Add: Revenue to Achieve 1 24 TIER	0.00	0.00	0.00	0.00	1.15	3.06	8.41	12.55	11.52	17.21	20.12	26.34	22.10	28.34	
Less: Market Revenue	29.01	36.57	28.94	24.26	29.05	24.95	24.45	22.93	21.81	21.66	24.56	20.76	22.70	26.29	
Total Customer Revenue	572.20	593.85	617.41	652.86	674.57	697.15	717.64	732.58	746.56	762.83	779.62	802.38	828.95	852.80	10,031.39
NPV Total Customer Revenue	530.18	509.79	491.07	481.12	460.59	441.04	420.64	397.85	375.65	355.64	338.76	321.12	307.38	292.99	5,721.80
KIUC Build Smelter Load Loss															
Total Revenue	590.20	506.04	539.61	586.63	515.64	544.76	567.07	485.01	491.35	464.98	386.73	355.46	387.98	433.59	
Add: Revenue to Achieve 1 24 TIER	12.05	44.66	35.28	37.51	153.18	142.38	149.89	225.54	229.26	228.54	330.24	336.86	356.27	350.85	
Less: Market Revenue	31.00	207.76	230.42	252.72	294.82	322.36	337.78	323.63	324.05	297.31	319.01	284.13	312.20	355.76	
Total Customer Revenue	559.21	298.28	309.20	333.90	374.00	364.78	379.18	386.93	396.55	396.22	397.96	408.19	432.06	428.67	5,465.12
NPV Total Customer Revenue	518.12	258.06	245.93	248.07	255.38	230.77	222.25	210.13	199.54	184.72	171.90	163.37	160.21	147.28	3,211.69
KIUC Buy Smelter Load Loss															
Total Revenue	601.21	515.17	497.04	517.02	464.23	487.04	485.27	444.17	430.97	449.03	375.03	373.27	379.71	435.28	
Add: Revenue to Achieve 1 24 TIER	19.49	18.99	17.95	19.29	94.97	92.76	100.27	150.41	152.34	148.91	228.43	234.79	253.80	252.11	
Less: Market Revenue	29.00	190.94	167.52	170.46	193.38	211.13	204.24	202.83	184.87	198.37	205.73	198.47	199.68	250.62	
Total Customer Revenue	572.20	324.24	329.52	346.56	365.83	368.67	381.31	391.75	398.44	399.57	397.73	409.59	433.82	436.77	5,555.98
NPV Total Customer Revenue	530.16	278.34	262.09	255.39	249.78	233.23	223.50	212.75	200.49	186.28	171.80	163.92	160.86	150.06	3,278.67

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III. QUALITATIVE FACTORS SUPPORT THE BUY CASE

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The Commission should Maximize Flexibility and Minimize Risk

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Q. Mr. Hayet addresses numerous qualitative factors that argue against the Build case and in favor of the Buy case. Do you have any additional comments?

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A. Yes. The validity of the results of the quantitative analyses is driven largely by the assumptions used in the modeling process. There is greater certainty surrounding some of the assumptions, such as the physical operation of the power plants. There is greater *uncertainty* surrounding other assumptions, such as the market price of power, whether for purchases by Big Rivers or sales by Big Rivers, and the ability of the Company to finance, or the cost of the financing if it is able to finance. Changes in these assumptions can change the ability to implement and/or the ranking of the various alternatives.

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Thus, in its review of the Company's request, the Commission should carefully consider the effects of these assumptions and select the alternative that provides the most flexibility in light of constantly changing circumstances; that minimizes the risk to all customers, rural, large industrial, and Smelters; and that minimizes the risk to the Company and its creditors.

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The Company's Cost Estimates Are Preliminary and Subject to Overruns

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Q. In addition to the qualitative factors addressed by Mr. Hayet, should the Commission be concerned about cost overruns?

A. Yes. Aside from the Company’s modeling of the Build, Partial Build, and Build Smelter load loss sensitivity cases, the reality is that any cost overruns will affect member revenue requirements and rates and place additional pressure on the Company, its creditors, its rural and large industrial customers, and the Smelters.

The Company estimates that its direct construction costs will be \$286.14 million and that deferred financing costs will add another \$15 million for a total capital cost of \$301 million in the Build alternatives. However, these estimates are preliminary estimates and do not reflect detailed engineering estimates. Engineering and design have not been completed, according to the Company’s Application. Thus, there is a high likelihood of cost overruns and costs that the Company did not consider in its quantitative analyses. For example, the Company plans to act as the general contractor using a “minimal contracts approach,” which it describes in response to Staff 1-18. Yet the Company did not include any costs for these activities in any of the cases, arguing that they would be “relatively insignificant” and “covered by the contingency in the estimate,” also according to its response to Staff 1-18. I have attached a copy of the Company’s response to Staff 1-18 as my Exhibit__(LK-4). In addition, the Company has not yet completed testing or modeling of its ESP performance and may have to install ESP upgrades, according to its response to Staff 1-14. I have

1 attached a copy of the Company's response to Staff 1-14 as my Exhibit ___(LK-
2 5).

3 In addition, the Commission should note that none of the contracts have
4 yet been bid out by the Company and there may be sizeable differences between
5 the preliminary estimates and actual bids by contractors. The Company is
6 relatively inexperienced in such large scale construction projects in recent years
7 and it may be required to depend more heavily on its contractors for certain
8 activities than reflected in the cost estimates.

9 Further, the Company already substantially increased its cost estimates for
10 the Build case earlier this year before it filed its Application in this proceeding.
11 On January 19, 2012, the Company's management presented a listing of projects
12 and a cost estimate of \$213.5 million to comply with CSAPR and MATS
13 requirements to the Big Rivers Board of Directors, according to the Board
14 Minutes provided by the Company in response to KIUC 1-43. On February 21,
15 2012, the Company's management updated the cost estimate to \$283.5 million,
16 also according to the Board Minutes provide in response to KIUC 1-43. I have
17 attached a copy of the relevant portions of the Company's response to KIUC 1-43
18 as my Exhibit ___(LK-6).

19 In response to KIUC 2-21, the Company confirmed that it had increased
20 the cost estimate from January 19, 2012 to February 21, 2012 and that the primary
21 reason was that the "capital estimates in the January 2012 board presentation
22 represented high level order of magnitude estimates developed by Big Rivers
23 personnel to indicate the level of capital expenditures facing Big Rivers in

1 complying with CSAPR and MATS. The capital estimates in the February 2012
2 board presentation represent the results of the S&L study.” In other words, the
3 difference was due to a more refined cost estimate. That tends to be the nature of
4 cost estimates and the risk of additional significant cost estimates as the
5 engineering and design work progresses is real. I have attached a copy of the
6 Company’s response to KIUC 2-21 as my Exhibit___(LK-7).

7 If the Commission authorizes the Company to proceed with ECP projects
8 4 and 5, then it will commit the Company, its creditors and all of its customers to
9 the completion of the projects, the financing of the projects, and the obligation to
10 pay through rates for the projects. Those commitments will remain in place even
11 if there are substantial cost overruns.

12 Thus, the Commission should recognize that there may be cost overruns in
13 the proposed ECP projects, with the most risk exposure on projects 4 and 5. The
14 Commission can avoid the uncertainty and risk exposure on projects 4 and 5 if
15 those projects are not authorized at this time.

16
17 **The Company’s Ability to Finance Is Uncertain**

18
19 **Q. Should the Commission be concerned about the Company’s ability to**
20 **finance?**

21 **A.** Yes. The Company’s ECP will require at least \$301 million in incremental
22 financing, assuming no cost overruns and no additional environmental
23 requirements. If there are cost overruns and additional environmental

1 requirements, the Company will require even more incremental financing.⁶ Of
2 the \$301 million in incremental financing, projects 4 and 5 comprise
3 approximately \$232 million. At the end of 2011, the Company had \$786 million
4 in debt outstanding. The \$301 million in incremental debt financing will increase
5 its debt outstanding by 38%, all else equal.

6 The Company's ability to finance the 2012 ECP projects is critical to the
7 implementation of the Build case and projects 4 and 5. If the Company cannot
8 finance these projects, along with all of its other financing requirements, then it
9 cannot undertake these projects and the Commission should not approve the
10 projects. Further, even if the Company is able to provide evidence that it will be
11 able to finance the projects, then the Commission must ensure that the cost to do
12 so will be reasonable.

13 The Company's financial health is tenuous and a continuing concern. It is
14 not certain that the Company will be able to finance the \$301 million, let alone
15 any cost overruns or additional environmental requirements. In addition,
16 incremental financing of this magnitude will reduce flexibility for the Company,
17 its creditors, and its customers. The Company's current credit ratings are BBB-

⁶ In a July 14, 2011 email concerning the costs of environmental compliance the Company estimated that compliance with the CCR would cost \$237 million and compliance with §316 a and b would cost \$55 million, according to the Company's response to Staff 2-17 in this proceeding. If these estimates are correct, the Company could face another nearly \$300 million in incremental financing. I have attached a copy of this response as my Exhibit__(LK-8). The Company more recently estimated that compliance with these two regulations would cost \$123 million, according to the Company's response to Staff 1-9. I have attached a copy of this response as my Exhibit__(LK-9).

1 from Standard and Poor's and Fitch and Baa1 from Moody's. These ratings are
2 reviewed annually in the September time frame and will be reviewed prior to
3 commencing construction, and thus, the financing, for projects 4 and 5.
4

5 **Q. Does the Company have a definitive plan to finance the capital and deferred**
6 **financing costs of the ECP projects?**

7 A. No. The Company does expect to issue debt to finance these costs, according to
8 Mr. Hite. [Hite Direct at 15]. However, it does not yet know what financing will
9 be available, the cost of any such debt, or its "execution strategy," according to
10 Mr. Hite. [*Id.*, 14-17].

11 The Company is "discussing" the potential for a term loan with the RUS,
12 "planning" meetings with institutional investors, and plans to discuss a potential
13 construction revolver with potential lenders. [*Id.*, 15-16]. The Company recently
14 filed a Second Updated response to KIUC 1-43 in which it disclosed that it is
15 attempting to negotiate a revolving credit agreement with CFC to provide
16 financing for the capital expenditures associated with the Company's 2012 ECP
17 projects.
18

19 **Q. When does the Company plan on filing a financing application with the**
20 **Commission?**

21 A. The Company does not plan on filing a financing application until early-August
22 2012, according to Mr. Hite. [*Id.*, 16]. It then plans to schedule rating agency
23 visits in September 2012 seeking an indicative investment grade rating of the

1 proposed debt issuances. [*Id.*].

2

3 **Q. How should the Commission address the uncertainty regarding the**
4 **Company's ability to finance the cost of the 2012 ECP projects?**

5 A. The best approach given the uncertainty regarding the Company's ability to
6 finance is to minimize the Company's capital expenditures and financing
7 requirements and to reject ECP projects 4 and 5. This approach maximizes
8 flexibility and minimizes the risk to the Company, its creditors, and its customers.

9

10 **Q. Does this complete your testimony?**

11 A. Yes.

AFFIDAVIT

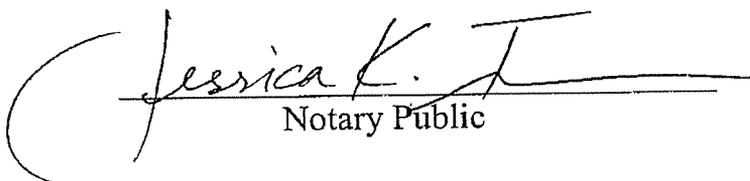
STATE OF GEORGIA)

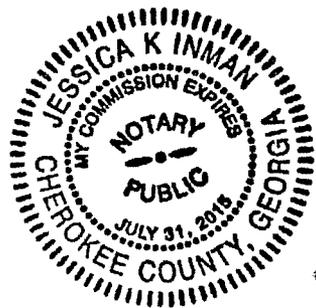
COUNTY OF FULTON)

LANE KOLLEN, being duly sworn, deposes and states: that the attached is his sworn testimony and that the statements contained are true and correct to the best of his knowledge, information and belief.


Lane Kollen

Sworn to and subscribed before me on this
23rd day of July 2012.


Notary Public



COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS)	
ELECTRIC CORPORATION FOR)	
APPROVAL OF ITS 2012 COMPLIANCE)	
PLAN, FOR APPROVAL OF ITS)	
AMENDED ENVIRONMENTAL COST	)	CASE NO. 2012-00063
RECOVERY SURCHARGE TARIFF,)	
FOR CERTIFICATES OF PUBLIC)	
CONVENIENCE AND NECESSITY, AND)	
FOR AUTHORITY TO ESTABLISH A)	
REGULATORY ACCOUNT)	

<p>EXHIBITS</p> <p>OF</p> <p>LANE KOLLEN</p>

ON BEHALF OF THE
KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.

J. KENNEDY AND ASSOCIATES, INC.
ROSWELL, GEORGIA

July 2012

EXHIBIT ____ (LK-1)

RESUME OF LANE KOLLEN, VICE PRESIDENT

EDUCATION

University of Toledo, BBA
Accounting

University of Toledo, MBA

Luther Rice University, MA

PROFESSIONAL CERTIFICATIONS

Certified Public Accountant (CPA)

Certified Management Accountant (CMA)

PROFESSIONAL AFFILIATIONS

American Institute of Certified Public Accountants

Georgia Society of Certified Public Accountants

Institute of Management Accountants

More than thirty years of utility industry experience in the financial, rate, tax, and planning areas. Specialization in revenue requirements analyses, taxes, evaluation of rate and financial impacts of traditional and nontraditional ratemaking, utility mergers/acquisition and diversification. Expertise in proprietary and nonproprietary software systems used by utilities for budgeting, rate case support and strategic and financial planning.

RESUME OF LANE KOLLEN, VICE PRESIDENT

EXPERIENCE

1986 to
Present:

J. Kennedy and Associates, Inc.: Vice President and Principal. Responsible for utility stranded cost analysis, revenue requirements analysis, cash flow projections and solvency, financial and cash effects of traditional and nontraditional ratemaking, and research, speaking and writing on the effects of tax law changes. Testimony before Connecticut, Florida, Georgia, Indiana, Louisiana, Kentucky, Maine, Maryland, Minnesota, New York, North Carolina, Ohio, Pennsylvania, Tennessee, Texas, West Virginia and Wisconsin state regulatory commissions and the Federal Energy Regulatory Commission.

1983 to
1986:

Energy Management Associates: Lead Consultant.
Consulting in the areas of strategic and financial planning, traditional and nontraditional ratemaking, rate case support and testimony, diversification and generation expansion planning. Directed consulting and software development projects utilizing PROSCREEN II and ACUMEN proprietary software products. Utilized ACUMEN detailed corporate simulation system, PROSCREEN II strategic planning system and other custom developed software to support utility rate case filings including test year revenue requirements, rate base, operating income and pro-forma adjustments. Also utilized these software products for revenue simulation, budget preparation and cost-of-service analyses.

1976 to
1983:

The Toledo Edison Company: Planning Supervisor.
Responsible for financial planning activities including generation expansion planning, capital and expense budgeting, evaluation of tax law changes, rate case strategy and support and computerized financial modeling using proprietary and nonproprietary software products. Directed the modeling and evaluation of planning alternatives including:

- Rate phase-ins.
- Construction project cancellations and write-offs.
- Construction project delays.
- Capacity swaps.
- Financing alternatives.
- Competitive pricing for off-system sales.
- Sale/leasebacks.

RESUME OF LANE KOLLEN, VICE PRESIDENT

CLIENTS SERVED

Industrial Companies and Groups

Air Products and Chemicals, Inc.	Lehigh Valley Power Committee
Airco Industrial Gases	Maryland Industrial Group
Alcan Aluminum	Multiple Intervenors (New York)
Armco Advanced Materials Co.	National Southwire
Armco Steel	North Carolina Industrial
Bethlehem Steel	Energy Consumers
Connecticut Industrial Energy Consumers	Occidental Chemical Corporation
ELCON	Ohio Energy Group
Enron Gas Pipeline Company	Ohio Industrial Energy Consumers
Florida Industrial Power Users Group	Ohio Manufacturers Association
Gallatin Steel	Philadelphia Area Industrial Energy
General Electric Company	Users Group
GPU Industrial Intervenors	PSI Industrial Group
Indiana Industrial Group	Smith Cogeneration
Industrial Consumers for	Taconite Intervenors (Minnesota)
Fair Utility Rates - Indiana	West Penn Power Industrial Intervenors
Industrial Energy Consumers - Ohio	West Virginia Energy Users Group
Kentucky Industrial Utility Customers, Inc.	Westvaco Corporation
Kimberly-Clark Company	

Regulatory Commissions and
Government Agencies

Cities in Texas-New Mexico Power Company's Service Territory
Cities in AEP Texas Central Company's Service Territory
Cities in AEP Texas North Company's Service Territory
Georgia Public Service Commission Staff
Kentucky Attorney General's Office, Division of Consumer Protection
Louisiana Public Service Commission Staff
Maine Office of Public Advocate
New York State Energy Office
Office of Public Utility Counsel (Texas)

RESUME OF LANE KOLLEN, VICE PRESIDENT

Utilities

Allegheny Power System
Atlantic City Electric Company
Carolina Power & Light Company
Cleveland Electric Illuminating Company
Delmarva Power & Light Company
Duquesne Light Company
General Public Utilities
Georgia Power Company
Middle South Services
Nevada Power Company
Niagara Mohawk Power Corporation

Otter Tail Power Company
Pacific Gas & Electric Company
Public Service Electric & Gas
Public Service of Oklahoma
Rochester Gas and Electric
Savannah Electric & Power Company
Seminole Electric Cooperative
Southern California Edison
Talquin Electric Cooperative
Tampa Electric
Texas Utilities
Toledo Edison Company

**Expert Testimony Appearances
of
Lane Kollen
as of February 2012**

Date	Case	Jurisdic.	Party	Utility	Subject
10/86	U-17282 Interim	LA	Louisiana Public Service Commission Staff	Gulf States Utilities	Cash revenue requirements financial solvency.
11/86	U-17282 Interim Rebuttal	LA	Louisiana Public Service Commission Staff	Gulf States Utilities	Cash revenue requirements financial solvency.
12/86	9613	KY	Attorney General Div. of Consumer Protection	Big Rivers Electric Corp.	Revenue requirements accounting adjustments financial workout plan.
1/87	U-17282 Interim	LA 19th Judicial District Ct.	Louisiana Public Service Commission Staff	Gulf States Utilities	Cash revenue requirements, financial solvency.
3/87	General Order 236	WV	West Virginia Energy Users' Group	Monongahela Power Co.	Tax Reform Act of 1986.
4/87	U-17282 Prudence	LA	Louisiana Public Service Commission Staff	Gulf States Utilities	Prudence of River Bend 1, economic analyses, cancellation studies.
4/87	M-100 Sub 113	NC	North Carolina Industrial Energy Consumers	Duke Power Co.	Tax Reform Act of 1986.
5/87	86-524-E-SC	WV	West Virginia Energy Users' Group	Monongahela Power Co.	Revenue requirements, Tax Reform Act of 1986.
5/87	U-17282 Case In Chief	LA	Louisiana Public Service Commission Staff	Gulf States Utilities	Revenue requirements, River Bend 1 phase-in plan, financial solvency.
7/87	U-17282 Case In Chief Surrebuttal	LA	Louisiana Public Service Commission Staff	Gulf States Utilities	Revenue requirements, River Bend 1 phase-in plan, financial solvency.
7/87	U-17282 Prudence Surrebuttal	LA	Louisiana Public Service Commission Staff	Gulf States Utilities	Prudence of River Bend 1, economic analyses, cancellation studies.
7/87	86-524 E-SC Rebuttal	WV	West Virginia Energy Users' Group	Monongahela Power Co.	Revenue requirements, Tax Reform Act of 1986.
8/87	9885	KY	Attorney General Div. of Consumer Protection	Big Rivers Electric Corp.	Financial workout plan.
8/87	E-015/GR-87-223	MN	Taconite Intervenors	Minnesota Power & Light Co.	Revenue requirements, O&M expense, Tax Reform Act of 1986.
10/87	870220-EI	FL	Occidental Chemical Corp.	Florida Power Corp.	Revenue requirements, O&M expense, Tax Reform Act of 1986.
11/87	87-07-01	CT	Connecticut Industrial Energy Consumers	Connecticut Light & Power Co.	Tax Reform Act of 1986.
1/88	U-17282	LA 19th Judicial District Ct.	Louisiana Public Service Commission	Gulf States Utilities	Revenue requirements, River Bend 1 phase-in plan, rate of return.
2/88	9934	KY	Kentucky Industrial Utility Customers	Louisville Gas & Electric Co.	Economics of Trimble County, completion.
2/88	10064	KY	Kentucky Industrial Utility Customers	Louisville Gas & Electric Co.	Revenue requirements, O&M expense, capital structure, excess deferred income taxes.

**Expert Testimony Appearances
of
Lane Kollen
as of February 2012**

Date	Case	Jurisdic.	Party	Utility	Subject
5/88	10217	KY	Alcan Aluminum National Southwire	Big Rivers Electric Corp.	Financial workout plan.
5/88	M-87017-1C001	PA	GPU Industrial Intervenors	Metropolitan Edison Co.	Nonutility generator deferred cost recovery.
5/88	M-87017-2C005	PA	GPU Industrial Intervenors	Pennsylvania Electric Co.	Nonutility generator deferred cost recovery.
6/88	U-17282	LA 19th Judicial District Ct.	Louisiana Public Service Commission	Gulf States Utilities	Prudence of River Bend 1 economic analyses, cancellation studies, financial modeling.
7/88	M-87017-1C001 Rebuttal	PA	GPU Industrial Intervenors	Metropolitan Edison Co.	Nonutility generator deferred cost recovery, SFAS No. 92.
7/88	M-87017-2C005 Rebuttal	PA	GPU Industrial Intervenors	Pennsylvania Electric Co.	Nonutility generator deferred cost recovery, SFAS No. 92.
9/88	88-05-25	CT	Connecticut Industrial Energy Consumers	Connecticut Light & Power Co.	Excess deferred taxes, O&M expenses.
9/88	10064 Rehearing	KY	Kentucky Industrial Utility Customers	Louisville Gas & Electric Co.	Premature retirements, interest expense.
10/88	88-170-EL-AIR	OH	Ohio Industrial Energy Consumers	Cleveland Electric Illuminating Co.	Revenue requirements, phase-in, excess deferred taxes, O&M expenses, financial considerations, working capital.
10/88	88-171-EL-AIR	OH	Ohio Industrial Energy Consumers	Toledo Edison Co.	Revenue requirements, phase-in, excess deferred taxes, O&M expenses, financial considerations, working capital.
10/88	8800-355-EI	FL	Florida Industrial Power Users' Group	Florida Power & Light Co.	Tax Reform Act of 1986, tax expenses, O&M expenses, pension expense (SFAS No. 87).
10/88	3780-U	GA	Georgia Public Service Commission Staff	Atlanta Gas Light Co.	Pension expense (SFAS No. 87).
11/88	U-17282 Remand	LA	Louisiana Public Service Commission Staff	Gulf States Utilities	Rate base exclusion plan (SFAS No. 71).
12/88	U-17970	LA	Louisiana Public Service Commission Staff	AT&T Communications of South Central States	Pension expense (SFAS No. 87).
12/88	U-17949 Rebuttal	LA	Louisiana Public Service Commission Staff	South Central Bell	Compensated absences (SFAS No. 43), pension expense (SFAS No. 87), Part 32, income tax normalization.
2/89	U-17282 Phase II	LA	Louisiana Public Service Commission Staff	Gulf States Utilities	Revenue requirements, phase-in of River Bend 1, recovery of canceled plant.
6/89	881602-EU 890326-EU	FL	Talquin Electric Cooperative	Talquin/City of Tallahassee	Economic analyses, incremental cost-of-service, average customer rates.
7/89	U-17970	LA	Louisiana Public Service Commission Staff	AT&T Communications of South Central States	Pension expense (SFAS No. 87), compensated absences (SFAS No. 43), Part 32.
8/89	8555	TX	Occidental Chemical Corp.	Houston Lighting & Power Co.	Cancellation cost recovery, tax expense, revenue requirements.

**Expert Testimony Appearances
of
Lane Kollen
as of February 2012**

Date	Case	Jurisdict.	Party	Utility	Subject
8/89	3840-U	GA	Georgia Public Service Commission Staff	Georgia Power Co	Promotional practices, advertising, economic development.
9/89	U-17282 Phase II Detailed	LA	Louisiana Public Service Commission Staff	Gulf States Utilities	Revenue requirements, detailed investigation.
10/89	8880	TX	Enron Gas Pipeline	Texas-New Mexico Power Co.	Deferred accounting treatment, sale/leaseback.
10/89	8928	TX	Enron Gas Pipeline	Texas-New Mexico Power Co.	Revenue requirements, imputed capital structure, cash working capital.
10/89	R-891364	PA	Philadelphia Area Industrial Energy Users Group	Philadelphia Electric Co.	Revenue requirements.
11/89 12/89	R-891364 Surrebuttal (2 Filings)	PA	Philadelphia Area Industrial Energy Users Group	Philadelphia Electric Co.	Revenue requirements, sale/leaseback.
1/90	U-17282 Phase II Detailed Rebuttal	LA	Louisiana Public Service Commission Staff	Gulf States Utilities	Revenue requirements, detailed investigation
1/90	U-17282 Phase III	LA	Louisiana Public Service Commission Staff	Gulf States Utilities	Phase-in of River Bend 1, deregulated asset plan.
3/90	890319-EI	FL	Florida Industrial Power Users Group	Florida Power & Light Co.	O&M expenses, Tax Reform Act of 1986.
4/90	890319-EI Rebuttal	FL	Florida Industrial Power Users Group	Florida Power & Light Co.	O&M expenses, Tax Reform Act of 1986.
4/90	U-17282	LA 19 th Judicial District Ct.	Louisiana Public Service Commission	Gulf States Utilities	Fuel clause, gain on sale of utility assets.
9/90	90-158	KY	Kentucky Industrial Utility Customers	Louisville Gas & Electric Co.	Revenue requirements, post-test year additions, forecasted test year.
12/90	U-17282 Phase IV	LA	Louisiana Public Service Commission Staff	Gulf States Utilities	Revenue requirements.
3/91	29327, et. al.	NY	Multiple Intervenors	Niagara Mohawk Power Corp.	Incentive regulation.
5/91	9945	TX	Office of Public Utility Counsel of Texas	El Paso Electric Co.	Financial modeling, economic analyses, prudence of Palo Verde 3.
9/91	P-910511 P-910512	PA	Allegheny Ludlum Corp., Amco Advanced Materials Co., The West Penn Power Industrial Users' Group	West Penn Power Co.	Recovery of CAAA costs, least cost financing.
9/91	91-231-E-NC	WV	West Virginia Energy Users Group	Monongahela Power Co.	Recovery of CAAA costs, least cost financing.
11/91	U-17282	LA	Louisiana Public Service Commission Staff	Gulf States Utilities	Asset impairment, deregulated asset plan, revenue requirements.

**Expert Testimony Appearances
of
Lane Kollen
as of February 2012**

Date	Case	Jurisdic.	Party	Utility	Subject
12/91	91-410-EL-AIR	OH	Air Products and Chemicals, Inc., Armco Steel Co., General Electric Co., Industrial Energy Consumers	Cincinnati Gas & Electric Co.	Revenue requirements, phase-in plan.
12/91	PUC Docket 10200	TX	Office of Public Utility Counsel of Texas	Texas-New Mexico Power Co.	Financial integrity, strategic planning, declined business affiliations.
5/92	910890-EI	FL	Occidental Chemical Corp.	Florida Power Corp.	Revenue requirements, O&M expense, pension expense, OPEB expense, fossil dismantling, nuclear decommissioning.
8/92	R-00922314	PA	GPU Industrial Intervenors	Metropolitan Edison Co	Incentive regulation, performance rewards, purchased power risk, OPEB expense.
9/92	92-043	KY	Kentucky Industrial Utility Consumers	Generic Proceeding	OPEB expense.
9/92	920324-EI	FL	Florida Industrial Power Users' Group	Tampa Electric Co.	OPEB expense.
9/92	39348	IN	Indiana Industrial Group	Generic Proceeding	OPEB expense.
9/92	910840-PU	FL	Florida Industrial Power Users' Group	Generic Proceeding	OPEB expense.
9/92	39314	IN	Industrial Consumers for Fair Utility Rates	Indiana Michigan Power Co.	OPEB expense.
11/92	U-19904	LA	Louisiana Public Service Commission Staff	Gulf States Utilities /Entergy Corp.	Merger.
11/92	8649	MD	Westvaco Corp., Eastalco Aluminum Co.	Polomac Edison Co.	OPEB expense.
11/92	92-1715-AU-COI	OH	Ohio Manufacturers Association	Generic Proceeding	OPEB expense.
12/92	R-00922378	PA	Armco Advanced Materials Co., The WPP Industrial Intervenors	West Penn Power Co.	Incentive regulation, performance rewards, purchased power risk, OPEB expense.
12/92	U-19949	LA	Louisiana Public Service Commission Staff	South Central Bell	Affiliate transactions, cost allocations, merger.
12/92	R-00922479	PA	Philadelphia Area Industrial Energy Users' Group	Philadelphia Electric Co.	OPEB expense.
1/93	8487	MD	Maryland Industrial Group	Baltimore Gas & Electric Co., Bethlehem Steel Corp.	OPEB expense, deferred fuel, CWIP in rate base.
1/93	39498	IN	PSI Industrial Group	PSI Energy, Inc.	Refunds due to over-collection of taxes on Marble Hill cancellation.
3/93	92-11-11	CT	Connecticut Industrial Energy Consumers	Connecticut Light & Power Co	OPEB expense.
3/93	U-19904 (Surrebuttal)	LA	Louisiana Public Service Commission Staff	Gulf States Utilities /Entergy Corp.	Merger.

**Expert Testimony Appearances
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Lane Kollen
as of February 2012**

Date	Case	Jurisdic.	Party	Utility	Subject
3/93	93-01-EL-EFC	OH	Ohio Industrial Energy Consumers	Ohio Power Co.	Affiliate transactions, fuel.
3/93	EC92-21000 ER92-806-000	FERC	Louisiana Public Service Commission Staff	Gulf States Utilities /Entergy Corp.	Merger.
4/93	92-1464-EL-AIR	OH	Air Products Armc Co Steel Industrial Energy Consumers	Cincinnati Gas & Electric Co.	Revenue requirements, phase-in plan.
4/93	EC92-21000 ER92-806-000 (Rebuttal)	FERC	Louisiana Public Service Commission	Gulf States Utilities /Entergy Corp.	Merger.
9/93	93-113	KY	Kentucky Industrial Utility Customers	Kentucky Utilities	Fuel clause and coal contract refund.
9/93	92-490, 92-490A, 90-360-C	KY	Kentucky Industrial Utility Customers and Kentucky Attorney General	Big Rivers Electric Corp.	Disallowances and restitution for excessive fuel costs, illegal and improper payments, recovery of mine closure costs.
10/93	U-17735	LA	Louisiana Public Service Commission Staff	Cajun Electric Power Cooperative	Revenue requirements, debt restructuring agreement, River Bend cost recovery
1/94	U-20647	LA	Louisiana Public Service Commission Staff	Gulf States Utilities Co	Audit and investigation into fuel clause costs.
4/94	U-20647 (Surrebuttal)	LA	Louisiana Public Service Commission Staff	Gulf States Utilities Co.	Nuclear and fossil unit performance, fuel costs, fuel clause principles and guidelines.
5/94	U-20178	LA	Louisiana Public Service Commission Staff	Louisiana Power & Light Co.	Planning and quantification issues of least cost integrated resource plan.
9/94	U-19904 Initial Post-Merger Earnings Review	LA	Louisiana Public Service Commission Staff	Gulf States Utilities Co	River Bend phase-in plan, deregulated asset plan, capital structure, other revenue requirement issues.
9/94	U-17735	LA	Louisiana Public Service Commission Staff	Cajun Electric Power Cooperative	G&T cooperative ratemaking policies, exclusion of River Bend, other revenue requirement issues.
10/94	3905-U	GA	Georgia Public Service Commission Staff	Southern Bell Telephone Co.	Incentive rate plan, earnings review.
10/94	5258-U	GA	Georgia Public Service Commission Staff	Southern Bell Telephone Co.	Alternative regulation, cost allocation.
11/94	U-19904 Initial Post-Merger Earnings Review (Rebuttal)	LA	Louisiana Public Service Commission Staff	Gulf States Utilities Co.	River Bend phase-in plan, deregulated asset plan, capital structure, other revenue requirement issues.
11/94	U-17735 (Rebuttal)	LA	Louisiana Public Service Commission Staff	Cajun Electric Power Cooperative	G&T cooperative ratemaking policy, exclusion of River Bend, other revenue requirement issues.
4/95	R-00943271	PA	PP&L Industrial Customer Alliance	Pennsylvania Power & Light Co.	Revenue requirements. Fossil dismantling, nuclear decommissioning.
6/95	3905-U Rebuttal	GA	Georgia Public Service Commission	Southern Bell Telephone Co.	Incentive regulation, affiliate transactions, revenue requirements, rate refund.
6/95	U-19904 (Direct)	LA	Louisiana Public Service Commission Staff	Gulf States Utilities Co.	Gas, coal, nuclear fuel costs, contract prudence, base/fuel realignment.

**Expert Testimony Appearances
of
Lane Kollen
as of February 2012**

Date	Case	Jurisdic.	Party	Utility	Subject
10/95	95-02614	TN	Tennessee Office of the Attorney General Consumer Advocate	BellSouth Telecommunications, Inc.	Affiliate transactions.
10/95	U-21485 (Direct)	LA	Louisiana Public Service Commission Staff	Gulf States Utilities Co.	Nuclear O&M, River Bend phase-in plan, base/fuel realignment, NOL and AltMin asset deferred taxes, other revenue requirement issues.
11/95	U-19904 (Surrebuttal)	LA	Louisiana Public Service Commission Staff	Gulf States Utilities Co. Division	Gas, coal, nuclear fuel costs, contract prudence, base/fuel realignment.
11/95	U-21485 (Supplemental Direct)	LA	Louisiana Public Service Commission Staff	Gulf States Utilities Co.	Nuclear O&M, River Bend phase-in plan, base/fuel realignment, NOL and AltMin asset deferred taxes, other revenue requirement issues.
12/95	U-21485 (Surrebuttal)				
1/96	95-299-EL-AIR 95-300-EL-AIR	OH	Industrial Energy Consumers	The Toledo Edison Co., The Cleveland Electric Illuminating Co.	Competition, asset write-offs and revaluation, O&M expense, other revenue requirement issues.
2/96	PUC Docket 14965	TX	Office of Public Utility Counsel	Central Power & Light	Nuclear decommissioning.
5/96	95-485-LCS	NM	City of Las Cruces	El Paso Electric Co.	Stranded cost recovery, municipalization.
7/96	8725	MD	The Maryland Industrial Group and Redland Genstar, Inc.	Baltimore Gas & Electric Co., Potomac Electric Power Co., and Constellation Energy Corp.	Merger savings, tracking mechanism, earnings sharing plan, revenue requirement issues.
9/96 11/96	U-22092 U-22092 (Surrebuttal)	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc.	River Bend phase-in plan, base/fuel realignment, NOL and AltMin asset deferred taxes, other revenue requirement issues, allocation of regulated/nonregulated costs.
10/96	96-327	KY	Kentucky Industrial Utility Customers, Inc.	Big Rivers Electric Corp.	Environmental surcharge recoverable costs.
2/97	R-00973877	PA	Philadelphia Area Industrial Energy Users Group	PECO Energy Co.	Stranded cost recovery, regulatory assets and liabilities, intangible transition charge, revenue requirements
3/97	96-489	KY	Kentucky Industrial Utility Customers, Inc.	Kentucky Power Co.	Environmental surcharge recoverable costs, system agreements, allowance inventory, jurisdictional allocation.
6/97	TO-97-397	MO	MCI Telecommunications Corp., Inc., MCImetro Access Transmission Services, Inc.	Southwestern Bell Telephone Co.	Price cap regulation, revenue requirements, rate of return.
6/97	R-00973953	PA	Philadelphia Area Industrial Energy Users Group	PECO Energy Co.	Restructuring, deregulation, stranded costs, regulatory assets, liabilities, nuclear and fossil decommissioning.
7/97	R-00973954	PA	PP&L Industrial Customer Alliance	Pennsylvania Power & Light Co.	Restructuring, deregulation, stranded costs, regulatory assets, liabilities, nuclear and fossil decommissioning

**Expert Testimony Appearances
of
Lane Kolten
as of February 2012**

Date	Case	Jurisdct.	Party	Utility	Subject
7/97	U-22092	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc.	Depreciation rates and methodologies, River Bend phase-in plan.
8/97	97-300	KY	Kentucky Industrial Utility Customers, Inc.	Louisville Gas & Electric Co., Kentucky Utilities Co	Merger policy, cost savings, surcredit sharing mechanism, revenue requirements, rate of return.
8/97	R-00973954 (Surrebuttal)	PA	PP&L Industrial Customer Alliance	Pennsylvania Power & Light Co.	Restructuring, deregulation, stranded costs, regulatory assets, liabilities, nuclear and fossil decommissioning.
10/97	97-204	KY	Alcan Aluminum Corp. Southwire Co.	Big Rivers Electric Corp.	Restructuring, revenue requirements, reasonableness.
10/97	R-974008	PA	Metropolitan Edison Industrial Users Group	Metropolitan Edison Co	Restructuring, deregulation, stranded costs, regulatory assets, liabilities, nuclear and fossil decommissioning, revenue requirements.
10/97	R-974009	PA	Penelec Industrial Customer Alliance	Pennsylvania Electric Co.	Restructuring, deregulation, stranded costs, regulatory assets, liabilities, nuclear and fossil decommissioning, revenue requirements.
11/97	97-204 (Rebuttal)	KY	Alcan Aluminum Corp. Southwire Co.	Big Rivers Electric Corp.	Restructuring, revenue requirements, reasonableness of rates, cost allocation.
11/97	U-22491	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc.	Allocation of regulated and nonregulated costs, other revenue requirement issues.
11/97	R-00973953 (Surrebuttal)	PA	Philadelphia Area Industrial Energy Users Group	PECO Energy Co.	Restructuring, deregulation, stranded costs, regulatory assets, liabilities, nuclear and fossil decommissioning.
11/97	R-973981	PA	West Penn Power Industrial Intervenors	West Penn Power Co.	Restructuring, deregulation, stranded costs, regulatory assets, liabilities, fossil decommissioning, revenue requirements, securitization.
11/97	R-974104	PA	Duquesne Industrial Intervenors	Duquesne Light Co.	Restructuring, deregulation, stranded costs, regulatory assets, liabilities, nuclear and fossil decommissioning, revenue requirements, securitization.
12/97	R-973981 (Surrebuttal)	PA	West Penn Power Industrial Intervenors	West Penn Power Co.	Restructuring, deregulation, stranded costs, regulatory assets, liabilities, fossil decommissioning, revenue requirements.
12/97	R-974104 (Surrebuttal)	PA	Duquesne Industrial Intervenors	Duquesne Light Co.	Restructuring, deregulation, stranded costs, regulatory assets, liabilities, nuclear and fossil decommissioning, revenue requirements, securitization.
1/98	U-22491 (Surrebuttal)	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc.	Allocation of regulated and nonregulated costs, other revenue requirement issues.
2/98	8774	MD	Westvaco	Potomac Edison Co.	Merger of Duquesne, AE, customer safeguards, savings sharing.
3/98	U-22092 (Allocated Stranded Cost Issues)	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc.	Restructuring, stranded costs, regulatory assets, securitization, regulatory mitigation.

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3/98	8390-U	GA	Georgia Natural Gas Group, Georgia Textile Manufacturers Assoc.	Atlanta Gas Light Co.	Restructuring, unbundling, stranded costs, incentive regulation, revenue requirements.
3/98	U-22092 (Allocated Stranded Cost Issues) (Surrebuttal)	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc.	Restructuring, stranded costs, regulatory assets, securitization, regulatory mitigation.
10/98	97-596	ME	Maine Office of the Public Advocate	Bangor Hydro-Electric Co.	Restructuring, unbundling, stranded costs, T&D revenue requirements.
10/98	9355-U	GA	Georgia Public Service Commission Adversary Staff	Georgia Power Co.	Affiliate transactions.
10/98	U-17735	LA	Louisiana Public Service Commission Staff	Cajun Electric Power Cooperative	G&T cooperative ratemaking policy, other revenue requirement issues.
11/98	U-23327	LA	Louisiana Public Service Commission Staff	SWEPCO, CSW and AEP	Merger policy, savings sharing mechanism, affiliate transaction conditions.
12/98	U-23358 (Direct)	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc.	Allocation of regulated and nonregulated costs, tax issues, and other revenue requirement issues.
12/98	98-577	ME	Maine Office of Public Advocate	Maine Public Service Co.	Restructuring, unbundling, stranded cost, T&D revenue requirements.
1/99	98-10-07	CT	Connecticut Industrial Energy Consumers	United Illuminating Co.	Stranded costs, investment tax credits, accumulated deferred income taxes, excess deferred income taxes.
3/99	U-23358 (Surrebuttal)	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc.	Allocation of regulated and nonregulated costs, tax issues, and other revenue requirement issues.
3/99	98-474	KY	Kentucky Industrial Utility Customers, Inc.	Louisville Gas and Electric Co.	Revenue requirements, alternative forms of regulation.
3/99	98-426	KY	Kentucky Industrial Utility Customers, Inc.	Kentucky Utilities Co.	Revenue requirements, alternative forms of regulation.
3/99	99-082	KY	Kentucky Industrial Utility Customers, Inc.	Louisville Gas and Electric Co.	Revenue requirements.
3/99	99-083	KY	Kentucky Industrial Utility Customers, Inc.	Kentucky Utilities Co.	Revenue requirements.
4/99	U-23358 (Supplemental Surrebuttal)	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc.	Allocation of regulated and nonregulated costs, tax issues, and other revenue requirement issues.
4/99	99-03-04	CT	Connecticut Industrial Energy Consumers	United Illuminating Co.	Regulatory assets and liabilities, stranded costs, recovery mechanisms.
4/99	99-02-05	Ct	Connecticut Industrial Utility Customers	Connecticut Light and Power Co.	Regulatory assets and liabilities, stranded costs, recovery mechanisms.
5/99	98-426 99-082 (Additional Direct)	KY	Kentucky Industrial Utility Customers, Inc.	Louisville Gas and Electric Co.	Revenue requirements.

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5/99	98-474 99-083 (Additional Direct)	KY	Kentucky Industrial Utility Customers, Inc.	Kentucky Utilities Co.	Revenue requirements.
5/99	98-426 98-474 (Response to Amended Applications)	KY	Kentucky Industrial Utility Customers, Inc.	Louisville Gas and Electric Co., Kentucky Utilities Co.	Alternative regulation.
6/99	97-596	ME	Maine Office of Public Advocate	Bangor Hydro-Electric Co.	Request for accounting order regarding electric industry restructuring costs.
6/99	U-23358	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc.	Affiliate transactions, cost allocations.
7/99	99-03-35	CT	Connecticut Industrial Energy Consumers	United Illuminating Co.	Stranded costs, regulatory assets, tax effects of asset divestiture.
7/99	U-23327	LA	Louisiana Public Service Commission Staff	Southwestern Electric Power Co., Central and South West Corp, American Electric Power Co.	Merger Settlement and Stipulation.
7/99	97-596 Surrebuttal	ME	Maine Office of Public Advocate	Bangor Hydro-Electric Co.	Restructuring, unbundling, stranded cost, T&D revenue requirements.
7/99	98-0452-E-GI	WV	West Virginia Energy Users Group	Monongahela Power, Potomac Edison, Appalachian Power, Wheeling Power	Regulatory assets and liabilities.
8/99	98-577 Surrebuttal	ME	Maine Office of Public Advocate	Maine Public Service Co.	Restructuring, unbundling, stranded costs, T&D revenue requirements.
8/99	98-426 99-082 Rebuttal	KY	Kentucky Industrial Utility Customers, Inc.	Louisville Gas and Electric Co.	Revenue requirements.
8/99	98-474 98-083 Rebuttal	KY	Kentucky Industrial Utility Customers, Inc.	Kentucky Utilities Co.	Revenue requirements.
8/99	98-0452-E-GI Rebuttal	WV	West Virginia Energy Users Group	Monongahela Power, Potomac Edison, Appalachian Power, Wheeling Power	Regulatory assets and liabilities.
10/99	U-24182 Direct	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc.	Allocation of regulated and nonregulated costs, affiliate transactions, tax issues, and other revenue requirement issues.
11/99	PUC Docket 21527	TX	The Dallas-Fort Worth Hospital Council and Coalition of Independent Colleges and Universities	TXU Electric	Restructuring, stranded costs, taxes, securitization.

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11/99	U-23358 Surrebuttal Affiliate Transactions Review	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc.	Service company affiliate transaction costs.
01/00	U-24182 Surrebuttal	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc.	Allocation of regulated and nonregulated costs, affiliate transactions, tax issues, and other revenue requirement issues.
04/00	99-1212-EL-ETP 99-1213-EL-ATA 99-1214-EL-AAM	OH	Greater Cleveland Growth Association	First Energy (Cleveland Electric Illuminating, Toledo Edison)	Historical review, stranded costs, regulatory assets, liabilities.
05/00	2000-107	KY	Kentucky Industrial Utility Customers, Inc.	Kentucky Power Co.	ECR surcharge roll-in to base rates.
05/00	U-24182 Supplemental Direct	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc.	Affiliate expense proforma adjustments.
05/00	A-110550F0147	PA	Philadelphia Area Industrial Energy Users Group	PECO Energy	Merger between PECO and Unicom.
05/00	99-1658-EL-ETP	OH	AK Steel Corp.	Cincinnati Gas & Electric Co.	Regulatory transition costs, including regulatory assets and liabilities, SFAS 109, ADIT, EDIT, ITC.
07/00	PUC Docket 22344	TX	The Dallas-Fort Worth Hospital Council and The Coalition of Independent Colleges and Universities	Statewide Generic Proceeding	Escalation of O&M expenses for unbundled T&D revenue requirements in projected test year.
07/00	U-21453	LA	Louisiana Public Service Commission	SWEPCO	Stranded costs, regulatory assets and liabilities.
08/00	U-24064	LA	Louisiana Public Service Commission Staff	CLECO	Affiliate transaction pricing ratemaking principles, subsidization of nonregulated affiliates, ratemaking adjustments.
10/00	SOAH Docket 473-00-1015 PUC Docket 22350	TX	The Dallas-Fort Worth Hospital Council and The Coalition of Independent Colleges and Universities	TXU Electric Co.	Restructuring, T&D revenue requirements, mitigation, regulatory assets and liabilities.
10/00	R-00974104 Affidavit	PA	Duquesne Industrial Intervenors	Duquesne Light Co.	Final accounting for stranded costs, including treatment of auction proceeds, taxes, capital costs, switchback costs, and excess pension funding.
11/00	P-00001837 R-00974008 P-00001838 R-00974009	PA	Metropolitan Edison Industrial Users Group Penelec Industrial Customer Alliance	Metropolitan Edison Co., Pennsylvania Electric Co.	Final accounting for stranded costs, including treatment of auction proceeds, taxes, regulatory assets and liabilities, transaction costs.
12/00	U-21453, U-20925, U-22092 (Subdocket C) Surrebuttal	LA	Louisiana Public Service Commission Staff	SWEPCO	Stranded costs, regulatory assets.

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01/01	U-24993 Direct	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc.	Allocation of regulated and nonregulated costs, tax issues, and other revenue requirement issues.
01/01	U-21453, U-20925, U-22092 (Subdocket B) Surrebuttal	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc.	Industry restructuring, business separation plan, organization structure, hold harmless conditions, financing.
01/01	Case No. 2000-386	KY	Kentucky Industrial Utility Customers, Inc.	Louisville Gas & Electric Co.	Recovery of environmental costs, surcharge mechanism.
01/01	Case No. 2000-439	KY	Kentucky Industrial Utility Customers, Inc.	Kentucky Utilities Co.	Recovery of environmental costs, surcharge mechanism.
02/01	A-110300F0095 A-110400F0040	PA	Met-Ed Industrial Users Group, Penelec Industrial Customer Alliance	GPU, Inc. FirstEnergy Corp.	Merger, savings, reliability.
03/01	P-00001860 P-00001861	PA	Met-Ed Industrial Users Group, Penelec Industrial Customer Alliance	Metropolitan Edison Co., Pennsylvania Electric Co.	Recovery of costs due to provider of last resort obligation.
04/01	U-21453, U-20925, U-22092 (Subdocket B) Settlement Term Sheet	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc.	Business separation plan: settlement agreement on overall plan structure.
04/01	U-21453, U-20925, U-22092 (Subdocket B) Contested Issues	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc.	Business separation plan: agreements, hold harmless conditions, separations methodology.
05/01	U-21453, U-20925, U-22092 (Subdocket B) Contested Issues Transmission and Distribution Rebuttal	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc.	Business separation plan: agreements, hold harmless conditions, separations methodology.
07/01	U-21453, U-20925, U-22092 (Subdocket B) Transmission and Distribution Term Sheet	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc.	Business separation plan: settlement agreement on T&D issues, agreements necessary to implement T&D separations, hold harmless conditions, separations methodology.
10/01	14000-U	GA	Georgia Public Service Commission Adversary Staff	Georgia Power Company	Revenue requirements, Rate Plan, fuel clause recovery
11/01	14311-U Direct Panel with Bolin Killings	GA	Georgia Public Service Commission Adversary Staff	Atlanta Gas Light Co	Revenue requirements, revenue forecast, O&M expense, depreciation, plant additions, cash working capital.

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Date	Case	Jurisdic.	Party	Utility	Subject
11/01	U-25687 Direct	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc.	Revenue requirements, capital structure, allocation of regulated and nonregulated costs, River Bend uprate.
02/02	PUC Docket 25230	TX	The Dallas-Fort Worth Hospital Council and the Coalition of Independent Colleges and Universities	TXU Electric	Stipulation. Regulatory assets, securitization financing.
02/02	U-25687 Surrebuttal	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc.	Revenue requirements, corporate franchise tax, conversion to LLC, River Bend uprate.
03/02	14311-U Rebuttal Panel with Bolin Killings	GA	Georgia Public Service Commission Adversary Staff	Atlanta Gas Light Co.	Revenue requirements, earnings sharing plan, service quality standards.
03/02	14311-U Rebuttal Panel with Michelle L. Thebert	GA	Georgia Public Service Commission Adversary Staff	Atlanta Gas Light Co.	Revenue requirements, revenue forecast, O&M expense, depreciation, plant additions, cash working capital.
03/02	001148-EI	FL	South Florida Hospital and Healthcare Assoc.	Florida Power & Light Co.	Revenue requirements. Nuclear life extension, storm damage accruals and reserve, capital structure, O&M expense.
04/02	U-25687 (Suppl. Surrebuttal)	LA	Louisiana Public Service Commission	Entergy Gulf States, Inc.	Revenue requirements, corporate franchise tax, conversion to LLC, River Bend uprate.
04/02	U-21453, U-20925 U-22092 (Subdocket C)	LA	Louisiana Public Service Commission	SWEPCO	Business separation plan, T&D Term Sheet, separations methodologies, hold harmless conditions.
08/02	EL01-88-000	FERC	Louisiana Public Service Commission	Entergy Services, Inc. and the Entergy Operating Companies	System Agreement, production cost equalization, tariffs.
08/02	U-25888	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc. and Entergy Louisiana, Inc.	System Agreement, production cost disparities, prudence.
09/02	2002-00224 2002-00225	KY	Kentucky Industrial Utilities Customers, Inc.	Kentucky Utilities Co., Louisville Gas & Electric Co.	Line losses and fuel clause recovery associated with off-system sales.
11/02	2002-00146 2002-00147	KY	Kentucky Industrial Utilities Customers, Inc.	Kentucky Utilities Co., Louisville Gas & Electric Co.	Environmental compliance costs and surcharge recovery.
01/03	2002-00169	KY	Kentucky Industrial Utilities Customers, Inc.	Kentucky Power Co	Environmental compliance costs and surcharge recovery.
04/03	2002-00429 2002-00430	KY	Kentucky Industrial Utilities Customers, Inc.	Kentucky Utilities Co., Louisville Gas & Electric Co.	Extension of merger surcredit, flaws in Companies' studies.
04/03	U-26527	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc.	Revenue requirements, corporate franchise tax, conversion to LLC, capital structure, post-test year adjustments.

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06/03	EL01-88-000 Rebuttal	FERC	Louisiana Public Service Commission	Entergy Services, Inc. and the Entergy Operating Companies	System Agreement, production cost equalization, tariffs.
06/03	2003-00068	KY	Kentucky Industrial Utility Customers	Kentucky Utilities Co.	Environmental cost recovery, correction of base rate error.
11/03	ER03-753-000	FERC	Louisiana Public Service Commission	Entergy Services, Inc. and the Entergy Operating Companies	Unit power purchases and sale cost-based tariff pursuant to System Agreement.
11/03	ER03-583-000, ER03-583-001, ER03-583-002 ER03-681-000, ER03-681-001 ER03-682-000, ER03-682-001, ER03-682-002 ER03-744-000, ER03-744-001 (Consolidated)	FERC	Louisiana Public Service Commission	Entergy Services, Inc., the Entergy Operating Companies, EWO Marketing, L.P, and Entergy Power, Inc	Unit power purchases and sale agreements, contractual provisions, projected costs, leveled rates, and formula rates.
12/03	U-26527 Surrebuttal	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc.	Revenue requirements, corporate franchise tax, conversion to LLC, capital structure, post-test year adjustments.
12/03	2003-0334 2003-0335	KY	Kentucky Industrial Utility Customers, Inc.	Kentucky Utilities Co., Louisville Gas & Electric Co.	Earnings Sharing Mechanism.
12/03	U-27136	LA	Louisiana Public Service Commission Staff	Entergy Louisiana, Inc.	Purchased power contracts between affiliates, terms and conditions.
03/04	U-26527 Supplemental Surrebuttal	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc.	Revenue requirements, corporate franchise tax, conversion to LLC, capital structure, post-test year adjustments.
03/04	2003-00433	KY	Kentucky Industrial Utility Customers, Inc.	Louisville Gas & Electric Co.	Revenue requirements, depreciation rates, O&M expense, deferrals and amortization, earnings sharing mechanism, merger surcredit, VDT surcredit.
03/04	2003-00434	KY	Kentucky Industrial Utility Customers, Inc.	Kentucky Utilities Co.	Revenue requirements, depreciation rates, O&M expense, deferrals and amortization, earnings sharing mechanism, merger surcredit, VDT surcredit.
03/04	SOAH Docket 473-04-2459 PUC Docket 29206	TX	Cities Served by Texas- New Mexico Power Co.	Texas-New Mexico Power Co.	Stranded costs true-up, including valuation issues, ITC, ADIT, excess earnings.
05/04	04-169-EL-UNC	OH	Ohio Energy Group, Inc.	Columbus Southern Power Co. & Ohio Power Co.	Rate stabilization plan, deferrals, T&D rate increases, earnings.

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06/04	SOAH Docket 473-04-4555 PUC Docket 29526	TX	Houston Council for Health and Education	CenterPoint Energy Houston Electric	Stranded costs true-up, including valuation issues, ITC, EDIT, excess mitigation credits, capacity auction true-up revenues, interest.
08/04	SOAH Docket 473-04-4555 PUC Docket 29526 (Suppl Direct)	TX	Houston Council for Health and Education	CenterPoint Energy Houston Electric	Interest on stranded cost pursuant to Texas Supreme Court remand.
09/04	U-23327 Subdocket B	LA	Louisiana Public Service Commission Staff	SWEPCO	Fuel and purchased power expenses recoverable through fuel adjustment clause, trading activities, compliance with terms of various LPSC Orders.
10/04	U-23327 Subdocket A	LA	Louisiana Public Service Commission Staff	SWEPCO	Revenue requirements.
12/04	Case Nos. 2004-00321, 2004-00372	KY	Gallatin Steel Co.	East Kentucky Power Cooperative, Inc., Big Sandy Recc, et al.	Environmental cost recovery, qualified costs, TIER requirements, cost allocation.
01/05	30485	TX	Houston Council for Health and Education	CenterPoint Energy Houston Electric, LLC	Stranded cost true-up including regulatory Central Co. assets and liabilities, ITC, EDIT, capacity auction, proceeds, excess mitigation credits, retrospective and prospective ADIT.
02/05	18638-U	GA	Georgia Public Service Commission Adversary Staff	Atlanta Gas Light Co.	Revenue requirements.
02/05	18638-U Panel with Tony Wackerly	GA	Georgia Public Service Commission Adversary Staff	Atlanta Gas Light Co.	Comprehensive rate plan, pipeline replacement program surcharge, performance based rate plan.
02/05	18638-U Panel with Michelle Thebert	GA	Georgia Public Service Commission Adversary Staff	Atlanta Gas Light Co.	Energy conservation, economic development, and tariff issues.
03/05	Case Nos. 2004-00426, 2004-00421	KY	Kentucky Industrial Utility Customers, Inc.	Kentucky Utilities Co., Louisville Gas & Electric	Environmental cost recovery, Jobs Creation Act of 2004 and §199 deduction, excess common equity ratio, deferral and amortization of nonrecurring O&M expense.
06/05	2005-00068	KY	Kentucky Industrial Utility Customers, Inc.	Kentucky Power Co.	Environmental cost recovery, Jobs Creation Act of 2004 and §199 deduction, margins on allowances used for AEP system sales.
06/05	050045-EI	FL	South Florida Hospital and Healthcare Assoc.	Florida Power & Light Co.	Storm damage expense and reserve, RTO costs, O&M expense projections, return on equity performance incentive, capital structure, selective second phase post-test year rate increase.
08/05	31056	TX	Alliance for Valley Healthcare	AEP Texas Central Co.	Stranded cost true-up including regulatory assets and liabilities, ITC, EDIT, capacity auction, proceeds, excess mitigation credits, retrospective and prospective ADIT.
09/05	20298-U	GA	Georgia Public Service Commission Adversary Staff	Atmos Energy Corp.	Revenue requirements, roll-in of surcharges, cost recovery through surcharge, reporting requirements.

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09/05	20298-U Panel with Victoria Taylor	GA	Georgia Public Service Commission Adversary Staff	Atmos Energy Corp.	Affiliate transactions, cost allocations, capitalization, cost of debt.
10/05	04-42	DE	Delaware Public Service Commission Staff	Artesian Water Co.	Allocation of tax net operating losses between regulated and unregulated.
11/05	2005-00351 2005-00352	KY	Kentucky Industrial Utility Customers, Inc.	Kentucky Utilities Co., Louisville Gas & Electric	Workforce Separation Program cost recovery and shared savings through VDT surcredit.
01/06	2005-00341	KY	Kentucky Industrial Utility Customers, Inc.	Kentucky Power Co.	System Sales Clause Rider, Environmental Cost Recovery Rider, Net Congestion Rider, Storm damage, vegetation management program, depreciation, off-system sales, maintenance normalization, pension and OPEB.
03/06	PUC Docket 31994	TX	Cities	Texas-New Mexico Power Co.	Stranded cost recovery through competition transition or change.
05/06	31994 Supplemental	TX	Cities	Texas-New Mexico Power Co.	Retrospective ADFIT, prospective ADFIT.
03/06	U-21453, U-20925, U-22092	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc.	Jurisdictional separation plan.
03/06	NOPR Reg 104385-OR	IRS	Alliance for Valley Health Care and Houston Council for Health Education	AEP Texas Central Company and CenterPoint Energy Houston Electric	Proposed Regulations affecting flow- through to ratepayers of excess deferred income taxes and investment tax credits on generation plant that is sold or deregulated.
04/06	U-25116	LA	Louisiana Public Service Commission Staff	Entergy Louisiana, Inc.	2002-2004 Audit of Fuel Adjustment Clause Filings. Affiliate transactions.
07/06	R-00061366, Et. al.	PA	Met-Ed Ind. Users Group Pennsylvania Ind. Customer Alliance	Metropolitan Edison Co., Pennsylvania Electric Co.	Recovery of NUG-related stranded costs, government mandated programs costs, storm damage costs.
07/06	U-23327	LA	Louisiana Public Service Commission Staff	Southwestern Electric Power Co.	Revenue requirements, formula rate plan, banking proposal.
08/06	U-21453, U-20925, U-22092 (Subdocket J)	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc.	Jurisdictional separation plan.
11/06	05CVH03-3375 Franklin County Court Affidavit	OH	Various Taxing Authorities (Non-Utility Proceeding)	State of Ohio Department of Revenue	Accounting for nuclear fuel assemblies as manufactured equipment and capitalized plant.
12/06	U-23327 Subdocket A Reply Testimony	LA	Louisiana Public Service Commission Staff	Southwestern Electric Power Co.	Revenue requirements, formula rate plan, banking proposal.
03/07	U-29764	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc., Entergy Louisiana, LLC	Jurisdictional allocation of Entergy System Agreement equalization remedy receipts.
03/07	PUC Docket 33309	TX	Cities	AEP Texas Central Co.	Revenue requirements, including functionalization of transmission and distribution costs.

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03/07	PUC Docket 33310	TX	Cities	AEP Texas North Co.	Revenue requirements, including functionalization of transmission and distribution costs.
03/07	2006-00472	KY	Kentucky Industrial Utility Customers, Inc.	East Kentucky Power Cooperative	Interim rate increase, RUS loan covenants, credit facility requirements, financial condition.
03/07	U-29157	LA	Louisiana Public Service Commission Staff	Cleco Power, LLC	Permanent (Phase II) storm damage cost recovery.
04/07	U-29764 Supplemental and Rebuttal	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc., Entergy Louisiana, LLC	Jurisdictional allocation of Entergy System Agreement equalization remedy receipts.
04/07	ER07-682-000 Affidavit	FERC	Louisiana Public Service Commission	Entergy Services, Inc. and the Entergy Operating Companies	Allocation of intangible and general plant and A&G expenses to production and state income tax effects on equalization remedy receipts.
04/07	ER07-684-000 Affidavit	FERC	Louisiana Public Service Commission	Entergy Services, Inc. and the Entergy Operating Companies	Fuel hedging costs and compliance with FERC USOA.
05/07	ER07-682-000 Affidavit	FERC	Louisiana Public Service Commission	Entergy Services, Inc. and the Entergy Operating Companies	Allocation of intangible and general plant and A&G expenses to production and account 924 effects on MSS-3 equalization remedy payments and receipts.
06/07	U-29764	LA	Louisiana Public Service Commission Staff	Entergy Louisiana, LLC, Entergy Gulf States, Inc.	Show cause for violating LPSC Order on fuel hedging costs.
07/07	2006-00472	KY	Kentucky Industrial Utility Customers, Inc.	East Kentucky Power Cooperative	Revenue requirements, post-test year adjustments, TIER, surcharge revenues and costs, financial need.
07/07	ER07-956-000 Affidavit	FERC	Louisiana Public Service Commission	Entergy Services, Inc.	Storm damage costs related to Hurricanes Katrina and Rita and effects of MSS-3 equalization payments and receipts.
10/07	05-UR-103 Direct	WI	Wisconsin Industrial Energy Group	Wisconsin Electric Power Company, Wisconsin Gas, LLC	Revenue requirements, carrying charges on CWIP, amortization and return on regulatory assets, working capital, incentive compensation, use of rate base in lieu of capitalization, quantification and use of Point Beach sale proceeds.
10/07	05-UR-103 Surrebuttal	WI	Wisconsin Industrial Energy Group	Wisconsin Electric Power Company, Wisconsin Gas, LLC	Revenue requirements, carrying charges on CWIP, amortization and return on regulatory assets, working capital, incentive compensation, use of rate base in lieu of capitalization, quantification and use of Point Beach sale proceeds.
10/07	25060-U Direct	GA	Georgia Public Service Commission Public Interest Adversary Staff	Georgia Power Company	Affiliate costs, incentive compensation, consolidated income taxes, §199 deduction.
11/07	06-0033-E-CN Direct	WV	West Virginia Energy Users Group	Appalachian Power Company	IGCC surcharge during construction period and post-in-service date.

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11/07	ER07-682-000 Direct	FERC	Louisiana Public Service Commission	Entergy Services, Inc. and the Entergy Operating Companies	Functionalization and allocation of intangible and general plant and A&G expenses.
01/08	ER07-682-000 Cross-Answering	FERC	Louisiana Public Service Commission	Entergy Services, Inc. and the Entergy Operating Companies	Functionalization and allocation of intangible and general plant and A&G expenses.
01/08	07-551-EL-AIR Direct	OH	Ohio Energy Group, Inc.	Ohio Edison Company, Cleveland Electric Illuminating Company, Toledo Edison Company	Revenue requirements.
02/08	ER07-956-000 Direct	FERC	Louisiana Public Service Commission	Entergy Services, Inc. and the Entergy Operating Companies	Functionalization of expenses in account 923; storm damage expense and accounts 924, 228.1, 182.3, 254 and 407.3; tax NOL carrybacks in accounts 165 and 236; ADIT; nuclear service lives and effect on depreciation and decommissioning.
03/08	ER07-956-000 Cross-Answering	FERC	Louisiana Public Service Commission	Entergy Services, Inc. and the Entergy Operating Companies	Functionalization of expenses in account 923; storm damage expense and accounts 924, 228.1, 182.3, 254 and 407.3; tax NOL carrybacks in accounts 165 and 236; ADIT; nuclear service lives and effect on depreciation and decommissioning.
04/08	2007-00562, 2007-00563	KY	Kentucky Industrial Utility Customers, Inc.	Kentucky Utilities Co., Louisville Gas and Electric Co.	Merger surcredit.
04/08	26837 Direct Panel with Thomas K. Bond, Cynthia Johnson, and Michelle Thebert	GA	Georgia Public Service Commission Staff	SCANA Energy Marketing, Inc.	Rule Nisi complaint.
05/08	26837 Rebuttal Panel with Thomas K. Bond, Cynthia Johnson, and Michelle Thebert	GA	Georgia Public Service Commission Staff	SCANA Energy Marketing, Inc.	Rule Nisi complaint.
05/08	26837 Supplemental Rebuttal Panel with Thomas K. Bond, Cynthia Johnson, and Michelle Thebert	GA	Georgia Public Service Commission Staff	SCANA Energy Marketing, Inc.	Rule Nisi complaint.

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Date	Case	Jurisdic.	Party	Utility	Subject
06/08	2008-00115	KY	Kentucky Industrial Utility Customers, Inc.	East Kentucky Power Cooperative, Inc.	Environmental surcharge recoveries, including costs recovered in existing rates, TIER.
07/08	27163 Direct	GA	Georgia Public Service Commission Public Interest Advocacy Staff	Atmos Energy Corp.	Revenue requirements, including projected test year rate base and expenses.
07/08	27163 Panel with Victoria Taylor	GA	Georgia Public Service Commission Public Interest Advocacy Staff	Atmos Energy Corp.	Affiliate transactions and division cost allocations, capital structure, cost of debt.
08/08	6680-CE-170 Direct	WI	Wisconsin Industrial Energy Group, Inc.	Wisconsin Power and Light Company	Nelson Dewey 3 or Colombia 3 fixed financial parameters.
08/08	6680-UR-116 Direct	WI	Wisconsin Industrial Energy Group, Inc.	Wisconsin Power and Light Company	CWIP in rate base, labor expenses, pension expense, financing, capital structure, decoupling.
08/08	6680-UR-116 Rebuttal	WI	Wisconsin Industrial Energy Group, Inc.	Wisconsin Power and Light Company	Capital structure.
08/08	6690-UR-119 Direct	WI	Wisconsin Industrial Energy Group, Inc.	Wisconsin Public Service Corp.	Prudence of Weston 3 outage, incentive compensation, Crane Creek Wind Farm incremental revenue requirement, capital structure.
09/08	6690-UR-119 Surrebuttal	WI	Wisconsin Industrial Energy Group, Inc.	Wisconsin Public Service Corp.	Prudence of Weston 3 outage, Section 199 deduction.
09/08	08-935-EL-SSO, 08-918-EL-SSO	OH	Ohio Energy Group, Inc.	First Energy	Standard service offer rates pursuant to electric security plan, significantly excessive earnings test.
10/08	08-917-EL-SSO	OH	Ohio Energy Group, Inc.	AEP	Standard service offer rates pursuant to electric security plan, significantly excessive earnings test.
10/08	2007-564, 2007-565, 2008-251 2008-252	KY	Kentucky Industrial Utility Customers, Inc.	Louisville Gas and Electric Co., Kentucky Utilities Company	Revenue forecast, affiliate costs, depreciation expenses, federal and state income tax expense, capitalization, cost of debt.
11/08	EL08-51	FERC	Louisiana Public Service Commission	Entergy Services, Inc.	Spindletop gas storage facilities, regulatory asset and bandwidth remedy.
11/08	35717	TX	Cities Served by Oncor Delivery Company	Oncor Delivery Company	Recovery of old meter costs, asset ADFFIT, cash working capital, recovery of prior year restructuring costs, levelized recovery of storm damage costs, prospective storm damage accrual, consolidated tax savings adjustment.
12/08	27800	GA	Georgia Public Service Commission	Georgia Power Company	AFUDC versus CWIP in rate base, mirror CWIP, certification cost, use of short term debt and trust preferred financing, CWIP recovery, regulatory incentive.
01/09	ER08-1056	FERC	Louisiana Public Service Commission	Entergy Services, Inc.	Entergy System Agreement bandwidth remedy calculations, including depreciation expense, ADIT, capital structure.
01/09	ER08-1056 Supplemental Direct	FERC	Louisiana Public Service Commission	Entergy Services, Inc.	Blytheville leased turbines; accumulated depreciation.

**Expert Testimony Appearances
of
Lane Kollen
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Date	Case	Jurisdic.	Party	Utility	Subject
02/09	EL08-51 Rebuttal	FERC	Louisiana Public Service Commission	Entergy Services, Inc.	Spindletop gas storage facilities regulatory asset and bandwidth remedy.
02/09	2008-00409 Direct	KY	Kentucky Industrial Utility Customers, Inc.	East Kentucky Power Cooperative, Inc.	Revenue requirements.
03/09	ER08-1056 Answering	FERC	Louisiana Public Service Commission	Entergy Services, Inc.	Entergy System Agreement bandwidth remedy calculations, including depreciation expense, ADIT, capital structure.
03/09	U-21453, U-20925 U-22092 (Subdocket J)	LA	Louisiana Public Service Commission Staff	Entergy Gulf States Louisiana, LLC	Violation of EGSI separation order, ETI and EGSL separation accounting, Spindletop regulatory asset.
04/09	U-21453, U-20925 U-22092 (Subdocket J) Rebuttal	LA	Louisiana Public Service Commission Staff	Entergy Gulf States Louisiana, LLC	Violation of EGSI separation order, ETI and EGSL separation accounting, Spindletop regulatory asset.
04/09	2009-00040 Direct-Interim (Oral)	KY	Kentucky Industrial Utility Customers, Inc.	Big Rivers Electric Corp.	Emergency interim rate increase; cash requirements.
04/09	PUC Docket 36530	TX	State Office of Administrative Hearings	Oncor Electric Delivery Company, LLC	Rate case expenses.
05/09	ER08-1056 Rebuttal	FERC	Louisiana Public Service Commission	Entergy Services, Inc.	Entergy System Agreement bandwidth remedy calculations, including depreciation expense, ADIT, capital structure.
06/09	2009-00040 Direct- Permanent	KY	Kentucky Industrial Utility Customers, Inc.	Big Rivers Electric Corp.	Revenue requirements, TIER, cash flow.
07/09	080677-EI	FL	South Florida Hospital and Healthcare Association	Florida Power & Light Company	Multiple test years, GBRA rider, forecast assumptions, revenue requirement, O&M expense, depreciation expense, Economic Stimulus Bill, capital structure.
08/09	U-21453, U-20925, U-22092 (Subdocket J) Supplemental Rebuttal	LA	Louisiana Public Service Commission	Entergy Gulf States Louisiana, LLC	Violation of EGSI separation order, ETI and EGSL separation accounting, Spindletop regulatory asset.
08/09	8516 and 29950	GA	Georgia Public Service Commission Staff	Atlanta Gas Light Company	Modification of PRP surcharge to include infrastructure costs.
09/09	05-UR-104 Direct and Surrebuttal	WI	Wisconsin Industrial Energy Group	Wisconsin Electric Power Company	Revenue requirements, incentive compensation, depreciation, deferral mitigation, capital structure, cost of debt.
09/09	09AL-299E	CO	CF&I Steel, Rocky Mountain Steel Mills LP, Climax Molybdenum Company	Public Service Company of Colorado	Forecasted test year, historic test year, proforma adjustments for major plant additions, tax depreciation.

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Date	Case	Jurisdic.	Party	Utility	Subject
09/09	6680-UR-117 Direct and Surrebuttal	WI	Wisconsin Industrial Energy Group	Wisconsin Power and Light Company	Revenue requirements, CWIP in rate base, deferral mitigation, payroll, capacity shutdowns, regulatory assets, rate of return.
10/09	09A-415E	CO	Cripple Creek & Victor Gold Mining Company, et al.	Black Hills/CO Electric Utility Company	Cost prudence, cost sharing mechanism.
10/09	EL09-50 Direct	LA	Louisiana Public Service Commission	Entergy Services, Inc.	Waterford 3 sale/leaseback accumulated deferred income taxes, Entergy System Agreement bandwidth remedy calculations.
10/09	2009-00329	KY	Kentucky Industrial Utility Customers, Inc.	Louisville Gas and Electric Company, Kentucky Utilities Company	Trimble County 2 depreciation rates.
12/09	PUE-2009-00030	VA	Old Dominion Committee for Fair Utility Rates	Appalachian Power Company	Return on equity incentive.
12/09	ER09-1224 Direct	FERC	Louisiana Public Service Commission	Entergy Services, Inc.	Hypothetical versus actual costs, out of period costs, Spindletop deferred capital costs, Waterford 3 sale/leaseback ADIT.
01/10	ER09-1224 Cross-Answering	FERC	Louisiana Public Service Commission	Entergy Services, Inc.	Hypothetical versus actual costs, out of period costs, Spindletop deferred capital costs, Waterford 3 sale/leaseback ADIT.
01/10	EL09-50 Rebuttal	LA	Louisiana Public Service Commission	Entergy Services, Inc.	Waterford 3 sale/leaseback accumulated deferred income taxes, Entergy System Agreement bandwidth remedy calculations.
02/10	ER09-1224 Final	FERC	Louisiana Public Service Commission	Entergy Services, Inc.	Hypothetical versus actual costs, out of period costs, Spindletop deferred capital costs, Waterford 3 sale/leaseback ADIT.
02/10	30442 Wackerly-Kollen Panel	GA	Georgia Public Service Commission Staff	Atmos Energy Corporation	Revenue requirement issues.
02/10	30442 McBride-Kollen Panel	GA	Georgia Public Service Commission Staff	Atmos Energy Corporation	Affiliate/division transactions, cost allocation, capital structure.
02/10	2009-00353	KY	Kentucky Industrial Utility Customers, Inc.	Louisville Gas and Electric Company, Kentucky Utilities Company	Ratemaking recovery of wind power purchased power agreements.
03/10	2009-00545	KY	Kentucky Industrial Utility Customers, Inc.	Kentucky Power Company	Ratemaking recovery of wind power purchased power agreement.
03/10	E015/GR-09-1151	MN	Large Power Interveners	Minnesota Power	Revenue requirement issues, cost overruns on environmental retrofit project.
03/10	EL10-55	FERC	Louisiana Public Service Commission	Entergy Services, Inc. and the Entergy Operating Companies	Depreciation expense and effects on System Agreement tariffs.

**Expert Testimony Appearances
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Date	Case	Jurisdic.	Party	Utility	Subject
04/10	2009-00459	KY	Kentucky Industrial Utility Customers, Inc.	Kentucky Power Company	Revenue requirement issues.
04/10	2009-00458, 2009-00459	KY	Kentucky Industrial Utility Customers, Inc.	Kentucky Utilities Company, Louisville Gas and Electric Company	Revenue requirement issues.
08/10	31647	GA	Georgia Public Service Commission Staff	Atlanta Gas Light Company	Revenue requirement and synergy savings issues
08/10	31647 Wackerly-Kollen Panel	GA	Georgia Public Service Commission Staff	Atlanta Gas Light Company	Affiliate transaction and Customer First program issues.
08/10	2010-00204	KY	Kentucky Industrial Utility Customers, Inc.	Louisville Gas and Electric Company, Kentucky Utilities Company	PPL acquisition of E.ON U.S. (LG&E and KU) conditions, acquisition savings, sharing deferral mechanism.
09/10	38339 Direct and Cross-Rebuttal	TX	Gulf Coast Coalition of Cities	CenterPoint Energy Houston Electric	Revenue requirement issues, including consolidated tax savings adjustment, incentive compensation FIN 48; AMS surcharge including roll-in to base rates; rate case expenses.
09/10	EL10-55	FERC	Louisiana Public Service Commission	Entergy Services, Inc. and the Entergy Operating Companies	Depreciation rates and expense input effects on System Agreement tariffs.
09/10	2010-00167	KY	Gallatin Steel	East Kentucky Power Cooperative, Inc.	Revenue requirements.
09/10	U-23327 Subdocket E Direct	LA	Louisiana Public Service Commission	SWEPCO	Fuel audit: SO2 allowance expense, variable O&M expense, off-system sales margin sharing.
11/10	U-23327 Rebuttal	LA	Louisiana Public Service Commission	SWEPCO	Fuel audit: SO2 allowance expense, variable O&M expense, off-system sales margin sharing.
09/10	U-31351	LA	Louisiana Public Service Commission Staff	SWEPCO and Valley Electric Membership Cooperative	Sale of Valley assets to SWEPCO and dissolution of Valley.
10/10	10-1261-EL-UNC	OH	Ohio OCC, Ohio Manufacturers Association, Ohio Energy Group, Ohio Hospital Association, Appalachian Peace and Justice Network	Columbus Southern Power Company	Significantly excessive earnings test.
10/10	10-0713-E-PC	WV	West Virginia Energy Users Group	Monongahela Power Company, the Potomac Edison Power Company	Merger of First Energy and Allegheny Energy.
10/10	U-23327 Subdocket F Direct	LA	Louisiana Public Service Commission Staff	SWEPCO	AFUDC adjustments in Formula Rate Plan.

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Date	Case	Jurisdct.	Party	Utility	Subject
11/10	EL10-55 Rebuttal	FERC	Louisiana Public Service Commission	Entergy Services, Inc. and the Entergy Operating Companies	Depreciation rates and expense input effects on System Agreement tariffs.
12/10	ER10-1350 Direct	FERC	Louisiana Public Service Commission	Entergy Services, Inc. and the Entergy Operating Companies	Waterford 3 lease amortization, ADIT, and fuel inventory effects on System Agreement tariffs.
01/11	ER10-1350 Cross-Answering	FERC	Louisiana Public Service Commission	Entergy Services, Inc. and the Entergy Operating Companies	Waterford 3 lease amortization, ADIT, and fuel inventory effects on System Agreement tariffs.
03/11	ER10-2001 Direct	FERC	Louisiana Public Service Commission	Entergy Services, Inc. and Entergy Arkansas, Inc.	EAI depreciation rates.
04/11	Cross-Answering				
04/11	U-23327 Subdocket E	LA	Louisiana Public Service Commission Staff	SWEPCO	Settlement, including resolution of SO2 allowance expense, variable O&M expense, and tiered sharing of off-system sales margins.
04/11	38306 Direct	TX	Cities Served by Texas- New Mexico Power Company	Texas-New Mexico Power Company	AMS deployment plan, AMS Surcharge, rate case expenses.
05/11	Supplemental Direct				
05/11	11-0274-E-GI	WV	West Virginia Energy Users Group	Appalachian Power Company and Wheeling Power Company	Deferral recovery phase-in, construction surcharge.
05/11	2011-00036	KY	Kentucky Industrial Utility Customers, Inc.	Big Rivers Electric Corp.	Revenue requirements.
06/11	29849	GA	Georgia Public Service Commission Staff	Georgia Power Company	Accounting issues related to Vogtle risk-sharing mechanism.
07/11	ER11-2161 Direct and Answering	FERC	Louisiana Public Service Commission	Entergy Services, Inc. and Entergy Texas, Inc.	ETI depreciation rates; accounting issues.
07/11	PUE-2011-00027	VA	Virginia Committee for Fair Utility Rates	Virginia Electric and Power Company	Return on equity performance incentive.
07/11	11-346-EL-SSO 11-348-EL-SSO 11-349-EL-AAM 11-350-EL-AAM	OH	Ohio Energy Group	AEP-OH	Equity Stabilization Incentive Plan; actual earned returns; ADIT offsets in riders.
08/11	ER-11-2161 Cross-Answering	FERC	Louisiana Public Service Commission	Entergy Services, Inc. and Entergy Texas, Inc.	ETI depreciation rates; accounting issues.
08/11	U-23327 Subdocket F Rebuttal	LA	Louisiana Public Service Commission Staff	SWEPCO	Depreciation rates and service lives; AFUDC adjustments.
08/11	05-UR-105	WI	Wisconsin Industrial Energy Group	WE Energies, Inc.	Suspended amortization expenses; revenue requirements

**Expert Testimony Appearances
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Date	Case	Jurisdic.	Party	Utility	Subject
08/11	ER11-2161 Cross-Answering	FERC	Louisiana Public Service Commission	Entergy Services, Inc. and Entergy Texas, Inc	ETI depreciation rates; accounting issues.
09/11	PUC Docket 39504	TX	Gulf Coast Coalition of Cities	CenterPoint Energy Houston Electric	Investment tax credit, excess deferred income taxes; normalization.
09/11	2011-00161 2011-00162	KY	Kentucky Industrial Utility Consumers, Inc.	Louisville Gas & Electric Company, Kentucky Utilities Company	Environmental requirements and financing.
10/11	11-4571-EL-UNC 11-4572-EL-UNC	OH	Ohio Energy Group	Columbus Southern Power Company, Ohio Power Company	Significantly excessive earnings.
10/11	4220-UR-117 Direct	WI	Wisconsin Industrial Energy Group	Northern States Power-Wisconsin	Nuclear O&M depreciation.
11/11	4220-UR-117 Surrebuttal	WI	Wisconsin Industrial Energy Group	Northern States Power-Wisconsin	Nuclear O&M depreciation.
11/11	PUC Docket 39722	TX	Cities Served by AEP Texas Central Company	AEP Texas Central Company	Investment tax credit, excess deferred income taxes; normalization.
02/12	PUC Docket 40020	TX	Cities Served by Oncor	Lone Star Transmission, LLC	Temporary rates.

EXHIBIT ____ (LK-2)

BIG RIVERS ELECTRIC CORPORATION

**APPLICATION OF BIG RIVERS ELECTRIC CORPORATION
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ESTABLISH A REGULATORY ACCOUNT
CASE NO. 2012-00063**

**Response to the Kentucky Industrial Utility Customers'
Second Request for Information
Dated June 22, 2012**

July 6, 2012

1 **Item 22) Refer to the Company's response to AG 1-67.**

- 2
- 3 **a. Please describe how the Company will reflect the**
- 4 **retirement of the Wilson scrubber in the ECR. Address**
- 5 **each of the following components:**
- 6 **i. gross plant,**
- 7 **ii. accumulated depreciation,**
- 8 **iii. net salvage, and**
- 9 **iv. changes in operating costs.**
- 10 **b. Does the Company's estimate of capital expenditures for**
- 11 **the Wilson scrubber include any costs to remove the**
- 12 **existing scrubber? If not, then where are the removal**
- 13 **costs reflected in the Company's financial models used to**
- 14 **evaluate the various scenarios?**
- 15 **c. Please provide the Company's estimate of costs to remove**
- 16 **the existing scrubber.**
- 17 **d. Please describe how the Company plans to track the costs**
- 18 **to remove the existing scrubber to ensure that the costs are**
- 19 **not included in the ECR?**
- 20 **e. Please describe how the Company plans to recover the net**
- 21 **book value and the costs to remove the existing scrubber.**
- 22

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**Response to the Kentucky Industrial Utility Customers'
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July 6, 2012

1 **Response)**

- 2 a. The Company will reflect the retirement of the Wilson scrubber
3 in the ECR as follows:
- 4 i. Only to the extent that the partial retirement of the
5 existing Wilson scrubber causes the (gross) plant-in-
6 service balance for non-ECP long-life environmental
7 assets (Accounts 312 A-K) to fall below the October 31,
8 2010 (test-year-end for PSC Case No. 2011-00036) level,
9 then gross plant will reduce depreciation expense
10 recovered under the ECR. Depreciation expense
11 recovered through the ECR will be decreased by a
12 depreciation adjustment calculated by applying the
13 "Accounts 312 A-K" depreciation rate to the lower of: (x)
14 the reduction in non-ECP plant-in-service below the
15 October 31, 2010 level (resulting from the partial
16 retirement of the existing Wilson scrubber); or (y) the
17 gross plant balance of the existing Wilson scrubber assets
18 being retired included in the October 31, 2010 plant-in-
19 service balance. This approach ensures that the amount
20 of depreciation expense recovered from ratepayers
21 through base rates does not exceed the Commission-
22 approved amount.

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- 1 ii. Accumulated depreciation reoved upon partial retirement
2 of the existing Wilson scrubber will have no effect on the
3 ECR.
4 iii. Net salvage upon partial retirement of the existing
5 Wilson scrubber will have no effect on the ECR.
6 iv. The ECR will only include actual variable operating costs
7 associated with the new scrubber.
8 b. The estimated capital expenditures included in the financial
9 model do not include removal costs or salvage value. The
10 assumption for modeling purposes is that any cost of removal
11 would be offset by salvage value. In addition, the design of the
12 new Wilson scrubber included in the ECP will allow the partial
13 retirement of the existing Wilson scrubber to occur without
14 requiring removal. Other than cash flow, including removal
15 costs or salvage value would have no other effect on the financial
16 model because these expenditures would simply be included in
17 the loss on retirement and recorded in the accumulated
18 depreciation reserve account.
19 c. Big Rivers does not have an estimate of removal costs or salvage
20 value for the partial retirement of the existing Wilson scrubber.
21 d. In the event that the partial retirement of the existing Wilson
22 scrubber is removed along with the installation of the new

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1 Wilson scrubber, Big Rivers would track removal cost and
2 salvage value for that portion of the construction project under
3 separate tasks (subaccounts). If a capital asset is removed when
4 retired, then amounts accumulated under the removal task and
5 the salvage value task are included in the calculation of gain or
6 loss on retirement of the asset and ultimately recorded in the
7 accumulated depreciation reserve account. Accordingly, net
8 salvage, whether positive or negative, will not affect the ECR.

9 e. Big Rivers continues to retire assets that are not fully
10 depreciated, and the partial retirement of the existing Wilson
11 scrubber will be no exception. The loss from these retirements
12 builds in the accumulated depreciation reserve account and in
13 theory will affect Big Rivers' depreciation rates in its next
14 depreciation study. Higher depreciation rates due to a history of
15 retiring capital assets at a loss will be the means by which Big
16 Rivers eventually recovers the cost of the partial retirement of
17 the existing Wilson scrubber.

18
19
20 **Witness) Mark A. Hite**

EXHIBIT ____ (LK-3)

BIG RIVERS ELECTRIC CORPORATION

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**Response to the Office of the Attorney General's
Initial Request for Information
Dated May 21, 2012**

June 1, 2012

1 **Item 22)** *Provide any economically feasibility tests undertaken by the*
2 *company with regard to the ability of the end-user to pay his/her/its bill*
3 *and thus the ability of same to continue to take the projected amount of*
4 *load and not decrease usage thus affecting the overall demand on the*
5 *system.*

6
7 **Response)** Big Rivers did not calculate any potential erosion in usage by end use
8 consumers that might result from the increase in rates stemming from the rate
9 changes in the requested environmental cost recovery mechanism in this
10 proceeding. Price elasticity analyses are not ordinarily undertaken by Applicants
11 in cases where the proposed rate increases are of the magnitude contemplated in
12 this case.

13

14

15 **Witness)** John Wolfram

16

BIG RIVERS ELECTRIC CORPORATION

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**Response to Commission Staff's
Second Request for Information
Dated June 22, 2012**

July 6, 2012

1 **Item 14)** *Refer to Big Rivers' response to Item 22 of the Attorney*
2 *General's Initial Data Request ("AG's First Request"). Big Rivers*
3 *responded "[p]rice elasticity analyses are not ordinarily undertaken by*
4 *Applicants in cases where the proposed rate increases are of the*
5 *magnitude contemplated in this case." Provide a discussion of what level*
6 *of proposed rate increases would prompt Big Rivers to perform price*
7 *elasticity analyses.*

8

9 **Response)** Big Rivers has not performed a study or analysis to determine at
10 what point price elasticity becomes an issue.

11

12

13 **Witness)** John Wolfram

14

EXHIBIT ____ (LK-4)

BIG RIVERS ELECTRIC CORPORATION

**APPLICATION OF BIG RIVERS ELECTRIC CORPORATION
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ESTABLISH A REGULATORY ACCOUNT
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**Response to Commission Staff's
Initial Request for Information
Dated May 21, 2012**

June 1, 2012

1 **Item 18)** *Refer to page 1-4 of the Exhibit DePriest – 2.*

2

3 *a. Describe the “minimal-contracts approach to project*
4 *execution” used in the development of the environmental*
5 *compliance study.*

6 *b. How much would the inclusion of owner’s cost add to the*
7 *estimated cost?*

8

9 **Response)**

10 a. “Minimal-contracts approach to project execution” refers to the
11 process control of engineering, procurement and construction.
12 Under an “EPC (engineer-procure-construct) contract” approach,
13 an Owner enters into a single contract with one company, who is
14 responsible for performing all engineering tasks, purchasing all
15 equipment and material, and performing all construction and
16 startup tasks. This approach is subject to large mark-ups in
17 equipment purchases from OEMs (original equipment
18 manufacturers), thereby increasing overall project costs. Under
19 a “minimal contracts approach,” the Owner enters into contracts
20 with each of the major equipment suppliers, an engineering
21 designer, and a construction contractor. This strategy allows
22 the Owner to perform major engineering design earlier in the

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1 overall process, provides the ability to purchase major
2 equipment directly and eliminate mark-up costs, and provides a
3 firm basis for the construction contract, thereby resulting in the
4 lowest overall cost to the Owner.

5 b. Owner's costs were not specifically included in the Sargent and
6 Lundy cost estimate. However, they are anticipated to be
7 relatively insignificant and are covered by the contingency in the
8 estimate.

9
10
11
12

Witness) William DePriest

EXHIBIT ____ (LK-5)

BIG RIVERS ELECTRIC CORPORATION

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1 **Item 14)** *Refer to page 16 of the DePriest Testimony, lines 16-25.*

2

3 **a.** *Did Sargent & Lundy consider the replacement of the*
4 *electro-static precipitators ("ESP") with a fabric filter?*

5 **b.** *Does Big Rivers have a strategy if the ESP performance is*
6 *inadequate?*

7

8 **Response)**

9 **a.** Yes.

10 **b.** Big Rivers anticipates performing precipitator testing or
11 modeling its ESP's performance in 2013. Should this testing or
12 modeling indicate potential issues not foreseen in the study
13 results, then Big Rivers will consider the ESP upgrades
14 mentioned in the DePriest testimony.

15

16

17 **Witnesses) a.** William DePriest

18 **b.** Robert W. Berry

19

EXHIBIT ____ (LK-6)

BIG RIVERS ELECTRIC CORPORATION

**APPLICATION OF BIG RIVERS ELECTRIC CORPORATION
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**Response to the Kentucky Industrial Utility Customers'
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June 1, 2012

1 **Item 43)** *Please provide a copy of all minutes from the Company's*
2 *Board of Directors meetings since January 2010 through the most recent*
3 *month available. This is a continuing request and the response should be*
4 *supplemented as each additional month is available.*

5

6 **Response)** Big Rivers objects to this request on the grounds that it is overly
7 broad and seeks information that is irrelevant to this proceeding. Without
8 waiving this objection, Big Rivers provides the attached minutes, presentations,
9 and attachments from Big Rivers' Board of Directors meetings from January 2010
10 through May 2012 on the CDs accompanying these responses. Information not
11 relevant to this proceeding has been redacted from the minutes.

12

13

14 **Witness)** Robert W. Berry

15



Environmental Compliance Update

Eric Robeson
January 19, 2012



Recommendations from Sargent & Lundy Study

- Replace FGD at Wilson
- Install SCR at one Green unit
- Upgrade fans at HMPL and install additional FGD recycle pumps
- Install low NOx burners at HMPL and Wilson
- Convert Reid to natural gas



CSAPR Update

- On December 30, the DC Court of Appeals issued a stay regarding CSAPR
- Compliance has been suspended pending resolution of this action
- Probable outcome will be a one year delay in implementation
- Until this is resolved, all utilities must continue to comply with CAIR, which was the air regulation prior to CSAPR
- Big Rivers should be in CAIR compliance with minimal NOx allowance purchases for 2012



MATS Mercury and Air Toxics Standard

- Regulations issued in December
- Emissions rates limits instead of total emissions (allowances)
- 2015 compliance date with 1 year extension likely
- Activated Carbon Injection required at all plants
- Precipitator upgrades with dry sorbent injection possible at all plants
- Subject to litigation as well

CSAPR & MATS Cost Update - Capital

CSAPR CAPITAL EXPENSE ESTIMATES (\$ Millions)					
Project	'12	'13	'14	'15	Total
Wilson FGD	5	30	50	15	100
Green SCR	5	50	20	-	75
HMPL Fan Upgrades	2	6	-	-	8
Reid Conversion	2	-	-	-	2
Total	14	86	70	15	185

MATS CAPITAL EXPENSE ESTIMATES (\$ Millions)					
Station	'12	'13	'14	'15	Total
Coleman	-	-	3.5	10.0	13.5
Wilson	-	-	1.0	4.0	5.0
Green	-	-	1.0	8.0	9.0
HMPL	-	-	-	1.0	1.0
Total	-	-	5.5	23.0	28.5

Overall - CSAPR & MATS CAPITAL EXPENSE (\$ Millions)					
Assumes no additional particulate compliance measures required.					
	'12	'13	'14	'15	Total
Total	14.0	86.0	75.5	38.0	213.5

CSAPR & MATS Cost Update - O&M

CSAPR O&M EXPENSE		
Project	\$(Millions)	Comment
Wilson FGD	0.70	
Green SCR	1.50	additional 4 personnel
HMPL clean Upgrades	0.75	
Reid Conversion	-	
Total	2.95	
MATS O&M EXPENSE		
Activated Carbon Injection and Particulate Monitors		
Station	\$(Millions)	Comment
Coleman	2.55	
Wilson	2.20	
Green	2.40	
HMPL	0.08	
Total	7.23	
OVERALL CSAPR & MATS O&M EXPENSE		
Assume no additional particulate compliance measures required		
Total	10.18	\$(Millions)



Alternatives

- Reduce generation and buy purchased power
- Install SNCR at Coleman and Green Units and replace burners at Coleman
 - Estimated cost of \$28M
- Convert Green Units to Natural Gas
 - Estimated \$25M each vs \$75M SCR each
 - MWH cost goes from \$30 to \$50
 - Complies with future HAPS/MACT and CCR regulations
- Buy NOx Allowances instead of SCR
 - Market needs to develop
 - Cannot exceed 18% variability limit of allowances



Time Line

- April 2012 File Environmental Compliance Plan, CPCN and Revised Environmental Surcharge
- Release A/E to develop RFP's
- October 2012 PSC Approval
- Notice to proceed to vendors
- January 2013 Vendor procurement begins
- July 2013 Construction begins
- January 2015 Wilson FGD in service

Environmental Compliance Update

Eric Robeson

February 21, 2012



Changes since last update

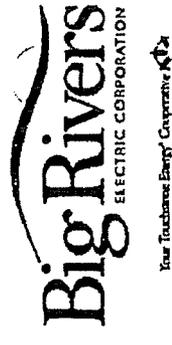
- Bob Berry assumed project lead
- S&L report issued
- Increased cap ex for Willson FGD
- Finalized MATS recommendations
- Evaluated NOx allowance option vs Green SCR
- Gave presentation to HMPL and Smelter Coordinating Committee

Big Rivers
ELECTRIC CORPORATION

Your Trustworthy Energy Corporation 

Internal Team Activities

- Weekly meetings/teleconferences
 - Gantt Chart
 - Financial Evaluation
 - Testimony
 - Environmental Compliance Plan (ECP), Certificate of Public Convenience and Necessity (CPCN) , and Environmental Surcharge (ES) filings



CSAPR Cap Ex and Cash Flow

	2012	2013	2014	2015	2016	Total
Wilson FGD	1.80	27.60	55.00	47.60	7.00	139.00
Green SCR	1.00	20.00	44.00	16.00		81.00
HMP/L FGD	0.30	2.20	3.10	0.70		6.30
Reid Conv	0.05	1.15				1.20
Total	3.15	50.95	102.10	64.30	7.00	227.50

All figures in millions



MATS Cap Ex and Cash Flow

	2012	2013	2014	2015	2016	Total
Wilson		1.20	4.80	5.24		11.24
Coleman		1.20	14.40	12.84		28.44
Green		1.20	8.00	9.28		18.48
HMPL				0.48		0.48
Total		3.60	27.20	27.84		58.64

All figures in millions

Annual O&M Expenses

	2013	2014	2015	2016
CSAPR		0.76	2.23	2.92
MIATS				9.07
Total		0.76	2.23	11.99

All figures in millions

Projected Rate Impacts by Year

2012	0.7%
2013	3.4%
2014	2.5%
2015	2.6%
2016	6.9%



Future Environmental Issues

- NAAQS Update
 - Reduce SO₂ and NO_x allowances by 20%
 - Second SCR at Green Station
 - \$81 M around 2018
- Coal Combustion Residuals
 - Reduce ash ponds
 - SSC: Submerged Scraper Conveyors at all plants
 - \$94 M by 2018
- 316b
 - Install rotating fish screens at Coleman and Sebree
 - \$6 M around 2016

Next Steps

- Financial Modeling Complete February 21
- Notice of Filing to PSC March 3
- Draft Testimony Complete March 3
- CPCN Document Complete March 3
- Final Recommendations to BOD March 16
- Meeting with RUS March 20
- Final Review of Testimony and Exhibits March 23
- File ECP/CPCN/ES April 2



Your. Together. Energy. Creativity.



Your Touchstone Energy® Cooperative

Big Rivers Environmental Surcharge (ES) Rate Formula

February 21, 2012

The ES Rate Formula...

- Environmental Compliance Plan (ECP) Monthly Costs, E(m), equals Return on Investment (ROI), plus Pollution Control Operating Expenses (OE) minus net proceeds from By-Product and Emission Allowance Sales (BAS), plus any (Over)/Under Recovery from the prior period
- $E(m) = ROI + OE - BAS + (Over)/Under Recovery$
- ES Factor = jurisdictional compliance costs divided by Member and Smelter kWh, kW or Adjusted Revenue

Options for ES Cost Allocation

Management Recommendation

- Total Adjusted Revenue = Rural revenue plus Surcredit, Large Industrial revenue plus Surcredit, and Smelter revenue less Smelter contractual premiums (premiums = 25 cents/MWh; Tier Adjustment Charge and Surcharge)

Other Options

- kWh = Rural kWh, Large Industrial kWh, and Smelter Base Monthly Energy kWh
- kWh/kW "Combo" = Variable cost on kWh basis as per above. Fixed cost allocated **entirely** to Members and Smelters – billing demand kW for Rural and LI, and Base Fixed Demand kW for Smelters
- Total kW and Net Adjusted Revenue (Net Adjusted Revenue = Total Adjusted Revenue less Fuel and Non-FAC PPA) based allocations are inappropriate due to significant variable cost and off-system sales

2012 ECP

- Includes Fixed O&M and Capital Costs
 1. Cost of capital components are a) interest, b) a 1.24 TIER thereon, c) depreciation, d) property taxes, and e) property insurance
 2. Is continued allocation of all ES costs on a kWh basis appropriate (as all costs are no longer variable)?

Allocation by kWh?

- Appropriate when the a majority of costs are variable
- 100% of existing plan costs are variable (approx. \$43.3 million in 2016)
- 2012 ECP costs are currently estimated to be 68% fixed and 32% variable (\$27.1 million fixed; \$12.8 million variable) in 2016
- Together, it's estimated that approximately 33% of all ES costs are fixed and 67% are variable
- To the extent costs are fixed, lower load factor consumers benefit with a kWh cost allocation

Calculation of 2012 ECP Cost

	CSAPR	MATS	Total
<u>Capital</u>			
Wilson	139,000,000	11,240,000	150,240,000
HMPL (Net of City)	3,850,000	280,000	4,130,000
Reid	1,200,000		1,200,000
Green	81,000,000	18,480,000	99,480,000
Coleman		28,440,000	28,440,000
	<u>225,050,000</u>	<u>58,440,000</u>	<u>283,490,000</u>
Cost of Capital	9.42%	9.42%	9.42%
Capital Cost	21,199,710	5,505,048	26,704,758
O&M Cost	3,220,000	10,010,000	13,230,000
Total Annual 2012 ECP Cost in 2016	<u>24,419,710</u>	<u>15,515,048</u>	<u>39,934,758</u>



Your Touchstone Energy® Cooperative

Additional Revenue Requirement Under ES Allocation Alternatives

	Total Adj. Revenue	kWh	kWh / kW Combo
Rural	6.6%	5.5%	6.6%
Large Industrial	6.6%	6.6%	7.4%
Smelter	5.5%	5.9%	5.8%
Off-System	6.1%	6.1%	4.2%

Note: This slide depicts the estimated percent rate increase from each rate class resulting from CASPR and MATS. To the extent the off-system increment isn't realized, the non-smelter and smelter rate classes would be required to make up the shortfall.

Management Recommendation

- **Total Adjusted Revenue... Rural revenue plus Surcredit, Large Industrial revenue plus Surcredit, and Smelter revenue less Smelter contractual premiums (premiums = 25 cents/MWh, Tier Adjustment Charge and Surcharge)**

EXHIBIT ____ (LK-7)

BIG RIVERS ELECTRIC CORPORATION

**APPLICATION OF BIG RIVERS ELECTRIC CORPORATION
FOR APPROVAL OF ITS 2012 ENVIRONMENTAL COMPLIANCE PLAN,
FOR APPROVAL OF ITS AMENDED ENVIRONMENTAL COST
RECOVERY SURCHARGE TARIFF, FOR CERTIFICATES OF PUBLIC
CONVENIENCE AND NECESSITY, AND FOR AUTHORITY TO
ESTABLISH A REGULATORY ACCOUNT
CASE NO. 2012-00063**

**Response to the Kentucky Industrial Utility Customers'
Second Request for Information
Dated June 22, 2012**

July 6, 2012

1 **Item 21) Refer to the Company's response to AG 1-46 and the attached**
2 **copy of the January 19, 2012 and February 21, 2012 presentations to the**
3 **Board.**

4

5 **a. Please confirm that the January presentation indicated**
6 **that capital expenditures to comply with CSAPR and**
7 **MATS would total \$213.5 million and the February**
8 **presentation increased the expenditures to \$283.5 million.**

9 **b. Please provide a detailed explanation why the capital**
10 **expenditures reflected in the February BOD presentation,**
11 **and the Application in this proceeding, are significantly**
12 **more than the January 19, 2012 estimate presented to the**
13 **Board. Provide a copy of all quantitative comparisons,**
14 **electronically, that explain the significant increase in**
15 **capital expenditures during the 4 week period between the**
16 **January and February BOD meetings.**

17

18 **Response)**

19 **a. Confirmed.**
20 **b. The capital estimates in the January 2012 board presentation**
21 **represented high level order of magnitude estimates developed**
22 **by Big Rivers personnel to indicate the level of capital**

BIG RIVERS ELECTRIC CORPORATION

**APPLICATION OF BIG RIVERS ELECTRIC CORPORATION
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ESTABLISH A REGULATORY ACCOUNT
CASE NO. 2012-00063**

**Response to the Kentucky Industrial Utility Customers'
Second Request for Information
Dated June 22, 2012**

July 6, 2012

1 expenditures facing Big Rivers in complying with CSAPR and
2 MATS. The capital estimates in the February 2012 board
3 presentation represent the results of the S&L study.

4 The differences are described in the table that follows.
5

Project	Jan (\$M)	Feb (\$M)	Comment on February Estimate
Wilson FGD	100.00	139.00	Included fan and control upgrades and further analysis of SESS budgetary pricing
Green SCR	75.00	81.00	Refined cost from S&L
HMPL FGD	8.00	3.85	Net of HMPL share
Reid Conversion	2.00	1.20	Refined cost from S&L
Coleman MATS	13.50	28.44	Added DSI systems
Wilson MATS	5.00	11.24	Added DSI systems
Green MATS	9.00	18.48	Added DSI systems
HMPL MATS	1.00	0.28	Net of HMPL share

6
7
8 **Witness)** Robert W. Berry
9

EXHIBIT ____ (LK-8)

BIG RIVERS ELECTRIC CORPORATION

**APPLICATION OF BIG RIVERS ELECTRIC CORPORATION
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CASE NO. 2012-00063**

**Response to Commission Staff's
Second Request for Information
Dated June 22, 2012**

July 6, 2012

1 **Item 17) Refer to Big Rivers' response to KIUC's First Request, Item 36,**
2 **and the July 14, 2011 email concerning EPA Proposed Regulations. Big**
3 **Rivers' proposed 2012 Environmental Compliance Plan estimates capital**
4 **expenditures of \$286.14 million. Provide a detailed line item explanation**
5 **for the differences between the capital expenditure estimates for the 2012**
6 **Environmental Compliance Plan and the capital expenditure estimates**
7 **contained in the July 14, 2011 email.**

8

9 **Response)** The July 14, 2011 e-mail was based on an October 28, 2010
10 presentation to the Public Service Commission. It included a high level estimate
11 from Big Rivers' internal staff for compliance with the existing potential EPA
12 regulations CATR, HAPS MACT, CCR and §316a & b. At the time of these
13 estimates the proposed regulations were not in their final form.

14 The estimates in Big Rivers' 2012 Environmental Compliance Plan
15 were based on the CSAPR and MATS regulations that had been issued in final
16 version, and did not include any costs for future regulations. In addition, the cost
17 estimates contained in the instant filing were prepared by an experienced
18 engineering firm with significant expertise in developing capital cost estimates.

19 Detailed line-item explanations for the differences are shown in the
20 table on the following page.

21

22

BIG RIVERS ELECTRIC CORPORATION

**APPLICATION OF BIG RIVERS ELECTRIC CORPORATION
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**Response to Commission Staff's
Second Request for Information
Dated June 22, 2012**

July 6, 2012

1

Explanation of Differences (All Dollars in Millions)			
	Big Rivers ECP Filing	July 14, 2011 E-mail	Explanation
CATR		\$138.0	\$30M to convert Green 1 and 2 to natural gas; \$108M to add SCR at Green 1 and 2; No FGD retrofit at Wilson
CSAPR	\$225.0		
HAPS/ MACT		\$410.0	\$338M-\$846M range (\$200 - \$500/kW); Includes baghouses on all units; Includes precipitator upgrades at all units
MATS	\$58.0		
CCR	0.0	\$237.0	Landfill \$152M; Dry bottom ash \$55M; Dry fly ash \$30M
§316a & b	0.0	\$55.0	Cooling tower at Coleman
GHG	0.0	0.0	
Total	\$283.0	\$840.0	

2

3

4

Witness) Robert W. Berry

5

EXHIBIT ____ (LK-9)

BIG RIVERS ELECTRIC CORPORATION

**APPLICATION OF BIG RIVERS ELECTRIC CORPORATION
FOR APPROVAL OF ITS 2012 ENVIRONMENTAL COMPLIANCE PLAN,
FOR APPROVAL OF ITS AMENDED ENVIRONMENTAL COST
RECOVERY SURCHARGE TARIFF, FOR CERTIFICATES OF PUBLIC
CONVENIENCE AND NECESSITY, AND FOR AUTHORITY TO
ESTABLISH A REGULATORY ACCOUNT
CASE NO. 2012-00063**

**Response to Commission Staff's
Initial Request for Information
Dated May 21, 2012**

June 1, 2012

1 **Item 9)** *Refer to page 28 of the Berry Testimony at lines 19-20 in which*
2 *it is noted that although the Sargent & Lundy study included*
3 *consideration of the U.S. Environmental Protection Agency's ("EPA")*
4 *proposed regulation concerning coal combustion residuals and the EPA's*
5 *rules relating to impingement mortality and entrainment under Section*
6 *316(b) of the Clean Water Act, Big Rivers did not include the potential*
7 *costs of compliance with these rules in analyzing the cost effectiveness of*
8 *the alternatives considered for inclusion in its 2012 Plan.*

- 9
- 10 **a.** *What impact would compliance with these potential*
11 *regulations have on the operations of the affected plants?*
12 **b.** *How would compliance with these regulations affect the*
13 *economic feasibility of Big Rivers' 2012 Plan?*
14

15 **Response)**

- 16 **a.** Neither the Coal Combustion Residuals ("CCR") regulation nor
17 the Section 316(b) rule is final, and EPA has requested
18 comment on regulatory alternatives it is considering. The
19 alternatives being considered under each rule are significantly
20 different, so determining compliance costs would be speculative
21 at this time. Big Rivers has accordingly not determined what

BIG RIVERS ELECTRIC CORPORATION

**APPLICATION OF BIG RIVERS ELECTRIC CORPORATION
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RECOVERY SURCHARGE TARIFF, FOR CERTIFICATES OF PUBLIC
CONVENIENCE AND NECESSITY, AND FOR AUTHORITY TO
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CASE NO. 2012-00063**

**Response to Commission Staff's
Initial Request for Information
Dated May 21, 2012**

June 1, 2012

1 effect these potential regulations would have on the operations
2 of the affected plants.
3 b. As shown in Tables 6-6 and 6-7 of DePriest Exhibit-2, S&L
4 projected that compliance with these two regulations may cost
5 Big Rivers \$122.74 million in capital, \$1.12 million annually in
6 incremental fixed O&M, and approximately \$2.50/ton in
7 variable O&M depending on available landfill options. However,
8 due to the uncertainty of what the final rules may require, Big
9 Rivers did not include these costs in its financial models. Big
10 Rivers will continue to monitor these pending regulations and
11 will fully incorporate the requirements into its compliance
12 planning when the certainty around such requirements
13 increases.

14
15 **Witness)** Robert W. Berry

16

BOEHM, KURTZ & LOWRY

ATTORNEYS AT LAW
36 EAST SEVENTH STREET
SUITE 1510
CINCINNATI, OHIO 45202
TELEPHONE (513) 421-2255
TELECOPIER (513) 421-2764

Via Overnight Mail

June 22, 2012

Mr. Jeff Derouen, Executive Director
Kentucky Public Service Commission
211 Sower Boulevard
Frankfort, Kentucky 40602

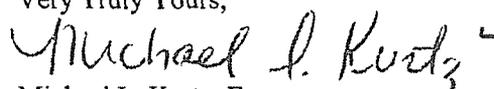
Re: Case No. 2012-00063

Dear Mr. Derouen:

Please find enclosed the original and ten (10) copies of KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.'s SUPPLEMENTAL SET OF DATA REQUESTS TO BIG RIVERS ELECTRIC CORPORATION for filing in the above-referenced matter.

By copy of this letter, all parties listed on the Certificate of Service have been served. Please place these documents of file.

Very Truly Yours,



Michael L. Kurtz, Esq.

Kurt J. Boehm, Esq.

BOEHM, KURTZ & LOWRY

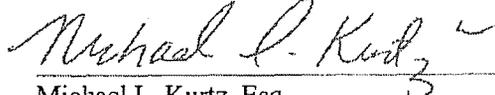
MLKkew

Attachment

cc: Certificate of Service
Quang Nyugen, Esq.
Faith Burns, Esq.
Larry Cook, Esq.
Matt James, Esq.
David C. Brown, Esq.

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing was served by electronic mail (when available) and by mailing a true and correct copy by regular, U.S. Mail, unless other noted, this 22ND day of June, 2012 to the following



Michael L. Kurtz, Esq.
Kurt J. Boehm, Esq.

JENNIFER B HANS, ESQ.
DENNIS G. HOWARD, II. ESQ.
LAWRENCE W. COOK, ESQ.
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SAN FRANCISCO, CA 94105

**COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION**

IN THE MATTER OF:

APPLICATION OF BIG RIVERS ELECTRIC	)	CASE NO. 2012-00063
CORPORATION FOR APPROVAL OF ITS)	
2012 ENVIRONMENTAL COMPLIANCE)	
PLAN, FOR APPROVAL OF ITS AMENDED)	
ENVIRONMENTAL COST RECOVERY)	
SURCHARGE TARIFF, FOR CERTIFICATES)	
OF PUBLIC CONVENIENCE AND)	
NECESSITY, AND FOR AUTHORITY TO)	
ESTABLISH A REGULATORY ACCOUNT)	

**KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.'s
SUPPLEMENTAL SET OF DATA REQUESTS TO
BIG RIVERS ELECTRIC CORPORATION**

Dated: June 22, 2012

DEFINITIONS

1. "Document(s)" is used in its customary broad sense and includes electronic mail and all written, typed, printed, electronic, computerized, recorded or graphic statements, memoranda, reports, communications or other matter, however produced or reproduced, and whether or not now in existence, or in your possession.
2. "Study" means any written, recorded, transcribed, taped, filmed, or graphic matter, however produced or reproduced, either formally or informally, a particular issue or situation, in whatever detail, whether or not the consideration of the issue or situation is in a preliminary stage, and whether or not the consideration was discontinued prior to completion whether preliminary or final, and whether or not referred to in Big Rivers' direct testimony.
3. If any document requested herein was at one time in existence, but has been lost, discarded or destroyed, identify such document as completely as possible, including the type of document, its date, the date or approximate date it was lost, discarded or destroyed, the identity of the person (s) who last had possession of the document and the identity of all persons having knowledge of the contents thereof.
4. "Person" means any natural person, corporation, professional corporation, partnership, association, joint venture, proprietorship, firm, or the other business enterprise or legal entity.
5. A request to identify a natural person means to state his or her full name and residence address, his or her present last known position and business affiliation at the time in question.
6. A request to identify a document means to state the date or dates, author or originator, subject matter, all addressees and recipients, type of document (e.g., letter, memorandum, telegram, chart, etc.), number of code number thereof or other means of identifying it, and its present location and custodian. If any such document was, but is no longer in the Company's possession or subject to its control, state what disposition was made of it.
7. A request to identify a person other than a natural person means to state its full name, the address of its principal office, and the type of entity.
8. "And" and "or" should be considered to be both conjunctive and disjunctive, unless specifically stated otherwise.
9. "Each" and "any" should be considered to be both singular and plural, unless specifically stated otherwise.
10. Words in the past tense should be considered to include the present, and words in the present tense include the past, unless specifically stated otherwise.
11. "You" or "your" means the person whose filed testimony is the subject of these interrogatories and, to the extent relevant and necessary to provide full and complete answers to any request, "you" or "your" may be deemed to include any person with information relevant to any interrogatory who is or was employed by or otherwise associated with the witness or who assisted, in any way, in the preparation of the witness' testimony.
12. "BREC" means Big Rivers Electric Corporation and/or any of their officers, directors, employees, or agents who may have knowledge of the particular matter addressed.

INSTRUCTIONS

1. If any matter is evidenced by, referenced to, reflected by, represented by, or recorded in any document, please identify and produce for discovery and inspection each such document.
2. These interrogatories are continuing in nature, and information which the responding party later becomes aware of, or has access to, and which is responsive to any request is to be made available to Kentucky Industrial Utility Customers. Any studies, documents, or other subject matter not yet completed that will be relied upon during the course of this case should be so identified and provided as soon as they are completed. The Respondent is obliged to change, supplement and correct all answers to interrogatories to conform to available information, including such information as it first becomes available to the Respondent after the answers hereto are served.
3. Unless otherwise expressly provided, each interrogatory should be construed independently and not with reference to any other interrogatory herein for purpose of limitation.
4. The answers provided should first restate the question asked and also identify the person(s) supplying the information.
5. Please answer each designated part of each information request separately. If you do not have complete information with respect to any interrogatory, so state and give as much information as you do have with respect to the matter inquired about, and identify each person whom you believe may have additional information with respect thereto.
6. In the case of multiple witnesses, each interrogatory should be considered to apply to each witness who will testify to the information requested. Where copies of testimony, transcripts or depositions are requested, each witness should respond individually to the information request.
7. The interrogatories are to be answered under oath by the witness(es) responsible for the answer.
8. Responses to requests for revenue, expense and rate base data should provide data on the basis of Total Company as well as Intrastate data, unless otherwise requested.

**SUPPLEMENTAL SET OF DATA REQUESTS OF
KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.
BIG RIVERS ELECTRIC CORPORATION
Case No. 2012-00063**

- Q2.1 With respect to Big Rivers' current arbitration with HMPL, please provide the following:
- a. The current status of the arbitration proceedings or appeals;
 - b. A copy of the arbitration award or opinion;
 - c. The short and long term financial impact of this decision on Big Rivers;
 - d. What is the projected impact on the arbitration award or opinion on Big Rivers' margins in 2012-15?
 - e. What is the effect of this decision on any of the models that support Big Rivers' Application in this case?
- Q2.2 With respect to the dam repair work that will permit full resumption of energy purchases from SEPA, please provide the following:
- a. the current status of the repair work;
 - b. When does Big Rivers expect to receive its full allocation of energy from SEPA?
 - c. Has Big Rivers included the full availability and price of SEPA energy in its modeling for this Application? Please explain. If not, why not?
- Q2.3 Please provide all documents and other communications provided to Cobank and CFC since the filing of Big Rivers' responses to KIUC's Initial Request for Information. Please note this is a continuing request requiring updated information.
- Q2.4 Please describe Big Rivers' current plans for the proposed bridge financing and later permanent financing of the construction projects proposed in this Application, including anticipated terms and conditions.
- Q2.5 When does Big Rivers plan to release and file its 2011 Annual Report? Please provide a copy when available.
- Q2.6 Please reference the Direct Testimony of Mark Hite, page 7, lines 20-22, which states that Big Rivers acquired forward pricing data (hourly energy prices, monthly coal prices, monthly natural gas prices and monthly allowance prices) from PACE Global which data were used by ACES in running the production cost model. Please also reference Big Rivers' Response to Item 32 of KIUC's Initial Request for information which states that Big Rivers relied on ACES and PACE Global for input assumptions surrounding commodity prices including emission allowances, fuel and wholesale energy market pricing. Please provide in narrative form and without reference to previously filed data disks an explanation whether the ACES production cost model used only

PACE Global assumptions or a combination of PACE Global and other projections with respect to the following forward pricing:

- a. wholesale energy prices;
- b. fuel prices;
- c. emission allowances,
- d. natural gas prices.

In your response, please provide by month, day or hour, the specific ACES data or data from any other non-PACE Global source actually used in the production cost model in a manner than can be compared with the PACE global data not used.

Q2.7 Refer to the Company's response to KIUC 1-2(d). Please provide an electronic version of the exhibit attached to the response with cell formulas intact.

Q2.8 Refer to the Company's response to AG 1-47(a) and the statement that "The financial analysis was performed by Big Rivers with input from ACES Power marketing and PACE Global."

- a. Please describe each step of the financial analysis and the role and activities performed by ACES, PACE, and Big Rivers, respectively.
- b. Please identify each person, the person's employer, and the specific responsibilities of each person in each step of the financial analysis described in response to part (a) of this question.

Q2.9 Refer to the Company's response to AG 1-47(c) and the statement that "ACES Power Marketing provided the planning models for these [sensitivity] scenarios" used to assess the "economic impact of two compliance options with regard to a loss in Smelter load" described by Mr. Berry in his Direct Testimony at 15.

- a. Please identify the "planning models" provided to Big Rivers by ACES for this purpose.
- b. Please distinguish between the "planning models" provided to Big Rivers by ACES for this purpose and the Big Rivers model that was used for this purpose and described by Mr. Hite in his Direct Testimony at 7 as follow: "Big Rivers developed a financial model to determine the net present value of revenue requirements ("NPVRR") over the 2012 - 2026 (15-year) study period."

Q2.10 Does Mr. Hite personally possess the expertise and knowledge to run the Ventyx PAR model used by ACES Power Marketing?

- a. If so, then: i) describe his expertise and knowledge, ii) specifically describe his experience in production cost modeling in general and the PAR model in particular, and iii) his personal involvement in running the Ventyx PAR model to quantify the production costs and any other amounts used in the "financial analysis" and/or in the "financial model" to assess the scenarios and sensitivity studies in this proceeding.

- b. If not, then please identify the witness supporting the production cost modeling and the quantification of the production costs used in the “financial analysis” and/or in the “financial model” to assess the scenarios and sensitivity studies in this proceeding. If there is no such witness, then please so state.

Q2.11 Refer to the Company’s response to PSC 1-1.

- a. Please provide the support for the estimates for each vendor, including, but not limited to, all workpapers, engagement letters, purchase orders, and correspondence (internal and external) and describe how the Company developed the estimates from these source documents. In addition, please identify the person(s) who developed these estimates and provide their name(s), company affiliation, and position (title).
- b. Please provide a copy of the service agreement with APM and any special agreements related specifically to the Company’s ECR application in this proceeding.
- c. Does the service agreement with APM allow APM to bill Big Rivers for work that it performs for Big Rivers?

Q2.12 Refer to the Company’s response to PSC 1-7. Please update this response for the current status of the Station 2 review being conducted by HMP&L. Identify the approvals, if any, that HMP&L needs to provide in order for Big Rivers to proceed and describe the status and future timing of each such approval.

Q2.13 Refer to the Company’s response to PSC 1-9 and the potential effects of compliance with the EPA regulation on coal combustion residuals and EPA rules relating to impingement mortality and entrainment.

- a. Please address whether, and if so, the manner in which, the Company could comply with these rules through constrained operation of its generating units. Please provide a copy of and a narrative description of all analyses that the Company or outside advisors on behalf of the Company have performed.
- b. If constrained operation is a viable compliance option, then please provide a sensitivity study against the base case and against the Partial Build scenario to quantify the effects of this option.

Q2.14 Refer to the Company’s response to PSC 1-22 and the conclusion that “It is believed that EPA will likely overcome challenges to the rule and will ultimately prevail.”

- a. Please provide a copy of all analyses and all supporting documents relied on for this conclusion.
- b. What is the likely effective compliance date if EPA overcomes the challenges? Please provide a copy of all analyses and all supporting documents relied on for your response.

Q2.15 Refer to the Company’s response to PSC 1-24 and the conclusion that “Big Rivers found it unnecessary to make assumptions about Smelter rates well beyond the 2023 time horizon because longer periods of time would only serve to improve the “Build Case.”

- a. Please describe in more detail why the Company believes that this conclusion is correct. In your response, address the fact that the NPV of the revenue requirements associated with the Build Case after the 15 years would increase the cost of the Build Case, not reduce it.
- b. Please provide a copy of all quantitative analyses that supports this conclusion.

Q2.16 Refer to the Company's response to PSC 1-26 and the statement that the sensitivity where the Company loses the load of one smelter, "the remaining smelter is assumed in the model to shoulder its proportionate share of the cost increase associated with the departure of the other smelter."

- a. Please explain the basis for this assumption and provide a copy of all documents relied for the assumption or used to test the validity of this assumption.
- b. Please confirm that in base rate proceedings, the Commission uses the off-system sales margins as a reduction to the revenue requirement. If the Company cannot confirm this statement, then please describe how the Company believes that the Commission uses the off-system sales margins in the revenue requirement. Please cite to and provide copies of all source documents relied on for your response.
- c. Please identify where this assumption is reflected in the sensitivity where the Company loses the load of one smelter.

Q2.17 Refer to the Company's response to AG 1-21. Please update this response with the current status of the engineering and design process. Be specific.

Q2.18 Please describe in detail how the Company's accounting for its fuel and purchased power costs changed after it joined MISO to reflect the fact that the Company bids all of its resources and load into MISO, if at all. In addition, please describe in detail the related effects on the costs included in its revenue requirement, including clause recoveries.

Q2.19 Please refer to the market prices shown on line 8 on the Risk spreadsheet in the Excel workbooks provided in response to KIUC's Motion to Dismiss for each of the scenarios.

- a. Provide the source(s) of these market prices and all analyses used to develop these prices, including all input sources, adjustments, assumptions, and electronic spreadsheets with formulas intact, including, but not limited to, the conversion of hourly or other data into the average annual rates reflected in this spreadsheet. Describe each step in the analytical process that led to the use of these specific market prices and make sure that each step is documented with all input, computations, and output files.
- b. Please provide a narrative description of these market prices, i.e., what do they represent, e.g., MISO energy prices averaged across all hours.
- c. Please confirm that the market prices include capacity costs. Describe how the changes in the MISO capacity auction process have been reflected in the market prices, if at all. If the changes have not been reflected in the market prices, then please provide a description of how these changes will be reflected in future market prices.

Q2.20 Refer to the Company's response to KIUC 1-17, which included a confidential chart labeled Forward Power Price Comparison. The chart compared the forward power prices obtained from Pace, APM, and IHS.

- a. Please describe how this comparison was used and by whom to develop the market prices shown on line 8 on the Risk spreadsheet in the Excel workbooks provided in response to KIUC's Motion to Dismiss for each of the scenarios, if at all.
- b. Please provide the data reflected on this chart in an electronic spreadsheet and provide all source documents used to obtain the data shown on this chart, including, but not limited to, all spreadsheets used to average projected hourly prices.
- c. Please provide another version of this chart that includes the market prices that were used for each of the Company's scenarios.

Q2.21 Refer to the Company's response to AG 1-46 and the attached copy of the January 19, 2012 and February 21, 2012 presentations to the Board.

- a. Please confirm that the January presentation indicated that capital expenditures to comply with CSAPR and MATS would total \$213.5 million and the February presentation increased the expenditures to \$283.5 million.
- b. Please provide a detailed explanation why the capital expenditures reflected in the February BOD presentation, and the Application in this proceeding, are significantly more than the January 19, 2012 estimate presented to the Board. Provide a copy of all quantitative comparisons, electronically, that explain the significant increase in capital expenditures during the 4 week period between the January and February BOD meetings.

Q2.22 Refer to the Company's response to AG 1-67.

- a. Please describe how the Company will reflect the retirement of the Wilson scrubber in the ECR. Address each of the following components: i) gross plant, ii) accumulated depreciation, iii) net salvage, iv) changes in operating costs.
- b. Does the Company's estimate of capital expenditures for the Wilson scrubber include any costs to remove the existing scrubber? If not, then where are the removal costs reflected in the Company's financial models used to evaluate the various scenarios?
- c. Please provide the Company's estimate of costs to remove the existing scrubber.
- d. Please describe how the Company plans to track the costs to remove the existing scrubber to ensure that the costs are not included in the ECR?
- e. Please describe how the Company plans to recover the net book value and the costs to remove the existing scrubber.

Q2.23 Refer to the Company's response to AG 1-70. Please confirm that the Company's capital expenditure estimate in this proceeding is net of HMP&L's share of the costs to retrofit HMP&L

Units 1 & 2. Please describe where the Company has reflected this reduction in the Excel financial models of each of the scenarios.

Q2.24 Refer to the last paragraph of the Company's response to KIUC 1-33, which states that "it was obvious that there were some significant differences between the two projections."

- a. Please provide a detailed description of the concern and why the Big Rivers believed it was necessary to acquire a third set of forward power prices from IHS Global.
- b. Please describe each of the steps taken by Big Rivers and/or its advisors to address the "significant differences" between the two projections.
- c. Please describe the resolution of this review and how this was reflected in the scenarios presented in this proceeding.
- d. Please identify, describe, and provide a copy of each sensitivity study using the APM or HIS forward price curves. Provide all supporting input files and output reports as well as the CFM workbooks. In addition, please describe what attempts were made to ensure that the forward power prices and natural gas prices used in each sensitivity were consistent and provide a copy of all documentation that addresses the consistency of these assumptions.

Q2.25 With regard to Big Rivers' response to AG 1-46, please provide all analyses, including electronic spreadsheets with formulas intact and supporting workpapers, included in the February 21, 2012 "Big Rivers Environmental Surcharge (ES) Rate Formula" presentation to the Big Rivers' Board and the "Environmental Surcharge (ES) Update – Rate Formula" presentation of March 16, 2012.

Q2.26 Regarding data found in the file - PACE_Big Rivers Data Request Inputs_120524.xlsx

- a. Is it correct, that this is one of just two files that PACE developed and was produced based on a KIUC request (the other being PACE_Big Rivers Data Request Outputs_120524.xlsx)?
- b. The file contains natural gas prices, coal prices, load forecast, CO2 costs, and Capital Cost Recovery Target Inputs for New Regional Expansion units. For all of these categories of data, PACE supplied 200 sets of data (200 iterations). Please provide a detailed explanation of the process, methodology, and assumptions used by PACE in creating the 200 iterations worth of data for each of these categories of data. Be sure to explain what was done to create this large number of iterations.
- c. How has the 200 iterations of data factored into any analyses that were discussed in any of Big Rivers' witnesses testimony?
- d. Please provide the revenue requirements model that led to the calculation of the Capital Cost Recovery Target Inputs for New Regional Expansion for each resource CC, CT and Wind.
- e. Why did PACE supply coal prices for only the Illinois Basin region, when its market price analysis clearly must have included a forecast of coal prices in other regions?

Q2.27 Regarding the Reference data found in the file - PACE__Big Rivers Data Request Inputs_120524.xlsx

- a. Please provide documentation describing the process, methodology and assumptions used by PACE in developing the Reference natural gas price inputs that were then used by ACES in its modeling that led to the results filed in any Big Rivers witness' testimony.
- b. Provide the same information for the Reference Illinois Basin coal prices.
- c. Provide the same information for the Reference Capital Cost Recovery Target inputs.
- d. Provide the same information for the Reference CO2 prices. Also, please confirm that these CO2 inputs were not used in any analysis that ACES performed to develop results that were included in its modeling that led to the results filed in any Big Rivers witness' testimony.

Q2.28 Regarding data found in the file - PACE__Big Rivers Data Request Outputs_120524.xlsx.

- a. What are the hours included in the on-peak and off-peak periods for each month?
- b. In the worktab Output Stochastic Energy Prices, there are 200 iterations worth of annual average on-peak, off-peak and all hours market price data for each year between 2012 and 2030. Please provide a detailed explanation of the process, methodology, and assumptions used by PACE in creating the 200 iterations worth of data. Be sure to explain what was done to create this large number of iterations.
- c. How has the 200 iterations of market price data factored into any analyses that were discussed in any of Big Rivers' witnesses testimony?
- d. In that same worktab there is no reference case market price data. Is that because the data found in the Output Hourly Energy Prices worktab is the reference case? Please explain.
- e. Why weren't emissions allowance prices included in the files that PACE supplied?

Q2.29 Please provide documentation describing the process, methodology and assumptions and all worksheets developed in constructing the data assumptions (e.g. natural gas price forecasts, environmental cost assumptions, etc.) used by ACES in developing any sensitivity cases that it performed. In doing, please describe all sensitivity cases performed by ACES.

Q2.30 In the 20 scenarios that ACES supplied, only 5 included an Assumptions folder. Please explain why 15 scenarios did not contain that folder, and if this was an oversight, please provide the missing folders.

Q2.31 Was it the case that Big Rivers did not develop financial analyses/NPV analyses of all of the 20 cases that ACES performed? If not, why not, and if so please explain why Big Rivers has not supplied that information. If corporate financial analyses were developed for the sensitivity cases, please supply those, electronically, and in the same format as has been provided for the other financial models that the Company has supplied.

Q2.32 If any additional cases have been performed by PACE/ACES/Big Rivers to date, that have not already been provided, please provide:

- a. A narrative description of the case.

- b. Explain why the Company or its consultant has decided to continue developing new cases.
 - c. Provide all spreadsheets, workpapers, analyses, production cost model input databases in native database format (fully populated database), output results, etc, to the same extent that the Company has supplied for previous cases it has provided.
- Q2.33 In the base case folder that ACES supplied containing Assumptions, there is a file containing what appears to be generic assumptions, List.xls. Please explain the purpose of the data included in the file. For example, that data includes startup data, forced outages, scheduled outages, etc, but no indication of any unit that the data applies to.
- Q2.34 Two files were supplied in the ACES folder related to the Base Case Assumptions, MidOffice Emission Curve 1-30-2012.xlsx and PCM (1-18-12) nominal.xlsx. Please explain in detail what was the information found in each of the files was used for in ACES analyses.
- Q2.35 Regarding the files, Load Shape Data.xlsx and Price Shape Data.xlsx, please explain how they were created and what they were used for. If they were used in the analysis that ACES performed, please supply any other workpapers, electronically, used in the creation of the files.
- Q2.36 Refer to the response to KIUC-1-14. Please supply all workpapers that contains S&L's derivation of upgrade costs used in this study. Mr. DePriest indicates that costs were derived from other sources, and this request is that the input assumptions and calculations be provided electronically with all formulas included. If the workpapers have been supplied, please provide a map between where the upgrade costs have been developed and have been input into corporate financial model net present value analysis.
- Q2.37 Refer to the response to KIUC-1-24. Has the excel spreadsheet referred to in Mr. Miller's May 18, 2012 email been supplied. If so please state the name and where it may be found, if not, please supply the spreadsheet any referenced spreadsheets in excel format, with all formulas active.
- Q2.38 Refer to the response to KIUC-1-25.
- a. Please explain in additional detail why the ACES model (Planning Model) does a better job reflecting market interaction between dispatching generating units versus buying power from the market?
 - b. What did ACES mean by "creating a least cost solution". Does that mean least cost in the sense of creating an expansion plan, or a least cost dispatch/commitment process which interacts with a market price profile?
 - c. The response indicates that the ACES model has the ability to run to show risks in cost-to-serve. What that capability used in any analyses presented in testimony in this case. If so, please explain how, and if not please explain why not.
- Q2.39 Refer to the response to KIUC-1-32. Was any analysis performed by Big Rivers or any of its consultants to determine whether the production cost results produced in the current studies were consistent with results developed in the most recent IRP published in 2010? If not, please explain why not, if so, please discuss the findings of that review, and supply any written documentation of that process or consideration of that process.
- Q2.40 Refer to the response to KIUC-1-33.

- a. What did Big Rivers mean when it said "analyses of the same size and scope"?
- b. Is that the explanation why it was reasonable for PACE to have included CO2 costs in its analysis while ACES did not include CO2 costs in its analysis?

Q2.41 In the work that PACE performed,

- a. Please provide a detailed explanation of how coal retirements were determined in the MISO market, and please supply any workpapers or documents of any type that were developed analyzing the coal retirement issue in MISO.
- b. Please explain how environmental regulations were incorporated in the analysis PACE performed, and supply any workpapers or documents of any type that were developed analyzing the environmental regulations, and how those regulations should be incorporated in the modeling that PACE performed.
- c. Please discuss the findings of how coal retirements and environmental regulations factored into the analysis that PACE conducted, and how those impacted the market price results that PACE produced.

Q2.42 In the work that ACES performed developing market price forecasts,

- a. Please provide a detailed explanation of how coal retirements were determined in the MISO market, and please supply any workpapers or documents of any type that were developed analyzing the coal retirement issue in MISO.
- b. As it relates to the market price forecasts that ACES created for any purpose associated with this study, please explain how environmental regulations were incorporated in the analysis, and supply any workpapers or documents of any type that were developed analyzing the environmental regulations, and how those regulations should be incorporated in the modeling that ACES performed.
- c. As it relates to the market price forecasts that ACES created for any purpose associated with this study, please discuss the findings of how coal retirements and environmental regulations factored into the analysis that ACES conducted, and how those impacted the market price results that ACES produced.

Q2.43 Refer to KIUC-1-34. Was anything other than nominal energy market prices from PACE Global used in the analysis that was presented in Mr. Hite's testimony. If so please explain how it was used, if not why not?

Q2.44 In its June 1, 2012 filing of confidential material, Big Rivers filed a draft document entitled "Load Concentration Analysis and Mitigation Plan" dated May 2012 ("Draft Mitigation Plan"). In connection with the Draft Mitigation Plan, please respond to the following:

- a. Who or what group within Big Rivers prepared or participated in the preparation of the Draft Mitigation Plan? Please state the names of those persons.
- b. Why is the Draft Mitigation Plan in draft form? Has the Draft Mitigation Plan been reviewed or approved by the Big Rivers Board of Directors? When does Big Rivers expect to finalize the Draft Mitigation Plan?
- c. Please provide all prior drafts of the Draft Mitigation Plan.

- d. When did work begin on the Draft Mitigation Plan and when was the current draft completed?
- e. Did Big Rivers engage any consultant(s) to assist in preparation of the Draft Mitigation Plan?
- f. Have any consultants reviewed the Draft Mitigation Plan or given input to Big Rivers? If so, please identify all consultants.
- g. Please provide all internal emails regarding preparation of the Draft Mitigation Plan since January 1, 2012.
- h. Please provide all documents and communications between Big Rivers and third parties regarding preparation of the Draft Mitigation Plan since January 1, 2012.
- i. To whom or to what third party has the Draft Mitigation Plan been circulated outside Big Rivers (other than to the Commission and Intervenors in this docket)?

- Q2.45 On Page 4, Paragraph 3, the Draft Mitigation Plan states that Big Rivers used both the PACE Global price curve and a more conservative ACES forward price curve in its preparation. Please state whether both the PACE Global price curve and a more conservative ACES forward price curve were also used in the production cost modeling prepared by ACES and later included in the Big Rivers financial model? If the answer is Yes, please explain how this was done and provide which hourly data were used for the period of the modeling study. If the answer is No, please explain why Big Rivers chose to use only one price curve in the modeling and multiple price curves in preparing the Draft Mitigation Plan.
- Q2.46 On Page 8, Paragraph 3, the Draft Mitigation Plan states that benchmarking data indicates Big Rivers' generation costs currently rank better than more than half of similar utilities. Please provide all data and documents supporting and demonstrating that statement. In your answer please include the names of all utilities in this statement, identifying those utilities that are "similar."
- Q2.47 On Page 8, following Paragraph 3, the Draft Mitigation Plan contains five bullets, the first indicating that to reduce market risks, Big Rivers will evaluate the option of executing forward bilateral sales with counterparties and wholesale sales agreements. Please provide the names of all perspective counterparties which Big Rivers has contacted regarding bilateral sales or wholesale sales agreements and the status of those discussions. Please state whether Big Rivers has entered into a confidentiality agreement with any such perspective counterparties. If so, please identify the counterparty and the status of those discussions.
- Q2.48 On Page 9, first literary paragraph, the Draft Mitigation Report indicates long-term approaches will include executing long-term wholesale agreements.
- a. Please state whether Big Rivers has commenced any such investigations and, if so, state the identity of those counterparties.
 - b. Please describe all steps taken to date in pursuance of this approach.
- Q2.49 On Page 9, first literary paragraph, the Draft Mitigation Report indicates long-term approaches will include existing load expansion.

- a. Please state whether Big Rivers has commenced any such investigations and, if so, state the identity of those parties.
 - b. Please describe all steps taken to date in pursuance of this approach.
- Q2.50 On Page 9, first literary paragraph, the draft Mitigation Report indicates long-term approaches will include load expansion by increasing the existing industrial load and by attracting new industries.
- a. Please state whether Big Rivers has commenced any such investigations and, if so, state the identity of those parties.
 - b. Please describe all steps taken to date in pursuance of this approach.
- Q2.51 On Page 9, first literary paragraph, the draft Mitigation Report indicates long-term approaches will include load expansion by attracting new Members.
- a. Please state whether Big Rivers has commenced any such investigations and, if so, state the identity of those parties.
 - b. Please describe all steps taken to date in pursuance of this approach.
 - c. Please state your understanding of the notice period in the contracts between TVA and the five Kentucky cooperatives in Kentucky being served by TVA.
- Q2.52 On Page 10, Final Paragraph, the Draft Mitigation Plan discusses the additional option of laying-up individual generating units or entire generating stations. Scenarios 3, 4, 6 and 7 include this option.
- a. Please describe the extent to which Big Rivers has investigated this option.
 - b. Please provide copies of all studies and documents prepared in connection with same.
- Q2.53 On Page 11, First Paragraph, the Draft Mitigation Plan discusses the additional option of liquidating generating stations.
- a. Please describe the extent to which Big Rivers has investigated this option.
 - b. Please provide copies of all studies and documents prepared in connection with same.
- Q2.54 On Page 10, Final Paragraph, the Draft Mitigation Plan discusses the additional option of a (i) merger with another G&T cooperative, (ii) acquisition of Big Rivers by another G&T cooperative or (iii) acquisition of Big Rivers by an Investor-Owned Utility.
- a. Please describe the extent to which Big Rivers has investigated this option and provide copies of all studies and documents prepared in connection with same.
 - b. If Big Rivers would consider the three options listed above after smelter closure, would Big Rivers consider investigating either of those options before smelter closure to determine if such options would prevent smelter closure and be beneficial to Big Rivers, the smelters and save the Western Kentucky jobs. If your answer is No, please explain fully.

- Q2.55 Refer to page 8 of the Load Concentration Analysis and Mitigation Plan, which states, "Benchmarking data indicates Big River's generation costs currently rank better than more than half of similar unit's costs, thus Big Rivers should be able to market a significant amount of its excess power."
- a. Please supply the benchmarking data and any analysis performed or reports written associated with that data.
 - b. What parties has Big Rivers entered into discussions with concerning marketing its excess power, and what discussions were held? Please supply any written communication of any form that went back and forth between Big Rivers and that party?
- Q2.56 On page 9 (Load Concentration Analysis), Big Rivers states that many entities were short of generating capacity prior to the economic downturn and will likely return to the same situation when the economy strengthens. Please supply any analysis or support of any kind that the Company possesses that it based that statement on.
- Q2.57 On page 9 (Load Concentration Analysis), Big Rivers also states that it has "a cost competitive advantage over many of its peers because it has a lower cost generating fleet than most which has largely already been retrofitted with pollution controls."
- a. Does this mean that Big Rivers generating fleet is lower in cost because Big Rivers has not already been retrofitted with pollution controls, while the others have? Please explain.
- Q2.58 Referring to the Load Concentration Analysis. Once the requested environmental upgrades have been made, will Big Rivers generating fleet still be lower in cost than the others? Please explain.
- Q2.59 Concerning Scenarios 1 through 8 of the Load Concentration Analysis, did ACES perform the modeling work using the PAR model? If not, who performed the modeling work and what production cost model was used?
- Q2.60 Concerning Scenario 1 of the Load Concentration Analysis:
- a. Was that scenario the same scenario as the Build, No Smelter Scenario in the Company's ECP filing? If not, please explain the differences (process, data assumptions, etc).
 - b. Other than the market price forecast, did PACE Global supply any other data that was used in the analysis. If so, please provide all information, documentation, etc, that PACE supplied for the production cost analysis.
 - c. If this scenario is different than the Build, No Smelter Scenario in the Company's ECP filing, provide a list of all assumptions that differentiated this case from the Build, No Smelters case in the ECP filing. Also, provide a fully populated, input database to the production cost model that was used to conduct the analysis and provide all results electronically from the production cost model used to develop that case. In addition, provide the input assumptions for the production cost model in excel spreadsheet format as the Company did for other cases supplied.
 - d. Finally, provide all models, workpapers, analyses, etc that were created and used to develop the results that are found on page 13 of the report. These models should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.

- e. Provide all models, data assumptions, workpapers, analyses, etc. that were created to perform an economic analysis (Net Present Value or similar analysis). These models should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.

Q2.61 Concerning Scenario 2 of the Load Concentration Analysis:

- a. Was that scenario the same scenario as the Buy, No Smelter Scenario in the Company's ECP filing? If not, please explain the differences (process, data assumptions, etc).
- b. Other than the market price forecast, did PACE Global supply any other data that was used in the analysis. If so, please provide all information, documentation, etc, that PACE supplied for the production cost analysis.
- c. If this scenario is different than the Buy, No Smelter Scenario in the Company's ECP filing, provide a list of all assumptions that differentiated this case from the Build, No Smelters case in the ECP filing. Also, provide a fully populated, input database to the production cost model that was used to conduct the analysis and provide all results electronically from the production cost model used to develop that case. In addition, provide the input assumptions for the production cost model in excel spreadsheet format as the Company did for other cases supplied.
- d. Finally, provide all models, workpapers, analyses, etc that were created and used to develop the results that are found on page 14 of the report. These models should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.
- e. Provide all models, data assumptions, workpapers, analyses, etc. that were created to perform an economic analysis (Net Present Value or similar analysis). These models should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.

Q2.62 Concerning Scenario 3 of the Load Concentration Analysis:

- a. Please provide the ACES market price forecast (referred to as lower market prices), and all models, assumptions, documentation, etc, used or produced in developing the market price forecast. Please supply all models and spreadsheets electronically, with all formulas active.
- b. Provide a list of all assumptions that differentiated this case from the Buy, No Smelters case in the ECP filing. Also, provide a fully populated, input database to the production cost model that was used to conduct the analysis and provide all results electronically from the production cost model used to develop that case. In addition, provide the input assumptions for the production cost model in excel spreadsheet format as the Company did for other cases supplied.
- c. Finally, provide all models, workpapers, analyses, etc that were created and used to develop the results that are found on page 15 of the report. These models should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.
- d. Provide all models, data assumptions, workpapers, analyses, etc. that were created to perform an economic analysis (Net Present Value or similar analysis). These models

should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.

Q2.63 Concerning Scenario 4 of the Load Concentration Analysis:

- a. Provide a list of all assumptions that differentiated this case from Scenario 3 of the Load Concentration Analysis. Also, provide a fully populated, input database to the production cost model that was used to conduct the analysis and provide all results electronically from the production cost model used to develop that case. In addition, provide the input assumptions for the production cost model in excel spreadsheet format as the Company did for other cases supplied.
- b. Finally, provide all models, workpapers, analyses, etc that were created and used to develop the results that are found on page 16 of the report. These models should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.
- c. Provide all models, data assumptions, workpapers, analyses, etc. that were created to perform an economic analysis (Net Present Value or similar analysis). These models should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.

Q2.64 Concerning Scenario 5 of the Load Concentration Analysis:

- a. Provide a list of all assumptions that differentiated this case from Scenario 1 of the Load Concentration Analysis. Also, provide a fully populated, input database to the production cost model that was used to conduct the analysis and provide all results electronically from the production cost model used to develop that case. In addition, provide the input assumptions for the production cost model in excel spreadsheet format as the Company did for other cases supplied.
- b. Finally, provide all models, workpapers, analyses, etc that were created and used to develop the results that are found on page 17 of the report. These models should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.
- c. Provide all models, data assumptions, workpapers, analyses, etc. that were created to perform an economic analysis (Net Present Value or similar analysis). These models should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.

Q2.65 Concerning Scenario 6 of the Load Concentration Analysis:

- a. Provide a list of all assumptions that differentiated this case from Scenario 4 of the Load Concentration Analysis. Also, provide a fully populated, input database to the production cost model that was used to conduct the analysis and provide all results electronically from the production cost model used to develop that case. In addition, provide the input assumptions for the production cost model in excel spreadsheet format as the Company did for other cases supplied.
- b. Finally, provide all models, workpapers, analyses, etc that were created and used to develop the results that are found on page 18 of the report. These models should be

supplied electronically, with all referenced spreadsheets attached, and all formulas active.

- c. Provide all models, data assumptions, workpapers, analyses, etc. that were created to perform an economic analysis (Net Present Value or similar analysis). These models should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.

Q2.66 Concerning Scenario 7 of the Load Concentration Analysis:

- a. Provide a list of all assumptions that differentiated this case from Scenario 6 of the Load Concentration Analysis. Also, provide a fully populated, input database to the production cost model that was used to conduct the analysis and provide all results electronically from the production cost model used to develop that case. In addition, provide the input assumptions for the production cost model in excel spreadsheet format as the Company did for other cases supplied.
- b. Finally, provide all models, workpapers, analyses, etc that were created and used to develop the results that are found on page 19 of the report. These models should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.
- c. Provide all models, data assumptions, workpapers, analyses, etc. that were created to perform an economic analysis (Net Present Value or similar analysis). These models should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.

Q2.67 Concerning Scenario 8 of the Load Concentration Analysis:

- a. Provide a list of all assumptions that differentiated this case from Scenario 1 of the Load Concentration Analysis. Also, provide a fully populated, input database to the production cost model that was used to conduct the analysis and provide all results electronically from the production cost model used to develop that case. In addition, provide the input assumptions for the production cost model in excel spreadsheet format as the Company did for other cases supplied.
- b. Finally, provide all models, workpapers, analyses, etc that were created and used to develop the results that are found on page 20 of the report. These models should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.
- c. Provide all models, data assumptions, workpapers, analyses, etc. that were created to perform an economic analysis (Net Present Value or similar analysis). These models should be supplied electronically, with all referenced spreadsheets attached, and all formulas active.

Q2.68 In the ECP filing production cost analyses, ACES used a single reference case fuel forecast, market price forecast, allowance price forecast from PACE Global even though PACE supplied 200 iterations.

- a. In the Load Concentration Study, was the same approach used in which a single reference case forecast for market prices, fuel costs, and allowance prices were used?

- b. If not, please explain why it was appropriate to conduct the studies differently?
- c. If so, please explain why single forecasts were used when PACE created multiple iterations.

Q2.69 On page 23 of the Load Concentration Study report, it states that Big Rivers will continue to conduct analyses. What analyses have been conducted since the Draft Report has been produced, or will be conducted? Please provide a detailed description of what have been or will be conducted.

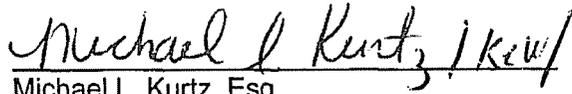
Q2.70 Concerning the LMP Impact Study – Loss of Smelter Load

- a. Please explain how results of this study factored into any results filed in the Company's ECP filing, or factored into any of the Scenarios 1 – 8 of the Load Concentration Analysis.
- b. Please provide all outputs from the LMP Impact Study that were treated as inputs to any study discussed in part a of this question.
- c. Why wasn't the PROMOD model used to conduct the studies discussed in part a of this question?

Q2.71 Regarding the PACE Global MISO Power Price Assessment dated January 12, 2012

- a. Are the reference price forecasts the same as what were used in the ACES analyses for the ECP Filing (Base Case, Build Case, etc)?
- b. Please provide an explanation of how the forecasts found on page 4 relate to the 200 iteration forecasts found in PACE_Big Rivers Data Request Outputs_120524.xlsx. Explain the difference in the way that the forecasts were created, and the difference in the way that the forecasts were used in any studies.
- c. Please supply all models, input data assumptions, spreadsheets, and documentation of any type, used in creating the data found on page 4 (HH Gas Prices), page 5 (coal prices), page 7 (CO2 prices), page 10 – 12 (market prices), and results found on pages 13 – 15. Also spreadsheets and models, should be provided electronically, with all formulas included. The spreadsheets and models for the data found on these pages should also be provided.
- d. Page 17 indicates that PACE Global would supply detailed data on MISO power price projections. Please supply the detailed data that PACE Global supplied to Big Rivers. This should be provided electronically, and all spreadsheets and models should have all referenced spreadsheets included and all formulas included.

Respectfully submitted,



Michael L. Kurtz, Esq.

BOEHM, KURTZ & LOWRY

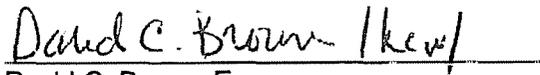
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**COUNSEL FOR KENTUCKY INDUSTRIAL UTILITY
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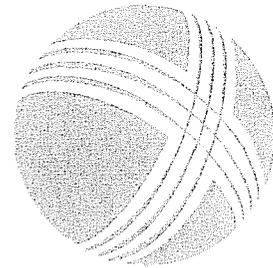
**CO-COUNSEL FOR ALCAN PRIMARY PRODUCTS
CORPORATION**

May 21, 2012

KWalton

 **KIUC Reply to BREC Response to Motion to Dis**
 **08/17/12 11:59 AM**

xerox



BOEHM, KURTZ & LOWRY

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Via Overnight Mail

May 2, 2012

Mr. Jeff Derouen, Executive Director
Kentucky Public Service Commission
211 Sower Boulevard
Frankfort, Kentucky 40602

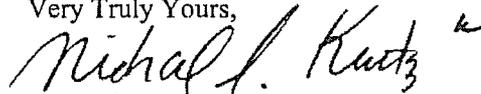
Re: Case No. 2012-00063

Dear Mr. Derouen:

Please find enclosed the original and ten (10) copies of KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.'s REPLY TO BIG RIVERS ELECTRIC CORPORATION'S RESPONSE TO MOTION TO DISMISS for filing in the above-referenced matter.

By copy of this letter, all parties listed on the Certificate of Service have been served. Please place these documents of file.

Very Truly Yours,



Michael L. Kurtz, Esq.

Kurt J. Boehm, Esq.

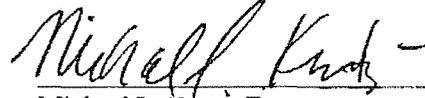
BOEHM, KURTZ & LOWRY

MLKkew
Attachment

cc: Certificate of Service
Quang Nyugen, Esq.
David C. Brown, Esq.

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing was served by electronic mail (when available) and by mailing a true and correct copy by regular, U.S. Mail, unless other noted, this 2nd day of May, 2012 to the following



Michael L. Kurtz, Esq.
Kurt J. Boehm, Esq.

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100 ST. ANN STREET
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OWENSBORO, KENTUCKY 42302-0727

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF: THE APPLICATION OF BIG RIVERS :
ELECTRIC CORPORATION FOR APPROVAL OF ITS 2012 : Case No. 2012-00063
ENVIRONMENTAL COMPLIANCE PLAN., FOR APPROVAL OF ITS :
AMENDED ENVIRONMENTAL COST RECOVERY SURCHARGE :
TARIFF, FOR CERTIFICATES OF PUBLIC CONVENIENCE AND :
NECESSITY, AND FOR AUTHORITY TO ESTABLISH A :
REGULATORY ACCOUNT :

**KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC'S REPLY TO
BIG RIVERS ELECTRIC CORPORATION'S RESPONSE TO MOTION TO DISMISS**

I. INTRODUCTION

Kentucky Industrial Utility Customers, Inc. ("KIUC") submits this Reply to Big Rivers Electric Corporation's ("Big Rivers") April 26, 2012 Response to KIUC's Motion to Dismiss.

II. ARGUMENT

1. Big Rivers' Claim That The Commission Lacks Authority To Dismiss Its Application Is Not Supported By KRS 278.020 and KRS 278.183.

On page 2 of its Response, Big Rivers argues that the Commission does not have authority to dismiss an application that meets all applicable filing requirements of KRS 278.020 and KRS 278.183.

Big Rivers states:

"Both statutes require the Commission to rule on the merits of an application and neither statute grants the Commission authority to dismiss an application that meets all applicable filing requirements because the application does not contain all the information an intervenor might request." (Response p. 2)

With respect to KRS 278.020, that section gives the Commission broad authority to approve, modify or disapprove an application; and gives the Commission discretion to conduct a hearing or decide the case as filed. KRS 278.020(1) states:

“Upon the filing of an application for a certificate, and after any public hearing which the commission may in its discretion conduct for all interested parties, the commission may issue or refuse to issue the certificate, or issue it in part and refuse it in part...”

If the Commission determines that the evidence presented in Big Rivers Application and testimony is insufficient to determine the reasonableness and cost-effectiveness of Big Rivers’ proposed Certificate and ECR plan, the Commission has authority to dismiss it without prejudice, pursuant to KRS 278.020.

With respect to KRS 278.183, Big Rivers’ Application and testimony does not meet “*all applicable filing requirements*” so its Application can be, and should be, dismissed. KRS 278.183 requires that the Commission conduct a hearing in order to “[c]onsider and approve the plan and rate surcharge if the commission finds the plan and rate surcharge reasonable and cost-effective for compliance with the applicable environmental requirements...” As explained in KIUC’s Motion to Dismiss, Big Rivers has not submitted sufficient evidence to support a finding that its plan is reasonable and cost-effective. Big Rivers’ Application and supporting testimony merely states the utility’s conclusion that its plan is cost-effective. Big Rivers fails to provide sufficient data or testimony to support its conclusion. Big Rivers’ unsupported claim that its plan is cost-effective is insufficient evidence for the utility to establish a *prima facie* case that its plan is “*reasonable and cost-effective*” per KRS 278.183. Without this *prima facie* case, the KRS 278.183(2) hearing requirement is not applicable.

As explained in KIUC’s Motion to Dismiss, Big Rivers’ Application is missing critical information needed to support its proposal. This information includes, but is not limited to:

- Sargent & Lundy models and electronic spreadsheets used to assess compliance options.

- PACE Global information provided to ACES Power Marketing, which includes forward hourly energy prices, monthly coal prices, monthly natural gas prices, and monthly allowance prices.
- Big Rivers' plant specific data provided to ACES Power Marketing.
- The ACES Power Marketing production cost models used.
- The Big Rivers' corporate financial model used and studies of compliance alternatives.
- Testimony from a PACE Global witness to support their projections of forward hourly energy prices, monthly coal prices, monthly natural gas prices and monthly allowance prices.
- Testimony from an ACES witness to support the production cost model runs.
- The assumptions under the sensitivity studies which assume the loss of the 7,300,000 mWh Smelter load at the end of 2013 (70% of native load sales) were not provided. So the Commission and Intervenors are left to guess whether Big Rivers assumed it would sell 7,300,000 mWh into the wholesale market as a merchant generator (for how much?), would close power plants (at what cost?), would sell power plants (at what price?), would merge with another G&T cooperative or would be acquired by an investor-owned electric utility.

As the Attorney General has also noted in its own Motion to Dismiss, filed on April 25, 2012, Big Rivers' Application fails to provide sufficient evidence with which the Commission can make the determinations required under KRS 278.183 and KRS 278.020. Therefore, Big Rivers has not made a *prime facie* showing and has failed to meet its burden of proof with substantial evidence.

2. Big Rivers' Submission Of New Evidence In Its Response To KIUC's Motion To Dismiss Does Not Cure The Utility's Deficient Application.

On page 3 of its Response, Big Rivers contends that KIUC's "*real complaint* [in the KIUC Motion to Dismiss] *seems to be that it has insufficient time to conduct discovery.*" Big Rivers attempts to resolve this perceived complaint by providing additional evidence in support of its conclusion that its ECR plan is reasonable and cost-effective. Big Rivers states that it recognizes:

"the time constraints placed on the Commission and parties... [and] given that KIUC's Motion to Dismiss indicates certain information that KIUC may later ask for in discovery, Big Rivers provides the following information mentioned in the Motion to Dismiss in lieu of waiting for KIUC's discovery requests:

1. *Electronic copies of the spreadsheet models used in the cost effectiveness evaluation; and*
2. *PACE Global price curve data for energy prices, fuel prices, and allowance prices.”*

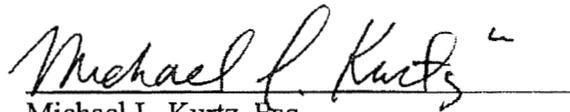
This unsolicited offer of additional data by Big Rivers is merely an attempt to back-fill an Application that was insufficient to support Big Rivers’ proposal, and an admission against interest that it’s Application was indeed deficient. Further, Big Rivers has not offered a witness to sponsor this new evidence.

The appropriate cure for a deficient filing is not for Big Rivers to haphazardly provide some of the missing evidence, without a sponsoring witness, as a part of its response to a Motion to Dismiss. Instead, the Commission should require Big Rivers to withdraw and re-file its Application with the proper supporting documents sponsored by a Big Rivers witness.

III. CONCLUSION

For the foregoing reason KIUC respectfully requests that the Commission dismiss, without prejudice, the April 2, 2012 Application of Big Rivers.

Respectfully submitted,



Michael L. Kurtz, Esq.

Kurt J. Boehm, Esq.

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UTILITY CUSTOMERS, INC.**

David C. Brown / Kew/

David C. Brown, Esq.

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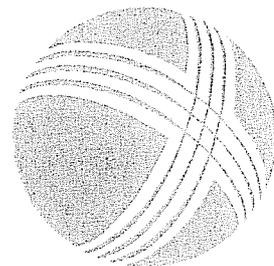
**CO-COUNSEL FOR ALCAN PRIMARY
PRODUCTS CORPORATION**

May 2, 2012

KWalton

 **KIUC Petition to Intervene - Docket #2012-00063**
 **08/17/12 11:59 AM**

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BOEHM, KURTZ & LOWRY

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CINCINNATI, OHIO 45202
TELEPHONE (513) 421-2255
TELECOPIER (513) 421-2764

Via Overnight Mail

April 11, 2012

Mr. Jeff Derouen, Executive Director
Kentucky Public Service Commission
211 Sower Boulevard
Frankfort, Kentucky 40602

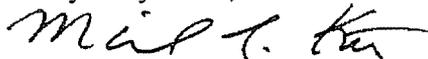
Re: Case No. 2012-00063

Dear Mr. Derouen:

Please find enclosed the original and ten (10) copies each of the PETITION TO INTERVENE OF THE KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC. for filing in the above-referenced matter.

By copy of this letter, all parties listed on the Certificate of Service have been served. Please place these documents of file.

Very Truly Yours,



Michael L. Kurtz, Esq.

Kurt J. Boehm, Esq.

BOEHM, KURTZ & LOWRY

MLKkew

Attachment

cc: Certificate of Service
Richard Raff, Esq.
David C. Brown, Esq.

**COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION**

IN THE MATTER OF: THE APPLICATION OF BIG RIVERS :
ELECTRIC CORPORATION FOR APPROVAL OF ITS 2012 : Case No. 2012-00063
ENVIRONMENTAL COMPLIANCE PLAN., FOR APPROVAL OF ITS :
AMENDED ENVIRONMENTAL COST RECOVERY SURCHARGE :
TARIFF, FOR CERTIFICATES OF PUBLIC CONVENIENCE AND :
NECESSITY, AND FOR AUTHORITY TO ESTABLISH A :
REGULATORY ACCOUNT :

**PETITION TO INTERVENE OF
KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.**

Pursuant to K.R.S. §278.310 and 807 KAR 5:001 Section 3(8), Kentucky Industrial Utility Customers, Inc. (“KIUC”) requests that it be granted full intervenor status in the above-captioned proceeding and states in support thereof as follows:

1. KIUC is an association of the largest electric and gas public utility customers in Kentucky. The purpose of KIUC is to represent the industrial viewpoint on energy and utility issues before this Commission and before all other appropriate governmental bodies.
2. The members of KIUC who purchase electricity from Big Rivers Electric Corporation (“Big Rivers”) through Kenergy Corp. who will participate herein are: Alcan Primary Products Corporation, Century Aluminum of Kentucky, General Partnership, Domtar Paper Co., LLC, Kimberly Clark Corporation and Aleris International, Inc. KIUC will supplement its Petition with the names of additional participating members as this information becomes known.
3. All KIUC member companies have a similar interest in ensuring that the rates charged by Big Rivers to Kenergy for pass-through to retail consumers are just and reasonable.
4. The matters being decided by the Commission in this case may have a significant impact on the rates paid by KIUC members for electricity. Electricity represents a significant cost of doing business for KIUC members. The attorneys for KIUC authorized to represent them in this proceeding and to take service of all documents are:

Michael L. Kurtz, Esq.
Kurt J. Boehm, Esq.
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CO-COUNSEL FOR ALCAN PRIMARY PRODUCTS CORPORATION

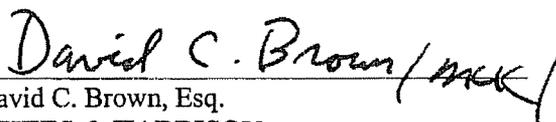
5. The position of KIUC cannot be adequately represented by any existing party. KIUC intends to play a constructive role in the Commission's decision making process herein and KIUC's participation will not unduly prejudice any party.

WHEREFORE, KIUC requests that it be granted full intervenor status in the above captioned proceeding.

Respectfully submitted,



Michael L. Kurtz, Esq.
Kurt J. Boehm, Esq.
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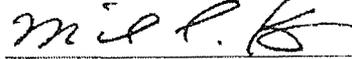


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**CO-COUNSEL FOR ALCAN PRIMARY PRODUCTS
CORPORATION**

April 11, 2012

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing was served by electronic mail (when available) or by mailing a true and correct copy by overnight mail, unless other noted, this 11TH day of April, 2012 to the following



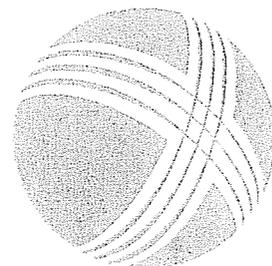
Michael L. Kurtz, Esq.
Kurt J. Boehm, Esq.

Honorable James M Miller
Attorney at Law
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100 St. Ann Street
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Owensboro, KY 42302-0727

KWalton

 **KIUC Motion to Dismiss - Docket #2012-00063.p**
 **08/17/12 11:59 AM**

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Via Overnight Mail

April 20, 2012

Mr. Jeff Derouen, Executive Director
Kentucky Public Service Commission
211 Sower Boulevard
Frankfort, Kentucky 40602

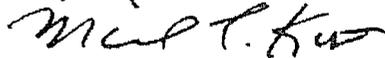
Re: Case No. 2012-00063

Dear Mr. Derouen:

Please find enclosed the original and ten (10) copies each of the MOTION TO DISMISS OF THE KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC. for filing in the above-referenced matter.

By copy of this letter, all parties listed on the Certificate of Service have been served. Please place these documents of file.

Very Truly Yours,



Michael L. Kurtz, Esq.
Kurt J. Boehm, Esq.
BOEHM, KURTZ & LOWRY

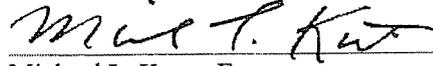
MLKkew

Attachment

cc: Certificate of Service
Quang Nyugen, Esq.
David C. Brown, Esq.

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing was served by electronic mail (when available) or by mailing a true and correct copy by overnight mail, unless other noted, this 20TH day of April, 2012 to the following



Michael L. Kurtz, Esq.
Kurt J. Boehm, Esq.

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OWENSBORO, KENTUCKY 42302-0727

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF:

IN THE MATTER OF: THE APPLICATION OF BIG RIVERS :
ELECTRIC CORPORATION FOR APPROVAL OF ITS 2012 :
ENVIRONMENTAL COMPLIANCE PLAN., FOR APPROVAL : Case No. 2012-00063
OF ITS AMENDED ENVIRONMENTAL COST RECOVERY :
SURCHARGE TARIFF, FOR CERTIFICATES OF PUBLIC :
CONVENIENCE AND NECESSITY, AND FOR AUTHORITY :
TO ESTABLISH A REGULATORY ACCOUNT :

MOTION TO DISMISS

Kentucky Industrial Utility Customers, Inc. (“KIUC”) moves the Kentucky Public Service Commission (“Commission”) to enter an Order dismissing the instant action initiated by Big Rivers Electric Corporation (“Big Rivers”). The Application filed by Big Rivers on April 2, 2012 (“Application”) fails to provide sufficient evidence with which the Commission can make the determinations required under KRS 278.183 and KRS 278.020. Consequently, Big Rivers has not made a *prime facie* showing and has failed to meet its burden of proof with substantial evidence.¹ The Commission should dismiss the instant action without prejudice. Big Rivers should then refile its Application with the requisite evidence.

¹ This Commission and Kentucky courts have repeatedly stated that “[a]pplicants before an administrative agency have the burden of proof.” Order, Case No. 2005-00220 (May 19, 2006); Order, Case No. 2005-00057 (Feb. 9, 2007); *Energy Regulatory Commission v. Kentucky Power Company*, Ky. App., 605 S.W. 2d 46, 50 (1980); Order, Case No. 2001-00265 (May 13, 2002). Further administrative findings must be based on substantial evidence. *Kentucky Board of Nursing v. Ward*, Ky. App., 890 S.W.2d 641, 642 (1994).

MEMORANDUM IN SUPPORT

Big Rivers failed to provide the requisite evidence with which the Commission can make a determination as to whether its Application satisfies the requirements of KRS 278.183 or KRS 278.020. KRS 278.183 requires the Commission to determine whether an environmental compliance plan and rate surcharge are “reasonable and cost-effective” for compliance with certain environmental requirements. Additionally KRS 278.020 requires the Commission to determine whether “public convenience and necessity require” the projects proposed in Big Rivers’ Application. But the Application fails to provide the requisite evidence with which the Commission can make such determinations. Consequently, Big Rivers failed to meet its burden of proof and failed to provide substantial evidence to support its Application. Therefore, the Commission should dismiss the instant action without prejudice.

As described by Big Rivers witness Mark A. Hite, Big Rivers hired Sargent & Lundy, LLC (“S&L”) to conduct an analysis of the cost-effectiveness of various compliance strategies.² Based on S&L’s analysis, Big Rivers chose three alternatives to evaluate from a cost-effectiveness standpoint, which Big Rivers has labeled the “Build Case,” “Partial Build Case,” and “Buy Case.”³ Big Rivers acquired forward pricing data from PACE Global and hired ACES Power Marketing (“ACES”) to run production cost models.⁴ Big Rivers compiled this data to develop four financial models used to evaluate the Build Case, Partial Build Case, Buy Case, and the *status quo* “Base Case.”⁵ Big Rivers also performed two sensitivity studies to assess whether the compliance strategy would change if the Smelter load was eliminated after 2013.⁶ The Smelter annual load of 7,300,000 mWh represents approximately

² Direct Testimony of Mark A. Hite (“Hite Testimony”)(April 2, 2012) at 5:3-7.

³ Hite Testimony at 6:1-17.

⁴ Hite Testimony at 7:18-8:5.

⁵ Hite Testimony at 7:5-10.

⁶ Hite Testimony at 9:19-10:18.

70% of Big Rivers' native load energy sales. The sensitivity studies were performed only against the Build Case and Buy Case compliance alternatives.

Big Rivers' Application provides only a cursory explanation of the entire analysis conducted and omits information and testimony critical to determining whether its compliance plan and rate surcharge are reasonable and cost-effective, or whether the projects proposed by it are required by public convenience and necessity. Critical information and testimony missing from the Application includes, but is not limited to:

- Sargent & Lundy models and electronic spreadsheets used to assess compliance options.
- PACE Global information provided to ACES Power Marketing, which includes forward hourly energy prices, monthly coal prices, monthly natural gas prices, and monthly allowance prices.
- Big Rivers' plant specific data provided to ACES Power Marketing.
- The ACES Power Marketing production cost models used.
- The Big Rivers' corporate financial model used and studies of compliance alternatives.
- Testimony from a PACE Global witness to support their projections of forward hourly energy prices, monthly coal prices, monthly natural gas prices and monthly allowance prices.
- Testimony from an ACES witness to support the production cost model runs.
- The assumptions under the sensitivity studies which assume the loss of the 7,300,000 mWh Smelter load at the end of 2013 (70% of native load sales) were not provided. So the Commission and Intervenors are left to guess whether Big Rivers assumed it would sell 7,300,000 mWh into the wholesale market as a merchant generator (for how much?), would close power plants (at what cost?), would sell power plants (at what price?), would merge with another G&T cooperative or would be acquired by an investor-owned electric utility.

The Company provided only a one page summary of the results of its review of the compliance alternatives and the two sensitivity studies attached as an Exhibit to Mr. Hite's testimony. This one page summary is insufficient evidence for the utility to establish a *prime facie* case and meet its burden of proof.

Big Rivers' Application is deficient, especially when compared to the level of detail provided in the recent environmental compliance filings of Kentucky Power Company, Kentucky Utilities Company, and Louisville Gas & Electric Company.

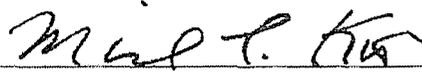
Big Rivers failed to provide critical information which the Commission would need to consider in making the determinations required under KRS 278.183 and KRS 278.020. The glaring deficiencies in the Application prevent Big Rivers from establishing a *prime facie* case that its environmental compliance plan is reasonable or cost-effective in light of other alternatives. Further, these deficiencies do not give this Commission even the minimal amount of evidence necessary to determine whether the public convenience and necessity require the \$286.14 million of compliance projects proposed by Big Rivers.

It is no answer to say that intervenors can obtain the missing evidence through discovery. KRS 278.183 provides that a hearing must be conducted within six months after an application is filed. Neither the Commission nor Intervenors should have to spend half of that six month period conducting discovery to ferret out information that should have been filed in Big Rivers' Application. Further, the missing information, once obtained, will surely lead to the need for additional discovery of information and assumptions referred to in those documents.

The Commission cannot and should not proceed to consider approving approximately \$286.14 million in capital expenditures and \$13.23 million in annual operating & maintenance expenses based merely upon the inadequate Application submitted by Big Rivers in this case. Instead, the Commission should dismiss the instant proceeding without prejudice and permit Big Rivers to file a proper Application.

WHEREFORE, Kentucky Industrial Utility Customers, Inc. respectfully requests that the Commission enter an Order dismissing this action without prejudice.

Respectfully submitted,



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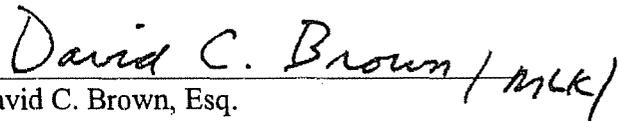
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CORPORATION**

April 20, 2012

KWalton

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COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF THE:

APPLICATION OF BIG RIVERS ELECTRIC) CASE NO. 2012-00063
CORPORATION FOR APPROVAL OF ITS)
2012 ENVIRONMENTAL COMPLIANCE)
PLAN, FOR APPROVAL OF ITS AMENDED)
ENVIRONMENTAL COST RECOVERY)
SURCHARGE TARIFF, FOR CERTIFICATES)
OF PUBLIC CONVENIENCE AND)
NECESSITY, AND FOR AUTHORITY TO)
ESTABLISH A REGULATORY ACCOUNT)

**MOTION TO COMPEL OR, IN THE ALTERNATIVE,
TO ISSUE SUBPOENA DUCES TECUM**

Kentucky Industrial Utility Customers, Inc. ("KIUC") and Ben Taylor and Sierra Club (collectively, "Intervenors") hereby move the Kentucky Public Service Commission ("Commission") to enter an Order requiring Big Rivers Electric Corporation ("Big Rivers") to request and require the production of certain information from its affiliate, ACES Power Marketing ("ACES"), and to provide that information to the parties in this proceeding or, in the alternative, to issue subpoena duces tecum pursuant to KRS 278.320 to require the production of the information directly from ACES. In particular, Intervenors seek production of the data base and input files that ACES developed and fed into the production cost modeling upon which Big Rivers' April 2, 2012 Application ("Application") is based. The information Intervenors seek is necessary to the Commission's ultimate determination of whether the ~~April 2, 2012~~ Application ("Application") filed by Big Rivers in this case satisfies the standards set forth in KRS 278.020 and 278.183, and to the parties' ability to fully review and evaluate that Application.

MEMORANDUM IN SUPPORT

In CPCN proceedings, the Commission, its staff, and intervenors attempt to validate the veracity of an applicant's conclusions. This audit process requires parties to examine key assumptions and analyses of the applicant to determine if they are reasonable, meaning that an auditor could reasonably follow key assumptions and derivations, analysis mechanisms, and conclusions drawn from those analyses. If the assumptions and/or analyses are flawed, then the resulting conclusions are typically not reasonable. In a typical CPCN case involving a retrofit, a reasonable audit should be able to review: (1) the company's estimate (or bid) for their environmental upgrade and the estimate (or bid) for replacement capacity; (2) a logically structured modeling analysis in which the Commission or intervenors may examine both input assumptions and output results; (3) sensitivity analyses that demonstrate robust conclusions, including explicit sensitivity inputs and outputs; (4) a clearly defined analytical framework for comparing the results of model runs; and (5) a justification of the project based on model results.

Transparency on the part of the applicant is an essential element of this audit process. A applicant must disclose information regarding input and output results, the modeling and analytical structure utilized, and which sensitivities were used, including inputs and outputs, how those sensitivities were selected. Without transparency regarding these issues it is impossible for the Commission or any party to verify, much less rely on, the applicant's assumptions and conclusions.

As part of the audit process of this CPCN application, Intervenors propounded specific discovery so that it could either review and verify or reject Big Rivers' analyses and conclusions. However, Big Rivers' responses to such requests for information were obstructive and evasive. Specifically, Big Rivers has failed require or request ACES to produce the database ACES

designed to run the Ventyx Planning and Risk (“PAR”) model used in its production cost modeling for Big Rivers’ Application. Intervenors submit that such database is plainly relevant to this proceeding, and responsive to their data requests. In addition, the lack of this data would render it impossible for the Commission to determine with certainty whether Big Rivers’ Application meets the standards set forth in KRS 278.020 and KRS 278.183

~~The specific issue requiring this Motion is Big Rivers’ failure to require or request ACES to produce the database ACES designed to run the Ventyx Planning and Risk (“PAR”) model used in its production cost modeling for Big Rivers’ Application. Big Rivers is a part owner of ACES and has estimated it will pay ACES \$50,000 for the work.[†] Without such data, neither Intervenors nor the Commission can verify the modeling results submitted by Big Rivers in this proceeding. KIUC Intervenors submits that such database is plainly relevant to this proceeding, and responsive to their data requests. In addition, the lack of this data therefore would render it impossible for the Commission to determine with certainty whether Big Rivers’ Application meets the standards set forth in KRS 278.020 and KRS 278.183.~~

The essence of this Motion is straightforward: the only acceptable method for Intervenors and the Commission to examine and verify the accuracy and completeness of this Application is to be able to replicate Big Rivers’ modeling and then test the output through sensitivity runs. To do this, it is necessary to have the exact inputs to the modeling carried out by ACES. Otherwise the Commission will be confronted with Big Rivers’ conclusions (apples) and the Intervenors’ conclusions (oranges).

[†]Big Rivers Response to the Staff’s Initial Request for Information, Item-1

The modeling in this case was a multi-step process involving three parties: Big Rivers, PACE Global ("PACE") and ACES Power Marketing ("ACES").² PACE Global provided Big Rivers with its projections of forward energy prices, monthly coal prices, monthly natural gas prices and monthly allowance prices. This data, along with Big Rivers' plant specific data, were supplied to ACES which was contracted to run the production cost model. It is correct that Big Rivers has provided to intervenors all the data that it provided to ACES, but only in the format it provided to ACES.

ACES then took the PACE and Big Rivers' data it received from Big Rivers and from that information developed a data base or inputs that were fed into Ventyx Planning and Risk ("PAR") model Ventyx PAR software that ACES used in its production cost modeling. The ACES production cost model outputs were then sent back to Big Rivers which fed the information into the Big Rivers financial model. Based on these three-tiered modeling analysis, Big Rivers claims that the retrofits it is proposing are the least cost alternative.

Intervenors' propounded discovery for each of the modeling phases, including the ACES phase. For instance, KIUC 1-21 explicitly states: "Provide copies of all models and spreadsheets developed containing input assumptions and output results. Provide these electronically, with all formulas intact." KIUC First Set of Data Requests to Big Rivers 1-21. In addition, SC 1-53 states:

Refer to p. 7 line 20 to p. 8 line 5 of the testimony of Mark Hite. Identify and --produce:

- a. All forward pricing data received from PACE Global for the production cost modeling.
- b. All Big Rivers plant specific data that was supplied to ACES Power Marketing.
- c. Please identify which financial model ACES Power Marketing used, who is the

² Direct Testimony of Mark Hite, pages 7-8

- vendor of the model, and whether the model is a proprietary model that requires a license in order to gain access to the files.
- d. Please produce, in machine readable format, all of the production cost modeling (including input and output files) and workpapers used to determine the NPVRR for each scenario generated by ACES Power Marketing
 - e. Please identify any changes to the input files that may be required to reproduce the modeling.
 - f. If changes are required, please explain why such changes were made.
 - g. Please identify the assumptions, including any supporting documentation, Big Rivers or its agents used in each base case and sensitivity scenario that you modeled
 - h. If a license is required to obtain access to any information in this request, please explain how Sierra Club could obtain that license or, if they already have a license, who they should provide information to regarding the license to obtain the files.

Ben Taylor and Sierra Club's First Request for Information to Big Rivers at 1-53; see also, KIUC First Set of Data Requests to Big Rivers KIUC 1-4, KIUC 1-20, and KIUC 1-22 .

Despite the specificity of these requests, ACES has refused to provide all of the requested information. See Big Rivers' Response to KIUC Initial Request for Information; Big Rivers' Response to Sierra Club Initial Request for Information. While it is correct that Big Rivers has provided to intervenors all the data that it provided to ACES, but Big Rivers has not produced the database and inputs that ACES created and fed into the production cost model. In fact, Big Rivers has failed to require or request ACES to produce the database because it claims it is not obligated to do so as they are the proprietary work of ACES. CITE. Without such database and inputs, there is no way for the parties or the Commission to recreate the modeling performed by ACES and used by Big Rivers.

ACES is not an unaffiliated entity so there is no reason why Big Rivers should not have required ACES to provide this database. Big Rivers is actually a partial owner of ACES and a member of its Board. See Big Rivers Response to the Staff's Initial Request for Information.

Item 1; see also Big Rivers website at <http://www.bigrivers.com/power.aspx>. “As a member of ACES, Big Rivers has an annual bilateral agreement with ACES under which ACES provides a wide array of services to Big Rivers, including the production cost modeling for the multiple scenarios analyzed in the development of this filing.” See Big Rivers Response to KIUC Initial Request for Information number 33. It strains credulity for Big Rivers to claim that it cannot obtain the database that ACES used in its production cost modeling.

The crux of the issue is that the ACES database and inputs to the Ventyx software are formatted differently than and therefore not the same as the data supplied to ACES by Big Rivers. In addition, in creating the database and inputs from the information provided by Big Rivers, ACES invariably made decisions regarding various factors, often referred to as “switches” or “vectors.” that the parties and Commission could only evaluate if the database is produced. For example, in a conference call held on June 4, 2012 among Big Rivers, ACES, Ventyx, KIUC, Sierra Club and the Attorney General’s office, ACES representatives suggested stated ~~(implied?~~ **What is the consensus?**) that the inputs it used included some of its own projections of future price curves that were presumably intended to supplement if not modify the data provided by Big Rivers and PACE.

~~Intervenors have~~ KIUC has gone to the expense of licensing the Ventyx PAR software to replicate Big Rivers’ modeling and test the Big Rivers outputs, but the software is useless without the ACES designed database. The Affidavit of Philip Hayek, consultant to KIUC, and the Affidavit of _____, consultant to Sierra Club, verify that despite Big Rives’ contention that it has supplied all the information it provided to ACES, that information is not in the same format that ACES actually used in the modeling, and does not include whatever “switches” or

“vectors” that ACES had to decide how to set in developing the database that it used in the model. The Affidavits also verify that it is usual and customary for utilities proposing “least cost” alternatives to be transparent and provide exactly the information that Intervenors seek by this Motion. **(Can we accurately cite KPSC cases?)**

KIUC attempted to remedy this issue through a letter (**email?**) sent via email to Big Rivers on May 11, 2012 in which KIUC specifically requested “[t]he input data assumptions, and all supporting documents associated with the development of the input data assumptions” used by ACES as well as “[t]he actual production cost model that ACES used, as well as all input files that went to the model at the time the runs were performed.”³ KIUC also proposed another solution under which KIUC’s consultants would travel to ACES’ office and work directly with ACES staff to make data changes to KIUC’s input files to then perform KIUC’s production cost runs, but Big River’s refused to accommodate this approach as well.

In addition to informal attempts to procure the data, as noted above, a number of questions in ~~KIUC’s~~ Intervenors’ first sets of discovery requests filed May 22, 2012 were sufficiently broad to have warranted the production of the Big Rivers-specific data used by ACES in its production cost modeling. See, KIUC Initial Request for Data from Big Rivers at KIUC 1-4, KIUC 1-20, KIUC 1-21, and KIUC 1-22, and Ben Taylor and Sierra Club’s Initial Request for Information at 1-53.

The impasse has occurred because Intervenors cannot run the Ventyx model and therefore assure the integrity of Big Rivers conclusions without the ACES database; and Big Rivers says it does not have the ACES database and will not request ACES to produce it. In the June 4, 2012 conference call ACES took the position that the specific files sought were the

³ The May 11, 2012 Letter (**email?**) is Attached

proprietary work product of ACES and that ACES was not obligated to provide the information in the specific format that ~~KIUC-Intervenors~~ requested. ~~Intervenors respectively-respectfully~~ submit that this response requires action by the Commission.

Big Rivers' refusal to provide the ACES database of Big Rivers-specific inputs in the format used in its production cost modeling prevents both Intervenors and the Commission from being able to verify the results of the ACES production cost modeling that Big Rivers' Application is based upon. Big Rivers has suggested that the information it has provided should be sufficient⁴ to approximate the results produced by ACES. Even if true, –it is an unnecessary burden for Intervenors to have to expend an undeterminable amount of work ~~in the interest of reproducing~~ to attempt to -identically reproduce what ACES has already created.

Even if ~~there were adequate time for~~ Intervenors ~~to could~~-perform that work and were ~~willing to do so~~, there would be no assurance that identical results would be produced. In modeling efforts such as this, the modeler sets various “switches” or “vectors” that play a significant role ~~inputs, sometimes referred to as run control switches, that~~ determine the outputs from the modeling exercise. Intervenors would have no idea how those switches or any other similar types of switches were set by ACES modelers without the database. Thus, without the specific input files from ACES, it would be only by chance that Intervenors could reproduce ACES' results identically.⁵

⁴ Big Rivers has not facilitated that process by providing all of the communications between Big Rivers and ACES reflecting directions to be followed, or assumptions to be applied, answers to questions posed by ACES to Big Rivers about the work. KIUC requested this information, see KIUC Initial Request for Information 1-4, and such information would facilitate replication of the ACES work product.

⁵ The importance of such switches or vectors was seen in the recent CPCN proceeding regarding Kentucky Power Company's then-proposed flue gas desulfurization project at the Big Sandy Unit 2 generating plant. Upon evaluating the modeling input database used by KPC, Sierra Club's expert witness in that proceeding discovered that the company had erroneously left on an energy demand vector that overstated demand by 20%. When KPC re-ran the model without that vector on, the results showed that the company's initial modeling had overstated

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Further, even if Intervenor or Staff were to obtain a license of the production cost modeling software used by ACES, there is insufficient time to recreate the PAR model input files in the exact way that ACES already constructed them, to enable the Intervenor to replicate the ACES results, which is a necessary starting point for Intervenor's work. KRS 278.183 provides that a hearing must be conducted within six months after an application is filed. Because of time limitations imposed by statute, it is critical that Big Rivers provide the information necessary for parties to verify the production cost modeling results presented in Big Rivers' Application.

Without a method by which to verify the accuracy of the information presented in Big Rivers' Application within the time constraints imposed by law, the Commission cannot make a final determination with certainty regarding whether Big Rivers' Application satisfies the requirements of KRS 278.183 or KRS 278.020. KRS 278.183 requires the Commission to determine whether an environmental compliance plan and rate surcharge are "reasonable and cost-effective" for compliance with certain environmental requirements. Additionally, KRS 278.020 requires the Commission to determine whether "public convenience and necessity require" projects proposed in Big Rivers' Application. The Commission should not proceed to determine whether Big Rivers' Application meets these standards without an examination of the accuracy of the modeling results that form the basis for Big Rivers' Application.

KIUC has previously voiced its concern regarding Big Rivers' failure to produce a witness to provide information regarding the assumptions used by ACES in its production cost modeling.⁶ The continued lack of critical data necessary to this case is a result of Big Rivers' failure to provide such a witness. Intervenor recognizes that the ACES information requested in

the cost of future energy purchases under various alternatives by \$1 to \$2 billion. See Scott C. Weaver Rebuttal Testimony at 27-28 filed in Docket No. 2011-0401.

⁶ KIUC Motion to Dismiss filed April 23, 2012.

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this Motion may need to be treated as confidential, and agrees to such treatment for all legitimately confidential information,⁷ but such information is vital to the Commission's ultimate determinations in this case and cannot be withheld.

WHEREFORE, Intervenor respectfully requests that the Commission enter an Order requiring Big Rivers to request the database of Big Rivers-specific data used by ACES in its production cost modeling and to provide that database to the parties in this proceeding or, in the alternative, to issue a subpoena duces tecum to obtain the information directly from ACES.

Respectfully submitted,

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⁷ On the June 4, 2012 call, Intervenor informed Big Rivers that they were willing to enter into a confidentiality agreement to protect the ACES information. Big Rivers failed to explain why such an agreement would not sufficiently protect ACES' interests.

Joe F. Childers

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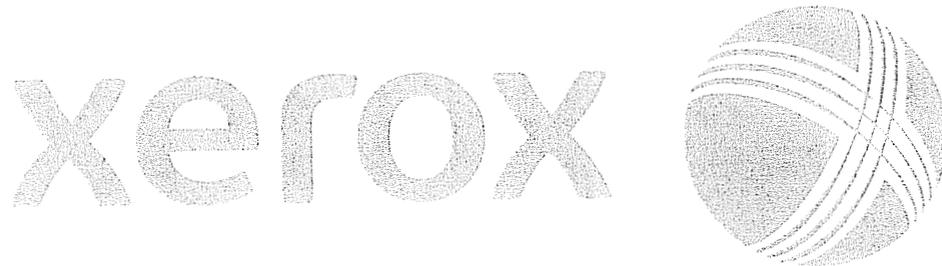
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June 8, 2012

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**COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION**

IN THE MATTER OF THE:

**APPLICATION OF BIG RIVERS ELECTRIC) CASE NO. 2012-00063
CORPORATION FOR APPROVAL OF ITS)
2012 ENVIRONMENTAL COMPLIANCE)
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ENVIRONMENTAL COST RECOVERY)
SURCHARGE TARIFF, FOR CERTIFICATES)
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NECESSITY, AND FOR AUTHORITY TO)
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**MOTION TO COMPEL OR, IN THE ALTERNATIVE,
TO ISSUE SUBPOENA DUCES TECUM**

Kentucky Industrial Utility Customers, Inc. ("KIUC") and Ben Taylor and Sierra Club and the Attorney General (collectively, "Intervenors") hereby move the Kentucky Public Service Commission ("Commission") to enter an Order requiring Big Rivers Electric Corporation ("Big Rivers") to request and require the production of certain information from its affiliate, ACES Power Marketing ("ACES"), and to provide that information to the parties in this proceeding or, in the alternative, to issue subpoena duces tecum pursuant to KRS 278.320 to require the production of the information directly from ACES. The information Intervenors seek balances the confidentiality concerns of Big Rivers with the minimum requirements of transparency and is necessary to the Commission's ultimate determination of whether the April 2, 2012 Application ("Application") filed by Big Rivers in this case satisfies the standards set forth in KRS 278.020 and 278.183.

MEMORANDUM IN SUPPORT

The specific issue requiring this Motion is Big Rivers' failure to require or request ACES to produce the database ACES designed to run the Ventyx Planning and Risk ("PAR") model

used in its production cost modeling for Big Rivers. Big Rivers is a part owner of ACES and has estimated it will pay ACES \$50,000 for the work.¹ Without such data, neither Intervenors nor the Commission can verify the modeling results submitted by Big Rivers in this proceeding. KIUC submits the lack of this data therefore would render it impossible for the Commission to determine with certainty whether Big Rivers' Application meets the standards set forth in KRS 278.020 and KRS 278.183.

The essence of this Motion is straightforward: the only acceptable method for Intervenors and the Commission to examine and verify the accuracy and completeness of this Application is to be able to replicate Big Rivers' modeling and then test the output through sensitivity runs. To do this, it is necessary to have the exact inputs to the model otherwise the Commission will be confronted with Big Rivers' conclusions (apples) and the Intervenors' conclusions (oranges).

The modeling in this case was a multi-step process involving three parties: Big Rivers, PACE Global ("PACE") and ACES Power Marketing ("ACES").² PACE Global provided Big Rivers with its projections of forward energy prices, monthly coal prices, monthly natural gas prices and monthly allowance prices. This data, along with Big Rivers' plant specific data, were supplied to ACES which was contracted to run the production cost model. It is correct that Big Rivers has provided to Intervenors all the data that it provided to ACES, but only in the format it provided to ACES.³

ACES then took the PACE and Big Rivers' data it received from Big Rivers and from that information developed a data base or inputs that were fed into Ventyx PAR software that

¹ Big Rivers Response to the Staff's Initial Request for Information, Item 1

² Direct Testimony of Mark Hite, pages 7-8

³ See also Big Rivers Response to the AG's Initial Request for Information, Item 15, in which the AG requested "any and all inputs used in the modeling."

ACES used in its production cost modeling. The ACES production cost model outputs were then sent back to Big Rivers which fed the information into the Big Rivers financial model.

The crux of the issue is that the ACES inputs to the Ventyx software are formatted differently than and therefore not the same as the data supplied to ACES by Big Rivers. In addition, in a conference call held on June 4, 2012 among Big Rivers, ACES, Ventyx, KIUC, Sierra Club and the Attorney General’s office, ACES representatives stated (**implied? What is the consensus?**) that the inputs it used included some of its own projections of future price curves that were presumably intended to supplement if not modify the data provided by Big Rivers and PACE.

Intervenors have gone to the expense of licensing the Ventyx PAR software to replicate Big Rivers’ modeling and test the Big Rivers outputs, but the software is useless without the ACES designed database. The Affidavit of Philip Hayek, consultant to KIUC, and the Affidavit of _____, consultant to Sierra Club, verify that despite Big Rives’ contention that it has supplied all the information it provided to ACES, that information is not in the same format that ACES actually used in the modeling. The Affidavits also verify that it is usual and customary for utilities proposing “least cost” alternatives to be transparent and provide exactly the information that Intervenors seek by this Motion. **(Can we accurately cite KPSC cases?)**

KIUC attempted to remedy this issue through a letter (**email?**) sent to Big Rivers on May 11, 2012 in which KIUC specifically requested “[t]he input data assumptions, and all supporting documents associated with the development of the input data assumptions” used by ACES as well as “[t]he actual production cost model that ACES used, as well as all input files that went to

Comment [J1]: Note that in this case, the PSC has already chided Big Rivers as to transparency in its preliminary order denying KIUC’s motion to dismiss.

Comment [J2]: AG’s office did a quick search, but could not identify a specific case. However, KIUC or SC more routinely requests this data, so we defer to your research/citations on this point.

the model at the time the runs were performed.”⁴ KIUC also proposed another solution under which KIUC’s consultants would travel to ACES’ office and work directly with ACES staff to make data changes to KIUC’s input files to then perform KIUC’s production cost runs, but Big River’s refused to accommodate this approach as well.

In addition to informal attempts to procure the data, a number of questions in KIUC’s first set of discovery requests filed May 22, 2012 were sufficiently broad to have warranted the production of the Big Rivers-specific data used by ACES in its production cost modeling. See, KIUC 1-4, KIUC 1-20, KIUC 1-21 and KIUC 1-22.

The impasse has occurred because Intervenors cannot run the Ventyx model and therefore assure the integrity of Big Rivers conclusions without the ACES database; and Big Rivers says it does not have the ACES database and will not request ACES to produce it. In the June 4, 2012 conference call ACES took the position that the specific files sought were the proprietary work product of ACES and that ACES was not obligated to provide the information in the specific format that KIUC requested. Intervenors respectively submit that this response requires action by the Commission.

Big Rivers’ refusal to provide the ACES database of Big Rivers-specific inputs in the format used in its production cost modeling prevents both Intervenors and the Commission from being able to verify the results of the ACES production cost modeling that Big Rivers’ Application is based upon. Big Rivers has suggested that the information it has provided should be sufficient to approximate the results produced by ACES. Even if true, it is an unnecessary burden for Intervenors to have to expend an undeterminable amount of work in the interest of reproducing identically what ACES has already created.

⁴ The May 11, 2012 Letter (email?) is Attached.

Even if Intervenors could perform that work and were willing to do so, there would be no assurance that identical results would be produced. In modeling efforts such as this, the modeler sets inputs, sometimes referred to as run control switches, that determine the output. Intervenors would have no idea how those switches or any other similar types of switches were set by ACES modelers without the database. Thus, without the specific input files from ACES, it would be only by chance that Intervenors could reproduce ACES' results identically.

Further, even if Intervenors or Staff were to obtain a license of the production cost modeling software used by ACES, there is insufficient time to recreate the PAR model input files in the exact way that ACES already constructed them, to enable the Intervenors to replicate the ACES results which is a necessary starting point for Intervenors' work. KRS 278.183 provides that a hearing must be conducted within six months after an application is filed. Because of time limitations imposed by statute, it is critical that Big Rivers provide the information necessary for parties to verify the production cost modeling results presented in Big Rivers' Application.

Without a method by which to verify the accuracy of the information presented in Big Rivers' Application within the time constraints imposed by law, the Commission cannot make a final determination with certainty regarding whether Big Rivers' Application satisfies the requirements of KRS 278.183 or KRS 278.020. KRS 278.183 requires the Commission to determine whether an environmental compliance plan and rate surcharge are "reasonable and cost-effective" for compliance with certain environmental requirements. Additionally, KRS 278.020 requires the Commission to determine whether "public convenience and necessity require" projects proposed in Big Rivers' Application. The Commission should not proceed to determine whether Big Rivers' Application meets these standards without an examination of the accuracy of the modeling results that form the basis for Big Rivers' Application.

KIUC has previously voiced its concern regarding Big Rivers' failure to produce a witness to provide information regarding the assumptions used by ACES in its production cost modeling.⁵ The continued lack of critical data necessary to this case is a result of Big Rivers' failure to provide such a witness. Intervenors recognize that the ACES information requested in this Motion may need to be treated as confidential, and agrees to such treatment, but such information is vital to the Commission's ultimate determinations in this case and cannot be withheld.

WHEREFORE, Intervenors respectfully requests that the Commission enter an Order requiring Big Rivers to request the database of Big Rivers-specific data used by ACES in its production cost modeling and to provide that database to the parties in this proceeding or, in the alternative, to issue a subpoena duces tecum to obtain the information directly from ACES.

Respectfully submitted,

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Kurt J. Boehm, Esq.
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**COUNSEL FOR KENTUCKY INDUSTRIAL
UTILITY CUSTOMERS, INC.**

David C. Brown, Esq.
STITES & HARBISON

⁵ KIUC Motion to Dismiss filed April 23, 2012.

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PRODUCTS CORPORATION**

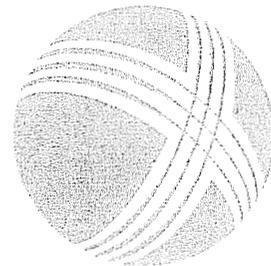
(OTHER SIGNATORIES)

June 8, 2012

KWalton

 **KIUC Motion for Extension & Informal Conf..pdf**
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xerox



BOEHM, KURTZ & LOWRY

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Via Overnight Mail

July 11, 2012

Mr. Jeff Derouen, Executive Director
Kentucky Public Service Commission
211 Sower Boulevard
Frankfort, Kentucky 40602

Re: Case No. 2012-00063

Dear Mr. Derouen:

Please find enclosed the original and ten (10) copies of KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.'s MOTION FOR EXTENSION OF TIME AND REQUEST FOR INFORMAL CONFERENCE for filing in the above-referenced matter.

By copy of this letter, all parties listed on the Certificate of Service have been served. Please place these documents of file.

Very Truly Yours,



Michael L. Kurtz, Esq.

Kurt J. Boehm, Esq.

BOEHM, KURTZ & LOWRY

MLKkew
Attachment

cc: Certificate of Service
Quang Nyugen, Esq.
Faith Burns, Esq.
Larry Cook, Esq.
Matt James, Esq.
David C. Brown, Esq.

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing was served by electronic mail (when available) and by mailing a true and correct copy by regular, U.S. Mail, unless other noted, this 11th day of July, 2012 to the following



Michael L. Kurtz, Esq.
Kurt J. Boehm, Esq.

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CHRISTOPHER KIN LEUNG
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OWENSBORO, KENTUCKY 42302-0727

**COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION**

IN THE MATTER OF THE:)	
)	
APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR APPROVAL OF ITS 2012 ENVIRONMENTAL COMPLIANCE PLAN, FOR APPROVAL OF ITS AMENDED ENVIRONMENTAL COST RECOVERY SURCHARGE TARIFF, FOR CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY, AND FOR AUTHORITY TO ESTABLISH A REGULATORY ACCOUNT	)	CASE NO. 2012-00063

**MOTION FOR EXTENSION OF TIME
AND REQUEST FOR INFORMAL CONFERENCE OF
KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.**

Kentucky Industrial Utility Customers, Inc. (“KIUC”) respectfully moves the Commission for an order extending the deadline for Intervenor testimony in this proceeding. Currently, the testimony of Intervenors is due July 18, 2012. KIUC requests that the Commission extend the deadline for Intervenor testimony to July 25, 2012.

As the Commission is aware, KIUC faced discovery issues related to obtaining certain information from ACES Power Marketing (“ACES”) in this proceeding.¹ This information is necessary to reproduce the modeling results used to support Big Rivers Electric Corporation’s (“Big Rivers”) Application. Although the parties have taken steps to resolve this issue and ACES has delivered some of the necessary information to KIUC, other critical information from ACES was either missing or was delivered in a form that has been difficult to analyze. For example:

- Once ACES and Big Rivers agreed that Ventyx would strip down ACES' large multi-client database to a database containing only Big Rivers' data, it had been KIUC's understanding that it would receive a fully functioning, validated database that could be relied on to accurately reproduce all of Big Rivers' cases. Instead, the database KIUC received was neither entirely functioning nor validated. When KIUC's consultant received the data and

¹ See Joint Motion to Compel (June 6, 2012).

performed his own tests of the database he found that many of the cases would not run because there were errors. The problems were relatively minor and are correctible, but correcting these problems took valuable time, which is why KIUC requested Big Rivers to include a validation step as part of the process to strip down the data.

- Since receiving the ACES database, KIUC has found that there were still excel spreadsheets that are used to process output data that had not been provided. Apparently those files were not provided because they were deleted by ACES, but without even providing an example, KIUC had no way to know how certain data produced by the PaR model was processed and input into the financial model.
- Given the numerous models that were used by different consultants and Big Rivers itself, the documentation of the files and naming conventions has been very limited, which has required additional time to ensure the proper files are matched up.
- There is a question as to whether the results that were first produced and supplied by Ventyx match up closely enough to those results that were originally produced by ACES. The results are clearly different, yet ACES and Big Rivers believe that when they are evaluated over a 15 year period, the results are close enough. ACES and Big Rivers may ultimately be correct, but this is an unexpected issue that KIUC must spend additional time to evaluate. Consequently, KIUC's experts need additional time to properly reproduce the modeling results used to support Big Rivers' Application, and to potentially revise Big Rivers' analyses.

There is good cause for the Commission to grant KIUC's Motion for Extension. KIUC has actively worked to get the necessary ACES information as quickly as possible and has tried to avoid unnecessarily delaying the resolution of this case. In addition, KIUC's request to extend the deadline for Intervenor testimony will allow KIUC to conduct a thorough analysis of the modeling results used to support Big Rivers' Application in this proceeding. A thorough analysis of these modeling results can provide the Commission valuable insight in its review of Big Rivers' Application.

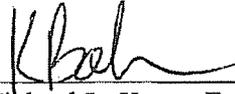
Pursuant to KIUC's Motion for Extension, the Commission should adopt the following revised procedural schedule:

July 25, 2012	Intervenor testimony due
July 27, 2012	Data requests to Intervenors
August 6, 2012	Intervenor responses to data requests
August 14, 2012	Big Rivers' Rebuttal testimony
August 22, 2012	Hearing at 10:00 a.m.

KIUC also respectfully requests that the Commission schedule an Informal Conference for Thursday, July 12, 2012 to discuss the issues related to this Motion.

Due to the short timeframe involved in this proceeding, KIUC requests a decision on this Motion by Friday, July 13, 2012.

Respectfully submitted,



Michael L. Kurtz, Esq.

Kurt J. Boehm, Esq.

BOEHM, KURTZ & LOWRY

36 East Seventh Street, Suite 1510

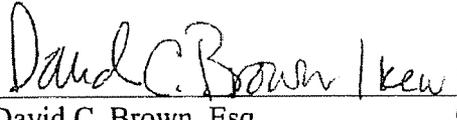
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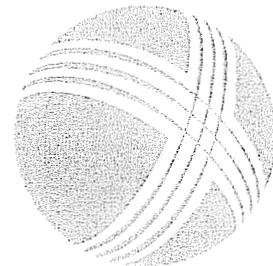
**CO-COUNSEL FOR ALCAN PRIMARY PRODUCTS
CORPORATION**

July 11, 2012

KWalton

 **KIUC 3rd Set of Data Requests, #2012-00063.pd**
 **08/17/12 11:58 AM**

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BOEHM, KURTZ & LOWRY

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TELEPHONE (513) 421-2255
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Via Overnight Mail

June 27, 2012

Mr. Jeff Derouen, Executive Director
Kentucky Public Service Commission
211 Sower Boulevard
Frankfort, Kentucky 40602

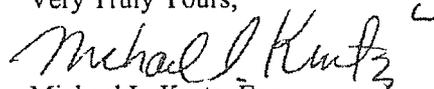
Re: Case No. 2012-00063

Dear Mr. Derouen:

Please find enclosed the original and ten (10) copies of KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.'s THIRD SET OF DATA REQUESTS TO BIG RIVERS ELECTRIC CORPORATION for filing in the above-referenced matter.

By copy of this letter, all parties listed on the Certificate of Service have been served. Please place these documents of file.

Very Truly Yours,



Michael L. Kurtz, Esq.

Kurt J. Boehm, Esq.

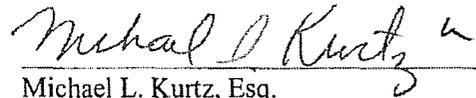
BOEHM, KURTZ & LOWRY

MLKkew
Attachment

cc: Certificate of Service
Quang Nyugen, Esq.
Faith Burns, Esq.
Larry Cook, Esq.
Matt James, Esq.
David C. Brown, Esq.

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing was served by electronic mail (when available) and by mailing a true and correct copy by regular, U.S. Mail, unless other noted, this 27th day of June, 2012 to the following



Michael L. Kurtz, Esq.
Kurt J. Boehm, Esq.

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SAN FRANCISCO, CA 94105

**COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION**

IN THE MATTER OF:

APPLICATION OF BIG RIVERS ELECTRIC	)	CASE NO. 2012-00063
CORPORATION FOR APPROVAL OF ITS)	
2012 ENVIRONMENTAL COMPLIANCE)	
PLAN, FOR APPROVAL OF ITS AMENDED)	
ENVIRONMENTAL COST RECOVERY)	
SURCHARGE TARIFF, FOR CERTIFICATES)	
OF PUBLIC CONVENIENCE AND)	
NECESSITY, AND FOR AUTHORITY TO)	
ESTABLISH A REGULATORY ACCOUNT)	

**KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.'s
THIRD SET OF DATA REQUESTS TO
BIG RIVERS ELECTRIC CORPORATION**

Dated: June 27, 2012

DEFINITIONS

1. "Document(s)" is used in its customary broad sense and includes electronic mail and all written, typed, printed, electronic, computerized, recorded or graphic statements, memoranda, reports, communications or other matter, however produced or reproduced, and whether or not now in existence, or in your possession.
2. "Study" means any written, recorded, transcribed, taped, filmed, or graphic matter, however produced or reproduced, either formally or informally, a particular issue or situation, in whatever detail, whether or not the consideration of the issue or situation is in a preliminary stage, and whether or not the consideration was discontinued prior to completion whether preliminary or final, and whether or not referred to in Big Rivers' direct testimony.
3. If any document requested herein was at one time in existence, but has been lost, discarded or destroyed, identify such document as completely as possible, including the type of document, its date, the date or approximate date it was lost, discarded or destroyed, the identity of the person (s) who last had possession of the document and the identity of all persons having knowledge of the contents thereof.
4. "Person" means any natural person, corporation, professional corporation, partnership, association, joint venture, proprietorship, firm, or the other business enterprise or legal entity.
5. A request to identify a natural person means to state his or her full name and residence address, his or her present last known position and business affiliation at the time in question.
6. A request to identify a document means to state the date or dates, author or originator, subject matter, all addressees and recipients, type of document (e.g., letter, memorandum, telegram, chart, etc.), number of code number thereof or other means of identifying it, and its present location and custodian. If any such document was, but is no longer in the Company's possession or subject to its control, state what disposition was made of it.
7. A request to identify a person other than a natural person means to state its full name, the address of its principal office, and the type of entity.
8. "And" and "or" should be considered to be both conjunctive and disjunctive, unless specifically stated otherwise.
9. "Each" and "any" should be considered to be both singular and plural, unless specifically stated otherwise.
10. Words in the past tense should be considered to include the present, and words in the present tense include the past, unless specifically stated otherwise.
11. "You" or "your" means the person whose filed testimony is the subject of these interrogatories and, to the extent relevant and necessary to provide full and complete answers to any request, "you" or "your" may be deemed to include any person with information relevant to any interrogatory who is or was employed by or otherwise associated with the witness or who assisted, in any way, in the preparation of the witness' testimony.
12. "BREC" means Big Rivers Electric Corporation and/or any of their officers, directors, employees, or agents who may have knowledge of the particular matter addressed.

INSTRUCTIONS

1. If any matter is evidenced by, referenced to, reflected by, represented by, or recorded in any document, please identify and produce for discovery and inspection each such document.
2. These interrogatories are continuing in nature, and information which the responding party later becomes aware of, or has access to, and which is responsive to any request is to be made available to Kentucky Industrial Utility Customers. Any studies, documents, or other subject matter not yet completed that will be relied upon during the course of this case should be so identified and provided as soon as they are completed. The Respondent is obliged to change, supplement and correct all answers to interrogatories to conform to available information, including such information as it first becomes available to the Respondent after the answers hereto are served.
3. Unless otherwise expressly provided, each interrogatory should be construed independently and not with reference to any other interrogatory herein for purpose of limitation.
4. The answers provided should first restate the question asked and also identify the person(s) supplying the information.
5. Please answer each designated part of each information request separately. If you do not have complete information with respect to any interrogatory, so state and give as much information as you do have with respect to the matter inquired about, and identify each person whom you believe may have additional information with respect thereto.
6. In the case of multiple witnesses, each interrogatory should be considered to apply to each witness who will testify to the information requested. Where copies of testimony, transcripts or depositions are requested, each witness should respond individually to the information request.
7. The interrogatories are to be answered under oath by the witness(es) responsible for the answer.
8. Responses to requests for revenue, expense and rate base data should provide data on the basis of Total Company as well as Intrastate data, unless otherwise requested.

**THIRD SET OF DATA REQUESTS OF
KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.
BIG RIVERS ELECTRIC CORPORATION
Case No. 2012-00063**

- Q3.1 Please explain the reason why the following inputs were selected/set using the values that ACES selected and entered in the PAR Model Execution Run Definition Screen and the Simulation Setting screen. Reliance on defaults is also a selection of an input, so please also explain why the default was selected.
- a. Iterations (run definition screen)
 - b. Dispatch (simulation setting screen)
 - c. Monte Carlo (simulation setting screen)
 - d. Draws per week (simulation setting screen)
- Q3.2 Does Big Rivers or ACES admit or deny that the results that were produced by ACES on ACES' computer (using its large database) were different than the results that Ventyx produced on its computer using the "stripped down" database by more than a usual amount associated with rounding, when considered on a monthly or an annual basis?
- Q3.3 One reason for the discrepancy discussed in the prior question could be due to the possibility that the order units have been placed in the databases may not be the same in both databases. This can be checked by comparing the Prosym text files (ex .DAT files) that the EPM Tool writes to disk before submitting runs. Could ACES check this, or alternatively, please produce and supply the .dat files for each of the 6 runs that ACES developed and that were reported in Mr. Hite's testimony?
- Q3.4 The Big River's database has several Transmission Areas. Please explain what all of the transmission areas are used for, and in the case that some areas are not used, please explain why those areas were included in the database.
- Q3.5 Please explain why Big Rivers relied on a single estimate of fuel costs, market prices, allowance prices, etc as support for its application to the Commission. Why didn't it include in its application additional analyses/support based on conducting any sensitivity cases?
- Q3.6 In each PCM file that Big Rivers supplied that are related to the Corporate Financial Models, there are rows at the bottom of the following Monthly Sources and Uses and the Annual Sources and Uses worktabs that have been either pasted in or refer to spreadsheets that still have not been supplied. Please provide the workpapers in electronic format, with all spreadsheets active, that were used to create the pasted in values on the Monthly Sources and Uses and the Annual Sources and Uses worktab for

every financial model/PCM file already supplied. Or provide the spreadsheets that were referenced on those worktabs that have not been supplied (Example, the base case has pasted in values, and the Build ACES Prices Sensitivity case that ACES ran in its test of the Ventyx data (Big Rivers 2012-2026 (CSAPR-MATS by equip) APM energy (5-8-12).xlsx) referenced external spreadsheets. Again, please check all of the PCM files and supply the requested information.

- Q3.7 Recently, ACES supplied another excel spreadsheet that was used as an intermediary file to format results that are incorporated into the PCM files that are then used by the Corporate Financial models. The file supplied was a 42 MB pivot table. Are any other such intermediary files used that have not been supplied? For example, were any other pivot table processing files used associated with any of the other PCM worktabs such as the Monthly/Annual Sources and Uses worktabs, or the Monthly/Annual Resources Report? If there were please supply those. If not please explain the process that was used to enter data into the necessary format required by the PCM file from the PAR model output.
- Q3.8 For each of the PCM spreadsheet worktabs that contain PAR model output results (ex Monthly Sources and Uses), please identify the names of the PAR model presets that ACES used to create the data that went into the worktab.
- Q3.9 Please supply all workpapers associated with the development of all unit characteristics modeled in the PAR model for each generating unit. If none exist, please explain how the unit characteristics were derived. Please supply this electronically, with all formulas included.
- Q3.10 Please provide all workpapers for the derivation of the emergency power price used in the database. If none exist, please explain how the price was derived. Please supply this electronically, with all formulas included.
- Q3.11 Please provide all workpapers for the derivation of the transmission limit that was used between Big Rivers and the markets that were modeled in the database. If none exist, please explain how the transmission limit was derived. Please supply this electronically, with all formulas included.
- Q3.12 ACES supplied approximately 15 sensitivity cases other than the cases that were incorporated in analyses that were used in Mr. Hite's testimony. Please identify which of the cases included ACES own market price forecasts (as opposed to PACE Globals), and provide all analyses used to develop those forecasts (both inputs and outputs) electronically, with all formulas included. Also, indicate what allowance prices SO₂, CO₂, NO_x, Hg were assumed in the analysis, if in fact these costs were included.
- Q3.13 If CO₂ costs were not used in the analysis discussed in the prior question, please discuss why not.

Respectfully submitted,



Michael L. Kurtz, Esq.

BOEHM, KURTZ & LOWRY

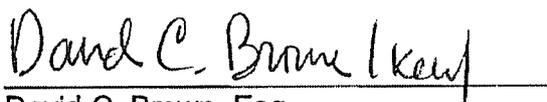
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**COUNSEL FOR KENTUCKY INDUSTRIAL UTILITY
CUSTOMERS, INC.**



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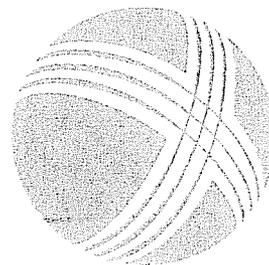
**CO-COUNSEL FOR ALCAN PRIMARY PRODUCTS
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June 27, 2012

KWalton

 **KIUC 1st Set DR to Sierra Club.pdf**
 **08/17/12 11:58 AM**

xerox



BOEHM, KURTZ & LOWRY

**ATTORNEYS AT LAW
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TELEPHONE (513) 421-2255
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Via Overnight Mail

July 30, 2012

Mr. Jeff Derouen, Executive Director
Kentucky Public Service Commission
211 Sower Boulevard
Frankfort, Kentucky 40602

Re: Case No. 2012-00063

Dear Mr. Derouen:

Please find enclosed the original and ten (10) copies of KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.'s FIRST SET OF DATA REQUESTS TO SIERRA CLUB for filing in the above-referenced matter.

By copy of this letter, all parties listed on the Certificate of Service have been served. Please place these documents of file.

Very Truly Yours,



Michael L. Kurtz, Esq.

Kurt J. Boehm, Esq.

BOEHM, KURTZ & LOWRY

MLKkew

Attachment

cc: Certificate of Service
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Faith Burns, Esq.
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Matt James, Esq.
David C. Brown, Esq.

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Michael L. Kurtz, Esq.
Kurt J. Boehm, Esq.

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HONORABLE JAMES M MILLER
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OWENSBORO, KENTUCKY 42302-0727

SHANNON FISK, ESQ/
CHRISTOPHER LEUNG, ESQ.
EARTHJUSTICE
NATURAL RESOURCES DEFENSE COUNCIL
156 WILLIAM STREET, SUITE 800
NEW YORK, NEW YORK 10038

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF:

APPLICATION OF BIG RIVERS ELECTRIC)	CASE NO. 2012-00063
CORPORATION FOR APPROVAL OF ITS)	
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PLAN, FOR APPROVAL OF ITS AMENDED)	
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ESTABLISH A REGULATORY ACCOUNT)	

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.'s
FIRST SET OF DATA REQUESTS TO
SIERRA CLUB

Dated: July 30, 2012

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3. If any document requested herein was at one time in existence, but has been lost, discarded or destroyed, identify such document as completely as possible, including the type of document, its date, the date or approximate date it was lost, discarded or destroyed, the identity of the person (s) who last had possession of the document and the identity of all persons having knowledge of the contents thereof.
4. "Person" means any natural person, corporation, professional corporation, partnership, association, joint venture, proprietorship, firm, or the other business enterprise or legal entity.
5. A request to identify a natural person means to state his or her full name and residence address, his or her present last known position and business affiliation at the time in question.
6. A request to identify a document means to state the date or dates, author or originator, subject matter, all addressees and recipients, type of document (e.g., letter, memorandum, telegram, chart, etc.), number of code number thereof or other means of identifying it, and its present location and custodian. If any such document was, but is no longer in the Company's possession or subject to its control, state what disposition was made of it.
7. A request to identify a person other than a natural person means to state its full name, the address of its principal office, and the type of entity.
8. "And" and "or" should be considered to be both conjunctive and disjunctive, unless specifically stated otherwise.
9. "Each" and "any" should be considered to be both singular and plural, unless specifically stated otherwise.
10. Words in the past tense should be considered to include the present, and words in the present tense include the past, unless specifically stated otherwise.
11. "You" or "your" means the person whose filed testimony is the subject of these interrogatories and, to the extent relevant and necessary to provide full and complete answers to any request, "you" or "your" may be deemed to include any person with information relevant to any interrogatory who is or was employed by or otherwise associated with the witness or who assisted, in any way, in the preparation of the witness' testimony.
12. "Sierra Club" means Sierra Club and/or any of their officers, directors, employees, or agents who may have knowledge of the particular matter addressed.

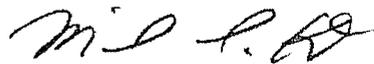
INSTRUCTIONS

1. If any matter is evidenced by, referenced to, reflected by, represented by, or recorded in any document, please identify and produce for discovery and inspection each such document.
2. These interrogatories are continuing in nature, and information which the responding party later becomes aware of, or has access to, and which is responsive to any request is to be made available to Kentucky Industrial Utility Customers. Any studies, documents, or other subject matter not yet completed that will be relied upon during the course of this case should be so identified and provided as soon as they are completed. The Respondent is obliged to change, supplement and correct all answers to interrogatories to conform to available information, including such information as it first becomes available to the Respondent after the answers hereto are served.
3. Unless otherwise expressly provided, each interrogatory should be construed independently and not with reference to any other interrogatory herein for purpose of limitation.
4. The answers provided should first restate the question asked and also identify the person(s) supplying the information.
5. Please answer each designated part of each information request separately. If you do not have complete information with respect to any interrogatory, so state and give as much information as you do have with respect to the matter inquired about, and identify each person whom you believe may have additional information with respect thereto.
6. In the case of multiple witnesses, each interrogatory should be considered to apply to each witness who will testify to the information requested. Where copies of testimony, transcripts or depositions are requested, each witness should respond individually to the information request.
7. The interrogatories are to be answered under oath by the witness(es) responsible for the answer.
8. Responses to requests for revenue, expense and rate base data should provide data on the basis of Total Company as well as Intrastate data, unless otherwise requested.

**FIRST SET OF DATA REQUESTS OF
KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC. TO
SIERRA CLUB
Case No. 2012-00063**

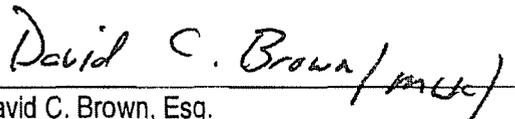
Q1.1. Please provide all spreadsheets, models and workpapers, with all formulas intact, and all referenced spreadsheets included, that were used in the development of the results presented in Ms. Wilson's Tables 1 and 12 of her testimony. This should include the cash flow models that were used, as discussed on page 31 of Ms. Wilson's testimony.

Respectfully submitted,



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CUSTOMERS, INC.**



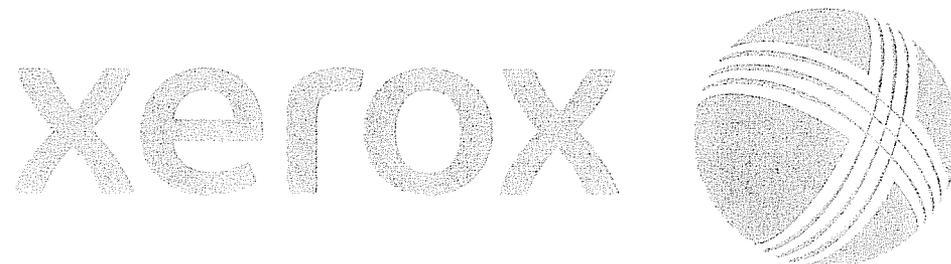
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**CO-COUNSEL FOR ALCAN PRIMARY PRODUCTS
CORPORATION**

July 30, 2012

KWalton

 **Joint Motion to Stay Procedural Schedule.pdf**
 **08/17/12 11:58 AM**



**COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION**

IN THE MATTER OF THE:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR APPROVAL OF ITS 2012 ENVIRONMENTAL COMPLIANCE PLAN, FOR APPROVAL OF ITS AMENDED ENVIRONMENTAL COST RECOVERY SURCHARGE TARIFF, FOR CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY, AND FOR AUTHORITY TO ESTABLISH A REGULATORY ACCOUNT)	CASE NO. 2012-00063
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JOINT MOTION TO STAY PROCEDURAL SCHEDULE

Kentucky Industrial Utility Customers, Inc. (“KIUC”), Ben Taylor and Sierra Club and the Attorney General (collectively, “Intervenors”) hereby move the Kentucky Public Service Commission (“Commission”) to enter an Order staying the procedural schedule in this docket until such time that Big Rivers Electric Corporation (“Big Rivers”) provides a full response to the Intervenors’ initial sets of information requests. Specifically, Intervenors move that all supplemental requests for information to Big Rivers be due twelve days after Big Rivers has completed its responses to initial information requests. All subsequent dates in the procedural schedule should be rescheduled accordingly. This request is necessitated by the fact that Big Rivers has failed to provide the database used in the production cost modeling that the company used to support its Application, and that some of the files produced by Big Rivers in response to discovery from KIUC were corrupted. While Intervenors are attempting to expeditiously resolve these matters with Big Rivers, these matters will not be resolved in time to provide Intervenors with a fair opportunity to submit supplementary data requests unless a stay is granted.

MEMORANDUM IN SUPPORT

The procedural schedule set forth in the Commission's April 30, 2012 Order provides that Big Rivers shall file responses to initial requests for information no later than June 1, 2012. The Commission's Order gives Intervenors twelve days after receiving Big Rivers' responses to their initial information requests before the second set of information requests to Big Rivers are due on June 13, 2012. Unfortunately, Big Rivers failed to provide complete responses to the Intervenors initial requests on June 1, and has not provided full responses as of this filing.

As set forth in the Intervenors' Joint Motion to Compel filed on June 6, 2012, the Intervenors seek production of the database and input files that ACES developed and fed into the production cost modeling upon which Big Rivers' April 2, 2012 Application is based. The Commission should not proceed to determine whether Big Rivers' Application is reasonable and cost-effective without an examination of the accuracy of the modeling results that form the basis for Big Rivers' Application for an Environmental Cost Recovery Surcharge Tariff. The database and input files used by ACES were not provided as part of Big Rivers' responses to initial information requests on June 1, 2012.

Since June 1, 2012 Intervenors have diligently tried to obtain this information from Big Rivers through both informal communications and through the Joint Motion to Compel filed on June 6, 2012. Big Rivers' Response to the Joint Motion to Compel sets out a proposed course of action for the Intervenors to obtain this information, but there are several conditions that need to be worked out between Big Rivers and Intervenors before that process can move forward (See Big Rivers' Response pp. 5-6). Additionally, Big Rivers' proposed plan to provide the requested information is to "strip down" the ACES database of non-Big Rivers data before it is provided

to the Intervenors and to have the Intervenors pay the cost of this process.¹ (Big Rivers' Response p. 6). If Big Rivers/ACES had not used a database that contains non-Big Rivers information there would be no need for the time-consuming step of purging this information from the database prior to providing it to the Intervenors.

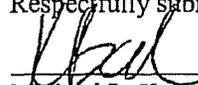
KIUC has also discovered that there are several files in the CDs provided by Big Rivers in response to KIUC's First Set of Data Requests that are missing and/or corrupted. KIUC is working informally with Big Rivers to rectify this problem. However, it is unlikely that correct and valid files will be provided in time for Intervenors to prepare supplemental information requests prior to June 13, 2012.

In sum, it is clear from Big Rivers' Response to the Joint Motion to Compel that obtaining the requested information will require a process of undetermined duration and will certainly not be concluded by June 13, 2012 when supplemental information requests are due. Intervenors should not be required to submit supplemental information requests before they have received a response to their initial information requests when the delay in providing a complete response is due to factors in Big Rivers' control and was not the fault of the Intervenors. To do so would greatly prejudice the Intervenors and would contravene the intent of the Commission's April 30, 2012 Order which contemplates that the Intervenors be afforded the opportunity to examine Big Rivers' responses to initial data responses prior to submitting supplemental responses.

¹ The Intervenors intend to file a Reply to Big Rivers' Response to the Joint Motion to Compel that will, among other things, dispute Big Rivers' proposal that Intervenors must pay the costs of "stripping down" the database of non-Big Rivers data.

WHEREFORE, Intervenor respectfully request that the Commission enter an Order staying the procedural schedule in this docket until such time that Big Rivers provides a full response to the Intervenor's initial set of information requests. The Intervenor requests that all supplemental requests for information to Big Rivers be due twelve days after Big Rivers has completed its responses to initial data requests and that all subsequent due dates in the procedural schedule should be postponed by the same number of days.

Respectfully submitted,



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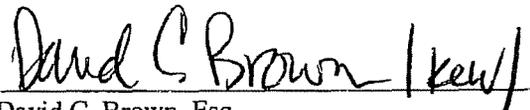
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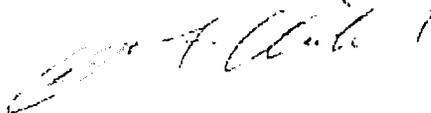
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INTERVENTION OFFICE OF THE ATTORNEY

GENERAL

June 11, 2012

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing was served by electronic mail (when available) and by mailing a true and correct copy by regular, U.S. Mail, unless other noted, this 11th day of June, 2012 to the following



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Kurt J. Boehm, Esq.

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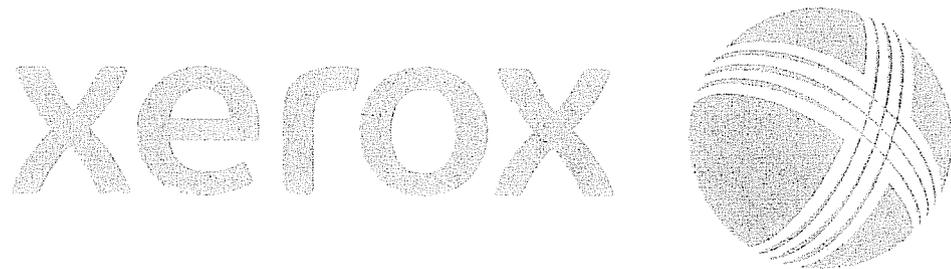
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KWalton

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MEMORANDUM IN SUPPORT

In CPCN proceedings, the Commission, its staff, and intervenors attempt to validate the veracity of an applicant's conclusions. This audit process requires parties to examine key assumptions and analyses of the applicant to determine if they are reasonable, meaning that an auditor could reasonably follow key assumptions and derivations, analysis mechanisms, and conclusions drawn from those analyses. If the assumptions and/or analyses are flawed, then the resulting conclusions are typically not reasonable. In a typical CPCN case involving a retrofit, a reasonable audit should be able to review: (1) the company's estimate (or bid) for their environmental upgrade and the estimate (or bid) for replacement capacity; (2) a logically structured modeling analysis in which the Commission or intervenors may examine both input assumptions and output results; (3) sensitivity analyses that demonstrate robust conclusions, including explicit sensitivity inputs and outputs; (4) a clearly defined analytical framework for comparing the results of model runs; and (5) a justification of the project based on model results.

Transparency on the part of the applicant is an essential element of this audit process. An applicant must disclose information regarding input and output results, the modeling and analytical structure utilized, which sensitivities were used, including inputs and outputs, and how those sensitivities were selected. Without transparency regarding these issues it is impossible for the Commission or any party to verify, much less rely on, the applicant's assumptions and conclusions.

As part of the audit process of this CPCN application, Intervenors propounded specific discovery so that it could either review and verify or reject Big Rivers' analyses and conclusions. However, Big Rivers' responses to such requests for information were obstructive and evasive. Specifically, Big Rivers has failed to require or request ACES to produce the database ACES

designed to run the Ventyx Planning and Risk (“PAR”) model used in its production cost modeling for Big Rivers’ Application. Intervenors submit that such database is plainly relevant to this proceeding, and responsive to their data requests. In addition, the lack of this data would render it impossible for the Commission to determine with certainty whether Big Rivers’ Application meets the standards set forth in KRS 278.020 and KRS 278.183

The essence of this Motion is straightforward: the only acceptable method for Intervenors and the Commission to examine and verify the accuracy and completeness of this Application is to be able to replicate Big Rivers’ modeling and then test the output through sensitivity runs. To do this, it is necessary to have the exact inputs to the modeling carried out by ACES. Otherwise the Commission will be confronted with Big Rivers’ conclusions (apples) and the Intervenors’ conclusions (oranges).

The modeling in this case was a multi-step process involving three parties: Big Rivers, PACE Global (“PACE”) and ACES.¹ PACE Global provided Big Rivers with its projections of forward energy prices, monthly coal prices, monthly natural gas prices and monthly allowance prices. This data, along with Big Rivers’ plant specific data, were supplied to ACES which was contracted to run the production cost model. ACES then took the PACE and Big Rivers’ data it received from Big Rivers and from that information developed a data base or inputs that were fed into the Ventyx Planning and Risk (“PAR”) model that ACES used in its production cost modeling. The ACES production cost model outputs were then sent back to Big Rivers which fed the information into the Big Rivers financial model. Based on these three-tiered modeling analyses, Big Rivers claims that the retrofits it is proposing are the least cost alternative.

¹ Direct Testimony of Mark Hite, pages 7-8

Intervenors' propounded discovery for each of the modeling phases, including the ACES phase. For instance, KIUC 1-21 explicitly states: "Provide copies of all models and spreadsheets developed containing input assumptions and output results. Provide these electronically, with all formulas intact." KIUC First Set of Data Requests to Big Rivers 1-21. In addition, SC 1-53 states:

Refer to p. 7 line 20 to p. 8 line 5 of the testimony of Mark Hite. Identify and produce:

- a. All forward pricing data received from PACE Global for the production cost modeling.
- b. All Big Rivers plant specific data that was supplied to ACES Power Marketing.
- c. Please identify which financial model ACES Power Marketing used, who is the vendor of the model, and whether the model is a proprietary model that requires a license in order to gain access to the files.
- d. Please produce, in machine readable format, all of the production cost modeling (including input and output files) and workpapers used to determine the NPVRR for each scenario generated by ACES Power Marketing
- e. Please identify any changes to the input files that may be required to reproduce the modeling.
- f. If changes are required, please explain why such changes were made.
- g. Please identify the assumptions, including any supporting documentation, Big Rivers or its agents used in each base case and sensitivity scenario that you modeled
- h. If a license is required to obtain access to any information in this request, please explain how Sierra Club could obtain that license or, if they already have a license, who they should provide information to regarding the license to obtain the files.

Ben Taylor and Sierra Club's First Request for Information to Big Rivers at 1-53; *see also*, KIUC First Set of Data Requests to Big Rivers KIUC 1-4, KIUC 1-20, and KIUC 1-22.

Despite the specificity of these requests, Big Rivers and ACES have refused to provide all of the requested information. *See* Big Rivers' Response to KIUC Initial Request for Information; Big Rivers' Response to Sierra Club Initial Request for Information. While it is true that Big Rivers has provided Intervenors all the data that it provided to ACES, Big Rivers has not

produced the database and inputs that ACES created and fed into the production cost model. In fact, Big Rivers has failed to require or request ACES to produce the database because it claims it is not obligated to do so as they are the proprietary work of ACES.. Without such database and inputs, there is no way for the parties or the Commission to recreate the modeling performed by ACES and used by Big Rivers.

ACES is not an unaffiliated entity so there is no reason why Big Rivers should not have required ACES to provide this database. Big Rivers is actually a partial owner of ACES and a member of its Board. See Big Rivers Response to the Staff's Initial Request for Information, Item 1; see also Big Rivers website at <http://www.bigrivers.com/power.aspx>. "As a member of ACES, Big Rivers has an annual bilateral agreement with ACES under which ACES provides a wide array of services to Big Rivers, including the production cost modeling for the multiple scenarios analyzed in the development of this filing." See Big Rivers Response to KIUC Initial Request for Information number 33. It strains credulity for Big Rivers to claim that it cannot obtain the database that ACES used in its production cost modeling. The crux of the issue is that the ACES database and inputs to the Ventyx software are formatted differently than and therefore not the same as the data supplied to ACES by Big Rivers. In addition, in creating the database and inputs from the information provided by Big Rivers, ACES invariably made decisions regarding various factors, often referred to as "switches" or "vectors," that the parties and Commission could only evaluate if the database is produced. For example, in a conference call held on June 4, 2012 among Big Rivers, ACES, Ventyx, KIUC, Sierra Club and the Attorney General's office, ACES representatives suggested that the inputs it used included some of its own projections of future price curves that were presumably intended to supplement if not modify the data provided by Big Rivers and PACE.

Prior to formal discovery, KIUC also attempted to seek this information through a letter sent via email to Big Rivers on May 11, 2012 in which KIUC specifically requested “[t]he input data assumptions, and all supporting documents associated with the development of the input data assumptions” used by ACES as well as “[t]he actual production cost model that ACES used, as well as all input files that went to the model at the time the runs were performed.”² KIUC also proposed another solution under which KIUC’s consultants would travel to ACES’ office and work directly with ACES staff to make data changes to KIUC’s input files to then perform KIUC’s production cost runs, but Big River’s refused to accommodate this approach as well.

In addition to informal attempts to procure the data, as noted above, a number of questions in Intervenors’ first sets of discovery requests filed May 22, 2012 were sufficiently broad to have warranted the production of the Big Rivers-specific data used by ACES in its production cost modeling. See, KIUC Initial Request for Data from Big Rivers at KIUC 1-4, KIUC 1-20, KIUC 1-21, KIUC 1-22, and Ben Taylor and Sierra Club’s Initial Request for Information at 1-53.

KIUC has gone to the expense of licensing the Ventyx PAR software to replicate Big Rivers’ modeling and test the Big Rivers outputs, but the software is useless without the ACES designed database. The impasse has occurred because Intervenors cannot run the Ventyx model and therefore assure the integrity of Big Rivers conclusions without the ACES database; and Big Rivers says it does not have the ACES database and will not request ACES to produce it. In the June 4, 2012 conference call ACES took the position that the specific files sought were the proprietary work product of ACES and that ACES was not obligated to provide the information

² The May 11, 2012 letter is Attached.

in the specific format that Intervenors requested. Intervenors respectfully submit that this response requires action by the Commission.

Big Rivers' refusal to provide the ACES database of Big Rivers-specific inputs in the format used in its production cost modeling prevents both Intervenors and the Commission from being able to verify the results of the ACES production cost modeling that Big Rivers' Application is based upon. Big Rivers has suggested that the information it has provided should be sufficient³ to approximate the results produced by ACES. Even if true, it is an unnecessary burden for Intervenors to have to expend an undeterminable amount of work to attempt to identically reproduce what ACES has already created.

Even if there were adequate time for Intervenors to perform that work, there would be no assurance that identical results would be produced. In modeling efforts such as this, the modeler sets various "switches" or "vectors" that play a significant role in determining the outputs from the modeling exercise. Intervenors would have no idea how those switches or any other similar types of switches were set by ACES modelers without the database. Thus, without the specific input files from ACES, it would be only by chance that Intervenors could reproduce ACES' results identically.⁴

³ Big Rivers has not facilitated that process by providing all of the communications between Big Rivers and ACES reflecting directions to be followed, or assumptions to be applied, answers to questions posed by ACES to Big Rivers about the work. KIUC requested this information, *see* KIUC Initial Request for Information 1-4, and such information would facilitate replication of the ACES work product.

⁴ The importance of such switches or vectors was seen in the recent CPCN proceeding regarding Kentucky Power Company's then-proposed flue gas desulfurization project at the Big Sandy Unit 2 generating plant. Upon evaluating the modeling input database used by KPC, Sierra Club's expert witness in that proceeding discovered that the company had erroneously left on an energy demand vector that overstated demand by 20%. When KPC re-ran the model without that vector on, the results showed that the company's initial modeling had overstated the cost of future energy purchases under various alternatives by \$1 to \$2 billion. See Scott C. Weaver Rebuttal Testimony at 27-28 filed in Docket No. 2011-0401,

Further, even if Intervenors or Staff were to obtain a license of the production cost modeling software used by ACES, there is insufficient time to recreate the PAR model input files in the exact way that ACES already constructed them, to enable the Intervenors to replicate the ACES results, which is a necessary starting point for Intervenors' work. KRS 278.183 provides that a hearing must be conducted within six months after an application is filed. Because of time limitations imposed by statute, it is critical that Big Rivers provide the information necessary for parties to verify the production cost modeling results presented in Big Rivers' Application. Without a method by which to verify the accuracy of the information presented in Big Rivers' Application within the time constraints imposed by law, the Commission cannot make a final determination with certainty regarding whether Big Rivers' Application satisfies the requirements of KRS 278.183 or KRS 278.020. KRS 278.183 requires the Commission to determine whether an environmental compliance plan and rate surcharge are "reasonable and cost-effective" for compliance with certain environmental requirements. Additionally, KRS 278.020 requires the Commission to determine whether "public convenience and necessity require" projects proposed in Big Rivers' Application. The Commission should not proceed to determine whether Big Rivers' Application meets these standards without an examination of the accuracy of the modeling results that form the basis for Big Rivers' Application.

KIUC has previously voiced its concern regarding Big Rivers' failure to produce a witness to provide information regarding the assumptions used by ACES in its production cost modeling.⁵ The continued lack of critical data necessary to this case is a result of Big Rivers' failure to provide such a witness. Intervenors recognize that the ACES information requested in this Motion may need to be treated as confidential, and agrees to such treatment for all

⁵ KIUC Motion to Dismiss filed April 23, 2012.

legitimately confidential information,⁶ but such information is vital to the Commission's ultimate determinations in this case and cannot be withheld.

WHEREFORE, Intervenors respectfully requests that the Commission enter an Order requiring Big Rivers to request the database of Big Rivers-specific data used by ACES in its production cost modeling and to provide that database to the parties in this proceeding or, in the alternative, to issue a subpoena duces tecum to obtain the information directly from ACES.

Respectfully submitted,

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**CO-COUNSEL FOR ALCAN PRIMARY
PRODUCTS CORPORATION**

⁶ On the June 4, 2012 call, Intervenors informed Big Rivers that they were willing to enter into a confidentiality agreement to protect the ACES information. Big Rivers failed to explain why such an agreement would not sufficiently protect ACES' interests.



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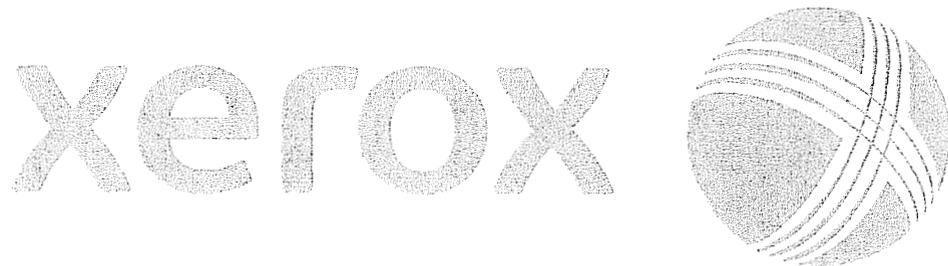
kristin.henry@sierraclub.org

Counsel for Ben Taylor and Sierra Club

June 8, 2012

KWalton

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COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF THE:

APPLICATION OF BIG RIVERS ELECTRIC) CASE NO. 2012-00063
CORPORATION FOR APPROVAL OF ITS)
2012 ENVIRONMENTAL COMPLIANCE)
PLAN, FOR APPROVAL OF ITS AMENDED)
ENVIRONMENTAL COST RECOVERY)
SURCHARGE TARIFF, FOR CERTIFICATES)
OF PUBLIC CONVENIENCE AND)
NECESSITY, AND FOR AUTHORITY TO)
ESTABLISH A REGULATORY ACCOUNT)

JOINT MOTION OF KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.,
BEN TAYLOR AND SIERRA CLUB, AND ATTORNEY GENERAL
TO COMPEL OR, IN THE ALTERNATIVE, TO ISSUE SUBPOENA DUCES TECUM

Kentucky Industrial Utility Customers, Inc. (“KIUC”), Ben Taylor and Sierra Club, and the Attorney General (collectively, “Intervenors”) hereby move the Kentucky Public Service Commission (“Commission”) to enter an Order requiring Big Rivers Electric Corporation (“Big Rivers”) to request and require the production of certain information from its affiliate, ACES Power Marketing (“ACES”), and to provide that information to the parties in this proceeding or, in the alternative, to issue subpoena duces tecum pursuant to KRS 278.320 to require the production of the information directly from ACES. In particular, Intervenors seek production of the data base and input files that ACES developed and fed into the production cost modeling upon which Big Rivers’ April 2, 2012 Application (“Application”) is based. The information Intervenors seek balances the confidentiality concerns of Big Rivers with the minimum requirements of transparency and is necessary to the Commission’s ultimate determination of whether the Application filed by Big Rivers in this case satisfies the standards set forth in KRS 278.020 and 278.183, and to the Intervenors’ ability to fully review and evaluate that Application.

MEMORANDUM IN SUPPORT

In CPCN proceedings, the Commission, its Staff, and intervenors attempt to validate the veracity of an applicant's conclusions. This audit process requires parties to examine key assumptions and analyses of the applicant to determine if they are reasonable, meaning that an auditor could reasonably follow key assumptions and derivations, analysis mechanisms, and conclusions drawn from those analyses. If the assumptions and/or analyses are flawed, then the resulting conclusions are typically not reasonable. In a typical CPCN case involving a retrofit, a reasonable audit should be able to review: (1) the company's estimate (or bid) for their environmental upgrade and the estimate (or bid) for replacement capacity; (2) a logically structured modeling analysis in which the Commission or intervenors may examine both input assumptions and output results; (3) sensitivity analyses that demonstrate robust conclusions, including explicit sensitivity inputs and outputs; (4) a clearly defined analytical framework for comparing the results of model runs; and (5) a justification of the project based on model results.

Transparency on the part of the applicant is an essential element of this audit process. An applicant must disclose information regarding input and output results, the modeling and analytical structure utilized, which sensitivities were used, including inputs and outputs, and how those sensitivities were selected. Without transparency regarding these issues it is impossible for the Commission or any party to verify, much less rely on, the applicant's assumptions and conclusions.

As part of the audit process of this CPCN application, Intervenors propounded specific discovery so that it could either review and verify or reject Big Rivers' analyses and conclusions. However, Big Rivers' responses to such requests for information were obstructive and evasive. Specifically, Big Rivers has failed to require or request ACES to produce the database ACES designed to run the Ventyx Planning and Risk ("PAR") model used in its production cost modeling for Big Rivers' Application. Intervenors submit that such database is plainly relevant to this proceeding, and responsive to their data requests. In addition, the lack of this data would render it impossible for the Commission to determine with certainty whether Big Rivers' Application meets the standards set forth in KRS 278.020 and KRS 278.183.

The essence of this Motion is straightforward: the only acceptable method for Intervenors and the Commission to examine and verify the accuracy and completeness of this Application is to be able to replicate Big Rivers' modeling and then test the output through sensitivity runs. To do this, it is necessary to have the exact inputs to the modeling carried out by ACES. Otherwise the Commission will be confronted with Big Rivers' conclusions (apples) and the Intervenors' conclusions (oranges).

The modeling in this case was a multi-step process involving three parties: Big Rivers, PACE Global ("PACE") and ACES.¹ PACE Global provided Big Rivers with its projections of forward energy prices, monthly coal prices, monthly natural gas prices and monthly allowance prices. This data, along with Big Rivers' plant specific data, were supplied to ACES which was contracted to run the production cost model. ACES then took the PACE and Big Rivers' data and from that information developed a data base or inputs that were fed into the Ventyx Planning and Risk ("PAR") model that ACES used in its production cost modeling. The ACES production cost model outputs were then sent back to Big Rivers which fed the information into the Big Rivers financial model. Based on these three-tiered modeling analyses, Big Rivers claims that the retrofits it is proposing are the least cost alternative.

Intervenors' propounded discovery for each of the modeling phases, including the ACES phase. For instance, KIUC 1-21 explicitly states: "Provide copies of all models and spreadsheets developed containing input assumptions and output results. Provide these electronically, with all formulas intact." KIUC First Set of Data Requests to Big Rivers 1-21. In addition, SC 1-53 states:

Refer to p. 7 line 20 to p. 8 line 5 of the testimony of Mark Hite. Identify and produce:

- a. All forward pricing data received from PACE Global for the production cost modeling.
- b. All Big Rivers plant specific data that was supplied to ACES Power Marketing.
- c. Please identify which financial model ACES Power Marketing used, who is the vendor of the model, and whether the model is a proprietary model that requires a license in order to gain access to the files.
- d. Please produce, in machine readable format, all of the production cost modeling (including input and output files) and workpapers used to determine the NPVRR for each scenario generated by ACES Power Marketing

¹ Direct Testimony of Mark Hite, pages 7-8

- e. Please identify any changes to the input files that may be required to reproduce the modeling.
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- g. Please identify the assumptions, including any supporting documentation, Big Rivers or its agents used in each base case and sensitivity scenario that you modeled
- h. If a license is required to obtain access to any information in this request, please explain how Sierra Club could obtain that license or, if they already have a license, who they should provide information to regarding the license to obtain the files.

Ben Taylor and Sierra Club's First Request for Information to Big Rivers at 1-53; *see also*, KIUC First Set of Data Requests to Big Rivers KIUC 1-4, KIUC 1-20, and KIUC 1-22; Attorney General First Set of Data Requests Item 15.

Despite the specificity of these requests, Big Rivers and ACES have refused to provide all of the requested information. *See* Big Rivers' Response to KIUC Initial Request for Information; Big Rivers' Response to Sierra Club Initial Request for Information. While it is true that Big Rivers has provided Intervenor all the data that it provided to ACES, Big Rivers has not produced the database and inputs that ACES created and fed into the production cost model. In fact, Big Rivers has failed to require or request ACES to produce the database because it claims it is not obligated to do so as they are the proprietary work of ACES. Without such database and inputs, there is no way for the parties or the Commission to recreate the modeling performed by ACES and used by Big Rivers.

ACES is not an unaffiliated entity so there is no reason why Big Rivers should not have required ACES to provide this database. Big Rivers is actually a partial owner of ACES and a member of its Board. *See* Big Rivers Response to the Staff's Initial Request for Information, Item 1; *see also* Big Rivers' website at <http://www.bigrivers.com/power.aspx>. "As a member of ACES, Big Rivers has an annual bilateral agreement with ACES under which ACES provides a wide array of services to Big Rivers, including the production cost modeling for the multiple scenarios analyzed in the development of this filing." *See* Big Rivers Response to KIUC Initial Request for Information number 33. It strains credulity for Big Rivers to claim that it cannot obtain the database that ACES used in its production cost modeling. The crux of the issue is that the ACES database and inputs to the Ventyx software are formatted differently than and therefore not the same as the data supplied to

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ACES by Big Rivers. In addition, in creating the database and inputs from the information provided by Big Rivers, ACES invariably made decisions regarding various factors, often referred to as “switches” or “vectors,” that the parties and Commission could only evaluate if the database is produced. For example, in a conference call held on June 4, 2012 among Big Rivers, ACES, Ventyx, KIUC, Sierra Club and the Attorney General’s office, ACES representatives suggested that the inputs it used included some of its own projections of future market power price curves that were presumably intended to supplement if not modify the market price forecasts provided by PACE.

Prior to formal discovery, KIUC also attempted to seek this information through a letter sent via email to Big Rivers on May 11, 2012 in which KIUC specifically requested “[t]he input data assumptions, and all supporting documents associated with the development of the input data assumptions” used by ACES as well as “[t]he actual production cost model that ACES used, as well as all input files that went to the model at the time the runs were performed.”² KIUC also proposed another solution under which KIUC’s consultants would travel to ACES’ office and work directly with ACES staff to make data changes to KIUC’s input files to then perform KIUC’s production cost runs, but Big River’s refused to accommodate this approach as well.

In addition to informal attempts to procure the data, as noted above, a number of questions in Intervenor’s first sets of discovery requests filed May 22, 2012 were sufficiently broad to have warranted the production of the Big Rivers-specific data used by ACES in its production cost modeling. *See* KIUC Initial Request for Data from Big Rivers at KIUC 1-4, KIUC 1-20, KIUC 1-21, KIUC 1-22; Ben Taylor and Sierra Club’s Initial Request for Information at 1-53; and Attorney General Initial Request 15.

KIUC has gone to the expense of licensing the Ventyx PAR software to replicate Big Rivers’ modeling and test the Big Rivers outputs, but the software is useless without the ACES designed database. The impasse has occurred because Intervenor cannot run the Ventyx model and therefore assure the integrity of Big Rivers’ conclusions without the ACES database; and Big Rivers says it does not have the ACES database and will not request ACES to produce it. In the June 4, 2012 conference call ACES took the position that the specific files

² The May 11, 2012 letter is attached.

sought were the proprietary work product of ACES and that ACES was not obligated to provide the information in the specific format that Intervenors requested. Intervenors respectfully submit that this response requires action by the Commission.

Big Rivers' refusal to provide the ACES database of Big Rivers-specific inputs in the format used in its production cost modeling prevents both Intervenors and the Commission from being able to verify the results of the ACES production cost modeling that Big Rivers' Application is based upon. Big Rivers has suggested that the information it has provided should be sufficient³ to approximate the results produced by ACES. Even if theoretically true, it is an unnecessary burden for Intervenors to have to expend an undeterminable amount of work to attempt to identically reproduce what ACES has already created.

Even if there were adequate time for Intervenors to perform that work, there would be no assurance that identical results would be produced. In modeling efforts such as this, the modeler sets various "switches" or "vectors" that play a significant role in determining the outputs from the modeling exercise. Intervenors would have no idea how those switches or any other similar types of switches were set by ACES modelers without the database. Thus, without the specific input files from ACES, it would be only by chance that Intervenors could reproduce ACES' results identically.⁴

Further, even if Intervenors or Staff were to obtain a license of the production cost modeling software used by ACES, there is insufficient time to recreate the PAR model input files in the exact way that ACES already constructed them to enable the Intervenors to replicate the ACES results, which is a necessary starting point for Intervenors' work. KRS 278.183 provides that a hearing must be conducted within six months after an application is filed. Because of time limitations imposed by statute, it is critical that Big Rivers provide the

³ Big Rivers has not facilitated that process by providing all of the communications between Big Rivers and ACES reflecting directions to be followed, or assumptions to be applied, answers to questions posed by ACES to Big Rivers about the work. KIUC requested this information, *see* KIUC Initial Request for Information 1-4, and such information would facilitate replication of the ACES work product.

⁴ The importance of such switches or vectors was seen in the recent CPCN proceeding regarding Kentucky Power Company's then-proposed flue gas desulfurization project at the Big Sandy Unit 2 generating plant. Upon evaluating the modeling input database used by KPC, Sierra Club's expert witness in that proceeding discovered that the company had erroneously left on an energy demand vector that overstated demand by 20%. When KPC re-ran the model without that vector on, the results showed that the company's initial modeling had overstated the cost of future energy purchases under various alternatives by \$1 to \$2 billion. See Scott C. Weaver Rebuttal Testimony at 27-28 filed in Docket No. 2011-0401.

information necessary for parties to verify the production cost modeling results presented in Big Rivers' Application. Without a method by which to verify the accuracy of the information presented in Big Rivers' Application within the time constraints imposed by law, the Commission cannot make a final determination with certainty regarding whether Big Rivers' Application satisfies the requirements of KRS 278.183 or KRS 278.020. KRS 278.183 requires the Commission to determine whether an environmental compliance plan and rate surcharge are "reasonable and cost-effective" for compliance with certain environmental requirements. Additionally, KRS 278.020 requires the Commission to determine whether "public convenience and necessity require" projects proposed in Big Rivers' Application. The Commission should not proceed to determine whether Big Rivers' Application meets these standards without an examination of the accuracy of the modeling results that form the basis for Big Rivers' Application.

KIUC has previously voiced its concern regarding Big Rivers' failure to produce a witness to provide information regarding the assumptions used by ACES in its production cost modeling.⁵ The continued lack of critical data necessary to this case is a result of Big Rivers' failure to provide such a witness. Intervenors recognize that the ACES information requested in this Motion may need to be treated as confidential, and agrees to such treatment for all legitimately confidential information,⁶ but such information is vital to the Commission's ultimate determinations in this case and cannot be withheld.

⁵ KIUC Motion to Dismiss filed April 23, 2012.

⁶ On the June 4, 2012 call, Intervenors informed Big Rivers that they were willing to enter into a confidentiality agreement to protect the ACES information. Big Rivers failed to explain why such an agreement would not sufficiently protect ACES' interests.

WHEREFORE, Intervenor respectfully requests that the Commission enter an Order requiring Big Rivers to request the database of Big Rivers-specific data used by ACES in its production cost modeling and to provide that database to the parties in this proceeding or, in the alternative, to issue a subpoena duces tecum to obtain the information directly from ACES.

Respectfully submitted,

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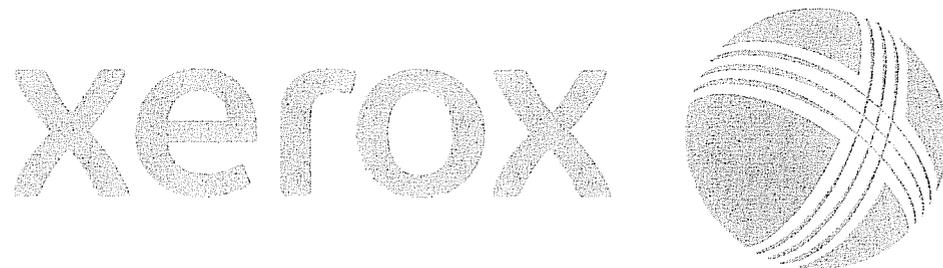
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June 6, 2012

KWalton

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**COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION**

IN THE MATTER OF THE:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR APPROVAL OF ITS 2012 ENVIRONMENTAL COMPLIANCE PLAN, FOR APPROVAL OF ITS AMENDED ENVIRONMENTAL COST RECOVERY SURCHARGE TARIFF, FOR CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY, AND FOR AUTHORITY TO ESTABLISH A REGULATORY ACCOUNT)	CASE NO. 2012-00063
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**JOINT MOTION OF KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.,
SIERRA CLUB AND ATTORNEY GENERAL
TO COMPEL OR, IN THE ALTERNATIVE, TO ISSUE SUBPOENA DUCES TECUM**

Kentucky Industrial Utility Customers, Inc. (“KIUC”), Ben Taylor and Sierra Club and the Attorney General (collectively, “Intervenors”) hereby move the Kentucky Public Service Commission (“Commission”) to enter an Order requiring Big Rivers Electric Corporation (“Big Rivers”) to request and require the production of certain information from its affiliate, ACES Power Marketing (“ACES”), and to provide that information to the parties in this proceeding or, in the alternative, to issue subpoena duces tecum pursuant to KRS 278.320 to require the production of the information directly from ACES. In particular, Intervenors seek production of the data base and input files that ACES developed and fed into the production cost modeling upon which Big Rivers’ April 2, 2012 Application (“Application”) is based. The information Intervenors seek balances the confidentiality concerns of Big Rivers with the minimum requirements of transparency and is necessary to the Commission’s ultimate determination of whether the Application filed by Big Rivers in this case satisfies the standards set forth in KRS 278.020 and 278.183, and to the Intervenors’ ability to fully review and evaluate that Application.

MEMORANDUM IN SUPPORT

In CPCN proceedings, the Commission, its Staff, and intervenors attempt to validate the veracity of an applicant's conclusions. This audit process requires parties to examine key assumptions and analyses of the applicant to determine if they are reasonable, meaning that an auditor could reasonably follow key assumptions and derivations, analysis mechanisms, and conclusions drawn from those analyses. If the assumptions and/or analyses are flawed, then the resulting conclusions are typically not reasonable. In a typical CPCN case involving a retrofit, a reasonable audit should be able to review: (1) the company's estimate (or bid) for their environmental upgrade and the estimate (or bid) for replacement capacity; (2) a logically structured modeling analysis in which the Commission or intervenors may examine both input assumptions and output results; (3) sensitivity analyses that demonstrate robust conclusions, including explicit sensitivity inputs and outputs; (4) a clearly defined analytical framework for comparing the results of model runs; and (5) a justification of the project based on model results.

Transparency on the part of the applicant is an essential element of this audit process. An applicant must disclose information regarding input and output results, the modeling and analytical structure utilized, which sensitivities were used, including inputs and outputs, and how those sensitivities were selected. Without transparency regarding these issues it is impossible for the Commission or any party to verify, much less rely on, the applicant's assumptions and conclusions.

As part of the audit process of this CPCN application, Intervenors propounded specific discovery so that it could either review and verify or reject Big Rivers' analyses and conclusions. However, Big Rivers' responses to such requests for information were obstructive and evasive. Specifically, Big Rivers has failed to require or request ACES to produce the database ACES designed to run the Ventyx Planning and Risk ("PAR") model used in its production cost modeling for Big Rivers' Application. Intervenors submit that such database is plainly relevant to this proceeding, and responsive to their data requests. In addition, the lack of this data would render it impossible for the Commission to determine with certainty whether Big Rivers' Application meets the standards set forth in KRS 278.020 and KRS 278.183

The essence of this Motion is straightforward: the only acceptable method for Intervenors and the Commission to examine and verify the accuracy and completeness of this Application is to be able to replicate Big Rivers' modeling and then test the output through sensitivity runs. To do this, it is necessary to have the exact inputs to the modeling carried out by ACES. Otherwise the Commission will be confronted with Big Rivers' conclusions (apples) and the Intervenors' conclusions (oranges).

The modeling in this case was a multi-step process involving three parties: Big Rivers, PACE Global ("PACE") and ACES.¹ PACE Global provided Big Rivers with its projections of forward energy prices, monthly coal prices, monthly natural gas prices and monthly allowance prices. This data, along with Big Rivers' plant specific data, were supplied to ACES which was contracted to run the production cost model. ACES then took the PACE and Big Rivers' data and from that information developed a data base or inputs that were fed into the Ventyx Planning and Risk ("PAR") model that ACES used in its production cost modeling. The ACES production cost model outputs were then sent back to Big Rivers which fed the information into the Big Rivers financial model. Based on these three-tiered modeling analyses, Big Rivers claims that the retrofits it is proposing are the least cost alternative.

Intervenors' propounded discovery for each of the modeling phases, including the ACES phase. For instance, KIUC 1-21 explicitly states: "Provide copies of all models and spreadsheets developed containing input assumptions and output results. Provide these electronically, with all formulas intact." KIUC First Set of Data Requests to Big Rivers 1-21. In addition, SC 1-53 states:

Refer to p. 7 line 20 to p. 8 line 5 of the testimony of Mark Hite. Identify and produce:

- a. All forward pricing data received from PACE Global for the production cost modeling.
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Ben Taylor and Sierra Club's First Request for Information to Big Rivers at 1-53; *see also*, KIUC First Set of Data Requests to Big Rivers KIUC 1-4, KIUC 1-20, and KIUC 1-22; Attorney General First Set of Data Requests Item 15.

Despite the specificity of these requests, Big Rivers and ACES have refused to provide all of the requested information. *See* Big Rivers' Response to KIUC Initial Request for Information; Big Rivers' Response to Sierra Club Initial Request for Information. While it is true that Big Rivers has provided Intervenors all the data that it provided to ACES, Big Rivers has not produced the database and inputs that ACES created and fed into the production cost model. In fact, Big Rivers has failed to require or request ACES to produce the database because it claims it is not obligated to do so as they are the proprietary work of ACES. Without such database and inputs, there is no way for the parties or the Commission to recreate the modeling performed by ACES and used by Big Rivers.

ACES is not an unaffiliated entity so there is no reason why Big Rivers should not have required ACES to provide this database. Big Rivers is actually a partial owner of ACES and a member of its Board. *See* Big Rivers Response to the Staff's Initial Request for Information, Item 1; *see also* Big Rivers' website at <http://www.bigrivers.com/power.aspx>. "As a member of ACES, Big Rivers has an annual bilateral agreement with ACES under which ACES provides a wide array of services to Big Rivers, including the production cost modeling for the multiple scenarios analyzed in the development of this filing." *See* Big Rivers Response to KIUC Initial Request for Information number 33. It strains credulity for Big Rivers to claim that it cannot obtain the database that ACES used in its production cost modeling. The crux of the issue is that the ACES database and inputs to the Ventyx software are formatted differently than and therefore not the same as the data supplied to

ACES by Big Rivers. In addition, in creating the database and inputs from the information provided by Big Rivers, ACES invariably made decisions regarding various factors, often referred to as “switches” or “vectors,” that the parties and Commission could only evaluate if the database is produced. For example, in a conference call held on June 4, 2012 among Big Rivers, ACES, Ventyx, KIUC, Sierra Club and the Attorney General’s office, ACES representatives suggested that the inputs it used included some of its own projections of future market power price curves that were presumably intended to supplement if not modify the market price forecasts provided by PACE.

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In addition to informal attempts to procure the data, as noted above, a number of questions in Intervenors’ first sets of discovery requests filed May 22, 2012 were sufficiently broad to have warranted the production of the Big Rivers-specific data used by ACES in its production cost modeling. See, KIUC Initial Request for Data from Big Rivers at KIUC 1-4, KIUC 1-20, KIUC 1-21, KIUC 1-22; Ben Taylor and Sierra Club’s Initial Request for Information at 1-53; and Attorney General Initial Request 15.

KIUC has gone to the expense of licensing the Ventyx PAR software to replicate Big Rivers’ modeling and test the Big Rivers outputs, but the software is useless without the ACES designed database. The impasse has occurred because Intervenors cannot run the Ventyx model and therefore assure the integrity of Big Rivers’ conclusions without the ACES database; and Big Rivers says it does not have the ACES database and will not request ACES to produce it. In the June 4, 2012 conference call ACES took the position that the specific files

² The May 11, 2012 letter is attached.

sought were the proprietary work product of ACES and that ACES was not obligated to provide the information in the specific format that Intervenors requested. Intervenors respectfully submit that this response requires action by the Commission.

Big Rivers' refusal to provide the ACES database of Big Rivers-specific inputs in the format used in its production cost modeling prevents both Intervenors and the Commission from being able to verify the results of the ACES production cost modeling that Big Rivers' Application is based upon. Big Rivers has suggested that the information it has provided should be sufficient³ to approximate the results produced by ACES. Even if theoretically true, it is an unnecessary burden for Intervenors to have to expend an undeterminable amount of work to attempt to identically reproduce what ACES has already created.

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information necessary for parties to verify the production cost modeling results presented in Big Rivers' Application. Without a method by which to verify the accuracy of the information presented in Big Rivers' Application within the time constraints imposed by law, the Commission cannot make a final determination with certainty regarding whether Big Rivers' Application satisfies the requirements of KRS 278.183 or KRS 278.020. KRS 278.183 requires the Commission to determine whether an environmental compliance plan and rate surcharge are "reasonable and cost-effective" for compliance with certain environmental requirements. Additionally, KRS 278.020 requires the Commission to determine whether "public convenience and necessity require" projects proposed in Big Rivers' Application. The Commission should not proceed to determine whether Big Rivers' Application meets these standards without an examination of the accuracy of the modeling results that form the basis for Big Rivers' Application.

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⁵ KIUC Motion to Dismiss filed April 23, 2012.

⁶ On the June 4, 2012 call, Intervenors informed Big Rivers that they were willing to enter into a confidentiality agreement to protect the ACES information. Big Rivers failed to explain why such an agreement would not sufficiently protect ACES' interests.

WHEREFORE, Intervenor respectfully requests that the Commission enter an Order requiring Big Rivers to request the database of Big Rivers-specific data used by ACES in its production cost modeling and to provide that database to the parties in this proceeding or, in the alternative, to issue a subpoena duces tecum to obtain the information directly from ACES.

Respectfully submitted,

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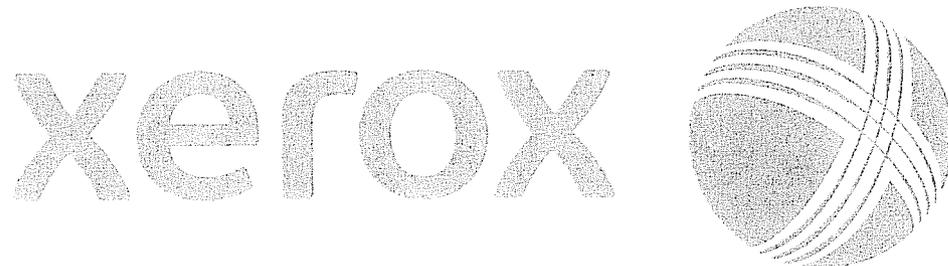
INTERVENTION OFFICE OF THE ATTORNEY

GENERAL

June 6, 2012

KWalton

 **Intervenors Joint Motion to Compel_Case No 2**
 **08/17/12 11:58 AM**



COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF THE:

APPLICATION OF BIG RIVERS ELECTRIC)
CORPORATION FOR APPROVAL OF ITS)
2012 ENVIRONMENTAL COMPLIANCE)
PLAN, FOR APPROVAL OF ITS AMENDED)
ENVIRONMENTAL COST RECOVERY)
SURCHARGE TARIFF, FOR CERTIFICATES)
OF PUBLIC CONVENIENCE AND)
NECESSITY, AND FOR AUTHORITY TO)
ESTABLISH A REGULATORY ACCOUNT)

CASE NO. 2012-00063

RECEIVED

JUN 06 2012

PUBLIC SERVICE
COMMISSION

JOINT MOTION OF KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.,
BEN TAYLOR AND SIERRA CLUB, AND ATTORNEY GENERAL
TO COMPEL OR, IN THE ALTERNATIVE, TO ISSUE SUBPOENA DUCES TECUM

Kentucky Industrial Utility Customers, Inc. ("KIUC"), Ben Taylor and Sierra Club and the Attorney General (collectively, "Intervenors") hereby move the Kentucky Public Service Commission ("Commission") to enter an Order requiring Big Rivers Electric Corporation ("Big Rivers") to request and require the production of certain information from its affiliate, ACES Power Marketing ("ACES"), and to provide that information to the parties in this proceeding or, in the alternative, to issue subpoena duces tecum pursuant to KRS 278.320 to require the production of the information directly from ACES. In particular, Intervenors seek production of the data base and input files that ACES developed and fed into the production cost modeling upon which Big Rivers' April 2, 2012 Application ("Application") is based. The information Intervenors seek balances the confidentiality concerns of Big Rivers with the minimum requirements of transparency and is necessary to the Commission's ultimate determination of whether the Application filed by Big Rivers in this case satisfies the standards set forth in KRS 278.020 and 278.183, and to the Intervenors' ability to fully review and evaluate that Application.

MEMORANDUM IN SUPPORT

In CPCN proceedings, the Commission, its Staff, and intervenors attempt to validate the veracity of an applicant's conclusions. This audit process requires parties to examine key assumptions and analyses of the applicant to determine if they are reasonable, meaning that an auditor could reasonably follow key assumptions and derivations, analysis mechanisms, and conclusions drawn from those analyses. If the assumptions and/or analyses are flawed, then the resulting conclusions are typically not reasonable. In a typical CPCN case involving a retrofit, a reasonable audit should be able to review: (1) the company's estimate (or bid) for their environmental upgrade and the estimate (or bid) for replacement capacity; (2) a logically structured modeling analysis in which the Commission or intervenors may examine both input assumptions and output results; (3) sensitivity analyses that demonstrate robust conclusions, including explicit sensitivity inputs and outputs; (4) a clearly defined analytical framework for comparing the results of model runs; and (5) a justification of the project based on model results.

Transparency on the part of the applicant is an essential element of this audit process. An applicant must disclose information regarding input and output results, the modeling and analytical structure utilized, which sensitivities were used, including inputs and outputs, and how those sensitivities were selected. Without transparency regarding these issues it is impossible for the Commission or any party to verify, much less rely on, the applicant's assumptions and conclusions.

As part of the audit process of this CPCN application, Intervenor's propounded specific discovery so that it could either review and verify or reject Big Rivers' analyses and conclusions. However, Big Rivers' responses to such requests for information were obstructive and evasive. Specifically, Big Rivers has failed to require or request ACES to produce the database ACES designed to run the Ventyx Planning and Risk ("PAR") model used in its production cost modeling for Big Rivers' Application. Intervenor's submit that such database is plainly relevant to this proceeding, and responsive to their data requests. In addition, the lack of this data would render it impossible for the Commission to determine with certainty whether Big Rivers' Application meets the standards set forth in KRS 278.020 and KRS 278.183.

The essence of this Motion is straightforward: the only acceptable method for Intervenors and the Commission to examine and verify the accuracy and completeness of this Application is to be able to replicate Big Rivers' modeling and then test the output through sensitivity runs. To do this, it is necessary to have the exact inputs to the modeling carried out by ACES. Otherwise the Commission will be confronted with Big Rivers' conclusions (apples) and the Intervenors' conclusions (oranges).

The modeling in this case was a multi-step process involving three parties: Big Rivers, PACE Global ("PACE") and ACES.¹ PACE Global provided Big Rivers with its projections of forward energy prices, monthly coal prices, monthly natural gas prices and monthly allowance prices. This data, along with Big Rivers' plant specific data, were supplied to ACES which was contracted to run the production cost model. ACES then took the PACE and Big Rivers' data and from that information developed a data base or inputs that were fed into the Ventyx Planning and Risk ("PAR") model that ACES used in its production cost modeling. The ACES production cost model outputs were then sent back to Big Rivers which fed the information into the Big Rivers financial model. Based on these three-tiered modeling analyses, Big Rivers claims that the retrofits it is proposing are the least cost alternative.

Intervenors' propounded discovery for each of the modeling phases, including the ACES phase. For instance, KIUC 1-21 explicitly states: "Provide copies of all models and spreadsheets developed containing input assumptions and output results. Provide these electronically, with all formulas intact." KIUC First Set of Data Requests to Big Rivers 1-21. In addition, SC 1-53 states:

Refer to p. 7 line 20 to p. 8 line 5 of the testimony of Mark Hite. Identify and produce:

- a. All forward pricing data received from PACE Global for the production cost modeling.
- b. All Big Rivers plant specific data that was supplied to ACES Power Marketing.
- c. Please identify which financial model ACES Power Marketing used, who is the vendor of the model, and whether the model is a proprietary model that requires a license in order to gain access to the files.
- d. Please produce, in machine readable format, all of the production cost modeling (including input and output files) and workpapers used to determine the NPVRR for each scenario generated by ACES Power Marketing

¹ Direct Testimony of Mark Hite, pages 7-8

- e. Please identify any changes to the input files that may be required to reproduce the modeling.
- f. If changes are required, please explain why such changes were made.
- g. Please identify the assumptions, including any supporting documentation, Big Rivers or its agents used in each base case and sensitivity scenario that you modeled
- h. If a license is required to obtain access to any information in this request, please explain how Sierra Club could obtain that license or, if they already have a license, who they should provide information to regarding the license to obtain the files.

Ben Taylor and Sierra Club's First Request for Information to Big Rivers at 1-53; *see also*, KIUC First Set of Data Requests to Big Rivers KIUC 1-4, KIUC 1-20, and KIUC 1-22; Attorney General First Set of Data Requests Item 15.

Despite the specificity of these requests, Big Rivers and ACES have refused to provide all of the requested information. *See* Big Rivers' Response to KIUC Initial Request for Information; Big Rivers' Response to Sierra Club Initial Request for Information. While it is true that Big Rivers has provided Intervenor all the data that it provided to ACES, Big Rivers has not produced the database and inputs that ACES created and fed into the production cost model. In fact, Big Rivers has failed to require or request ACES to produce the database because it claims it is not obligated to do so as they are the proprietary work of ACES. Without such database and inputs, there is no way for the parties or the Commission to recreate the modeling performed by ACES and used by Big Rivers.

ACES is not an unaffiliated entity so there is no reason why Big Rivers should not have required ACES to provide this database. Big Rivers is actually a partial owner of ACES and a member of its Board. *See* Big Rivers Response to the Staff's Initial Request for Information, Item 1; *see also* Big Rivers' website at <http://www.bigrivers.com/power.aspx>. "As a member of ACES, Big Rivers has an annual bilateral agreement with ACES under which ACES provides a wide array of services to Big Rivers, including the production cost modeling for the multiple scenarios analyzed in the development of this filing." *See* Big Rivers Response to KIUC Initial Request for Information number 33. It strains credulity for Big Rivers to claim that it cannot obtain the database that ACES used in its production cost modeling. The crux of the issue is that the ACES database and inputs to the Ventyx software are formatted differently than and therefore not the same as the data supplied to

ACES by Big Rivers. In addition, in creating the database and inputs from the information provided by Big Rivers, ACES invariably made decisions regarding various factors, often referred to as “switches” or “vectors,” that the parties and Commission could only evaluate if the database is produced. For example, in a conference call held on June 4, 2012 among Big Rivers, ACES, Ventyx, KIUC, Sierra Club and the Attorney General’s office, ACES representatives suggested that the inputs it used included some of its own projections of future market power price curves that were presumably intended to supplement if not modify the market price forecasts provided by PACE.

Prior to formal discovery, KIUC also attempted to seek this information through a letter sent via email to Big Rivers on May 11, 2012 in which KIUC specifically requested “[t]he input data assumptions, and all supporting documents associated with the development of the input data assumptions” used by ACES as well as “[t]he actual production cost model that ACES used, as well as all input files that went to the model at the time the runs were performed.”² KIUC also proposed another solution under which KIUC’s consultants would travel to ACES’ office and work directly with ACES staff to make data changes to KIUC’s input files to then perform KIUC’s production cost runs, but Big River’s refused to accommodate this approach as well.

In addition to informal attempts to procure the data, as noted above, a number of questions in Intervenors’ first sets of discovery requests filed May 22, 2012 were sufficiently broad to have warranted the production of the Big Rivers-specific data used by ACES in its production cost modeling. See, KIUC Initial Request for Data from Big Rivers at KIUC 1-4, KIUC 1-20, KIUC 1-21, KIUC 1-22; Ben Taylor and Sierra Club’s Initial Request for Information at 1-53; and Attorney General Initial Request 15.

KIUC has gone to the expense of licensing the Ventyx PAR software to replicate Big Rivers’ modeling and test the Big Rivers outputs, but the software is useless without the ACES designed database. The impasse has occurred because Intervenors cannot run the Ventyx model and therefore assure the integrity of Big Rivers’ conclusions without the ACES database; and Big Rivers says it does not have the ACES database and will not request ACES to produce it. In the June 4, 2012 conference call ACES took the position that the specific files

² The May 11, 2012 letter is attached.

sought were the proprietary work product of ACES and that ACES was not obligated to provide the information in the specific format that Intervenors requested. Intervenors respectfully submit that this response requires action by the Commission.

Big Rivers' refusal to provide the ACES database of Big Rivers-specific inputs in the format used in its production cost modeling prevents both Intervenors and the Commission from being able to verify the results of the ACES production cost modeling that Big Rivers' Application is based upon. Big Rivers has suggested that the information it has provided should be sufficient³ to approximate the results produced by ACES. Even if theoretically true, it is an unnecessary burden for Intervenors to have to expend an undeterminable amount of work to attempt to identically reproduce what ACES has already created.

Even if there were adequate time for Intervenors to perform that work, there would be no assurance that identical results would be produced. In modeling efforts such as this, the modeler sets various "switches" or "vectors" that play a significant role in determining the outputs from the modeling exercise. Intervenors would have no idea how those switches or any other similar types of switches were set by ACES modelers without the database. Thus, without the specific input files from ACES, it would be only by chance that Intervenors could reproduce ACES' results identically.⁴

Further, even if Intervenors or Staff were to obtain a license of the production cost modeling software used by ACES, there is insufficient time to recreate the PAR model input files in the exact way that ACES already constructed them to enable the Intervenors to replicate the ACES results, which is a necessary starting point for Intervenors' work. KRS 278.183 provides that a hearing must be conducted within six months after an application is filed. Because of time limitations imposed by statute, it is critical that Big Rivers provide the

³ Big Rivers has not facilitated that process by providing all of the communications between Big Rivers and ACES reflecting directions to be followed, or assumptions to be applied, answers to questions posed by ACES to Big Rivers about the work. KIUC requested this information, *see* KIUC Initial Request for Information 1-4, and such information would facilitate replication of the ACES work product.

⁴ The importance of such switches or vectors was seen in the recent CPCN proceeding regarding Kentucky Power Company's then-proposed flue gas desulfurization project at the Big Sandy Unit 2 generating plant. Upon evaluating the modeling input database used by KPC, Sierra Club's expert witness in that proceeding discovered that the company had erroneously left on an energy demand vector that overstated demand by 20%. When KPC re-ran the model without that vector on, the results showed that the company's initial modeling had overstated the cost of future energy purchases under various alternatives by \$1 to \$2 billion. *See* Scott C. Weaver Rebuttal Testimony at 27-28 filed in Docket No. 2011-0401.

information necessary for parties to verify the production cost modeling results presented in Big Rivers' Application. Without a method by which to verify the accuracy of the information presented in Big Rivers' Application within the time constraints imposed by law, the Commission cannot make a final determination with certainty regarding whether Big Rivers' Application satisfies the requirements of KRS 278.183 or KRS 278.020. KRS 278.183 requires the Commission to determine whether an environmental compliance plan and rate surcharge are "reasonable and cost-effective" for compliance with certain environmental requirements. Additionally, KRS 278.020 requires the Commission to determine whether "public convenience and necessity require" projects proposed in Big Rivers' Application. The Commission should not proceed to determine whether Big Rivers' Application meets these standards without an examination of the accuracy of the modeling results that form the basis for Big Rivers' Application.

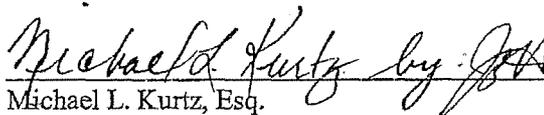
KIUC has previously voiced its concern regarding Big Rivers' failure to produce a witness to provide information regarding the assumptions used by ACES in its production cost modeling.⁵ The continued lack of critical data necessary to this case is a result of Big Rivers' failure to provide such a witness. Intervenors recognize that the ACES information requested in this Motion may need to be treated as confidential, and agrees to such treatment for all legitimately confidential information,⁶ but such information is vital to the Commission's ultimate determinations in this case and cannot be withheld.

⁵ KIUC Motion to Dismiss filed April 23, 2012.

⁶ On the June 4, 2012 call, Intervenors informed Big Rivers that they were willing to enter into a confidentiality agreement to protect the ACES information. Big Rivers failed to explain why such an agreement would not sufficiently protect ACES' interests.

WHEREFORE, Intervenors respectfully requests that the Commission enter an Order requiring Big Rivers to request the database of Big Rivers-specific data used by ACES in its production cost modeling and to provide that database to the parties in this proceeding or, in the alternative, to issue a subpoena duces tecum to obtain the information directly from ACES.

Respectfully submitted,



Michael L. Kurtz, Esq.

Kurt J. Boehm, Esq.

BOEHM, KURTZ & LOWRY

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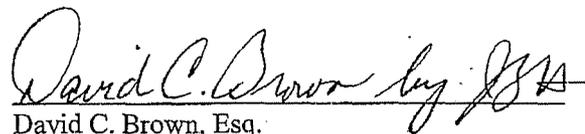
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David C. Brown, Esq.

STITES & HARBISON

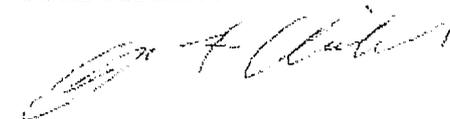
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COUNSEL FOR THE ATTORNEY GENERAL

June 6, 2012

Certificate of Service and Filing

Counsel certifies that an original and ten photocopies of the foregoing were served and filed by hand delivery to Jeff Derouen, Executive Director, Public Service Commission, 211 Sower Boulevard, Frankfort, Kentucky 40601; counsel further states that true and accurate copies of the foregoing were mailed via First Class U.S. Mail, postage pre-paid, to:

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Attorney at Law
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Honorable James M Miller
Sullivan, Mountjoy, Stainback & Miller, PSC
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Owensboro, KY 42302-0727

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TELEPHONE (513) 421-2255
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Via Electronic Mail

May 11, 2012

James M Miller, Esq.
Sullivan, Mountjoy, Stainback & Miller, PSC
100 St. Ann Street
P.O. Box 727
Owensboro, Kentucky 42302-0727

Re: Big Rivers 2012 Environmental Compliance Plan, KPSC Docket No. 2012-00063

Dear Jim:

KIUC has retained J. Kennedy and Associates, Inc. and Hayet Power System Consulting to review the Company's environmental compliance options and its proposed projects in this proceeding. They will review the data and analyses performed by Sargent & Lundy, the data and projections developed by Pace Global Insight, the Big Rivers plant data, the data used and the projections developed by Aces Power Marketing, and the Company's selection and modeling of various options and sensitivities.

The short time frame of this proceeding requires that we obtain access to this data and the models used and developed by both your consultants/contractors and Company personnel, as soon as possible. To the extent that we will need to obtain licenses or sign confidentiality or other agreements with the Company's consultants/contractors, we would like to complete that process as soon as possible, even before we issue discovery on May 21, 2012 or wait for the responses.

In the interest of expediting this process, we would appreciate your cooperation in obtaining following information and access to the various models (inputs, outputs and models) that were used in support of the Company's proposed projects:

Pace Global

Mark Hite's testimony at page 7 states, "Big Rivers acquired forward pricing data from Pace Global..." With regard to Pace Global data we would like the following items:

- The input data assumptions and all supporting documents associated with the development of the input data assumptions.
- The actual model that Pace Global used, as well as all input files that went into the model at the time the runs were performed and output files, as well as any other documents that Pace Global generated based on the output results.
- Any documentation concerning requirements to install the Pace Global model on our own computers and a copy of the User's Manual.

ACES Power Marketing

At page 7, Mr. Hite stated, "This data, along with Big Rivers' plant specific data was supplied to ACES Power Marketing ("ACES"), who ran all of the production cost models for this evaluation." We would like to obtain the following information:

James M. Miller, Esq.
Page 2 of 2
May 11, 2012

- The input data assumptions, and all supporting documents associated with the development of the input data assumptions
- The actual production cost model that ACES used, as well as all input files that went to the model at the time the runs were performed.
- All output files, as well as any other documents that ACES developed based on the output results.
- Documentation concerning requirements to install the ACES model on our own computers.
- A copy of the User's Manual.

Sargent & Lundy

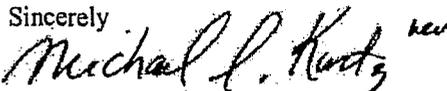
At page 13 of Mr. DePriest's testimony, he stated, "S&L used models and worksheets developed in-house to generate the capital and O&M cost estimates used in the compliance study." We would like to obtain the same input information, models, and output information as described in the bullets above regarding the S&L models.

"Build", "Partial Build" and "Buy" Cases

Finally, at pages 6-7, Mr. Hite described the Company's development of a financial model to evaluate various options (scenarios) that the Company considered. You previously provided that model to the parties. In addition to the model and the related files, we would like to obtain the input assumptions and all supporting documents associated with the development of the input assumptions.

In other proceedings in which our consultants have been involved, the utility has assisted them in obtaining any licenses that are required in order to obtain and use the software models. We would like to find out what requirements and costs may be required for them to acquire the models as soon as possible, as well as the process by which the models can be requested and obtained. Most likely a confidentiality agreement will be required as well.

Since there will be various processes required to go through to obtain these models and the relevant information used for and produced by these models, we would appreciate your cooperation and immediate attention to our request. We can arrange to have a conference call with Company and/or consultant/contractor personnel to expedite this process.

Sincerely

Michael L. Kurtz, Esq.
BOEHM, KURTZ & LOWRY

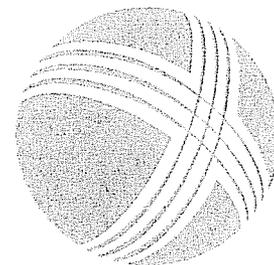
MLKkew

cc: David C. Brown, Esq.
Jennifer B. Hans, Esq.
Dennis Howard, Esq.
Larry Cook, Esq.
Joe Childers, Esq.
Kristin Henry, Esq.
Quang Nyugen, Esq.
Faith Burns, Esq.

KWalton

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EPM Planning and Risk Training Hayet Power Systems Consulting Statement of Work (SOW)

18th June, 2012 – V1.1

SOW Reference: SOW-ADV-NA-120476



SOW-ADV-NA-120476

This Statement of Work ("SOW") is effective as of _____ ("Effective Date") by and between Ventyx Inc., located at 400 Perimeter Center Terrace, Suite 500, Atlanta, Georgia 30346 ("Ventyx") and Hayet Power Systems Consulting, whose office is located at 215 Huntcliff Terrace, Atlanta, GA 30350 ("Client").

This SOW is entered into under the Consulting Agreement between the Parties dated _____ ("Contract"). In the event of any conflict in the terms between this SOW and the Contract, the terms of this SOW shall prevail. All capitalized terms not otherwise defined herein shall have the same meaning as in the Contract.

Ventyx Sales Executive

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Phone: 678.825.1467
Cell: 404.964.8882
Fax:
E-mail: Brenton.Meese@ventyx.abb.com

Ventyx Project Manager

Name: Joe McLeer
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E-mail: joseph.mcleer@ventyx.abb.com

Client Project Manager

Name: Phil Hayet
Address: 215 Huntcliff Terrace
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Phone: 770-587-5402
Fax: 877-862-0734
E-mail: philhayet@concentric.net

Client "Bill to" Contact/Dept.:

Name: Phil Hayet
Address: 215 Huntcliff Terrace
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Phone: 770-587-5402
Fax: 877-862-0734
E-mail: philhayet@concentric.net

PO # :

1 INTRODUCTION AND OBJECTIVES

Client has entered into a consulting engagement with another party that licenses the Ventyx EPM Planning and Risk software for the purposes of performing certain analyses on their behalf. Client has agreed to license the Ventyx Planning and Risk software but as a new user will require assistance with the installation and use of the product.

1.1 Understanding the Requirements

Client has requested training on the Ventyx EPM Planning and Risk (PaR) module, which they have licensed on a limited-term basis for the purposes of performing work on a consulting engagement. Client has indicated that only a limited scope use of PaR would be needed to facilitate the scope of work they are to perform and would not require a complete understanding of all the main features and functions of software. Therefore the Client has requested only a 1-day training session as opposed to the typical 3-4 days of training required for most new PaR users.

1.2 References

- EPM 5.3 Minimum Data Model Requirements
- EPM 5.3 Certified Environments

2 SCOPE OF WORK

2.1 Task 1 – Provide EPM Planning and Risk Overview Training

Ventyx will provide a 1-day EPM Planning and Risk overview training session. This training will provide a working knowledge of the EPM interface and cover basic data editing concepts, run setup and execution, and basic output reporting methods.

2.2 Task 2 – Provide Additional Consulting Support

Ventyx will provide an estimated 1-week of additional consulting support to assist the Client with any software installation or modeling issues that are encountered during the engagement period. Such support will include review of the Client's hardware to ensure that it meets the minimum requirements, assistance with the installation and setup of any prerequisite software such as MS SQL Server, and any Ventyx-specific software such as the EPM Core, Application Management, and Prosym,, setup and formatting of SQL Server databases, and assistance with any post-training issues associated with the use of Planning and Risk.

3 ESTIMATED SCHEDULE & DELIVERABLES

The following estimated schedule and deliverables have been identified within this Statement of Work (SOW).

3.1 Estimated Schedule of Work

The estimated schedule of work will be agreed to upon acceptance of the Statement of Work (SOW) by both parties.

3.2 Deliverables from Ventyx

Ventyx will deliver the following items under the Statement of Work (SOW):

- Basic EPM Planning and Risk overview training (1 day)
- Additional consulting support to assist the Client with any software installation or modeling issues (estimated 1 week)

3.3 Deliverables from Client

The Client will deliver the following items to support the activities for this Statement of Work (SOW):

- None.



3.4 Assumptions

The following assumptions have been made when producing this Statement of Work (SOW):

- Client will procure all prerequisite software as specified by the EPM 5.3 Certified Environments document referenced in Section 1.2, namely a certified version of SQL Server. Ventyx will assist Client with the procurement and installation of all prerequisite software.
- All Ventyx software is to be delivered electronically.
- Training will be provided at Ventyx's Atlanta office, unless an alternative mutually agreed upon location is decided at the time of the training.
- The Ventyx project manager will provide a single point of contact between Client and Ventyx with regard to scope, schedule, and resources assigned to accomplish the Ventyx services.
- Client will have the appropriate computer hardware and technical environment in place, and will provide all required access, prior to the Ventyx consultants commencing work.
- Client computer hardware and software will meet the minimum requirements as specified in the References noted in Section 1.2 of this SOW.
- Any other additional services beyond the scope as stated in Section 2 of this SOW will be billed at the attached rate schedule.

4 CHARGES

4.1 Fee Summary

The fee for this training is an estimated \$14,000 and will be performed on a Time and Materials basis, exclusive of expenses and taxes. The estimates provided below are intended to be an estimate for budgetary and Ventyx resource scheduling purposes only.

All fees presented in the SOW are expressed in US Dollars unless stated otherwise.

Task	Estimated Effort	Estimated Duration	Resources	Day Rate	Fee
Provide EPM Planning and Risk Overview training	1 day	1 day	Training Consultant	2,000	2,000
Provide Optional Consulting Support	1 week	4 weeks	Lead Consultant	2,400	12,000

4.2 Travel Expenses

Travel expenses for this SOW are estimated to be \$0.

4.3 Payment Terms

Ventyx will invoice monthly in arrears and Client agrees to pay Ventyx thirty (30) days from date of invoice.

6 SIGNATURE OF ACCEPTANCE

Pricing is subject to change at Ventyx's sole discretion if not signed by Hayet Power System Consulting and returned to Ventyx on or before 30 June 2012.

IN WITNESS WHEREOF, the parties have caused this SOW to be executed by their duly authorized representatives.

Hayet Power Systems Consulting

By: Philip Hayet
Name: Philip Hayet
Title: President
Date: 6/18/2012

Ventyx Inc.

By: _____	By: _____
Name: _____	Name: _____
Title: _____	Title: _____
Date: _____	Date: _____

To indicate approval, please return a signed PDF version of the entire PSO SOW via email or fax to:

*Tencia DeLuke, tencia.deluke@ventyx.abb.com
Fax +1-770-206-2279*

If your company requires an original hard copy, please mail two signed sets to:

*Tencia DeLuke
Ventyx Inc.
400 Perimeter Center Terrace, Suite 500,
Atlanta Georgia 30346
Tel: +1-678-825-1445*

**VENTYX
2012 RATE SCHEDULE - CONSULTING SERVICES**

Rate Group	Hourly Fee US \$
Sr. Vice President	420
Vice President, Subject Matter Expert / Expert Witness	400
Director	370
Principal Consultant	315
Lead Consultant	300
Project Manager	265
Senior Consultant	230
Consultant	210
Associate Consultant	185
Technical and Administrative Professionals	145

15% Adder for Work for Litigation / Regulatory Proceedings

Support Service Charges. In addition to payment for professional services, all reasonable and necessary expenses incurred in connection with the performance of professional services will be billed at cost. Such expenses include, but are not limited to, outside reproduction costs, artwork, airline travel, meals, lodging, postage, freight, telephone, and travel related expenses. Mileage is charged at the prevailing Standard Mileage Rate as determined by the Internal Revenue Service.

Insurance Provisions. Where a Client requires that it or other entities be named as additional insured with regard to company insurance policies, any cost to Ventyx of such provisions shall be billed to the Client.

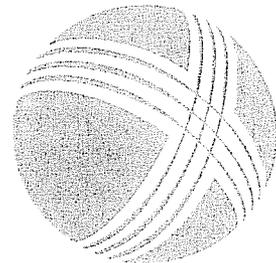
Fee Schedule Revision. This schedule is effective commencing January 1, 2012, and may be revised periodically by Ventyx.

KWalton

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EPM Planning and Risk Training Hayet Power Systems Consulting Estimate Statement of Work (SOW)

13th June, 2012 – V1.0

SOW Reference: SOW-ADV-NA-120476

IMPORTANT NOTICE

This budgetary offer [dated] is preliminary and not final and as such non-binding. It is tendered for discussion only, does not constitute a term to contract and Ventyx can, without notice, make any changes at Ventyx's discretion.

This Statement of Work ("SOW") is effective as of June 15, 2012 ("Effective Date") by and between Ventyx Inc., located at 400 Perimeter Center Terrace, Suite 500, Atlanta, Georgia 30346 ("Ventyx") and Hayet Power Systems Consulting, whose office is located at 215 Huntcliff Terrace, Atlanta, GA 30350 ("Client").

This SOW is entered into under the Consulting Agreement between the Parties dated _____ ("Contract"). In the event of any conflict in the terms between this SOW and the Contract, the terms of this SOW shall prevail. All capitalized terms not otherwise defined herein shall have the same meaning as in the Contract.

Ventyx Sales Executive

Name: Brenton Meese
Phone: 678.825.1467
Cell: 404.964.8882
Fax:
E-mail: Brenton.Meese@ventyx.abb.com

Ventyx Project Manager

Name: Joe McLeer
Phone: 678-830-1079
Cell:
Fax:
E-mail: joseph.mcleer@ventyx.abb.com

Client Project Manager

Name: Phil Hayet
Address: 215 Huntcliff Terrace
Atlanta, GA 30350
Phone: 770-587-5402
Fax: 877-862-0734
E-mail: philhayet@concentric.net

Client "Bill to" Contact/Dept.:

Name: Phil Hayet
Address: 215 Huntcliff Terrace
Atlanta, GA 30350
Phone: 770-587-5402
Fax: 877-862-0734
E-mail: philhayet@concentric.net

PO #:

1 INTRODUCTION AND OBJECTIVES

Client has entered into a consulting engagement with another party that licenses the Ventyx EPM Planning and Risk software for the purposes of performing certain analyses on their behalf. Client has agreed to license the Ventyx Planning and Risk software but as a new user will require assistance with the installation and use of the product.

1.1 Understanding the Requirements

Client has requested training on the Ventyx EPM Planning and Risk (PaR) module, which they have licensed on a limited-term basis for the purposes of performing work on a consulting engagement. Client has indicated that only a limited scope use of PaR would be needed to facilitate the scope of work they are to perform and would not require a complete understanding of all the main features and functions of software. Therefore the Client has requested only a 1-day training session as opposed to the typical 3-4 days of training required for most new PaR users.

1.2 References

- EPM 5.3 Minimum Data Model Requirements
- EPM 5.3 Certified Environments

2 SCOPE OF WORK

2.1 Task 1 – Provide EPM Planning and Risk Overview Training

Ventyx will provide a 1-day EPM Planning and Risk overview training session. This training will provide a working knowledge of the EPM interface and cover basic data editing concepts, run setup and execution, and basic output reporting methods.

2.2 Task 2 – Provide Additional Consulting Support

Ventyx will provide an estimated 1-week of additional consulting support to assist the Client with any software installation or modeling issues that are encountered during the engagement period. Such support will include review of the Client's hardware to ensure that it meets the minimum requirements, assistance with the installation and setup of any prerequisite software such as MS SQL Server, and any Ventyx-specific software such as the EPM Core, Application Management, and Prosym,, setup and formatting of SQL Server databases, and assistance with any post-training issues associated with the use of Planning and Risk.

3 ESTIMATED SCHEDULE & DELIVERABLES

The following estimated schedule and deliverables have been identified within this Statement of Work (SOW).

3.1 Estimated Schedule of Work

The estimated schedule of work will be agreed to upon acceptance of the Statement of Work (SOW) by both parties.

3.2 Deliverables from Ventyx

Ventyx will deliver the following items under the Statement of Work (SOW):

- Basic EPM Planning and Risk overview training (1 day)
- Additional consulting support to assist the Client with any software installation or modeling issues (estimated 1 week)

3.3 Deliverables from Client

The Client will deliver the following items to support the activities for this Statement of Work (SOW):

- None.

3.4 Assumptions

The following assumptions have been made when producing this Statement of Work (SOW):

- Client will procure all prerequisite software as specified by the EPM 5.3 Certified Environments document referenced in Section 1.2, namely a certified version of SQL Server. Ventyx will assist Client with the procurement and installation of all prerequisite software.
- All Ventyx software is to be delivered electronically.
- Training will be provided at Ventyx's Atlanta office, unless an alternative mutually agreed upon location is decided at the time of the training.
- The Ventyx project manager will provide a single point of contact between Client and Ventyx with regard to scope, schedule, and resources assigned to accomplish the Ventyx services.
- Client will have the appropriate computer hardware and technical environment in place, and will provide all required access, prior to the Ventyx consultants commencing work.
- Client computer hardware and software will meet the minimum requirements as specified in the References noted in Section 1.2 of this SOW.
- Any other additional services beyond the scope as stated in Section 2 of this SOW will be billed at the attached rate schedule.

4 CHARGES

4.1 Fee Summary

The fee for this training is an estimated \$14,000 and will be performed on a Time and Materials basis, exclusive of expenses and taxes. The estimates provided below are intended to be an estimate for budgetary and Ventyx resource scheduling purposes only.

All fees presented in the SOW are expressed in US Dollars unless stated otherwise.

Task	Estimated Effort	Estimated Duration	Resources	Day Rate	Fee
Provide EPM Planning and Risk Overview training	1 day	1 day	Training Consultant	2,000	2,000
Provide Optional Consulting Support	1 week	4 weeks	Lead Consultant	2,400	12,000

4.2 Travel Expenses

Travel expenses for this SOW are estimated to be \$0.

4.3 Payment Terms

Ventyx will invoice monthly in arrears and Client agrees to pay Ventyx thirty (30) days from date of invoice.

6 SIGNATURE OF ACCEPTANCE

Pricing is subject to change at Ventyx's sole discretion if not signed by Hayet Power System Consulting and returned to Ventyx on or before 30 June 2012.

IN WITNESS WHEREOF, the parties have caused this SOW to be executed by their duly authorized representatives.

Hayet Power Systems Consulting

By: Philip Hayet
Name: Philip Hayet
Title: President
Date: June 15, 2012

Ventyx Inc.

By: _____	By: _____
Name: _____	Name: _____
Title: _____	Title: _____
Date: _____	Date: _____

To indicate approval, please return a signed PDF version of the entire PSO SOW via email or fax to:

*Tencia DeLuxe, tencia.deluxe@ventyx.abb.com
Fax +1-770-206-2279*

If your company requires an original hard copy, please mail two signed sets to:

*Tencia DeLuxe
Ventyx Inc.
400 Perimeter Center Terrace, Suite 500,
Atlanta Georgia 30346
Tel: +1-678-825-1445*

**VENTYX
2012 RATE SCHEDULE - CONSULTING SERVICES**

Rate Group	Hourly Fee US \$
Sr. Vice President	420
Vice President, Subject Matter Expert / Expert Witness	400
Director	370
Principal Consultant	315
Lead Consultant	300
Project Manager	265
Senior Consultant	230
Consultant	210
Associate Consultant	185
Technical and Administrative Professionals	145

15% Adder for Work for Litigation / Regulatory Proceedings

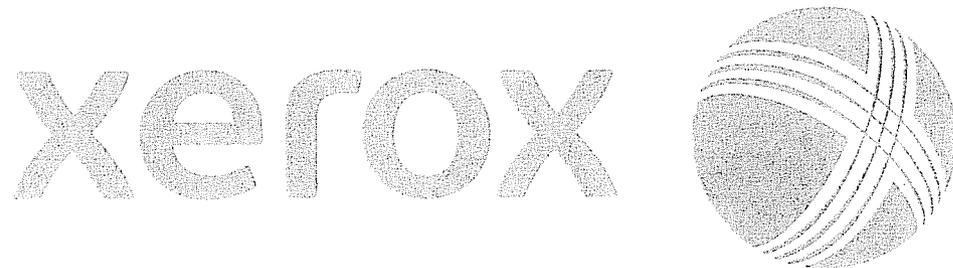
Support Service Charges. In addition to payment for professional services, all reasonable and necessary expenses incurred in connection with the performance of professional services will be billed at cost. Such expenses include, but are not limited to, outside reproduction costs, artwork, airline travel, meals, lodging, postage, freight, telephone, and travel related expenses. Mileage is charged at the prevailing Standard Mileage Rate as determined by the Internal Revenue Service.

Insurance Provisions. Where a Client requires that it or other entities be named as additional insured with regard to company insurance policies, any cost to Ventyx of such provisions shall be billed to the Client.

Fee Schedule Revision. This schedule is effective commencing January 1, 2012, and may be revised periodically by Ventyx.

KWalton

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**Amendment No. 1
To the License Agreement
Between
Ventyx Inc.
And
Hayet Power Systems Consulting**

This Amendment No. 1 is made and entered into this ___ day of _____, 2012 (the "Effective Date") by and between Ventyx Inc., successor in interest to Ventyx Energy, LLC ("Ventyx"), having an address of 400 Perimeter Center Terrace, Suite 500, Atlanta, Georgia 30346, and Hayet Power Systems Consulting having an address of 215 Huntcliff Terrace, Atlanta, Georgia 30350 ("Licensee"), and is an amendment to that certain License Agreement between Ventyx and Licensee effective March 16, 2011 (the "License Agreement").

WHEREAS, under the License Agreement, Licensee licenses Ventyx's proprietary software to provide consulting services; and the license for such software expired March 15, 2012; and

WHEREAS, Licensee wishes to license an additional software program under such License Agreement; and

WHEREAS, Ventyx is agreeable to the foregoing subject to the terms and conditions set forth herein.

NOW THEREFORE, the parties agree as follows:

1. LICENSE RENEWAL AND ADDITIONAL SOFTWARE

Effective March 16, 2012 the license for the listed software is hereby renewed for a one (1) year term, as set forth below. The Planning and Risk software is hereby added to Section 1 of Exhibit A to the License Agreements as if originally included therein. Licensee shall complete a Client Engagement form as set forth in Exhibit A attached hereto for each Client Engagement. In consideration of the license renewal and additional software, Licensee shall pay Ventyx the fee(s) set forth below.

Products	Renew (R) New (N)	No. of Authorized Users	Fees*	Retroactive Service Term
PROMOD IV Zonal Transmission	R	1	\$12,500/per single Client Engagement/per three (3) month term ¹	March 16, 2012 – March 15, 2013
Planning and Risk	N	1	\$27,000 per single Client Engagement for three (3) months thereafter \$9,000 per single Client Engagement/per month	
Delivery Fee (The Delivery Fee is applicable to new			\$2,000 ¹	

deliveries of PROMOD or an updated newer version of PROMOD delivered other than from the initial delivery.				
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I In the event the engagement is for an existing project in which PROMOD has already been delivered, then the Delivery Fee shall be waived. . Delivery Fees do not apply for Planning and Risk.

* Fees are due and payable net thirty (30) days from the date of Invoice, whichever is later.

2. RENEWAL

The term shall automatically renew for successive annual terms at Ventyx's then-current fees unless sooner terminated as set forth in the License Agreement.

3. NO OTHER CHANGES

Except as specifically modified in this Amendment, the License Agreement shall remain in full force and effect.

IN WITNESS WHEREOF, the parties have executed this Amendment as of the date last set forth below and further represent and warrant that the individuals signing below have the corporate power and authority to enter into this Amendment and to carry out the transactions contemplated in this Amendment.

BILLING INFORMATION	
Billing Contact	
Name:	Phil Hayet
Title:	President
Address:	215 Huntcliff Terrace, Atlanta, Georgia 30350
Phone:	770-587-5402
Fax :	877-862-0734
Email:	philhaye@concentric.net
PO#	
Other Info:	

Accepted:
Hayet Power Systems Consulting
 By: Philip Hayet
 Printed Name: Philip Hayet
 Title: President
 Date: June 15, 2012

Accepted:
Ventyx Inc.
 By: _____
 Printed Name: _____
 Title: _____
 Date: _____

Ventyx Inc.
 By: _____
 Printed Name: _____
 Title: _____

Date: _____

Exhibit A to Amendment No. 1

CLIENT ENGAGEMENT FORM

This Client Engagement Form is attached to and made part of the License Agreement dated March 16, 2011 ("Agreement") between Ventyx Inc. (as successor in interest to Ventyx Energy, LLC) located at 400 Perimeter Center Terrace, Suite 500, Atlanta, Georgia 30346 ("Ventyx") and Hayet Power Systems Consulting located at 215 Huntcliff Terrace, Atlanta, Georgia 30350 ("Licensee"). This form shall be completed by Licensee for each new Client Engagement or start of continued use of the Software for an existing Client Engagement. Please fax completed form to the attention of Ventyx's Legal Department at (770) 206-2279.

Accuracy:

Licensee hereby represents and warrants that the information set forth in this Client Engagement Form truly and accurately reflects the information for Licensee's applicable Client Engagement. Licensee agrees to display the following legend on any deliverable (including but not limited to reports, summaries or commentaries) for each Client Engagement. "The results of this study were prepared using Ventyx's proprietary Software."

NAME AND ADDRESS OF ENGAGEMENT PARTY:

BOEHM, KURTZ & LOWRY
36 E. Seventh St., Suite 1510
Cincinnati, Ohio 45202
On behalf of KIUC

NAME OF LICENSED SOFTWARE:

PROMOD IV Zonal

Planning and Risk

GENERAL NATURE OF CLIENT ENGAGEMENT:

Big Rivers Electric Corporation Environmental Compliance Plan Proceeding (Docket 2012 - 00063)

START DATE:

June 18, 2012

END DATE:

September 17, 2012

The term set forth in this Client Engagement Form shall not extend beyond the term of the Agreement.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first set forth below and further represent and warrant that the individuals signing below have the corporate power and authority to enter into this Agreement and to carry out the transactions contemplated in this Agreement.

ACCEPTED:

Hayet Power Systems Consulting

By: Philip Hayet

Printed Name: Philip Hayet

Title: President

Date: June 15, 2012

ACCEPTED:

Ventyx Inc.

By: _____

Printed Name: _____

Title: _____

Date: _____

Ventyx Inc.

By: _____

Printed Name: _____

Title: _____

Date: _____



Ventyx Consulting Agreement

This Consulting Agreement ("Agreement") is by and between Ventyx Inc., whose office is located at 400 Perimeter Center Terrace, Suite 500, Atlanta, Georgia 30346 ("Ventyx") and Hayet Power Systems Consulting, whose office is located at 215 Huntcliff Terrace, Atlanta, GA 30350 ("Client"), effective upon execution of both parties. Ventyx will provide the services set forth herein:

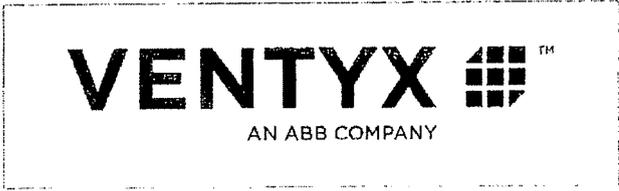
1. Consulting Services. Ventyx will make available the services of Ventyx personnel to perform certain short-term consulting services ("Services") as generally described in one or more Statement of Work ("SOW") under this Agreement. Successive Statements of Work shall be identified by number and each shall reference this Agreement.
2. Payments. Client will pay Ventyx for the Services as set forth the applicable SOW. In addition, Client will pay, or reimburse Ventyx for, (i) all taxes based upon the charges in this Agreement (ii) all Services-related and reasonable travel and travel-related expenses. If the payment terms are not specified in the applicable SOW, Ventyx will invoice Client on a monthly basis for all charges payable hereunder, which shall be due within 30 days from invoice receipt date. Any sum not paid when due will bear interest until paid at the maximum rate of interest allowed by applicable law.
3. Confidentiality. The parties recognize that in the course of performing the Services, both parties may have access to confidential or proprietary information belonging to the other and each agrees that any such confidential and proprietary information shall remain confidential and shall not be disclosed to any third party. Each party agrees that, for a period of two (2) years from receipt of information from the other party hereunder, such party will use the same means it uses to protect its own confidential proprietary information, but in any event not less than reasonable means, to prevent the disclosure and to protect the confidentiality of both (i) written information received from the other party which is marked or identified as confidential, and (ii) oral or visual information ("Confidential Information"). The foregoing will not prevent either party from disclosing Confidential Information which belongs to such party or is (i) already known by the recipient party without an obligation of confidentiality, (ii) publicly known or becomes publicly known through no unauthorized act of the recipient party, (iii) rightfully received from a third party without breaching any confidentiality or non-disclosure obligations to any third party, (iv) independently developed by the recipient party without use of the other party's Confidential Information, (v) disclosed without similar restrictions to a third party by the party owning Confidential Information, (vi) approved by the other party for disclosure, or (vii) required to be disclosed pursuant to a requirement of a governmental agency or law so long as the disclosing party provides the other party with notice of such requirement prior to any such disclosure and reasonably cooperates with the other party in connection with obtaining any protective order limiting such disclosure.
4. Proprietary Rights. The parties acknowledge and agree that: (a) Ventyx owns all right, title and interest in and to all Ventyx Confidential Information (and the media containing such Confidential Information) including, without limitation, the Work Product and all patent, trademark, copyright, trade secret, and other intellectual property rights related thereto; and (b) Client owns all right, title and interest in and to all of Client's Confidential Information (and the media containing such Confidential Information) including, without limitation, the patent, trademark, copyright, trade secret, and other intellectual property rights related thereto, as well as engagement-specific reports delivered by Ventyx except with respect to the Ventyx Confidential Information or Work Product contained in such reports. All Work Product, and all patent, trademark, copyright, trade secret, and other intellectual property rights related thereto, is the property of Ventyx and is licensed nonexclusively to Client, at no additional license fee, pursuant to the terms of the license for software contained in a License Agreement and subject to the terms of this Agreement. To the extent Client acquires any rights in the Work Product Client hereby assigns such rights to Ventyx. Client shall give Ventyx all reasonable assistance and execute all documents necessary to assist or enable Ventyx to perfect, preserve, register and/or record such assignment and Ventyx's rights in any Work Product.
5. Termination. Either party may terminate this Agreement in whole, but not in part, for any reason upon providing sixty days prior written notice to the other party. Upon termination of this Agreement for any reason, Ventyx will cease to

perform the Services hereunder for Client and Client will pay to Ventyx: (a) for Services performed on a time and materials basis, all sums due including reimbursable expenses to Ventyx as a result of Services performed prior to such termination; or (b) for Services performed on a fixed fee basis, for all milestones initiated at the effective date of the termination.

6. Warranty Disclaimer and Limitation on Liability. VENTYX MAKES NO REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, AND HEREBY EXPRESSLY DISCLAIMS ANY AND ALL SUCH WARRANTIES, REGARDING ANY MATTER INCLUDING THE MERCHANTABILITY, SUITABILITY, ORIGINALITY, FITNESS FOR A PARTICULAR USE OR PURPOSE, OR RESULTS TO BE DERIVED FROM THE USE OF ANY MATERIALS OR SERVICES PROVIDED UNDER THIS AGREEMENT. IN NO EVENT SHALL VENTYX BE LIABLE FOR ANY LOST PROFITS, LOSS OF GOODWILL, OR FOR SPECIAL, EXEMPLARY, PUNITIVE, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR ANY OTHER DAMAGES. THE SERVICES PERFORMED UNDER THIS AGREEMENT ARE ASSOCIATED WITH THE VENTYX SOFTWARE LICENSED BY CLIENT AND CLIENT ACKNOWLEDGES THAT THEY ARE NOT CONSIDERED ACCOUNTING SERVICES. SUBJECT TO THE FOREGOING LIMITATION OF LIABILITY VENTYX'S LIABILITY UNDER THIS AGREEMENT SHALL NOT EXCEED THE AMOUNT PAID BY CLIENT TO VENTYX UNDER THE SOW GIVING RISE TO THE LIABILITY.
7. Relationship of Parties. Ventyx in furnishing the Services to Client under this Agreement is acting only as an independent contractor.
8. Agreement. This Agreement constitutes the entire agreement between the parties with respect to the subject matter of this Agreement. No change, waiver or discharge will be valid unless in writing and signed by an authorized representative of the party against whom such change, waiver or discharge is sought to be enforced. This Agreement will be governed by and construed in accordance with the laws, other than choice of law rules, of the State of Georgia.

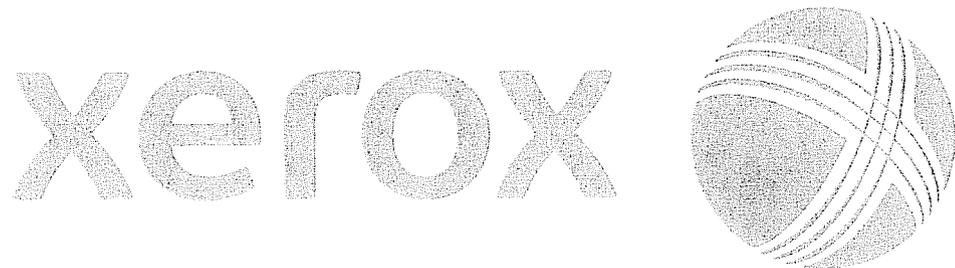
IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first set forth below and further represent and warrant that the individuals signing below have the corporate power and authority to enter into this Agreement and to carry out the transactions contemplated in this Agreement.

<p>ACCEPTED: Hayet Power Systems Consulting</p> <p>Authorized Signature: <u>Philip Hayet</u></p> <p>Printed Name: <u>Philip Hayet</u></p> <p>Title: <u>President</u></p> <p>Date: <u>June 15, 2012</u></p>	<p>ACCEPTED: Ventyx Inc.</p> <p>Authorized Signature: _____</p> <p>Printed Name: _____</p> <p>Title: _____</p> <p>Date: _____</p> <p>Authorized Signature: _____</p> <p>Printed Name: _____</p> <p>Title: _____</p> <p>Date: _____</p>
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KWalton

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**Amendment No. 1
To the License Agreement
Between
Ventyx Inc.
And
Hayet Power Systems Consulting**

This Amendment No. 1 is made and entered into this ___ day of _____, 2012 (the "Effective Date") by and between Ventyx Inc., successor in interest to Ventyx Energy, LLC ("Ventyx"), having an address of 400 Perimeter Center Terrace, Suite 500, Atlanta, Georgia 30346, and Hayet Power Systems Consulting having an address of 215 Huntcliff Terrace, Atlanta, Georgia 30350 ("Licensee"), and is an amendment to that certain License Agreement between Ventyx and Licensee effective March 16, 2011 (the "License Agreement").

Comment [gk1]: The agreement will be dated on the last date of signature which is when Ventyx signs.

WHEREAS, under the License Agreement, Licensee licenses Ventyx's proprietary software to provide consulting services; and the license for such software expired March 15, 2012; and

WHEREAS, Licensee wishes to license an additional software program under such License Agreement; and

WHEREAS, Ventyx is agreeable to the foregoing subject to the terms and conditions set forth herein.

NOW THEREFORE, the parties agree as follows:

1. LICENSE RENEWAL AND ADDITIONAL SOFTWARE

Effective March 16, 2012 the license for the listed software is hereby renewed for a one (1) year term, as set forth below. The Planning and Risk software is hereby added to Section 1 of Exhibit A to the License Agreements as if originally included therein. Licensee shall complete a Client Engagement form as set forth in Exhibit A attached hereto for each Client Engagement. In consideration of the license renewal and additional software, Licensee shall pay Ventyx the fee(s) set forth below.

Products	Renew (R) New (N)	No. of Authorized Users	Fees*	Retroactive Service Term
PROMOD IV Zonal Transmission	R	1	\$12,500/per single Client Engagement/per three (3) month term ¹	March 16, 2012 – March 15, 2013
Planning and Risk	N	1	\$27,000 per single Client Engagement for three (3) months thereafter \$9,000 per single Client Engagement/per month	
Delivery Fee (The Delivery Fee is applicable to new			\$2,0001	

deliveries of PROMOD or an updated newer version of PROMOD delivered other than from the initial delivery				
-----------------------------------------------------------------------------------------------------------	--	--	--	--

1 In the event the engagement is for an existing project in which PROMOD has already been delivered, then the Delivery Fee shall be waived . Delivery Fees do not apply for Planning and Risk.

* Fees are due and payable net thirty (30) days from the date of Invoice, whichever is later.

2. RENEWAL

The term shall automatically renew for successive annual terms at Ventyx's then-current fees unless sooner terminated as set forth in the License Agreement.

3. NO OTHER CHANGES

Except as specifically modified in this Amendment, the License Agreement shall remain in full force and effect.

IN WITNESS WHEREOF, the parties have executed this Amendment as of the date last set forth below and further represent and warrant that the individuals signing below have the corporate power and authority to enter into this Amendment and to carry out the transactions contemplated in this Amendment.

BILLING INFORMATION		
Billing Contact		
Name:	Phil Hayet	Phone: 770-587-5402
Title:	President	Fax : 877-862-0734
Address:	215 Huntcliff Terrace, Atlanta, Georgia 30350	Email: philhaye@concentric.net
		PO#
		Other Info:

Accepted:
Hayet Power Systems Consulting

By: _____
Printed Name: _____
Title: _____
Date: _____

Accepted:
Ventyx Inc.

By: _____
Printed Name: _____
Title: _____
Date: _____

Ventyx Inc.

By: _____
Printed Name: _____
Title: _____

Date: _____

Exhibit A to Amendment No. 1

CLIENT ENGAGEMENT FORM

This Client Engagement Form is attached to and made part of the License Agreement dated March 16, 2011 ("Agreement") between Ventyx Inc (as successor in interest to Ventyx Energy, LLC) located at 400 Perimeter Center Terrace, Suite 500, Atlanta, Georgia 30346 ("Ventyx") and Hayet Power Systems Consulting located at 215 Huntcliff Terrace, Atlanta, Georgia 30350 ("Licensee"). This form shall be completed by Licensee for each new Client Engagement or start of continued use of the Software for an existing Client Engagement. Please fax completed form to the attention of Ventyx's Legal Department at (770) 206-2279

Accuracy:

Licensee hereby represents and warrants that the information set forth in this Client Engagement Form truly and accurately reflects the information for Licensee's applicable Client Engagement. Licensee agrees to display the following legend on any deliverable (including but not limited to reports, summaries or commentaries) for each Client Engagement. "The results of this study were prepared using Ventyx's proprietary Software "

NAME AND ADDRESS OF ENGAGEMENT PARTY:

BOEHM, KURTZ & LOWRY
36 E. Seventh St., Suite 1510
Cincinnati, Ohio 45202
On behalf of KIUC

NAME OF LICENSED SOFTWARE: PROMOD IV Zonal Planning and Risk

GENERAL NATURE OF CLIENT ENGAGEMENT:

Big Rivers Electric Corporation Environmental Compliance Plan Proceeding (Docket 2012 – 00063)

START DATE: June 18, 2012 **END DATE:** September 17, 2012

The term set forth in this Client Engagement Form shall not extend beyond the term of the Agreement.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first set forth below and further represent and warrant that the individuals signing below have the corporate power and authority to enter into this Agreement and to carry out the transactions contemplated in this Agreement.

ACCEPTED:
Hayet Power Systems Consulting
By: _____
Printed Name: _____
Title: _____
Date: _____

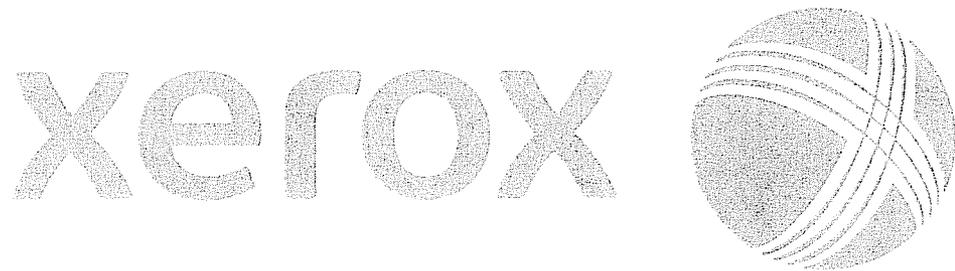
ACCEPTED:
Ventyx Inc.
By: _____
Printed Name: _____
Date: _____

Ventyx Inc.
By: _____
Printed Name: _____
Title: _____

Date: _____

KWalton

 Hayet Non-Disclosure Agreement.pdf
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NON-DISCLOSURE AGREEMENT

This Non-Disclosure Agreement (“Agreement”) is entered into this 21st day of June 2012, by and between Hayet Power Systems Consulting (“Hayet”) and Alliance for Cooperative Energy Services Power Marketing LLC, (“ACES Power Marketing” or “APM”) (each individually referred to as “Party” and collectively as “Parties”).

RECITALS

WHEREAS, APM provides, inter alia, certain modeling services for Big Rivers Electric Corporation (“Big Rivers”) through the use of proprietary software licensed to APM by Ventyx; and

WHEREAS, APM has created a confidential and proprietary database within the licensed proprietary software which contains information used by APM to prepare certain scenarios for use in the Captioned Case (defined below); and

WHEREAS, Hayet is the consultant for certain Intervenors in the Captioned Case and such Intervenors desire that Hayet have access to APM’s confidential and proprietary Database within the Ventyx licensed proprietary software which contains information used by APM to prepare certain scenarios for use in the Captioned Case by Big Rivers; and

WHEREAS, APM, pursuant to a request by Big Rivers and pursuant to conditions established by APM’s license with Ventyx (the owner of the proprietary software), is willing to provide to Hayet the portion of APM’s confidential and proprietary database that pertains to Big Rivers, provided that, Hayet agrees to the terms and conditions expressed herein.

NOW WHEREFORE, in consideration of the promises and covenants herein and for good and valuable consideration, the adequacy and sufficiency of which are hereby acknowledged, the Parties intending to be legally bound do hereby agree as follows:

Section 1. Definitions.

“Authorized Representative” shall mean a person employed by Hayet who has signed a Non-Disclosure Certificate pursuant to this Agreement and who is a licensed user of the Ventyx PaR software under Hayet’s license with Ventyx.

“Captioned Case” shall mean the case currently before the Kentucky Public Service Commission and captioned as “*APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR APPROVAL OF ITS 2012 ENVIRONMENTAL COMPLIANCE PLAN, FOR APPROVAL OF ITS AMENDED ENVIRONMENTAL COST RECOVERY SURCHARGE TARIFF, FOR CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY, AND FOR AUTHORITY TO ESTABLISH A REGULATORY ACCOUNT, CASE NO. 2012-00063.*”

“Database” shall mean the electronic computer file derived from the Ventyx PaR licensed proprietary software that contains certain Big Rivers model data parameters used by APM in developing scenarios for Big Rivers and used in support of the Captioned Case.

“Notes of Protected Materials” means memoranda, handwritten notes, or any other form of information (including electronic information) that copies or discloses Protected Materials. Notes of Protected Materials are subject to the same restrictions provided in this Agreement for Protected Materials except as specifically provided otherwise in this Agreement.

“Protected Materials” shall mean the Database and any other materials provided to Hayet by APM, with such other materials being noted as being confidential by APM, pursuant to the terms of this Agreement.

Section 2. Use of the Database and Protected Materials. This Agreement shall govern the use of the Database provided to Hayet by APM. The Database shall be used exclusively by Hayet for work directly related to the Captioned Case. The Database shall be installed on and accessible through the computer containing Hayet’s licensed Ventyx software. Protected Materials shall be made available under the terms of this Agreement to Hayet solely for its use in the Captioned Case and any appeals from the Captioned Case, and may not be used by Hayet for any commercial, business, or other purpose whatsoever.

Section 3. Duration of Use. Protected Materials shall remain available to Hayet until the sooner of: (a) an order terminating this proceeding becomes no longer subject to judicial review, or (b) the termination of Hayet’s license with Ventyx. If requested to do so in writing after that date, Hayet shall, within fifteen days of such request, return the Protected Materials (excluding Notes of Protected Materials) to APM, or shall destroy the materials, except that copies of filings, official transcripts and exhibits in this proceeding that contain Protected Materials and Notes of Protected Materials may be retained, if they are maintained in accordance with this Agreement. Within such time period, Hayet, if requested to do so, shall also submit to APM an affidavit stating that, to the best of its knowledge, all Protected Materials and all Notes of Protected Materials have been returned or have been destroyed or will be maintained in accordance with this Agreement. To the extent Protected Materials are not returned or destroyed, they shall remain subject to this Agreement.

Section 4. Non-Disclosure Certificate. Hayet shall execute a Non-Disclosure Certificate in the form of the attached Exhibit A certifying its understanding and agreement with the terms of this Agreement. A copy of each Non-Disclosure Certificate shall be provided to APM prior to disclosure of any Protected Materials to Hayet.

Section 5. Protection of Materials. All Protected Materials shall be maintained by Hayet in a secure place. Access to those materials shall be limited to Hayet. Protected Materials shall be treated as confidential by Hayet. Protected Materials shall not be used except as necessary for the conduct of this proceeding, nor shall they be disclosed in any manner to any person except as outlined in Section 6 of this Agreement. Hayet may make notes of Protected Materials, which shall be treated as Notes of Protected Materials if they disclose the contents of Protected Materials. Hayet may use this information for purposes of this proceeding, and may not use

information contained in any Protected Materials obtained through this proceeding to give Hayet or any competitor or potential competitor of APM a commercial advantage or otherwise economically disadvantage APM based on disclosure of the Protected Materials outside of this proceeding.

In the event, APM inadvertently provides confidential information unrelated to the Captioned Case, or otherwise fails to designate materials other than the Database as Protected Materials at the time they are provided to Hayet, APM shall notify Hayet promptly upon discovery of the inadvertent disclosure. Hayet agrees that from the time forward that Hayet has been notified that such materials are deemed confidential, Hayet shall maintain the confidentiality or protection afforded the information, and agrees to: (a) immediately return the privileged information; and (b) to protect the confidential materials as Protected Materials, and to not use any information derived from such inadvertent disclosure in a manner inconsistent with the preservation of the confidential nature of the materials.

Section 6. Disclosure. Only Authorized Representatives shall have access to the Database. In the event that Hayet ceases to be engaged in the Captioned Case, access to Protected Materials by Hayet shall be terminated. Even if no longer engaged in this Captioned Case, Hayet shall continue to be bound by the provisions of this Agreement and the Non-Disclosure Certificate. No other disclosure of the Database shall be permitted. The Parties agree that the output of modeling analyses that may be conducted using the information contained in the Database as well as input assumptions entered into the Database for purposes of modeling analyses will be treated as confidential among any parties who have signed the Confidentiality Agreement in the Captioned Case and are not prohibited from disclosure under this Agreement. Hayet shall take all reasonable precautions necessary to assure that Protected Materials are not distributed to unauthorized persons.

Section 7. Nature of Information. Hayet hereby accepts the representations of APM that the Database is of a special, unique, unusual, extraordinary, and/or intellectual character and that the Parties further accept that the Database is an APM trade secret that is not available to the public, and that, if disclosed, would subject APM to risk of competitive disadvantage or other business injury. APM may be irreparably injured by disclosure of the Database. APM and Hayet acknowledge and agree that money damages would not be a sufficient remedy for any breach of this Agreement, and that in addition to all other remedies, a Party shall be entitled to specific performance and injunctive or other equitable relief as a remedy for any such breach, and the Parties agree to waive any requirement for the securing or posting of any bond in connection with such remedy.

Section 8. Survival of Obligations. The obligations and commitments established by this Agreement shall remain in full force and effect for a period of two (2) years from the conclusion of any right to appeal the proceedings in the Captioned Case.

Section 9. Governing Law. The validity and interpretation of this Agreement and the legal relations of the Parties to it shall be governed by the laws of the State of Indiana. In the event that a court of competent jurisdiction determines that any portion of this Agreement is unreasonable because of its term or scope, or for any other reason, the Parties agree that such

court may reform such provision so that it is reasonable under the circumstances and that such provision, as reformed, shall be enforceable. The Parties further agree that service of any process, summons, notice or document by U.S. certified or registered mail to the Parties' respective executive offices will be effective service of process for any action, suit, or proceeding brought in any such court.

Section 10. Miscellaneous Provisions.

(a) Neither party shall assign this Agreement without the prior written approval of the other party. Nothing in this Agreement, express or implied, is intended or shall be construed to confer upon any person or entity other than the parties hereto any right, remedy or claim under or by reason of this Agreement.

(b) This Agreement sets forth the entire agreement between the parties as to the subject matter of this Agreement and supersedes all prior agreements, commitments, representations, writings and discussions between them, whether written or oral, with respect to the subject matter hereof. Except as otherwise expressly provided in this Agreement, this Agreement may not be amended or terminated except in writing and signed by a duly authorized representative of the Party to be bound thereby.

(c) If any provision of this Agreement or its application to any person or circumstance is adjudged invalid or unenforceable by any court of competent jurisdiction, then the remainder of this Agreement or the application of such provision to other persons or circumstances shall not be affected thereby.

(d) No delay or failure to exercise any right under this Agreement shall operate as a continuing or permanent waiver of such right or preclude the further exercise of that right or any other right. This Agreement shall be binding on the parties and their successors, heirs, affiliates, and assigns. This Agreement may be executed in any number of counterparts, and each such counterpart shall be deemed an original instrument.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed and delivered by their respective duly authorized officers as of the date first written above.

**ALLIANCE FOR COOPERATIVE
ENERGY SERVICES POWER
MARKETING LLC**

**HAYET POWER SYSTEMS
CONSULTING**

By: _____

Name: _____

Title: _____

By: Philip Hayet

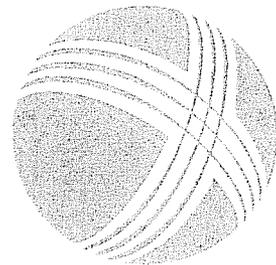
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Title: President

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COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS)	
ELECTRIC CORPORATION FOR)	
APPROVAL OF ITS 2012 COMPLIANCE)	
PLAN, FOR APPROVAL OF ITS)	
AMENDED ENVIRONMENTAL COST	)	CASE NO. 2012-00063
RECOVERY SURCHARGE TARIFF,)	
FOR CERTIFICATES OF PUBLIC)	
CONVENIENCE AND NECESSITY, AND)	
FOR AUTHORITY TO ESTABLISH A)	
REGULATORY ACCOUNT)	

<p><u>PUBLIC VERSION</u></p> <p>DIRECT TESTIMONY</p> <p>AND EXHIBITS</p> <p>OF</p> <p>PHILIP HAYET</p>

ON BEHALF OF THE
KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.

HAYET POWER SYSTEMS CONSULTING
ATLANTA, GEORGIA

July 23, 2012

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

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DIRECT TESTIMONY OF PHILIP HAYET

QUALIFICATIONS AND SUMMARY

1

2 **Q. Please state your name and business address.**

3 **A.** My name is Philip Hayet, and my business address is Hayet Power Systems
4 Consulting ("HPSC"), 215 Huntcliff Terrace, Atlanta, Georgia, 30350.

5

6 **Q. What is your occupation and your business title?**

7 **A.** I am an Electrical Engineer, and I am President of HPSC.

8

9 **Q. What consulting services does HPSC provide?**

10 **A.** HPSC provides consulting services related to electric utility system planning,

1 resource analysis, production cost modeling, and utility industry policy issues.
2 Clients have included state regulatory agencies, industrial electricity consumers,
3 consulting firms, and merchant generators located both inside and outside the United
4 States.

5
6 **Q. Please summarize your education and qualifications.**

7 A. I graduated from Purdue University in 1979 with a B.S. degree in Electrical
8 Engineering, and from the Georgia Institute of Technology in 1980 with an M.S.
9 degree in Electrical Engineering, with a specialization in Power Systems.

10

11 **Q. Please describe your professional experience.**

12 A. I have over thirty years of experience in the electric utility industry, in which I
13 have worked in the areas of generation resource planning, economic analysis, and
14 rate analysis. I began my career working for Energy Management Associates
15 ("EMA" now known as Ventyx), an Atlanta based utility consulting firm, in
16 which I supported Ventyx's PROMOD IV™ ("PROMOD") production cost
17 software clients.¹ PROMOD is a detailed production cost modeling tool that is
18 widely used by utilities throughout the United States to perform electric utility
19 operations and planning studies. In addition to providing client support and
20 production cost modeling training for Ventyx's utility clients, I also performed

¹ I will refer to this Company as Ventyx, which is also the supplier of Big Rivers' current production costing model, known as the Planning and Risk Model ("PaR"). The PaR model is one of a number of tools incorporated within Ventyx's Energy Portfolio Management ("EPM") suite of modeling tools.

1 numerous consulting assignments using the PROMOD production cost modeling
2 software.

3

4 In 1991 I moved to Ventyx's SRATEGIST Department where I managed a Client
5 Service Support Team. SRATEGIST is a resource planning tool used to evaluate
6 alternative resource options to derive a utility's optimal long-term resource plan.
7 While part of this department, I worked on numerous consulting assignments such
8 as avoided cost analyses, demand-side management studies, and Integrated
9 Resource Planning ("IRP") studies for utilities across the U.S and abroad.

10

11 In 1996 I began my own consulting firm, HPSC, in which I continue to work on
12 projects involving generation resource planning, economic analysis, and rate
13 analysis. During my career, I have had extensive experience working with
14 production cost modeling tools, including PROMOD, Strategist, Cumulus, GRID,
15 EGEAS, MAINPLAN, PROSYM, and PaR. Additional background, including a
16 list of my specific regulatory appearances can be found in Exhibit Hayet-1.

17

18 **Q. Have you previously testified before the Kentucky Public Service Commission**
19 **("Commission" or "PSC")?**

20 A. No. Although I have made numerous appearances before other state regulatory
21 commissions and before the Federal Energy Regulatory Commission, this is my first
22 appearance before this Commission. Most, if not all, of these projects and testimony
23 involved production resource issues.

1

2 **Q. On whose behalf are you testifying in this proceeding?**

3 A. I am testifying on behalf of the Kentucky Industrial Utility Customers, Inc.
4 ("KIUC").

5

6 **Q. Please summarize your testimony.**

7 A. My testimony reviews Big Rivers Electric Corporation's ("Big Rivers" or "The
8 Company") request for approval of a new environmental compliance plan and
9 certificates of public convenience and necessity ("CPCNs") that would allow it
10 to be able to construct a set of environmental upgrade projects, which are
11 included in Big Rivers 2012 Environmental Compliance Plan ("ECP"). My
12 testimony primarily addresses the economic evaluation that Big Rivers conducted,
13 which is included in Mr. Hite's testimony and summarized in Exhibit Hite-4. I
14 discuss the production cost analyses that Big Rivers and its consultants
15 performed, and the alternative analyses that I conducted, which used the same
16 modeling tool Big Rivers relied on, and began with data that Big Rivers and its
17 consultants used in their studies. My testimony also discusses some of the
18 problems that I discovered in conducting my work based on the various disputes
19 that arose between KIUC and Big Rivers over access to their modeling data,
20 errors that I found in instructions supplied, and errors in the data that Big Rivers
21 used to conduct its analyses.

22

23 **Q. Please summarize your conclusions and recommendations?**

- 1 A. My conclusions and recommendations are as follows:
- 2 1. The Company's economic evaluations fail to justify its proposed ECP, and the
3 Company should not be granted CPCNs for projects other than those related to
4 meeting the MATS requirements.
- 5 2. Based on both a quantitative evaluation and qualitative factors, I conclude that
6 the Company's Buy Case, which requires approximately \$200 million less in
7 capital expenditures, is the most prudent course of action for the Company at
8 this time, in order for it to meet environmental regulations. After correcting
9 for numerous modeling errors, on a net present value basis the Buy Case and
10 the Build Case are basically a wash. Given the fact that there is no clear
11 economic advantage between the Buy and Build cases, I conclude that the
12 Buy Case is superior and less risky given the possibility of additional
13 undiscovered errors in Big Rivers' analysis, uncertainty surrounding the
14 Smelter load, the preliminary nature of Big Rivers' cost estimates in the Build
15 case, the fact that additional environmental regulations (requiring additional
16 unidentified costs) are likely to be imposed on Big Rivers' coal generation,
17 and the inherent risk of Big Rivers becoming a merchant generator in the
18 MISO market. An additional appeal of the Buy Case is that it would not
19 preclude Big Rivers from performing the proposed large environmental
20 upgrade projects in the future, when the picture becomes clearer regarding
21 some of the uncertainties.²
- 22 3. The Company's economic evaluation, based on its production cost modeling
23 approach is flawed, sub-optimal, and contains numerous modeling errors. I
24 have corrected many of the modeling issues in my analysis. One of the most
25 significant modeling concern was Big Rivers use of a very high PACE market
26 energy forecast that included CO2 costs, combined with the inconsistent
27 assumption that Big Rivers itself would incur no CO2 costs. This inconsistent
28 assumption biased the study results in favor of the Build Case.
- 29 4. While the Company went to elaborate steps to conduct its study, it should
30 have expended more effort documenting the study methodology in its
31 testimony. Five witnesses filed testimony on behalf of the Company, and only
32 the Company's Vice President of Accounting and Interim Chief Financial
33 Officer, Mr. Mark Hite, described the study, and only from a high level

² Given Big Rivers dependence on coal, KIUC would not oppose, further consideration of the Reid Steam Unit gas conversion project. Additionally, given the small cost of the environmental upgrades, KIUC would not oppose further consideration of the upgrade projects at HMP&L Units 1 & 2.

1 perspective.

2

3 **COMPANY'S 2012 ECP REQUEST**

4

4 **Q. Please describe Big Rivers's 2012 ECP proposal.**

5

5 A. Big Rivers currently has an existing environmental compliance plan that had been
6 designed to control various emissions including SO₂ and NO_x, which had
7 previously been approved in 2008. Given the recent series of environmental
8 regulations finalized by the EPA, including the Cross-State Air Pollution Rule
9 ("CSAPR") that was supposed to begin January 1, 2012, and the Mercury Air
10 Toxics Standard ("MATS"), which requires compliance beginning in April 2015,
11 Big Rivers has proposed a plan to meet the new environmental regulations.³ Big
12 Rivers and its consultants have conducted a study of its options to comply with
13 these regulations, which led to the development of the 2012 ECP. A summary of
14 Big Rivers' proposed environmental upgrade projects can be found in Exhibit
15 Berry-2 attached to Company witness Robert Berry's testimony.

16

17 **Q. What studies did Big Rivers conduct to develop its ECP?**

18

18 A. Big Rivers began by reviewing the environmental regulations currently in effect,
19 and new regulations that have been proposed, the levels of emissions that its
20 generating fleet currently produces, and the amount of emissions reductions and
21 possible emissions reductions that might have to be achieved. The 2012 ECP was

³ Due to a court order in the 11th circuit court, CSAPR is currently stayed on appeal. However, Big Rivers has assumed that the order will eventually be lifted and utilities will have to comply with the rules.

1 developed based on a study performed for Big Rivers by Sargent and Lundy, LLC
2 (“S&L”), who evaluated different technology alternatives that would allow Big
3 Rivers to meet the new and proposed EPA regulations, including CSAPR and
4 MATS. Many technology types were screened in the analysis besides the ones
5 that were ultimately selected.
6

7 **Q. Were other regulations such as EPA's proposed §316(b) of the Clean Water**
8 **Act ("316b") and Coal Combustion Residuals ("CCR") considered?**

9 A. Yes, S&L evaluated those regulations and made recommendations, however, Big
10 Rivers' 2012 ECP did not include any specific actions to address those proposed
11 regulations, as Big Rivers plans to continue monitoring those rules and address
12 them in the future. According to Mr. Shaw's testimony, possible compliance
13 alternatives for the 316(b) rules include water modifications to the existing intake
14 structures at some of its units. Possible compliance alternatives for the CCR
15 regulations include converting existing ponds to dry bottom ash systems using
16 submerged scraper conveyors ("SSCs"). Big Rivers' economic analysis did not
17 assume any costs for either of these two proposed EPA rules. To the extent that
18 either proposed rule makes generating from its coal units more expensive, then
19 the cost of the Build Case compared to the Buy Case would increase.
20

21 **Q. Please summarize some of the important findings of the S&L study.**

22 A. Some of the conclusions of the study are:

- 23
- Big Rivers can meet CSAPR on a system-wide basis, but will have to make

1 unit specific modifications to meet MATS, and all of the Company's coal units
2 will require some upgrades to comply with MATS.

- 3 • A set of eight projects are proposed in the ECP. Four to satisfy CSAPR at a
4 cost of \$227.50, and four to satisfy MATS at a cost of \$58.64 million. These
5 include projects at the Henderson Municipal Power & Light ("HMP&L")
6 Station Two coal-fired units owned by the City of Henderson (estimates above
7 include HMP&L's costs).
- 8 • One of two large CSAPR projects includes a Scrubber replacement at DB
9 Wilson that would increase its SO₂ removal efficiency from 91% to 99%.
10 Big Rivers expects this project to be completed by 2016 at a cost of \$139
11 million, and would require an annual incremental increase in O&M costs
12 starting at \$760,000 per year. As Mr. Kollen testifies, the cost of removing
13 the existing Wilson scrubber is not included in the \$139 million cost estimate.
- 14 • A second large CSAPR project is an SCR addition at Green Unit 2, which is
15 expected to cost \$81 million, and planned for completion in 2015.
16 Incremental O&M expenses are estimated to start at \$1.6 million.
- 17 • Two smaller CSAPR projects are to convert Reid Unit 1 to fire on natural gas
18 at a cost of \$1.2 million and to be completed January 1, 2014; and another
19 project that includes various plant improvements at HMP&L Units 1 and 2 to
20 reduce SO₂ emissions. The HMP&L projects are estimated to cost \$6.30
21 million and are scheduled for completion January 1, 2015. Incremental O&M
22 costs are estimated to start at a cost of \$0.475 thousand dollars.
- 23 • Four MATS projects are planned at the Coleman, Wilson, Green, and

1 HMP&L plants to control emissions of Mercury and other emissions. The
2 cost of those projects is \$58.64 million and they are scheduled for completion
3 January 1, 2016. Incremental O&M costs are estimated at approximately \$10
4 million starting in 2016.

5

6 **Q. Were all of the options that S&L recommended accepted by Big Rivers?**

7 A. No. S&L recommended that advanced low NOx burners be installed at Coleman
8 Units 1, 2 and 3. However, Big Rivers decided to avoid the capital expense of
9 those projects, and recognized that since CSAPR is a cap-and-trade program, it
10 would have the option to purchase additional allowances if necessary to comply
11 with the CSAPR requirements. Also, as mentioned above, S&L identified
12 upgrades to meet other regulations such as additional water and combustion
13 residual regulations; however, Big Rivers intends to continue monitoring EPA
14 activity as those regulations are developed.

15

16 **Q. Does Big Rivers 2012 ECP indicate that it will meet the compliance deadlines
17 in MATS and CSAPR?**

18 A. Strictly speaking no; though there are strategies Big Rivers has identified that will
19 allow it to be in compliance with the regulations. The stricter Phase 2 compliance
20 requirements of CSAPR begin in 2014, and MATS requirements begin in 2015.
21 Big Rivers' compliance plan indicates that many projects won't be complete until
22 2016. Big Rivers' analysis is that since the CSAPR rule has been stayed by the
23 DC Circuit Court of Appeals, if it is reinstated as written, there will likely be at

1 least a one year compliance delay until 2015. Given that projects such as the
2 Wilson Scrubber are not planned to come online until 2016, Big Rivers states its
3 compliance strategy will either be to rely on banked allowances, purchase
4 allowances, or curtailments of generation at its units.

5
6 **Q. Did S&L's economic evaluation consider the option of reducing generation
7 and purchasing incremental needs from the market instead of performing
8 environmental upgrades?**

9 A. No. While the S&L study discusses the possibility of complying with CSAPR by
10 reducing generation and purchasing incremental power from the market, it did not
11 quantify the economic impacts of this option. Such a study would require a
12 production cost modeling evaluation that would include simulating Big Rivers'
13 loads and resources, and the opportunity to purchase power from the MISO
14 market. After the S&L study was complete, and a set of environmental upgrades
15 were identified for meeting the new EPA rules (except for the proposed water and
16 combustion residual regulations) Big Rivers (with the assistance of additional
17 consultants) then proceeded to conduct a production cost/economic evaluation.

BIG RIVERS PRODUCTION COST/ECONOMIC EVALUATION

18
19 **Q. Please describe the cases that were analyzed as part of the production cost
20 modeling.**

21 A. Big Rivers identified three cases it decided to evaluate: the Build Case, the Partial
22 Build Case, and the Buy Case. The Build Case includes the eight projects

1 discussed above, four that satisfy MATS and four that satisfy CSAPR
2 requirements. The Partial Build Case was designed to meet CSAPR requirements
3 by including all projects except for the Green 2 SCR project. The Buy Case only
4 included the four projects that satisfy the MATS requirements, and constraints
5 were imposed to limit unit generation and to replace that generation with
6 incremental purchases from the market. Two sensitivity cases also were
7 performed to determine if the Build case still was more economic than the Buy
8 case if the Smelter load were lost.

9
10 **Q. What was the responsibility of the consultants Big Rivers retained?**

11 A. Along with Big Rivers, three consultants played a role in the production
12 cost/economic evaluation; two that played a primary role, and one that played a
13 more limited secondary role. The three consultants were PACE Global
14 ("PACE"), ACES Power Marketing ("ACES"), and IHS. PACE conducted
15 modeling analyses to derive reference case forecasts for energy market prices,
16 monthly coal prices, monthly natural gas prices, and monthly allowances prices.
17 ACES performed the production cost modeling analyses that incorporated the data
18 PACE supplied, and other data assumptions that Big Rivers provided, including
19 generating unit characteristics and load forecasts. ACES also provided a forecast
20 of wholesale energy prices. IHS' limited role was to provide an additional
21 projection of market energy prices. Big Rivers entered the production cost results
22 into its corporate financial model and performed a net present value revenue
23 requirement analysis.

1

2 **Q. How was the MISO System represented in the analysis?**

3 A. Big Rivers chose to model the MISO System using a simplified approach that
4 avoided the need to represent all of the loads and resources of all the generation
5 and load owning entities in MISO. Instead, the production cost evaluation
6 represented the MISO energy market, which covers parts of 13 states, and
7 includes over 100,000 MW of generating unit capacity, using a single market
8 price profile. This profile contained hourly market prices assumed at the closest
9 trading hub to the Big Rivers System. Every hour between January 1, 2012 and
10 December 31, 2026 was included in the \$/MWH profile. Purchases and sales are
11 derived based on an hourly comparison of the system incremental cost to the cost
12 of the hourly market price forecast. If the market price is less than the cost to
13 generate in that hour, then purchases are made, and if the market price is greater
14 than the cost to generate in that hour, then sales are made.

15

16 This is not an uncommon approach to conducting a production cost study, as it
17 significantly reduces the amount of input assumptions needed to conduct the
18 study. Certainly there are some limitations that should be recognized in a study
19 such as this, including the fact that it does not capture transmission modeling
20 impacts, and it does not include a commitment and dispatch process that
21 optimizes operating reserves across the entire MISO System.

22

23 **Q. How was the MISO market price profile developed?**

1 A. PACE performed a large scale production cost dispatch simulation using a model
2 named AuroraXMP ("Aurora"), which is owned and licensed by EPIS, Inc.
3 PACE's model included all of the loads and resources of the MISO System, and
4 developed hourly market price projections at the hub closest to Big Rivers. PACE
5 performed a stochastic analysis simulating a large number of cases and developed
6 individual market price forecasts for each case simulated. While numerous
7 market price forecasts were developed, Pace was able to derive a reference case
8 forecast, which it refers to as being "...representative of the mean outcome of its
9 distribution".⁴ The reference case forecast was supplied to ACES for purposes of
10 conducting the production cost analysis. In a similar manner, PACE developed
11 numerous projections of natural gas prices, emissions prices, and coal prices
12 which were all manipulated to develop reference price forecasts.

13
14 Importantly, the PACE market price forecast assumed that restrictions on CO2
15 emissions would be required during the study period. This assumption regarding
16 CO2 emissions had the effect of greatly increasing the PACE market price
17 forecast and making the Buy Case more expensive. The Build Case did not
18 assume any added costs for complying with future CO2 emission limits.

19
20 **Q. Did ACES develop any of the market price forecasts that were used in the**
21 **studies presented by the Company in Mr. Hite's testimony?**

⁴ See Big Rivers' confidential and non-confidential response to KIUC 2-28.

1 A. No. Only PACE global assumptions were used in the study that was conducted to
2 support Big Rivers application in this proceeding. However, some discovery
3 responses discuss a market energy price forecast that ACES developed and used
4 in sensitivity studies that were discussed in a report dated nearly two months after
5 testimony was filed in this proceeding. As it turns out, the ACES market price
6 forecast is considerably lower than the PACE forecast.

7

8 **Q. What was the purpose of IHS's limited role of supplying what turned out to**
9 **be a third market energy price forecast developed during this study?**

10 A. According to Big River, it was "...obtained in an attempt to be as accurate and
11 thorough as possible". (Big Rivers Response to KIUC 2-24) Exhibit Hayet-2 is a
12 confidential exhibit taken from a data response Big Rivers supplied (KIUC 1-17)
13 that shows that there is close correlation between the lower ACES and IHS
14 forecasts, and an extreme divergence between those and the much higher PACE
15 forecast (which included costs associated with CO2 emission restrictions) that
16 was used to produce results that were reported in testimony. In light of what the
17 comparison shows, it is not clear how Big Rivers relied on the accuracy that it
18 derived by obtaining the IHS forecast, as it never used any results based on either
19 the ACES or IHS market price forecasts to support its recommendation that it be
20 granted CPCNs for the proposed environmental projects. Had it done that, it
21 would have shown how sensitive the economic results are to the choice of the
22 market price forecast. Later in my testimony, I will present that comparison.

23

1 **Q. Please summarize the steps performed to conduct Big Rivers' production**
2 **cost/economic analysis.**

3 A. The following steps were performed:

- 4 1) Big Rivers supplied generating unit characteristics, load forecasts, and
5 other economic assumptions to ACES and PACE.
- 6 2) PACE developed numerous market energy price, natural gas price, coal
7 price, and emissions allowances forecasts, and derived from those single
8 reference price forecasts that ACES used in its production cost modeling
9 (Ventyx Planning and Risk Model - PaR).
- 10 3) The Build Case included changes such as SO₂ and NO_X removal rates
11 and VO&M costs as a result of applying environmental upgrades to
12 specific generating units.
- 13 4) In the Buy Cases, Big Rivers took certain units out of service for certain
14 months, mostly during shoulder months to restrict production of
15 emissions.
- 16 5) Emissions price adders were incorporated in the dispatch price of
17 generating units, but were ignored from the production cost results
18 produced by the model. Big Rivers computed emissions allowances in a
19 spreadsheet in a later step.
- 20 6) 15 year production cost runs were performed, and ACES transferred
21 production cost results (fuel costs, startup costs, VO&M costs, purchase
22 power costs, sale revenues, emissions, as well as other output variables
23 such as unit generation) to Big Rivers who loaded the results into its
24 Corporate Financial Model ("CFM"). Purchases and sales of emissions
25 allowances, including banking of allowances, were factored into the
26 analysis in the CFM.
- 27 7) The CFM included the fixed costs of the environmental upgrade projects
28 that were relevant to each case, and developed total company revenue
29 requirements. Present value revenue requirements were computed using
30 a 7.93% discount rate, and the cases were compared to determine which
31 was the most cost-effective.

32

PROCESS FOLLOWED TO ANALYZE BIG RIVERS' RESULTS

33

34 **Q. What process did you follow to evaluate Big Rivers study and results?**

35 A. The approach I typically follow for generation planning studies such as this is to

1 review the utility's modeling methodology, assumptions, and results. Oftentimes
2 for the production cost work that I perform, I either request the utility to work
3 with me to make runs, or I request the utility to supply the same exact database
4 they used, and I obtain the same production cost model from the model vendor.
5 In this case, we first notified the Company of our intent to pursue one of these two
6 paths in a letter to the Company on May 11, 2012. Though we had several
7 communications with the Company regarding this matter, by May 31, 2012, we
8 received clear messages from the Company that they would refuse to provide the
9 exact database we requested, and that they would not allow us to work together
10 with ACES to run our cases on their computer.

11

12 **Q. How was this matter resolved?**

13 A. On June 6, 2012, KIUC, the Sierra Club, and the Attorney General filed a joint
14 motion to compel, and on June 8, 2012, the Company filed a response. Basically,
15 the Company stated that it believed that an intervener should be able to take the
16 data the Company supplied in spreadsheet format and be able to retrace the
17 Company's steps and recreate the database. KIUC believed that would be overly
18 burdensome and would not necessarily be guaranteed to lead to the same results
19 that the Company had produced. Furthermore, in all my years of working in the
20 production cost modeling area, both on my own at my own company and prior to
21 that at Ventyx, I have never experienced a utility refusing to supply the exact
22 database that they had developed. This was unprecedented in my experience.
23 However, in the Company's response to the motion to compel, they laid out a path

1 forward to resolve the matter, but in doing so it became clear what the heart of the
2 matter really was.

3

4 **Q. What do you believe that was?**

5 A. Apparently Big Rivers' consultant embedded the data used to conduct the Big
6 Rivers' study in a larger database containing other clients' data, which was
7 confidential. To strip out the data was not a trivial matter, and Big Rivers and
8 ACES believed that if they had to turn over the database, it would be best for
9 Ventyx to strip it apart, and an agreement was struck for Big Rivers to hire
10 Ventyx to do that. In future regulatory proceedings concerning studies such as
11 these, I recommend that Big Rivers always develop databases in such a way that
12 they can be turned over to the Commission and interveners upon request and with
13 appropriate confidentiality agreements.

14

15 **Q. Did you encounter any other difficulties in acquiring the database?**

16 A. Yes, there have been a multitude of problems. In the interest of brevity I will list
17 them in bullet form:

- 18 • Big Rivers refused to have either ACES or Ventyx validate that identical
19 results could be produced. As a result half of the cases would not run, and I
20 had to work closely with Ventyx to fix them;
- 21 • Run definitions, which are required to make PaR runs were not kept by
22 ACES. This led to problems in identifying how to recreate cases;
- 23 • Results are close but still may not be identical for all of the cases;

- 1 • Some files that Big Rivers supplied were corrupt and had to be re-supplied;
- 2 • Instructions have been misleading. In some cases instructions about the files
- 3 that were needed to recreate runs were wrong.
- 4 • Spreadsheets were delivered with references to other spreadsheets, but the
- 5 other spreadsheets were not supplied and had to be requested.
- 6 • Files that could have been used to verify what data had been used, and to
- 7 validate results were not kept by ACES.

8

9 **Q. How have these problems impacted your ability to conduct your analysis?**

10 A. There is no question that dealing with all of these issues along the way has been a

11 significant distraction, and I am sure that there may have been other analyses and

12 runs that I would have performed if time permitted. Be that as it may, I have in

13 fact conducted the cases that I was interested in and I am presenting those in this

14 testimony.

15

16 **Q. Have you identified any issues with data assumptions that ACES used in its**

17 **study that you do not agree with?**

18 A. Yes, in general I believe that the Company has overstated the cost of the Buy

19 Case. According to Mr. Berry's testimony at page 32, Big Rivers will not be able

20 to complete its two large CSAPR projects until 2016. Furthermore, Mr. Berry

21 states that "If the new compliance requirements are put into effect in 2015 as

22 currently written and Big Rivers does not have sufficient quantities of allowances

23 banked, it will either purchase allowances or curtail generation to achieve

1 compliance until all of the projects are completed." What the Company does that
2 is unreasonable is to begin implementing changes and incurring costs in the Buy
3 Case in early 2012. For example, in the Buy Case, the Company shuts down the
4 DB Wilson unit in March 2012 for three months for the first time. However, in
5 the Build Case, the DB Wilson unit does not have a change to its emissions
6 removal rate until several years later. This results in overstating the costs of
7 operating the System in the Buy Case for several years. I changed this input in
8 the Buy Case to begin shutting down the DB Wilson unit in 2016 to be consistent
9 with the Build Case.

10

11 **Q. What other modeling corrections did you make?**

12 A. I will list the rest of the modeling corrections I made in bullet form.

- 13 • Buy Case. DB Wilson VO&M is higher in the Buy Case than the Build Case. By
14 2026, it is as much as 13.6% higher than the Build Case. I set the values in the
15 Buy Case equal to the Build Case. This still understates the costs in the Build
16 Case to some extent. (See Incremental VO&M costs on Page 2 of 2 in Exhibit
17 Berry-2).
- 18 • Build Case. DB Wilson Emissions Removal Rate. DB Wilson's upgrade will not
19 be completed until 2016. ACES had the emissions reduction rate change
20 beginning January 2015. I reset this to begin January 2016.
- 21 • Build No Smelter Case. The Company input VO&M at Green 1 at a significantly
22 higher amount in the Build No Smelter Case than in the Buy No Smelter Case. I
23 corrected this.
- 24 • Build Case. VO&M at Green 2 is the same in the Build and Buy cases, although
25 it should be different once the Green 2 SCR is added in 2015. Incremental O&M
26 is indicated to be \$1.58 million beginning in 2015 due to the addition of the SCR
27 per Exhibit Berry-2 page 2 of 2. I added this change to the Build Case.

- 1 • HMPL 1&2 has the same VO&M in the Build and Buy Cases. Exhibit Berry-2
2 indicates that the Build Case should be higher by approx \$800,000 per year. I did
3 not have time to make this correction, but had it been made it would have
4 increased the cost of the Build Case.
- 5 • HMPL 1&2. The Buy No Smelter Case has higher VO&M than all of the other
6 cases, which does not make sense. I changed this to be consistent with the other
7 cases.
- 8 • Build Case. The Build Case has the environmental upgrade project completed
9 January 1, 2014. According to Exhibit Berry-2 page 1 of 2, it should be 2015. I
10 made this correction to the Build Cases.
- 11 • HMPL 1&2 VO&M costs. The Costs that the Company used in its financial
12 analysis do not match what the Company indicates should have been used in the
13 production cost model. The Company should explain this.
- 14 • Coleman 1, 2 & 3. Even though compliance with CSAPR won't begin until 2016,
15 Big Rivers has begun to constrain the dispatch of the Coleman units as early as
16 2013. I changed this to begin in 2016.
- 17 • Coleman 1, 2 & 3. Given that the units will now be shut down for multi-month
18 periods of time to limit emissions, it may not be necessary to schedule
19 maintenance during a different period of time. I changed the maintenance to
20 occur at the same time that the unit is taken offline.
- 21 • For purposes of my runs, I selected to use a specific Monte Carlo feature known
22 as the Convergent Monte Carlo method. Because I selected this option, I noticed
23 inconsistencies in the results including Coleman 2 having hundreds of startups per
24 year. It turned out that the database had two inputs reversed. The mean time to
25 repair input was switched and input as the average time to repair at the Coleman 2
26 unit. I corrected this error and the results appeared to be reasonable.
- 27 • PACE market price forecast is too high to use as a reference case. A comparison
28 of the market price forecasts provided by IHS and ACES to the PACE Global
29 forecast indicates that the PACE Global forecast (which assumes significant CO2
30 compliance costs during the study period) is an outlier and should not be relied as
31 a reference case forecast. I have used the ACES forecast, which is essentially the
32 same as the IHS forecast, as the basis for my market price forecast.
- 33 • Using the ACES forecast corrects for another flaw in the study. ACES has
34 developed its market price forecast without consideration of CO2 costs being

1 imposed, while PACE considered CO2 costs. To run a production cost model in
 2 the Build Case without imposing CO2 costs constraints, but including in that
 3 model a market price forecast that does include CO2 costs is completely
 4 inconsistent and biased in favor of the Build Case. An assumption that market
 5 prices will be very high in part because of the inclusion of CO2 costs has two
 6 basic modeling effects: it makes buying market power less attractive and it makes
 7 selling power as a merchant generator more attractive. But a CO2 requirement
 8 would make generating from Big Rivers' coal units much more expensive, and
 9 that was not considered. Either consideration of CO2 costs should be removed
 10 from the process of developing the market price forecast, or CO2 costs should be
 11 included in the production cost modeling step along with the market price forecast
 12 that included consideration of CO2 costs. By using the ACES market price
 13 forecast, I have essentially removed CO2 costs from the market price forecast,
 14 which leads to consistency in the production cost modeling step.

KIUC Alternative Analysis

15

16 **Q. Have you corrected the data assumptions you discussed above?**

17 A. Yes, the following table contains KIUC's results with all of the data
 18 improvements discussed, and with revised market prices based on the ACES
 19 market price forecast.

Cases with ACES Market Prices and KIUC Changes
Net Present Value Revenue Requirement
 Millions of Dollars

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Diff
Build	304	289	283	276	275	258	244	231	221	210	199	189	183	174	165	3,500
Buy	307	289	277	273	274	262	254	243	230	219	206	197	188	180	172	3,570 71
Build No Sm	304	289	66	63	60	54	40	42	42	41	36	31	30	33	27	1,157
Buy No Sm	307	289	62	63	59	51	45	46	46	44	38	32	31	34	30	1,178 21

21

22 These results can be compared to the Company's results for these same cases
 23 presented in Exhibit Hite-4.

Comparison of Total 15 Year NPV Revenue Requirements

	Company Results (Millions of \$)		KIUC Changes and ACES Prices (Millions of \$)	
Buy	3,921		3,570	
Build	3,210		3,500	
	711	22.1%	70	2.0%
Buy No Smelter	265		1,178	
Build No Smelter	-334		1,157	
	599	-179.3%	21	1.8%

1

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7 **Q. How do you interpret these results?**

8 A.

9

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18

These cases indicate that when data assumptions have been corrected, and the ACES market prices have been added, which KIUC believes is a more reasonable forecast, the Buy Case is only slightly higher in cost than the Build Case, both with and without the smelter load.

These results indicate that the Build and Buy scenarios are very close in cost, however, it is necessary to consider other factors, as well as whether there are any other costs that have not been properly accounted for in the study. These results do not present a complete picture of the risks the Company faces by committing to this construction program. The proposed projects represent a sizable construction program for Big Rivers, and it would not be unreasonable to expect there could be cost overruns during construction. Second, these environmental costs do not include the costs of compliance with other regulations including 316(b) water regulations and the Coal Combustion Residual regulations. Furthermore, these results do not include all of the incremental VO&M costs indicated that are included on page 2 of Exhibit Berry-2. If all of these costs were

1 factored in, it is likely that the Buy Case would have a cost advantage over the
2 Build Case.

3

4 **Q. Do you believe there are any other means by which the Company could have**
5 **reduced the cost of the Buy Case?**

6 A. Yes, as I have explained previously, Big Rivers controlled emissions in the Buy
7 Case, by selecting certain months to remove units from service. In doing that, it
8 limited the production cost model's ability to dispatch units economically, while
9 at the same time meeting emissions limits. A few other ways could have been
10 evaluated, which the Company never discussed having done, in order to derive a
11 more optimal dispatch result in the Buy Case. For example, annual emission
12 limits could have been entered and the model could have tried to optimize the
13 dispatch to find a more economic result while still meeting the emissions limits.
14 Another approach would have been to increase the price of the emissions cost,
15 entered as part of the dispatch price, until the emissions were reduced below the
16 emissions constraint. In addition, based on the method that Company did use,
17 which was to shut down certain units for certain periods of time, it is also possible
18 that different combinations of units could have been selected than those the
19 Company selected, that would have resulted in production costs that were lower
20 than those the Company produced. For example, the Company consistently took
21 the Coleman and Wilson units out of service in the Buy Case, but possibly the
22 Green units should have been tested to see if taking those units out of service
23 would have led to a more economic result. Given more time, I could have

1 performed the additional modeling analyses, and I believe the Buy Case results
2 would have been lower than those the Company produced, making the Buy Case
3 an even better option to pursue.

4

5 **Q. Please discuss the Company's position that its results indicate that the Build**
6 **Scenario is more cost effective even with a loss of the entire smelter load?**

7 A. The comparison table above indicates that the Big Rivers System would be
8 slightly better off under the Build Case even if the Company were to lose the
9 smelter load. To lose nearly 70% of the Company's load and still be comfortable
10 spending nearly \$300 million on environmental upgrade capital costs does not
11 seem reasonable. It is one matter to spend this amount of capital knowing that
12 there is a long term load to supply, however, it is quite another if in fact the
13 Company were to lose the smelter load. Furthermore, losing the smelter load, and
14 investing nearly \$300 million in its generating units effectively means that Big
15 Rivers would become a merchant generator that would have only coal-fired
16 energy available for sale. All future environmental upgrade costs, would have to
17 be passed on to the MISO market, if in fact the market would even accept paying
18 those costs. Also, as discussed previously, Big Rivers assumes that it would be
19 selling excess generation into a very high priced market that includes CO2 costs,
20 but inconsistently assumes that it would incur no increased costs of its own
21 because of the very same CO2 restrictions.

22

23 **Q. Wouldn't it be even riskier for Big Rivers to become a merchant generator?**

1 A. Yes, especially in the MISO market. Unlike PJM, MISO is only beginning to
2 implement an organized market for capacity, and given that many of MISO's
3 members are regulated entities, many Companies will opt out of the capacity
4 market, which will make excess generation inherently less valuable than in PJM.

5
6 **Q. Have other companies encountered difficulties surviving as merchant
7 generators?**

8 A. Yes, the following is a table of merchant generators that have all gone bankrupt
9 since 2000, which is all the more reason to be concerned about Big Rivers
10 becoming a merchant generator.

Generator	Year of Bankruptcy
Enron	2001
Mirant	2003
NRG	2003
Calpine	2005
Dynegy	July 2012
AES Eastern Energy	January 2012

11

12 **Q. Please summarize your conclusions regarding Big Rivers request to construct
13 the proposed environmental upgrades.**

14 A. I believe that some environmental upgrades are necessary and should be
15 implemented including the four MATS projects. However, I believe that the two
16 large CSAPR projects, including the new Scrubber at Wilson and the SCR at
17 Green 2 should be avoided at the present time since there is no clear economic
18 advantage between the Build and the Buy cases. I also believe that the Build Case
19 is riskier because, as I have discussed above, there are likely additional costs in

1 that case that have not been accounted for. Furthermore, Big Rivers would
2 effectively become a merchant generator in the event that there is a loss of
3 Smelter load, which is inherently a risky proposition. An additional appeal of the
4 Buy Case is that it would not preclude Big Rivers from performing the proposed
5 large environmental upgrade projects in the future, when the picture becomes
6 clearer regarding the uncertainties that I have identified. Another scenario that
7 the Company may want to consider would be for Big Rivers to perform the two
8 smaller upgrade projects, which would provide for some reduction in emissions,
9 and further control emissions in the same manner as in the Buy Case. This would
10 be considered a modification of the Company's Buy Case, though the Company
11 has not provided any analysis of this case, which it could do at a future point in
12 time. This case would involve a fairly small amount of risk as it would only
13 involve a cost of \$7.5 million according to Exhibit Berry-2.

14

15 **Q. Does this complete your testimony?**

16 **A. Yes.**

AFFIDAVIT

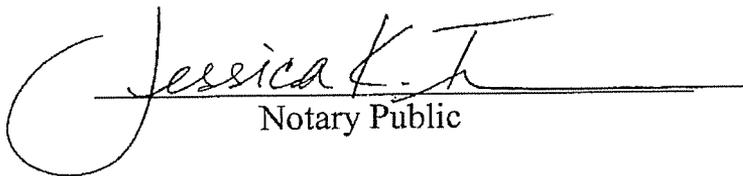
STATE OF GEORGIA)

COUNTY OF FULTON)

PHILIP HAYET, being duly sworn, deposes and states: that the attached is his sworn testimony and that the statements contained are true and correct to the best of his knowledge, information and belief.


Philip Hayet

Sworn to and subscribed before me on this
23rd day of July 2012.


Notary Public



COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS)	
ELECTRIC CORPORATION FOR)	
APPROVAL OF ITS 2012 COMPLIANCE)	
PLAN, FOR APPROVAL OF ITS)	
AMENDED ENVIRONMENTAL COST	)	CASE NO. 2012-00063
RECOVERY SURCHARGE TARIFF,)	
FOR CERTIFICATES OF PUBLIC)	
CONVENIENCE AND NECESSITY, AND)	
FOR AUTHORITY TO ESTABLISH A)	
REGULATORY ACCOUNT)	

<p>EXHIBITS</p> <p>OF</p> <p>PHILIP HAYET</p>

ON BEHALF OF THE
KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.

HAYET POWER SYSTEMS CONSULTING
ATLANTA, GEORGIA

July 2012

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS)	
ELECTRIC CORPORATION FOR)	
APPROVAL OF ITS 2012 COMPLIANCE)	
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RECOVERY SURCHARGE TARIFF,)	
FOR CERTIFICATES OF PUBLIC)	
CONVENIENCE AND NECESSITY, AND)	
FOR AUTHORITY TO ESTABLISH A)	
REGULATORY ACCOUNT)	

<p>EXHIBIT HAYET-1</p> <p>OF</p> <p>PHILIP HAYET</p>

ON BEHALF OF THE
KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.

HAYET POWER SYSTEMS CONSULTING
ATLANTA, GEORGIA

July 2012

RESUME OF PHILIP HAYET

EDUCATION/CERTIFICATION

M.S., Electrical Engineering, Georgia Institute of Technology, 1980
B.S., Electrical Engineering, Purdue University, 1979
Cooperative Education Certificate, Purdue University, 1979
Registered as a Professional Engineer in the State of Georgia, 1987
Member National Professional Engineering Society

EXPERIENCE

Mr. Hayet has provided consulting services to Public Utility Commissions, State Energy Offices, Consumer Advocate Offices, Electric Utilities, Global Power Developers, and Industrial Companies for over thirty years. Mr. Hayet's expertise covers a number of areas including utility system planning and operations, market price forecasting, Integrated Resource Planning, renewable resource evaluation, transmission planning, demand-side analysis, and economic analysis. In 1995, Mr. Hayet began his own utility consulting firm, Hayet Power Systems Consulting ("HPSC"), and has worked for customers in the United States, and internationally in Australia, Japan, Singapore, Malaysia, the United Kingdom, and Vietnam. In addition to continuing to work for HPSC, in 2000, Mr. Hayet began working part time for the consulting firm of J. Kennedy & Associates, Inc. to provide support for projects requiring utility resource planning analysis and software modeling expertise.

Prior to 1995, Mr. Hayet worked for fifteen years at Energy Management Associates, now Ventyx, where he provided consulting services and client service support for the widely used utility system planning software models, PROMOD IV and STRATEGIST. Clients included various electric utilities, governmental agencies, and private industry. Mr. Hayet helped to design some of the features that exist within the PROMOD IV and STRATEGIST systems, such as the competitive market modeling features in STRATEGIST.

Mr. Hayet has conducted numerous consulting studies in the areas of Renewable Resource Evaluation, Renewable Portfolio Standards Evaluation, Green Pricing Tariff Development, Electric Market Price Forecasting, Generating Unit Cost/Benefit Analysis, Integrated Resource Planning, Demand-Side Management, Load Forecasting, Rate Case Analysis and Regulatory Support. A list of recent projects is included below.

SPECIFIC EXPERIENCE

Projects Since 2000 - Hayet Power Systems Consulting, Atlanta, GA – President

- Submitted Direct Testimony May 2012 at the Georgia Public Service Commission concerning Georgia Power's Sixth Semi-Annual Vogtle Construction Monitoring Report (Docket 29849).
- Submitted Direct Testimony May 2012 at the Georgia Public Service Commission concerning Georgia Power's Fuel Cost Recovery Filing (FCR-23 - Docket 35277).
- Submitted Direct Testimony November 2011 at the Georgia Public Service Commission concerning Georgia Power's request to decertify two aging coal units, to acquire PPA

RESUME OF PHILIP HAYET

resources, and to have approved its IRP Update, on behalf of the Georgia Public Service Commission Staff (Docket 34218).

- Submitted Direct Testimony November 2011 at the Georgia Public Service Commission concerning Georgia Power's request to certify the reacquisition of wholesale block capacity, on behalf of the Georgia Public Service Commission Staff (Docket 26550).
- Submitted an Initial and Rebuttal Expert Report (April and June 2011, respectively) on behalf of the Department of Justice in US District Court, Civil Action No. 2:10-cv-13101-BAF-RSW.
- Filed Direct Testimony June 2011 at the Georgia Public Service Commission concerning Georgia Power's Fourth Semi-Annual Vogtle Construction Monitoring Report Period Ending December 31, 2011 (Docket 29849-U).
- Filed Direct testimony April 2011 at the Georgia Public Service Commission concerning Georgia Power's Fuel Cost Recovery Filing (FCR-22) (Docket 33302).
- Filed Direct testimony December 2010 at the Georgia Public Service Commission concerning Georgia Power's Third Semi-Annual Vogtle Construction Monitoring Report Period Ended June 30, 2010 (Docket 29849-U).
- Filed Direct testimony June 2010 at the Georgia Public Service Commission concerning Georgia Power's Second Semi-Annual Vogtle Construction Monitoring Report Period Ended December 31, 2009 (Docket 29849-U).
- Filed Direct testimony January 2010 at the Georgia Public Service Commission concerning Georgia Power's Fuel Cost Recovery Filing (FCR-21) (Docket 28945).
- Filed Direct testimony October 2009 at the Georgia Public Service Commission concerning Georgia Power's First Semi-Annual Vogtle Construction Monitoring Report Period Ended June 30, 2009 (Docket 29849-U).
- Filed Direct and Sur-rebuttal testimony in September and October 2009, respectively at the Utah Public Service Commission concerning PacifiCorp's 2009 Rate Case with regard to net power costs (Docket 09-035-23).
- Assisted the Utah Office of Consumer Services to evaluate PacifiCorp's 2008 IRP (Docket 09-2035-01).
- Assisting the Georgia Public Service Commission Staff to investigate the acquisition of additional coal and combustion turbine capacity currently wholesale capacity (Docket 26550).
- Testified on Georgia Public Service Commission Staff concerning Georgia Power's Certification request for the Vogtle 3 and 4 Nuclear units (Docket 27800).
- Testified on behalf of the Utah Committee of Consumer Services concerning PacifiCorp's 2008 request to acquire the Chehalis Combined Cycle Power Plant based on a waiver of the RFP solicitation process (Docket 08-035-35).
- Submitted testimony on behalf of the Utah Committee of Consumer Services concerning PacifiCorp's 2007 Rate Case with regard to net power costs (Docket 07-035-93).

RESUME OF PHILIP HAYET

- Testified in April 2008 in front of the Georgia Public Service Commission regarding Georgia Power's November 2006 Fuel Cost Recovery filing (Docket 26794-U).
- Assisted the Georgia Public Service Commission Staff to evaluate Georgia Power's 2007 IRP filings (Docket 24505-U).
- Conducted an investigation of the Southern Company interchange accounting and fuel accounting practices on behalf of the Georgia Public Service Commission (Docket 21162-U).
- Testified in January 2007 in front of the Georgia Public Service Commission regarding Georgia Power's November 2006 Fuel Cost Recovery filing (Docket 23540-U).
- Assisted the Utah Committee of Consumer Services to evaluate PacifiCorp's 2007 IRP.
- Provided regulatory support to the Utah Committee of Consumer Services concerning PacifiCorp's 2006 Rate Case with regard to net power costs (Docket 06-35-01).
- Testified in May 2006 in front of the Georgia Public Service Commission regarding Georgia Power and Savannah Electric's March 2006 Fuel Cost Recovery filing (Docket 22403-U).
- Assisted the Utah Committee of Consumer Services by evaluating PacifiCorp's 2005 IRP and assisted in writing comments that were filed with the Commission.
- Assisted the Utah Committee of Consumer Services by participating in a collaborative process to develop an avoided cost tariff for large QFs.

Projects Since 2000 - J. Kennedy and Associates, Inc. Atlanta, GA – Director of Consulting

- Filed Direct Testimony (March 2012) regarding Entergy's change of control filing to move to the Midwest ISO in LPSC Docket 32148.
- Filed Direct Testimony (September 2011) in support of a settlement agreement at the Louisiana Public Service Commission regarding the reasonableness of Cleco's CCPN to upgrade its Madison 3 coal unit to accommodate biomass fuel in accordance with the LPSC's Renewable Energy Pilot in Docket U-31792.
- Filed Direct (January 2011) and Cross-Answering (February 2011) Testimony at FERC regarding the reasonableness of Entergy's 2009 production costs that were used to develop bandwidth payments in Docket ER09-1350.
- Testified at FERC regarding an LPSC complaint that Entergy violated provisions of its System Agreement related to individual operating company sales in FERC Docket EL09-61.
- Testified at FERC regarding the reasonableness of Entergy's 2008 production costs that were used to develop bandwidth payments in Docket ER08-1224.
- Filed testimony at the Public Utilities Commission of the State of Colorado, in October 2009 concerning Black Hills/Colorado's CPCN application to construct two LMS 100 natural gas combustion turbine units. Docket No. 09A-415E
- Testified in front of the Minnesota Public Service Commission, September 2009 concerning Minnesota Power's Request for Approval to Purchase Square Butte's 500 kV DC transmission

RESUME OF PHILIP HAYET

line, and to restructure a coal based power purchase agreement. MPUC Docket No. E015/PA-09-526

- Testified in front of FERC, July 2009, concerning the Louisiana Public Service Commission's complaint regarding Entergy's 2007 rough production cost equalization compliance filing in the System Agreement Case in FERC Docket No. ER08-1056.
- Worked with the Louisiana Public Service Commission in a collaborative effort to implement a Green Pricing Tariff for Entergy Gulf States Louisiana, Entergy Louisiana, CLECO, and SWEPCO. Coordination is required between the utility, power developers, other customers, and Commission Staff. (Docket No. R-28271)
- Assisted the Louisiana Public Service Commission Staff with a rulemaking to design Integrated Resource Planning ("IRP") rules. (Docket No. R-30021)
- Assisted the Louisiana Public Service Commission Staff with a rulemaking for the opportunity to implement a Renewable Portfolio Standard in Louisiana. (Docket No. R-28271 Sub-Docket B)
- Filed Testimony at FERC in Jan 2009, concerning the 2007 System Agreement Rough Production Cost Equalization production cost equalization compliance filing in the System Agreement Case in FERC Docket No. ER08-1056.
- Testified in front of the Wisconsin Public Service Commission in 2008 regarding WPL's certification proceeding concerning the Nelson Dewey CFB coal-fired generating unit. (6680-CE-170).
- Testified at FERC in July 2008, concerning the Louisiana Public Service Commission's complaint regarding Entergy's 2006 rough production cost equalization compliance filing in the System Agreement Case in FERC Docket No. ER07-956.
- Testified in front of the Wisconsin Public Service Commission in 2008 regarding WEPCO's request to implement environmental upgrades at its Oak Creek Power Plant in Docket 6630-CE-299..
- Assisting the Louisiana Public Service Commission Staff with the review and evaluation of Cleco Power's 2008 Short Term RFP and its 2010 Long-Term RFP.
- Provided regulatory support on behalf of the Louisiana Public Service Commission Staff concerning jurisdictional separation of Entergy Gulf States in Docket No. U-21453.
- Provided regulatory support on behalf of the Louisiana Public Service Commission Staff concerning the potential benefit of Transmission upgrades in Docket No. U-25116.
- Provided regulatory support on behalf of the Louisiana Public Service Commission concerning a FERC complaint regarding power purchase contracts in FERC Docket No. ER03-753-000.
- Provided regulatory support on behalf of the Louisiana Public Service Commission Staff in a retail proceeding evaluating the benefits of possibly retiring some of Entergy's gas-fired units. Docket No. U-27136 (Subdocket A).

RESUME OF PHILIP HAYET

- In 2002 – 2003, provided regulatory support on behalf of the Louisiana Public Service Commission's FERC complaint regarding cost allocation issues between the Entergy Operating Companies in the FERC Docket No. EL01-88-000.
- In 2002 – 2003, provided regulatory support on behalf of the Louisiana Public Service Commission Staff in a retail proceeding concerning Entergy's billing practices. Docket No. U-25888
- In 2000 – 2001, provided regulatory support on behalf of the Louisiana Public Service Commission's intervention in Entergy's proposed System Agreement modifications in the FERC Docket No. ER00-2854-000.

Other Projects Conducted Since 1996

- Provided assistance in 2004 to the Utah Committee of Consumer Services to analyze a series of power purchase agreements and special contracts between PacifiCorp and several of its industrial customers.
- Assisted the Georgia Public Service Commission Staff to evaluate Georgia Power and Savannah Electric's 2004 IRP filings. Also, testified in front of the Georgia Public Service Commission in that proceeding.
- Provided regulatory support to the Utah Committee of Consumer Services regarding PacifiCorp's 2003 Utah General Rate Case Docket # 03-2035-02.
- Worked on behalf of the Oregon Public Utility Commission to Audit PacifiCorp's Net Power Costs per a Settlement Agreement accepted by the Public Utility Commission of Oregon in its Order No. 01-787. Audit report in Docket No. UE-116 filed July 2003.
- Worked on behalf of the Utah Committee of Consumer Services to provide guidance and assist in the analysis of PacifiCorp's 2002 Integrated Resource Plan.
- Worked on behalf of the Utah Committee of Consumer Services to help analyze PacifiCorp's restructuring proposals.
- Testified in front of the Utah Public Service Commission in regards to PacifiCorp's Utah General Rate Case Docket # 010-035-010
- Submitted an expert report in August 2002 in the United States District Court for the Middle District of North Carolina in the Civil Action No. 1:00 CV 1262, United States v. Duke Energy Corporation. The case concerned compliance with the 1977 Clean Air Act and the report concerned generation resource planning and production cost modeling issues.
- Provided general rate case assistance in other hearings in Oregon, Washington and Wyoming
- Modeled the Singapore Power Electricity System and analyzed the benefits of dispatching a new oil-fired unit within the system.
- Modeled the Australian National Energy Market to develop market based energy price forecasts on behalf of an Independent Power Producer in Australia

RESUME OF PHILIP HAYET

- Analyzed the benefit of purchasing existing gas-fired steam turbine units within the Australian market
- Developed market price forecasts for South Australia as part of the evaluation of a new gas fired combined cycle unit
- Modeled the Vietnam Electricity System as part of a project to develop Least Cost Expansion plans for Vietnam
- Assisted in the evaluation of a large gas-fired combined cycle plant in Vietnam
- Assisted in the development of Market Price Forecasts in several regions of the US. These forecasts were used as the basis for stranded cost estimates, which were filed in testimony in a number of jurisdictions across the country.
- Helped to analyze the rate structure and develop an electricity price forecast for the Metropolitan Atlanta Rapid Transit Authority (MARTA) in Atlanta, Georgia
- Testified regarding the reasonableness of PacifiCorp's determination of Net Power Cost as part of a rate case proceeding in Utah
- Provided rate case support opposing PacifiCorp's rate increases in both Oregon and Washington State. Performed alternative power cost modeling using software simulations
- Critiqued the IRP filings of 5 utilities in South Carolina on behalf of the South Carolina State Energy Office
- Conducted research regarding ISO Tariffs and Operations for the PJM Power Pool, the California ISO, and the Midwest ISO on behalf of a Japanese Research.
- Performed research on numerous electric utility issues for 3 Japanese research organizations. This was primarily related to deregulation issues in the US in anticipation of deregulation being introduced in Japan.

1991 to **EDS Utilities Division, Atlanta, GA**
1996: **Lead Consultant, PROSCREEN (Now STRATEGIST) Department**

- Managed a client services software team that supported approximately 75 users of the STRATEGIST electric utility strategic planning software.
- Participated in the development of STRATEGIST's competitive market modeling features and the Network Economy Interchange Module
- Provided client management direction and support, and developed new consulting business opportunities.
- Performed system planning consulting studies including integrated resource planning, DSM analysis, marketing profitability studies, optimal reserve margin analyses, etc.
- Based on experience with PROMOD IV, converted numerous PROMOD IV databases to STRATEGIST, and performed benchmark analyses of the two models.

RESUME OF PHILIP HAYET

**1988 to 1991: Energy Management Associates (EMA), Atlanta, GA
Manager, Production Analysis Department**

- Served as Project Manager of a database modeling effort to create an integrated utility operations and generation planning database. Database items were automatically fed into PROMOD IV.
- Supervised and directed a staff of five software developers working with a 4GL database programming language.
- Interfaced with clients to determine system software specifications, and provide ongoing client training and support

**1980 to 1988: Energy Management Associates (EMA), Atlanta, GA
Senior Consultant, PROMOD IV Department**

- Provided client service support to EMA's base of over 70 electric utility customers using the PROMOD IV probabilistic production cost simulation software.
- Provided consulting services in a number of areas including generation resource planning, regulatory support, and benchmarking.

PUBLICATIONS

Authored "The Developing Vietnamese Power System", which will appear in an upcoming addition of Power Value Magazine

Co-Authored "The European Electricity Market", which appeared in the June 2000 edition of Hart's Energy Markets

Authored "Singapore's Developing Power Market", which appeared in the July/August 1999 edition of Power Value Magazine

Co-authored "The New Energy Services Industry – Part 1", which appeared in the January/February 1999 edition of Power Value Magazine.

Co-authored and Presented "Evaluation of a Large Number of Demand-Side Measures in the IRP Process: Florida Power Corporation's Experience", Presented at the 3rd International Energy and DSM Conference, Vancouver British Columbia, November 1994

RESUME OF PHILIP HAYET

Co-authored “Impact of DSM Program on Delmarva’s Integrated Resource Plan”, Published in the 4th International Energy and DSM Conference Proceedings, held in Berlin, Germany, 1995

RESUME OF PHILIP HAYET

TESTIMONY AND EXPERT WITNESS APPEARANCES

Filed Direct testimony May 2012 at the Georgia Public Service Commission concerning Georgia Power's Sixth Semi-Annual Vogtle Construction Monitoring Report (Docket 29849-U).

Filed Direct Testimony (May 2012) at the Georgia Public Service Commission concerning Georgia Power's Fuel Cost Recovery Filing (FCR-23 - Docket 35277).

Filed Direct Testimony (March 2012) regarding Entergy's change of control filing to move to the Midwest ISO in LPSC Docket 32148.

Submitted Direct testimony November 2011 at the Georgia Public Service Commission concerning Georgia Power's request to decertify two aging coal units, to acquire PPA resources, and to have approved its IRP Update, on behalf of the Georgia Public Service Commission Staff (Docket 34218).

Submitted Direct testimony November 2011 at the Georgia Public Service Commission concerning Georgia Power's request to certify the reacquisition of wholesale block capacity, on behalf of the Georgia Public Service Commission Staff (Docket 26550).

Filed Direct Testimony (September 2011) in support of a settlement agreement at the Louisiana Public Service Commission regarding the reasonableness of Cleco's CCPN to upgrade its Madison 3 coal unit to accommodate biomass fuel in accordance with the LPSC's Renewable Energy Pilot in Docket U-31792.

Submitted an Initial and Rebuttal Expert Report (April and June 2011, respectively), on behalf of the Department of Justice in US District Court, Civil Action No. 2:10-cv-13101-BAF-RSW.

Filed Direct testimony June 2011 at the Georgia Public Service Commission concerning Georgia Power's Fourth Semi-Annual Vogtle Construction Monitoring Report Period Ending December 31, 2011 (Docket 29849-U).

Filed Direct testimony April 2011 at the Georgia Public Service Commission concerning Georgia Power's Fuel Cost Recovery Filing (FCR-22) (Docket 33302).

Filed direct testimony (January 2011) and Cross Answering Testimony (February 2011) at FERC regarding the reasonableness of Entergy's 2009 production costs that were used to develop bandwidth payments in Docket ER09-1350.

Filed direct testimony December 2010 at the Georgia Public Service Commission concerning Georgia Power's Third Semi-Annual Vogtle Construction Monitoring Report Period Ended June 30, 2010 (Docket 29849-U)

Filed direct testimony June 2010 at the Georgia Public Service Commission concerning Georgia Power's Second Semi-Annual Vogtle Construction Monitoring Report Period Ended December 31, 2009 (Docket 29849-U)

RESUME OF PHILIP HAYET

Testified at FERC in 2010 regarding an LPSC complaint that Entergy violated provisions of its System Agreement related to individual operating company sales in FERC Docket EL09-61.

Filed, direct testimony January 2010 at the Georgia Public Service Commission concerning Georgia Power's Fuel Cost Recovery Filing in Docket No. 28945.

Filed testimony at FERC December 2009 regarding the reasonableness of Entergy's 2008 production costs that were used to develop bandwidth payments in Docket ER08-1224.

Filed Direct testimony December 2009 at the Georgia Public Service Commission concerning Georgia Power's First Semi-Annual Vogtle Construction Monitoring Report Period Ended June 30, 2009 (Docket 29849-U)

Filed Direct and Surrebuttal testimony in September and October 2009, respectively at the Utah Public Service Commission concerning PacifiCorp's 2009 Rate Case with regard to net power costs (Docket 09-035-23)

Filed testimony at the Public Utilities Commission of the State of Colorado, in October 2009 concerning Black Hills/Colorado's CPCN application to construct two LMS 100 natural gas combustion turbine units. Docket No. 09A-415E

Testified in front of the Minnesota Public Service Commission, September 2009 concerning Minnesota Power's Request for Approval to Purchase Square Butte's 500 kV DC transmission line, and to restructure a coal based power purchase agreement. MPUC Docket No. E015/PA-09-526

Filed testimony on behalf of the LPSC Staff in July 2009, concerning SWEPCO and CLECO's application to acquire the Oxbow Mine to supply the Dolet Hills Power Station in LPSC Docket No. U-30975.

Testified at FERC in July 2009, concerning the Louisiana Public Service Commission's complaint regarding Entergy's 2007 rough production cost equalization compliance filing in the System Agreement Case in FERC Docket No. ER08-1056.

Filed Testimony December 2008 at the Georgia Public Service Commission concerning Georgia Power's Certification request for the Vogtle 3 and 4 Nuclear units (Docket 27800)

Filed Testimony November 2008 at the West Virginia Public Service Commission concerning their fuel cost recovery filing (Docket 08-15-11-E-61)

Testified in front of the Wisconsin Public Service Commission in September 2008 regarding WPL's certification proceeding concerning the Nelson Dewey CFB coal-fired generating unit. (6680-CE-170).

RESUME OF PHILIP HAYET

Testified at FERC in July 2008, concerning the Louisiana Public Service Commission's complaint regarding Entergy's 2006 rough production cost equalization compliance filing in the System Agreement Case in FERC Docket No. ER07-956.

Testified in front of the Wisconsin Public Service Commission in 2008 regarding WEPCO's request to implement environmental upgrades at its Oak Creek Power Plant in Docket 6630-CE-299.

Filed direct testimony April 2008 at the Georgia Public Service Commission concerning Georgia Power's Fuel Cost Recovery Filing in Docket No. 26794 (FCR-20).

Testified in October 2007 in front of the Louisiana Public Service Commission regarding Cleco Power's 2008 Short Term RFP in Docket No. U-30334.

Testified in June 2007 in front of the Georgia Public Service Commission regarding Georgia Power's 2007 Integrated Resource Planning Study. Testified on behalf of the Georgia Public Service Commission Staff. in Docket No. 24505-U.

Filed testimony in Apr 2007 regarding the reasonableness of PacifiCorp's determination of Utah jurisdictional Net Power Costs in PacifiCorp's General Rate Case Docket 07-035-93.

Testified in January 2007 in front of the Georgia Public Service Commission concerning Georgia Power's November 2006 fuel Cost Recovery Filing in Docket No. 23540-U.

Testified in November 2006 in front of the Louisiana Public Service Commission concerning transmission issues associated with the audit of Entergy Louisiana's Fuel Adjustment Clause Filings (Docket U-25116).

Filed Testimony in August 2006 in front of the Louisiana Public Service Commission concerning jurisdictional separation of Entergy Gulf States in Docket No. U-21453

Testified in May 2006 in front of the Georgia Public Service Commission regarding Georgia Power and Savannah Electric's March 2006 Fuel Cost Recovery filing (Docket 22403-U).

Testified in Apr 2006 in front of the Utah Public Service Commission regarding PacifiCorp Certification request to expand the Blundell Geothermal Power Station (Docket -05-035-54). Related to Mid-American Energy Holding's Acquisition of PacifiCorp.

Filed Testimony in July 2005 regarding PacifiCorp's Avoided Cost proceeding (03-035-14).

Filed Testimony in December 2005 regarding the reasonableness of PacifiCorp's determination of Utah jurisdictional Net Power Costs in PacifiCorp's General Rate Case (Docket 04-035-42).

RESUME OF PHILIP HAYET

Testified in March 2005 in front of the Utah Public Service Commission regarding whether the Stipulation that had previously been agreed to concerning PacifiCorp's Schedule 38 avoided cost tariff was still valid for the remaining unsubscribed capacity available under the Stipulation's cap.

Testified in November 2004 in front of the Utah Public Service Commission regarding an industrial customer's request for both a special economic development tariff and a large QF tariff. Testimony was provided on behalf of the Utah Committee of Consumer Services in Docket No. 03-035-19 (Special Contract) and No. 03-035-38 (QF proceeding).

Testified in August 2004 in front of FERC on behalf of the Louisiana Public Service Commission concerning a complaint that had been filed against Entergy concerning a series of affiliate power purchase agreements FERC Docket ER03-583-000.

Testified in June 2004 in front of the Georgia Public Service Commission regarding Georgia Power and Savannah Electric's 2004 Integrated Resource Planning Studies. Testimony was provided on behalf of the Georgia Public Service Commission Staff. Georgia Docket Nos. 17687 and 17688.

Testified in May 2004 in front of the Utah Public Service Commission concerning the development of a large QF avoided cost methodology. Testimony was provided on behalf of the Utah Committee of Consumer Services in Docket 03-035-14.

Testified in July 2003 in front of FERC in support of the Louisiana Public Service Commission's complaint regarding cost allocation issues amongst the Entergy Operating Companies in the FERC Docket Number EL01-88-000.

Submitted an expert report in August 2002 in the United States District Court for the Middle District of North Carolina in the Civil Action No. 1:00 CV 1262, United States v. Duke Energy Corporation.

Testified in July 2002 on behalf of the Utah committee for consumer services regarding a special contract for an industrial consumer in support of a settlement agreement in a PacifiCorp Utah proceeding in Docket Number 02-035-02.

Provided testimony in the Fall of 2001 in front of FERC on behalf of the Louisiana Public Service Commission's intervention in Entergy's proposed System Agreement modifications in the FERC Docket No. ER00-2854-000.

Testified in July 2001 regarding the reasonableness of PacifiCorp's determination of Utah jurisdictional Net Power Costs in PacifiCorp's General Rate Case Docket 01-035-01

Testified in September 1998 regarding the reasonableness of PacifiCorp's determination of Utah jurisdictional Net Power Costs as part of a Settlement Proceeding in PacifiCorp's rate case Docket Number 97-035-01.

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS)	
ELECTRIC CORPORATION FOR)	
APPROVAL OF ITS 2012 COMPLIANCE)	
PLAN, FOR APPROVAL OF ITS)	
AMENDED ENVIRONMENTAL COST	)	CASE NO. 2012-00063
RECOVERY SURCHARGE TARIFF,)	
FOR CERTIFICATES OF PUBLIC)	
CONVENIENCE AND NECESSITY, AND)	
FOR AUTHORITY TO ESTABLISH A)	
REGULATORY ACCOUNT)	

EXHIBIT HAYET-2
OF
PHILIP HAYET

ON BEHALF OF THE
KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.

HAYET POWER SYSTEMS CONSULTING
ATLANTA, GEORGIA

July 2012

CONFIDENTIAL

FILED UNDER SEAL

KWalton

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CONFIDENTIALITY AGREEMENT

Kentucky Public Service Commission
Case No. 2012-00063

This Agreement is entered into by and between Big Rivers Electric Corporation (“Big Rivers”) and _____ (“Intervenor”).

WHEREAS, Intervenor has moved or may move to intervene in the above referenced case and has requested review of certain information Big Rivers believes to be confidential and proprietary;

WHEREAS, during the course of this proceeding, Big Rivers may, by petition for confidential treatment, seek protection from public disclosure of information Big Rivers believes to be confidential and proprietary and for which it believes public disclosure would prove harmful to Big Rivers, and will under those circumstances, provide Intervenor with access to that information pursuant to the following confidentiality agreement alone; and

WHEREAS, Intervenor is willing to enter into this agreement and have access to the information at issue upon the terms and conditions contained herein;

NOW, THEREFORE, the parties covenant and agree as follows:

1. Access to information which Big Rivers believes to be confidential and propriety for which confidential treatment is sought by Big Rivers in this case will be limited strictly to Intervenor, its legal counsel and/or consultants, and employees of Intervenor’s clients in this matter who have a need for access to the information for purposes of this proceeding, who shall execute a nondisclosure certificate as described in paragraph 3 and attached as Exhibit A to this agreement.

2. Use of the information provided pursuant to this confidentiality agreement shall be limited strictly to Case No. 2012-00063 before the Kentucky Public Service Commission (the “Commission”) and any appeals from that case.

3. The non-disclosure certificate shall require Intervenor, its legal counsel, and its consultants to read a copy of this agreement and certify in writing that it, he, or she has reviewed this agreement and agrees to be bound by its terms before disclosure of the confidential and proprietary information will be made. The certificate shall contain the full name of Intervenor’s legal counsel and/or consultant(s) and their permanent business address. A copy of each certificate shall be provided to Big Rivers.

4. All copies of documents containing information that are provided to Intervenor under this agreement pending a ruling by the Commission upon a petition for confidential treatment, and information for which the Commission has Ordered that confidential treatment shall be afforded, shall be deemed to be held in trust pursuant to this agreement and shall be returned to Big Rivers upon demand at the conclusion of Case No. 2012-00063. Upon demand for return of the information, any notations or other work product of Intervenor, its counsel, or its

consultants made or contained in the information shall be redacted prior to the return of the information to Big Rivers. Upon election by the Attorney General, the information may be destroyed by a professional certified in shredding the materials. Upon exercising this election, the Attorney General shall certify to the company that the information has been destroyed.

5. If Intervenor desires to make use of any confidential or proprietary information obtained as a result of its, its legal counsel's, or its consultant's examination of the information, whether in testimony filed by Intervenor or through cross-examination of any witness or otherwise, Intervenor shall notify Big Rivers in advance of the proposed use and shall meet with Big Rivers' representatives to attempt in good faith to establish a procedure that will accommodate the needs of Intervenor to make use of the information without risking its public disclosure. If Big Rivers and Intervenor are unable to agree on a means of preventing public disclosure of the confidential and proprietary information, Big Rivers and Intervenor will submit these issues to the Commission for resolution before the proposed use of the information is made.

6. Each and every party to this agreement will act in good faith, and no party to the agreement will do anything to deprive any other party of the benefit of this agreement. The parties agree that the Commission is the sole and exclusive forum for considering any alleged breach of this agreement, and that the remedies within the jurisdiction of the Commission are the only available remedies. This agreement does not restrict the parties from seeking any injunctive relief in a court of competent jurisdiction which they believe that they are otherwise entitled to seek; furthermore, it does not extinguish any right to judicial review of the Commission's actions. The parties do, however, expressly waive any other relief or remedy to which they might be entitled in the absence of the limitations of this agreement.

7. Intervenor's participation in this agreement shall not be construed as an admission that the information claimed to be confidential and proprietary is, as a matter of law, confidential and proprietary, or as a waiver of any right to assert that the information is not confidential and proprietary before the Commission or any court of competent jurisdiction. In the event the Commission should rule that any of the information should be removed from the restrictions imposed by this agreement, Intervenor shall not disclose such information until the Commission's Order subjecting the information to public disclosure is final pursuant to KRS 278.410, or until all appeals of such Order have been exhausted, unless authorized to do so by Big Rivers or a court of competent jurisdiction.

8. This agreement shall bind the parties to it from the date of its execution. Every executed copy of this agreement will be deemed an original.

EXECUTED this ____ day of May, 2012.

Intervenor

By: _____

Title: _____

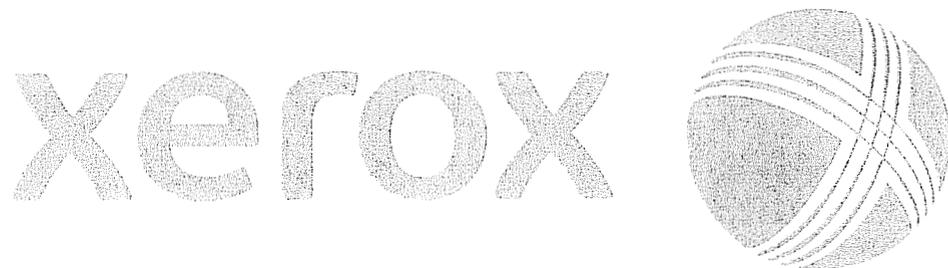
Big Rivers Electric Corporation

By: _____

Title: _____

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CONFIDENTIALITY AGREEMENT

Kentucky Public Service Commission
Case No. 2012-00063

This Agreement is entered into by and between Big Rivers Electric Corporation (“Big Rivers”) and _____ (“Intervenor”).

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WHEREAS, Intervenor is willing to enter into this agreement and have access to the information at issue upon the terms and conditions contained herein;

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3. The non-disclosure certificate shall require Intervenor, its legal counsel, and its consultants to read a copy of this agreement and certify in writing that it, he, or she has reviewed this agreement and agrees to be bound by its terms before disclosure of the confidential and proprietary information will be made. The certificate shall contain the full name of Intervenor’s legal counsel and/or consultant(s) and their permanent business address. A copy of each certificate shall be provided to Big Rivers.

4. All copies of documents containing information that are provided to Intervenor under this agreement pending a ruling by the Commission upon a petition for confidential treatment, and information for which the Commission has Ordered that confidential treatment shall be afforded, shall be deemed to be held in trust pursuant to this agreement and shall be returned to Big Rivers upon demand at the conclusion of Case No. 2012-00063. Upon demand for return of the information, any notations or other work product of Intervenor, its counsel, or its

consultants made or contained in the information shall be redacted prior to the return of the information to Big Rivers.

5. If Intervenor desires to make use of any confidential or proprietary information obtained as a result of its, its legal counsel's, or its consultant's examination of the information, whether in testimony filed by Intervenor or through cross-examination of any witness or otherwise, Intervenor shall notify Big Rivers in advance of the proposed use and shall meet with Big Rivers' representatives to attempt in good faith to establish a procedure that will accommodate the needs of Intervenor to make use of the information without risking its public disclosure. If Big Rivers and Intervenor are unable to agree on a means of preventing public disclosure of the confidential and proprietary information, Big Rivers and Intervenor will submit these issues to the Commission for resolution before the proposed use of the information is made.

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8. This agreement shall bind the parties to it from the date of its execution. Every executed copy of this agreement will be deemed an original.

EXECUTED this ____ day of May, 2012.

Intervenor

By: _____

Title: _____

Big Rivers Electric Corporation

By: _____

Title: _____

KWalton

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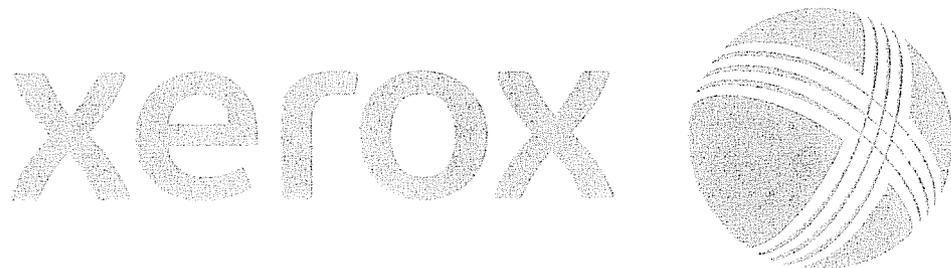


EXHIBIT A

**NON-DISCLOSURE CERTIFICATE
RELATED TO THE
NON-DISCLOSURE AGREEMENT BETWEEN HAYET POWER SYSTEM
CONSULTING AND ACES POWER MARKETING LLC**

I hereby certify my understanding that access to Protected Materials is provided to me pursuant to the terms and restrictions of the Non-Disclosure Agreement between Hayet Power Systems Consulting (“Hayet”) and Alliance for Cooperative Energy Services Power Marketing LLC, (“ACES Power Marketing” or “APM”) and for use in the case currently before the Kentucky Public Service Commission and captioned as “*APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR APPROVAL OF ITS 2012 ENVIRONMENTAL COMPLIANCE PLAN, FOR APPROVAL OF ITS AMENDED ENVIRONMENTAL COST RECOVERY SURCHARGE TARIFF, FOR CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY, AND FOR AUTHORITY TO ESTABLISH A REGULATORY ACCOUNT, CASE NO. 2012-00063*”.

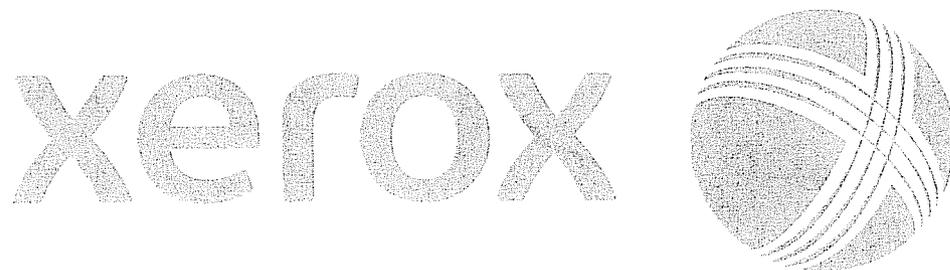
I certify that I have been given a copy of and have read the Non-Disclosure Agreement, and that I agree to be bound by it. I understand that the contents of the Database, Protected Materials, any notes or other memoranda, or any other form of information that copies or discloses Protected Materials shall not be disclosed to anyone other than in accordance with that Protective Agreement, and will be used only for the purposes of this Captioned Case.

Print and Sign Name

Address

KWalton

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NON-DISCLOSURE AGREEMENT

This Non-Disclosure Agreement (“Agreement”) is entered into this 21st day of June 2012, by and between Hayet Power Systems Consulting (“Hayet”) and Alliance for Cooperative Energy Services Power Marketing LLC, (“ACES Power Marketing” or “APM”) (each individually referred to as “Party” and collectively as “Parties”).

RECITALS

WHEREAS, APM provides, inter alia, certain modeling services for Big Rivers Electric Corporation (“Big Rivers”) through the use of proprietary software licensed to APM by Ventyx; and

WHEREAS, APM has created a confidential and proprietary database within the licensed proprietary software which contains information used by APM to prepare certain scenarios for use in the Captioned Case (defined below); and

WHEREAS, Hayet is the consultant for certain Intervenors in the Captioned Case and such Intervenors desire that Hayet have access to APM’s confidential and proprietary Database within the Ventyx licensed proprietary software which contains information used by APM to prepare certain scenarios for use in the Captioned Case by Big Rivers; and

WHEREAS, APM, pursuant to a request by Big Rivers and pursuant to conditions established by APM’s license with Ventyx (the owner of the proprietary software), is willing to provide to Hayet the portion of APM’s confidential and proprietary database that pertains to Big Rivers, provided that, Hayet agrees to the terms and conditions expressed herein.

NOW WHEREFORE, in consideration of the promises and covenants herein and for good and valuable consideration, the adequacy and sufficiency of which are hereby acknowledged, the Parties intending to be legally bound do hereby agree as follows:

Section 1. Definitions.

“Authorized Representative” shall mean a person employed by Hayet who has signed a Non-Disclosure Certificate pursuant to this Agreement and who is a licensed user of the Ventyx PaR software under Hayet’s license with Ventyx.

“Captioned Case” shall mean the case currently before the Kentucky Public Service Commission and captioned as “*APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR APPROVAL OF ITS 2012 ENVIRONMENTAL COMPLIANCE PLAN, FOR APPROVAL OF ITS AMENDED ENVIRONMENTAL COST RECOVERY SURCHARGE TARIFF, FOR CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY, AND FOR AUTHORITY TO ESTABLISH A REGULATORY ACCOUNT, CASE NO. 2012-00063*”.

“Database” shall mean the electronic computer file derived from the Ventyx PaR licensed proprietary software that contains certain Big Rivers model data parameters used by APM in developing scenarios for Big Rivers and used in support of the Captioned Case.

“Notes of Protected Materials” means memoranda, handwritten notes, or any other form of information (including electronic information) that copies or discloses Protected Materials. Notes of Protected Materials are subject to the same restrictions provided in this Agreement for Protected Materials except as specifically provided otherwise in this Agreement.

“Protected Materials” shall mean the Database and any other materials provided to Hayet by APM, with such other materials being noted as being confidential by APM, pursuant to the terms of this Agreement.

Section 2. Use of the Database and Protected Materials. This Agreement shall govern the use of the Database provided to Hayet by APM. The Database shall be used exclusively by Hayet for work directly related to the Captioned Case. The Database shall be installed on and accessible through the computer containing Hayet’s licensed Ventyx software. Protected Materials shall be made available under the terms of this Agreement to Hayet solely for its use in the Captioned Case and any appeals from the Captioned Case, and may not be used by Hayet for any commercial, business, or other purpose whatsoever.

Section 3. Duration of Use. Protected Materials shall remain available to Hayet until the sooner of: (a) an order terminating this proceeding becomes no longer subject to judicial review, or (b) the termination of Hayet’s license with Ventyx. If requested to do so in writing after that date, Hayet shall, within fifteen days of such request, return the Protected Materials (excluding Notes of Protected Materials) to APM, or shall destroy the materials, except that copies of filings, official transcripts and exhibits in this proceeding that contain Protected Materials and Notes of Protected Materials may be retained, if they are maintained in accordance with this Agreement. Within such time period, Hayet, if requested to do so, shall also submit to APM an affidavit stating that, to the best of its knowledge, all Protected Materials and all Notes of Protected Materials have been returned or have been destroyed or will be maintained in accordance with this Agreement. To the extent Protected Materials are not returned or destroyed, they shall remain subject to this Agreement.

Section 4. Non-Disclosure Certificate. Hayet shall execute a Non-Disclosure Certificate in the form of the attached Exhibit A certifying its understanding and agreement with the terms of this Agreement. A copy of each Non-Disclosure Certificate shall be provided to APM prior to disclosure of any Protected Materials to Hayet.

Section 5. Protection of Materials. All Protected Materials shall be maintained by Hayet in a secure place. Access to those materials shall be limited to Hayet. Protected Materials shall be treated as confidential by Hayet. Protected Materials shall not be used except as necessary for the conduct of this proceeding, nor shall they be disclosed in any manner to any person except as outlined in Section 6 of this Agreement. Hayet may make notes of Protected Materials, which shall be treated as Notes of Protected Materials if they disclose the contents of Protected Materials. Hayet may use this information for purposes of this proceeding, and may not use

information contained in any Protected Materials obtained through this proceeding to give Hayet or any competitor or potential competitor of APM a commercial advantage or otherwise economically disadvantage APM based on disclosure of the Protected Materials outside of this proceeding.

In the event, APM inadvertently provides confidential information unrelated to the Captioned Case, or otherwise fails to designate materials other than the Database as Protected Materials at the time they are provided to Hayet, APM shall notify Hayet promptly upon discovery of the inadvertent disclosure. Hayet agrees that from the time forward that Hayet has been notified that such materials are deemed confidential, Hayet shall maintain the confidentiality or protection afforded the information, and agrees to: (a) immediately return the privileged information; and (b) to protect the confidential materials as Protected Materials, and to not use any information derived from such inadvertent disclosure in a manner inconsistent with the preservation of the confidential nature of the materials.

Section 6. Disclosure. Only Authorized Representatives shall have access to the Database. In the event that Hayet ceases to be engaged in the Captioned Case, access to Protected Materials by Hayet shall be terminated. Even if no longer engaged in this Captioned Case, Hayet shall continue to be bound by the provisions of this Agreement and the Non-Disclosure Certificate. No other disclosure of the Database shall be permitted. The Parties agree that the output of modeling analyses that may be conducted using the information contained in the Database is not covered under this Agreement. Hayet shall take all reasonable precautions necessary to assure that Protected Materials are not distributed to unauthorized persons.

Section 7. Nature of Information. Hayet hereby accepts the representations of APM that the Database is of a special, unique, unusual, extraordinary, and/or intellectual character and that the Parties further accept that the Database is an APM trade secret that is not available to the public, and that, if disclosed, would subject APM to risk of competitive disadvantage or other business injury. APM may be irreparably injured by disclosure of the Database. APM and Hayet acknowledge and agree that money damages would not be a sufficient remedy for any breach of this Agreement, and that in addition to all other remedies, a Party shall be entitled to specific performance and injunctive or other equitable relief as a remedy for any such breach, and the Parties agree to waive any requirement for the securing or posting of any bond in connection with such remedy.

Section 8. Survival of Obligations. The obligations and commitments established by this Agreement shall remain in full force and effect for a period of two (2) years from the conclusion of any right to appeal the proceedings in the Captioned Case.

Section 9. Governing Law. The validity and interpretation of this Agreement and the legal relations of the Parties to it shall be governed by the laws of the State of Indiana. In the event that a court of competent jurisdiction determines that any portion of this Agreement is unreasonable because of its term or scope, or for any other reason, the Parties agree that such court may reform such provision so that it is reasonable under the circumstances and that such provision, as reformed, shall be enforceable. The Parties further agree that service of any process, summons, notice or document by U.S. certified or registered mail to the Parties'

respective executive offices will be effective service of process for any action, suit, or proceeding brought in any such court.

Section 10. Miscellaneous Provisions.

(a) Neither party shall assign this Agreement without the prior written approval of the other party. Nothing in this Agreement, express or implied, is intended or shall be construed to confer upon any person or entity other than the parties hereto any right, remedy or claim under or by reason of this Agreement.

(b) This Agreement sets forth the entire agreement between the parties as to the subject matter of this Agreement and supersedes all prior agreements, commitments, representations, writings and discussions between them, whether written or oral, with respect to the subject matter hereof. Except as otherwise expressly provided in this Agreement, this Agreement may not be amended or terminated except in writing and signed by a duly authorized representative of the Party to be bound thereby.

(c) If any provision of this Agreement or its application to any person or circumstance is adjudged invalid or unenforceable by any court of competent jurisdiction, then the remainder of this Agreement or the application of such provision to other persons or circumstances shall not be affected thereby.

(d) No delay or failure to exercise any right under this Agreement shall operate as a continuing or permanent waiver of such right or preclude the further exercise of that right or any other right. This Agreement shall be binding on the parties and their successors, heirs, affiliates, and assigns. This Agreement may be executed in any number of counterparts, and each such counterpart shall be deemed an original instrument.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed and delivered by their respective duly authorized officers as of the date first written above.

**ALLIANCE FOR COOPERATIVE
ENERGY SERVICES POWER
MARKETING LLC**

**HAYET POWER SYSTEMS
CONSULTING**

By: _____

By: _____

Name: _____

Name: _____

Title: _____

Title: _____

KWalton

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 08/17/12 11:45 AM



NON-DISCLOSURE AGREEMENT

This Non-Disclosure Agreement (“Agreement”) is entered into this ___ day of June 2012, by and between Hayet Power Systems Consulting (“Hayet”) and Alliance for Cooperative Energy Services Power Marketing LLC, (“ACES Power Marketing” or “APM”) (each individually referred to as “Party” and collectively as “Parties”).

RECITALS

WHEREAS, APM provides, inter alia, certain modeling services for Big Rivers Electric Corporation (“Big Rivers”) through the use of proprietary software licensed to APM by Ventyx; and

WHEREAS, APM has created a confidential and proprietary database within the licensed proprietary software which contains information used by APM to prepare certain scenarios for use in the Captioned Case (defined below); and

WHEREAS, Hayet is the consultant for certain Intervenors in the Captioned Case and such Intervenors desire that Hayet have access to APM’s confidential and proprietary Database within the Ventyx licensed proprietary software which contains information used by APM to prepare certain scenarios for use in the Captioned Case by Big Rivers; and

WHEREAS, APM, pursuant to a request by Big Rivers and pursuant to conditions established by APM’s license with Ventyx (the owner of the proprietary software), is willing to provide to Hayet the portion of APM’s confidential and proprietary database that pertains to Big Rivers, provided that, Hayet agrees to the terms and conditions expressed herein.

NOW WHEREFORE, in consideration of the promises and covenants herein and for good and valuable consideration, the adequacy and sufficiency of which are hereby acknowledged, the Parties intending to be legally bound do hereby agree as follows:

Section 1. Definitions.

“Authorized Representative” shall mean a person who has signed a Confidentiality Agreement with Big Rivers.

“Captioned Case” shall mean the case currently before the Kentucky Public Service Commission and captioned as “*APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR APPROVAL OF ITS 2012 ENVIRONMENTAL COMPLIANCE PLAN, FOR APPROVAL OF ITS AMENDED ENVIRONMENTAL COST RECOVERY SURCHARGE TARIFF, FOR CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY, AND FOR AUTHORITY TO ESTABLISH A REGULATORY ACCOUNT, CASE NO. 2012-00063*”.

“Database” shall mean the electronic computer file derived from the Ventyx PaR licensed proprietary software that contains certain Big Rivers model data parameters used by APM in developing scenarios for Big Rivers and used in support of the Captioned Case.

“Input Assumptions” means data items formatted within the Database in a specific format as required by the PaR model. Input assumptions include, but are not limited to fuel costs and other fuel related data, load forecast, generating unit characteristics, dispatch constraint parameters, market price forecasts, etc.

“Notes of Protected Materials” means memoranda, handwritten notes, or any other form of information (including electronic information) that copies or discloses Protected Materials. Notes of Protected Materials are subject to the same restrictions provided in this Agreement for Protected Materials except as specifically provided otherwise in this Agreement.

“Protected Materials” shall mean the Database and any other materials provided to Hayet by APM, with such other materials being noted as being confidential by APM, pursuant to the terms of this Agreement.

Section 2. Use of the Database and Protected Materials. This Agreement shall govern the use of the Database provided to Hayet by APM. The Database shall be used exclusively by Hayet for work directly related to the Captioned Case. The Database shall be installed on and accessible through the computer containing Hayet’s licensed Ventyx software. Protected Materials shall be made available under the terms of this Agreement to Hayet solely for its use in the Captioned Case and any appeals from the Captioned Case, and may not be used by Hayet for any commercial, business, or other purpose whatsoever.

Section 3. Duration of Use. Protected Materials shall remain available to Hayet until the sooner of: (a) an order terminating this proceeding becomes no longer subject to judicial review, or (b) the termination of Hayet’s license with Ventyx. If requested to do so in writing after that date, Hayet shall, within fifteen days of such request, return the Protected Materials (excluding Notes of Protected Materials) to APM, or shall destroy the materials, except that copies of filings, official transcripts and exhibits in this proceeding that contain Protected Materials and Notes of Protected Materials may be retained, if they are maintained in accordance with this Agreement. Within such time period, Hayet, if requested to do so, shall also submit to APM an affidavit stating that, to the best of its knowledge, all Protected Materials and all Notes of Protected Materials have been returned or have been destroyed or will be maintained in accordance with this Agreement. To the extent Protected Materials are not returned or destroyed, they shall remain subject to this Agreement.

Section 4. Non-Disclosure Certificate. Hayet shall execute a Non-Disclosure Certificate in the form of the attached Exhibit A certifying its understanding and agreement with the terms of this Agreement. A copy of each Non-Disclosure Certificate shall be provided to APM prior to disclosure of any Protected Materials to Hayet.

Section 5. Protection of Materials. All Protected Materials shall be maintained by Hayet in a secure place. Access to those materials shall be limited to Hayet. Protected Materials shall be treated as confidential by Hayet. Protected Materials shall not be used except as necessary for the conduct of this Proceeding, nor shall they be disclosed in any manner to any person except as outlined in Section 6 of this Agreement. Hayet may make notes of Protected Materials, which

shall be treated as Notes of Protected Materials if they disclose the contents of Protected Materials. Hayet may use this information for purposes of this proceeding, and may not use information contained in any Protected Materials obtained through this Proceeding to give Hayet or any competitor or potential competitor of APM a commercial advantage or otherwise economically disadvantage APM based on disclosure of the Protected Materials outside of this proceeding.

In the event, APM inadvertently provides confidential information unrelated to the Captioned Case, or otherwise fails to designate materials other than the Database as Protected Materials at the time they are provided to Hayet, APM shall notify Hayet promptly upon discovery of the inadvertent disclosure. Hayet agrees that from the time forward that Hayet has been notified that such materials are deemed confidential, Hayet shall maintain the confidentiality or protection afforded the information, and agrees to: (a) immediately return the privileged information; and (b) to protect the confidential materials as Protected Materials, and to not use any information derived from such inadvertent disclosure in a manner inconsistent with the preservation of the confidential nature of the materials.

Section 6. Disclosure. Hayet may discuss Input Assumptions with Authorized Representatives, but Authorized Representatives may not have access to the Database. In the event that Hayet ceases to be engaged in the Captioned Case, access to Protected Materials by Hayet shall be terminated. Even if no longer engaged in this Captioned Case, Hayet shall continue to be bound by the provisions of this Agreement and the Non-Disclosure Certificate. No other disclosure of the Database shall be permitted. The Parties agree that the output of modeling analyses that may be conducted using the information contained in the Database will be treated as non-confidential information that may be disclosed publicly in a manner similar to the manner in which Big Rivers disclosed the output of its modeling analyses in the Captioned Case. Hayet shall take all reasonable precautions necessary to assure that Protected Materials are not distributed to unauthorized persons.

Section 7. Nature of Information. Hayet hereby accepts the representations of APM that the Database is of a special, unique, unusual, extraordinary, and/or intellectual character and that the Parties further accept that the Database is an APM trade secret that is not available to the public, and that, if disclosed, would subject APM to risk of competitive disadvantage or other business injury. APM may be irreparably injured by disclosure of the Database. APM and Hayet acknowledge and agree that money damages would not be a sufficient remedy for any breach of this Agreement, and that in addition to all other remedies, a Party shall be entitled to specific performance and injunctive or other equitable relief as a remedy for any such breach, and the Parties agree to waive any requirement for the securing or posting of any bond in connection with such remedy.

Section 8. Survival of Obligations. The obligations and commitments established by this Agreement shall remain in full force and effect for a period of two (2) years from the conclusion of any right to appeal the proceedings in the Captioned Case.

Section 9. Governing Law. The validity and interpretation of this Agreement and the legal relations of the Parties to it shall be governed by the laws of the State of Indiana. In the event

that a court of competent jurisdiction determines that any portion of this Agreement is unreasonable because of its term or scope, or for any other reason, the Parties agree that such court may reform such provision so that it is reasonable under the circumstances and that such provision, as reformed, shall be enforceable. The Parties further agree that service of any process, summons, notice or document by U.S. certified or registered mail to the Parties' respective executive offices will be effective service of process for any action, suit, or proceeding brought in any such court.

Section 10. Miscellaneous Provisions.

(a) Neither party shall assign this Agreement without the prior written approval of the other party. Nothing in this Agreement, express or implied, is intended or shall be construed to confer upon any person or entity other than the parties hereto any right, remedy or claim under or by reason of this Agreement.

(b) This Agreement sets forth the entire agreement between the parties as to the subject matter of this Agreement and supersedes all prior agreements, commitments, representations, writings and discussions between them, whether written or oral, with respect to the subject matter hereof. Except as otherwise expressly provided in this Agreement, this Agreement may not be amended or terminated except in writing and signed by a duly authorized representative of the Party to be bound thereby.

(c) If any provision of this Agreement or its application to any person or circumstance is adjudged invalid or unenforceable by any court of competent jurisdiction, then the remainder of this Agreement or the application of such provision to other persons or circumstances shall not be affected thereby.

(d) No delay or failure to exercise any right under this Agreement shall operate as a continuing or permanent waiver of such right or preclude the further exercise of that right or any other right. This Agreement shall be binding on the parties and their successors, heirs, affiliates, and assigns. This Agreement may be executed in any number of counterparts, and each such counterpart shall be deemed an original instrument.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed and delivered by their respective duly authorized officers as of the date first written above.

**ALLIANCE FOR COOPERATIVE
ENERGY SERVICES POWER
MARKETING LLC**

**HAYET POWER SYSTEMS
CONSULTING**

By: _____

By: _____

Name: _____

Name: _____

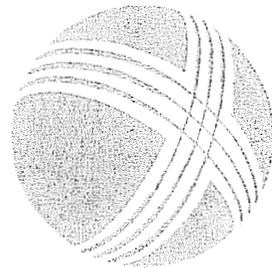
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Ventyx Consulting Agreement

This Consulting Agreement ("Agreement") is by and between Ventyx Inc., whose office is located at 400 Perimeter Center Terrace, Suite 500, Atlanta, Georgia 30346 ("Ventyx") and Hayet Power Systems Consulting, whose office is located at 215 Huntcliff Terrace, Atlanta, GA 30350 ("Client"), effective upon execution of both parties. Ventyx will provide the services set forth herein:

1. Consulting Services. Ventyx will make available the services of Ventyx personnel to perform certain short-term consulting services ("Services") as generally described in one or more Statement of Work ("SOW") under this Agreement. Successive Statements of Work shall be identified by number and each shall reference this Agreement.
2. Payments. Client will pay Ventyx for the Services as set forth the applicable SOW. In addition, Client will pay, or reimburse Ventyx for, (i) all taxes based upon the charges in this Agreement (ii) all Services-related and reasonable travel and travel-related expenses. If the payment terms are not specified in the applicable SOW, Ventyx will invoice Client on a monthly basis for all charges payable hereunder, which shall be due within 30 days from invoice receipt date. Any sum not paid when due will bear interest until paid at the maximum rate of interest allowed by applicable law.
3. Confidentiality. The parties recognize that in the course of performing the Services, both parties may have access to confidential or proprietary information belonging to the other and each agrees that any such confidential and proprietary information shall remain confidential and shall not be disclosed to any third party. Each party agrees that, for a period of two (2) years from receipt of information from the other party hereunder, such party will use the same means it uses to protect its own confidential proprietary information, but in any event not less than reasonable means, to prevent the disclosure and to protect the confidentiality of both (i) written information received from the other party which is marked or identified as confidential, and (ii) oral or visual information ("Confidential Information"). The foregoing will not prevent either party from disclosing Confidential Information which belongs to such party or is (i) already known by the recipient party without an obligation of confidentiality, (ii) publicly known or becomes publicly known through no unauthorized act of the recipient party, (iii) rightfully received from a third party without breaching any confidentiality or non-disclosure obligations to any third party, (iv) independently developed by the recipient party without use of the other party's Confidential Information, (v) disclosed without similar restrictions to a third party by the party owning Confidential Information, (vi) approved by the other party for disclosure, or (vii) required to be disclosed pursuant to a requirement of a governmental agency or law so long as the disclosing party provides the other party with notice of such requirement prior to any such disclosure and reasonably cooperates with the other party in connection with obtaining any protective order limiting such disclosure.
4. Proprietary Rights. The parties acknowledge and agree that: (a) Ventyx owns all right, title and interest in and to all Ventyx Confidential Information (and the media containing such Confidential Information) including, without limitation, the Work Product and all patent, trademark, copyright, trade secret, and other intellectual property rights related thereto; and (b) Client owns all right, title and interest in and to all of Client's Confidential Information (and the media containing such Confidential Information) including, without limitation, the patent, trademark, copyright, trade secret, and other intellectual property rights related thereto, as well as engagement-specific reports delivered by Ventyx except with respect to the Ventyx Confidential Information or Work Product contained in such reports. All Work Product, and all patent, trademark, copyright, trade secret, and other intellectual property rights related thereto, is the property of Ventyx and is licensed nonexclusively to Client, at no additional license fee, pursuant to the terms of the license for software contained in a License Agreement and subject to the terms of this Agreement. To the extent Client acquires any rights in the Work Product Client hereby assigns such rights to Ventyx. Client shall give Ventyx all reasonable assistance and execute all documents necessary to assist or enable Ventyx to perfect, preserve, register and/or record such assignment and Ventyx's rights in any Work Product.
5. Termination. Either party may terminate this Agreement in whole, but not in part, for any reason upon providing sixty days prior written notice to the other party. Upon termination of this Agreement for any reason, Ventyx will cease to

perform the Services hereunder for Client and Client will pay to Ventyx: (a) for Services performed on a time and materials basis, all sums due including reimbursable expenses to Ventyx as a result of Services performed prior to such termination; or (b) for Services performed on a fixed fee basis, for all milestones initiated at the effective date of the termination.

6. Warranty Disclaimer and Limitation on Liability. VENTYX MAKES NO REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, AND HEREBY EXPRESSLY DISCLAIMS ANY AND ALL SUCH WARRANTIES, REGARDING ANY MATTER INCLUDING THE MERCHANTABILITY, SUITABILITY, ORIGINALITY, FITNESS FOR A PARTICULAR USE OR PURPOSE, OR RESULTS TO BE DERIVED FROM THE USE OF ANY MATERIALS OR SERVICES PROVIDED UNDER THIS AGREEMENT. IN NO EVENT SHALL VENTYX BE LIABLE FOR ANY LOST PROFITS, LOSS OF GOODWILL, OR FOR SPECIAL, EXEMPLARY, PUNITIVE, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR ANY OTHER DAMAGES. THE SERVICES PERFORMED UNDER THIS AGREEMENT ARE ASSOCIATED WITH THE VENTYX SOFTWARE LICENSED BY CLIENT AND CLIENT ACKNOWLEDGES THAT THEY ARE NOT CONSIDERED ACCOUNTING SERVICES. SUBJECT TO THE FOREGOING LIMITATION OF LIABILITY VENTYX'S LIABILITY UNDER THIS AGREEMENT SHALL NOT EXCEED THE AMOUNT PAID BY CLIENT TO VENTYX UNDER THE SOW GIVING RISE TO THE LIABILITY.
7. Relationship of Parties. Ventyx in furnishing the Services to Client under this Agreement is acting only as an independent contractor.
8. Agreement. This Agreement constitutes the entire agreement between the parties with respect to the subject matter of this Agreement. No change, waiver or discharge will be valid unless in writing and signed by an authorized representative of the party against whom such change, waiver or discharge is sought to be enforced. This Agreement will be governed by and construed in accordance with the laws, other than choice of law rules, of the State of Georgia.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first set forth below and further represent and warrant that the individuals signing below have the corporate power and authority to enter into this Agreement and to carry out the transactions contemplated in this Agreement.

ACCEPTED:
Hayet Power Systems Consulting

ACCEPTED:
Ventyx Inc.

Authorized Signature: _____

Authorized Signature: _____

Printed Name: _____

Printed Name: _____

Title: _____

Title: _____

Date: _____

Date: _____

Authorized Signature: _____

Printed Name: _____

Title: _____

Date: _____



EPM Planning and Risk Training Hayet Power Systems Consulting Estimate Statement of Work (SOW)

13th June, 2012 -- V1.0

SOW Reference: SOW-ADV-NA-120476

IMPORTANT NOTICE

This budgetary offer [dated] is preliminary and not final and as such non-binding. It is tendered for discussion only, does not constitute a term to contract and Ventyx can, without notice, make any changes at Ventyx's discretion.

This Statement of Work ("SOW") is effective as of _____ ("Effective Date") by and between Ventyx Inc., located at 400 Perimeter Center Terrace, Suite 500, Atlanta, Georgia 30346 ("Ventyx") and Hayet Power Systems Consulting, whose office is located at 215 Huntcliff Terrace, Atlanta, GA 30350 ("Client").

This SOW is entered into under the Consulting Agreement between the Parties dated _____ ("Contract"). In the event of any conflict in the terms between this SOW and the Contract, the terms of this SOW shall prevail. All capitalized terms not otherwise defined herein shall have the same meaning as in the Contract.

Ventyx Sales Executive

Name: Brenton Meese
Phone: 678.825.1467
Cell: 404.964.8882
Fax:
E-mail: Brenton.Meese@ventyx.abb.com

Ventyx Project Manager

Name: Joe McLeer
Phone: 678-830-1079
Cell:
Fax:
E-mail: joseph.mcleer@ventyx.abb.com

Client Project Manager

Name: Phil Hayet
Address: 215 Huntcliff Terrace
Atlanta, GA 30350
Phone: 770-587-5402
Fax: 877-862-0734
E-mail: philhayet@concentric.net

Client "Bill to" Contact/Dept.:

Name: Phil Hayet
Address: 215 Huntcliff Terrace
Atlanta, GA 30350
Phone: 770-587-5402
Fax: 877-862-0734
E-mail: philhayet@concentric.net

PO # :

1 INTRODUCTION AND OBJECTIVES

Client has entered into a consulting engagement with another party that licenses the Ventyx EPM Planning and Risk software for the purposes of performing certain analyses on their behalf. Client has agreed to license the Ventyx Planning and Risk software but as a new user will require assistance with the installation and use of the product.

1.1 Understanding the Requirements

Client has requested training on the Ventyx EPM Planning and Risk (PaR) module, which they have licensed on a limited-term basis for the purposes of performing work on a consulting engagement. Client has indicated that only a limited scope use of PaR would be needed to facilitate the scope of work they are to perform and would not require a complete understanding of all the main features and functions of software. Therefore the Client has requested only a 1-day training session as opposed to the typical 3-4 days of training required for most new PaR users.

1.2 References

- EPM 5.3 Minimum Data Model Requirements
- EPM 5.3 Certified Environments

2 SCOPE OF WORK

2.1 Task 1 – Provide EPM Planning and Risk Overview Training

Ventyx will provide a 1-day EPM Planning and Risk overview training session. This training will provide a working knowledge of the EPM interface and cover basic data editing concepts, run setup and execution, and basic output reporting methods.

2.2 Task 2 – Provide Additional Consulting Support

Ventyx will provide an estimated 1-week of additional consulting support to assist the Client with any software installation or modeling issues that are encountered during the engagement period. Such support will include review of the Client's hardware to ensure that it meets the minimum requirements, assistance with the installation and setup of any prerequisite software such as MS SQL Server, and any Ventyx-specific software such as the EPM Core, Application Management, and Prosym,, setup and formatting of SQL Server databases, and assistance with any post-training issues associated with the use of Planning and Risk.

3 ESTIMATED SCHEDULE & DELIVERABLES

The following estimated schedule and deliverables have been identified within this Statement of Work (SOW).

3.1 Estimated Schedule of Work

The estimated schedule of work will be agreed to upon acceptance of the Statement of Work (SOW) by both parties.

3.2 Deliverables from Ventyx

Ventyx will deliver the following items under the Statement of Work (SOW):

- Basic EPM Planning and Risk overview training (1 day)
- Additional consulting support to assist the Client with any software installation or modeling issues (estimated 1 week)

3.3 Deliverables from Client

The Client will deliver the following items to support the activities for this Statement of Work (SOW):

- None.

3.4 Assumptions

The following assumptions have been made when producing this Statement of Work (SOW):

- Client will procure all prerequisite software as specified by the EPM 5.3 Certified Environments document referenced in Section 1.2, namely a certified version of SQL Server. Ventyx will assist Client with the procurement and installation of all prerequisite software.
- All Ventyx software is to be delivered electronically.
- Training will be provided at Ventyx's Atlanta office, unless an alternative mutually agreed upon location is decided at the time of the training.
- The Ventyx project manager will provide a single point of contact between Client and Ventyx with regard to scope, schedule, and resources assigned to accomplish the Ventyx services.
- Client will have the appropriate computer hardware and technical environment in place, and will provide all required access, prior to the Ventyx consultants commencing work.
- Client computer hardware and software will meet the minimum requirements as specified in the References noted in Section 1.2 of this SOW.
- Any other additional services beyond the scope as stated in Section 2 of this SOW will be billed at the attached rate schedule.

4 CHARGES

4.1 Fee Summary

The fee for this training is an estimated \$14,000 and will be performed on a Time and Materials basis, exclusive of expenses and taxes. The estimates provided below are intended to be an estimate for budgetary and Ventyx resource scheduling purposes only.

All fees presented in the SOW are expressed in US Dollars unless stated otherwise.

Task	Estimated Effort	Estimated Duration	Resources	Day Rate	Fee
Provide EPM Planning and Risk Overview training	1 day	1 day	Training Consultant	2,000	2,000
Provide Optional Consulting Support	1 week	4 weeks	Lead Consultant	2,400	12,000

4.2 Travel Expenses

Travel expenses for this SOW are estimated to be \$0.

4.3 Payment Terms

Ventyx will invoice monthly in arrears and Client agrees to pay Ventyx thirty (30) days from date of invoice.

6 SIGNATURE OF ACCEPTANCE

Pricing is subject to change at Ventyx's sole discretion if not signed by Hayet Power System Consulting and returned to Ventyx on or before 30 June 2012.

IN WITNESS WHEREOF, the parties have caused this SOW to be executed by their duly authorized representatives.

Hayet Power Systems Consulting

By: _____
Name: _____
Title: _____
Date: _____

Ventyx Inc.

By: _____	By: _____
Name: _____	Name: _____
Title: _____	Title: _____
Date: _____	Date: _____

To indicate approval, please return a signed PDF version of the entire PSO SOW via email or fax to:

*Tencia DeLuke, tencia.deluke@ventyx.abb.com
Fax +1-770-206-2279*

If your company requires an original hard copy, please mail two signed sets to:

*Tencia DeLuke
Ventyx Inc.
400 Perimeter Center Terrace, Suite 500,
Atlanta Georgia 30346
Tel: +1-678-825-1445*

**VENTYX
2012 RATE SCHEDULE - CONSULTING SERVICES**

Rate Group	Hourly Fee US \$
Sr. Vice President	420
Vice President, Subject Matter Expert / Expert Witness	400
Director	370
Principal Consultant	315
Lead Consultant	300
Project Manager	265
Senior Consultant	230
Consultant	210
Associate Consultant	185
Technical and Administrative Professionals	145

15% Adder for Work for Litigation / Regulatory Proceedings

Support Service Charges. In addition to payment for professional services, all reasonable and necessary expenses incurred in connection with the performance of professional services will be billed at cost. Such expenses include, but are not limited to, outside reproduction costs, artwork, airline travel, meals, lodging, postage, freight, telephone, and travel related expenses. Mileage is charged at the prevailing Standard Mileage Rate as determined by the Internal Revenue Service.

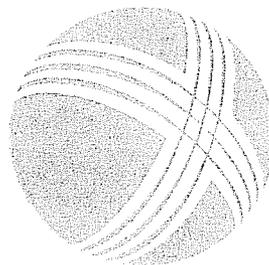
Insurance Provisions. Where a Client requires that it or other entities be named as additional insured with regard to company insurance policies, any cost to Ventyx of such provisions shall be billed to the Client.

Fee Schedule Revision. This schedule is effective commencing January 1, 2012, and may be revised periodically by Ventyx.

KWalton

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CONFIDENTIALITY AGREEMENT

Kentucky Public Service Commission

Case No. 2012-00063

This Agreement is entered into by and between Big Rivers Electric Corporation (“Big Rivers”) and the Office of the Attorney General for the Commonwealth of Kentucky (“Intervenor”).

WHEREAS, Intervenor has moved or may move to intervene in the above referenced case and has requested review of certain information Big Rivers believes to be confidential and proprietary;

WHEREAS, during the course of this proceeding, Big Rivers may, by petition for confidential treatment, seek protection from public disclosure of information Big Rivers believes to be confidential and proprietary and for which it believes public disclosure would prove harmful to Big Rivers, and will under those circumstances, provide Intervenor with access to that information pursuant to the following confidentiality agreement alone; and

WHEREAS, Intervenor is willing to enter into this agreement and have access to the information at issue upon the terms and conditions contained herein;

NOW, THEREFORE, the parties covenant and agree as follows:

1. Access to information which Big Rivers believes to be confidential and propriety for which confidential treatment is sought by Big Rivers in this case will be limited strictly to Intervenor, its legal counsel and/or consultants, and employees of Intervenor’s clients in this matter who have a need for access to the information for purposes of this proceeding, who shall execute a nondisclosure certificate as described in paragraph 3 and attached as Exhibit A to this agreement.
2. Use of the information provided pursuant to this confidentiality agreement shall be limited strictly to Case No. 2012-00063 before the Kentucky Public Service Commission (the “Commission”) and any appeals from that case.
3. The non-disclosure certificate shall require Intervenor, its legal counsel, and its consultants to read a copy of this agreement and certify in writing that it, he, or she has reviewed this agreement and agrees to be bound by its terms before disclosure of the confidential and proprietary information will be made. The certificate shall contain the full name of Intervenor’s legal counsel and/or consultant(s) and their permanent business address. A copy of each certificate shall be provided to Big Rivers.
4. All copies of documents containing information that are provided to Intervenor under this agreement pending a ruling by the Commission upon a petition for confidential treatment, and information for which the Commission has Ordered that confidential treatment shall be afforded, shall be deemed to be held in trust pursuant to this agreement and shall be returned to Big Rivers upon demand at the conclusion of Case No. 2012-00063. Upon demand

for return of the information, any notations or other work product of Intervenor, its counsel, or its consultants made or contained in the information shall be redacted prior to the return of the information to Big Rivers. Upon election by the Attorney General, the information may be destroyed by a professional certified in shredding the materials. Upon exercising this election, the Attorney General shall certify to the company that the information has been destroyed.

5. If Intervenor desires to make use of any confidential or proprietary information obtained as a result of its, its legal counsel's, or its consultant's examination of the information, whether in testimony filed by Intervenor or through cross-examination of any witness or otherwise, Intervenor shall notify Big Rivers in advance of the proposed use and shall meet with Big Rivers' representatives to attempt in good faith to establish a procedure that will accommodate the needs of Intervenor to make use of the information without risking its public disclosure. If Big Rivers and Intervenor are unable to agree on a means of preventing public disclosure of the confidential and proprietary information, Big Rivers and Intervenor will submit these issues to the Commission for resolution before the proposed use of the information is made.

6. Each and every party to this agreement will act in good faith, and no party to the agreement will do anything to deprive any other party of the benefit of this agreement. The parties agree that the Commission is the sole and exclusive forum for considering any alleged breach of this agreement, and that the remedies within the jurisdiction of the Commission are the only available remedies. This agreement does not restrict the parties from seeking any injunctive relief in a court of competent jurisdiction which they believe that they are otherwise entitled to seek; furthermore, it does not extinguish any right to judicial review of the Commission's actions. The parties do, however, expressly waive any other relief or remedy to which they might be entitled in the absence of the limitations of this agreement.

7. Intervenor's participation in this agreement shall not be construed as an admission that the information claimed to be confidential and proprietary is, as a matter of law, confidential and proprietary, or as a waiver of any right to assert that the information is not confidential and proprietary before the Commission or any court of competent jurisdiction. In the event the Commission should rule that any of the information should be removed from the restrictions imposed by this agreement, Intervenor shall not disclose such information until the Commission's Order subjecting the information to public disclosure is final pursuant to KRS 278.410, or until all appeals of such Order have been exhausted, unless authorized to do so by Big Rivers or a court of competent jurisdiction.

8. This agreement shall bind the parties to it from the date of its execution. Every executed copy of this agreement will be deemed an original.

EXECUTED this 3rd day of May, 2012.

JACK CONWAY
ATTORNEY GENERAL



Jennifer Black Hans
Dennis G. Howard, II
Lawrence W. Cook
Assistant Attorneys General
1024 Capital Center Drive,
Suite 200
Frankfort Ky 40601-8204
(502) 696-5453
Fax: (502) 573-1009

Intervenor

Big Rivers Electric Corporation

By: _____

Title: _____

EXHIBIT A

NONDISCLOSURE CERTIFICATE

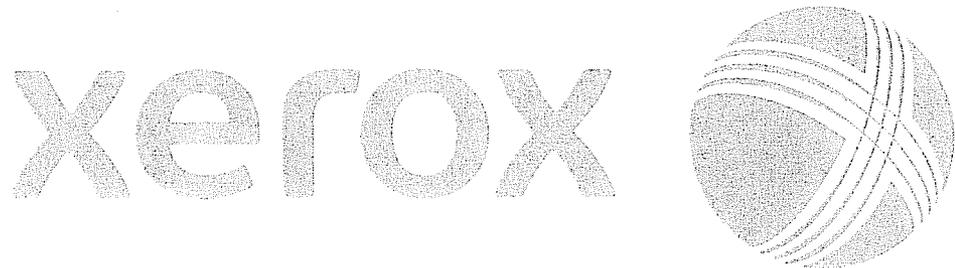
The undersigned hereby certify that, before disclosure to them of confidential and proprietary information of Big Rivers, they have read the confidentiality agreement between Big Rivers and the Office of the Attorney General for the Commonwealth of Kentucky, which is incorporated herein by reference as if set forth in its entirety, and agree to be bound by its terms.

Name

Address

KWalton

 Microsoft Office Outlook - Memo Style
 08/17/12 11:44 AM



Kim Walton

From: Melnykovych, Andrew (PSC) [Andrew.Melnykovych@ky.gov]
Sent: Friday, July 06, 2012 2:12 PM
To: Nguyen, Quang D (PSC)
Cc: DeRouen, Jeff (PSC)
Subject: BREC ECP/ESM public meetings

Quang;

Here's the information on the public meetings for the Big rivers environmental compliance plan/surcharge case (#2012-000630

Monday, August 13 – Paducah

Room 109, Emerging Technology Center, West Kentucky Community & Technical College

5:30 pm CDT – information session, Q&A

6:30 pm CDT – public comments

Tuesday, August 14 - Henderson

Stagg Meeting Room, Henderson Fine arts Center

1 pm CDT – information session, Q&A

2 pm CDT – public comments

In keeping with the usual procedure, there will be no presentations by applicant or intervenors, but they are welcome to attend. And we'd like BREC to have people available to answer questions one-on-one and off the record

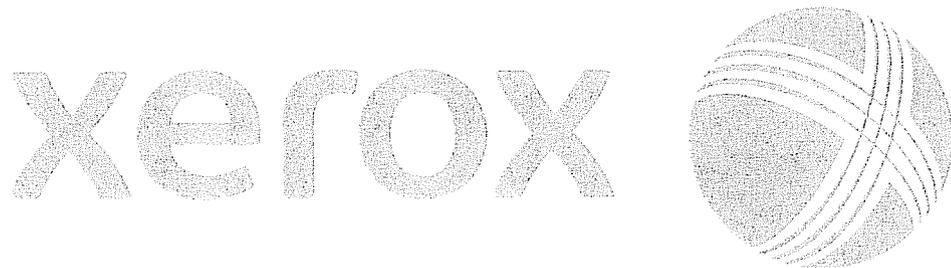
Any of the parties with questions can contact me

Andrew Melnykovych

Director of Communications
Kentucky Public Service Commission
211 Sower Boulevard
Frankfort, KY 40601
502-564-3940 x208 cell:502-330-5981

KWalton

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1 COMMONWEALTH OF KENTUCKY
2 BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY
3
4

5 In the Matter of:

6
7 Application of Big Rivers Electric Corporation)
8 for Approval of its 2012 Environmental)
9 Compliance Plan, for Approval of its Amended)
10 Environmental Cost Recovery Surcharge Tariff,) Case No. 2012-00063
11 for Certificates of Public Convenience and)
12 Necessity, and for Authority to Establish a)
13 Regulatory Account)
14

15
16 **BIG RIVERS ELECTRIC CORPORATION'S FIRST REQUEST FOR INFORMATION**
17 **TO KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.**
18

19 Big Rivers Electric Corporation submits this first request for information to Kentucky
20 Utility Industrial Utility Customers, Inc., to be answered in accordance with the following
21 Definitions and Instructions.

22 DEFINITIONS

23 1. Whenever it is necessary to bring within the scope of these information requests
24 documents that otherwise might be construed to be outside their scope (1) the use of "and" as
25 well as "or" shall be construed both disjunctively and conjunctively; (2) the use of a word in its
26 singular form shall be construed to include within its meaning its plural form as well, and vice
27 versa; (3) the use of "include" and "including" shall be construed to mean "without limitation";
28 and (4) the use of a verb in any tense or voice shall be construed as the use of that verb in all
29 other tenses and voices.

30 2. "Big Rivers" means Big Rivers Electric Corporation.

31 3. "KIUC," "you," or "your" means Kentucky Industrial Utility Customers, Inc., its
32 agents, officers, directors, employees, attorneys, consultants, and members.

1 4. “Smelter” or “Smelters” means one or both of Century Aluminum of Kentucky
2 General Partnership and Alcan Primary Products Corporation, and includes their agents, officers,
3 directors, employees, attorneys, consultants, parent companies, divisions, subsidiaries, and other
4 related companies.

5 5. “Commission” means the Kentucky Public Service Commission.

6 6. “Kentucky Attorney General” includes his agents, employees, and consultants.

7 7. “Ventyx” includes its agents, officers, directors, employees, attorneys,
8 consultants, parent companies, divisions, subsidiaries, and other related companies.

9 8. “Sierra Club” includes its agents, officers, directors, employees, attorneys,
10 consultants, divisions, subsidiaries, chapters, and other related organizations.

11 9. “APM” means Alliance for Cooperative Energy Services Power Marketing, its
12 agents, officers, directors, employees, attorneys, and consultants.

13 10. “Pace” means Pace Global, LLC.

14 11. “NPVRR” means net present value revenue requirement.

15 12. “MISO” means Midwest Independent Transmission System Operator, Inc.

16 13. “Document” means any written, recorded, transcribed, printed or impressed
17 matter of whatever kind, however produced, stored or reproduced, including, but not limited to,
18 sound or pictorial recordings, computerized information, books, pamphlets, letters, memoranda,
19 telegrams, electronic or mechanical transmissions, communications of all kinds, reports, notes,
20 working papers, handwritings, charts, papers, writings, printings, transcriptions, tapes and
21 records of all kinds.

22 14. “Person” includes a natural person, a business organization of any type, an
23 unincorporated association, a governmental subdivision, agency, or entity, and a business trust.

- 1 15. Wherever in these information requests you are asked to “identify,” you are
2 requested:
- 3 a. when identifying an oral communication, to:
- 4 i. identify the author thereof and the parties thereto,
5 ii. state the date of the communication,
6 iii. state the place of the communication,
7 iv. state the substance of the communication, and
8 v. state whether such communication has been reduced to writing and, if so,
9 identify each document and the present custodian thereof;
- 10 b. when identifying other information, to state:
- 11 i. the source thereof,
12 ii. any oral communications pertaining thereto,
13 iii. any documents pertaining thereto, and
14 iv. the substance of the information;
- 15 c. when identifying a document, to:
- 16 i. identify the author thereof and the parties thereto,
17 ii. state its title or other identifying data,
18 iii. state the date of the document or if no date appears thereon, the
19 approximate date,
20 iv. state the exact nature and substance thereof;
21 v. identify each person having possession, care, custody or control of the
22 original and any copies thereof,

1 possible the content of each such document, the date such document and its copies were
2 destroyed or lost and, if destroyed, the identity of the person authorizing such destruction, and
3 the identity of the last known custodian of such document prior to its destruction.

4 4. These data requests shall be deemed continuing and you should serve upon Big
5 Rivers' counsel (1) supplemental responses to these data requests if additional information or
6 information that changes your response to any data request is obtained during the course of this
7 proceeding, and (2) any documents requested herein that become available or that are discovered
8 after the date your responses to these data requests are due.

9 INFORMATION REQUESTS

10
11 1. Please provide supplements to Exhibits SJB-2 and SJB-3, in the existing format,
12 but using data for 2017 instead of 2016. Separately, please do the same using data for 2018.
13 Please provide these exhibits in electronic spreadsheet form with all cell formulas intact, and
14 provide any other workpapers, calculations and assumptions used in developing the revised
15 exhibits.

16 2. Please refer to pages 4 and 9 of Mr. Baron's testimony. Please explain why Mr.
17 Baron thinks "the inclusions of fuel...in the 'allocator' is not appropriate" when allocating
18 environmental costs among classes but is appropriate when allocating costs between off-system
19 sales and sales to Big Rivers' members.

20 3. Please provide all workpapers, spreadsheets (in electronic form with formulas
21 intact), and other documents supporting the calculations contained on page 10 of Mr. Baron's
22 testimony.

23 4. Please refer to Baron Exhibits SJB-2 and SJB-3. Please provide these exhibits in
24 electronic spreadsheet form with all cell formulas intact.

1 5. Have Domtar Paper Co., LLC and Kimberly-Clark Corporation each agreed to
2 Mr. Baron's proposed cost allocation methodology?

3 6. Please refer to page 3 of Mr. Hayet's testimony. Please list each project in which
4 Mr. Hayet has performed production cost modeling using the Planning and Risk model, the name
5 of the utility involved, and the year Mr. Hayet performed each such modeling.

6 7. Please refer to page 13 of Mr. Hayet's testimony, lines 14-17. Please identify
7 each Pace market price forecast iteration that included CO₂ and each Pace market price forecast
8 iteration that did not include CO₂.

9 8. Please refer to page 17 of Mr. Hayet's testimony, line 19. Please identify each
10 case that Mr. Hayet could not get to run and what precisely was done to resolve the issue.

11 9. Please provide the dates and times of all correspondence and communications
12 between Mr. Hayet and anyone at APM, including direct telephone calls, conference calls, e-
13 mails, faxes, or any other communications. Please provide a copy of all correspondence and a
14 brief description of the subject and nature of each communication.

15 10. Please refer to page 18 of Mr. Hayet's testimony, lines 12-13. For each case Mr.
16 Hayet performed, please list each input and assumption he changed, explain why the input or
17 assumption was changed, and provide all analyses, documents, or other bases supporting the
18 change.

19 11. Please refer to page 18 of Mr. Hayet's testimony, lines 12-13. For each case Mr.
20 Hayet performed, please provide all input files, input assumptions, output files, databases, run
21 definitions, and any other files or information needed to replicate the results.

22 12. Please provide all spreadsheets, models, and supporting documentation, with
23 formulas intact, for the table depicting the NPVRR on page 21 of Mr. Hayet's testimony.

- 1 13. Please refer to the table on page 21 of Mr. Hayet's testimony.
- 2 a. Please provide the annual figures for each of the cases in nominal dollars before
- 3 they are discounted to present value.
- 4 b. Please provide this information both as a hard copy and in electronic format with
- 5 formulas intact.
- 6 c. Please provide the discount rate used by Mr. Hayet.
- 7 14. Please refer to page 22 of Mr. Hayet's testimony, lines 17-18. Please list each
- 8 item of incremental VO&M costs he claims is not included in the results.
- 9 15. Please refer to page 8 of Mr. Kollen's testimony, lines 10-11.
- 10 a. Please provide all analyses, documents, or other bases for his assertion that Big
- 11 Rivers' management team is relatively inexperienced in large scale construction
- 12 projects.
- 13 b. Please quantify, on a net present value basis, the dollar impact Mr. Kollen claims
- 14 the alleged inexperience will have on the Build Case and the Buy Case.
- 15 16. Please refer to page 15 of Mr. Kollen's testimony, lines 2-12. What dollar impact
- 16 does correcting the alleged error have on the NPVRR of the Build Case, the Buy Case, and the
- 17 difference between the two cases?
- 18 17. Please refer to Mr. Kollen's testimony, page 15 line 13 through page 16 line 7.
- 19 What dollar impact does correcting the alleged error have on the NPVRR of the Build Case, the
- 20 Buy Case, and the difference between the two cases?
- 21 18. Please refer to page 23 of Mr. Kollen's testimony, lines 10 and 13. Are the
- 22 percent increases he refers to wholesale or retail increases?

1 19. Please refer to page 24 of Mr. Kollen’s testimony, lines 12-14. Please list all of
2 the “necessary steps” Mr. Kollen recommends that the Commission take to ensure that the
3 smelters do not terminate their contracts, and provide a detailed explanation of how each step
4 will achieve that objective.

5 20. Please provide all spreadsheets, models and supporting documentation, with
6 formulas intact, for the table depicting “all-in” non-smelter member revenue requirements, found
7 on page 25 of Mr. Kollen’s testimony.

8 21. Please refer to page 29 of Mr. Kollen’s testimony, lines 7-11, where Mr. Kollen
9 states that “if the Commission authorizes Big Rivers to proceed with ECP projects 4 and 5, then
10 it will commit the Company, its creditors, and all of its customers to the completion of the
11 projects, the financing of the projects, and the obligation to pay through rates for the projects.”

12 a. Does Mr. Kollen believe that by approving projects 4 and 5 in the instant case, the
13 Commission is waiving its authority to address future construction, operation, and
14 ratemaking issues related to these projects? Please explain in detail.

15 b. Does Mr. Kollen believe that if the Commission approves projects 4 and 5, then
16 Big Rivers, its creditors, and/or its members waive any rights related to future
17 consideration of the projects, their construction, operation, and future ratemaking
18 treatment? Please explain in detail.

19 22. To the extent not provided in connection with a response to another Big Rivers
20 information request, please provide all spreadsheets, models, and supporting documentation,
21 with formulas intact, for each table in Mr. Kollen’s testimony.

1 23. Does KIUC agree with Ms. Wilson’s testimony that Big Rivers should retire all of
2 its coal units and construct natural gas combined cycle units? Please explain your response in
3 detail.

4 24. Please provide all emails, memos, and other documents, sent by KIUC to the
5 Kentucky Attorney General, Ventyx, or Sierra Club since January 1, 2012.

6 25. Please provide all emails, memoranda, and other documents sent to KIUC from
7 the Kentucky Attorney General, Ventyx, or Sierra Club since January 1, 2012.

8 26. Please provide all emails, memos, and other documents, sent by KIUC to persons
9 other than Big Rivers, the Kentucky Attorney General, Ventyx, or Sierra Club since January 1,
10 2012, regarding this case or analyses performed relating to Big Rivers’ environmental
11 compliance options.

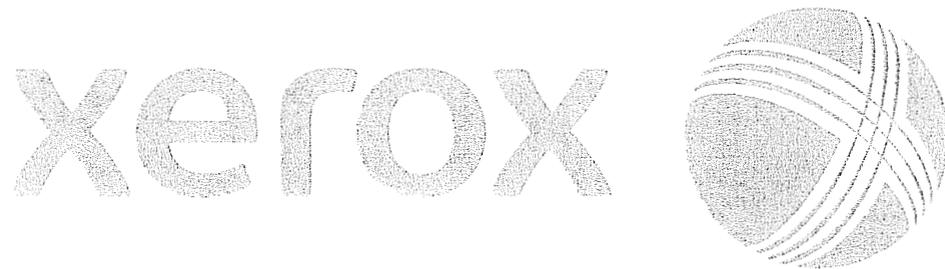
12 27. Please provide all emails, memos, and other documents, sent to KIUC from
13 persons other than Big Rivers, the Kentucky Attorney General, Ventyx, or Sierra Club since
14 January 1, 2012, regarding this case or analyses performed relating to Big Rivers’ environmental
15 compliance options.

16 28. Please provide the dates and times of all correspondence and communications
17 between Mr. Hayet and anyone at Ventyx, including direct telephone calls, conference calls, e-
18 mails, faxes, or any other communications. Please provide a copy of all documents concerning,
19 regarding, or related to that correspondence and a brief description of the subject and nature of
20 each communication.

21 29. Please provide a copy of all documents, whether hardcopy or electronic, Mr.
22 Hayet received from Ventyx or that were prepared by or for him, in whole or in part, while at
23 Ventyx.

KWalton

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 08/17/12 11:44 AM



1 COMMONWEALTH OF KENTUCKY
2 BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY
3
4

5 In the Matter of:

6
7 Application of Big Rivers Electric Corporation)
8 for Approval of its 2012 Environmental)
9 Compliance Plan, for Approval of its Amended)
10 Environmental Cost Recovery Surcharge Tariff,) Case No. 2012-00063
11 for Certificates of Public Convenience and)
12 Necessity, and for Authority to Establish a)
13 Regulatory Account)
14

15
16 **BIG RIVERS ELECTRIC CORPORATION'S FIRST REQUEST FOR INFORMATION**
17 **TO SIERRA CLUB**
18

19 Big Rivers Electric Corporation submits this first request for information to Sierra Club
20 to be answered in accordance with the following Definitions and Instructions.

21 **DEFINITIONS**

22 1. Whenever it is necessary to bring within the scope of these information requests
23 documents that otherwise might be construed to be outside their scope (1) the use of "and" as
24 well as "or" shall be construed both disjunctively and conjunctively; (2) the use of a word in its
25 singular form shall be construed to include within its meaning its plural form as well, and vice
26 versa; (3) the use of "include" and "including" shall be construed to mean "without limitation";
27 and (4) the use of a verb in any tense or voice shall be construed as the use of that verb in all
28 other tenses and voices.

29 2. "Big Rivers" means Big Rivers Electric Corporation.

30 3. "Sierra Club," "you," or "your" means Sierra Club, its agents, officers, directors,
31 employees, attorneys, consultants, divisions, subsidiaries, chapters, and other related
32 organizations.

- 1 4. “Synapse” means Synapse Energy Economics, Inc., its agents, officers, directors,
2 employees, attorneys, consultants, parent companies, divisions, subsidiaries, and other related
3 companies.
- 4 5. “KIUC,” means Kentucky Industrial Utility Customers, Inc., its agents, officers,
5 directors, employees, attorneys, consultants, and members.
- 6 6. “Smelter” or “Smelters” means one or both of Century Aluminum of Kentucky
7 General Partnership and Alcan Primary Products Corporation.
- 8 7. “Commission” means the Kentucky Public Service Commission.
- 9 8. “Kentucky Attorney General” includes his agents, employees, and consultants.
- 10 9. “Ventyx” includes its agents, officers, directors, employees, attorneys,
11 consultants, parent companies, divisions, subsidiaries, and other related companies.
- 12 10. “APM” means Alliance for Cooperative Energy Services Power Marketing, its
13 agents, officers, directors, employees, attorneys, and consultants.
- 14 11. “Pace” means Pace Global, LLC.
- 15 12. “NPVRR” means net present value revenue requirement.
- 16 13. “NGCC” means natural gas combined cycle.
- 17 14. “DSM” means demand-side management.
- 18 15. “MISO” means Midwest Independent Transmission System Operator, Inc.
- 19 16. “Document” means any written, recorded, transcribed, printed or impressed
20 matter of whatever kind, however produced, stored or reproduced, including, but not limited to,
21 sound or pictorial recordings, computerized information, books, pamphlets, letters, memoranda,
22 telegrams, electronic or mechanical transmissions, communications of all kinds, reports, notes,

1 working papers, handwritings, charts, papers, writings, printings, transcriptions, tapes and
2 records of all kinds.

3 17. "Person" includes a natural person, a business organization of any type, an
4 unincorporated association, a governmental subdivision, agency, or entity, and a business trust.

5 18. Wherever in these information requests you are asked to "identify," you are
6 requested:

7 a. when identifying an oral communication, to:

8 i. identify the author thereof and the parties thereto,

9 ii. state the date of the communication,

10 iii. state the place of the communication,

11 iv. state the substance of the communication, and

12 v. state whether such communication has been reduced to writing and, if so,
13 identify each document and the present custodian thereof;

14 b. when identifying other information, to state:

15 i. the source thereof,

16 ii. any oral communications pertaining thereto,

17 iii. any documents pertaining thereto, and

18 iv. the substance of the information;

19 c. when identifying a document, to:

20 i. identify the author thereof and the parties thereto,

21 ii. state its title or other identifying data,

22 iii. state the date of the document or if no date appears thereon, the
23 approximate date,

- 1 iv. state the exact nature and substance thereof;
- 2 v. identify each person having possession, care, custody or control of the
- 3 original and any copies thereof,
- 4 vi. if such document was, but no longer is, in your possession or subject to
- 5 your control, state what disposition was made of it, and
- 6 vii. produce the document.

7 INSTRUCTIONS

8 1. If any document called for by any of these data requests is withheld based upon a
9 claim of privilege or work product, please produce so much of the document as to which you do
10 not claim privilege or protection, and for each document or part of a document for which you
11 claim privilege or protection, describe or identify:

- 12 a. The nature, subject matter and substance of the document or part of the document
- 13 withheld;
- 14 b. The nature of the privilege or protection claimed;
- 15 c. The date, author or authors, addressee or addressees, and distribution of the
- 16 document;
- 17 d. Each person in whose possession, custody or control any copy of the document is
- 18 or has been; and
- 19 e. Paragraph number of the schedule of documents to which the document or part of
- 20 the document is responsive.

21 2. If, for reasons other than a claim of privilege or work product, you refuse to
22 answer any data request or to produce any document requested, state the grounds upon which the

1 refusal is based with sufficient specificity to permit a determination of the propriety of such
2 refusal.

3 3. If any copy of any document requested herein or any record which refers or
4 relates to any document requested herein has been destroyed or lost, set forth to the extent
5 possible the content of each such document, the date such document and its copies were
6 destroyed or lost and, if destroyed, the identity of the person authorizing such destruction, and
7 the identity of the last known custodian of such document prior to its destruction.

8 4. These data requests shall be deemed continuing and you should serve upon Big
9 Rivers' counsel (1) supplemental responses to these data requests if additional information or
10 information that changes your response to any data request is obtained during the course of this
11 proceeding, and (2) any documents requested herein that become available or that are discovered
12 after the date your responses to these data requests are due.

13 INFORMATION REQUESTS

14 1. Please refer to page 10 of Dr. Steinhurst's testimony, lines 13-16, where he states
15 that Synapse compared the Build Case to a natural gas combined cycle unit "using several
16 combinations of more appropriate assumptions." Please list each input and assumption Synapse
17 changed, explain why the input or assumption was changed, and provide all analyses,
18 documents, or other bases supporting the change.

19 2. Please refer to page 11 of Dr. Steinhurst's testimony, beginning at line 20, where
20 he states, "It is also contrary to the experience of national leaders in energy efficiency who have
21 found it possible to achieve savings in excess of 1% of retail sales per year consistently for a
22 decade or more."

23 a. Please provide all documents upon which Mr. Steinhurst bases that statement.

- 1 b. Please list each utility Mr. Steinhurst is referring to in that statement, and for each
2 utility listed:
- 3 i. please provide the percentage of residential load to total load for each of
4 the last 10 years, and
- 5 ii. please state whether all of the energy savings Mr. Steinhurst mentions
6 came from a reduction in residential energy consumption, and if not,
7 provide the annual energy consumption reductions from residential
8 consumers.
- 9 3. Please refer to page 12 of Dr. Steinhurst's testimony, lines 6-12. Using Big
10 Rivers' proposed Build Case, provide a detailed analysis showing how DSM and energy
11 efficiency programs will eliminate the need for Big Rivers to build one or more of the proposed
12 projects, and still permit Big Rivers to comply with all environmental regulations in a timely and
13 less cost manner than the Build Case.
- 14 4. Please refer to the table on page 14 of Dr. Steinhurst's testimony.
- 15 a. Please provide all workpapers, models, databases, and other documents, in
16 electronic form with formulas intact, used in developing each number in the table.
- 17 b. Please provide the basis, including all assumptions and supporting documents,
18 used in developing each number in the table.
- 19 5. For each table in Ms. Wilson's testimony.
- 20 a. Please provide all workpapers, models, databases, and other documents, in
21 electronic form with formulas intact, used in developing each number in the table.
- 22 b. Please provide the basis, including all assumptions and supporting documents,
23 used in developing each number in the table.

1 6. For each input and assumption used in Ms. Wilson’s analysis that differs from the
2 inputs and assumptions in Big Rivers’ Build Case, please list the input or assumption, and
3 provide the basis for the input or assumption and all supporting worksheets or other documents.

4 7. Please refer to the testimony of Ms. Wilson.

5 a. Please explain in detail the extent to which Ms. Wilson incorporated potential

6 future environmental laws or regulations relating to or affecting natural gas

7 production (including potential laws or regulations relating to hydraulic

8 fracturing) or natural gas combined cycle units into her analysis. If her answer is

9 that she did not incorporate consideration of those subjects in her analysis, please

10 explain why not.

11 b. Please provide a natural gas forward price curve showing the impact of such

12 environmental laws and regulations over the expected life of the proposed natural

13 gas combined cycle units.

14 c. Please provide all workpapers and other documents supporting the impact of

15 potential future environmental laws or regulations on the price of natural gas over

16 the expected life of the proposed natural gas combined cycle units.

17 d. Has Sierra Club adopted a public position regarding the appropriateness of the

18 technique of hydraulic fracturing in connection with the production of natural gas,

19 or advocated imposition of any limits, prohibitions, bans, or other laws or

20 regulations restricting use of the technique of hydraulic fracturing in connection

21 with the production of natural gas? If so, please provide all documents relating to

22 the positions taken by Sierra Club on those subjects, including details relating to

23 the positions, and an estimated impact on the natural gas forward prices used in

1 Ms. Wilson's analysis if the positions taken by Sierra Club on those subjects are
2 implemented by laws, regulations, or otherwise.

3 e. Does Sierra Club have an opinion about the likelihood that any limits,
4 prohibitions, bans, restrictions or other laws or regulations will be imposed on use
5 of the technique of hydraulic fracturing in connection with the production of
6 natural gas? If so, please provide all documents relating to such opinion, details
7 explaining the basis for the opinion, and an estimated impact on the natural gas
8 forward prices used in Ms. Wilson's analysis if the limits, prohibitions, bans,
9 restrictions or other laws or regulations Sierra Club believes are likely to be
10 imposed on use of the technique of hydraulic fracturing in connection with the
11 production of natural gas are implemented by laws, regulations, or otherwise.

12 f. Has Sierra Club proposed to any administrative agency or branch of a local, state
13 or federal government any limits, prohibitions, bans, restrictions or other laws or
14 regulations on use of the technique of hydraulic fracturing in connection with the
15 production of natural gas? If so, please provide all documents relating to such
16 proposals, details relating to the proposal, and an estimated impact on the natural
17 gas forward prices used in Ms. Wilson's analysis if the proposals offered by
18 Sierra Club are implemented by laws, regulations, or otherwise.

19 8. Please refer to the tables on pages 9 and 10 of Ms. Wilson's testimony.

20 a. Please provide all analyses and other documents showing the impact of the coal
21 retirements listed on power market prices in general and on power market prices
22 in MISO.

23 b. With regard to the 120 GW estimates:

- 1 i. Of the 120 GW, how many GW of coal retirements were from coal
2 generation in MISO?
- 3 ii. What is the total capacity of coal generation (in GW) in MISO?
- 4 iii. What is the total capacity of coal generation (in GW) in the United States?
- 5 iv. What percent of the total coal capacity in the United States would a
6 retirement of 120 GW represent?
- 7 v. What percent of MISO coal capacity would the MISO retirements
8 represent?
- 9 vi. Has Sierra Club made any estimates of the impact of retiring 120 GW of
10 coal on system reliability and resource adequacy, specifically in MISO?
- 11 vii. Did ICF/EEI provide a list of generators they expect to be retired (adding
12 up to the total GW of retirements reported)? If so, were any Big Rivers'
13 facilities on that list?

14 9. Please refer to page 12 of Ms. Wilson's testimony, lines 15-16. Provide any
15 allowance price forecast showing allowance prices different than the Pace forecast, and for each
16 price forecast, provide the impact to the NPVRR of the Big Rivers Build Case (using Big Rivers'
17 assumptions).

18 10. What modeling software did Ms. Wilson or Synapse use to perform the cost
19 comparisons of the natural gas combined cycle scenarios versus Big Rivers' scenarios referenced
20 in Ms. Wilson's testimony?

- 21 a. Provide copies of all models, databases, input and output files, input assumptions,
22 in electronic format with formulas intact.

1 11. What capital, fuel, allowance, and operation and maintenance costs did Ms.
2 Wilson assume in her analysis for the combined cycle build? Provide all such costs, the basis for
3 those assumptions, and all documents supporting those assumptions. Include the manufacturer
4 and model number of the combined cycle units used as the basis for any assumption.

5 12. What compliance option does Ms. Wilson use in her analysis for NAAQS, 316b,
6 CCR, and effluent limitations?

7 a. Provide all capital and operation and maintenance cost estimates used by Ms.
8 Wilson in her analysis for the equipment needed for compliance with NAAQS
9 316b, CCR and effluent limitations. Provide all bases for those estimates and all
10 supporting documents. Provide the in service date for the equipment.

11 13. Explain in detail how Ms. Wilson modeled Big Rivers' debt structure when
12 assuming retirement of the existing fleet and construction of new natural gas combined cycle
13 (NGCC) units?

14 a. How would retiring Big Rivers' entire fleet affect Big Rivers' financial statements
15 and equity as a percentage of assets?

16 b. How was Big Rivers' current debt modeled?

17 c. What sort of financing was assumed given Big Rivers' current debt structure and
18 the additional amount of debt required when constructing new NGCC units?

19 d. What is the additional amount of debt required to build new NGCC units?

20 e. What interest rate was assumed on the new debt?

21 14. Please refer to Exhibit RW-3. That exhibit is a study entitled, "EEI Preliminary
22 Reference Case and Scenario Results." At the bottom of each page of that study is a notice that
23 states, "EEI CONFIDENTIAL BUSINESS INFORMATION: Do Not Cite, Quote or Distribute."

1 Each page of the study, except the cover page, also includes a notice of ICF International's
2 copyright.

3 a. What rights or authority does Sierra Club have to copy, cite, quote, and distribute
4 the study? Please provide all evidence of such rights or authority.

5 b. Please provide the business contact information for each person who provided the
6 study to Sierra Club or who Sierra Club contacted to obtain the right or authority
7 to copy, cite, quote, and distribute the study.

8 15. Please provide all emails, memos, and other documents, sent by Sierra Club to the
9 Kentucky Attorney General, Ventyx, or KIUC since January 1, 2012.

10 16. Please provide all emails, memoranda, and other documents sent to Sierra Club
11 from the Kentucky Attorney General, Ventyx, or KIUC since January 1, 2012.

12 17. Please provide all emails, memos, and other documents, sent by Sierra Club to
13 persons other than Big Rivers, the Kentucky Attorney General, Ventyx or KIUC since January 1,
14 2012, regarding this case or analyses performed relating to Big Rivers' environmental
15 compliance options.

16 18. Please provide all emails, memos, and other documents, sent to Sierra Club from
17 persons other than Big Rivers, the Kentucky Attorney General, Ventyx or KIUC since January 1,
18 2012, regarding this case or analyses performed relating to Big Rivers' environmental
19 compliance options.

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On this the 30th day of July, 2012.

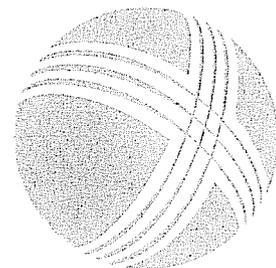
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Counsel for Big Rivers Electric Corporation

KWalton

 **Baron Direct Testimony & Exhibits (PUBLIC) - F**
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COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

IN THE MATTER OF:

APPLICATION OF BIG RIVERS ELECTRIC)
CORPORATION FOR APPROVAL OF ITS)
2012 ENVIRONMENTAL COMPLIANCE)
PLAN, FOR APPROVAL OF ITS AMENDED)
ENVIRONMENTAL COST RECOVERY)
SURCHARGE TARIFF, FOR CERTIFICATES)
OF PUBLIC CONVENIENCE AND)
NECESSITY, AND FOR AUTHORITY TO)
ESTABLISH A REGULATORY ACCOUNT)

CASE NO. 2012-00063

PUBLIC

DIRECT TESTIMONY

AND EXHIBITS

OF

STEPHEN J. BARON

ON BEHALF OF THE

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.

J. KENNEDY AND ASSOCIATES, INC.
ROSWELL, GEORGIA

July 2012

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

IN THE MATTER OF:

APPLICATION OF BIG RIVERS ELECTRIC)
CORPORATION FOR APPROVAL OF ITS)
2012 ENVIRONMENTAL COMPLIANCE)
PLAN, FOR APPROVAL OF ITS AMENDED)
ENVIRONMENTAL COST RECOVERY) CASE NO. 2012-00063
SURCHARGE TARIFF, FOR CERTIFICATES)
OF PUBLIC CONVENIENCE AND)
NECESSITY, AND FOR AUTHORITY TO)
ESTABLISH A REGULATORY ACCOUNT)

DIRECT TESTIMONY OF STEPHEN J. BARON

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I. QUALIFICATIONS AND SUMMARY

Q. Please state your name and business address.

A. My name is Stephen J. Baron. My business address is J. Kennedy and Associates, Inc. ("Kennedy and Associates"), 570 Colonial Park Drive, Suite 305, Roswell, Georgia 30075.

Q. What is your occupation and by whom are you employed?

A. I am the President and a Principal of Kennedy and Associates, a firm of utility rate, planning, and economic consultants in Atlanta, Georgia.

1 **Q. Please describe briefly the nature of the consulting services provided by**
2 **Kennedy and Associates.**

3 A. Kennedy and Associates provides consulting services in the electric and gas utility
4 industries. Our clients include state agencies and industrial electricity consumers.
5 The firm provides expertise in system planning, load forecasting, financial analysis,
6 cost-of-service, and rate design. Current clients include the Georgia and Louisiana
7 Public Service Commissions, and industrial consumer groups throughout the United
8 States.

9
10 **Q. Please state your educational background and experience.**

11 A. I graduated from the University of Florida in 1972 with a B.A. degree with high
12 honors in Political Science and significant coursework in Mathematics and
13 Computer Science. In 1974, I received a Master of Arts Degree in Economics, also
14 from the University of Florida.

15
16 I have more than thirty years of experience in the electric utility industry in the areas
17 of cost and rate analysis, forecasting, planning, and economic analysis.

18
19 I have presented testimony as an expert witness in Arizona, Arkansas, Colorado,
20 Connecticut, Florida, Georgia, Indiana, Kentucky, Louisiana, Maine, Michigan,
21 Minnesota, Maryland, Missouri, New Jersey, New Mexico, New York, North
22 Carolina, Ohio, Pennsylvania, Texas, Utah, Virginia, West Virginia, Wisconsin,

1 Wyoming, the Federal Energy Regulatory Commission and in United States
2 Bankruptcy Court.

3

4 A complete copy of my resume and my testimony appearances is contained in Baron
5 Exhibit__(SJB-1).

6

7 **Q. Have you previously presented testimony before the Kentucky Public Service**
8 **Commission?**

9 A. Yes. I have testified before the Kentucky Public Service Commission in eighteen
10 cases over the past thirty years, including Big Rivers Electric Corporation (“Big
11 Rivers” or “the Company”).

12

13 **Q. On whose behalf are you testifying in this proceeding?**

14 A. I am testifying on behalf of Kentucky Industrial Utility Customers, Inc. (“KIUC”), a
15 group of large industrial and Smelter customers of Big Rivers Electric Corporation,
16 (“Big Rivers” or the “Company”). These customers are Alcan Primary Products
17 Corporation, Century Aluminum of Kentucky, General Partnership, Domtar Paper
18 Co., LLC and Kimberly-Clark Corporation.

19

20 **Q. What is the purpose of your testimony?**

21 A. I am responding to the Company’s proposed Environmental Cost Recovery (“ECR”)
22 surcharge rate design methodology that results in a uniform percentage charge for

1 each rate schedule and individual customer, based on “total adjusted revenues.” The
2 Company’s proposed rate recovery methodology (discussed in the testimony of Big
3 Rivers’ witness John Wolfram), assigns environmental costs to Rural, Large
4 Industrial and Smelter rate classes on the basis of total revenues (adjusted to remove
5 surcharges and credits), including fuel (FAC and fuel in base rates) expenses. While
6 the Big Rivers’ allocation methodology is an improvement over the current kWh
7 allocation methodology, the inclusion of fuel (FAC and fuel in base rates) in the
8 “allocator” is not appropriate since environmental expenditures are unrelated to the
9 market cost of coal and natural gas. As I will discuss, KIUC recommends that the
10 Environmental Surcharge (“ES”) tariff reflect a non-fuel base revenue allocator,
11 consistent with the methodology approved by the Commission for Louisville Gas
12 and Electric Company (“LGE”) and Kentucky Utilities Company (“KU”).
13 However, in recognition of the impact of the KIUC proposal on Rural customers,
14 KIUC recommends that the non-fuel base revenue allocator only be in effect until
15 the depletion of the Member Rate Stability Mechanism (“MRSM”) and the Rural
16 Economic Reserve (“RER”) funds. Upon depletion of the mitigation of the
17 environmental surcharge for Rural customers, KIUC recommends that the ES tariff
18 revert to the “total adjusted revenue” allocation methodology proposed by Big
19 Rivers in this case.

20
21 **Q. Would you please summarize your testimony?**

22 **A. Yes. I recommend and conclude the following:**

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- The Commission should modify Big Rivers’ proposed ECR rate recovery mechanism (Tariff ES) such that environmental revenue requirements are allocated first to off-system and the combined retail rate classes on the basis of Big Rivers’ proposed total adjusted revenue allocation methodology and then among the three Big Rivers’ retail rate classes (Rural, Large Industrial, Smelter) on the basis of non-fuel base revenues.
- In recognition of the impact of KIUC’s proposed non-fuel base revenue allocation method on Rural customers after the depletion of the Member Rate Stability Mechanism and Rural Economic Reserve balances, KIUC proposes that upon the depletion of these mitigation sources, the ES Tariff allocation methodology revert to Big Rivers’ proposed total adjusted revenue methodology.
- Based on KIUC’s proposal, Rural customers will not experience any bill impact from a non-fuel base revenue allocation during the period in which the MRSM and RER provide mitigation and will pay the same ES charges as proposed by Big Rivers’ upon the depletion of the MRSM and RER balances. KIUC estimates that the MRSM and RER balances will be depleted in 2017, versus 2018 under Big Rivers’ proposed allocation of environmental costs.
- KIUC’s proposed environmental cost allocation methodology should be adopted by the Commission regardless of whether the Commission approves the “Build Case,” the “Partial Build Case”, the “Buy Case” or any other compliance plan approved in this case.

1 allocates fixed and variable environmental costs on rate schedule revenues that
2 include fuel (FAC and fuel in base rates) that are unrelated to these environmental
3 costs. In particular, high load factor Smelter and Large Industrial customers will be
4 assigned millions of dollars of environmental costs based, in part, on the level of fuel
5 prices.

6
7 Big Rivers' proposed allocation factor includes each rate class's base fuel revenues,
8 FAC revenues and Non-FAC PPA revenues. These fuel and FAC revenues are
9 determined by both the level of fuel prices and market energy prices, as well as a
10 class's mWh energy use. Effectively, base fuel revenues and FAC revenues
11 revenues can be thought of as a fuel price weighted mWh allocator; the higher the
12 level of fuel prices (i.e., natural gas prices, coal prices), the larger the mWh energy
13 weighting will be in the Big Rivers' allocator.

14

15 **Q. Has the Commission approved a non-fuel base revenue allocation methodology**
16 **for other Kentucky utilities?**

17 A. Yes. The Commission approved an Environmental Cost Recovery mechanism that
18 allocates environmental revenue requirements among non-residential rate classes
19 using a non-fuel base revenue allocator for both Louisville Gas and Electric
20 Company and Kentucky Utilities (Case Numbers 2011-00161, 2011-00162).

21

1 **Q. You indicated that you supported Big Rivers’ proposed allocation**
2 **methodology, but only in part. Would you please explain your qualified**
3 **support, given your general objection to a total revenue allocation method?**

4 A. While I will recommend that the ES tariff incorporate a non-fuel base revenue
5 allocation methodology for the reasons previously discussed, I recognize that this
6 will result in a higher allocation of environmental costs to Rural customers once the
7 Member Rate Stability Mechanism and Rural Economic Reserve funds are depleted.
8 As such, KIUC proposes that the non-fuel base revenue ES allocation method revert
9 to Big Rivers’ proposed total adjusted revenue methodology after the depletion of
10 the MRSM and RER funds. In this manner, Rural customers will not experience any
11 increased cost associated with the KIUC proposed allocation method after the
12 MRSM and RER funds are fully depleted because, at that point, the ES cost
13 allocation will revert to Big Rivers’ proposal in this case.

14
15 **Q. Will the MRSM and RER funds be depleted earlier under the KIUC proposal**
16 **than under Big Rivers’ proposed ES cost allocation?**

17 A. Yes. Due to the higher ES cost allocation to the Rural rate class, these mitigation
18 funds will be depleted approximately 1 year earlier under the KIUC proposal than
19 under the Big Rivers’ cost allocation proposal. Using Big Rivers’ “Build Case”
20 financial forecast model, the KIUC cost allocation methodology would deplete the
21 MRSM and RER funds in 2017, versus 2018 under the Company’s cost allocation
22 methodology. Thus, Rural customers would only experience a bill impact under the

1 KIUC proposal for some portions of 2017 and 2018. Prior to the depletion of the
2 MRSM and RER funds sometime in 2017, there would be no impact on Rural
3 customers; after 2018, there would also be no impact on Rural customers (compared
4 to the Big Rivers' proposal).

5

6 **Q. Have you developed an analysis that estimates the impact of the KIUC**
7 **proposed environmental cost allocation methodology?**

8 A. Yes. Baron Exhibit __ (SJB-2) provides an estimate for the year 2016 of the allocated
9 environmental costs using a non-fuel base revenue allocation methodology. This is
10 the first full year of environmental revenue requirements under the Company's
11 proposed "Build Case" 2012 plan. It should be noted that this exhibit relies on
12 projections that Big Rivers' has classified as Confidential in this case and thus
13 should be considered "Confidential" as well.

14

15 **Q. Would you please explain your cost allocation analysis?**

16 A. Yes. The first step in the analysis is to develop non-fuel base revenues for the year
17 2016. In its response to KIUC 1-50, Big Rivers provided a breakdown of the
18 components of its "total adjusted revenues" by rate class. Using this data, I removed
19 1) FAC revenues and 2) Fuel revenues in Base Rates from Big Rivers' 2016 Rural,
20 Large Industrial and Smelter rate class "total adjusted revenues."

21

22 **Q. Did you also remove these fuel revenues from "market" revenues?**

1 A. No. KIUC is proposing a two-step cost allocation proposal that first (Step 1)
2 allocates environmental costs between off-system (“market”) and retail jurisdictions
3 on the same basis as proposed by Big Rivers, which is “total adjusted revenues.” In
4 Step 2, the remaining environmental costs are allocated to Big Rivers’ three retail
5 rate classes on the basis of non-fuel base revenues.

6
7 For the year 2016, Big Rivers’ total adjusted revenue allocator assigned 23.99% of
8 the total system environmental costs to the Rural class, 8.03% to the Large Industrial
9 class and 55.81% to the Smelters. Based on the information provided in response to
10 KUC 1-50, the corresponding allocation factors using a non-fuel base revenue
11 allocation method assigns 28.21% of the total system environmental costs to the
12 Rural class, 8.29% to the Large Industrial class and 51.32% to the Smelters. As I
13 indicated, the allocation to the off-system class is the same under the KIUC method
14 as proposed by Big Rivers. Exhibit__(SJB-2) provides a comparison of Big
15 Rivers’ proposed allocation to the KIUC proposed non-fuel base revenue allocation
16 for each rate class using the Company’s estimated 2016 environmental revenue
17 requirements. Baron Exhibit__(SJB-3) presents the percentage impact of the ES
18 cost allocation for 2016 on total rate class revenues. As one would expect, removing
19 fuel revenues from the ES allocation results in a lower assignment to the high load
20 factor Smelter rate class. However, as I discussed previously, the Rural class is not
21 affected by KIUC’s allocation proposal (relative to the Big Rivers’ proposal) until
22 2017 due to the mitigation provided by the MRSM and RER funds. Upon the

1 depletion of these balances, the allocation of ES costs would revert to Big Rivers’
2 proposed methodology, leaving the Rural class at the same rate level as proposed by
3 the Company.

4

5 **Q. Are there important economic development issues impacted by the Company’s**
6 **proposed ECR rate recovery method?**

7 A. Yes. As I showed in my Exhibit__(SJB-3), Big Rivers’ is requesting an ES increase
8 of 11.4% in 2016 under its “Build Case” proposal. This increase would be in
9 addition to any other revenue increases associated with fuel, purchased power or
10 other costs related to generation and transmission. While the KIUC proposal would
11 only reduce this large increase on the Smelters by 1%, it will mitigate the impact of
12 Big Rivers’ proposed environmental expenditures. Big Rivers’ proposed ES
13 surcharge recovery mechanism that recovers its proposed very large environmental
14 revenue requirement, in part, based on a customer’s fuel charges is particularly
15 detrimental to high load factor Smelter and large industrial manufacturing
16 customers. Big Rivers’ methodology contributes to a reduction in the cost-
17 effectiveness of high load factor Kentucky manufacturing facilities, relative to
18 national and international competitors. These manufacturing facilities provide
19 substantial employment in Kentucky. Higher electric rates impact the relative
20 competitiveness of these customers – if Kentucky manufacturing costs rise relative
21 to manufacturing costs in other states or internationally, Kentucky manufacturing is
22 placed at a competitive disadvantage. Many of Kentucky’s largest employers are

1 energy-intensive and located in Kentucky in large part because of low electric rates.
2 KIUC's proposal will help improve the competitiveness of the Kentucky economy.

3

4 **Q. KIUC is recommending that the Commission reject Big Rivers' proposed**
5 **"Build Case" 2012 environmental compliance plan in this case and adopt a**
6 **"Buy Case" plan. In the event that the Commission adopts KIUC's**
7 **recommendation to implement the "Buy Case" compliance plan, do you**
8 **continue to recommend that the Commission also adopt your cost allocation**
9 **proposal?**

10 A. Yes. KIUC's proposed environmental cost allocation methodology should be
11 adopted by the Commission in the event that the Commission approves the KIUC
12 recommended "Buy Case" environmental compliance plan, Big Rivers'
13 recommended "Build Case" plan or any other compliance plan approved in this
14 case. For the reasons that I have discussed, a non-fuel base revenue cost allocation
15 methodology is reasonable and will have only a small impact on Rural customers for
16 a portion of the years 2017 and 2018, after the depletion of the MRSM and RER
17 funds.

18

19 **Q. Does that complete your testimony?**

20 A. Yes.

AFFIDAVIT

STATE OF GEORGIA)

COUNTY OF FULTON)

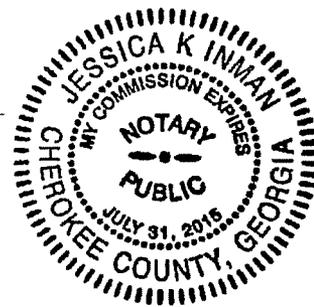
STEPHEN J. BARON, being duly sworn, deposes and states: that the attached is his sworn testimony and that the statements contained are true and correct to the best of his knowledge, information and belief.

Stephen J. Baron
Stephen J. Baron

Sworn to and subscribed before me on this
23rd day of July 2012.

Jessica K. Inman

Notary Public



COMMONWEALTH OF KENTUCKY

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SURCHARGE TARIFF, FOR CERTIFICATES)
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NECESSITY, AND FOR AUTHORITY TO)
ESTABLISH A REGULATORY ACCOUNT)**

CASE NO. 2012-00063

EXHIBITS

OF

STEPHEN J. BARON

ON BEHALF OF THE

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.

**J. KENNEDY AND ASSOCIATES, INC.
ROSWELL, GEORGIA**

July 2012

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

IN THE MATTER OF:

**APPLICATION OF BIG RIVERS ELECTRIC)
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CASE NO. 2012-00063

EXHIBIT __ (SJB-1)

OF

STEPHEN J. BARON

ON BEHALF OF THE

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.

**J. KENNEDY AND ASSOCIATES, INC.
ROSWELL, GEORGIA**

July 2012

Professional Qualifications

Of

Stephen J. Baron

Mr. Baron graduated from the University of Florida in 1972 with a B.A. degree with high honors in Political Science and significant coursework in Mathematics and Computer Science. In 1974, he received a Master of Arts Degree in Economics, also from the University of Florida. His areas of specialization were econometrics, statistics, and public utility economics. His thesis concerned the development of an econometric model to forecast electricity sales in the State of Florida, for which he received a grant from the Public Utility Research Center of the University of Florida. In addition, he has advanced study and coursework in time series analysis and dynamic model building.

Mr. Baron has more than thirty years of experience in the electric utility industry in the areas of cost and rate analysis, forecasting, planning, and economic analysis.

Following the completion of my graduate work in economics, he joined the staff of the Florida Public Service Commission in August of 1974 as a Rate Economist. His responsibilities included the analysis of rate cases for electric, telephone, and gas utilities, as well as the preparation of cross-examination material and the preparation of staff recommendations.

In December 1975, he joined the Utility Rate Consulting Division of Ebasco Services, Inc.

J. KENNEDY AND ASSOCIATES, INC.

as an Associate Consultant. In the seven years he worked for Ebasco, he received successive promotions, ultimately to the position of Vice President of Energy Management Services of Ebasco Business Consulting Company. His responsibilities included the management of a staff of consultants engaged in providing services in the areas of econometric modeling, load and energy forecasting, production cost modeling, planning, cost-of-service analysis, cogeneration, and load management.

He joined the public accounting firm of Coopers & Lybrand in 1982 as a Manager of the Atlanta Office of the Utility Regulatory and Advisory Services Group. In this capacity he was responsible for the operation and management of the Atlanta office. His duties included the technical and administrative supervision of the staff, budgeting, recruiting, and marketing as well as project management on client engagements. At Coopers & Lybrand, he specialized in utility cost analysis, forecasting, load analysis, economic analysis, and planning.

In January 1984, he joined the consulting firm of Kennedy and Associates as a Vice President and Principal. Mr. Baron became President of the firm in January 1991.

During the course of his career, he has provided consulting services to more than thirty utility, industrial, and Public Service Commission clients, including three international utility clients.

J. KENNEDY AND ASSOCIATES, INC.

He has presented numerous papers and published an article entitled "How to Rate Load Management Programs" in the March 1979 edition of "Electrical World." His article on "Standby Electric Rates" was published in the November 8, 1984 issue of "Public Utilities Fortnightly." In February of 1984, he completed a detailed analysis entitled "Load Data Transfer Techniques" on behalf of the Electric Power Research Institute, which published the study.

Mr. Baron has presented testimony as an expert witness in Arizona, Arkansas, Colorado, Connecticut, Florida, Georgia, Indiana, Kentucky, Louisiana, Maine, Michigan, Minnesota, Maryland, Missouri, New Jersey, New Mexico, New York, North Carolina, Ohio, Pennsylvania, Texas, Utah, Virginia, West Virginia, Wisconsin, Wyoming, the Federal Energy Regulatory Commission and in United States Bankruptcy Court. A list of his specific regulatory appearances follows.

**Expert Testimony Appearances
of
Stephen J. Baron
As of July 2012**

Date	Case	Jurisdct.	Party	Utility	Subject
4/81	203(B)	KY	Louisville Gas & Electric Co.	Louisville Gas & Electric Co.	Cost-of-service.
4/81	ER-81-42	MO	Kansas City Power & Light Co.	Kansas City Power & Light Co.	Forecasting
6/81	U-1933	AZ	Arizona Corporation Commission	Tucson Electric Co.	Forecasting planning.
2/84	8924	KY	Airco Carbide	Louisville Gas & Electric Co.	Revenue requirements, cost-of-service, forecasting, weather normalization
3/84	84-038-U	AR	Arkansas Electric Energy Consumers	Arkansas Power & Light Co.	Excess capacity, cost-of-service, rate design.
5/84	830470-EI	FL	Florida Industrial Power Users' Group	Florida Power Corp.	Allocation of fixed costs, load and capacity balance, and reserve margin. Diversification of utility.
10/84	84-199-U	AR	Arkansas Electric Energy Consumers	Arkansas Power and Light Co.	Cost allocation and rate design.
11/84	R-842651	PA	Lehigh Valley Power Committee	Pennsylvania Power & Light Co.	Interruptible rates, excess capacity, and phase-in.
1/85	85-65	ME	Airco Industrial Gases	Central Maine Power Co.	Interruptible rate design.
2/85	I-840381	PA	Philadelphia Area Industrial Energy Users' Group	Philadelphia Electric Co.	Load and energy forecast.
3/85	9243	KY	Alcan Aluminum Corp., et al.	Louisville Gas & Electric Co.	Economics of completing fossil generating unit.
3/85	3498-U	GA	Attorney General	Georgia Power Co.	Load and energy forecasting, generation planning economics.
3/85	R-842632	PA	West Penn Power Industrial Intervenors	West Penn Power Co.	Generation planning economics, prudence of a pumped storage hydro unit.
5/85	84-249	AR	Arkansas Electric Energy Consumers	Arkansas Power & Light Co.	Cost-of-service, rate design return multipliers.
5/85		City of Santa Clara	Chamber of Commerce	Santa Clara Municipal	Cost-of-service, rate design.

J. KENNEDY AND ASSOCIATES, INC.

**Expert Testimony Appearances
of
Stephen J. Baron
As of July 2012**

Date	Case	Jurisdct.	Party	Utility	Subject
6/85	84-768- E-42T	WV	West Virginia Industrial Intervenors	Monongahela Power Co.	Generation planning economics, prudence of a pumped storage hydro unit.
6/85	E-7 Sub 391	NC	Carolina Industrials (CIGFUR III)	Duke Power Co.	Cost-of-service, rate design, interruptible rate design.
7/85	29046	NY	Industrial Energy Users Association	Orange and Rockland Utilities	Cost-of-service, rate design.
10/85	85-043-U	AR	Arkansas Gas Consumers	Arkla, Inc	Regulatory policy, gas cost-of- service, rate design.
10/85	85-63	ME	Airco Industrial Gases	Central Maine Power Co.	Feasibility of interruptible rates, avoided cost.
2/85	ER- 8507698	NJ	Air Products and Chemicals	Jersey Central Power & Light Co.	Rate design.
3/85	R-850220	PA	West Penn Power Industrial Intervenors	West Penn Power Co.	Optimal reserve, prudence, off-system sales guarantee plan.
2/86	R-850220	PA	West Penn Power Industrial Intervenors	West Penn Power Co.	Optimal reserve margins, prudence, off-system sales guarantee plan.
3/86	85-299U	AR	Arkansas Electric Energy Consumers	Arkansas Power & Light Co.	Cost-of-service, rate design, revenue distribution.
3/86	85-726- EL-AIR	OH	Industrial Electric Consumers Group	Ohio Power Co.	Cost-of-service, rate design, interruptible rates.
5/86	86-081- E-GI	WV	West Virginia Energy Users Group	Monongahela Power Co.	Generation planning economics, prudence of a pumped storage hydro unit.
8/86	E-7 Sub 408	NC	Carolina Industrial Energy Consumers	Duke Power Co.	Cost-of-service, rate design, interruptible rates.
10/86	U-17378	LA	Louisiana Public Service Commission Staff	Gulf States Utilities	Excess capacity, economic analysis of purchased power.
12/86	38063	IN	Industrial Energy Consumers	Indiana & Michigan Power Co.	Interruptible rates.

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Date	Case	Jurisdic.	Party	Utility	Subject
3/87	EL-86-53-001 EL-86-57-001	Federal Energy Regulatory Commission (FERC)	Louisiana Public Service Commission Staff	Gulf States Utilities, Southern Co.	Cost/benefit analysis of unit power sales contract.
4/87	U-17282	LA	Louisiana Public Service Commission Staff	Gulf States Utilities	Load forecasting and imprudence damages, River Bend Nuclear unit
5/87	87-023-E-C	WV	Airco Industrial Gases	Monongahela Power Co.	Interruptible rates.
5/87	87-072-E-G1	WV	West Virginia Energy Users' Group	Monongahela Power Co.	Analyze Mon Power's fuel filing and examine the reasonableness of MP's claims.
5/87	86-524-E-SC	WV	West Virginia Energy Users' Group	Monongahela Power Co.	Economic dispatching of pumped storage hydro unit
5/87	9781	KY	Kentucky Industrial Energy Consumers	Louisville Gas & Electric Co.	Analysis of impact of 1986 Tax Reform Act.
6/87	3673-U	GA	Georgia Public Service Commission	Georgia Power Co.	Economic prudence, evaluation of Vogtle nuclear unit - load forecasting, planning
6/87	U-17282	LA	Louisiana Public Service Commission Staff	Gulf States Utilities	Phase-in plan for River Bend Nuclear unit.
7/87	85-10-22	CT	Connecticut Industrial Energy Consumers	Connecticut Light & Power Co.	Methodology for refunding rate moderation fund
8/87	3673-U	GA	Georgia Public Service Commission	Georgia Power Co.	Test year sales and revenue forecast.
9/87	R-850220	PA	West Penn Power Industrial Intervenors	West Penn Power Co.	Excess capacity, reliability of generating system
10/87	R-870651	PA	Duquesne Industrial Intervenors	Duquesne Light Co.	Interruptible rate, cost-of-service, revenue allocation, rate design.
10/87	I-860025	PA	Pennsylvania Industrial Intervenors		Proposed rules for cogeneration, avoided cost, rate recovery.
10/87	E-015/	MN	Taconite	Minnesota Power	Excess capacity, power and

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Date	Case	Jurisdct.	Party	Utility	Subject
	GR-87-223		Intervenors	& Light Co.	cost-of-service, rate design.
10/87	8702-EI	FL	Occidental Chemical Corp.	Florida Power Corp.	Revenue forecasting, weather normalization.
12/87	87-07-01	CT	Connecticut Industrial Energy Consumers	Connecticut Light Power Co.	Excess capacity, nuclear plant phase-in.
3/88	10064	KY	Kentucky Industrial Energy Consumers	Louisville Gas & Electric Co.	Revenue forecast, weather normalization rate treatment of cancelled plant
3/88	87-183-TF	AR	Arkansas Electric Consumers	Arkansas Power & Light Co.	Standby/backup electric rates.
5/88	870171C001	PA	GPU Industrial Intervenors	Metropolitan Edison Co.	Cogeneration deferral mechanism, modification of energy cost recovery (ECR).
6/88	870172C005	PA	GPU Industrial Intervenors	Pennsylvania Electric Co.	Cogeneration deferral mechanism, modification of energy cost recovery (ECR).
7/88	88-171-EL-AIR 88-170-EL-AIR Interim Rate Case	OH	Industrial Energy Consumers	Cleveland Electric/ Toledo Edison	Financial analysis/need for interim rate relief
7/88	Appeal of PSC	19th Judicial Docket U-17282	Louisiana Public Service Commission Circuit Court of Louisiana	Gulf States Utilities	Load forecasting, imprudence damages.
11/88	R-880989	PA	United States Steel	Carnegie Gas	Gas cost-of-service, rate design.
11/88	88-171-EL-AIR 88-170-EL-AIR	OH	Industrial Energy Consumers	Cleveland Electric/ Toledo Edison. General Rate Case.	Weather normalization of peak loads, excess capacity, regulatory policy.
3/89	870216/283 284/286	PA	Armco Advanced Materials Corp., Allegheny Ludlum Corp.	West Penn Power Co.	Calculated avoided capacity, recovery of capacity payments
8/89	8555	TX	Occidental Chemical Corp.	Houston Lighting & Power Co.	Cost-of-service, rate design.

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8/89	3840-U	GA	Georgia Public Service Commission	Georgia Power Co.	Revenue forecasting, weather normalization.
9/89	2087	NM	Attorney General of New Mexico	Public Service Co. of New Mexico	Prudence - Palo Verde Nuclear Units 1, 2 and 3, load forecasting.
10/89	2262	NM	New Mexico Industrial Energy Consumers	Public Service Co. of New Mexico	Fuel adjustment clause, off-system sales, cost-of-service, rate design, marginal cost.
11/89	38728	IN	Industrial Consumers for Fair Utility Rates	Indiana Michigan Power Co.	Excess capacity, capacity equalization, jurisdictional cost allocation, rate design, interruptible rates.
1/90	U-17282	LA	Louisiana Public Service Commission Staff	Gulf States Utilities	Jurisdictional cost allocation, O&M expense analysis.
5/90	890366	PA	GPU Industrial Intervenors	Metropolitan Edison Co.	Non-utility generator cost recovery.
6/90	R-901609	PA	Armco Advanced Materials Corp., Allegheny Ludlum Corp	West Penn Power Co.	Allocation of QF demand charges in the fuel cost, cost-of-service, rate design.
9/90	8278	MD	Maryland Industrial Group	Baltimore Gas & Electric Co.	Cost-of-service, rate design, revenue allocation.
12/90	U-9346 Rebuttal	MI	Association of Businesses Advocating Tariff Equity	Consumers Power Co.	Demand-side management, environmental externalities.
12/90	U-17282 Phase IV	LA	Louisiana Public Service Commission Staff	Gulf States Utilities	Revenue requirements, jurisdictional allocation.
12/90	90-205	ME	Airco Industrial Gases	Central Maine Power Co.	Investigation into interruptible service and rates.
1/91	90-12-03 Interim	CT	Connecticut Industrial Energy Consumers	Connecticut Light & Power Co.	Interim rate relief, financial analysis, class revenue allocation.
5/91	90-12-03 Phase II	CT	Connecticut Industrial Energy Consumers	Connecticut Light & Power Co.	Revenue requirements, cost-of-service, rate design, demand-side management.

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Date	Case	Jurisdct.	Party	Utility	Subject
8/91	E-7, SUB SUB 487	NC	North Carolina Industrial Energy Consumers	Duke Power Co.	Revenue requirements, cost allocation, rate design, demand- side management.
8/91	8341 Phase I	MD	Westvaco Corp.	Potomac Edison Co.	Cost allocation, rate design, 1990 Clean Air Act Amendments.
8/91	91-372 EL-UNC	OH	Armco Steel Co., L.P.	Cincinnati Gas & Electric Co	Economic analysis of cogeneration, avoid cost rate.
9/91	P-910511 P-910512	PA	Allegheny Ludlum Corp., Armco Advanced Materials Co., The West Penn Power Industrial Users' Group	West Penn Power Co.	Economic analysis of proposed CWIP Rider for 1990 Clean Air Act Amendments expenditures.
9/91	91-231 -E-NC	WV	West Virginia Energy Users' Group	Monongahela Power Co.	Economic analysis of proposed CWIP Rider for 1990 Clean Air Act Amendments expenditures.
10/91	8341 - Phase II	MD	Westvaco Corp.	Potomac Edison Co	Economic analysis of proposed CWIP Rider for 1990 Clean Air Act Amendments expenditures.
10/91	U-17282	LA	Louisiana Public Service Commission Staff	Gulf States Utilities	Results of comprehensive management audit.
Note: No testimony was prefiled on this.					
11/91	U-17949 Subdocket A	LA	Louisiana Public Service Commission Staff	South Central Bell Telephone Co. and proposed merger with Southern Bell Telephone Co	Analysis of South Central Bell's restructuring and
12/91	91-410- EL-AIR	OH	Armco Steel Co., Air Products & Chemicals, Inc	Cincinnati Gas & Electric Co	Rate design, interruptible rates.
12/91	P-880286	PA	Armco Advanced Materials Corp., Allegheny Ludlum Corp.	West Penn Power Co.	Evaluation of appropriate avoided capacity costs - QF projects
1/92	C-913424	PA	Duquesne Interruptible Complainants	Duquesne Light Co.	Industrial interruptible rate.
6/92	92-02-19	CT	Connecticut Industrial Energy Consumers	Yankee Gas Co.	Rate design

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8/92	2437	NM	New Mexico Industrial Intervenors	Public Service Co of New Mexico	Cost-of-service
8/92	R-00922314	PA	GPU Industrial Intervenors	Metropolitan Edison Co.	Cost-of-service, rate design, energy cost rate.
9/92	39314	ID	Industrial Consumers for Fair Utility Rates	Indiana Michigan Power Co.	Cost-of-service, rate design, energy cost rate, rate treatment.
10/92	M-00920312 C-007	PA	The GPU Industrial Intervenors	Pennsylvania Electric Co.	Cost-of-service, rate design, energy cost rate, rate treatment
12/92	U-17949	LA	Louisiana Public Service Commission Staff	South Central Bell Co.	Management audit
12/92	R-00922378	PA	Armco Advanced Materials Co. The WPP Industrial Intervenors	West Penn Power Co	Cost-of-service, rate design, energy cost rate, SO ₂ allowance rate treatment
1/93	8487	MD	The Maryland Industrial Group	Baltimore Gas & Electric Co.	Electric cost-of-service and rate design, gas rate design (flexible rates)
2/93	E002/GR-92-1185	MN	North Star Steel Co. Praxair, Inc.	Northern States Power Co.	Interruptible rates.
4/93	EC92 21000 ER92-806-000 (Rebuttal)	Federal Energy Regulatory Commission	Louisiana Public Service Commission Staff	Gulf States Utilities/Entergy agreement	Merger of GSU into Entergy System, impact on system
7/93	93-0114-E-C	WV	Airco Gases	Monongahela Power Co.	Interruptible rates.
8/93	930759-EG	FL	Florida Industrial Power Users' Group	Generic - Electric Utilities	Cost recovery and allocation of DSM costs
9/93	M-009 30406	PA	Lehigh Valley Power Committee	Pennsylvania Power & Light Co.	Ratemaking treatment of off-system sales revenues
11/93	346	KY	Kentucky Industrial Utility Customers	Generic - Gas Utilities	Allocation of gas pipeline transition costs - FERC Order 636
12/93	U-17735	LA	Louisiana Public Service Commission Staff	Cajun Electric Power Cooperative	Nuclear plant prudence, forecasting, excess capacity

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4/94	E-015/ GR-94-001	MN	Large Power Intervenors	Minnesota Power Co.	Cost allocation, rate design, rate phase-in plan.
5/94	U-20178	LA	Louisiana Public Service Commission	Louisiana Power & Light Co.	Analysis of least cost integrated resource plan and demand-side management program.
7/94	R-00942986	PA	Armco, Inc.; West Penn Power Industrial Intervenors	West Penn Power Co.	Cost-of-service, allocation of rate increase, rate design, emission allowance sales, and operations and maintenance expense.
7/94	94-0035- E-42T	WV	West Virginia Energy Users Group	Monongahela Power Co.	Cost-of-service, allocation of rate increase, and rate design.
8/94	EC94 13-000	Federal Energy Regulatory Commission	Louisiana Public Service Commission	Gulf States Utilities/Entergy	Analysis of extended reserve shutdown units and violation of system agreement by Entergy.
9/94	R-00943 081 R-00943 081C0001	PA	Lehigh Valley Power Committee	Pennsylvania Public Utility Commission	Analysis of interruptible rate terms and conditions, availability.
9/94	U-17735	LA	Louisiana Public Service Commission	Cajun Electric Power Cooperative	Evaluation of appropriate avoided cost rate.
9/94	U-19904	LA	Louisiana Public Service Commission	Gulf States Utilities	Revenue requirements.
10/94	5258-U	GA	Georgia Public Service Commission	Southern Bell Telephone & Telegraph Co.	Proposals to address competition in telecommunication markets
11/94	EC94-7-000 ER94-898-000	FERC	Louisiana Public Service Commission	El Paso Electric and Central and Southwest	Merger economics, transmission equalization hold harmless proposals.
2/95	941-430EG	CO	CF&I Steel, L.P.	Public Service Company of Colorado	Interruptible rates, cost-of-service.
4/95	R-00943271	PA	PP&L Industrial Customer Alliance	Pennsylvania Power & Light Co.	Cost-of-service, allocation of rate increase, rate design, interruptible rates.
6/95	C-00913424 C-00946104	PA	Duquesne Interruptible Complainants	Duquesne Light Co.	Interruptible rates.

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Date	Case	Jurisdct.	Party	Utility	Subject
8/95	ER95-112 -000	FERC	Louisiana Public Service Commission	Entergy Services, Inc	Open Access Transmission Tariffs - Wholesale.
10/95	U-21485	LA	Louisiana Public Service Commission	Gulf States Utilities Company	Nuclear decommissioning, revenue requirements, capital structure.
10/95	ER95-1042 -000	FERC	Louisiana Public Service Commission	System Energy Resources, Inc.	Nuclear decommissioning, revenue requirements
10/95	U-21485	LA	Louisiana Public Service Commission	Gulf States Utilities Co.	Nuclear decommissioning and cost of debt capital, capital structure.
11/95	I-940032	PA	Industrial Energy Consumers of Pennsylvania	State-wide - all utilities	Retail competition issues.
7/96	U-21496	LA	Louisiana Public Service Commission	Central Louisiana Electric Co.	Revenue requirement analysis.
7/96	8725	MD	Maryland Industrial Group	Baltimore Gas & Elec. Co., Potomac Elec. Power Co., Constellation Energy Co	Ratemaking issues associated with a Merger.
8/96	U-17735	LA	Louisiana Public Service Commission	Cajun Electric Power Cooperative	Revenue requirements.
9/96	U-22092	LA	Louisiana Public Service Commission	Entergy Gulf States, Inc.	Decommissioning, weather normalization, capital structure.
2/97	R-973877	PA	Philadelphia Area Industrial Energy Users Group	PECO Energy Co.	Competitive restructuring policy issues, stranded cost, transition charges.
6/97	Civil Action No. 94-11474	US Bank- ruptcy Court Middle District of Louisiana	Louisiana Public Service Commission	Cajun Electric Power Cooperative	Confirmation of reorganization plan; analysis of rate paths produced by competing plans.
6/97	R-973953	PA	Philadelphia Area Industrial Energy Users Group	PECO Energy Co.	Retail competition issues, rate unbundling, stranded cost analysis.
6/97	8738	MD	Maryland Industrial Group	Generic	Retail competition issues

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7/97	R-973954	PA	PP&L Industrial Customer Alliance	Pennsylvania Power & Light Co	Retail competition issues, rate unbundling, stranded cost analysis.
10/97	97-204	KY	Alcan Aluminum Corp. Southwire Co	Big River Electric Corp.	Analysis of cost of service issues - Big Rivers Restructuring Plan
10/97	R-974008	PA	Metropolitan Edison Industrial Users	Metropolitan Edison Co.	Retail competition issues, rate unbundling, stranded cost analysis
10/97	R-974009	PA	Pennsylvania Electric Industrial Customer	Pennsylvania Electric Co.	Retail competition issues, rate unbundling, stranded cost analysis.
11/97	U-22491	LA	Louisiana Public Service Commission	Entergy Gulf States, Inc.	Decommissioning, weather normalization, capital structure.
11/97	P-971265	PA	Philadelphia Area Industrial Energy Users Group	Enron Energy Services Power, Inc./ PECO Energy	Analysis of Retail Restructuring Proposal.
12/97	R-973981	PA	West Penn Power Industrial Intervenors	West Penn Power Co	Retail competition issues, rate unbundling, stranded cost analysis.
12/97	R-974104	PA	Duquesne Industrial Intervenors	Duquesne Light Co.	Retail competition issues, rate unbundling, stranded cost analysis.
3/98 (Allocated Stranded Cost Issues)	U-22092	LA	Louisiana Public Service Commission	Gulf States Utilities Co.	Retail competition, stranded cost quantification.
3/98	U-22092		Louisiana Public Service Commission	Gulf States Utilities, Inc.	Stranded cost quantification, restructuring issues.
9/98	U-17735		Louisiana Public Service Commission	Cajun Electric Power Cooperative, Inc	Revenue requirements analysis, weather normalization.
12/98	8794	MD	Maryland Industrial Group and Millennium Inorganic Chemicals Inc	Baltimore Gas and Electric Co	Electric utility restructuring, stranded cost recovery, rate unbundling.
12/98	U-23358	LA	Louisiana Public Service Commission	Entergy Gulf States, Inc.	Nuclear decommissioning, weather normalization, Entergy System Agreement.
5/99 (Cross- 40-000 Answering Testimony)	EC-98-	FERC	Louisiana Public Service Commission	American Electric Power Co. & Central South West Corp	Merger issues related to market power mitigation proposals.

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Date	Case	Jurisdic.	Party	Utility	Subject
5/99 (Response Testimony)	98-426	KY	Kentucky Industrial Utility Customers, Inc	Louisville Gas & Electric Co.	Performance based regulation, settlement proposal issues, cross-subsidies between electric gas services.
6/99	98-0452	WV	West Virginia Energy Users Group	Appalachian Power, Monongahela Power, & Potomac Edison Companies	Electric utility restructuring, stranded cost recovery, rate unbundling
7/99	99-03-35	CT	Connecticut Industrial Energy Consumers	United Illuminating Company	Electric utility restructuring, stranded cost recovery, rate unbundling.
7/99	Adversary Proceeding No. 98-1065	U.S. Bankruptcy Court	Louisiana Public Service Commission	Cajun Electric Power Cooperative	Motion to dissolve preliminary injunction.
7/99	99-03-06	CT	Connecticut Industrial Energy Consumers	Connecticut Light & Power Co	Electric utility restructuring, stranded cost recovery, rate unbundling
10/99	U-24182	LA	Louisiana Public Service Commission	Entergy Gulf States, Inc.	Nuclear decommissioning, weather normalization, Entergy System Agreement.
12/99	U-17735	LA	Louisiana Public Service Commission	Cajun Electric Power Cooperative, Inc.	Ananlysi of Proposed Contract Rates, Market Rates.
03/00	U-17735	LA	Louisiana Public Service Commission	Cajun Electric Power Cooperative, Inc.	Evaluation of Cooperative Power Contract Elections
03/00	99-1658- EL-ETP	OH	AK Steel Corporation	Cincinnati Gas & Electric Co.	Electric utility restructuring, stranded cost recovery, rate Unbundling

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08/00	98-0452 E-GI	WVA	West Virginia Energy Users Group	Appalachian Power Co American Electric Co.	Electric utility restructuring rate unbundling.
08/00	00-1050 E-T 00-1051-E-T	WVA	West Virginia Energy Users Group	Mon Power Co. Potomac Edison Co.	Electric utility restructuring rate unbundling.
10/00	SOAH 473- 00-1020 PUC 2234	TX	The Dallas-Fort Worth Hospital Council and The Coalition of Independent Colleges And Universities	TXU, Inc.	Electric utility restructuring rate unbundling.
12/00	U-24993	LA	Louisiana Public Service Commission	Entergy Gulf States, Inc.	Nuclear decommissioning, revenue requirements
12/00	EL00-66- 000 & ER00-2854 EL95-33-002	LA	Louisiana Public Service Commission	Entergy Services Inc.	Inter-Company System Agreement: Modifications for retail competition, interruptible load.
04/01	U-21453, U-20925, U-22092 (Subdocket B) Addressing Contested Issues	LA	Louisiana Public Service Commission	Entergy Gulf States, Inc	Jurisdictional Business Separation - Texas Restructuring Plan
10/01	14000-U	GA	Georgia Public Service Commission Adversary Staff	Georgia Power Co.	Test year revenue forecast
11/01	U-25687	LA	Louisiana Public Service Commission	Entergy Gulf States, Inc	Nuclear decommissioning requirements transmission revenues
11/01	U-25965	LA	Louisiana Public Service Commission	Generic	Independent Transmission Company ("Transco"). RTO rate design.
03/02	001148-EI	FL	South Florida Hospital and Healthcare Assoc.	Florida Power & Light Company	Retail cost of service, rate design, resource planning and demand side management.
06/02	U-25965	LA	Louisiana Public Service Commission	Entergy Gulf States Entergy Louisiana	RTO Issues
07/02	U-21453	LA	Louisiana Public Service Commission	SWEPCO, AEP	Jurisdictional Business Sep. - Texas Restructuring Plan.

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08/02	U-25888	LA	Louisiana Public Service Commission	Entergy Louisiana, Inc. Entergy Gulf States, Inc.	Modifications to the Inter-Company System Agreement, Production Cost Equalization.
08/02	EL01-88-000	FERC	Louisiana Public Service Commission	Entergy Services Inc. and the Entergy Operating Companies	Modifications to the Inter-Company System Agreement, Production Cost Equalization.
11/02	02S-315EG	CO	CF&I Steel & Climax Molybdenum Co.	Public Service Co. of Colorado	Fuel Adjustment Clause
01/03	U-17735	LA	Louisiana Public Service Commission	Louisiana Coops	Contract Issues
02/03	02S-594E	CO	Cripple Creek and Victor Gold Mining Co.	Aquila, Inc.	Revenue requirements, purchased power.
04/03	U-26527	LA	Louisiana Public Service Commission	Entergy Gulf States, Inc.	Weather normalization, power purchase expenses, System Agreement expenses.
11/03	ER03-753-000	FERC	Louisiana Public Service Commission Staff	Entergy Services, Inc. and the Entergy Operating Companies	Proposed modifications to System Agreement Tariff MSS-4.
11/03	ER03-583-000 ER03-583-001 ER03-583-002 ER03-681-000, ER03-681-001 ER03-682-000, ER03-682-001 ER03-682-002	FERC	Louisiana Public Service Commission	Entergy Services, Inc., the Entergy Operating Companies, EWO Marketing, L P, and Entergy Power, Inc.	Evaluation of Wholesale Purchased Power Contracts
12/03	U-27136	LA	Louisiana Public Service Commission	Entergy Louisiana, Inc.	Evaluation of Wholesale Purchased Power Contracts
01/04	E-01345-03-0437	AZ	Kroger Company	Arizona Public Service Co.	Revenue allocation rate design.
02/04	00032071	PA	Duquesne Industrial Intervenors	Duquesne Light Company	Provider of last resort issues.
03/04	03A-436E	CO	CF&I Steel, LP and Climax Molybdenum	Public Service Company of Colorado	Purchased Power Adjustment Clause.

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04/04	2003-00433 2003-00434	KY	Kentucky Industrial Utility Customers, Inc	Louisville Gas & Electric Co. Kentucky Utilities Co	Cost of Service Rate Design
0-6/04	03S-539E	CO	Cripple Creek, Victor Gold Mining Co., Goodrich Corp., Holcim (U.S.), Inc., and The Trane Co.	Aquila, Inc	Cost of Service, Rate Design Interruptible Rates
06/04	R-00049255	PA	PP&L Industrial Customer Alliance PPLICA	PPL Electric Utilities Corp.	Cost of service, rate design, tariff issues and transmission service charge.
10/04	04S-164E	CO	CF&I Steel Company, Climax Mines	Public Service Company of Colorado	Cost of service, rate design, Interruptible Rates.
03/05	Case No 2004-00426 Case No 2004-00421	KY	Kentucky Industrial Utility Customers, Inc.	Kentucky Utilities Louisville Gas & Electric Co.	Environmental cost recovery.
06/05	050045-EI	FL	South Florida Hospital and Healthcare Assoc.	Florida Power & Light Company	Retail cost of service, rate design
07/05	U-28155	LA	Louisiana Public Service Commission Staff	Entergy Louisiana, Inc. Entergy Gulf States, Inc.	Independent Coordinator of Transmission – Cost/Benefit
09/05	Case Nos 05-0402-E-CN 05-0750-E-PC	WVA	West Virginia Energy Users Group	Mon Power Co Potomac Edison Co.	Environmental cost recovery, Securitization, Financing Order
01/06	2005-00341	KY	Kentucky Industrial Utility Customers, Inc.	Kentucky Power Company	Cost of service, rate design, transmission expenses. Congestion Cost Recovery Mechanism
03/06	U-22092	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc	Separation of EGSi into Texas and Louisiana Companies.
04/06	U-25116	LA	Louisiana Public Service Commission Staff	Entergy Louisiana, Inc	Transmission Prudence Investigation
06/06	R-00061346 C0001-0005	PA	Duquesne Industrial Intervenors & IECPA	Duquesne Light Co	Cost of Service, Rate Design, Transmission Service Charge, Tariff Issues
06/06	R-00061366 R-00061367 P-00062213 P-00062214		Met-Ed Industrial Energy Users Group and Penelec Industrial Customer Alliance	Metropolitan Edison Co. Pennsylvania Electric Co	Generation Rate Cap, Transmission Service Charge, Cost of Service, Rate Design, Tariff Issues
07/06	U-22092 Sub-J	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc	Separation of EGSi into Texas and Louisiana Companies.

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Date	Case	Jurisdct.	Party	Utility	Subject
07/06	Case No. 2006-00130 Case No. 2006-00129	KY	Kentucky Industrial Utility Customers, Inc.	Kentucky Utilities Louisville Gas & Electric Co.	Environmental cost recovery.
08/06	Case No. PUE-2006-00065	VA	Old Dominion Committee For Fair Utility Rates	Appalachian Power Co.	Cost Allocation, Allocation of Rev Incr, Off-System Sales margin rate treatment
09/06	E-01345A-05-0816	AZ	Kroger Company	Arizona Public Service Co.	Revenue allocation, cost of service, rate design.
11/06	Doc. No. 97-01-15RE02	CT	Connecticut Industrial Energy Consumers	Connecticut Light & Power United Illuminating	Rate unbundling issues
01/07	Case No. 06-0960-E-42T	WV	West Virginia Energy Users Group	Mon Power Co. Potomac Edison Co.	Retail Cost of Service Revenue apportionment
03/07	U-29764	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc. Entergy Louisiana, LLC	Implementation of FERC Decision Jurisdictional & Rate Class Allocation
05/07	Case No. 07-63-EL-UNC	OH	Ohio Energy Group	Ohio Power, Columbus Southern Power	Environmental Surcharge Rate Design
05/07	R-00049255 Remand	PA	PP&L Industrial Customer Alliance PPLICA	PPL Electric Utilities Corp.	Cost of service, rate design, tariff issues and transmission service charge.
06/07	R-00072155	PA	PP&L Industrial Customer Alliance PPLICA	PPL Electric Utilities Corp.	Cost of service, rate design, tariff issues.
07/07	Doc. No. 07F-037E	CO	Gateway Canyons LLC	Grand Valley Power Coop.	Distribution Line Cost Allocation
09/07	Doc. No. 05-UR-103	WI	Wisconsin Industrial Energy Group, Inc.	Wisconsin Electric Power Co.	Cost of Service, rate design, tariff Issues, Interruptible rates
11/07	ER07-682-000	FERC	Louisiana Public Service Commission Staff	Entergy Services, Inc. and the Entergy Operating Companies	Proposed modifications to System Agreement Schedule MSS-3 Cost functionalization issues.
1/08	Doc. No. 20000-277-ER-07	WY	Cimarex Energy Company	Rocky Mountain Power (PacifiCorp)	Vintage Pricing, Marginal Cost Pricing Projected Test Year
1/08	Case No. 07-551	OH	Ohio Energy Group	Ohio Edison, Toledo Edison Cleveland Electric Illuminating	Class Cost of Service, Rate Restructuring, Apportionment of Revenue Increase to Rate Schedules
2/08	ER07-956	FERC	Louisiana Public Service Commission Staff	Entergy Services, Inc. and the Entergy Operating Companies	Entergy's Compliance Filing System Agreement Bandwidth Calculations.
2/08	Doc No. P-00072342	PA	West Penn Power Industrial Intervenors	West Penn Power Co.	Default Service Plan issues.

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Stephen J. Baron
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Date	Case	Jurisdct.	Party	Utility	Subject
3/08	Doc No. E-01933A-05-0650	AZ	Kroger Company	Tucson Electric Power Co.	Cost of Service, Rate Design
05/08	08-0278 E-GI	WV	West Virginia Energy Users Group	Appalachian Power Co. American Electric Power Co.	Expanded Net Energy Cost "ENEC" Analysis.
6/08	Case No. 08-124-EL-ATA	OH	Ohio Energy Group	Ohio Edison, Toledo Edison Cleveland Electric Illuminating	Recovery of Deferred Fuel Cost
7/08	Docket No. 07-035-93	UT	Kroger Company	Rocky Mountain Power Co.	Cost of Service, Rate Design
08/08	Doc. No. 6680-UR-116	WI	Wisconsin Industrial Energy Group, Inc.	Wisconsin Power and Light Co	Cost of Service, rate design, tariff Issues, Interruptible rates.
09/08	Doc. No. 6690-UR-119	WI	Wisconsin Industrial Energy Group, Inc	Wisconsin Public Service Co	Cost of Service, rate design, tariff Issues, Interruptible rates
09/08	Case No. 08-936-EL-SSO	OH	Ohio Energy Group	Ohio Edison, Toledo Edison Cleveland Electric Illuminating	Provider of Last Resort Competitive Solicitation
09/08	Case No. 08-935-EL-SSO	OH	Ohio Energy Group	Ohio Edison, Toledo Edison Cleveland Electric Illuminating	Provider of Last Resort Rate Plan
09/08	Case No. 08-917-EL-SSO 08-918-EL-SSO	OH	Ohio Energy Group	Ohio Power Company Columbus Southern Power Co.	Provider of Last Resort Rate Plan
10/08	2008-00251 2008-00252	KY	Kentucky Industrial Utility Customers, Inc.	Louisville Gas & Electric Co. Kentucky Utilities Co.	Cost of Service, Rate Design
11/08	08-1511 E-GI	WV	West Virginia Energy Users Group	Mon Power Co. Potomac Edison Co	Expanded Net Energy Cost "ENEC" Analysis.
11/08	M-2008-2036188, M-2008-2036197	PA	Met-Ed Industrial Energy Users Group and Penelec Industrial Customer Alliance	Metropolitan Edison Co. Pennsylvania Electric Co.	Transmission Service Charge
01/09	ER08-1056	FERC	Louisiana Public Service Commission	Entergy Services, Inc. and the Entergy Operating Companies	Entergy's Compliance Filing System Agreement Bandwidth Calculations.
01/09	E-01345A-08-0172	AZ	Kroger Company	Arizona Public Service Co.	Cost of Service, Rate Design
02/09	2008-00409	KY	Kentucky Industrial Utility Customers, Inc.	East Kentucky Power Cooperative, Inc.	Cost of Service, Rate Design

J. KENNEDY AND ASSOCIATES, INC.

**Expert Testimony Appearances
of
Stephen J. Baron
As of July 2012**

Date	Case	Jurisdct.	Party	Utility	Subject
5/09	PUE-2009-00018	VA	VA Committee For Fair Utility Rates	Dominion Virginia Power Company	Transmission Cost Recovery Rider
5/09	09-0177-E-GI	WV	West Virginia Energy Users Group	Appalachian Power Company	Expanded Net Energy Cost "ENEC" Analysis
6/09	PUE-2009-00016	VA	VA Committee For Fair Utility Rates	Dominion Virginia Power Company	Fuel Cost Recovery Rider
6/09	PUE-2009-00038	VA	Old Dominion Committee For Fair Utility Rates	Appalachian Power Company	Fuel Cost Recovery Rider
7/09	080677-EI	FL	South Florida Hospital and Healthcare Assoc.	Florida Power & Light Company	Retail cost of service, rate design
8/09	U-20925 (RRF 2004)	LA	Louisiana Public Service Commission Staff	Entergy Louisiana LLC	Interruptible Rate Refund Settlement
9/09	09AL-299E	CO	CF&I Steel Company Climax Molybdenum	Public Service Company of Colorado	Energy Cost Rate issues
9/09	Doc. No 05-UR-104	WI	Wisconsin Industrial Energy Group, Inc.	Wisconsin Electric Power Co.	Cost of Service, rate design, tariff issues, Interruptible rates
9/09	Doc. No 6680-UR-117	WI	Wisconsin Industrial Energy Group, Inc.	Wisconsin Power and Light Co.	Cost of Service, rate design, tariff issues, Interruptible rates.
10/09	Docket No. 09-035-23	UT	Kroger Company	Rocky Mountain Power Co.	Cost of Service, Allocation of Rev Increase
10/09	09AL-299E	CO	CF&I Steel Company Climax Molybdenum	Public Service Company of Colorado	Cost of Service, Rate Design
11/09	PUE-2009-00019	VA	VA Committee For Fair Utility Rates	Dominion Virginia Power Company	Cost of Service, Rate Design
11/09	09-1485 E-P	WV	West Virginia Energy Users Group	Mon Power Co. Potomac Edison Co.	Expanded Net Energy Cost "ENEC" Analysis
12/09	Case No 09-906-EL-SSO	OH	Ohio Energy Group	Ohio Edison, Toledo Edison Cleveland Electric Illuminating	Provider of Last Resort Rate Plan
12/09	ER09-1224	FERC	Louisiana Public Service Commission	Entergy Services, Inc and the Entergy Operating Companies	Entergy's Compliance Filing System Agreement Bandwidth Calculations
12/09	Case No PUE-2009-00030	VA	Old Dominion Committee For Fair Utility Rates	Appalachian Power Co.	Cost Allocation, Allocation of Rev Increase, Rate Design

**Expert Testimony Appearances
of
Stephen J. Baron
As of July 2012**

Date	Case	Jurisdct.	Party	Utility	Subject
2/10	Docket No 09-035-23	UT	Kroger Company	Rocky Mountain Power Co	Rate Design
3/10	Case No. 09-1352-E-42T	WV	West Virginia Energy Users Group	Mon Power Co. Potomac Edison Co.	Retail Cost of Service Revenue apportionment
3/10	E015/ GR-09-1151	MN	Large Power Intervenors	Minnesota Power Co.	Cost of Service, rate design
4/10	EL09-61	FERC	Louisiana Public Service Service Commission	Entergy Services, Inc. and the Entergy Operating Companies	System Agreement Issues Related to off-system sales
4/10	2009-00459	KY	Kentucky Industrial Utility Customers, Inc.	Kentucky Power Company	Cost of service, rate design, transmission expenses.
4/10	2009-00548 2009-00549	KY	Kentucky Industrial Utility Customers, Inc.	Louisville Gas & Electric Co. Kentucky Utilities Co.	Cost of Service, Rate Design
7/10	R-2010- 2161575	PA	Philadelphia Area Industrial Energy Users Group	PECO Energy Company	Cost of Service, Rate Design
09/10	2010-00167	KY	Kentucky Industrial Utility Customers, Inc.	East Kentucky Power Cooperative, Inc.	Cost of Service, Rate Design
09/10	10M-245E	CO	CF&I Steel Company Climax Molybdenum	Public Service Company of Colorado	Economic Impact of Clean Air Act
11/10	10-0699- E-42T	WV	West Virginia Energy Users Group	Appalachian Power Company	Cost of Service, Rate Design, Transmission Rider
11/10	Doc. No. 4220-UR-116	WI	Wisconsin Industrial Energy Group, Inc	Northern States Power Co Wisconsin	Cost of Service, rate design
12/10	10A-554EG	CO	CF&I Steel Company Climax Molybdenum	Public Service Company	Demand Side Management Issues
12/10	10-2586-EL- SSO	OH	Ohio Energy Group	Duke Energy Ohio	Provider of Last Resort Rate Plan Electric Security Plan
3/11	20000-384- ER-10	WY	Wyoming Industrial Energy Consumers	Rocky Mountain Power Wyoming	Electric Cost of Service, Revenue Apportionment, Rate Design
5/11	2011-00036	KY	Kentucky Industrial Utility Customers, Inc	Big Rivers Electric Corporation	Cost of Service, Rate Design
6/11	Docket No 10-035-124	UT	Kroger Company	Rocky Mountain Power Co.	Class Cost of Service
6/11	PUE-2011 -00045	VA	VA Committee For Fair Utility Rates	Dominion Virginia Power Company	Fuel Cost Recovery Rider

J. KENNEDY AND ASSOCIATES, INC.

**Expert Testimony Appearances
of
Stephen J. Baron
As of July 2012**

Date	Case	Jurisdct.	Party	Utility	Subject
07/11	U-29764	LA	Louisiana Public Service Commission Staff	Entergy Gulf States, Inc. Entergy Louisiana, LLC	Entergy System Agreement - Successor Agreement, Revisions, RTO Day 2 Market Issues
07/11	Case Nos. 11-346-EL-SSO 11-348-EL-SSO	OH	Ohio Energy Group	Ohio Power Company Columbus Southern Power Co.	Electric Security Rate Plan, Provider of Last Resort Issues
08/11	PUE-2011-00034	VA	Old Dominion Committee For Fair Utility Rates	Appalachian Power Co.	Cost Allocation, Rate Recovery of RPS Costs
09/11	2011-00161 2011-00162	KY	Kentucky Industrial Utility	Louisville Gas & Electric Co. Kentucky Utilities Company	Environmental Cost Recovery
09/11	Case Nos. 11-346-EL-SSO 11-348-EL-SSO	OH	Ohio Energy Group	Ohio Power Company Columbus Southern Power Co.	Electric Security Rate Plan, Stipulation Support Testimony
10/11	11-0452 E-P-T	WV	West Virginia Energy Users Group	Mon Power Co. Potomac Edison Co.	Energy Efficiency/Demand Reduction Cost Recovery
11/11	11-1272 E-P	WV	West Virginia Energy Users Group	Mon Power Co. Potomac Edison Co.	Expanded Net Energy Cost "ENEC" Analysis
11/11	E-01345A-11-0224	AZ	Kroger Company	Arizona Public Service Co.	Decoupling
12/11	E-01345A-11-0224	AZ	Kroger Company	Arizona Public Service Co.	Cost of Service, Rate Design
3/12	Case No. 2011-00401	KY	Kentucky Industrial Utility Consumers	Kentucky Power Company	Environmental Cost Recovery
4/12	2011-00036 Rehearing Case	KY	Kentucky Industrial Utility Customers, Inc.	Big Rivers Electric Corporation	Cost of Service, Rate Design
5/12	2011-346 2011-348	OH	Ohio Energy Group	Ohio Power Company	Electric Security Rate Plan Interruptible Rate Issues
6/12	PUE-2012-00051	VA	Old Dominion Committee For Fair Utility Rates	Appalachian Power Company	Fuel Cost Recovery Rider
6/12	12-00012 12-00026	TN	Eastman Chemical Co. Air Products and Chemicals, Inc.	Kingsport Power Company	Demand Response Programs
6/12	Docket No. 11-035-200	UT	Kroger Company	Rocky Mountain Power Co.	Class Cost of Service
6/12	12-0275-E-GI-EE	WV	West Virginia Energy Users Group	Appalachian Power Company	Energy Efficiency Rider

J. KENNEDY AND ASSOCIATES, INC.

**Expert Testimony Appearances
of
Stephen J. Baron
As of July 2012**

Date	Case	Jurisdic.	Party	Utility	Subject
6/12	12-0399- E-P	WV	West Virginia Energy Users Group	Appalachian Power Company	Expanded Net Energy Cost ("ENEC")
7/12	120015-EI	FL	South Florida Hospital and Healthcare Assoc.	Florida Power & Light Company	Retail cost of service, rate design

J. KENNEDY AND ASSOCIATES, INC.

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

IN THE MATTER OF:

**APPLICATION OF BIG RIVERS ELECTRIC)
CORPORATION FOR APPROVAL OF ITS)
2012 ENVIRONMENTAL COMPLIANCE)
PLAN, FOR APPROVAL OF ITS AMENDED)
ENVIRONMENTAL COST RECOVERY)
SURCHARGE TARIFF, FOR CERTIFICATES)
OF PUBLIC CONVENIENCE AND)
NECESSITY, AND FOR AUTHORITY TO)
ESTABLISH A REGULATORY ACCOUNT)**

CASE NO. 2012-00063

EXHIBIT __ (SJB-2)

OF

STEPHEN J. BARON

ON BEHALF OF THE

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.

**J. KENNEDY AND ASSOCIATES, INC.
ROSWELL, GEORGIA**

July 2012

KIUC Proposed 2016 Environmental Cost Allocation Using Non-Fuel Base Revenues

	2016	BREC As-Filed Total Adj. Rev Allocator	Non-Fuel Allocator (Retail)	Retail/ Off/System Allocator	Proposed KIUC Allocator	Difference
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Environmental Compliance Cost

Total Environmental Compliance Cost

Total Adjusted Revenue

Rural
Large Industrial
Smelter
Total Retail

Off-System
Total

ES Revenue Requirement

Rural
Large Industrial
Smelter
Off-System
Total

Source:
Responses to KIUC 1.54, KIUC 1.50

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

IN THE MATTER OF:

**APPLICATION OF BIG RIVERS ELECTRIC)
CORPORATION FOR APPROVAL OF ITS)
2012 ENVIRONMENTAL COMPLIANCE)
PLAN, FOR APPROVAL OF ITS AMENDED)
ENVIRONMENTAL COST RECOVERY)
SURCHARGE TARIFF, FOR CERTIFICATES)
OF PUBLIC CONVENIENCE AND)
NECESSITY, AND FOR AUTHORITY TO)
ESTABLISH A REGULATORY ACCOUNT)**

CASE NO. 2012-00063

EXHIBIT __ (SJB-3)

OF

STEPHEN J. BARON

ON BEHALF OF THE

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.

**J. KENNEDY AND ASSOCIATES, INC.
ROSWELL, GEORGIA**

July 2012

**KIUC Proposed 2016 Environmental Cost Allocation Using Non-Fuel Base Revenues
Member Bill Impact**

	<u>2016 Base Case Revenues (w/o ES, RER, TIER)</u>	<u>Big Rivers' Proposed ES Revenue Allocation</u>	<u>Percent of Bill</u>	<u>KIUC Proposed ES Revenue Allocation</u>	<u>Percent of Bill</u>	<u>Difference</u>	<u>Difference w/MRSM, RER</u>
Rural							
Large Industrial							
Smelter							
Total Retail							
Off-System							

KWalton

 **Big Rivers - CPCN - Discovery - SC 1st Set to K**
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**COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION**

In the Matter of:

**Application of Big Rivers Electric Corporation for Approval)
of its 2012 Environmental Compliance Plan, Approval of its) CASE NO. 2012-00063
Amended Environmental Cost Recovery Surcharge Tariffs,)
and for the Certificates of Public Convenience and Necessity,)
and the Authority to Establish a Regulatory Account)**

**BEN TAYLOR AND SIERRA CLUB’S REQUEST FOR
INFORMATION TO KENTUCKY INDUSTRIAL UTILITY CUSTOMERS**

Intervenors Ben Taylor and Sierra Club (collectively “Movants”), pursuant to the Kentucky Public Service Commission’s (“Commission”) Orders of April 30, June 19, and July 19, 2012, propound the following requests for information on the Kentucky Industrial Utility Customers (“KIUC”) regarding Big Rivers Electric Corporation’s application for certificates of public convenience and necessity and approval of its 2012 compliance plan that is the subject of the above captioned proceeding.

KIUC shall answer these requests for information in the manner set forth in the April 30 Order and by no later than the August 6, 2012 deadline set forth in the Appendix of the June 19 Order. Please produce the requested documents in electronic format at the offices of Sierra Club, 85 Second Street, 2nd Floor, San Francisco, CA 94105 or at such other location as may be mutually agreed upon between counsel of record.

Intervenors reserve the right to serve supplemental, revised, or additional discovery requests as permitted in this proceeding.

DEFINITIONS

“CCR” means coal combustion residuals

“Company” refers to Big Rivers Electric Cooperative, and its affiliates, employees, and authorized agents.

“CPCN” means certificate of public convenience and necessity

“FGD” means flue gas desulfurization

“Hg” means mercury

“NAAQS” means National Ambient Air Quality Standards

“NO_x” means nitrogen oxides

“NPV” means net present value

“NPVRR” means net present value of revenue requirements

“O&M” means operation and maintenance

“SCR” means selective catalytic reduction technology

“SO₂” means sulfur dioxide

“316(b)” refers to Section 316(b) of the Clean Water Act

PRIVILEGE OR CONFIDENTIALITY

If you claim a privilege including, but not limited to, the attorney-client privilege or the work product doctrine, as grounds for not fully and completely responding to any interrogatory or request for production, describe the basis for your claim of privilege in sufficient detail so as to permit the Commission to adjudicate the validity of the claim if called upon to do so. With respect to documents for which a privilege is claimed, produce a “privilege log” that identifies the author, recipient, date and subject matter of the documents or interrogatory answers for

which you are asserting a claim of privilege and any other information pertinent to the claim that would enable the Intervenor or the Commission to evaluate the validity of such claims.

To the extent that you can legitimately claim that any interrogatory response or responsive document is entitled to confidentiality, the Intervenor is willing to enter into a confidentiality agreement that would protect such response or document from public disclosure.

REQUESTS FOR INFORMATION

1. Please execute a PaR model run of the Company's Build case with the following changes:
 - a. Refer to page 22 lines 17-18 of the direct testimony of Philip Hayet, which states that the Company's results do not include all incremental O&M costs shown in Exhibit Berry-2. Please add in these additional O&M costs that are identified in the Hayet testimony that were not included in the Company's original run.
 - b. Please change the Company's environmental capital expenditures given in real 2011\$ to nominal dollars in the calculation of NPVRR as follows:

	2012	2013	2014	2015	2016	2017	2018	2019	2020
Wilson FGD	\$1.78	\$27.73	\$56.19	\$49.50	\$7.41	\$0.00	\$0.00	\$0.00	\$0.00
Green 2 SCR	\$0.99	\$20.09	\$44.95	\$16.64	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
HMPL 1 SO2 (Gross)	\$0.15	\$1.13	\$1.57	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
HMPL 2 SO2 (Gross)	\$0.15	\$1.13	\$1.57	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Reid 1 NG	\$0.10	\$1.11	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Wilson Hg	\$0.00	\$1.21	\$4.90	\$5.45	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Green 1 Hg	\$0.00	\$0.60	\$4.09	\$4.82	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Green 2 Hg	\$0.00	\$0.60	\$4.09	\$4.82	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Coleman 1 Hg	\$0.00	\$0.40	\$4.90	\$4.45	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Coleman 2 Hg	\$0.00	\$0.40	\$4.90	\$4.45	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Coleman 3 Hg	\$0.00	\$0.40	\$4.90	\$4.45	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
HMPL 1 Hg	\$0.00	\$0.00	\$0.00	\$0.25	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
HMPL 2 Hg	\$0.00	\$0.00	\$0.00	\$0.25	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

- c. Please add the capital expenditures recommended by Sargent & Lundy to comply with the forthcoming NAAQS revisions, the CCR rule, and the 316(b) rule, in nominal dollars as follows:

	2012	2013	2014	2015	2016	2017	2018	2019	2020
Green 1 NAAQS	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$87.41	\$0.00	\$0.00	\$0.00
Green 1 CCR	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$15.11	\$0.00	\$0.00	\$0.00
Green 1 316(b)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1.11	\$0.00	\$0.00	\$0.00
Green 2 CCR	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$15.11	\$0.00	\$0.00	\$0.00
Green 2 316(b)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1.11	\$0.00	\$0.00	\$0.00
HMPL 1 CCR	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$15.11	\$0.00	\$0.00	\$0.00
HMPL 2 CCR	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$15.11	\$0.00	\$0.00	\$0.00
Coleman 1 CCR	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$13.67	\$0.00	\$0.00	\$0.00
Coleman 1 316(b)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1.44	\$0.00	\$0.00	\$0.00
Coleman 2 CCR	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$13.67	\$0.00	\$0.00	\$0.00
Coleman 2 316(b)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1.44	\$0.00	\$0.00	\$0.00
Coleman 3 CCR	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$13.67	\$0.00	\$0.00	\$0.00
Coleman 3 316(b)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1.44	\$0.00	\$0.00	\$0.00

- d. Please add the additional O&M expenditures associated with the technologies recommended by Sargent & Lundy to comply with the forthcoming NAAQS revisions, the CCR rule, and the 316(b) rule, in nominal dollars as follows:

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Green 1 NAAQS	\$ -	\$ 2,330,869	\$ 2,376,845	\$ 2,424,382	\$ 2,472,870	\$ 2,522,327	\$ 2,572,774	\$ 2,624,229	\$ 2,676,714	\$ 2,730,248	\$ 2,784,853
Green 1 CCR	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Green 1 316(b)	\$ -	\$ 199,635	\$ 203,572	\$ 207,644	\$ 211,797	\$ 216,033	\$ 220,353	\$ 224,760	\$ 229,256	\$ 233,841	\$ 238,518
Green 2 CCR	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Green 2 316(b)	\$ -	\$ 199,635	\$ 203,572	\$ 207,644	\$ 211,797	\$ 216,033	\$ 220,353	\$ 224,760	\$ 229,256	\$ 233,841	\$ 238,518
HMPL 1 CCR	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
HMPL 2 CCR	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Coleman 1 CCR	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Coleman 1 316(b)	\$ -	\$ 269,776	\$ 275,098	\$ 280,600	\$ 286,212	\$ 291,936	\$ 297,775	\$ 303,730	\$ 309,805	\$ 316,001	\$ 322,321
Coleman 2 CCR	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Coleman 2 316(b)	\$ -	\$ 269,776	\$ 275,098	\$ 280,600	\$ 286,212	\$ 291,936	\$ 297,775	\$ 303,730	\$ 309,805	\$ 316,001	\$ 322,321
Coleman 3 CCR	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Coleman 3 316(b)	\$ -	\$ 269,776	\$ 275,098	\$ 280,600	\$ 286,212	\$ 291,936	\$ 297,775	\$ 303,730	\$ 309,805	\$ 316,001	\$ 322,321

Respectfully submitted,



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Joe F. Childers & Associates
300 Lexington Building
201 West Short Street
Lexington, Kentucky 40507
859-253-9824
859-258-9288 (facsimile)

Of counsel:

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Shannon Fisk
Earthjustice
156 William Street
Suite 800
New York, New York 10038
(215) 327-9922
sfisk@earthjustice.org

Dated: July 30, 2012

CERTIFICATE OF SERVICE

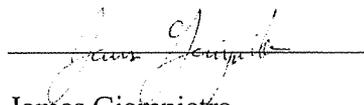
I certify that I mailed a copy of Ben Taylor and Sierra Club's Request for Information from Kentucky Industrial Utility Customers by first class mail on July 30, 2012 to the following:

James M. Miller, Esq.
Tyson Kamuf
Sullivan, Mountjoy, Stainback & Miller, PSC
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Cincinnati, OH 45202

David C. Brown, Esq.
Stites & Harbison
1800 Aegon Center, 400 West Market Street
Louisville, KY 40202

A handwritten signature in cursive script, appearing to read "James Giampietro", is written over a horizontal line.

James Giampietro

KWalton

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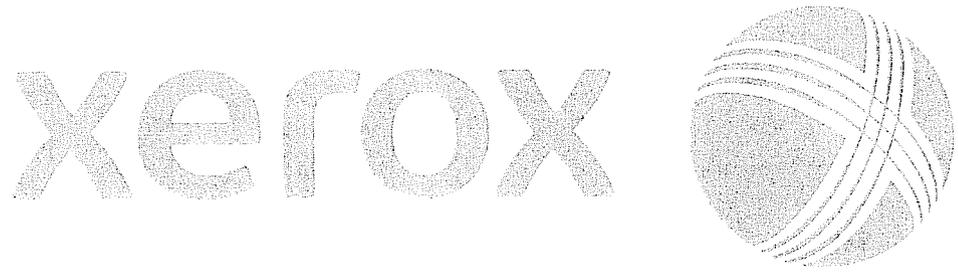


EXHIBIT A

**NON-DISCLOSURE CERTIFICATE
RELATED TO THE
NON-DISCLOSURE AGREEMENT BETWEEN HAYET POWER SYSTEM
CONSULTING AND ACES POWER MARKETING LLC**

I hereby certify my understanding that access to Protected Materials is provided to me pursuant to the terms and restrictions of the Non-Disclosure Agreement between Hayet Power Systems Consulting (“Hayet”) and Alliance for Cooperative Energy Services Power Marketing LLC, (“ACES Power Marketing” or “APM”) and for use in the case currently before the Kentucky Public Service Commission and captioned as “*APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR APPROVAL OF ITS 2012 ENVIRONMENTAL COMPLIANCE PLAN, FOR APPROVAL OF ITS AMENDED ENVIRONMENTAL COST RECOVERY SURCHARGE TARIFF, FOR CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY, AND FOR AUTHORITY TO ESTABLISH A REGULATORY ACCOUNT, CASE NO. 2012-00063*”.

I certify that I have been given a copy of and have read the Non-Disclosure Agreement, and that I agree to be bound by it. I understand that the contents of the Database, Protected Materials, any notes or other memoranda, or any other form of information that copies or discloses Protected Materials shall not be disclosed to anyone other than in accordance with that Protective Agreement, and will be used only for the purposes of this Captioned Case.

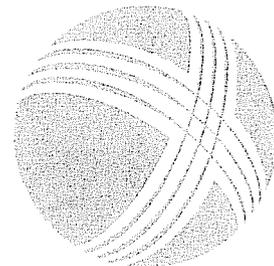
Print and Sign Name

Address

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NON-DISCLOSURE AGREEMENT

This Non-Disclosure Agreement (“Agreement”) is entered into this 21st day of June 2012, by and between Hayet Power Systems Consulting (“Hayet”) and Alliance for Cooperative Energy Services Power Marketing LLC, (“ACES Power Marketing” or “APM”) (each individually referred to as “Party” and collectively as “Parties”).

RECITALS

WHEREAS, APM provides, inter alia, certain modeling services for Big Rivers Electric Corporation (“Big Rivers”) through the use of proprietary software licensed to APM by Ventyx; and

WHEREAS, APM has created a confidential and proprietary database within the licensed proprietary software which contains information used by APM to prepare certain scenarios for use in the Captioned Case (defined below); and

WHEREAS, Hayet is the consultant for certain Intervenors in the Captioned Case and such Intervenors desire that Hayet have access to APM’s confidential and proprietary Database within the Ventyx licensed proprietary software which contains information used by APM to prepare certain scenarios for use in the Captioned Case by Big Rivers; and

WHEREAS, APM, pursuant to a request by Big Rivers and pursuant to conditions established by APM’s license with Ventyx (the owner of the proprietary software), is willing to provide to Hayet the portion of APM’s confidential and proprietary database that pertains to Big Rivers, provided that, Hayet agrees to the terms and conditions expressed herein.

NOW WHEREFORE, in consideration of the promises and covenants herein and for good and valuable consideration, the adequacy and sufficiency of which are hereby acknowledged, the Parties intending to be legally bound do hereby agree as follows:

Section 1. Definitions.

“Authorized Representative” shall mean a person employed by Hayet who has signed a Non-Disclosure Certificate pursuant to this Agreement and who is a licensed user of the Ventyx PaR software under Hayet’s license with Ventyx. ~~Confidentiality Agreement with Big Rivers.~~

“Captioned Case” shall mean the case currently before the Kentucky Public Service Commission and captioned as “*APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR APPROVAL OF ITS 2012 ENVIRONMENTAL COMPLIANCE PLAN, FOR APPROVAL OF ITS AMENDED ENVIRONMENTAL COST RECOVERY SURCHARGE TARIFF, FOR CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY, AND FOR AUTHORITY TO ESTABLISH A REGULATORY ACCOUNT, CASE NO. 2012-00063*”.

“Database” shall mean the electronic computer file derived from the Ventyx PaR licensed proprietary software that contains certain Big Rivers model data parameters used by APM in developing scenarios for Big Rivers and used in support of the Captioned Case.

~~“Input Assumptions” means data items formatted within the Database in a specific format as required by the PaR model. Input assumptions include, but are not limited to fuel costs and other fuel related data, load forecast, generating unit characteristics, dispatch constraint parameters, market price forecasts, etc.~~

“Notes of Protected Materials” means memoranda, handwritten notes, or any other form of information (including electronic information) that copies or discloses Protected Materials. Notes of Protected Materials are subject to the same restrictions provided in this Agreement for Protected Materials except as specifically provided otherwise in this Agreement.

“Protected Materials” shall mean the Database and any other materials provided to Hayet by APM, with such other materials being noted as being confidential by APM, pursuant to the terms of this Agreement.

Section 2. Use of the Database and Protected Materials. This Agreement shall govern the use of the Database provided to Hayet by APM. The Database shall be used exclusively by Hayet for work directly related to the Captioned Case. The Database shall be installed on and accessible through the computer containing Hayet’s licensed Ventyx software. Protected Materials shall be made available under the terms of this Agreement to Hayet solely for its use in the Captioned Case and any appeals from the Captioned Case, and may not be used by Hayet for any commercial, business, or other purpose whatsoever.

Section 3. Duration of Use. Protected Materials shall remain available to Hayet until the sooner of: (a) an order terminating this proceeding becomes no longer subject to judicial review, or (b) the termination of Hayet’s license with Ventyx. If requested to do so in writing after that date, Hayet shall, within fifteen days of such request, return the Protected Materials (excluding Notes of Protected Materials) to APM, or shall destroy the materials, except that copies of filings, official transcripts and exhibits in this proceeding that contain Protected Materials and Notes of Protected Materials may be retained, if they are maintained in accordance with this Agreement. Within such time period, Hayet, if requested to do so, shall also submit to APM an affidavit stating that, to the best of its knowledge, all Protected Materials and all Notes of Protected Materials have been returned or have been destroyed or will be maintained in accordance with this Agreement. To the extent Protected Materials are not returned or destroyed, they shall remain subject to this Agreement.

Section 4. Non-Disclosure Certificate. Hayet shall execute a Non-Disclosure Certificate in the form of the attached Exhibit A certifying its understanding and agreement with the terms of this Agreement. A copy of each Non-Disclosure Certificate shall be provided to APM prior to disclosure of any Protected Materials to Hayet.

Section 5. Protection of Materials. All Protected Materials shall be maintained by Hayet in a secure place. Access to those materials shall be limited to Hayet. Protected Materials shall be

treated as confidential by Hayet. Protected Materials shall not be used except as necessary for the conduct of this Proceeding, nor shall they be disclosed in any manner to any person except as outlined in Section 6 of this Agreement. Hayet may make notes of Protected Materials, which shall be treated as Notes of Protected Materials if they disclose the contents of Protected Materials. Hayet may use this information for purposes of this proceeding, and may not use information contained in any Protected Materials obtained through this Proceeding to give Hayet or any competitor or potential competitor of APM a commercial advantage or otherwise economically disadvantage APM based on disclosure of the Protected Materials outside of this proceeding.

In the event, APM inadvertently provides confidential information unrelated to the Captioned Case, or otherwise fails to designate materials other than the Database as Protected Materials at the time they are provided to Hayet, APM shall notify Hayet promptly upon discovery of the inadvertent disclosure. Hayet agrees that from the time forward that Hayet has been notified that such materials are deemed confidential, Hayet shall maintain the confidentiality or protection afforded the information, and agrees to: (a) immediately return the privileged information; and (b) to protect the confidential materials as Protected Materials, and to not use any information derived from such inadvertent disclosure in a manner inconsistent with the preservation of the confidential nature of the materials.

Section 6. Disclosure. ~~Hayet may discuss Input Assumptions with Authorized Representatives, but Only~~ Authorized Representatives may not ~~shall~~ have access to the Database. In the event that Hayet ceases to be engaged in the Captioned Case, access to Protected Materials by Hayet shall be terminated. Even if no longer engaged in this Captioned Case, Hayet shall continue to be bound by the provisions of this Agreement and the Non-Disclosure Certificate. No other disclosure of the Database shall be permitted. The Parties agree that the output of modeling analyses that may be conducted using the information contained in the Database is not covered under this Agreement. ~~will be treated as non-confidential information that may be disclosed publicly in a manner similar to the manner in which Big Rivers disclosed the output of its modeling analyses in the Captioned Case.~~ Hayet shall take all reasonable precautions necessary to assure that Protected Materials are not distributed to unauthorized persons.

Section 7. Nature of Information. Hayet hereby accepts the representations of APM that the Database is of a special, unique, unusual, extraordinary, and/or intellectual character and that the Parties further accept that the Database is an APM trade secret that is not available to the public, and that, if disclosed, would subject APM to risk of competitive disadvantage or other business injury. APM may be irreparably injured by disclosure of the Database. APM and Hayet acknowledge and agree that money damages would not be a sufficient remedy for any breach of this Agreement, and that in addition to all other remedies, a Party shall be entitled to specific performance and injunctive or other equitable relief as a remedy for any such breach, and the Parties agree to waive any requirement for the securing or posting of any bond in connection with such remedy.

Section 8. Survival of Obligations. The obligations and commitments established by this Agreement shall remain in full force and effect for a period of two (2) years from the conclusion of any right to appeal the proceedings in the Captioned Case.

Section 9. Governing Law. The validity and interpretation of this Agreement and the legal relations of the Parties to it shall be governed by the laws of the State of Indiana. In the event that a court of competent jurisdiction determines that any portion of this Agreement is unreasonable because of its term or scope, or for any other reason, the Parties agree that such court may reform such provision so that it is reasonable under the circumstances and that such provision, as reformed, shall be enforceable. The Parties further agree that service of any process, summons, notice or document by U.S. certified or registered mail to the Parties' respective executive offices will be effective service of process for any action, suit, or proceeding brought in any such court.

Section 10. Miscellaneous Provisions.

(a) Neither party shall assign this Agreement without the prior written approval of the other party. Nothing in this Agreement, express or implied, is intended or shall be construed to confer upon any person or entity other than the parties hereto any right, remedy or claim under or by reason of this Agreement.

(b) This Agreement sets forth the entire agreement between the parties as to the subject matter of this Agreement and supersedes all prior agreements, commitments, representations, writings and discussions between them, whether written or oral, with respect to the subject matter hereof. Except as otherwise expressly provided in this Agreement, this Agreement may not be amended or terminated except in writing and signed by a duly authorized representative of the Party to be bound thereby.

(c) If any provision of this Agreement or its application to any person or circumstance is adjudged invalid or unenforceable by any court of competent jurisdiction, then the remainder of this Agreement or the application of such provision to other persons or circumstances shall not be affected thereby.

(d) No delay or failure to exercise any right under this Agreement shall operate as a continuing or permanent waiver of such right or preclude the further exercise of that right or any other right. This Agreement shall be binding on the parties and their successors, heirs, affiliates, and assigns. This Agreement may be executed in any number of counterparts, and each such counterpart shall be deemed an original instrument.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed and delivered by their respective duly authorized officers as of the date first written above.

**ALLIANCE FOR COOPERATIVE
ENERGY SERVICES POWER
MARKETING LLC**

**HAYET POWER SYSTEMS
CONSULTING**

By: _____

By: _____

Name: _____

Title: _____

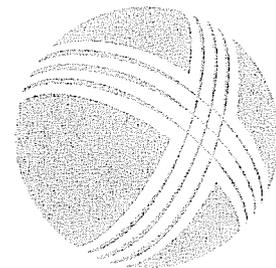
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Title: _____

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COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC)	
CORPORATION FOR AN APPROVAL OF ITS)	
2012 ENVIRONMENTAL COMPLIANCE PLAN,)	
FOR APPROVAL OF ITS AMENDED	)	CASE NO.
ENVIRONMENTAL COST RECOVERY	)	2012-00063
SURCHARGE TARIFF, FOR CERTIFICATES OF)	
PUBLIC CONVENIENCE AND NECESSITY,)	
AND FOR AUTHORITY TO ESTABLISH A)	
REGULATORY ACCOUNT)	

COMMISSION STAFF'S FIRST REQUEST FOR INFORMATION TO
BEN TAYLOR AND SIERRA CLUB

Ben Taylor and Sierra Club (collectively "Sierra Club"), pursuant to 807 KAR 5:001, is to file with the Commission the original and ten copies of the following information, with a copy to all parties of record. The information requested herein is due on or before August 6, 2012. Responses to requests for information shall be appropriately bound, tabbed and indexed. Each response shall include the name of the witness responsible for responding to the questions related to the information provided.

Each response shall be answered under oath or, for representatives of a public or private corporation or a partnership or association or a governmental agency, be accompanied by a signed certification of the preparer or the person supervising the preparation of the response on behalf of the entity that the response is true and accurate to the best of that person's knowledge, information, and belief formed after a reasonable inquiry.

Sierra Club shall make timely amendment to any prior response if it obtains information which indicates that the response was incorrect when made or, though correct when made, is now incorrect in any material respect. For any request to which Sierra Club fails or refuses to furnish all or part of the requested information, it shall provide a written explanation of the specific grounds for its failure to completely and precisely respond.

Careful attention shall be given to copied material to ensure that it is legible. When the requested information has been previously provided in this proceeding in the requested format, reference may be made to the specific location of that information in responding to this request.

1. Refer to the Direct Testimony of Rachel S. Wilson (“Wilson Testimony”) at pages 8-9, lines 18-4. Provide copies or sources of documents referred to in list items A-C.

2. Refer to the Wilson Testimony at page 20, line 3. What level of demand side management (“DSM”) is reasonable for a company such as Big Rivers Electric Corporation (“Big Rivers’) that has smelters as 70 percent of its load?

3. Refer to the Wilson Testimony at page 20, lines 10-11. Given the depreciation study conducted by Burns & McDonald that assesses unit conditions and life extension concerns, what specific expectations would you have regarding further degradation of heat rate, forced outages, and availability of Big Rivers’ generation units?

4. Refer to the Wilson Testimony at page 24, lines 26-28. Provide a listing of all of the instances where a utility’s evaluation of a market replacement option resulted in a

lower net present value revenue requirement (“NPVRR”) when compared to a natural gas combined cycle (“NGCC”) replacement option. Include the NPVRR for each option reviewed and the NPVRR difference between the market replacement option and the NGCC replacement alternative.

5. Refer to the Wilson Testimony at page 25, lines 1-14.

a. Provide details on how the effects of natural gas and CO₂ emission prices were removed from the hourly market forecast price.

b. Explain and provide sources to support the assertion that the marginal emission rate from coal-fired units is 1.0 – 1.1 tons CO₂/MWh and the marginal emission rate from natural gas-fired units is 0.6 – 0.7 tons CO₂/MWh.

c. Provide support for the conclusion that the PACE market prices forecast results in a marginal emission rate of 1.8 tons CO₂/MWh in later years.

6. Refer to the Wilson Testimony at page 26.

a. Is the testimony suggesting that the heat rates and availability assumed by Big Rivers are too high? If so, by how much? (Provide in percentage or absolute amounts).

b. Is this modeling assumption inconsistent with general practices?

c. What assumptions for heat rates and availability were used for other Midwest Independent Transmission System Operator, Inc. (“MISO”) units that were used in the Big Rivers, PACE and ACES analyses?

7. Refer to Wilson Testimony at page 27, lines 15-18. Given the uncertainty as to exact costs for new control technology – some experts suggesting it will go up in price as demand increases while others note that actual results indicate that prices are

below expectations, what level of inflation should be used for the capital expenditures during the procurement and construction process? Explain your response.

8. Refer to the Wilson Testimony at page 28, lines 14-17. Provide the basis for the statement that one or more of Big Rivers units would likely require additional retrofits to be in compliance with the Mercury Air Toxics Rule.

9. Refer to the Wilson Testimony at page 31, lines 21-24. Is there any evidence to support the argument that there are significant energy efficiency savings available that would reduce Big Rivers' load given the high level concentration of the smelter's load?

10. Refer to the Wilson Testimony at page 32, lines 6-15. Provide details on input assumptions that were different from those used by Big Rivers. Provide the range and an explanation as to why they were used.

11. Refer to the Wilson Testimony at page 33, lines 4-8. Provide an electronic copy of the cash flow model with all inputs and assumptions.

12. Refer to the Wilson Testimony at page 33, Table 8 – Synapse Recommended Case. Provide all inputs, analyses and assumptions relied upon to produce this table. Include a listing of each assumption, the references to support the assumption, a listing of all data sources used, and the electronic versions of the spreadsheets or other applications used to calculate the values in the table.

13. Refer to the Direct Testimony of William Steinhurst (“Steinhurst Testimony”) at page 10, line 29, which suggests that wind energy be considered as an effective alternative energy source to replace Big Rivers generation. Please explain how the addition of on-shore wind energy could result in a lower cost option.

15. Refer to the Steinhurst Testimony, page 11, lines 11-29. The testimony states that a larger DSM load reduction should be assumed. Recognizing that the majority of the load on the Big Rivers' system is associated with the two smelters, explain how the remaining load can be significantly reduced through further DSM programs so as to replace a Big Rivers generating unit. Provide specific programs and their estimated impact on demand.

16. Refer to the Steinhurst Testimony at page 12, lines 20-22. It states there "If BREC had done its analysis on a unit-by-unit basis, it is likely that DSM could have offset the need to retrofit or replace some units." Provide a detailed explanation in support of this statement. Include in the explanation the reasoning for concluding that the result is "likely."

17. Refer to the Steinhurst Testimony, page 14. Provide a reference to the estimate provided in the scenario as presented at lines 1-12.

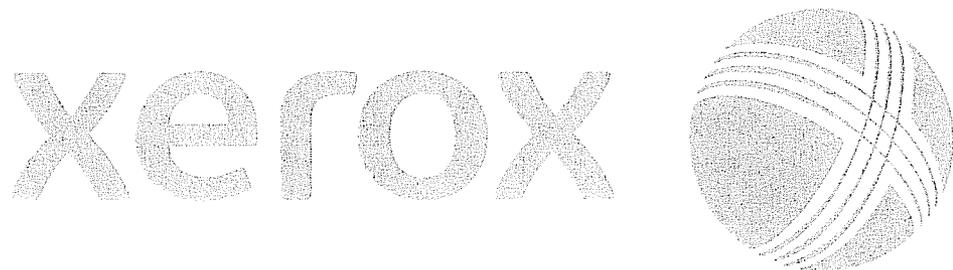
Jeff Derouen
Executive Director
Public Service Commission
P. O. Box 615
Frankfort, KY 40602

DATED _____

cc: Parties of Record

KWalton

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**NON-DISCLOSURE CERTIFICATE
RELATED TO THE
NON-DISCLOSURE AGREEMENT BETWEEN HAYET POWER SYSTEM
CONSULTING KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC. AND ACES
POWER MARKETING LLC**

I hereby certify my understanding that access to ~~Protected Materials~~the Database is provided to me pursuant to the terms and restrictions of the Non-Disclosure Agreement between Hayet Power Systems Consulting (“Hayet”) Kentucky Industrial Utility Customers, Inc. (“KIUC”) and Alliance for Cooperative Energy Services Power Marketing LLC, (“ACES Power Marketing” or “APM”) and for use in the case currently before the Kentucky Public Service Commission under Case No. 20121-00036.401 and captioned as *“In the Matter of: Application of Kentucky Power Company For Approval Of Its 2011 Environmental Compliance Plan, For Approval Of Its Amended Environmental Cost Recovery Surcharge Tariff, And For the Grant Of A Certificate Of Public Convenience And Necessity For The Construction And Acquisition Of Related Facilities”*.

I certify that I have been given a copy of and have read the Non-Disclosure Agreement, and that I agree to be bound by it. I understand that the contents of the Database, ~~Protected Materials~~, any notes or other memoranda, or any other form of information that copies or discloses ~~Protected Materials~~information contained in the Database shall not be disclosed to anyone other than in accordance with that ~~Protective~~ Agreement, and will be used only for the purposes of this ~~Captioned Case~~Proceeding.

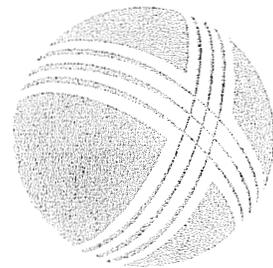
Print and Sign Name

Address

KWalton

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**COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION**

In the Matter of:

**Application of Big Rivers Electric Cooperative for Approval of)
its 2012 Environmental Compliance Plan, Approval of its) CASE NO. 2012-00063
Amended Environmental Cost Recovery Surcharge Tariffs,)
and for the Certificates of Public Convenience and Necessity,)
and the Authority to Establish a Regulatory Account)**

**BEN TAYLOR AND SIERRA CLUB’S INITIAL REQUESTS FOR
INFORMATION TO BIG RIVERS ELECTRIC COOPERATIVE**

Proposed Intervenors Ben Taylor and Sierra Club (collectively “Movants”) pursuant to the Kentucky Public Service Commission’s (“Commission”) April 30, 2012 Order (“April 12 Order”), propound the following requests for information on the Big Rivers Electric Cooperative’s (“Big Rivers”) regarding Big Rivers’ application for certificates of public convenience and necessity and approval of its 2012 compliance plan that is the subject of the above captioned proceeding.

Big Rivers shall answer these requests for information in the manner set forth in the April 30 Order and by no later than the June 1, 2012 deadline set forth in the Appendix of the April 30 Order. Please produce the requested documents in electronic format at the offices of Sierra Club, 85 Second Street, 2nd Floor, San Francisco, CA 94105 or at such other location as may be mutually agreed upon between counsel of record.

Wherever the response to an interrogatory or request consists of a statement that the requested information is already available to the Proposed Intervenors, provide a detailed citation to the document that contains the information. This citation shall include the title of the

document, relevant page number(s), and to the extent possible paragraph number(s) and/or chart/table/figure number(s).

In the event that any document referred to in response to any request for information has been destroyed, specify the date and the manner of such destruction, the reason for such destruction, the person authorizing the destruction and the custodian of the document at the time of its destruction.

The Proposed Intervenors reserve the right to serve supplemental, revised, or additional discovery requests as permitted in this proceeding.

DEFINITIONS

Unless otherwise specified in each individual interrogatory or request, “you,” “your,” “Big Rivers,” “Cooperative” or “Company” refers to Big Rivers Electric Cooperative, and its affiliates, employees, and authorized agents.

“And” and “or” shall be construed either conjunctively or disjunctively as required by the context to bring within the scope of these interrogatories and requests for production of documents any information which might be deemed outside their scope by another construction.

“Any” means all or each and every example of the requested information.

“CFC” means National Rural Utilities Cooperative Finance Corporation

“CO₂” means carbon dioxide

“Communication” means any transmission or exchange of information between two or more persons, whether orally or in writing, and includes, without limitation, any conversation or discussion by means of letter, telephone, note, memorandum, telegraph, telex, telecopy, cable, email, or any other electronic or other medium.

“CPCN” means certificate of public convenience and necessity

“CSAPR” means the Cross-State Air Pollution Rule

“Document” refers to written matter of any kind, regardless of its form, and to information recorded on any storage medium, whether in electrical, optical or electromagnetic form, and capable of reduction to writing by the use of computer hardware and software, and includes all copies, drafts, proofs, both originals and copies either (1) in the possession, custody or control of the Companies regardless of where located, or (2) produced or generated by, known to or seen by the Companies, but now in their possession, custody or control, regardless of where located whether or still in existence.

Such “documents” shall include, but are not limited to, applications, permits, monitoring reports, computer printouts, contracts, leases, agreements, papers, photographs, tape recordings, transcripts, letters or other forms of correspondence, folders or similar containers, programs, telex, TWX and other teletype communications, memoranda, reports, studies, summaries, minutes, minute books, circulars, notes (whether typewritten, handwritten or otherwise), agenda, bulletins, notices, announcements, instructions, charts, tables, manuals, brochures, magazines, pamphlets, lists, logs, telegrams, drawings, sketches, plans, specifications, diagrams, drafts, books and records, formal records, notebooks, diaries, registers, analyses, projections, email correspondence or communications and other data compilations from which information can be obtained (including matter used in data processing) or translated, and any other printed, written, recorded, stenographic, computer-generated, computer-stored, or electronically stored matter, however and by whomever produced, prepared, reproduced, disseminated or made.

Without limitation, the term “control” as used in the preceding paragraphs means that a document is deemed to be in your control if you have the right to secure the document or a copy thereof from another person or public or private entity having actual possession thereof. If a

document is responsive to a request, but is not in your possession or custody, identify the person with possession or custody. If any document was in your possession or subject to your control, and is no longer, state what disposition was made of it, by whom, the date on which such disposition was made, and why such disposition was made.

For purposes of the production of “documents,” the term shall include copies of all documents being produced, to the extent the copies are not identical to the original, thus requiring the production of copies that contain any markings, additions or deletions that make them different in any way from the original

“DSM” means demand-side management programs including demand-response, interruptible load, and efficiency programs.

“ESP” means electrostatic precipitator

“FGD” means flue gas desulfurization

“HCl” means hydrogen chloride

“HMP&L” means Henderson Municipal Power & Light

“Identify” means:

- (a) With respect to a person, to state the person’s name, address and business relationship (e.g., “employee”) to Big Rivers;
- (b) With respect to a document, to state the nature of the document in sufficient detail for identification in a request for production, its date, its author, and to identify its custodian. If the information or document identified is recorded in electrical, optical or electromagnetic form, identification includes a description of the computer hardware or software required to reduce it to readable form.

“IRP” means Integrated Resource Plan

“MATS” means Mercury Air Toxics Standard Rule

“MWh” means megawatt-hours

“NOx” means nitrogen oxides

“NPV” means net present value

“NPVRR” means net present value of revenue requirements

“O&M” means operation and maintenance

“PRB” means the Powder River Basin

“Relating to” or “concerning” means and includes pertaining to, referring to, or having as a subject matter, directly or indirectly, expressly or implied, the subject matter of the specific request.

“RUS” means Rural Utilities Service

“SCR” means selective catalytic reduction technology

“SO₂” means sulfur dioxide

PRIVILEGE OR CONFIDENTIALITY

If you claim a privilege including, but not limited to, the attorney-client privilege or the work product doctrine, as grounds for not fully and completely responding to any interrogatory or request for production, describe the basis for your claim of privilege in sufficient detail so as to permit the Commission to adjudicate the validity of the claim if called upon to do so. With respect to documents for which a privilege is claimed, produce a “privilege log” that identifies the author, recipient, date and subject matter of the documents or interrogatory answers for which you are asserting a claim of privilege and any other information pertinent to the claim that would enable the Proposed Intervenors or the Commission to evaluate the validity of such claims.

To the extent that you can legitimately claim that any interrogatory response or responsive document is entitled to confidentiality, the Proposed Intervenors are willing to enter

into a confidentiality agreement that would protect such response or document from public disclosure.

TIME

Unless otherwise provided, the applicable time period for each of these requests for information is January 1, 2009 to the present.

REQUESTS FOR INFORMATION

1. For each of the Wilson, Green, Coleman, Reid, or HMP&L generating units:
 - a. Identify the expected retirement date
 - b. Produce the most recent depreciation study
 - c. Produce the most recent condition or performance assessment
 - d. Produce the most recent retirement, continued unit operation, or life extension study or analysis
 - e. Produce any analysis or assessment of the economics of continued operation of such unit
 - f. Produce any analysis or assessment of the impact that retirement of each unit would have on capacity adequacy, transmission grid stability, transmission grid support, voltage support, or transmission system reliability
 - g. Identify any transmission grid upgrades or changes that would be needed to permit the retirement of any of the units
 - h. Produce any analysis or assessment of the need for the continued operation of each unit.

2. For each of the Wilson, Green, Coleman, Reid, or HMP&L generating units, identify and produce any analysis of the net present value revenue requirement, cost, or feasibility of retiring the unit and replacing the energy or capacity produced by that unit with any of the following resources:
 - a. Energy efficiency
 - b. Demand side management
 - c. Demand response
 - d. Combined heat and power
 - e. Wind energy
 - f. Solar
 - g. Hydroelectric
 - h. Construction of a new natural gas combined cycle facility
 - i. Purchase of power from an existing natural gas combined cycle facility

- j. Purchase of an existing natural gas combined cycle facility
 - k. Natural gas combustion turbines
 - l. Power purchase agreements
 - m. A combination of any or all of the resources identified in subsections a through l above
3. For each of the Wilson, Green, Coleman, Reid, or HMP&L generating units, identify:
 - a. The annual non-environmental capital expenditures expected or projected to be made for each year from 2012 through 2031.
 - b. The annual fixed O&M costs for each year from 2012 through 2031.
 - c. The annual variable O&M costs for each year from 2012 through 2031.
 4. Produce a non-redacted, full color or original digital copy of any Integrated Resource Plans (“IRPs”) created and/or filed by Big Rivers or its agents since 2004.
 5. Produce any strategic or technical documents generated since 2004 by Big Rivers or its agents regarding mechanisms by which the company could or should comply with environmental regulations, including air quality compliance planning, water quality planning, and solid waste compliance planning.
 6. Identify any CO₂ prices assumed in Big River’s Environmental Compliance Plan by either Big Rivers or its Agents for each year of 2012 through 2035, and explain how any such CO₂ prices were factored into Big River’s Environmental Compliance Plan Analysis.
 7. Produce a copy of any forecast or projection of future CO₂ costs, taxes, or emissions allowances prices that has been prepared by or for Big Rivers.
 8. Produce a copy of any plan for reducing CO₂ emissions that has been prepared by or for Big Rivers.
 9. With respect to EPA’s GHG Tailoring Rule:
 - a. Does the Company anticipate that any of its units would be subject to EPA’s GHG Tailoring Rule? If so, when? If not, why not?
 - b. What impact does the Company anticipate the Tailoring Rule having on either the costs of operations of any of its units?
 - c. Please provide any work papers or modeling analysis that considers the cost

impacts associated with the Tailoring Rule.

10. EPA recently issued a proposed New Source Performance Standard that would regulate greenhouse gas emissions from electric generating units. In this proposed rule, EPA stated that it soon plans to issue regulations for existing electric generating units. With respect to EPA's forthcoming rule regulating greenhouse gas emissions for existing electric generating units ("EGUs"):
 - a. Does the Company anticipate that the forthcoming existing EGU greenhouse gas rule could impact any of its units? If so, what would be the expected cost of this rulemaking? If not, why not?
 - b. Has a cost for the he forthcoming existing EGU greenhouse gas rule been taken into account in the modeling done by the Company in support of its application for CPCN? If not, how would such a cost impact its analysis?
 - c. Please provide any work papers or modeling analysis that considers the cost impacts associated with the forthcoming existing EGU greenhouse gas rule.

11. With respect to new pollution control installations and CWA NPDES permits:
 - a. Does the Company expect that new pollution control installations would have any effect on current CWA NPDES permits at any of its units?
 - b. If applicable, please provide any of the Company's recent applications for changes or modifications to any of its NPDES permits.
 - c. Does the Company anticipate that the pending Effluent Limitation guidelines rule could impact any of its units? If so, what would be the expected cost of this rulemaking? If not, why not?
 - d. Has a cost for the pending Effluent Limitation guidelines been taken into account in the modeling done by the Company in support of its application for CPCN? If not, how would such a cost impact its analysis?

12. Produce a copy of any assessment of future natural gas prices and supplies that has been prepared by or for Big Rivers.

13. Produce a copy of any assessments of future coal prices and supplies that has been prepared by or for Big Rivers.

14. Refer to p. 6, lines 10-11 of the Application:
 - a. Identify the status of the engineering and design for each of the projects for which Big Rivers is seeking a CPCN
 - b. State when the engineering and design for each project is expected to be completed

- c. State how much money has been spent to date on engineering and design
 - d. Identify the estimated total cost for engineering and design for each project.
15. Refer to p. 13, lines 17-20 of the testimony of Robert Berry. For each of Big Rivers' customer classes, identify the date and size in percent of each rate increase that Big Rivers has implemented since 2003.
16. Refer to p. 16, lines 6-9 of the testimony of Robert Berry.
- a. Identify the capacity factor at which the Big Rivers fleet could operate to comply with CSAPR without "significant capital investments in additional emissions reduction equipment"
 - b. Identify the capacity factor at which the Big Rivers fleet could operate to comply with MATS without "significant capital investments in additional emissions reduction equipment"
17. Refer to p. 18 of the testimony of Robert Berry and p. 3-4 of Ex. 2 to the testimony of William DePriest (the Sargent & Lundy Environmental Compliance Study). With regards to the new flue gas desulfurization system ("FGD") for Wilson Unit 1 referenced therein:
- a. Identify the type of FGD that would be installed
 - b. Identify the basis for contending that the new FGD would achieve 99% removal of sulfur dioxide emissions from Wilson Unit 1
 - c. Produce any documents supporting the contention that the new FGD would achieve 99% removal of sulfur dioxide emissions from Wilson Unit 1.
18. Refer to p. 25, lines 8-13 of the testimony of Robert Berry. State whether the parasitic load related to each of the projects for which a CPCN is being sought in this filing would impact the cost of producing energy from any of the Big Rivers units. If so, identify the approximate impact. If not, explain why not.
19. Refer to p. 27 line 18 to p. 28 line 3 of the testimony of Robert Berry and p. 20, lines 9-16 of the testimony of William DePriest. With regards to the advanced low NOx burner systems for the Coleman Units:
- a. Identify the capital cost of such system for each unit
 - b. Identify the O&M cost of such system for each unit
 - c. Identify the amount change to the NPVRR of the Build Case for the Coleman Units if the advanced low NOx burner systems were included
 - d. Produce any evaluation of the economics of installing advanced low NOx burner systems on the Coleman Units

20. Refer to p. 27 line 18 to p. 28 line 3 of the testimony of Robert Berry. With regards to the SCR for Green Unit 1:
 - a. Identify the capital cost of the SCR
 - b. Identify the annual O&M cost of the SCR
 - c. Identify the amount change to the NPVRR of the Build Case for Green Unit 1 if the SCR were included
 - d. Produce any evaluation of the economics of installing an SCR on Green Unit 1

21. Refer to page 27, lines 18-22 and page 28, lines 1-3 of the testimony of Robert Berry. Has Big Rivers done any analysis of the potential effects of the NAAQS reductions for any of its units? Please provide the work papers showing the results of this analysis.

22. Refer to p. 28, lines 16-18 of the testimony of Robert Berry. State whether the “additional precipitator testing” referenced therein has occurred. If so, describe and produce the results of such testing. If not, explain why not.

23. Refer to p. 29, lines 13-17 of the testimony of Robert Berry.
 - a. Identify the “magnitude of potential savings from DSM and energy efficiency” referenced therein.
 - b. Identify and produce any evaluation of the ability of Big Rivers to achieve energy savings through the use of DSM
 - c. Identify the magnitude of savings from DSM and energy efficiency would be needed to “materially assist Big Rivers in complying with CSAPR and MATS.”
 - d. Identify and produce any evaluation of the role that DSM could play in replacing the need for any of the projects for which a CPCN is sought in this proceeding
 - e. Describe the DSM and energy efficiency programs currently offered by Big Rivers, including demand-response, interruptible load, and efficiency programs.
 - f. Identify any additional DSM and energy efficiency programs Big Rivers intends to offer in the future.
 - g. For the DSM and energy efficiency programs currently offered by Big Rivers, identify the:
 - i. Cost
 - ii. Annual MW or MWh reductions achieved through such programs since their inception,
 - iii. Annual MW or MWh reductions projected to be achieved through such programs for each year through 2026,
 - iv. Expected life of the programs
 - v. Penetration of these programs.
 - h. Produce any DSM potential studies performed by or for Big Rivers in the last five

years, including attendant workbooks or calculations. Describe if or how the results of such studies are incorporated into the current case. If they are not, explain why not.

24. Refer to Exhibit 4 of the testimony of Robert Berry. With regards to the capital cost estimates for the proposed WFGD for the Wilson plant:
 - a. Identify what “SESS” stands for
 - b. Produce the “SESS budget proposal number 4296”
 - c. Describe how the WFGD capital cost estimate was derived from the SESS budget proposal number 4296
 - d. Produce any document supporting or regarding the WFGD capital cost estimate that was derived from or included in the SESS budget proposal number 4296

25. Refer to p. 8, lines 20-23 of the testimony of William DePriest.
 - a. Identify any “engineering services” that Sargent & Lundy is contracted to perform “to help implement” the projects for which Big Rivers is seeking CPCNs in this proceeding.
 - b. If Big Rivers has not presently contracted with Sargent & Lundy for any such engineering services, state whether Big Rivers is considering having Sargent & perform such engineering services for any of the projects.

26. Refer to p. 13, lines 15-24 of the testimony of William DePriest.
 - a. Please identify which financial model Big Rivers used, who is the vendor of the model, and whether the model is a proprietary model that requires a license in order to gain access to the files.
 - b. Produce, in machine-readable format, all of the models (including input and output files) and worksheets used to generate the capital costs, O&M costs, and NPV for each of the technologies evaluated as part of the compliance study.
 - c. Please identify any changes to the input files that may be required to reproduce the modeling.
 - d. If changes are required, please specify why such changes were done.
 - e. Please identify the assumptions, including any supporting documentation, Big Rivers or its agents used in each base case and sensitivity scenario that you modeled
 - f. If a license is required to obtain access to any information in this request, please explain who Sierra Club should contact to either obtain that license or present information that Sierra Club or its experts already have a license for that model.

27. According to page 20, lines 11-16 of the testimony of William DePriest, Big Rivers plans

to meet CSAPR regulations in part with the purchase of NO_x allowances.

- a. Has Big Rivers done any analysis of the future market for NO_x allowances in Kentucky? If so, please provide any work papers associated with that analysis.
- b. Is the Company certain that enough allowances will be available for purchase such that the Company can meet its allowance obligation?

28. According to page 20, lines 19-24 of the testimony of William DePriest, the potential impacts of the proposed EPA rule for Section 316(b) of the Clean Water Act were considered by S&L.

- a. Does the Company anticipate that this pending regulation would impact any of its units? If so, what would be the expected cost of this rulemaking? If not, why not?
- b. Has a cost for the pending 316(b) rule been taken into account in the modeling done by the Company in support of its application for CPCN? If not, how would such a cost impact its analysis?
- c. Please provide any work papers or modeling analysis that considers the cost impacts associated with the 316(b) rule.

29. According to page 20, lines 19-24 of the testimony of William DePriest, the potential impacts of the proposed EPA rule for Coal Combustion Residuals (CCR) were considered by S&L.

- a. Does the Company anticipate that this pending regulation would impact any of its units? If so, what would be the expected cost of this rulemaking? If not, why not?
- b. Has a cost for the pending Coal Combustion Residuals rule been taken into account in the modeling done by the Company in support of its application for CPCN? If not, how would such a cost impact its analysis?
- c. Please provide any work papers or modeling analysis that considers the cost impacts associated with the CCR rule.

30. Refer to p. ES-9 of Exhibit 2 to the testimony of William DePriest.

- a. Explain why no technology was selected for compliance with potential Coal Combustion Residue regulations for the Wilson and Reid plants.
- b. Identify the amount change to the NPVRR of the Build Case for the Coleman, Green, and HMP&L units if Coal Combustion Residue compliance were included

31. Refer to p. 1-3 of Exhibit 2 to the testimony of William DePriest (the Sargent & Lundy Environmental Compliance Study).

- a. For each cost identified in Table 1-1, identify for what year the value that is listed is for
- b. For each cost identified in Table 1-1, identify what the value was assumed to be in each year through 2033 for purposes of the environmental compliance study

- c. For each of the following costs, identify the basis for the value used in the environmental compliance study, and produce any documents supporting such values
 - i. Coal
 - ii. Natural gas
 - iii. SO₂ allowances
 - iv. NO_x allowances
 - v. Sorbent – Hydrated Lime
 - vi. Activated Carbon

32. Identify Big Rivers' actual electric energy sales in MWh and actual peak loads in MW for each year since 2004.

33. Identify Big Rivers' projected electric energy sales in MWh and projected peak demand in MW for each year of 2012 through 2033.

34. Identify Big Rivers' projected electric energy sales in MWh and projected peak demand in MW for each year of 2012 through 2033 if:
 - a. the Century Aluminum of Kentucky General Partnership aluminum smelter stops purchasing power from Big Rivers
 - b. the Alcan Primary Products Corporation aluminum smelter stops purchasing power from Big Rivers
 - c. if both the Century and Alcan aluminum smelters stop purchasing power from Big Rivers.

35. Refer to p. 1-8 of Ex. 2 to the testimony of William DePriest (the Sargent & Lundy Environmental Compliance Study). With regards to the low-NO_x burner upgrades at Wilson and HMP&L units 1 and 2 identified therein:
 - a. Explain what is meant that Big Rivers has "committed" to such upgrades
 - b. Identify the status of those upgrades and, if they have not yet commenced, when Big Rivers expects to commence them
 - c. Identify the capital cost of such upgrade for each unit
 - d. Identify by how much per year such upgrades are estimated to reduce O&M costs for each unit

36. Refer to p. 2-4 of Ex. 2 to the testimony of William DePriest (the Sargent & Lundy Environmental Compliance Study). With regards to the baseline mercury, HCl, and SO₂ emissions for each unit identified in Tables 2-3 and 2-4 therein:

- a. Identify and produce each stack test upon which the baseline emissions figures are based
 - b. State whether such stack tests are reflective of the emissions that would be measured through the use of a continuous emission monitor including during times of startup and shutdown. If so, how? If not, why not?
 - c. State whether the environmental compliance cost would increase if the reductions in mercury, HCl, or SO₂ needed to bring the Big Rivers units into compliance with the MATS rule were higher than the “required reduction” identified in Tables 2-3 and 2-4.
 - d. State whether the control technologies selected would change if the reductions in mercury, HCl, or SO₂ needed to bring the Big Rivers units into compliance with the MATS rule were higher than the “required reduction” identified in Tables 2-3 and 2-4.
37. Refer to p. 2-4 of Ex. 2 to the testimony of William DePriest (the Sargent & Lundy Environmental Compliance Study). State whether the “additional stack test data . . . needed to more accurately predict HCl emissions from each unit” has been collected. If not, why not? If so, produce such data.
38. Refer to p. 3-4 of Ex. 2 to the testimony of William DePriest (the Sargent & Lundy Environmental Compliance Study). Identify the number of excess SO₂ credits per year that are estimated to result if the FGD proposed for the Wilson plant removes 99% of SO₂ emissions. State whether such excess credits are assumed to be sold or used at other Big Rivers units.
39. Refer to p. 3-5 of Ex. 2 to the testimony of William DePriest (the Sargent & Lundy Environmental Compliance Study). Identify which “currently available FGD technology has been proven to achieve removal efficiency of > 99%” for SO₂ emissions, and whether such greater than 99% removal efficiency is on a continuous basis.
40. Refer to p. 3-6 of Ex. 2 to the testimony of William DePriest (the Sargent & Lundy Environmental Compliance Study). With regards to the statement that “the effect of sorbent injection on ESP performance should be tested before implementation”:
- a. State whether such testing has occurred.
 - i. If not, why not?
 - ii. If so, produce the results of such testing.
 - b. Produce any evaluation of the adequacy of the existing ESPs at the Wilson, Green, and Coleman units to ensure compliance with applicable particulate matter emission limits after the addition of dry sorbent injection and activated carbon injection.

- c. If the existing ESPs are inadequate to ensure compliance at any of the Wilson, Green, or Coleman units:
 - i. Identify the capital and annual O&M costs for each unit for upgrading the ESP
 - ii. Identify the capital and annual O&M costs for each unit for installing a polishing baghouse
 - iii. Identify the capital and annual O&M costs for each unit for installing a full baghouse

- 41. Refer to p. 5-2 of Ex. 2 to the testimony of William DePriest (the Sargent & Lundy Environmental Compliance Study). With regards to the conversion of Green Units 1 and 2 referenced in Table 5-1, identify the cost of natural gas for each year that was used in estimating the \$47.2 million O&M cost.

- 42. Refer to p. 5-11 of Ex. 2 to the testimony of William DePriest (the Sargent & Lundy Environmental Compliance Study). Identify the basis for the conclusion that the “break even” gas pricing for converting Green Units 1 and 2 to natural gas is \$2.23/mmBtu. Produce any modeling and worksheets, in machine-readable format, upon which that conclusion is based.

- 43. Refer to p. 1 of Ex. 3 to the testimony of William DePriest. Identify and produce the stack test results upon which the data in Table 1 on that page is based.

- 44. Refer to p. 2 of Ex. 3 to the testimony of William DePriest. State whether Big Rivers has had Sargent & Lundy develop the computer-based model of ESPs described therein. If so, produce the results of such modeling. If not, explain why not.

- 45. Refer to Ex. 4 to the testimony of William DePriest:
 - a. Identify the average and maximum sulfur content, in lbs/mmBtu, of the coal burned in each of the Big Rivers generating units for each of the past five years
 - b. Identify the assumed sulfur content, in lbs/mmBtu, of the PRB coal evaluated in the fuel switching analysis set forth in Ex. 4.
 - c. State whether you analyzed using other types of coal, such as lower-sulfur bituminous coal, to achieve compliance with CSAPR. If so, produce any documents regarding such analysis. If not, explain why not.
 - d. Identify the sulfur content, in lbs/mmBtu, that would need to be burned in the Big Rivers generating units to achieve compliance with CSAPR.

46. Refer to p. 5 of Ex. 4 to the testimony of William DePriest.
 - a. Identify the basis for the assumption that Big Rivers' bituminous coal costs \$2.00/mmBtu.
 - b. Identify the basis for the assumption that "PRB fuels are likely to cost closer to \$3.00/mmBtu"
 - c. Produce any documents supporting the assumed bituminous and PRB coal costs.

47. Refer to p. 5 of Ex. 4 to the testimony of William DePriest.
 - a. State whether capital changes would be needed to any of the HMP&L, Wilson, or Green units in order for such unit to be able to burn bituminous coal with a lower sulfur content than the coal currently burned in those units.
 - b. If the answer to subsection (a) is yes, identify the estimated cost of such changes for each unit.

48. Refer to p. 60 of the Environmental Regulatory Review prepared by Sergeant & Lundy, which is attached to William DePriest's Testimony as App. 4. Did Big Rivers or its agents ever consider the material probability that the Kentucky General Assembly will pass clean energy legislation, such as the Clean Energy Opportunity Act (HB 167), between 2012 and 2035?
 - a. If yes, please explain the basis for Big River's position.
 - b. If no, please explain why the Big Rivers or its Agents did not include this possibility in its sensitivity analyses?
 - c. Is it Big Rivers' position that there is no material probability that U.S. Congress or the state of Kentucky will pass legislation between 2012 and 2035 requiring specific quantities of retail electric energy requirements to be met from renewable sources of energy and/or energy efficiency?
 - d. If yes, please explain the basis for Big Rivers' position.
 - e. If no, please explain why Big Rivers did not include this possibility in its sensitivity analyses?

49. Refer to p. 6 of the testimony of Mark Hite, lines 13-17. For the "Buy Case," did Big Rivers evaluate locking in supplies and prices under long-term purchase power agreements for a portion of its requirements under the Buy Case?
 - a. If not please explain why not.
 - b. If yes, please provide that analysis.

50. Refer to Mark Hite's testimony, lines 1-17, regarding the discussion of alternatives

considered

- a. Explain whether a RFQ solicitation for capacity and energy was issued as an additional alternative to reliance on the market capacity and energy and pricing.
- b. Explain the rationale for only considering market participation as an alternative.
- c. If a RFQ solicitation was issued, provide the analysis of the bids, including the terms of the bids and why each bid received was not acceptable.
- d. If a RFQ solicitation was not issued seeking capacity and energy, explain the rationale for not seeking such a solicitation.

51. Refer to p. 6 of the testimony of Mark Hite, lines 1-17. Please confirm that Big Rivers or its agents did not model a natural gas alternative in the cost-effectiveness modeling.

52. Refer to p. 6 line 19 through p. 7 line 17 of the testimony of Mark Hite.

- a. Please identify which financial model Big Rivers used, who is the vendor of the model, and whether the model is a proprietary model that requires a license in order to gain access to the files.
- b. Please produce, in machine readable format, all of the financial modeling (including input and output files) and workpapers used to determine the NPVRR for each scenario evaluated by Big Rivers or its agents.
- c. Please identify any changes to the input files that may be required to reproduce the modeling.
- d. If changes were made, please explain why such changes were made.
- e. Please identify the assumptions, including any supporting documentation, Big Rivers or its agents used in each base case and sensitivity scenario that you modeled
- f. If a license is required to obtain access to any information in this request, please explain who Sierra Club should contact to either obtain that license or present information that Sierra Club or its experts already have a license for that model.

53. Refer to p. 7 line 20 to p. 8 line 5 of the testimony of Mark Hite. Identify and produce:

- a. All forward pricing data received from PACE Global for the production cost modeling.
- b. All Big Rivers plant specific data that was supplied to ACES Power Marketing.
- c. Please identify which financial model ACES Power Marketing used, who is the vendor of the model, and whether the model is a proprietary model that requires a license in order to gain access to the files.
- d. Please produce, in machine readable format, all of the production cost modeling

(including input and output files) and workpapers used to determine the NPVRR for each scenario generated by ACES Power Marketing

- e. Please identify any changes to the input files that may be required to reproduce the modeling.
- f. If changes are required, please explain why such changes were made.
- g. Please identify the assumptions, including any supporting documentation, Big Rivers or its agents used in each base case and sensitivity scenario that you modeled
- h. If a license is required to obtain access to any information in this request, please explain how Sierra Club could obtain that license or, if they already have a license, who they should provide information to regarding the license to obtain the files.

54. Refer to p. 10, lines 10-12 of the testimony of Mark Hite. State whether any other sensitivity analyses, besides the No Smelter Case, were performed by Big Rivers or its agents. If so, produce the results of all such analyses, including any supporting modeling and workpapers in machine readable format. If not, explain why not.

55. Refer to p.4 of the testimony of Mark Hite. State whether Big Rivers or its agents performed any analyses comparing the NPVRR of the Build Case for any of the Wilson, Green, Coleman, Reid, or HMP&L generating units to the NPVRR of retiring and replacing the energy or capacity produced by each such unit. If so, produce any documents regarding those analyses, including any modeling (including input and output files) and workpapers in machine readable format.

56. Refer to p. 15 of the testimony of Mark Hite.

- a. Produce all reports, memoranda, presentations, or other documents provided to the Rural Utilities Service ("RUS"), CoBank, or the National Rural Utilities Cooperative Finance Corporation ("CFC") by either Big Rivers or Touchstone Energy since 2004 regarding:
 - i. the environmental compliance status of the Wilson, Green, Coleman, Reid, or HMP&L generating units,
 - ii. past, present or future environmental compliance of the Wilson, Green, Coleman, Reid, or HMP&L generating units,
- b. Please provide any application(s) for a loan or loan guarantee submitted to the RUS, CoBank, or CFC, including any supporting documentation for the loan or loan guarantee request, for the retrofits requested in these CPCNs for the Wilson, Green, Coleman, Reid, or HMP&L generating units;
- c. Please provide any response from RUS, Co-Bank, or CFC regarding a request for a loan or loan guarantee for retrofits proposed in this application of the Wilson,

Green, Coleman, Reid, or HMP&L generating units.

- d. If RUS, CoBank, or CFC has agreed to provide a loan or loan guarantee, please provide any loan or loan guarantee paperwork between RUS/CoBank/CFC and Big Rivers regarding the retrofit of the Wilson, Green, Coleman, Reid, or HMP&L generating units.
- e. Please provide any environmental assessment or environmental impact statement, including any drafts, prepared to support a loan or loan guarantee from RUS, CoBank, or CFC for the retrofits of the Wilson, Green, Coleman, Reid, or HMP&L generating units.
- f. If no environmental assessment or environmental impact statement was prepared for the retrofits proposed in this application because one or more of these projects fall under a categorical exclusion, please provide any correspondence or documents from RUS that discuss application of the categorical exclusion.
- g. Please continue to provide any such documentation as listed in (a)-(f) above as generated on a regular basis.

57. Refer to p. 15 of Mark A. Hite's Testimony, produce all reports, memoranda, presentations, or other documents provided to stockholders, investors, banks, investment firms, investment brokers or dealers, investment analysts, bond rating agencies, by either Big Rivers or Touchstone Energy since 2004 regarding:

- a. the environmental compliance status of the Wilson, Green, Coleman, Reid, or HMP&L generating units,
- b. past, present or future environmental compliance of the Wilson, Green, Coleman, Reid, or HMP&L generating units,
- c. litigation or settlements concerning environmental matters at the Wilson, Green, Coleman, Reid, or HMP&L generating units the Big Sandy plant, to the extent not covered by attorney-client privilege,
- d. past, present or future need for the Wilson, Green, Coleman, Reid, or HMP&L generating units, or the need for or plans for capital additions to any of those units, whether for environmental compliance or otherwise,
- e. any other matter that could affect the costs or output of the Wilson, Green, Coleman, Reid, or HMP&L generating units.
- f. To the extent not already provided in response to subsections a-e above, please provide any agendas, handouts, minutes, documents prepared for or resulting from each meeting of Big Rivers and/or Touchstone Energy with stockholders, investors, banks, investment firms, investment brokers or dealers, investment analysts, bond rating agencies or the like at which the matters listed above were discussed in any way
- g. Please continue to provide any such documentation as listed in (a)-(f) above as generated on a regular basis.

Respectfully submitted,



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Dated: May 21, 2012

CERTIFICATE OF SERVICE

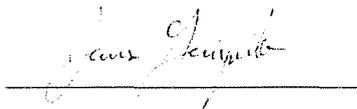
I certify that I mailed a copy of Ben Taylor and Sierra Club's First Request for Information from Big Rivers Electric Cooperative by first class mail on May 21, 2012 to the following:

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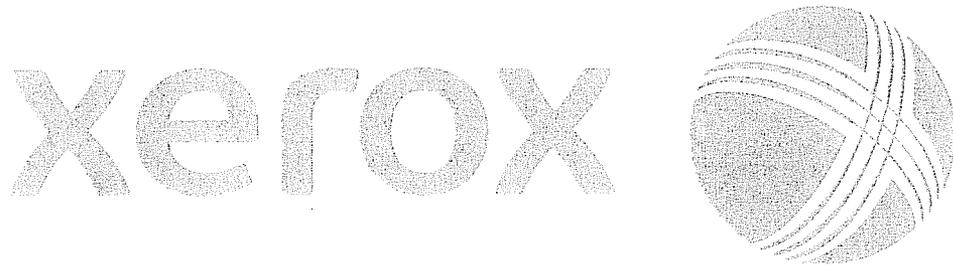
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James Giampietro

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**COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION**

In the Matter of:

**Application of Big Rivers Electric Cooperative for Approval of)
its 2012 Environmental Compliance Plan, Approval of its) CASE NO. 2012-00063
Amended Environmental Cost Recovery Surcharge Tariffs,)
and for the Certificates of Public Convenience and Necessity,)
and the Authority to Establish a Regulatory Account)**

**BEN TAYLOR AND SIERRA CLUB'S INITIAL REQUESTS FOR
INFORMATION TO BIG RIVERS ELECTRIC COOPERATIVE**

Proposed Intervenor Ben Taylor and Sierra Club (collectively "Movants") pursuant to the Kentucky Public Service Commission's ("Commission") April 30, 2012 Order ("April 12 Order"), propound the following requests for information on the Big Rivers Electric Cooperative's ("Big Rivers") regarding Big Rivers' application for certificates of public convenience and necessity and approval of its 2012 compliance plan that is the subject of the above captioned proceeding.

Big Rivers shall answer these requests for information in the manner set forth in the April 30 Order and by no later than the June 1, 2012 deadline set forth in the Appendix of the April 30 Order. Please produce the requested documents in electronic format at the offices of Sierra Club, 85 Second Street, 2nd Floor, San Francisco, CA 94105 or at such other location as may be mutually agreed upon between counsel of record.

Wherever the response to an interrogatory or request consists of a statement that the requested information is already available to the Proposed Intervenor, provide a detailed citation to the document that contains the information. This citation shall include the title of the

document, relevant page number(s), and to the extent possible paragraph number(s) and/or chart/table/figure number(s).

In the event that any document referred to in response to any request for information has been destroyed, specify the date and the manner of such destruction, the reason for such destruction, the person authorizing the destruction and the custodian of the document at the time of its destruction.

The Proposed Intervenors reserve the right to serve supplemental, revised, or additional discovery requests as permitted in this proceeding.

DEFINITIONS

Unless otherwise specified in each individual interrogatory or request, “you,” “your,” “Big Rivers,” “Cooperative” or “Company” refers to Big Rivers Electric Cooperative, and its affiliates, employees, and authorized agents.

“And” and “or” shall be construed either conjunctively or disjunctively as required by the context to bring within the scope of these interrogatories and requests for production of documents any information which might be deemed outside their scope by another construction.

“Any” means all or each and every example of the requested information.

“CFC” means National Rural Utilities Cooperative Finance Corporation

“CO₂” means carbon dioxide

“Communication” means any transmission or exchange of information between two or more persons, whether orally or in writing, and includes, without limitation, any conversation or discussion by means of letter, telephone, note, memorandum, telegraph, telex, telecopy, cable, email, or any other electronic or other medium.

“CPCN” means certificate of public convenience and necessity

“CSAPR” means the Cross-State Air Pollution Rule

“Document” refers to written matter of any kind, regardless of its form, and to information recorded on any storage medium, whether in electrical, optical or electromagnetic form, and capable of reduction to writing by the use of computer hardware and software, and includes all copies, drafts, proofs, both originals and copies either (1) in the possession, custody or control of the Companies regardless of where located, or (2) produced or generated by, known to or seen by the Companies, but now in their possession, custody or control, regardless of where located whether or still in existence.

Such “documents” shall include, but are not limited to, applications, permits, monitoring reports, computer printouts, contracts, leases, agreements, papers, photographs, tape recordings, transcripts, letters or other forms of correspondence, folders or similar containers, programs, telex, TWX and other teletype communications, memoranda, reports, studies, summaries, minutes, minute books, circulars, notes (whether typewritten, handwritten or otherwise), agenda, bulletins, notices, announcements, instructions, charts, tables, manuals, brochures, magazines, pamphlets, lists, logs, telegrams, drawings, sketches, plans, specifications, diagrams, drafts, books and records, formal records, notebooks, diaries, registers, analyses, projections, email correspondence or communications and other data compilations from which information can be obtained (including matter used in data processing) or translated, and any other printed, written, recorded, stenographic, computer-generated, computer-stored, or electronically stored matter, however and by whomever produced, prepared, reproduced, disseminated or made.

Without limitation, the term “control” as used in the preceding paragraphs means that a document is deemed to be in your control if you have the right to secure the document or a copy thereof from another person or public or private entity having actual possession thereof. If a

document is responsive to a request, but is not in your possession or custody, identify the person with possession or custody. If any document was in your possession or subject to your control, and is no longer, state what disposition was made of it, by whom, the date on which such disposition was made, and why such disposition was made.

For purposes of the production of “documents,” the term shall include copies of all documents being produced, to the extent the copies are not identical to the original, thus requiring the production of copies that contain any markings, additions or deletions that make them different in any way from the original

“DSM” means demand-side management programs including demand-response, interruptible load, and efficiency programs.

“ESP” means electrostatic precipitator

“FGD” means flue gas desulfurization

“HCl” means hydrogen chloride

“HMP&L” means Henderson Municipal Power & Light

“Identify” means:

- (a) With respect to a person, to state the person’s name, address and business relationship (e.g., “employee”) to Big Rivers;
- (b) With respect to a document, to state the nature of the document in sufficient detail for identification in a request for production, its date, its author, and to identify its custodian. If the information or document identified is recorded in electrical, optical or electromagnetic form, identification includes a description of the computer hardware or software required to reduce it to readable form.

“IRP” means Integrated Resource Plan

“MATS” means Mercury Air Toxics Standard Rule

“MWh” means megawatt-hours

“NOx” means nitrogen oxides

“NPV” means net present value

“NPVRR” means net present value of revenue requirements

“O&M” means operation and maintenance

“PRB” means the Powder River Basin

“Relating to” or “concerning” means and includes pertaining to, referring to, or having as a subject matter, directly or indirectly, expressly or implied, the subject matter of the specific request.

“RUS” means Rural Utilities Service

“SCR” means selective catalytic reduction technology

“SO₂” means sulfur dioxide

PRIVILEGE OR CONFIDENTIALITY

If you claim a privilege including, but not limited to, the attorney-client privilege or the work product doctrine, as grounds for not fully and completely responding to any interrogatory or request for production, describe the basis for your claim of privilege in sufficient detail so as to permit the Commission to adjudicate the validity of the claim if called upon to do so. With respect to documents for which a privilege is claimed, produce a “privilege log” that identifies the author, recipient, date and subject matter of the documents or interrogatory answers for which you are asserting a claim of privilege and any other information pertinent to the claim that would enable the Proposed Intervenors or the Commission to evaluate the validity of such claims.

To the extent that you can legitimately claim that any interrogatory response or responsive document is entitled to confidentiality, the Proposed Intervenors are willing to enter

into a confidentiality agreement that would protect such response or document from public disclosure.

TIME

Unless otherwise provided, the applicable time period for each of these requests for information is January 1, 2009 to the present.

REQUESTS FOR INFORMATION

1. For each of the Wilson, Green, Coleman, Reid, or HMP&L generating units:
 - a. Identify the expected retirement date
 - b. Produce the most recent depreciation study
 - c. Produce the most recent condition or performance assessment
 - d. Produce the most recent retirement, continued unit operation, or life extension study or analysis
 - e. Produce any analysis or assessment of the economics of continued operation of such unit
 - f. Produce any analysis or assessment of the impact that retirement of each unit would have on capacity adequacy, transmission grid stability, transmission grid support, voltage support, or transmission system reliability
 - g. Identify any transmission grid upgrades or changes that would be needed to permit the retirement of any of the units
 - h. Produce any analysis or assessment of the need for the continued operation of each unit.

2. For each of the Wilson, Green, Coleman, Reid, or HMP&L generating units, identify and produce any analysis of the net present value revenue requirement, cost, or feasibility of retiring the unit and replacing the energy or capacity produced by that unit with any of the following resources:
 - a. Energy efficiency
 - b. Demand side management
 - c. Demand response
 - d. Combined heat and power
 - e. Wind energy
 - f. Solar
 - g. Hydroelectric
 - h. Construction of a new natural gas combined cycle facility
 - i. Purchase of power from an existing natural gas combined cycle facility

- j. Purchase of an existing natural gas combined cycle facility
 - k. Natural gas combustion turbines
 - l. Power purchase agreements
 - m. A combination of any or all of the resources identified in subsections a through l above

3. For each of the Wilson, Green, Coleman, Reid, or HMP&L generating units, identify:
 - a. The annual non-environmental capital expenditures expected or projected to be made for each year from 2012 through 2031.
 - b. The annual fixed O&M costs for each year from 2012 through 2031.
 - c. The annual variable O&M costs for each year from 2012 through 2031.

4. Produce a non-redacted, full color or original digital copy of any Integrated Resource Plans (“IRPs”) created and/or filed by Big Rivers or its agents since 2004.

5. Produce any strategic or technical documents generated since 2004 by Big Rivers or its agents regarding mechanisms by which the company could or should comply with environmental regulations, including air quality compliance planning, water quality planning, and solid waste compliance planning.

6. Identify any CO₂ prices assumed in Big River’s Environmental Compliance Plan by either Big Rivers or its Agents for each year of 2012 through 2035, and explain how any such CO₂ prices were factored into Big River’s Environmental Compliance Plan Analysis.

7. Produce a copy of any forecast or projection of future CO₂ costs, taxes, or emissions allowances prices that has been prepared by or for Big Rivers.

8. Produce a copy of any plan for reducing CO₂ emissions that has been prepared by or for Big Rivers.

9. With respect to EPA’s GHG Tailoring Rule:
 - a. Does the Company anticipate that any of its units would be subject to EPA’s GHG Tailoring Rule? If so, when? If not, why not?
 - b. What impact does the Company anticipate the Tailoring Rule having on either the costs of operations of any of its units?
 - c. Please provide any work papers or modeling analysis that considers the cost

impacts associated with the Tailoring Rule.

10. EPA recently issued a proposed New Source Performance Standard that would regulate greenhouse gas emissions from electric generating units. In this proposed rule, EPA stated that it soon plans to issue regulations for existing electric generating units. With respect to EPA's forthcoming rule regulating greenhouse gas emissions for existing electric generating units ("EGUs"):
 - a. Does the Company anticipate that the forthcoming existing EGU greenhouse gas rule could impact any of its units? If so, what would be the expected cost of this rulemaking? If not, why not?
 - b. Has a cost for the he forthcoming existing EGU greenhouse gas rule been taken into account in the modeling done by the Company in support of its application for CPCN? If not, how would such a cost impact its analysis?
 - c. Please provide any work papers or modeling analysis that considers the cost impacts associated with the forthcoming existing EGU greenhouse gas rule.

11. With respect to new pollution control installations and CWA NPDES permits:
 - a. Does the Company expect that new pollution control installations would have any effect on current CWA NPDES permits at any of its units?
 - b. If applicable, please provide any of the Company's recent applications for changes or modifications to any of its NPDES permits.
 - c. Does the Company anticipate that the pending Effluent Limitation guidelines rule could impact any of its units? If so, what would be the expected cost of this rulemaking? If not, why not?
 - d. Has a cost for the pending Effluent Limitation guidelines been taken into account in the modeling done by the Company in support of its application for CPCN? If not, how would such a cost impact its analysis?

12. Produce a copy of any assessment of future natural gas prices and supplies that has been prepared by or for Big Rivers.

13. Produce a copy of any assessments of future coal prices and supplies that has been prepared by or for Big Rivers.

14. Refer to p. 6, lines 10-11 of the Application:
 - a. Identify the status of the engineering and design for each of the projects for which Big Rivers is seeking a CPCN
 - b. State when the engineering and design for each project is expected to be completed

- c. State how much money has been spent to date on engineering and design
 - d. Identify the estimated total cost for engineering and design for each project.

15. Refer to p. 13, lines 17-20 of the testimony of Robert Berry. For each of Big Rivers' customer classes, identify the date and size in percent of each rate increase that Big Rivers has implemented since 2003.

16. Refer to p. 16, lines 6-9 of the testimony of Robert Berry.
 - a. Identify the capacity factor at which the Big Rivers fleet could operate to comply with CSAPR without "significant capital investments in additional emissions reduction equipment"
 - b. Identify the capacity factor at which the Big Rivers fleet could operate to comply with MATS without "significant capital investments in additional emissions reduction equipment"

17. Refer to p. 18 of the testimony of Robert Berry and p. 3-4 of Ex. 2 to the testimony of William DePriest (the Sargent & Lundy Environmental Compliance Study). With regards to the new flue gas desulfurization system ("FGD") for Wilson Unit 1 referenced therein:
 - a. Identify the type of FGD that would be installed
 - b. Identify the basis for contending that the new FGD would achieve 99% removal of sulfur dioxide emissions from Wilson Unit 1
 - c. Produce any documents supporting the contention that the new FGD would achieve 99% removal of sulfur dioxide emissions from Wilson Unit 1.

18. Refer to p. 25, lines 8-13 of the testimony of Robert Berry. State whether the parasitic load related to each of the projects for which a CPCN is being sought in this filing would impact the cost of producing energy from any of the Big Rivers units. If so, identify the approximate impact. If not, explain why not.

19. Refer to p. 27 line 18 to p. 28 line 3 of the testimony of Robert Berry and p. 20, lines 9-16 of the testimony of William DePriest. With regards to the advanced low NOx burner systems for the Coleman Units:
 - a. Identify the capital cost of such system for each unit
 - b. Identify the O&M cost of such system for each unit
 - c. Identify the amount change to the NPVRR of the Build Case for the Coleman Units if the advanced low NOx burner systems were included
 - d. Produce any evaluation of the economics of installing advanced low NOx burner systems on the Coleman Units

20. Refer to p. 27 line 18 to p. 28 line 3 of the testimony of Robert Berry. With regards to the SCR for Green Unit 1:
 - a. Identify the capital cost of the SCR
 - b. Identify the annual O&M cost of the SCR
 - c. Identify the amount change to the NPVRR of the Build Case for Green Unit 1 if the SCR were included
 - d. Produce any evaluation of the economics of installing an SCR on Green Unit 1

21. Refer to page 27, lines 18-22 and page 28, lines 1-3 of the testimony of Robert Berry. Has Big Rivers done any analysis of the potential effects of the NAAQS reductions for any of its units? Please provide the work papers showing the results of this analysis.

22. Refer to p. 28, lines 16-18 of the testimony of Robert Berry. State whether the “additional precipitator testing” referenced therein has occurred. If so, describe and produce the results of such testing. If not, explain why not.

23. Refer to p. 29, lines 13-17 of the testimony of Robert Berry.
 - a. Identify the “magnitude of potential savings from DSM and energy efficiency” referenced therein.
 - b. Identify and produce any evaluation of the ability of Big Rivers to achieve energy savings through the use of DSM
 - c. Identify the magnitude of savings from DSM and energy efficiency would be needed to “materially assist Big Rivers in complying with CSAPR and MATS.”
 - d. Identify and produce any evaluation of the role that DSM could play in replacing the need for any of the projects for which a CPCN is sought in this proceeding
 - e. Describe the DSM and energy efficiency programs currently offered by Big Rivers, including demand-response, interruptible load, and efficiency programs.
 - f. Identify any additional DSM and energy efficiency programs Big Rivers intends to offer in the future.
 - g. For the DSM and energy efficiency programs currently offered by Big Rivers, identify the:
 - i. Cost
 - ii. Annual MW or MWh reductions achieved through such programs since their inception,
 - iii. Annual MW or MWh reductions projected to be achieved through such programs for each year through 2026,
 - iv. Expected life of the programs
 - v. Penetration of these programs.
 - h. Produce any DSM potential studies performed by or for Big Rivers in the last five

years, including attendant workbooks or calculations. Describe if or how the results of such studies are incorporated into the current case. If they are not, explain why not.

24. Refer to Exhibit 4 of the testimony of Robert Berry. With regards to the capital cost estimates for the proposed WFGD for the Wilson plant:
 - a. Identify what “SESS” stands for
 - b. Produce the “SESS budget proposal number 4296”
 - c. Describe how the WFGD capital cost estimate was derived from the SESS budget proposal number 4296
 - d. Produce any document supporting or regarding the WFGD capital cost estimate that was derived from or included in the SESS budget proposal number 4296

25. Refer to p. 8, lines 20-23 of the testimony of William DePriest.
 - a. Identify any “engineering services” that Sargent & Lundy is contracted to perform “to help implement” the projects for which Big Rivers is seeking CPCNs in this proceeding.
 - b. If Big Rivers has not presently contracted with Sargent & Lundy for any such engineering services, state whether Big Rivers is considering having Sargent & perform such engineering services for any of the projects.

26. Refer to p. 13, lines 15-24 of the testimony of William DePriest.
 - a. Please identify which financial model Big Rivers used, who is the vendor of the model, and whether the model is a proprietary model that requires a license in order to gain access to the files.
 - b. Produce, in machine-readable format, all of the models (including input and output files) and worksheets used to generate the capital costs, O&M costs, and NPV for each of the technologies evaluated as part of the compliance study.
 - c. Please identify any changes to the input files that may be required to reproduce the modeling.
 - d. If changes are required, please specify why such changes were done.
 - e. Please identify the assumptions, including any supporting documentation, Big Rivers or its agents used in each base case and sensitivity scenario that you modeled
 - f. If a license is required to obtain access to any information in this request, please explain who Sierra Club should contact to either obtain that license or present information that Sierra Club or its experts already have a license for that model.

27. According to page 20, lines 11-16 of the testimony of William DePriest, Big Rivers plans

to meet CSAPR regulations in part with the purchase of NOx allowances.

- a. Has Big Rivers done any analysis of the future market for NOx allowances in Kentucky? If so, please provide any work papers associated with that analysis.
- b. Is the Company certain that enough allowances will be available for purchase such that the Company can meet its allowance obligation?

28. According to page 20, lines 19-24 of the testimony of William DePriest, the potential impacts of the proposed EPA rule for Section 316(b) of the Clean Water Act were considered by S&L.

- a. Does the Company anticipate that this pending regulation would impact any of its units? If so, what would be the expected cost of this rulemaking? If not, why not?
- b. Has a cost for the pending 316(b) rule been taken into account in the modeling done by the Company in support of its application for CPCN? If not, how would such a cost impact its analysis?
- c. Please provide any work papers or modeling analysis that considers the cost impacts associated with the 316(b) rule.

29. According to page 20, lines 19-24 of the testimony of William DePriest, the potential impacts of the proposed EPA rule for Coal Combustion Residuals (CCR) were considered by S&L.

- a. Does the Company anticipate that this pending regulation would impact any of its units? If so, what would be the expected cost of this rulemaking? If not, why not?
- b. Has a cost for the pending Coal Combustion Residuals rule been taken into account in the modeling done by the Company in support of its application for CPCN? If not, how would such a cost impact its analysis?
- c. Please provide any work papers or modeling analysis that considers the cost impacts associated with the CCR rule.

30. Refer to p. ES-9 of Exhibit 2 to the testimony of William DePriest.

- a. Explain why no technology was selected for compliance with potential Coal Combustion Residue regulations for the Wilson and Reid plants.
- b. Identify the amount change to the NPVRR of the Build Case for the Coleman, Green, and HMP&L units if Coal Combustion Residue compliance were included

31. Refer to p. 1-3 of Exhibit 2 to the testimony of William DePriest (the Sargent & Lundy Environmental Compliance Study).

- a. For each cost identified in Table 1-1, identify for what year the value that is listed is for
- b. For each cost identified in Table 1-1, identify what the value was assumed to be in each year through 2033 for purposes of the environmental compliance study

- c. For each of the following costs, identify the basis for the value used in the environmental compliance study, and produce any documents supporting such values
 - i. Coal
 - ii. Natural gas
 - iii. SO₂ allowances
 - iv. NO_x allowances
 - v. Sorbent – Hydrated Lime
 - vi. Activated Carbon

32. Identify Big Rivers' actual electric energy sales in MWh and actual peak loads in MW for each year since 2004.

33. Identify Big Rivers' projected electric energy sales in MWh and projected peak demand in MW for each year of 2012 through 2033.

34. Identify Big Rivers' projected electric energy sales in MWh and projected peak demand in MW for each year of 2012 through 2033 if:
 - a. the Century Aluminum of Kentucky General Partnership aluminum smelter stops purchasing power from Big Rivers
 - b. the Alcan Primary Products Corporation aluminum smelter stops purchasing power from Big Rivers
 - c. if both the Century and Alcan aluminum smelters stop purchasing power from Big Rivers.

35. Refer to p. 1-8 of Ex. 2 to the testimony of William DePriest (the Sargent & Lundy Environmental Compliance Study). With regards to the low-NO_x burner upgrades at Wilson and HMP&L units 1 and 2 identified therein:
 - a. Explain what is meant that Big Rivers has "committed" to such upgrades
 - b. Identify the status of those upgrades and, if they have not yet commenced, when Big Rivers expects to commence them
 - c. Identify the capital cost of such upgrade for each unit
 - d. Identify by how much per year such upgrades are estimated to reduce O&M costs for each unit

36. Refer to p. 2-4 of Ex. 2 to the testimony of William DePriest (the Sargent & Lundy Environmental Compliance Study). With regards to the baseline mercury, HCl, and SO₂ emissions for each unit identified in Tables 2-3 and 2-4 therein:

- a. Identify and produce each stack test upon which the baseline emissions figures are based
 - b. State whether such stack tests are reflective of the emissions that would be measured through the use of a continuous emission monitor including during times of startup and shutdown. If so, how? If not, why not?
 - c. State whether the environmental compliance cost would increase if the reductions in mercury, HCl, or SO₂ needed to bring the Big Rivers units into compliance with the MATS rule were higher than the “required reduction” identified in Tables 2-3 and 2-4.
 - d. State whether the control technologies selected would change if the reductions in mercury, HCl, or SO₂ needed to bring the Big Rivers units into compliance with the MATS rule were higher than the “required reduction” identified in Tables 2-3 and 2-4.
37. Refer to p. 2-4 of Ex. 2 to the testimony of William DePriest (the Sargent & Lundy Environmental Compliance Study). State whether the “additional stack test data . . . needed to more accurately predict HCl emissions from each unit” has been collected. If not, why not? If so, produce such data.
38. Refer to p. 3-4 of Ex. 2 to the testimony of William DePriest (the Sargent & Lundy Environmental Compliance Study). Identify the number of excess SO₂ credits per year that are estimated to result if the FGD proposed for the Wilson plant removes 99% of SO₂ emissions. State whether such excess credits are assumed to be sold or used at other Big Rivers units.
39. Refer to p. 3-5 of Ex. 2 to the testimony of William DePriest (the Sargent & Lundy Environmental Compliance Study). Identify which “currently available FGD technology has been proven to achieve removal efficiency of > 99%” for SO₂ emissions, and whether such greater than 99% removal efficiency is on a continuous basis.
40. Refer to p. 3-6 of Ex. 2 to the testimony of William DePriest (the Sargent & Lundy Environmental Compliance Study). With regards to the statement that “the effect of sorbent injection on ESP performance should be tested before implementation”:
- a. State whether such testing has occurred.
 - i. If not, why not?
 - ii. If so, produce the results of such testing.
 - b. Produce any evaluation of the adequacy of the existing ESPs at the Wilson, Green, and Coleman units to ensure compliance with applicable particulate matter emission limits after the addition of dry sorbent injection and activated carbon injection.

- c. If the existing ESPs are inadequate to ensure compliance at any of the Wilson, Green, or Coleman units:
 - i. Identify the capital and annual O&M costs for each unit for upgrading the ESP
 - ii. Identify the capital and annual O&M costs for each unit for installing a polishing baghouse
 - iii. Identify the capital and annual O&M costs for each unit for installing a full baghouse

41. Refer to p. 5-2 of Ex. 2 to the testimony of William DePriest (the Sargent & Lundy Environmental Compliance Study). With regards to the conversion of Green Units 1 and 2 referenced in Table 5-1, identify the cost of natural gas for each year that was used in estimating the \$47.2 million O&M cost.

42. Refer to p. 5-11 of Ex. 2 to the testimony of William DePriest (the Sargent & Lundy Environmental Compliance Study). Identify the basis for the conclusion that the “break even” gas pricing for converting Green Units 1 and 2 to natural gas is \$2.23/mmBtu. Produce any modeling and worksheets, in machine-readable format, upon which that conclusion is based.

43. Refer to p. 1 of Ex. 3 to the testimony of William DePriest. Identify and produce the stack test results upon which the data in Table 1 on that page is based.

44. Refer to p. 2 of Ex. 3 to the testimony of William DePriest. State whether Big Rivers has had Sargent & Lundy develop the computer-based model of ESPs described therein. If so, produce the results of such modeling. If not, explain why not.

45. Refer to Ex. 4 to the testimony of William DePriest:
 - a. Identify the average and maximum sulfur content, in lbs/mmBtu, of the coal burned in each of the Big Rivers generating units for each of the past five years
 - b. Identify the assumed sulfur content, in lbs/mmBtu, of the PRB coal evaluated in the fuel switching analysis set forth in Ex. 4.
 - c. State whether you analyzed using other types of coal, such as lower-sulfur bituminous coal, to achieve compliance with CSAPR. If so, produce any documents regarding such analysis. If not, explain why not.
 - d. Identify the sulfur content, in lbs/mmBtu, that would need to be burned in the Big Rivers generating units to achieve compliance with CSAPR.

46. Refer to p. 5 of Ex. 4 to the testimony of William DePriest.
- a. Identify the basis for the assumption that Big Rivers' bituminous coal costs \$2.00/mmBtu.
 - b. Identify the basis for the assumption that "PRB fuels are likely to cost closer to \$3.00/mmBtu"
 - c. Produce any documents supporting the assumed bituminous and PRB coal costs.
47. Refer to p. 5 of Ex. 4 to the testimony of William DePriest.
- a. State whether capital changes would be needed to any of the HMP&L, Wilson, or Green units in order for such unit to be able to burn bituminous coal with a lower sulfur content than the coal currently burned in those units.
 - b. If the answer to subsection (a) is yes, identify the estimated cost of such changes for each unit.
48. Refer to p. 60 of the Environmental Regulatory Review prepared by Sergeant & Lundy, which is attached to William DePriest's Testimony as App. 4. Did Big Rivers or its agents ever consider the material probability that the Kentucky General Assembly will pass clean energy legislation, such as the Clean Energy Opportunity Act (HB 167), between 2012 and 2035?
- a. If yes, please explain the basis for Big River's position.
 - b. If no, please explain why the Big Rivers or its Agents did not include this possibility in its sensitivity analyses?
 - c. Is it Big Rivers' position that there is no material probability that U.S. Congress or the state of Kentucky will pass legislation between 2012 and 2035 requiring specific quantities of retail electric energy requirements to be met from renewable sources of energy and/or energy efficiency?
 - d. If yes, please explain the basis for Big Rivers' position.
 - e. If no, please explain why Big Rivers did not include this possibility in its sensitivity analyses?
49. Refer to p. 6 of the testimony of Mark Hite, lines 13-17. For the "Buy Case," did Big Rivers evaluate locking in supplies and prices under long-term purchase power agreements for a portion of its requirements under the Buy Case?
- a. If not please explain why not.
 - b. If yes, please provide that analysis.
50. Refer to Mark Hite's testimony, lines 1-17, regarding the discussion of alternatives

considered

- a. Explain whether a RFQ solicitation for capacity and energy was issued as an additional alternative to reliance on the market capacity and energy and pricing.
- b. Explain the rationale for only considering market participation as an alternative.
- c. If a RFQ solicitation was issued, provide the analysis of the bids, including the terms of the bids and why each bid received was not acceptable.
- d. If a RFQ solicitation was not issued seeking capacity and energy, explain the rationale for not seeking such a solicitation.

51. Refer to p. 6 of the testimony of Mark Hite, lines 1-17. Please confirm that Big Rivers or its agents did not model a natural gas alternative in the cost-effectiveness modeling.

52. Refer to p. 6 line 19 through p. 7 line 17 of the testimony of Mark Hite.

- a. Please identify which financial model Big Rivers used, who is the vendor of the model, and whether the model is a proprietary model that requires a license in order to gain access to the files.
- b. Please produce, in machine readable format, all of the financial modeling (including input and output files) and workpapers used to determine the NPVRR for each scenario evaluated by Big Rivers or its agents.
- c. Please identify any changes to the input files that may be required to reproduce the modeling.
- d. If changes were made, please explain why such changes were made.
- e. Please identify the assumptions, including any supporting documentation, Big Rivers or its agents used in each base case and sensitivity scenario that you modeled
- f. If a license is required to obtain access to any information in this request, please explain who Sierra Club should contact to either obtain that license or present information that Sierra Club or its experts already have a license for that model.

53. Refer to p. 7 line 20 to p. 8 line 5 of the testimony of Mark Hite. Identify and produce:

- a. All forward pricing data received from PACE Global for the production cost modeling.
- b. All Big Rivers plant specific data that was supplied to ACES Power Marketing.
- c. Please identify which financial model ACES Power Marketing used, who is the vendor of the model, and whether the model is a proprietary model that requires a license in order to gain access to the files.
- d. Please produce, in machine readable format, all of the production cost modeling

(including input and output files) and workpapers used to determine the NPVRR for each scenario generated by ACES Power Marketing

- e. Please identify any changes to the input files that may be required to reproduce the modeling.
- f. If changes are required, please explain why such changes were made.
- g. Please identify the assumptions, including any supporting documentation, Big Rivers or its agents used in each base case and sensitivity scenario that you modeled
- h. If a license is required to obtain access to any information in this request, please explain how Sierra Club could obtain that license or, if they already have a license, who they should provide information to regarding the license to obtain the files.

54. Refer to p. 10, lines 10-12 of the testimony of Mark Hite. State whether any other sensitivity analyses, besides the No Smelter Case, were performed by Big Rivers or its agents. If so, produce the results of all such analyses, including any supporting modeling and workpapers in machine readable format. If not, explain why not.

55. Refer to p.4 of the testimony of Mark Hite. State whether Big Rivers or its agents performed any analyses comparing the NPVRR of the Build Case for any of the Wilson, Green, Coleman, Reid, or HMP&L generating units to the NPVRR of retiring and replacing the energy or capacity produced by each such unit. If so, produce any documents regarding those analyses, including any modeling (including input and output files) and workpapers in machine readable format.

56. Refer to p. 15 of the testimony of Mark Hite.

- a. Produce all reports, memoranda, presentations, or other documents provided to the Rural Utilities Service (“RUS”), CoBank, or the National Rural Utilities Cooperative Finance Corporation (“CFC”) by either Big Rivers or Touchstone Energy since 2004 regarding:
 - i. the environmental compliance status of the Wilson, Green, Coleman, Reid, or HMP&L generating units,
 - ii. past, present or future environmental compliance of the Wilson, Green, Coleman, Reid, or HMP&L generating units,
- b. Please provide any application(s) for a loan or loan guarantee submitted to the RUS, CoBank, or CFC, including any supporting documentation for the loan or loan guarantee request, for the retrofits requested in these CPCNs for the Wilson, Green, Coleman, Reid, or HMP&L generating units;
- c. Please provide any response from RUS, Co-Bank, or CFC regarding a request for a loan or loan guarantee for retrofits proposed in this application of the Wilson,

Green, Coleman, Reid, or HMP&L generating units.

- d. If RUS, CoBank, or CFC has agreed to provide a loan or loan guarantee, please provide any loan or loan guarantee paperwork between RUS/CoBank/CFC and Big Rivers regarding the retrofit of the Wilson, Green, Coleman, Reid, or HMP&L generating units.
- e. Please provide any environmental assessment or environmental impact statement, including any drafts, prepared to support a loan or loan guarantee from RUS, CoBank, or CFC for the retrofits of the Wilson, Green, Coleman, Reid, or HMP&L generating units.
- f. If no environmental assessment or environmental impact statement was prepared for the retrofits proposed in this application because one or more of these projects fall under a categorical exclusion, please provide any correspondence or documents from RUS that discuss application of the categorical exclusion.
- g. Please continue to provide any such documentation as listed in (a)-(f) above as generated on a regular basis.

57. Refer to p. 15 of Mark A. Hite's Testimony, produce all reports, memoranda, presentations, or other documents provided to stockholders, investors, banks, investment firms, investment brokers or dealers, investment analysts, bond rating agencies, by either Big Rivers or Touchstone Energy since 2004 regarding:

- a. the environmental compliance status of the Wilson, Green, Coleman, Reid, or HMP&L generating units,
- b. past, present or future environmental compliance of the Wilson, Green, Coleman, Reid, or HMP&L generating units,
- c. litigation or settlements concerning environmental matters at the Wilson, Green, Coleman, Reid, or HMP&L generating units the Big Sandy plant, to the extent not covered by attorney-client privilege,
- d. past, present or future need for the Wilson, Green, Coleman, Reid, or HMP&L generating units, or the need for or plans for capital additions to any of those units, whether for environmental compliance or otherwise,
- e. any other matter that could affect the costs or output of the Wilson, Green, Coleman, Reid, or HMP&L generating units.
- f. To the extent not already provided in response to subsections a-e above, please provide any agendas, handouts, minutes, documents prepared for or resulting from each meeting of Big Rivers and/or Touchstone Energy with stockholders, investors, banks, investment firms, investment brokers or dealers, investment analysts, bond rating agencies or the like at which the matters listed above were discussed in any way
- g. Please continue to provide any such documentation as listed in (a)-(f) above as generated on a regular basis.

Respectfully submitted,



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Dated: May 21, 2012

CERTIFICATE OF SERVICE

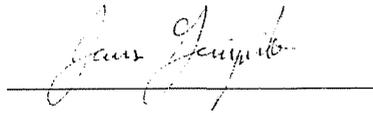
I certify that I mailed a copy of Ben Taylor and Sierra Club's First Request for Information from Big Rivers Electric Cooperative by first class mail on May 21, 2012 to the following:

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Boehm, Kurtz & Lowry
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Cincinnati, OH 45202

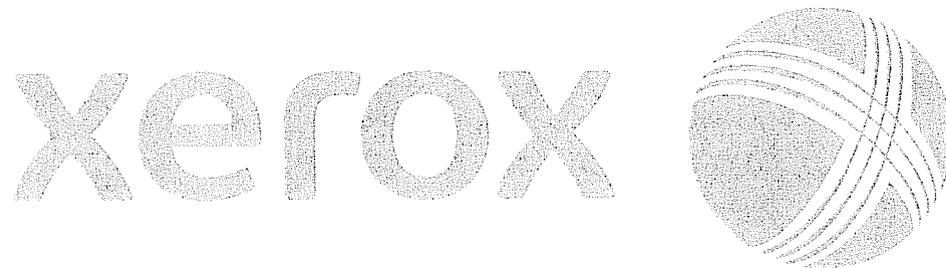
David C. Brown, Esq.
Stites & Harbison
1800 Aegon Center, 400 West Market Street
Louisville, KY 40202



James Giampietro

KWalton

 2012-00063 SC PHV for Kristin Henry 2012-06-0
 08/17/12 11:44 AM



**COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION**

In the Matter of:

**Application of Big Rivers Electric Cooperative for Approval of)
its 2012 Environmental Compliance Plan, Approval of its) CASE NO. 2012-00063
Amended Environmental Cost Recovery Surcharge Tariffs,)
and for the Certificates of Public Convenience and Necessity,)
and the Authority to Establish a Regulatory Account)**

MOTION TO ADMIT PRO HAC VICE BY SIERRA CLUB

COMES NOW Intervenor Sierra Club, by and through counsel, hereby seeks to have admitted to practice law in Kentucky, for the limited purpose of this matter, Hon. Kristin Henry, Counsel for Sierra Club, 85 2nd Street Floor 2, San Francisco, CA 94105. Mrs. Henry is a member in good standing of the State Bar of California (CA Bar No. 220908).

Attached please find an approved Kentucky Bar Association (KBA) out-of-state counsel certification form confirming payment of \$270, pursuant to Kentucky Supreme Court Rule 3.030, as well as a proposed order for the Commission.

WHEREFORE, the Commission is hereby requested to enter an Order permitting Mrs. Henry to appear *pro hac vice* in this case.

Respectfully submitted,

Dated: June 7, 2012



Joe Childers, Esq.
Joe F. Childers & Associates
300 Lexington Building
201 West Short Street
Lexington, Kentucky 40507
859-253-9824
859-258-9288 (facsimile)

Of counsel:

Kristin Henry
Staff Attorney
Sierra Club
85 Second Street
San Francisco, CA 94105
Phone: (415) 977-5716
Fax: (415) 977-5793
kristin.henry@sierraclub.org

CERTIFICATE OF SERVICE

I certify that I mailed a copy of the following documents by first class mail on June 7, 2012 to the below parties of record:

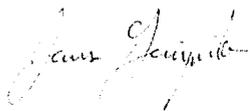
- Motion to Admit Kristin Henry Pro Hac Vice
- Kentucky Bar Association Out-Of-State Certification Form
- Proposed Commission Order

James M. Miller, Esq.
Tyson Kamuf
Sullivan, Mountjoy, Stainback & Miller, PSC
100 Saint Ann Street
P.O. Box 727
Owensboro, KY 42302-0727

Jennifer B. Hans
Larry Cook
Matt James
Assistant Attorney General's Office
1024 Capital Center Drive, Suite 200
Frankfort, KY 40601-8204

Michael L. Kurtz
Kurt J. Boehm
Boehm, Kurtz & Lowry
36 East Seventh Street, Suite 1510
Cincinnati, OH 45202

David C. Brown, Esq.
Stites & Harbison
1800 Aegon Center, 400 West Market Street
Louisville, KY 40202



James Giampietro

KENTUCKY BAR ASSOCIATION

514 WEST MAIN STREET
FRANKFORT, KENTUCKY 40601-1812

(502) 564-3795

FAX (502) 564-3225

www.kybar.org

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M. Gail Wilson

KENTUCKY BAR ASSOCIATION OUT-OF-STATE CERTIFICATION FORM

COURT Kentucky Public Service Commission

CASE NO. 2012-00063

SCR 3.030 Membership, practice by nonmembers and classes of membership

(2) A person admitted to practice in another state, but not in this state, shall be permitted to practice a case in this state only if that attorney subjects himself or herself to the jurisdiction and rules of the court governing professional conduct, pays a per case fee of \$270.00 to the Kentucky Bar Association and engages a member of the association as co-counsel, whose presence shall be necessary at all trials and at other times when required by the court. No motion for permission to practice in any state court in this jurisdiction shall be granted without submission to the admitting court of a certification from the Kentucky Bar Association of receipt of this fee.

The Kentucky Bar Association certifies that Kristin Henry has paid the per case fee of \$270.00 in the above referenced case as required in SCR 3.030(2).

A handwritten signature in cursive script that reads 'Michele M. Pogrotsky'. The signature is written in black ink and is positioned above a horizontal line.

Michele M. Pogrotsky, Deputy Registrar

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

Application of Big Rivers Electric Cooperative)	
For Approval of its 2012 Environmental)	
Compliance Plan, Approval of its Amended)	
Environmental Cost Recovery Surcharge Tariffs,)	
and for the Certificates of Public Convenience	)	CASE NO. 2012-00063
and Necessity, and the Authority to Establish)	
a Regulatory Account)	

ORDER

On June 7, 2012, Joe F. Childers, an attorney licensed to practice law in the Commonwealth of Kentucky, who is representing Intervenor Sierra Club, moved the Commission to admit *pro hac vice* Kristin Henry, an attorney whose office is in the state of California, to practice law before the Commission on behalf of Intervenor Ben Taylor and Sierra Club in this case. In support of the request, Kristin Henry has shown that she is a member in good standing of another state bar and has been certified to practice before the Commission in this case by the Kentucky Bar Association under Supreme Court Rule 3.030(2). In addition, Kristin Henry has agreed to be subject to the jurisdiction and rules of the Commission and the Kentucky Bar Association.

IT IS THEREFORE ORDERED that Kristin Henry is admitted *pro hac vice* for the purpose of representing Intervenor Ben Taylor and Sierra Club in the above-styled proceeding provided that Joe F. Childers, Joe F. Childers & Associates, 300 Lexington Building, 201 West Short Street, Lexington, KY 40507, or another member of the

Kentucky Bar Association, acts as co-counsel and is present at any and all proceedings before this Commission.

By the Commission

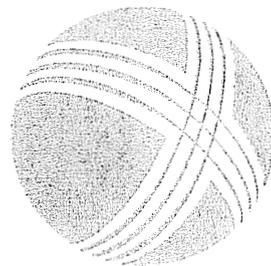
ATTEST:

Executive Director

KWalton

 2012-00063 SC Cvr Ltr re Conf. Sub 2012-06-27.
 08/17/12 11:44 AM

xerox





VIA COURIER AND EMAIL

June 27, 2012

Mr. Jeff Derouen
Executive Director
Kentucky Public Service Commission
211 Sower Boulevard
Frankfort, Kentucky 40601

**Re: Intervenor Ben Taylor and Sierra Club's 3rd Set of Requests for Information to
Big Rivers Electric Corp.
Docket 2012-00063**

Dear Mr. Derouen,

Enclosed please find 11 copies of the public version of Ben Taylor and Sierra Club's 3rd set of requests for information to Big Rivers Electric Corp. in docket 2012-00063. All questions in this discovery request include information that is subject to a petition for confidential treatment filed by James Miller and Tsyon Kamuf, Counsel for Big Rivers Electric Corp. A confidential version of this discovery request will be filed separately with the Commission today.

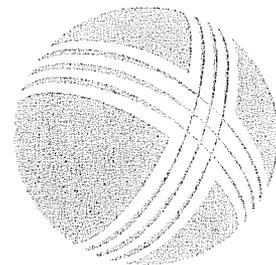
Sincerely,

James Giampietro
Sierra Club Environmental Law Program
85 2nd Street, 2nd Floor
San Francisco CA, 94105
Office: (415)977-5638
james.giampietro@sierraclub.org

KWalton

 2012-00063 SC 3rd Data Rqst to Big Rivers [PU]
 08/17/12 11:44 AM

xerox



**COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION**

In the Matter of:

**Application of Big Rivers Electric Corporation for Approval)
of its 2012 Environmental Compliance Plan, Approval of its) CASE NO. 2012-00063
Amended Environmental Cost Recovery Surcharge Tariffs,)
and for the Certificates of Public Convenience and Necessity,)
and the Authority to Establish a Regulatory Account)**

**BEN TAYLOR AND SIERRA CLUB’S SUPPLEMENTAL REQUESTS FOR
MODELING-RELATED INFORMATION TO
BIG RIVERS ELECTRIC CORPORATION
(PUBLIC VERSION)**

Intervenors Ben Taylor and Sierra Club (collectively “Environmental Intervenors”) pursuant to the Kentucky Public Service Commission’s (“Commission”) April 30, 2012 Order (“April 30 Order”) and the Commission’s June 19, 2012 Order (“June 19 Order”), propound the following supplemental requests for modeling-related information on the Big Rivers Electric Corporation (“Big Rivers”) regarding Big Rivers’ application for certificates of public convenience and necessity and approval of its 2012 compliance plan that is the subject of the above captioned proceeding (hereafter referred to as “Environmental Intervenors Third Request for Information”).

Big Rivers shall answer these requests for information in the manner set forth in the April 30 Order and by no later than the July 6, 2012 deadline set forth in the Appendix of the June 19 Order. Please produce the requested documents in electronic format at the offices of Sierra Club, 85 Second Street, 2nd Floor, San Francisco, CA 94105 or at such other location as may be mutually agreed upon between counsel of record.

Wherever the response to an interrogatory or request consists of a statement that the requested information is already available to the Environmental Intervenors, provide a detailed citation to the document that contains the information. This citation shall include the title of the document, relevant page number(s), and to the extent possible paragraph number(s) and/or chart/table/figure number(s).

In the event that any document referred to in response to any request for information has been destroyed, specify the date and the manner of such destruction, the reason for such destruction, the person authorizing the destruction and the custodian of the document at the time of its destruction.

The Environmental Intervenors reserve the right to serve supplemental, revised, or additional discovery requests as permitted in this proceeding.

DEFINITIONS

Unless otherwise specified in each individual interrogatory or request, “you,” “your,” “Big Rivers,” “BREC,” “Cooperative” or “Company” refers to Big Rivers Electric Corporation, and its affiliates, employees, and authorized agents.

“And” and “or” shall be construed either conjunctively or disjunctively as required by the context to bring within the scope of these interrogatories and requests for production of documents any information which might be deemed outside their scope by another construction.

“Any” means all or each and every example of the requested information.

“CO₂” means carbon dioxide

“Communication” means any transmission or exchange of information between two or more persons, whether orally or in writing, and includes, without limitation, any conversation or

discussion by means of letter, telephone, note, memorandum, telegraph, telex, telecopy, cable, email, or any other electronic or other medium.

“Document” refers to written matter of any kind, regardless of its form, and to information recorded on any storage medium, whether in electrical, optical or electromagnetic form, and capable of reduction to writing by the use of computer hardware and software, and includes all copies, drafts, proofs, both originals and copies either (1) in the possession, custody or control of the Companies regardless of where located, or (2) produced or generated by, known to or seen by the Companies, but now in their possession, custody or control, regardless of where located whether or still in existence.

Such “documents” shall include, but are not limited to, applications, permits, monitoring reports, computer printouts, contracts, leases, agreements, papers, photographs, tape recordings, transcripts, letters or other forms of correspondence, folders or similar containers, programs, telex, TWX and other teletype communications, memoranda, reports, studies, summaries, minutes, minute books, circulars, notes (whether typewritten, handwritten or otherwise), agenda, bulletins, notices, announcements, instructions, charts, tables, manuals, brochures, magazines, pamphlets, lists, logs, telegrams, drawings, sketches, plans, specifications, diagrams, drafts, books and records, formal records, notebooks, diaries, registers, analyses, projections, email correspondence or communications and other data compilations from which information can be obtained (including matter used in data processing) or translated, and any other printed, written, recorded, stenographic, computer-generated, computer-stored, or electronically stored matter, however and by whomever produced, prepared, reproduced, disseminated or made.

Without limitation, the term “control” as used in the preceding paragraphs means that a document is deemed to be in your control if you have the right to secure the document or a copy

thereof from another person or public or private entity having actual possession thereof. If a document is responsive to a request, but is not in your possession or custody, identify the person with possession or custody. If any document was in your possession or subject to your control, and is no longer, state what disposition was made of it, by whom, the date on which such disposition was made, and why such disposition was made.

For purposes of the production of “documents,” the term shall include copies of all documents being produced, to the extent the copies are not identical to the original, thus requiring the production of copies that contain any markings, additions or deletions that make them different in any way from the original

“FGD” means flue gas desulfurization

“Identify” means:

- (a) With respect to a person, to state the person’s name, address and business relationship (e.g., “employee”) to Big Rivers;
- (b) With respect to a document, to state the nature of the document in sufficient detail for identification in a request for production, its date, its author, and to identify its custodian. If the information or document identified is recorded in electrical, optical or electromagnetic form, identification includes a description of the computer hardware or software required to reduce it to readable form.

“KIUC” means Kentucky Industrial Utility Customers

“O&M” means operation and maintenance

“OSS” means off-system sales

“Relating to” or “concerning” means and includes pertaining to, referring to, or having as a subject matter, directly or indirectly, expressly or implied, the subject matter of the specific request.

PRIVILEGE OR CONFIDENTIALITY

If you claim a privilege including, but not limited to, the attorney-client privilege or the work product doctrine, as grounds for not fully and completely responding to any interrogatory or request for production, describe the basis for your claim of privilege in sufficient detail so as to permit the Commission to adjudicate the validity of the claim if called upon to do so. With respect to documents for which a privilege is claimed, produce a “privilege log” that identifies the author, recipient, date and subject matter of the documents or interrogatory answers for which you are asserting a claim of privilege and any other information pertinent to the claim that would enable the Environmental Intervenors or the Commission to evaluate the validity of such claims.

To the extent that you can legitimately claim that any interrogatory response or responsive document is entitled to confidentiality, the Environmental Intervenors are willing to enter into a confidentiality agreement that would protect such response or document from public disclosure.

TIME

Unless otherwise provided, the applicable time period for each of these requests for information is January 1, 2009 to the present.

REQUESTS FOR INFORMATION

1. [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
 - a. [REDACTED]
[REDACTED]
 - b. [REDACTED]
[REDACTED]

c. [Redacted]
[Redacted]
[Redacted]

2. [Redacted]
[Redacted]
[Redacted]
[Redacted]

3. [Redacted]
[Redacted]
[Redacted]
[Redacted]
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a. [Redacted]
b. [Redacted]
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4. [Redacted]

a. [Redacted]
[Redacted]

i. [Redacted]
[Redacted]
[Redacted]

b. [Redacted]
[Redacted]

i. [Redacted]
[Redacted]
[Redacted]

5. [Redacted]

a. [Redacted]
[Redacted]

i. [Redacted]
[Redacted]
[Redacted]

b. [Redacted]

[Redacted]

- i. [Redacted]

6. [Redacted]

- a. [Redacted]

- i. [Redacted]

- b. [Redacted]

- i. [Redacted]

7. [Redacted]

- a. [Redacted]

- b. [Redacted]

- c. [Redacted]

8. [Redacted]

9. [Redacted]

- a. [redacted]
 - i. [redacted]
 - ii. [redacted]
- b. [redacted]
 - i. [redacted]
 - ii. [redacted]
- c. [redacted]

10. [redacted]
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[redacted]

11. [redacted]
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- a. [redacted]
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 - b. [redacted]
[redacted]

12. [redacted]
[redacted]
[redacted]
[redacted]
[redacted]

13. [redacted]
[redacted]
[redacted]
[redacted]

14. [redacted]
- a. [redacted]

[Redacted]
[Redacted]
b. [Redacted]
[Redacted]

15. [Redacted]
a. [Redacted]
[Redacted]
i. [Redacted]
ii. [Redacted]

16. [Redacted]
[Redacted]
[Redacted]
[Redacted]
[Redacted]
a. [Redacted]
b. [Redacted]

17. [Redacted]
a. [Redacted]
[Redacted]
[Redacted]
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[Redacted]
b. [Redacted]
[Redacted]
[Redacted]
[Redacted]
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c. [Redacted]
[Redacted]
[Redacted]
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[Redacted]
d. [Redacted]
[Redacted]
[Redacted]
[Redacted]

- e. [Redacted]
- f. [Redacted]
- g. [Redacted]
- h. [Redacted]
- i. [Redacted]
- j. [Redacted]
- k. [Redacted]
- i. [Redacted]
- ii. [Redacted]

18. [Redacted]
- a. [Redacted]
 - b. [Redacted]
 - c. [Redacted]

- [REDACTED]
- [REDACTED]
- d. [REDACTED]
- [REDACTED]
- [REDACTED]
- e. [REDACTED]
- [REDACTED]
- f. [REDACTED]
- [REDACTED]
- g. [REDACTED]
- [REDACTED]

19. [REDACTED]

- a. [REDACTED]
- [REDACTED]
- b. [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- c. [REDACTED]
- [REDACTED]
- d. [REDACTED]
- [REDACTED]
- e. [REDACTED]
- [REDACTED]
- f. [REDACTED]
- [REDACTED]
- g. [REDACTED]
- [REDACTED]

20. [REDACTED]

- a. [REDACTED]
- b. [REDACTED]

[Redacted]

- i. [Redacted]
- ii. [Redacted]

21. [Redacted]

- a. [Redacted]
- b. [Redacted]
- c. [Redacted]
- d. [Redacted]
- e. [Redacted]

22. [Redacted]

- a. [Redacted]
- b. [Redacted]

Respectfully submitted,



Joe Childers, Esq.
Joe F. Childers & Associates
300 Lexington Building
201 West Short Street
Lexington, Kentucky 40507
859-253-9824
859-258-9288 (facsimile)

Of counsel:

Kristin Henry
Staff Attorney
Sierra Club
85 Second Street
San Francisco, CA 94105
Phone: (415)977-5716
Fax: (415) 977-5793
kristin.henry@sierraclub.org

Dated: June 27, 2012

CERTIFICATE OF SERVICE

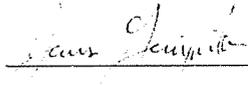
I certify that I mailed a copy of Ben Taylor and Sierra Club's Supplemental Requests for Modeling-Related Information to Big Rivers Electric Corporation by first class mail on June 27, 2012 to the following:

James M. Miller, Esq.
Tyson Kamuf
Sullivan, Mountjoy, Stainback & Miller, PSC
100 Saint Ann Street
P.O. Box 727
Owensboro, KY 42302-0727

Jennifer B. Hans
Matt James
Lawrence Cook
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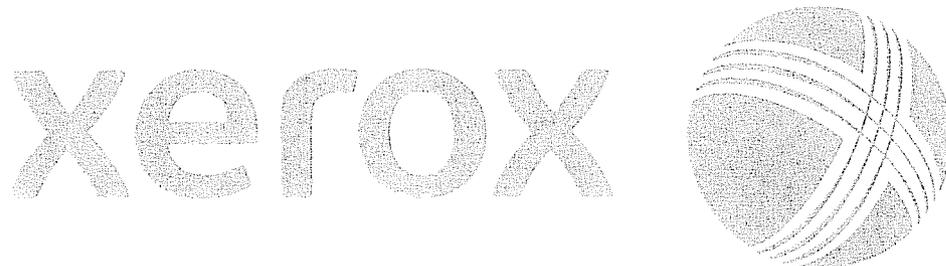
David C. Brown, Esq.
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1800 Aegon Center, 400 West Market Street
Louisville, KY 40202



James Giampietro

KWalton

 Microsoft Word - 2012-00063 SC 3rd Data Rqst
 08/17/12 11:44 AM



**COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION**

In the Matter of:

**Application of Big Rivers Electric Corporation for Approval)
of its 2012 Environmental Compliance Plan, Approval of its) CASE NO. 2012-00063
Amended Environmental Cost Recovery Surcharge Tariffs,)
and for the Certificates of Public Convenience and Necessity,)
and the Authority to Establish a Regulatory Account)**

**BEN TAYLOR AND SIERRA CLUB’S SUPPLEMENTAL REQUESTS FOR
MODELING-RELATED INFORMATION TO
BIG RIVERS ELECTRIC CORPORATION
(PUBLIC VERSION)**

Intervenors Ben Taylor and Sierra Club (collectively “Environmental Intervenors”) pursuant to the Kentucky Public Service Commission’s (“Commission”) April 30, 2012 Order (“April 30 Order”) and the Commission’s June 19, 2012 Order (“June 19 Order”), propound the following supplemental requests for modeling-related information on the Big Rivers Electric Corporation (“Big Rivers”) regarding Big Rivers’ application for certificates of public convenience and necessity and approval of its 2012 compliance plan that is the subject of the above captioned proceeding (hereafter referred to as “Environmental Intervenors Third Request for Information”).

Big Rivers shall answer these requests for information in the manner set forth in the April 30 Order and by no later than the July 6, 2012 deadline set forth in the Appendix of the June 19 Order. Please produce the requested documents in electronic format at the offices of Sierra Club, 85 Second Street, 2nd Floor, San Francisco, CA 94105 or at such other location as may be mutually agreed upon between counsel of record.

Wherever the response to an interrogatory or request consists of a statement that the requested information is already available to the Environmental Intervenors, provide a detailed citation to the document that contains the information. This citation shall include the title of the document, relevant page number(s), and to the extent possible paragraph number(s) and/or chart/table/figure number(s).

In the event that any document referred to in response to any request for information has been destroyed, specify the date and the manner of such destruction, the reason for such destruction, the person authorizing the destruction and the custodian of the document at the time of its destruction.

The Environmental Intervenors reserve the right to serve supplemental, revised, or additional discovery requests as permitted in this proceeding.

DEFINITIONS

Unless otherwise specified in each individual interrogatory or request, “you,” “your,” “Big Rivers,” “BREC,” “Cooperative” or “Company” refers to Big Rivers Electric Corporation, and its affiliates, employees, and authorized agents.

“And” and “or” shall be construed either conjunctively or disjunctively as required by the context to bring within the scope of these interrogatories and requests for production of documents any information which might be deemed outside their scope by another construction.

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“Communication” means any transmission or exchange of information between two or more persons, whether orally or in writing, and includes, without limitation, any conversation or

discussion by means of letter, telephone, note, memorandum, telegraph, telex, telecopy, cable, email, or any other electronic or other medium.

“Document” refers to written matter of any kind, regardless of its form, and to information recorded on any storage medium, whether in electrical, optical or electromagnetic form, and capable of reduction to writing by the use of computer hardware and software, and includes all copies, drafts, proofs, both originals and copies either (1) in the possession, custody or control of the Companies regardless of where located, or (2) produced or generated by, known to or seen by the Companies, but now in their possession, custody or control, regardless of where located whether or still in existence.

Such “documents” shall include, but are not limited to, applications, permits, monitoring reports, computer printouts, contracts, leases, agreements, papers, photographs, tape recordings, transcripts, letters or other forms of correspondence, folders or similar containers, programs, telex, TWX and other teletype communications, memoranda, reports, studies, summaries, minutes, minute books, circulars, notes (whether typewritten, handwritten or otherwise), agenda, bulletins, notices, announcements, instructions, charts, tables, manuals, brochures, magazines, pamphlets, lists, logs, telegrams, drawings, sketches, plans, specifications, diagrams, drafts, books and records, formal records, notebooks, diaries, registers, analyses, projections, email correspondence or communications and other data compilations from which information can be obtained (including matter used in data processing) or translated, and any other printed, written, recorded, stenographic, computer-generated, computer-stored, or electronically stored matter, however and by whomever produced, prepared, reproduced, disseminated or made.

Without limitation, the term “control” as used in the preceding paragraphs means that a document is deemed to be in your control if you have the right to secure the document or a copy

thereof from another person or public or private entity having actual possession thereof. If a document is responsive to a request, but is not in your possession or custody, identify the person with possession or custody. If any document was in your possession or subject to your control, and is no longer, state what disposition was made of it, by whom, the date on which such disposition was made, and why such disposition was made.

For purposes of the production of “documents,” the term shall include copies of all documents being produced, to the extent the copies are not identical to the original, thus requiring the production of copies that contain any markings, additions or deletions that make them different in any way from the original

“FGD” means flue gas desulfurization

“Identify” means:

- (a) With respect to a person, to state the person’s name, address and business relationship (e.g., “employee”) to Big Rivers;
- (b) With respect to a document, to state the nature of the document in sufficient detail for identification in a request for production, its date, its author, and to identify its custodian. If the information or document identified is recorded in electrical, optical or electromagnetic form, identification includes a description of the computer hardware or software required to reduce it to readable form.

“KIUC” means Kentucky Industrial Utility Customers

“O&M” means operation and maintenance

“OSS” means off-system sales

“Relating to” or “concerning” means and includes pertaining to, referring to, or having as a subject matter, directly or indirectly, expressly or implied, the subject matter of the specific request.

PRIVILEGE OR CONFIDENTIALITY

If you claim a privilege including, but not limited to, the attorney-client privilege or the work product doctrine, as grounds for not fully and completely responding to any interrogatory or request for production, describe the basis for your claim of privilege in sufficient detail so as to permit the Commission to adjudicate the validity of the claim if called upon to do so. With respect to documents for which a privilege is claimed, produce a “privilege log” that identifies the author, recipient, date and subject matter of the documents or interrogatory answers for which you are asserting a claim of privilege and any other information pertinent to the claim that would enable the Environmental Intervenors or the Commission to evaluate the validity of such claims.

To the extent that you can legitimately claim that any interrogatory response or responsive document is entitled to confidentiality, the Environmental Intervenors are willing to enter into a confidentiality agreement that would protect such response or document from public disclosure.

TIME

Unless otherwise provided, the applicable time period for each of these requests for information is January 1, 2009 to the present.

REQUESTS FOR INFORMATION

1. [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
 - a. [REDACTED]
[REDACTED]
 - b. [REDACTED]
[REDACTED]

c. [Redacted]

2. [Redacted]

3. [Redacted]

a. [Redacted]
b. [Redacted]

4. [Redacted]
a. [Redacted]

i. [Redacted]

b. [Redacted]

i. [Redacted]

5. [Redacted]
a. [Redacted]

i. [Redacted]

b. [Redacted]

[Redacted]

- i. [Redacted]

6. [Redacted]

- a. [Redacted]

- i. [Redacted]

- b. [Redacted]

- i. [Redacted]

7. [Redacted]

- a. [Redacted]
- b. [Redacted]

- c. [Redacted]

8. [Redacted]

9. [Redacted]

- a. [Redacted]
 - i. [Redacted]
 - ii. [Redacted]
- b. [Redacted]
 - i. [Redacted]
 - ii. [Redacted]
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19. [REDACTED]

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- b. [Redacted]

Respectfully submitted,



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Dated: June 27, 2012

CERTIFICATE OF SERVICE

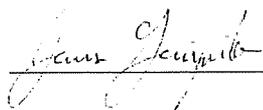
I certify that I mailed a copy of Ben Taylor and Sierra Club's Supplemental Requests for Modeling-Related Information to Big Rivers Electric Corporation by first class mail on June 27, 2012 to the following:

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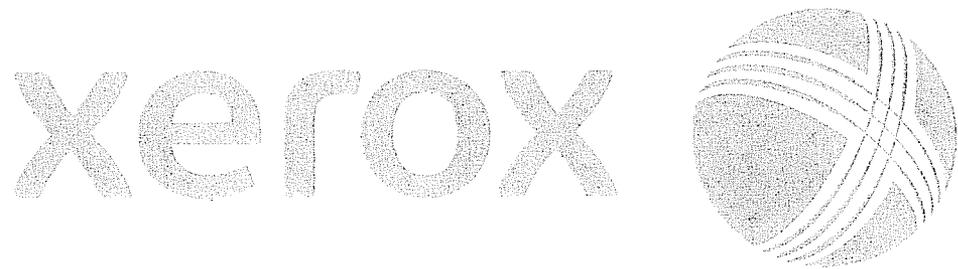
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James Giampietro

KWalton

 2012-00063 SC 2nd Data Rqst to Big Rivers [PU
 08/17/12 11:44 AM



**COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION**

In the Matter of:

**Application of Big Rivers Electric Corporation for Approval)
of its 2012 Environmental Compliance Plan, Approval of its) CASE NO. 2012-00063
Amended Environmental Cost Recovery Surcharge Tariffs,)
and for the Certificates of Public Convenience and Necessity,)
and the Authority to Establish a Regulatory Account)**

PUBLIC VERSION

**BEN TAYLOR AND SIERRA CLUB’S SUPPLEMENTAL REQUESTS FOR
INFORMATION TO BIG RIVERS ELECTRIC CORPORATION**

Intervenors Ben Taylor and Sierra Club (collectively “Environmental Intervenors”) pursuant to the Kentucky Public Service Commission’s (“Commission”) April 30, 2012 Order (“April 30 Order”) and the Commission’s June 19, 2012 Order (“June 19 Order”), propound the following supplemental requests for information on the Big Rivers Electric Corporation (“Big Rivers”) regarding Big Rivers’ application for certificates of public convenience and necessity and approval of its 2012 compliance plan that is the subject of the above captioned proceeding. As provided for in the June 19 Order, Environmental Intervenors reserve the right to submit additional supplemental requests for information regarding modeling-related information by June 27, 2012.

Big Rivers shall answer these requests for information in the manner set forth in the April 30 Order and by no later than the July 6, 2012 deadline set forth in the Appendix of the June 19 Order. Please produce the requested documents in electronic format at the offices of Sierra Club,

85 Second Street, 2nd Floor, San Francisco, CA 94105 or at such other location as may be mutually agreed upon between counsel of record.

Wherever the response to an interrogatory or request consists of a statement that the requested information is already available to the Environmental Intervenors, provide a detailed citation to the document that contains the information. This citation shall include the title of the document, relevant page number(s), and to the extent possible paragraph number(s) and/or chart/table/figure number(s).

In the event that any document referred to in response to any request for information has been destroyed, specify the date and the manner of such destruction, the reason for such destruction, the person authorizing the destruction and the custodian of the document at the time of its destruction.

The Environmental Intervenors reserve the right to serve supplemental, revised, or additional discovery requests as permitted in this proceeding.

DEFINITIONS

Unless otherwise specified in each individual interrogatory or request, “you,” “your,” “Big Rivers,” “BREC,” “Cooperative” or “Company” refers to Big Rivers Electric Corporation, and its affiliates, employees, and authorized agents.

“And” and “or” shall be construed either conjunctively or disjunctively as required by the context to bring within the scope of these interrogatories and requests for production of documents any information which might be deemed outside their scope by another construction.

“Any” means all or each and every example of the requested information.

“CO₂” means carbon dioxide

“Communication” means any transmission or exchange of information between two or more persons, whether orally or in writing, and includes, without limitation, any conversation or discussion by means of letter, telephone, note, memorandum, telegraph, telex, telecopy, cable, email, or any other electronic or other medium.

“CPCN” means certificate of public convenience and necessity

“CSAPR” means the Cross-State Air Pollution Rule

“Document” refers to written matter of any kind, regardless of its form, and to information recorded on any storage medium, whether in electrical, optical or electromagnetic form, and capable of reduction to writing by the use of computer hardware and software, and includes all copies, drafts, proofs, both originals and copies either (1) in the possession, custody or control of the Companies regardless of where located, or (2) produced or generated by, known to or seen by the Companies, but now in their possession, custody or control, regardless of where located whether or still in existence.

Such “documents” shall include, but are not limited to, applications, permits, monitoring reports, computer printouts, contracts, leases, agreements, papers, photographs, tape recordings, transcripts, letters or other forms of correspondence, folders or similar containers, programs, telex, TWX and other teletype communications, memoranda, reports, studies, summaries, minutes, minute books, circulars, notes (whether typewritten, handwritten or otherwise), agenda, bulletins, notices, announcements, instructions, charts, tables, manuals, brochures, magazines, pamphlets, lists, logs, telegrams, drawings, sketches, plans, specifications, diagrams, drafts, books and records, formal records, notebooks, diaries, registers, analyses, projections, email correspondence or communications and other data compilations from which information can be obtained (including matter used in data processing) or translated, and any other printed, written,

recorded, stenographic, computer-generated, computer-stored, or electronically stored matter, however and by whomever produced, prepared, reproduced, disseminated or made.

Without limitation, the term “control” as used in the preceding paragraphs means that a document is deemed to be in your control if you have the right to secure the document or a copy thereof from another person or public or private entity having actual possession thereof. If a document is responsive to a request, but is not in your possession or custody, identify the person with possession or custody. If any document was in your possession or subject to your control, and is no longer, state what disposition was made of it, by whom, the date on which such disposition was made, and why such disposition was made.

For purposes of the production of “documents,” the term shall include copies of all documents being produced, to the extent the copies are not identical to the original, thus requiring the production of copies that contain any markings, additions or deletions that make them different in any way from the original

“DSM” means demand-side management programs including demand-response, interruptible load, and efficiency programs.

“Environmental retrofit” refers to retrofits contemplated in this docket for the purposes of meeting environmental compliance obligations

“Environmental retrofit unit” means generating units owned or operated by BREC that are expected to obtain environmental retrofits as contemplated in this docket.

“ESP” means electrostatic precipitator

“FGD” means flue gas desulfurization

“HCl” means hydrogen chloride

“HMP&L” means Henderson Municipal Power & Light

“Identify” means:

- (a) With respect to a person, to state the person’s name, address and business relationship (e.g., “employee”) to Big Rivers;
- (b) With respect to a document, to state the nature of the document in sufficient detail for identification in a request for production, its date, its author, and to identify its custodian. If the information or document identified is recorded in electrical, optical or electromagnetic form, identification includes a description of the computer hardware or software required to reduce it to readable form.

“MATS” means Mercury Air Toxics Standard Rule

“MISO” means Midwest Independent Transmission System Operator, Inc

“MWh” means megawatt-hours

“NOx” means nitrogen oxides

“NPV” means net present value

“NPVRR” means net present value of revenue requirements

“O&M” means operation and maintenance

“Relating to” or “concerning” means and includes pertaining to, referring to, or having as a subject matter, directly or indirectly, expressly or implied, the subject matter of the specific request.

“SCR” means selective catalytic reduction technology

“SO₂” means sulfur dioxide

PRIVILEGE OR CONFIDENTIALITY

If you claim a privilege including, but not limited to, the attorney-client privilege or the work product doctrine, as grounds for not fully and completely responding to any interrogatory or request for production, describe the basis for your claim of privilege in sufficient detail so as to permit the Commission to adjudicate the validity of the claim if called upon to do so. With

respect to documents for which a privilege is claimed, produce a “privilege log” that identifies the author, recipient, date and subject matter of the documents or interrogatory answers for which you are asserting a claim of privilege and any other information pertinent to the claim that would enable the Environmental Intervenors or the Commission to evaluate the validity of such claims.

To the extent that you can legitimately claim that any interrogatory response or responsive document is entitled to confidentiality, the Environmental Intervenors are willing to enter into a confidentiality agreement that would protect such response or document from public disclosure.

TIME

Unless otherwise provided, the applicable time period for each of these requests for information is January 1, 2009 to the present.

REQUESTS FOR INFORMATION

1. Refer to your response to SC 1-3, which gives annual capital and O&M expenditures by plant:
 - a. Please provide the annual non-environmental capital expenditures expected or projected to be made by year, **by unit**, and by expenditure type for each of the years listed in your response.
 - b. Please provide annual fixed O&M costs by year, **by unit** for the environmental controls requested in this CPCN.
 - c. Please provide annual fixed O&M costs by year, **by unit** for all other equipment.
 - d. Please provide annual variable O&M costs by year, **by unit** for the environmental controls requested in this CPCN.
 - e. Please provide annual variable O&M costs by year, **by unit** for all other equipment.

2. Please confirm or deny the following:

- a. BREC is requesting environmental surcharge and CPCN for environmental retrofits with capital and O&M estimates developed only by Sargent & Lundy and presented in Exhibit Berry-2.
 - i. If environmental surcharge and/or CPCN capital and/or O&M estimates have been developed or vetted by any other party aside from Sargent & Lundy, please provide such estimates and the source documentation and work papers from which those estimates are derived.
 - b. To date, BREC has not contracted for engineering services for any of the environmental retrofits.
 - i. If BREC has contracted for engineering services, please provide the name of each engineering services contractor, the date engineering services were contracted, the specific services and retrofits for which BREC has contracted, and any reports or files delivered to date by each such contractor.
 - c. The estimated environmental retrofit capital costs do not include owner's costs.
 - d. The estimated environmental retrofit capital costs do not include AFUDC.
 - e. To date, BREC has not contracted for procurement services for any of the environmental retrofits.
 - i. If BREC has contracted for procurement services, please provide the name of each procurement services contractor, the date procurement services were contracted, the specific retrofits for which services were contracted, and any reports or files delivered to date by each such contractor.
3. Regarding the estimated capital expenditures for each environmental control contemplated in this proceeding:
- a. Please define the error range (in %+/- or \$+/-) of the estimates for each of the environmental controls;
 - b. State whether BREC considers each of these estimates preliminary, developing, or final (i.e. contractually certain)? If BREC uses other terminology to define this stage of estimate development, please provide the appropriate terminology.
 - c. Please provide the estimated annual capital outlay for each of the environmental controls, without AFUDC, in nominal dollars. Please provide in electronic spreadsheet form.
 - d. Please provide the estimated annual AFUDC for each of the environmental controls. Please provide in electronic spreadsheet form.
 - e. Will BREC return to this Commission for an environmental surcharge adjustment if the capital and/or O&M costs of the environmental retrofit projects are higher than predicted by S&L? If so, when?
 - f. Will BREC return to this Commission for an environmental surcharge adjustment if the capital and/or O&M costs of the environmental retrofit projects are lower than predicted by S&L? If so, when?

4. Please provide a record of each major capital project (i.e., individual projects over \$20 million) at each of BREC's coal-fired generating units from 2000-2012, inclusive. For each project, please provide the year, descriptive title, unit or units applicable, the estimated capital cost at this stage of development (as defined in request 3b, above), the final capital cost, and the capital amount approved for recovery from Kentucky ratepayers (exclusive of returns on investment). Please provide in electronic spreadsheet form.

5. With respect to BREC unit equivalent availability, forced outage rates, and heat rates:
 - a. State whether BREC expects constant, increasing, or decreasing unit availability for each of the environmental retrofit units.
 - b. Please provide an annual forecast for unit availability for each of the environmental retrofit units through 2026. Please provide in electronic spreadsheet form.
 - c. State whether BREC expects constant, increasing, or decreasing forced outage rates for each of the environmental retrofit units.
 - d. Please provide an annual forecast for forced outage rates each of the environmental retrofit units through 2026. Please provide in electronic spreadsheet form.
 - e. State whether BREC expects constant, increasing, or decreasing heat rates for each of the environmental retrofit units.
 - f. Provide an annual forecast for heat rates for each of the environmental retrofit units through 2026.
 - g. Please provide any work papers or studies documenting expected future unit availability, equivalent forced outage rates, or heat rates at the BREC units through 2026.

6. Refer to Exhibit Berry-2:
 - a. State whether BREC expects that the emission control projects shown in Exhibit Berry-2 will have any impact on unit heat rates.
 - b. Please identify any changes in unit heat rates that might be expected as a result of emissions control projects.
 - c. Please provide the work papers detailing expected changes in unit heat rates with the addition of emissions control projects.

7. Refer to p. 27 line 18 to p. 28 line 3 of the testimony of Robert Berry
 - a. State whether the Company is aware of the President's statement dated September 2011 on the delay of the ozone NAAQS to 2013?

- b. Please explain, in detail, the discrepancy between the President's commitment to reconsider the ozone standard in 2013 and the Company's assertion that "potential NAAQS reductions are not expected to be published until 2016."
 - c. State whether the Company is aware of the "Draft Regulatory Impact Analysis Final National Ambient Air Quality Standard for Ozone" issued by the EPA, dated July 2011 (http://www.epa.gov/airquality/ozonepollution/pdfs/201107_OMBdraft-OzoneRIA.pdf)?
 - d. At what level does the Company expect new primary ozone NAAQS, if issued, to be set (in parts per million)?

8. Refer to p. 27 line 18 to p. 28 line 3 of the testimony of Robert Berry, and to the responses to SC 1-19 and SC 1-20:
 - a. If more stringent ozone NAAQS reductions are indeed promulgated in 2016 and require compliance by 2018, would BREC apply for a CPCN from the Commission for any required emissions control projects?
 - b. If so, when does the Company expect it would need to file its application?
 - c. Would BREC expect to recover capital cost expenditures incurred as a result of ozone NAAQS compliance?
 - d. Has BREC quantified the rate increase that might be expected if advanced low NOx burners are installed at the Coleman units? If so, please identify the expected rate increase resulting from installation advanced low NOx burners at the Coleman units.
 - e. Please provide any work papers that detail the calculations behind the expected rate increase associated with the advanced low NOx burners at the Coleman units.
 - f. Has BREC quantified the rate increase that might be expected if an SCR is installed at Green Unit 1? If so, please identify the expected rate increase resulting from installation of an SCR at Green Unit 1.
 - g. Please provide any work papers that detail the calculations behind the expected rate increase associated with the installation of an SCR at Green Unit 1.

9. Refer to the Company's response to SC 1-35:
 - a. For what purpose did the Company choose to retrofit the burners at HMP&L 1 & 2 and Wilson? Please provide a detailed description.
 - b. Please provide citations to regulatory requirements or other decisions requiring such retrofits.
 - c. Please provide air and construction permits issued by the Kentucky Department for Environmental Protection (KY DEP).
 - d. Please provide applications or notices provided by the Company to the KY DEP requesting such permits.

- e. Please provide documentation and/or workpapers supporting the decision to retrofit the burners at HMP&L 1 & 2, and Wilson. Provide any spreadsheets in original, electronic format.
- f. Please provide the schedule associated with the capital expenditures for the low NOx burner (LNB) upgrades at the HMP&L and Wilson units, by year and by unit, which gives a timeline detailing capital that has already been spent, as well as capital that has yet to be spent. Please provide schedule in electronic spreadsheet form.
- g. Please provide a schedule of cancellation fees for the LNB projects.
- h. What percentage of capital expenditures could be avoided if the HMP&L and/or Wilson LNB projects were to be canceled as of July 1st, 2012?
- i. What percentage of capital expenditures could be avoided if the HMP&L and/or Wilson units were to retire in 2013?
- j. What percentage of capital expenditures could be avoided if the HMP&L and/or Wilson units were to retire in 2015?

10. Refer to Company's response to SC 1-40:

- a. With respect to ESP upgrades:
 - i. When does BREC expect to test the effect of dry sorbent injection on ESP performance? If BREC does not expect to conduct such a test, explain why not.
 - ii. If ESP upgrades are in fact required at any of BREC's units, does the Company expect to apply for a CPCN from the Commission for these projects?
 - iii. If BREC expects to apply for a CPCN for such ESP upgrades, when does the Company expect it would need to file its application?
 - iv. Would BREC expect to recover capital cost expenditures incurred as a result of ESP upgrades?
 - v. Has BREC quantified the rate increase that might be expected if ESP upgrades are necessary?
 - vi. Please identify the expected rate increase resulting from any ESP upgrades.
 - vii. Please provide any work papers that detail the calculations behind the expected rate increase associated with the ESP upgrades.
- b. With respect to polishing baghouse technology:
 - i. If BREC determines that ESP upgrades are still not sufficient for MATS compliance at one or more units, does the Company plan to evaluate polishing baghouse technology?
 - ii. If BREC determines that a polishing baghouse is necessary at one or more units, does the Company expect to apply for a CPCN from the Commission?
 - iii. If BREC expects to apply for a CPCN for such polishing baghouse upgrades, when does the Company expect it would need to file its application?

- iv. Would BREC expect to recover capital cost expenditures incurred as a result of polishing baghouse upgrades?
 - v. Would BREC expect to recover capital cost expenditures incurred as a result of polishing baghouse installation?
 - vi. Has BREC quantified the rate increase that might be expected if a polishing baghouse is necessary at one or more units?
 - vii. Please identify the expected rate increase resulting from any polishing baghouse installations.
 - viii. Please provide any work papers that detail the calculations behind the expected rate increase associated with a polishing baghouse at one or more units.
- c. With respect to full baghouse technology:
- i. If BREC determines that ESP upgrades are still not sufficient for MATS compliance at one or more units, does the Company plan to evaluate full baghouse technology?
 - ii. If BREC determines that a full baghouse is necessary at one or more units, does the Company expect to apply for a CPCN from the Commission?
 - iii. If BREC expects to apply for a CPCN for such full baghouse upgrades, when does the Company expect it would need to file its application?
 - iv. Would BREC expect to recover capital cost expenditures incurred as a result of full baghouse upgrades?
 - v. Would BREC expect to recover capital cost expenditures incurred as a result of full baghouse installation?
 - vi. Has BREC quantified the rate increase that might be expected if a full baghouse is necessary at one or more units?
 - vii. Please identify the expected rate increase resulting from any full baghouse installations.
 - viii. Please provide any work papers that detail the calculations behind the expected rate increase associated with a full baghouse at one or more units.

11. Refer to your response to Staff 1-3:

- a. Are the market energy purchases that will be made during the time Wilson is offline taken into account in BREC's calculations of revenue requirements and NPVRR?
- b. Please provide the quantities of market purchases and associated prices that are expected to occur while Wilson is offline.

12. Refer to your response to Staff 1-37:

- a. Are the market energy purchases that will be made during the time the BREC units are offline taken into account in BREC's modeling and calculations of revenue requirements and NPVRR?

- b. Please provide the quantities of market purchases and associated prices that are expected to occur while the BREC units are offline.
13. Refer to your response to Staff 1-19, which states that “there is no capital cost component associated with increasing the limestone quality”:
- a. State whether there is an O&M cost component associated with increasing the limestone quality.
 - b. If so, is that included in the O&M cost estimate shown in Exhibit Berry-2?
 - c. Please provide an estimate of the O&M cost of increasing the limestone quality, by year.
 - d. State whether limestone of better quality has been tested in the Coleman units to ensure that it does in fact improve the performance of the scrubber.
 - e. If so, please provide the results of those tests.
 - f. If not, explain why not.
14. Refer to p. 8 lines 4-11 of the testimony of William DePriest, which describes the types and quantities of projects for which S&L has provided, or is providing, engineering services.
- a. State whether S&L is providing or has provided engineering services for any projects relating to the Coal Combustion Residuals rule.
 - b. If so, how many?
 - c. If not, how many utilities have asked S&L for estimates of the expected cost of compliance with the CCR rule?
 - d. State whether S&L is providing or has provided engineering services for any projects relating to the 316(b) rule?
 - e. If so, how many?
 - f. If not, how many utilities have asked S&L for estimates of the expected cost of compliance with the 316(b) rule?
15. Refer to p. 15 lines 11-22 of the testimony of William DePriest, which recommends low NOx burners at the Coleman units in order to reduce the burden of purchasing allowances to comply with CSAPR, but states that “future allowance pricing will play a role in whether this recommendation is exercised.”
- a. When does BREC expect to make a decision as to whether low NOx burners will be installed at the Coleman units?
 - b. What is the allowance price at which BREC believes low NOx burners on the Coleman units become the more economic choice for NOx compliance?

16. Refer to p. 20 lines 13-16 of the testimony of William DePriest, which states that BREC will have the option of purchasing NOx compliance allowances in lieu of using low NOx burners at the Coleman units. Are these NOx allowance purchases taken into account in BREC's modeling and calculations of revenue requirements and NPVRR?
17. Refer to p. 21 lines 12-23 of the testimony of William DePriest, which states that the Wilson FGD and Green 2 SCR projects will not be completed in time to meet current CSAPR requirements in 2014.
 - a. Has BREC quantified and modeled the SO2 and NOx allowances that it expects to have banked in 2014?
 - b. Has BREC quantified and modeled the SO2 and NOx allowances that it expects to need to purchase from 2014 until the time these projects are completed?
 - c. Does BREC expect that the emissions control projects necessary to comply with the MATS rule will be completed by the compliance deadline?
 - d. If not, how does BREC expect to comply with the MATS rule?
18. Refer to Exhibit DePriest-2, page 5-1, which states that capital cost estimates for emission control projects do not include owner costs or AFUDC.
 - a. Please provide estimates of owner costs for each of the emission control projects examined by Sargent & Lundy in this study, including those not selected by BREC for installation.
 - b. Please provide estimates of AFUDC for each of the emission control projects examined by Sargent & Lundy in this study, including those not selected by BREC for installation.
19. Refer to p. 9 line 18 of the testimony of John Wolfram, which lists "emissions allowance expense" as one of the cost components to be included in BREC's proposed ES tariff rider.
 - a. Please provide all work papers that demonstrate how BREC quantified the amount of emissions allowances it expects to purchase and the associated cost.
 - b. What does BREC plan to do if the emissions allowance expense is much higher than anticipated?
 - c. What does BREC plan to do if the emissions allowance expense is much lower than anticipated?
20. Refer to the December 11, 2011 Financial Statement of Big Rivers, provided as an attachment to response AG 1-37: Please explain why the fuel cost seen in the Statements of Operations increases by over 250% from 2009 to 2010

21. Refer to your response to AG 1-55. Please explain why there was the need for a 3% rate increase in “buy” scenario, but not in the “build” scenario to meet the TIER requirement.
22. Refer to your response to Staff 1-31. Please comment on how a 1.1 TIER would affect the results of the 2012 Compliance Plan, instead of the 1.24 TIER currently being used.
23. Refer to your response to KIUC 1-33, which mentions three different sets of forward power prices. Please state which power prices were used and in which section of the analysis, referencing any specific spreadsheet workbooks that have already been provided, and producing any spreadsheet workbooks that have not yet been provided.
24. Refer to Table 5-8 of Exhibit DePriest-2. Please provide any spreadsheets, modeling and calculations associated with the analysis behind the “Break Even” natural gas price for conversion of the Reid 1 or Green 1 & 2 units.
25. 
26. Does Big Rivers currently have an interruptible agreement with the smelters or any other large commercial or industrial customers to reduce load in event of an emergency or at times of high peak demand?
 - a. If not, has Big Rivers ever considered such a program that would allow it to avoid some built capacity of electric generating facilities? Produce any analysis of such a program.
 - b. If so, please provide the current or expected impacts of those agreements in energy reductions, peak demand reductions and cost savings, both annual and monthly throughout the time period analyzed during the study.
27. With regards to the load forecast used in your application and supporting analyses:
 - a. Please provide the BREC load forecast, by month and year for both peak and energy requirements relied upon by ACES in its modeling analysis of the BREC units.
 - b. State whether any other BREC load forecast was used in any portion of your application or supporting analyses.

- i. If so, identify and explain the differences between the load forecasts that were used.
 - c. For each load forecast used in your application or supporting analyses:
 - i. State what month and year the load forecast was developed
 - ii. Produce the load forecast and any supporting analyses, worksheets, and modeling files.
 - iii. Please provide a description of the models, methods, data and key assumptions used to develop the load forecast.
 - iv. State whether the load forecast reflects the projected impacts of any DSM programs? If so, please identify each specific DSM program, the quantity of reductions from DSM embedded in the load forecast, and the basis for the quantity of reductions assumed, and produce any work papers regarding such reductions.
 - v. State whether the load forecast reflects the projected impact of any federal efficiency standards or programs. If so, please identify each specific federal efficiency standard or program, the quantity of reductions in forecasted load resulting from those standards and programs, and the basis for the quantity of reductions assumed, and produce any work papers regarding such reductions.
 - d. Produce Big Rivers' most recent load forecast, along with any supporting analyses, work papers, or modeling files.

28. Refer to your response to SC 1-2 and KIUC 1-26:

- a. Identify the current unamortized plant balance for each of Big Rivers' coal-fired generating units.
- b. Identify the projected unamortized plant balance as of January 1, 2016 for each of Big Rivers' coal-fired generating units
- c. Identify the estimated salvage value for each of Big Rivers' coal-fired generating units.

29. Refer to your response to SC 1-16a. For each year through 2026, identify the size in kWh of the energy shortfall that would need to be filled if Big Rivers' coal fleet operated at a capacity factor of 62%.

30. Refer to your response to SC 1-17.

- a. Identify any coal-fired electric generating units that have achieved an average SO₂ removal of at least 99% over a 30-day or 12-month period through the use of a wet FGD.
- b. Produce any continuous emissions monitoring ("CEMs") data demonstrating achievement of at least 99% SO₂ removal at a coal-fired electric generating unit through use of a wet FGD

- c. Produce any wet FGD vendor guarantees of at least 99% SO₂ removal for a coal-fired electric generating unit.
 - d. Identify the annual estimated cost of additional SO₂ allowance purchases if the wet FGD proposed for the Wilson plant achieves an annual average of 98% SO₂ removal, rather than 99%.

- 31. Refer to your response to SC 1-25(b). Produce the proposals “from Sargent & Lundy and other engineering firms for assistance on the projects listed in the Environmental Compliance Plan filing,” and describe the status of Big Rivers’ review of those proposals including when you plan to make a final decision on such proposals.

- 32. Refer to your response to SC 1-33. For each year of 2012 through 2033, identify the projected level in MWh of off-system sales.

- 33. Refer to your responses to SC 1-36 and KIUC 1-7. For each of SO₂, HCl, and mercury:
 - a. State whether the results from each stack test are reflective of the average 30-day emissions of each pollutant from each coal unit
 - i. If so, explain how they are reflective.
 - ii. If not, explain why not
 - b. State whether the results from each stack test are reflective of the average annual emissions of each pollutant from each coal unit
 - i. If so, explain how they are reflective
 - ii. If not, explain why not
 - c. Produce the results of any other stack test for any of the those pollutants that has been carried out at any of the Big Rivers coal units since 2005
 - d. State whether information regarding the emissions of any of those pollutants has been provided to U.S. EPA in response to any Information Collection Request.
 - i. If so, produce all such information.

- 34. Refer to your response to SC 1-37. Identify the basis for your belief that “estimated emission rates accurately characterize HCl emissions.” Produce any documents supporting that belief.

- 35. Refer to your response to SC 1-39. Identify over what period of time and at what emission sources “limestone based, vertical wet FGD systems with forced oxidation have been proven to achieve SO₂ removal efficiency of 99%.” Produce any documents supporting that contention.

36. Refer to your response to SC 1-31.c. i and ii.
- a. Identify in dollars per mmBtu the “available U.S. Energy Information Administration pricing” referenced therein for coal for each year of 2012 through 2033.
 - b. Identify in dollars per mmBtu the “available U.S. Energy Information Administration pricing” referenced therein for natural gas for each year of 2012 through 2033
 - c. State specifically what document or documents contain the “available U.S. Energy Information Administration pricing at the time of the study” are referenced therein, and produce such document or documents.
37. Refer to your response to SC 1-45.c. Identify and produce any documents upon which your reasons identified therein for rejecting the use of lower sulfur Central Appalachian coal are based.
38. Compare your response to SC 1-45.c. with your response to SC 1-47.
- a. Explain why in the former response you state that the use of Central Appalachian coal would require “modifications to units,” while in the latter you state that “it is not expected” that the burning of “lower sulfur bituminous coals would result in capital changes” at the HMP&L, Wilson, or Green Units.
 - b. Identify any modifications that would be needed to burn lower sulfur bituminous coals at the HMP&L, Wilson, or Green Units, and the capital and O&M costs of such modifications.
39. Refer to your response to KIUC 1-14.
- a. Identify the “670MW bituminous coal-fired power plant” that the cost of replacing the Wilson FGD was based on, the year in which the scrubber on that plant occurred, and the cost of such scrubber. Produce any documents regarding that scrubber project.
 - b. Identify the “similarly sized bituminous coal-fired units” upon which the SCR costs were based, the years in which SCRs were installed on those units, and the cost of installing each such SCR. Produce the “recent project cost data” for such units.
 - c. Produce the “similar sized unit co-firing study” upon which the costs for the Green and Reid natural gas conversions were developed, and identify the unit in such study.
 - d. Identify the “460MW coal-fired plant in the Southwest” upon which the costs for the Green and Reid natural gas conversions were developed, the cost of the conversion project for such plant, and the year in which that conversion occurred.

- e. Identify the “similarly sized coal-fired plants” from which CCR modification costs were developed, the cost of the CCR modifications at such plants, and the years in which the CCR modifications took place. Produce the “recent conversion studies” and “recent past project data” referenced therein
40. Refer to your response to Staff 1-9. Produce any assessment or document regarding the impact that potential CCR and/or 316(b) regulations could have on the economics of Big Rivers’ 2012 Plan or on the economic feasibility of the continued operation of any of Big Rivers’ coal-fired generating units.
41. Refer to the table attached to your response to Staff 1-16.
- a. Identify and produce each “quotation[] received from other projects during study” referenced therein.
 - b. Identify and produce each “similar compliance stud[y]” referenced therein.
 - c. Produce the “2012 Budget Input e-mail” and any documents supporting the information contained in that e-mail.
 - d. Identify and produce the “U.S. Department of Energy, Energy Information Administration” document or documents referenced therein.
42. Refer to your response to Staff 1-39. Identify the basis for the PACE Global projections of CO2 costs that were used in the ACES planning models, and produce any documents or work papers regarding such projections.
43. Refer to your response to AG 1-20.
- a. Identify any SO2 emission limit that you included in your Title V permit renewal application for the Wilson plant if the new FGD scrubber is installed.
 - b. Identify the assumed SO2 removal efficiency for the new FGD scrubber upon which that emission limit is based.
 - c. Produce the Title V permit renewal application referenced therein.
44. Refer to the November 11, 2011 Budget Letter from Siemens regarding SESS Budget Proposal No. 4296.
- a. Identify the SO2 removal percentage being achieved by the wet FGD at the Coleman facility.
 - b. Given that SESS Budget Proposal No. 4296 is proposing a “design which is expected to provide Wilson Unit 1 with SO2 removal levels similar to the Coleman facility,” if the wet FGD at the Coleman facility is achieving less than 99% removal, identify the additional capital and O&M costs over those in the

SESS Budget Proposal that would be needed for the wet FGD at Wilson Unit 1 to achieve an average annual SO2 removal of 99%.

45. Refer to page 7 of the Big Rivers 2010 IRP, Appendix B.

- a. Explain the basis for limiting the Big Rivers energy efficiency program budget to \$11.2 million from 2011-2020.
- b. State what level of annual energy efficiency program budget would be needed to achieve the level of energy savings and peak demand reduction identified for the achievable potential scenario.
- c. Identify the basis for assuming a 30% market penetration by 2020 for achievable cost effective energy efficiency programs, rather than a higher market penetration level. Produce any documents supporting or regarding that 30% market penetration assumption.

46. Refer to p. 29 of the Big Rivers 2010 IRP, Appendix B.

- a. State how the annual avoided energy costs identified in Table 5.1 compare to the annual energy costs assumed in the 2012 Plan.
- b. State how the annual avoided capacity costs identified in Table 5.2 compare to the annual capacity costs assumed in the 2012 Plan.
- c. Identify the levels of economic, achievable, and program potential energy and capacity savings using the annual energy and capacity costs assumed in the 2012 Plan rather than the annual energy and capacity costs assumed in the 2010 IRP.

47. With regards to either of Big Rivers' two smelter customers, identify:

- a. Any energy efficiency, demand side management, or demand response programs that Big Rivers has evaluated to achieve energy savings or reduce peak demand for either of the two smelters
- b. Any energy efficiency, demand side management, or demand response programs that Big Rivers has offered to either of the two smelters
- c. Any energy efficiency, demand side management, or demand response program that either of the two smelters is currently implementing

48. [REDACTED]

- a. [REDACTED]
- b. [REDACTED]
- c. [REDACTED]

d.

e.

f.

g.

Respectfully submitted,



Joe Childers, Esq.
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859-258-9288 (facsimile)

Of counsel:

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kristin.henry@sierraclub.org

Dated: June 22, 2012

CERTIFICATE OF SERVICE

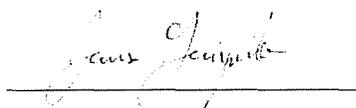
I certify that I mailed a copy of Ben Taylor and Sierra Club's Supplemental Requests for Information to Big Rivers Electric Corporation by first class mail on June 22, 2012 to the following:

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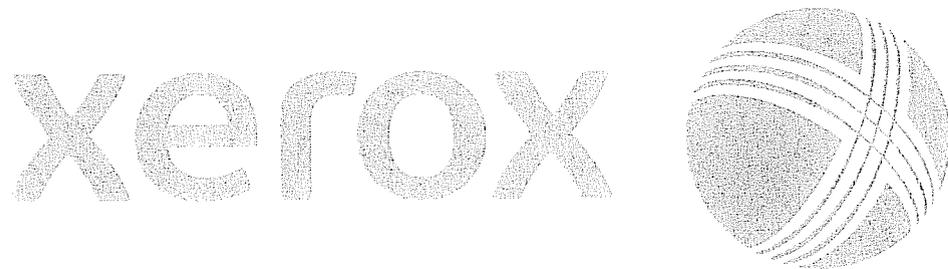
David C. Brown, Esq.
Stites & Harbison
1800 Aegon Center, 400 West Market Street
Louisville, KY 40202



James Giampietro

KWalton

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VIA COURIER AND EMAIL

June 22, 2012

Mr. Jeff Derouen
Executive Director
Kentucky Public Service Commission
211 Sower Boulevard
Frankfort, Kentucky 40601

**Re: Intervenor Ben Taylor and Sierra Club's 2nd Set of Requests for Information to
Big Rivers Electric Corp.
Docket 2012-00063**

Dear Mr. Derouen,

Enclosed please find 11 copies of the public version of Ben Taylor and Sierra Club's 2nd set of requests for information to Big Rivers Electric Corp. in docket 2012-00063. Also included in this filing is a confidential version of the document in a sealed envelope marked "Confidential". Questions 25 (pp. 14) and 48 (pp. 19-20) include information that is subject to a petition for confidential treatment filed by James Miller and Tsyon Kamuf, Counsel for Big Rivers Electric Corp.

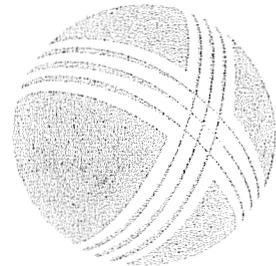
Sincerely,

James Giampietro
Sierra Club Environmental Law Program
85 2nd Street, 2nd Floor
San Francisco CA, 94105
Office: (415)977-5638
james.giampietro@sierraclub.org

KWalton

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COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC)	
CORPORATION FOR AN APPROVAL OF ITS)	
2012 ENVIRONMENTAL COMPLIANCE PLAN,)	
FOR APPROVAL OF ITS AMENDED	)	CASE NO.
ENVIRONMENTAL COST RECOVERY	)	2012-00063
SURCHARGE TARIFF, FOR CERTIFICATES OF)	
PUBLIC CONVENIENCE AND NECESSITY,)	
AND FOR AUTHORITY TO ESTABLISH A)	
REGULATORY ACCOUNT)	

COMMISSION STAFF'S FIRST REQUEST FOR INFORMATION TO
KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.

Kentucky Industrial Utility Customers, Inc. ("KIUC"), pursuant to 807 KAR 5:001, is to file with the Commission the original and ten copies of the following information, with a copy to all parties of record. The information requested herein is due on or before August 6, 2012. Responses to requests for information shall be appropriately bound, tabbed and indexed. Each response shall include the name of the witness responsible for responding to the questions related to the information provided.

Each response shall be answered under oath or, for representatives of a public or private corporation or a partnership or association or a governmental agency, be accompanied by a signed certification of the preparer or the person supervising the preparation of the response on behalf of the entity that the response is true and accurate to the best of that person's knowledge, information, and belief formed after a reasonable inquiry.

KIUC shall make timely amendment to any prior response if it obtains information which indicates that the response was incorrect when made or, though correct when made, is now incorrect in any material respect. For any request to which KIUC fails or refuses to furnish all or part of the requested information, it shall provide a written explanation of the specific grounds for its failure to completely and precisely respond.

Careful attention shall be given to copied material to ensure that it is legible. When the requested information has been previously provided in this proceeding in the requested format, reference may be made to the specific location of that information in responding to this request.

1. Refer to the Direct Testimony of Stephen J. Baron ("Baron Testimony"), Baron Exhibit_(SJB-2) which was filed under petition for confidentiality. Provide this Exhibit for the years 2017 and 2018.

2. Refer to the Baron Testimony, Baron Exhibit_(SJB-3) which was filed under petition for confidential treatment.

a. Explain how the 2016 Base Case Revenues were derived. Include in your response specific cell references to the Big Rivers Financial Forecast (2012-2026) Base Case which was filed on June 14, 2012 under petition for confidential treatment.

b. Confirm that this exhibit shows that, under the KIUC proposal, the Rural Economic Reserve would be depleted by \$3,387,759 more in 2016 than under Big Rivers' proposal.

c. Provide this Exhibit for the years 2017 and 2018.

3. Refer to the Direct Testimony of Lane Kollen (“Kollen Testimony”) at pages 8-9, wherein Mr. Kollen provides factors that he believes weigh against environmental compliance Projects 4 (Wilson Unit 1 scrubber) and 5 (Green Unit 2 SCR) included in the Build Case but not in the Buy Case. On page 9, Mr. Kollen lists one of the factors as being “the flexibility that the Buy Case affords the Commission to subsequently revisit the Build alternative if the economics support such a decision in the future.” Is Mr. Kollen suggesting that Big Rivers should buy power and mothball the Wilson and Green units? If yes, what costs does Mr. Kollen believe would be associated with mothballing the plants?

4. Refer to the Kollen Testimony at pages 17 and 18. Provide Mr. Kollen’s definition of fixed production maintenance expense as discussed here. Include examples of fixed production maintenance expenses as defined here. Identify fixed production maintenance expenses that could be reduced by 25 percent in the event of the loss of smelter load.

5. Refer to the Kollen Testimony at page 18, line 5. Provide all support for the \$133 million reduction in net present value that would result from a 25 percent reduction in fixed production maintenance expense.

6. Refer to the Kollen Testimony at page 23, lines 8-13. Reference is made to average rate increases for the rural and large industrial classes of 69 percent under the Build Scenario and the Smelters terminating their contracts and 84 percent increase under the Buy Scenario and the Smelters terminating their contracts. Provide all support for these percentage increases.

7. State fully and succinctly the KIUC recommendation. If the KIUC recommendation is for Big Rivers to forego Projects 4 and 5 of its proposed environmental compliance plan and instead pursue the Buy Scenario, would KIUC agree that the Buy Scenario is not without risk? Does KIUC have any suggestions on ways to mitigate some of the risk associated with pursuing the Buy Scenario?

8. Refer to the Kollen Testimony, page 29, lines 12 thru 15. Did KIUC consider the likely commodity, equipment and labor cost increases associated with the delay of Projects 4 and 5? If so, provide an estimate of the potential increases and provide support for the estimates.

9. Refer to pages 30-31 of the Kollen Testimony at which Mr. Kollen discusses Big Rivers' credit rating. Is Mr. Kollen aware that Fitch Ratings recently reaffirmed Big Rivers BBB-rating on the \$83.3 million County of Ohio, Kentucky's pollution control refunding revenue bonds series 2010A?

10. Refer to the Direct Testimony of Philip Hayet ("Hayet Testimony"), pages 21 and 22. Provide electronic versions of the analysis used to prepare the tables on pages 21 and 22 of the Hayet Testimony. List all assumptions and identify all data sources used in the analysis.

Jeff Derouen
Executive Director
Public Service Commission
P. O. Box 615
Frankfort, KY 40602

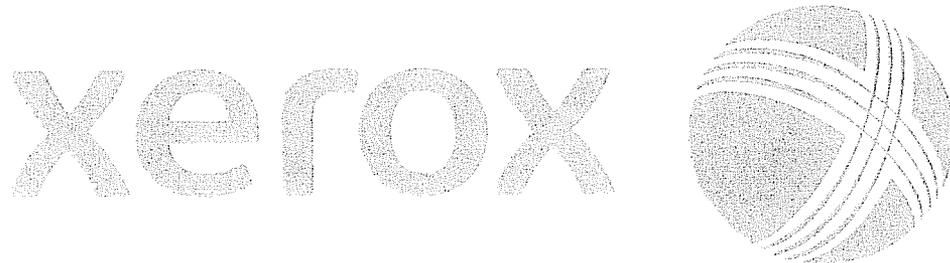
DATED _____

cc: Parties of Record

Case No. 2012-00063

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of Big Rivers-specific inputs used by ACES to run the Ventyx Planning and Risk (“PAR”) model that was used in conducting its production cost modeling for Big Rivers. Without such data, neither intervenors nor the Commission itself can verify the modeling results submitted by Big Rivers in this proceeding. The lack of this data therefore renders it impossible for the Commission to determine with certainty whether Big Rivers’ Application meets the standards set forth in KRS 278.020 and KRS 278.183.

KIUC attempted to remedy this issue through a letter sent to Big Rivers on May 11, 2012 in which KIUC specifically requested “[t]he input data assumptions, and all supporting documents associated with the development of the input data assumptions” used by ACES as well as “[t]he actual production cost model that ACES used, as well as all input files that went to the model at the time the runs were performed.”¹ KIUC also asked Big Rivers for additional information in the May 11, 2012 letter. Though Big Rivers provided some of the information requested by KIUC in a Response filed May 24, 2012, Big Rivers did not provide the database of inputs specific to Big Rivers that ACES had used in conducting its production cost modeling. KIUC has also contacted Big Rivers in an attempt to retrieve this information, but has not succeeded in procuring the necessary data.

In addition to informal attempts to procure the data, a number of questions in KIUC’s first set of discovery requests filed May 22, 2012 were sufficiently broad to have warranted the production of the Big Rivers-specific data used by ACES in its production cost modeling. For example, KIUC Q1.4 stated:

Please supply all documents, memos, letters and emails that were sent back and forth between the Company and ACES concerning either input or output data associated with the base case and five scenarios, as well as any other cases that ACES performed.

Q1.20, regarding Big Rivers witness Hite’s testimony, stated:

¹ The May 11, 2012 Letter is Attached.

Page 8 discusses that Big Rivers received production cost results from ACES Power Marketing. Please provide all documents, memos, letters and emails that went back and forth between ACES and Big Rivers regarding these analyses, including the engagement letter, contract documents, data assumption documents, model result analyses, etc.

Q1.21 stated:

Provide copies of all models and spreadsheets developed containing input assumptions and output results. Provide these electronically, with all formulas intact.

Q1.22 stated:

Provide copies of all written reports, memos, emails or documentation of any type that either ACES or PACE Global produced regarding this project, as well as any that Big Rivers produced related to the analyses that either ACES or PACE Global performed.

In responding to KIUC's discovery requests, Big Rivers failed, and now explicitly refuses, to provide the database of Big Rivers-specific inputs that was used by ACES in its production cost modeling. On a conference call on June 4, 2012, which included people from Big Rivers, ACES, Venytx, KIUC, the Sierra Club, the Attorney General's office, Big Rivers and ACES explained that the data sought had been provided in another format, and that the specific files sought were the proprietary work product of ACES and that ACES was not obligated to provide the information in the specific format that KIUC requested.

Big Rivers' failure to provide the ACES database of Big Rivers-specific inputs in the format used in its production cost modeling prevents both intervenors and the Commission from being able to verify the results of the ACES production cost modeling that Big Rivers' Application is based upon with certainty. Big Rivers suggests that the information that has been provided should be sufficient to be able to closely match the results produced by ACES. That may be true, however, KIUC believes that it is an unnecessary burden for KIUC to have to perform an unspecified amount of work in the interests of first reproducing identically what ACES has already created. Even if KIUC were willing to perform that work, there would be no

assurance that identical results would be produced. Oftentimes in modeling efforts such as this, the modeler sets inputs, sometimes referred to as run control switches, and KIUC would have no idea how those switches or any other similar types of switches were set by ACES modelers without the database. Thus, without the specific input files from ACES, which have not been provided to KIUC, there would be no guarantee that KIUC could reproduce ACES' results identically. Further, even if intervenors or Staff were to obtain a license of the production cost modeling software used by ACES, there is insufficient time for parties to replicate-recreate the PAR model input files in the exact way that ACES already constructed them, such that the parties would be able to replicate the ACES results with exact precision, which is a necessary starting point for KIUC's work. ~~the modeling conducted by ACES without a database of the inputs specific to Big Rivers used by ACES in conducting its production cost modeling.~~ KRS 278.183 provides that a hearing must be conducted within six months after an application is filed. Because of time limitations imposed by statute, it is critical that Big Rivers provide the information necessary for parties to verify the production cost modeling results presented in Big Rivers' Application. It should also be mentioned that another option was offered Big Rivers, in which KIUC's consultants would travel to ACES' office and work directly with ACES Staff to make data changes to KIUC's input files to then perform KIUC's production cost runs. Big River's refused to accommodate this approach as well.

Without a method by which to verify the accuracy of the information presented in Big Rivers' Application within the time constraints imposed by law, the Commission cannot make a final determination with certainty regarding whether Big Rivers' Application satisfies the requirements of KRS 278.183 or KRS 278.020. KRS 278.183 requires the Commission to determine whether an environmental compliance plan and rate surcharge are "reasonable and

cost-effective” for compliance with certain environmental requirements. Additionally, KRS 278.020 requires the Commission to determine whether “public convenience and necessity require” projects proposed in Big Rivers’ Application. The Commission should not proceed to determine whether Big Rivers’ Application meets these standards without an examination of the accuracy of the modeling results that form the basis for Big Rivers’ Application.

KIUC voiced its concern regarding Big Rivers’ failure to produce a witness to provide information regarding the assumptions used by ACES in its production cost modeling in KIUC’s Motion to Dismiss. The continued lack of critical data necessary to this case is a result of Big Rivers’ failure to provide such a witness. KIUC recognizes that the ACES information requested in this Motion may need to be treated as confidential, and would not object to such treatment. But such information is vital to the Commission’s ultimate determinations in this case and therefore, the Commission should require Big Rivers to request the database from ACES and to provide that information to the parties in this proceeding.

WHEREFORE, KIUC respectfully requests that the Commission enter an Order requiring Big Rivers to request the database of Big Rivers-specific data used by ACES in its production cost modeling and to provide that database to the parties in this proceeding.

Respectfully submitted,

Michael L. Kurtz, Esq.
Kurt J. Boehm, Esq.

BOEHM, KURTZ & LOWRY

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E-Mail: mkurtz@BKLawfirm.com

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**COUNSEL FOR KENTUCKY INDUSTRIAL
UTILITY CUSTOMERS, INC.**

David C. Brown, Esq.

STITES & HARBISON

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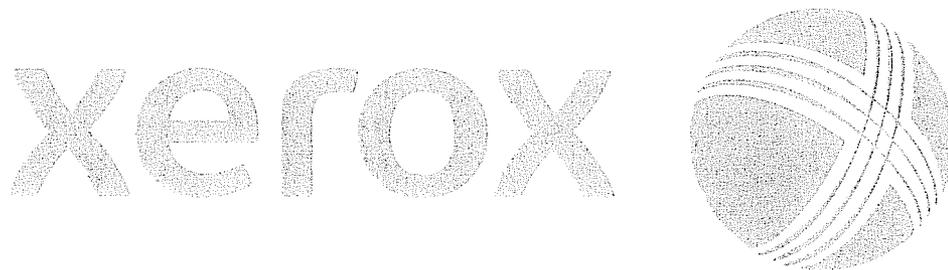
E-mail. dbrown@stites.com

**CO-COUNSEL FOR ALCAN PRIMARY
PRODUCTS CORPORATION**

June 8, 2012

KWalton

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NON-DISCLOSURE AGREEMENT

Kentucky Public Service Commission
Case No. 2012-00063

This Non-Disclosure Agreement is entered into this ___ day of June 2012, by and between Kentucky Industrial Utility Customers, Inc. (“KIUC” or “Intervenor”) and Alliance for Cooperative Energy Services Power Marketing LLC (“ACES Power Marketing” or “APM”) (each individually referred to as “Party” and collectively as “Parties”).

WHEREAS, APM provides, inter alia, certain modeling services for Big Rivers Electric Corporation (“Big Rivers”) through the use of proprietary software licensed to APM by Ventyx; and

WHEREAS, APM has created a Database that APM believes to be confidential and proprietary within the licensed proprietary software which contains information used by APM to prepare certain scenarios for use in Kentucky Public Service Commission Case No. 2012-00063 (“this Proceeding”); and

WHEREAS, KIUC is an Intervenor in this Proceeding and such Intervenor desires access to APM’s Database within the Ventyx licensed proprietary software which contains information used by APM to prepare certain scenarios for use in this Proceeding by Big Rivers; and

WHEREAS, APM, pursuant to a request by Big Rivers and pursuant to conditions established by APM’s license with Ventyx, the owner of the proprietary software, is willing to provide to KIUC the portion of APM’s Database that pertains to Big Rivers, provided that, KIUC agrees to the terms and conditions expressed herein.

NOW WHEREFORE, in consideration of the promises and covenants herein and for good and valuable consideration, the adequacy and sufficiency of which are hereby acknowledged, the Parties intending to be legally bound do hereby agree as follows:

Definitions:

“Database” shall mean the electronic computer file derived from the Ventyx PaR licensed proprietary software that contains certain Big Rivers model data parameters used by APM in developing scenarios for Big Rivers and used in support of this Proceeding.

“Notes” means memoranda, handwritten notes, or any other form of information (including electronic information) that copies or discloses the information contained in the Database. Notes are subject to the same restrictions provided in this Agreement for the Database except as specifically provided otherwise in this Agreement.

Agreement:

1. Access to the Database that APM believes to be confidential and propriety and for which confidential treatment is sought by APM in this case will be limited strictly to Intervenor, its legal counsel and/or consultants, and employees of Intervenor's clients in this matter who have a need for access to the Database for purposes of this Proceeding and who shall execute a non-disclosure certificate as described in paragraph 3 and attached as Exhibit A to this agreement.

2. Use of the Database provided pursuant to this Non-Disclosure Agreement shall be limited strictly to this Proceeding and any appeals from this Proceeding.

3. The non-disclosure certificate shall require Intervenor, its legal counsel, and its consultants to read a copy of this agreement and certify in writing that it, he, or she has reviewed this agreement and agrees to be bound by its terms before disclosure of the confidential and proprietary information will be made. The certificate shall contain the full name of Intervenor's legal counsel and/or consultant(s) and their permanent business address. A copy of each certificate shall be provided to APM.

4. Pending a ruling by the Commission upon a petition for confidential treatment of the Database and if the Commission orders that confidential treatment shall be afforded, the Database shall be deemed to be held in trust pursuant to this agreement and shall be returned to APM upon demand at the conclusion of this Proceeding. Upon demand for return of the information, any notations or other work product of Intervenor, its counsel, or its consultants made or contained in the information shall be redacted prior to the return of the information to APM. Copies of filings, official transcripts and exhibits in this Proceeding that contain information contained in the Database and Notes may be retained, if they are maintained in a secure place.

5. If Intervenor desires to make use of any confidential or proprietary information obtained as a result of its, its legal counsel's, or its consultant's examination of the Database, whether in testimony filed by Intervenor or through cross-examination of any witness or otherwise, Intervenor shall notify APM in advance of the proposed use and shall meet with APM's representatives to attempt in good faith to establish a procedure that will accommodate the needs of Intervenor to make use of the information without risking its public disclosure. If APM and Intervenor are unable to agree on a means of preventing public disclosure of the confidential and proprietary information, APM and Intervenor will submit these issues to the Commission for resolution before the proposed use of the information is made.

6. Each and every party to this agreement will act in good faith, and no party to the agreement will do anything to deprive any other party of the benefit of this agreement. The Parties agree that the Commission is the sole and exclusive forum for considering any alleged breach of this agreement, and that the remedies within the jurisdiction of the Commission are the only available remedies. This agreement does not restrict the parties from seeking any injunctive relief in a court of competent jurisdiction which they believe that they are otherwise entitled to seek; furthermore, it does not extinguish any right to judicial review of the Commission's actions. The parties do, however, expressly waive any other relief or remedy to which they might be entitled in the absence of the limitations of this agreement.

7. Intervenor's participation in this agreement shall not be construed as an admission that the information claimed to be confidential and proprietary is, as a matter of law, confidential and proprietary, or as a waiver of any right to assert that the information is not confidential and proprietary before the Commission or any court of competent jurisdiction. In the event the Commission should rule that any of the information should be removed from the restrictions imposed by this agreement, Intervenor shall not disclose such information until the Commission's Order subjecting the information to public disclosure is final pursuant to KRS 278.410, or until all appeals of such Order have been exhausted, unless authorized to do so by APM or a court of competent jurisdiction.

8. This agreement shall bind the parties to it from the date of its execution. Every executed copy of this agreement will be deemed an original.

EXECUTED this ___ day of June, 2012.

Kentucky Industrial Utility
Customers, Inc.

By: _____

Title: _____

Alliance for Cooperative Energy
Services Power Marketing LLC

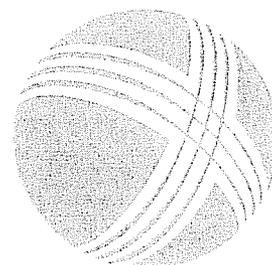
By: _____

Title: _____

KWalton

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COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC)	
CORPORATION FOR AN APPROVAL OF ITS)	
2012 ENVIRONMENTAL COMPLIANCE PLAN,)	
FOR APPROVAL OF ITS AMENDED	)	CASE NO.
ENVIRONMENTAL COST RECOVERY	)	2012-00063
SURCHARGE TARIFF, FOR CERTIFICATES OF)	
PUBLIC CONVENIENCE AND NECESSITY,)	
AND FOR AUTHORITY TO ESTABLISH A)	
REGULATORY ACCOUNT)	

COMMISSION STAFF'S FIRST REQUEST FOR INFORMATION TO
KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.

Kentucky Industrial Utility Customers, Inc. ("KIUC"), pursuant to 807 KAR 5:001, is to file with the Commission the original and ten copies of the following information, with a copy to all parties of record. The information requested herein is due on or before August 6, 2012. Responses to requests for information shall be appropriately bound, tabbed and indexed. Each response shall include the name of the witness responsible for responding to the questions related to the information provided.

Each response shall be answered under oath or, for representatives of a public or private corporation or a partnership or association or a governmental agency, be accompanied by a signed certification of the preparer or the person supervising the preparation of the response on behalf of the entity that the response is true and accurate to the best of that person's knowledge, information, and belief formed after a reasonable inquiry.

KIUC shall make timely amendment to any prior response if it obtains information which indicates that the response was incorrect when made or, though correct when made, is now incorrect in any material respect. For any request to which KIUC fails or refuses to furnish all or part of the requested information, it shall provide a written explanation of the specific grounds for its failure to completely and precisely respond.

Careful attention shall be given to copied material to ensure that it is legible. When the requested information has been previously provided in this proceeding in the requested format, reference may be made to the specific location of that information in responding to this request.

1. Refer to the Direct Testimony of Stephen J. Baron ("Baron Testimony"), Baron Exhibit_(SJB-2) which was filed under petition for confidentiality. Provide this Exhibit for the years 2017 and 2018.

2. Refer to the Baron Testimony, Baron Exhibit_(SJB-3) which was filed under petition for confidential treatment.

a. Explain how the 2016 Base Case Revenues were derived. Include in your response specific cell references to the Big Rivers Financial Forecast (2012-2026) Base Case which was filed on June 14, 2012 under petition for confidential treatment.

b. Confirm that this exhibit shows that, under the KIUC proposal, the Rural Economic Reserve would be depleted by \$3,387,759 more in 2016 than under Big Rivers' proposal.

c. Provide this Exhibit for the years 2017 and 2018.

3. Refer to the Direct Testimony of Lane Kollen (“Kollen Testimony”) at pages 8-9, wherein Mr. Kollen provides factors that he believes weigh against environmental compliance Projects 4 (Wilson Unit 1 scrubber) and 5 (Green Unit 2 SCR) included in the Build Case but not in the Buy Case. On page 9, Mr. Kollen lists one of the factors as being “the flexibility that the Buy Case affords the Commission to subsequently revisit the Build alternative if the economics support such a decision in the future.” Is Mr. Kollen suggesting that Big Rivers should buy power and mothball the Wilson and Green units? If yes, what costs does Mr. Kollen believe would be associated with mothballing the plants?

4. Refer to the Kollen Testimony at pages 17 and 18. Provide Mr. Kollen’s definition of fixed production maintenance expense as discussed here. Include examples of fixed production maintenance expenses as defined here. Identify fixed production maintenance expenses that could be reduced by 25 percent in the event of the loss of smelter load.

5. Refer to the Kollen Testimony at page 18, line 5. Provide all support for the \$133 million reduction in net present value that would result from a 25 percent reduction in fixed production maintenance expense.

6. Refer to the Kollen Testimony at page 23, lines 8-13. Reference is made to average rate increases for the rural and large industrial classes of 69 percent under the Build Scenario and the Smelters terminating their contracts and 84 percent increase under the Buy Scenario and the Smelters terminating their contracts. Provide all support for these percentage increases.

7. State fully and succinctly the KIUC recommendation. If the KIUC recommendation is for Big Rivers to forego Projects 4 and 5 of its proposed environmental compliance plan and instead pursue the Buy Scenario, would KIUC agree that the Buy Scenario is not without risk? Does KIUC have any suggestions on ways to mitigate some of the risk associated with pursuing the Buy Scenario?

8. Refer to the Kollen Testimony, page 29, lines 12 thru 15. Did KIUC consider the likely commodity, equipment and labor cost increases associated with the delay of Projects 4 and 5? If so, provide an estimate of the potential increases and provide support for the estimates.

9. Refer to pages 30-31 of the Kollen Testimony at which Mr. Kollen discusses Big Rivers' credit rating. Is Mr. Kollen aware that Fitch Ratings recently reaffirmed Big Rivers BBB-rating on the \$83.3 million County of Ohio, Kentucky's pollution control refunding revenue bonds series 2010A?

10. Refer to the Direct Testimony of Philip Hayet ("Hayet Testimony"), pages 21 and 22. Provide electronic versions of the analysis used to prepare the tables on pages 21 and 22 of the Hayet Testimony. List all assumptions and identify all data sources used in the analysis.

Jeff Derouen
Executive Director
Public Service Commission
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Frankfort, KY 40602

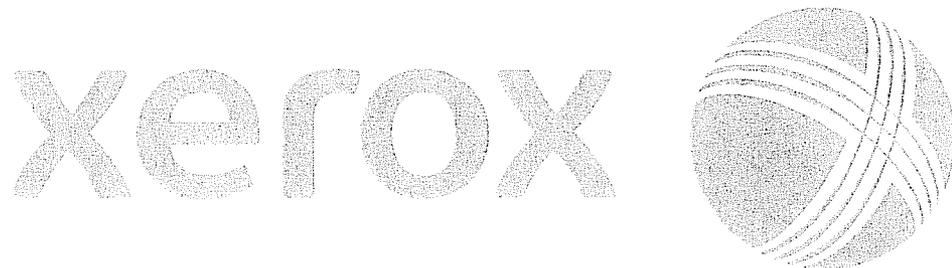
DATED _____

cc: Parties of Record

Case No. 2012-00063

KWalton

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COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC)	
CORPORATION FOR APPROVAL OF ITS 2012)	
ENVIRONMENTAL COMPLIANCE PLAN, FOR)	
APPROVAL OF ITS AMENDED ENVIRONMENTAL	)	CASE NO. 2012-00063
COST RECOVERY SURCHARGE TARIFF, FOR)	
CERTIFICATES OF PUBLIC CONVENIENCE AND)	
NECESSITY, AND FOR AUTHORITY TO)	
ESTABLISH A REGULATORY ACCOUNT)	

COMMISSION STAFF'S FIRST REQUEST FOR INFORMATION TO
BIG RIVERS ELECTRIC CORPORATION

Big Rivers Electric Corporation ("Big Rivers"), pursuant to 807 KAR 5:001, is to file with the Commission the original and ten copies of the following information, with a copy to all parties of record. The information requested herein is due on or before June 1, 2012. Responses to requests for information shall be appropriately bound, tabbed and indexed. Each response shall include the name of the witness responsible for responding to the questions related to the information provided.

Each response shall be answered under oath or, for representatives of a public or private corporation or a partnership or association or a governmental agency, be accompanied by a signed certification of the preparer or the person supervising the preparation of the response on behalf of the entity that the response is true and accurate to the best of that person's knowledge, information, and belief formed after a reasonable inquiry.

Big Rivers shall make timely amendment to any prior response if it obtains information which indicates that the response was incorrect when made or, though correct when made, is now incorrect in any material respect. For any request to which Big Rivers fails or refuses to furnish all or part of the requested information, it shall provide a written explanation of the specific grounds for its failure to completely and precisely respond.

Careful attention shall be given to copied material to ensure that it is legible. When the requested information has been previously provided in this proceeding in the requested format, reference may be made to the specific location of that information in responding to this request.

1. Refer to the Application, page 7, which states that Big Rivers is requesting authority to establish a regulatory account. The Application states, “[a]s explained further in Mr. Hite’s testimony, Big Rivers has incurred costs in developing this Application, and it will incur additional costs to prosecute this case. These costs primarily stem from the retention of experts in the legal, regulatory, and engineering professions.” Provide the actual costs incurred to date by type and vendor. Consider this an ongoing request to be updated by the 15th of the month, to report the prior month’s expense, for each month up to and including the month of the hearing in this case.

2. Refer to page 13 of the Direct Testimony of Robert W. Berry (“Berry Testimony”), lines 17-20. It states, “[i]n 2016, when the projects in the 2012 Plan should be complete, total billings to the rate classes will increase by approximately 6.9% relative to projected 2016 billings absent the 2012 Plan, and by approximately 7.8%

relative to projected 2012 billings.” Also refer to Exhibits Wolfram-5 and Wolfram-6, of the Direct Testimony of John Wolfram (“Wolfram Testimony”).

a. Exhibit Wolfram-6 shows the 6.9 percent and 7.8 percent increases to be for the Rural class. State whether the percentages apply only to the Rural class or to the system as a whole.

b. Provide the projected completed forms from Exhibit Wolfram-5 which support the 6.9 percent and 7.8 percent projected 2016 billing.

c. Provide the calculations that support the amounts shown in columns 1, 2 and 3 of Exhibit Wolfram-6.

3. Refer to page 18 of the Berry Testimony at lines 17-19. How will Big Rivers replace the demand and energy that would normally be provided by Wilson Unit 1 during the three-year period from 2013 through 2016 when the new flue gas desulfurization, or scrubber, system is being fabricated and constructed?

4. Refer to page 20 of the Berry Testimony. Project 6 is the completion of the Reid Unit 1 conversion of the boiler’s coal burners to natural gas. KRS 278.183(1) provides, in relevant part, as follows:

[A] utility shall be entitled to current recovery of its costs of complying with the Federal Clean Air Act as amended and those federal, state, or local environmental requirements which apply to coal combustion wastes and by-products from facilities utilized for production of energy from coal in accordance with the utility’s compliance plan

a. Provide the basis of how the costs of Project 6 can be recovered through an environmental surcharge in light of the language of KRS 278.183(1).

b. If Project 6 could not be reflected in the monthly environmental cost recovery mechanism, provide the effect this would have on any testimony and/or exhibits filed in this proceeding.

c. Starting at line 9, Mr. Berry states that four of the boiler's eight coal burners were converted to natural gas in 2004 but that the burners were never permitted, tested or put into service. Mr. Berry also states that Project 6 "will provide the maintenance, testing and other necessary tasks to complete the existing natural gas conversion that was started in 2004."

(1) State whether the four converted burners are currently recorded in plant in service on Big Rivers' books or if they are recorded in another account for plant not in service.

(2) State whether the investment of the 2004 conversion is being recovered through Big Rivers' base rates.

(3) Provide Big Rivers' plan with regard to the four coal burners.

d. State whether there is an adequate supply of gas to serve a converted Reid Unit 1.

e. At lines 15-17 of the Berry Testimony on page 20, Mr. Berry states that "[n]atural gas firing will reduce SO₂ and NO_x emissions for CSAPR, and exempt [Reid Unit 1] from MATS." Explain how the conversion to natural gas would exempt Reid Unit 1 from the MATS requirements.

5. Refer to page 21 of the Berry Testimony. Starting at line 6, Mr. Berry states that the estimated capital cost for Reid Unit 1 conversion is \$1.2 million and that ongoing operation and maintenance expenses are not expected to increase. He also

states that “[h]owever, anticipated increases in fuel cost will most likely cause this unit to continue to be used for peaking service in the future.”

a. Confirm that the type of “fuel cost” to which Mr. Berry is referring is natural gas. If not, provide the type of fuel cost referred to.

b. Is Reid Unit 1 currently used for peaking purposes? If yes, explain why a coal unit such as Reid Unit 1 is not used for baseload purposes.

6 Refer to page 21 of the Berry Testimony at lines 7-9, which refers to anticipated increases in fuel costs that would likely result in Reid Unit 1 being used as a peaking unit after its conversion to natural gas. When does Big Rivers anticipate such an increase in fuel costs will occur that would render Reid Unit 1 to be a peaking unit after being converted to natural gas?

7. Refer to page 22 of the Berry Testimony. Starting at line 12, Mr. Berry states that the portion of the 2012 Environmental Compliance Plan (“2012 Plan”) related to Station Two is currently under review by Henderson Municipal Power and Light (“HMP&L”). Provide the status of the Station Two review being conducted by HMP&L and the timeframe for a response from HMP&L.

8. Refer to page 23 of the Berry Testimony at lines 19-20. Does Big Rivers plan to accomplish the two years of fabrication and construction related to Projects 8, 9 and 10 during planned outage schedules?

9. Refer to page 28 of the Berry Testimony at lines 19-20 in which it is noted that although the Sargent & Lundy study included consideration of the U.S. Environmental Protection Agency’s (“EPA”) proposed regulation concerning coal combustion residuals and the EPA’s rules relating to impingement mortality and

entrainment under Section 316(b) of the Clean Water Act, Big Rivers did not include the potential costs of compliance with these rules in analyzing the cost effectiveness of the alternatives considered for inclusion in its 2012 Plan.

a. What impact would compliance with these potential regulations have on the operations of the affected plants?

b. How would compliance with these regulations affect the economic feasibility of Big Rivers' 2012 Plan?

10. Refer to Exhibit Berry-3, pages 1-2.

a. Provide the age of each of the units listed on Tables 1-2 and 1-3.

b. Provide the most recent life extension studies performed on each of the units listed on Tables 1-2 and 1-3.

11. Refer to Exhibit Berry-3, page 1 of 3, at footnote 2.

a. For each of the three Coleman Units, provide the actual average SO₂ emissions of the three highest years during the 2006-2010 time period.

b. Explain why an annual average emission rate of 0.25 lb/MMBtu was used.

12. Refer to page 4 of the Direct Testimony of William DePriest ("DePriest Testimony") wherein Mr. DePriest provides the total capital and operation and maintenance costs associated with Project 7, the upgrades at HMP&L Units 1 and 2, as well as Big Rivers' share of those costs. Provide the basis for the allocation of costs between Big Rivers and HMP&L or state where in the Application it can be found.

13. Refer to page 15 of the DePriest Testimony, lines 3-7 concerning the conversion of Reid Unit 1 to natural gas.

a. What is the expected impact of the Reid Unit 1 conversion on the unit's heat rate and generating capability?

b. Explain whether Big Rivers considered retiring Reid Unit 1 and repowering the unit with a natural gas combined cycle unit.

c. Explain whether Big Rivers considered retiring Reid Unit 1 and purchasing power on the wholesale market.

14. Refer to page 16 of the DePriest Testimony, lines 16-25.

a. Did Sargent & Lundy consider the replacement of the electro-static precipitators ("ESP") with a fabric filter?

b. Does Big Rivers have a strategy if the ESP performance is inadequate?

15. Refer to Exhibit DePriest – 2, Sargent & Lundy study, at page ES-1. What are the current plans to update the environmental compliance study to reflect the new Mercury and Air Toxins Standard, or MATS rule?

16. Refer to page 1-3 of the Exhibit DePriest – 2, Table 1-1. For each of the economic parameters listed, provide the source of the data and, where appropriate, any supporting calculations and documentation.

17. Refer to page 1-3 of the Exhibit DePriest – 2, Table 1-1. The Sargent & Lundy study used a natural gas forecast of \$4.50/MMBtu.

a. Recognizing that the current cost of natural gas is \$2.00/MMBtu, what is the impact of a continued low natural gas price forecast on the proposed environmental compliance decisions?

b. Has any sensitivity analysis been performed relative to a range of natural gas price forecasts?

18. Refer to page 1-4 of the Exhibit DePriest – 2.

a. Describe the “minimal-contracts approach to project execution” used in the development of the environmental compliance study.

b. How much would the inclusion of owner’s cost add to the estimated cost?

19. Refer to page 4-15 of the Exhibit DePriest – 2. At the bottom of the page it is stated that “[r]eturning the Coleman scrubber back to as-designed operation conditions and lime produces a reduction of approximately 2,630 tpy when compared to the baseline output.” Explain how and why the Coleman scrubber is not currently operating as designed. Include in your response the cost to return the scrubber back to as-designed operations.

20. Refer to Exhibit DePriest – 2, the second page after Page A-1 of Appendix 1. This page includes a chart labeled “Technology Selection & Results – NAAQS/CSAPR & MACT.” For each of the Coleman units, the Capital Cost for SO₂ is shown as \$3.93 million. Identify the project(s) related to this investment.

21. Refer to Exhibit DePriest – 2, the first page after Page A-3 of Appendix 3. Provide this schedule electronically with the formulas intact and unprotected.

22. Refer to page 9 of the Direct Testimony of Thomas L. Shaw (“Shaw Testimony”), lines 5-6. Discuss the basis for the belief that the Cross-State Air Pollution Rule will be imposed in a form substantially similar to its current form.

23. Refer to page 16 of the Shaw Testimony. Starting at line 4, Mr. Shaw discusses the proposal to add a Dry Sorbent Injection system at the Coleman, Wilson, and Green units for acid gas removal. Regarding this proposal, Mr. Shaw states that, “[i]t is *anticipated* that the combination of Dry Sorbent Injection and the necessary reductions to meet the 2014 CASPR allocations will result in unit SO₂ emission rates below 0.20 lb/MMBtu, which will allow for use of SO₂ emissions data as a surrogate for demonstrating compliance with the acid gas provisions of the MATS rule.” (Emphasis added). Is there uncertainty as to whether this proposal will make Big Rivers compliant with the MATS rule? If yes, explain.

24. Refer to page 6 of the Direct Testimony of Mark A. Hite (“Hite Testimony”), lines 19-21.

a. Why was a 15-year study period used in the financial model?

b. Refer to page 1-3 of the Exhibit DePriest – 2, Table 1-1. One of the design basis values and assumptions for the Sargent & Lundy study listed on the Table, Operating Life of the Facility, is assumed to be 20 years. Why was a 15-year period used for the financial model instead of the assumed operating life of 20 years?

25. Refer to page 7 of the Hite Testimony, lines 11-15, at which Mr. Hite discusses the use of Big Rivers' 2010 cost of capital, 7.93 percent, as the discount rate for net present value purposes. Mr. Hite states that a discount rate of 7.93 percent was also used for the Sargent and Lundy study. Explain how it was determined that 7.93 percent was reasonable for the purpose of net present value calculations.

26. Refer to page 10 of the Hite Testimony. A discussion of a sensitivity analysis pertaining to the loss of the Smelter load is provided.

a. Describe any analysis performed to determine the physical and economic feasibility of selling the capacity and energy that results from the loss of the Smelter load.

b. Identify and provide the results of any other sensitivity or risk analyses performed by Big Rivers relating to the economic feasibility of its proposed 2012 Plan.

27. Refer to page 14 of the Hite Testimony. Beginning at line 13, Mr. Hite states that “[a]ny gain or loss will be booked to the Accumulated Depreciation Reserve Account.”

a. Confirm that Big Rivers is aware that neither a gain nor a loss is recorded on the retirement of a plant asset but that the difference between the original cost and accumulated depreciation for the asset is recorded in the accumulated depreciation reserve account.

b. Explain whether there will be any sale of equipment that is retired from service.

28. Refer to page 19 of the Hite Testimony, lines 9-14, at which Big Rivers requests authority to establish a regulatory asset for costs related to this case, to amortize the costs over three years, and to recover them through the environmental surcharge. Is Big Rivers aware of any other environmental compliance case in which the Commission has approved a similar request?

29. Refer to Exhibit Hite-3, page 1 of 3. Just past the middle of the page, the Exhibit shows an interest rate of 5.5 percent for 2012 Plan capital financing. On page

17, line 18, of the Hite Testimony, the rate is estimated to be 5.78 percent to 6.16 percent. Explain the discrepancy in interest rate estimates.

30. Refer to Exhibit Hite-3, page 3 of 3, the “Build” assumptions. Listed in this section is the statement “Member Rate Stability Mechanism adjusted to accommodate new ES allocation method.” Explain this assumption and state whether any adjustment would be necessary to the Member Rate Stability Mechanism tariff.

31. Refer to page 11 of the Wolfram Testimony at lines 8-12 which state that Big Rivers’ proposal to use a 1.24 TIER in the rate of return on rate base (“RORB”) calculation is because it is limited to a 1.24 TIER as defined in the Smelter Agreements. Provide the TIER that Big Rivers is required to achieve by its debt covenants and explain why that TIER level would not be more appropriate for use in the RORB calculation.

32. Refer to page 13 of the Wolfram Testimony which states that Big Rivers is proposing to revise its current “per kWh” allocation of environmental costs to a “percentage of Total Adjusted Revenue” allocation method. For the year 2011, provide the total amount that was allocated to each member under the current allocation method and the total amount that would have been allocated to each member had the proposed allocation method been in place in 2011.

33. Refer to page 19 of the Wolfram Testimony, line 3, at which Mr. Wolfram states that Big Rivers’ proposed forms are “generally” consistent with forms approved by the Commission for other electric utilities. Is Big Rivers aware of anything in the proposed forms that is not consistent with other forms approved by the Commission?

34. Refer to Revised Exhibit Wolfram-3.

a. Refer to page 5 of 6. Under the “Availability” section, it is stated that the “[t]he Environmental Surcharge (“ES”) is mandatory to all Standard Rate Schedules listed in Section 1 of the General Index” Section 1 of the General Index of Big Rivers’ tariff includes the following rate schedules: Rural Delivery Service, Large Industrial Customer, Cable Television Attachment, Cogeneration Small Power Production Purchase, Cogeneration Small Power Production Sales, and Large Industrial Customer Expansion. Explain why the ES should apply to the Cable Television Attachment and the Cogeneration tariffs.

b. Refer to page 6 of 6. Paragraph (3) states that “[t]he revenue $R(m)$ is the average monthly revenue, including base revenues and automatic adjustment clause revenue less Environmental Cost Recovery Surcharge revenues”

(1) Explain why “automatic adjustment clause” is used rather than stating the specific adjustment clause(s) that would be included?

(2) Does the use of “automatic adjustment clause” refer only to the Fuel Adjustment Clause (“FAC”) and the Non-Smelter Non-FAC Purchase Power Adjustment? If no, explain.

(3) The phrase “automatic adjustment clause *revenue*” is used. (Emphasis added). Instead of the word “revenue,” should a different word or combination of words be used given that automatic adjustment clauses can result in a credit on member bills?

35. Refer to Exhibit Wolfram-5.

a. Refer to page 2 of 16, ES Form 1.10. This form shows $E(m) = RORB + OE - BAS$ where RORB is identified as Rate Base times the Rate of Return. Exhibit Wolfram-3, pages 4 and 5, show $E(m) = [RB/12](RORB)] + OE - BAS$ where RORB is identified as the Rate of Return on Environmental Compliance Rate Base. Although the calculations would result in the same $E(m)$, explain why the formula in the ES form differs from that in the proposed tariff and why the definition of RORB differs in the exhibits.

b. Refer to page 3 of 16, ES Form 2.0. The first two sections on this form are identified as "RORB". Confirm that the first section should be identified as "RB" or explain why it is correct as shown.

36. Refer to Exhibit Wolfram-6, page 1 of 1. Provide this exhibit with the effects of Project No. 6, Converting Burners to Natural Gas, removed from the schedule.

37. State whether any of Big Rivers units will be taken offline during construction of the 2012 Plan projects. If yes, provide the projected shutdown dates by unit and state how Big Rivers plans to meet its load requirements during those times.

38. Provide the following operational information for all units proposed for pollution control retrofit:

- a. Commercial operation date;
- b. The number of normal cycles (stops and starts);
- c. The number of emergency trips and starts;
- d. Capacity Factor for the last five years;
- e. Heat Rate for the last five years; and

f. For the last 10 years, provide any and all major and minor outages, including the major projects completed during each outage.

39. Has Big Rivers considered the potential impact of CO₂ regulation or legislation being promulgated or enacted during the planning period studied? If so, discuss the impact. If not, explain why the potential CO₂ impact was not considered.

40. Provide a detailed description of the decision model used in the Sargent & Lundy study. Provide electronic versions of the models including all input and output files.

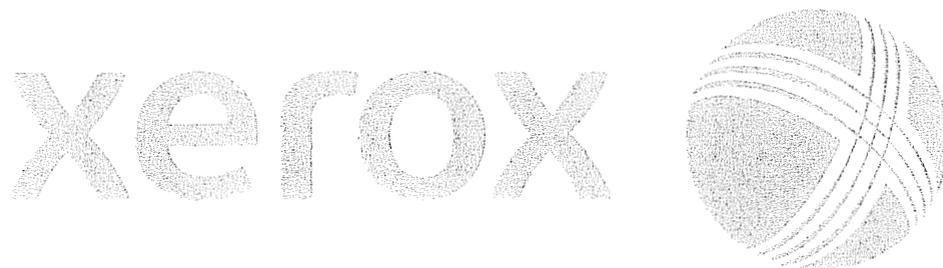
Jeff Derouen
Executive Director
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DATED: _____

cc: Parties of Record

KWalton

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COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC)	
CORPORATION FOR APPROVAL OF ITS 2012)	
ENVIRONMENTAL COMPLIANCE PLAN, FOR)	
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COST RECOVERY SURCHARGE TARIFF, FOR)	2012-00063
CERTIFICATES OF PUBLIC CONVENIENCE AND)	
NECESSITY, AND FOR AUTHORITY TO)	
ESTABLISH A REGULATORY ACCOUNT)	

COMMISSION STAFF'S SECOND REQUEST FOR INFORMATION TO
BIG RIVERS ELECTRIC CORPORATION

Big Rivers Electric Corporation ("Big Rivers"), pursuant to 807 KAR 5:001, is to file with the Commission the original and ten copies of the following information, with a copy to all parties of record. The information requested herein is due on or before July 6, 2012. Responses to requests for information shall be appropriately bound, tabbed and indexed. Each response shall include the name of the witness responsible for responding to the questions related to the information provided.

Each response shall be answered under oath or, for representatives of a public or private corporation or a partnership or association or a governmental agency, be accompanied by a signed certification of the preparer or the person supervising the preparation of the response on behalf of the entity that the response is true and accurate to the best of that person's knowledge, information, and belief formed after a reasonable inquiry.

Big Rivers shall make timely amendment to any prior response if it obtains information which indicates that the response was incorrect when made or, though correct when made, is now incorrect in any material respect. For any request to which Big Rivers fails or refuses to furnish all or part of the requested information, it shall provide a written explanation of the specific grounds for its failure to completely and precisely respond.

Careful attention shall be given to copied material to ensure that it is legible. When the requested information has been previously provided in this proceeding in the requested format, reference may be made to the specific location of that information in responding to this request.

1. Refer to the Application, the Direct Testimony of John Wolfram, Exhibit Wolfram-6. A note at the bottom of the page states that the Smelter adjusted rates in the exhibit to reflect the removal of the TIER Adjustment Charge. According to the exhibit, the TIER Adjustment Charge appears to be \$2.95 per MWh for the Base 2012, \$1.36 per MWh for the Base 2016, and \$2.46 per MWh for the Build 2016. Explain the reason for the differences in the TIER Adjustment Charge for each of the scenarios.

2. Refer to the Application, the Direct Testimony of Robert W. Berry, Exhibit Berry-2, page 1. Please provide an explanation for the FGD cost estimate of \$139 million. This estimate is significantly below the cost estimates included in the Environmental Protection Agency ("EPA") Base Case V.4.10, Chapter 5, Table 5-4, page 5-6.¹

¹ The EPA Base Case v.4.10, Chapter 5, can be accessed at <http://www.epa.gov/airmarkets/progsregs/epa-ipm/docs/v410/Chapter5.pdf>.

3. Refer to Big Rivers' response to Item 5 of Commission Staff's Initial Request for Information ("Staff's First Request"), page 1 at lines 16-21. Provide the analysis that was utilized to justify the \$1.2 million gas conversion of Reid Unit 1. Given the age and condition of this Unit and the resultant impact on Unit heat rate, provide an analysis of other options that were considered.

4. Refer to Big Rivers' response to Staff's First Request, Item 9. Prepare an analysis of the impact of the EPA's proposed regulations pertaining to the Clean Water Act – Water Intake Fish Impingement (316b), Waste Water Discharge and Coal Combustion Residuals costs based on the estimates in part b of the response. The analysis should include a re-run of Big Rivers' financial model and a comparison of the build, partial build and buy alternatives if these costs are included in the analysis. Provide an estimate of the impact on rates when the costs to comply with the proposed regulations are included in the analysis.

5. Refer to Big Rivers' response to Item 10 of Staff's First Request, page 1 at lines 11-14. Provide a summary of major availability detractors that have impacted the following units over the past 5 years:

- a. Coleman Unit 1
- b. Coleman Unit 2
- c. Coleman Unit 3
- d. Wilson Unit 1
- e. Green Unit 1
- f. Green Unit 2
- g. Henderson Unit 1
- h. Henderson Unit 2
- i. Reid Unit 1

6. Refer to Big Rivers' response to Staff's First Request, Item 10.b, the Burns and McDonnell Depreciation Study, page ES-3. Provide a summary of the ongoing

creep stress analysis and testing that has been completed on each of the following units. Include in the summary an analysis of the high energy piping system to include the analysis of flow accelerated corrosion.

- a. Coleman Unit 1
- b. Coleman Unit 2
- c. Coleman Unit 3
- d. Wilson Unit 1
- e. Green Unit 1
- f. Green Unit 2
- g. Henderson Unit 1
- h. Henderson Unit 2
- i. Reid Unit 1

7. Refer to Big Rivers' response to Staff's First Request, Item 10.b, the Burns and McDonnell Depreciation Study, Table II-6, page II-14. What are the major reasons for the excessively high EFOR on Reid Unit 1?

8. Refer to Big Rivers' response to Staff's First Request, Item 10.b, the Burns and McDonnell Depreciation Study, page II-16. What are the results of the 2011 oiler chemical cleaning on Wilson Unit 1?

9. Refer to Big Rivers' response to Staff's First Request, Item 10.b, the Burns and McDonnell Depreciation Study, page II-19. Provide a summary of the Coleman Unit 3 turbine/generator overhaul that was scheduled for 2012.

10. Refer to Big Rivers' response to Item 18 of Staff's First Request, page 2 at lines 1-4, that describes the multi-prime methodology that Big Rivers' plans for managing the environmental compliance plan projects. Provide a detailed organization plan for the prescribed project management team, including specific relevant skill sets and experience.

11. Refer to the response to Item 28 of Staff's First Request.

a. The response states that there are "other cases in which the Commission approved an applicant's request to establish a regulatory asset, where such treatment is consistent with the Commission's practice of amortizing prudently incurred but extraordinary expenses over a three-year period for ratemaking purposes." Provide the case numbers for the cases referred to in this response. For each case cited, if the decision in the case does not address the amortization period, provide the case number of the subsequent rate case in which the amortization period was addressed.

b. KRS 278.183 expressly permits the recovery of the cost of a Commission-hired consultant through the environmental surcharge. Other utilities have included these costs for recovery in the environmental surcharge as they were incurred as opposed to recording them as a regulatory asset. Clarify whether Big Rivers believes it is necessary to include the costs of the Commission-hired consultant in a regulatory asset.

12. Refer to the response to Items 34 and 35 of Staff's First Request. Provide revised tariff pages and ES Form pages to reflect the text changes discussed in the responses to Items 34.a, 34.c, 35.a, and 35.b.

13. Refer to the response to Item 36 of Staff's First Request. Does the response indicate that Exhibit Wolfram-6 would not change as a result of removing the effects of Project 6 from the 2012 Environmental Compliance Plan? If no, provide a revised Exhibit Wolfram-6 to reflect the removal of Project 6.

14. Refer to Big Rivers' response to Item 22 of the Attorney General's Initial Data Request ("AG's First Request"). Big Rivers responded "[p]rice elasticity analyses are not ordinarily undertaken by Applicants in cases where the proposed rate increases are of the magnitude contemplated in this case." Provide a discussion of what level of proposed rate increases would prompt Big Rivers to perform price elasticity analyses.

15. Refer to Big Rivers' response to Item 66 of the AG's First Request. Explain whether the depreciation rates reflected in Big Rivers' response are the same depreciation rates presently being used for current capital projects in Accounts 312 A-K and 312 L-P.

16. Refer to Big Rivers' response to the Kentucky Industrial Utility Customers, Inc.'s First Set of Data Requests ("KIUC's First Request"), Item 26 at line 13. With regard to the \$169 per kW estimate, provide the support for the derivation of the estimate. Are the costs to comply with EPA's proposed regulations pertaining to the Clean Water Act – Water Intake Fish Impingement (316b), Waste Water Discharge and Coal Combustion Residuals, included in this estimate?

17. Refer to Big Rivers' response to KIUC's First Request, Item 36, and the July 14, 2011 email concerning EPA Proposed Regulations. Big Rivers' proposed 2012 Environmental Compliance Plan estimates capital expenditures of \$286.14 million. Provide a detailed line item explanation for the differences between the capital expenditure estimates for the 2012 Environmental Compliance Plan and the capital expenditure estimates contained in the July 14, 2011 email.

18. Did Big Rivers, as part of the development of its 2012 Environmental Compliance Plan, consider replacing any of its generation units with natural gas

combined cycle units? If so, provide all analysis and data that support the decision to not replace any existing units with combined cycle units. If this alternative was not considered, provide a detailed explanation as well as all analysis and data supporting this decision to not replace any existing units with combined cycle units.

Jeff Derouen
Executive Director
Public Service Commission
P. O. Box 615
Frankfort, KY 40602

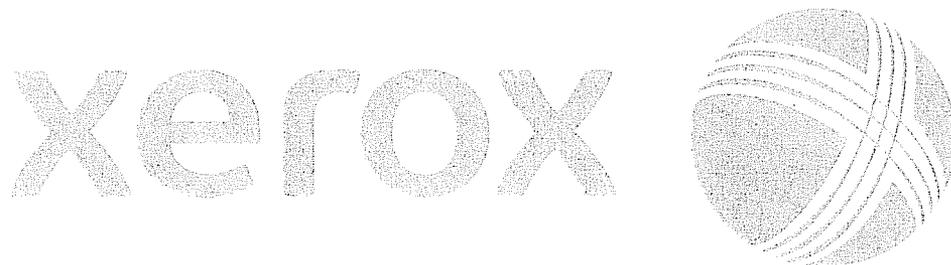
DATED _____

cc: Parties of Record

Case No. 2012-00063

KWalton

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COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

RECEIVED

APPLICATION OF BIG RIVERS)
ELECTRIC CORPORATION, INC.)
FOR APPROVAL OF ITS)
2012 ENVIRONMENTAL COMPLIANCE PLAN,)
FOR APPROVAL OF ITS AMENDED)
ENVIRONMENTAL COST RECOVERY)
SURCHARGE TARIFF, FOR CERTIFICATES OF)
PUBLIC CONVENIENCE AND NECESSITY,)
AND FOR AUTHORITY TO ESTABLISH)
A REGULATORY ACCOUNT)

JUN 21 2012

PUBLIC SERVICE
COMMISSION

Case No. 2012-00063

ATTORNEY GENERAL'S SUPPLEMENTAL DATA REQUESTS
PUBLIC REDACTED VERSION

Comes now the intervenor, the Attorney General of the Commonwealth of Kentucky, by and through his Office of Rate Intervention, and submits these Supplemental Requests for Information to Big Rivers Electric Corporation, Inc. [hereinafter referred to as "BREC"] to be answered by the date specified in the Commission's Order of Procedure, and in accord with the following:

- (1) In each case where a request seeks data provided in response to a staff request, reference to the appropriate request item will be deemed a satisfactory response.
- (2) Please identify the witness who will be prepared to answer questions concerning each request.

(3) Please repeat the question to which each response is intended to refer. The Office of the Attorney General can provide counsel for BREC with an electronic version of these questions, upon request.

(4) These requests shall be deemed continuing so as to require further and supplemental responses if the company receives or generates additional information within the scope of these requests between the time of the response and the time of any hearing conducted hereon.

(5) Each response shall be answered under oath or, for representatives of a public or private corporation or a partnership or association, be accompanied by a signed certification of the preparer or person supervising the preparation of the response on behalf of the entity that the response is true and accurate to the best of that person's knowledge, information, and belief formed after a reasonable inquiry.

(6) If any request appears confusing, please request clarification directly from the Office of Attorney General.

(7) To the extent that the specific document, workpaper or information as requested does not exist, but a similar document, workpaper or information does exist, provide the similar document, workpaper, or information.

(8) To the extent that any request may be answered by way of a computer printout, please identify each variable contained in the printout which would not be self evident to a person not familiar with the printout.

(9) If the company has objections to any request on the grounds that the requested information is proprietary in nature, or for any other reason, please notify the Office of the Attorney General as soon as possible.

(10) As used herein, the words "document" or "documents" are to be construed broadly and shall mean the original of the same (and all non-identical copies or drafts thereof) and if the original is not available, the best copy available. These terms shall include all information recorded in any written, graphic or other tangible form and shall include, without limiting the generality of the foregoing, all reports; memoranda; books or notebooks; written or recorded statements, interviews, affidavits and depositions; all letters or correspondence; telegrams, cables and telex messages; contracts, leases, insurance policies or other agreements; warnings and caution/hazard notices or labels; mechanical and electronic recordings and all information so stored, or transcripts of such recordings; calendars, appointment books, schedules, agendas and diary entries; notes or memoranda of conversations (telephonic or otherwise), meetings or conferences; legal pleadings and transcripts of legal proceedings; maps, models, charts, diagrams, graphs and other demonstrative materials; financial statements, annual reports, balance sheets and other accounting records; quotations or offers; bulletins, newsletters, pamphlets, brochures and all other similar publications; summaries or compilations of data; deeds, titles, or other instruments of ownership; blueprints and specifications; manuals, guidelines, regulations, procedures, policies and instructional materials of any type; photographs or pictures, film, microfilm and microfiche; videotapes; articles; announcements and notices of any type; surveys,

studies, evaluations, tests and all research and development (R&D) materials; newspaper clippings and press releases; time cards, employee schedules or rosters, and other payroll records; cancelled checks, invoices, bills and receipts; and writings of any kind and all other tangible things upon which any handwriting, typing, printing, drawings, representations, graphic matter, magnetic or electrical impulses, or other forms of communication are recorded or produced, including audio and video recordings, computer stored information (whether or not in printout form), computer-readable media or other electronically maintained or transmitted information, and all other rough drafts, revised drafts (including all handwritten notes or other marks on the same) and copies of documents as hereinbefore defined by whatever means made.

(11) For any document withheld on the basis of privilege, state the following: date; author; addressee; indicated or blind copies; all persons to whom distributed, shown, or explained; and, the nature and legal basis for the privilege asserted.

(12) In the event any document called for has been destroyed or transferred beyond the control of the company, please state: the identity of the person by whom it was destroyed or transferred, and the person authorizing the destruction or transfer; the time, place, and method of destruction or transfer; and, the reason(s) for its destruction or transfer. If destroyed or disposed of by operation of a retention policy, state the retention policy.

(13) Please provide written responses, together with any and all exhibits pertaining thereto, in one or more bound volumes, separately indexed and tabbed by each response, in compliance with Kentucky Public Service Commission Regulations.

Respectfully submitted,
JACK CONWAY
ATTORNEY GENERAL



JENNIFER BLACK HANS
DENNIS G. HOWARD, II
LAWRENCE W. COOK
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Certificate of Service and Filing

Counsel certifies that an original and ten photocopies of the foregoing were served and filed by hand delivery to Jeff Derouen, Executive Director, Public Service Commission, 211 Sower Boulevard, Frankfort, Kentucky 40601; counsel further states that true and accurate copies of the foregoing were mailed via First Class U.S. Mail, postage pre-paid, to:

Mark A. Bailey
President and CEO
Big Rivers Electric Corporation
201 3rd St.
Henderson, KY 42420

Robert W. Berry, Vice President
Production
Big Rivers Electric Corporation
201 3rd St.
Henderson, KY 42420

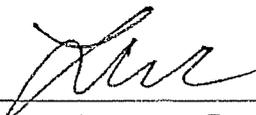
Hon. James M. Miller
Hon. Tyson Kamuf
Sullivan, Mountjoy, Stainback & Miller, PSC
P.O. Box 727
Owensboro, KY 42302-0727

Hon. Michael L. Kurtz
Boehm, Kurtz & Lowry
36 E. 7th St.
Ste. 1510
Cincinnati, Ohio 45202

Albert Yockey, Vice President,
Governmental Relations & Enterprise Risk
Management
Big Rivers Electric Corporation
201 3rd St.
Henderson, KY 42420

Joe Childers
Joe F. Childers & Associates
300 Lexington Building
201 West Short Street
Lexington, KY 40507

this 21st day of June, 2012



Assistant Attorney General

Application of Big Rivers Electric Corporation, Inc.
For Approval of its 2012 Environmental Compliance Plan, Amended Environmental Cost
Recovery Surcharge Tariff, for Certificates of Public Convenience
and Necessity, and for Authority to Establish a Regulatory Account
Case No. 2012-00063
Attorney General's Supplemental Data Requests
PUBLIC REDACTED VERSION

1. Reference BREC's response to AG DR 1-1, wherein BREC was asked to provide "the actual, average usage for BREC's rural class of customers for the past five years" [emphasis added]. Provide the amount of energy consumed by the average rural customer of the three member rural electric cooperatives ("coops"). (Note that the question did not ask to provide this information with regard to the average of the three coops' kwh sales.)
2. Reference BREC's response to AG DR 1-2, wherein BREC was asked to provide "the actual, average monthly usage for BREC's industrial class of customers for the past five years" [emphasis added]. Provide the amount of energy consumed by the average industrial customer of the three member coops (Note that the question did not ask to provide this information with regard to the average of the three coops' kwh sales.)
3. Reference BREC's response to AG DR 1-5. Provide the chart which was requested.
4. Reference BREC's response to AG DR 1-7.
 - a. BREC failed to state whether the total costs of the \$49.185 million in gross plant retirement for the Wilson scrubber is included in the total costs which are the subject of the instant filing. If so, identify exactly and precisely where such an entry can be located in the filing materials.
 - b. With regard to BREC's response to subpart (a) of this question, BREC failed to provide the chart requested, and instead stated only "not applicable," without stating why such a chart is not applicable. Provide the chart and a complete explanation.
5. Reference BREC's response to AG DR 1-13 and Hite Testimony, Section V. Has BREC consulted with Goldman Sachs and its bond counsel, Orrick Herrington & Sutcliffe LLP concerning the opportunities available for public financing, including qualified private activity bonds pursuant to Internal Revenue Code Section 142(a)(6)?

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- a. If the answer is in the affirmative, please provide all records and related communication concerning the analysis of the opportunity for using tax-exempt, qualified private activity bonds under Kentucky's 2012 calendar year volume cap allocation for private activity bonds. If no, why not?
 - b. Would BREC consider evaluating whether it could obtain financing at a favorable interest rate using tax-exempt qualified private activity bonds? If not, why not?
 - c. Has BREC or their representative contacted the Finance Cabinet about the availability of private activity volume cap for qualifying portions of the project? If yes, please discuss. If not, why not?
6. If BREC should attempt to obtain forms of secured financing other than through the RUS (e.g., through private placement and public capital debt markets, or industry lenders such as CoBank and ACB) would it first be required to obtain a lien accommodation from the RUS?
- a. If the response is "yes," please provide an estimate of how long it would take to obtain such a lien accommodation, and any and all other requirements BREC would have to meet in order to qualify for the accommodation.
7. Has BREC considered the option of obtaining a trust indenture to finance its ECR costs, similar to that set forth in EKPC's application in Case No. 2012-00249?
8. Reference BREC's response to AG DR 1-14 and 1-21. Please provide a copy of the Request for Proposal (RFP) for the Wilson FGD replacement project.
9. Reference BREC's response to AG DR 1-18. BREC was asked, to provide a detailed breakdown of, *inter alia*, "other costs, identifying fully the nature of such other costs." No such description was provided. Provide a complete description and detailed breakdown of such costs.
10. Reference BREC's response to AG DR 1-26. State who will be responsible for providing notice to retail ratepayers: BREC, or the member coops?

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- a. Provide copies of the notice that will be provided to retail rural class customers.
 - b. How will any such notice referenced in subpart (a), above, be provided? If necessary, provide a complete list of any and all media outlets who will publish any such notice.
 - c. AG DR 1-26 asked the company to identify where in the notice to ratepayers the actual dollar amount was listed. The question did not ask for how the amounts could be calculated. Respond to the question.
11. Reference the response to AG 1-33, the Fitch Ratings rating report dated June, 2011. Confirm that this report indicates that a rating action could be triggered by EPA regulations.
12. Reference the Fitch Rating Report attached to BREC's response to AG 1-33, p. 7. Confirm that the report states: "Big Rivers estimates that full compliance with the regulations could require expenditures of \$785 million by 2015, and increase wholesale rates and member retail rates by 39% and 20%, respectively."
- a. Please explain what caused the company to change the above-referenced cost estimate of achieving compliance to the cost estimate which is set forth in the instant filing.
13. Reference BREC's response to AG 1-44 (a) and (b), wherein BREC states that in 2018, the rural class should experience an increase of approximately 6.9%. Provide this figure in terms of actual dollars for the monthly bill of the average rural customer for each of the three members.
14. Reference BREC's response to AG 1-46, Update to BREC's Board, dated February 21, 2012, p. 7. Explain under what circumstances, and when, BREC will seek the increase in base rates as set forth in this slide.
15. Reference BREC's response to AG 1-46, "Environmental Compliance Update to Big Rivers Board" at p. 5, wherein a chart indicates "Overall CSAPR & MATS Capital Expense" total of \$213.5 million and at p. 6, wherein a chart indicates "Overall CSAPR & MATS O & M Expense" of \$10.18 million. Reconcile the above-referenced estimates with the figures set forth in BREC's application.

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16. Reference BREC's response to AG 1-46, "Big Rivers Letter to Rural Utilities Service" at p. 2, wherein it is stated: "We are unclear about whether the term 'generating facilities' includes pollution control equipment added to existing generating facilities." Has RUS responded to this query? If yes, please provide the responsive communication or identify where it has been provided in response to initial requests for information.
17. Reference BREC's response to AG 1-64, attachment 1 (letter from Mark Hite dated March 6, 2012). At page 2 of this letter, Mr. Hite states, "We understand that qualifying for RUS loan funds requires compliance with a number of requirements, including compliance with the National Environmental Policy Act."
 - a. Please describe the requirements referenced in Mr. Hite's letter, with which BREC will need to comply in order to qualify for RUS loans.
 - b. If BREC is still learning what these requirements will be, does it agree to promptly supplement its response hereto in order to provide this information to the Commission and to the parties?
18. Reference BREC's response to AG 1-64, attachment 4 ("Financing Document RUS Loan Application Package"). At p. 26 of that document, BREC states that annual O & M costs are estimated at \$13.230 million.
 - a. Reconcile this figure with the figure of \$15.73 million for annual O & M costs provided in BREC's response to AG 1-56.
 - b. Reconcile the two above-referenced O & M figures with that set forth in BREC's response to KIUC 1-43, February 21, 2012 minutes of BREC's Board of Directors, the attached "Environmental Compliance Update," dated February 21, 2012, p. 6, which indicates annual O & M will be \$11.99 million.
19. Reference BREC's response to AG 1-39 and (a) wherein BREC states: "The additional O & M costs were estimated in 2011 dollars and adjusted for inflation at 2.5% each year through 2023." Please provide a total sum of estimated O & M costs that BREC is requesting to recover between 2012 and 2023, broken down by each year.

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20. Reference the company's response to AG 1-77. Provide the proposed return on investment in terms of a percentage, over the life span of the project. If necessary in order to fully address this question, use hypothetical data, but carefully note where any such hypothetical data is employed.
21. Reference the company's response to AG 1-78, regarding the proposed deviation (total adjusted revenue) from BREC's ECR methodology, in particular the fixed cost recovery component. Express the data provided on the attached "Allocation of Environmental Plan Costs" in terms of percentages (i.e., the rural class will pay what percentage of the total costs, etc.). Provide the same data, again in terms of percentages, using the existing ECR methodology (\$/kWh).
 - a. Explain the statement " . . . the Rural class has a lower load factor than Big Rivers' other customer classes."
 - b. Do the rural classes of all three members, when taken as a whole, in fact comprise a lower load factor than all of the other classes? Explain in complete detail.
22. Reference BREC's response to AG 1-90. The company failed to provide a substantive, meaningful response to AG 1-1, 1-2 and 1-3, and does so again in 1-90. Provide a chart, broken down by the three members, further broken down by the classes; for each average customer (as defined by the average level of consumption for each class, and for each member) provide a dollar amount of the percentage increases noted in Wolfram exhibit 6. If necessary, contact counsel for the Attorney General if you should have any questions.
23. Reference the company's response to AG 1-92. Please provide a substantive, meaningful response to the question.
24. Reference BREC's response to KIUC 1-36, file named "Capital Cost Estimates" on the CD attached in response thereto. This e-mail from Eric Robeson indicates that "Scenario 2 is most likely one," and gives a total of \$458 million including HAPS and MACT.
 - a. To what scenario or document(s) does this e-mail make reference?

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- b. Have any and all such documents already been provided by BREC? If so, please provide a specific reference.
 - c. How was the \$458 million figure developed, and by whom? Upon what plan(s) was or were that figure based?
 - d. Has BREC already provided any and all documents, memoranda, and workpapers associated with the projects which are included within that dollar figure? If not, please do so.
25. Reference BREC's response to KIUC 1-36, file named "Capital Cost Estimates 0000" on the CD attached in response thereto. Please explain the meaning of the sentence: "If scenario 2 is more likely than scenario 1, how hard would it be to reverse the numbering of them?"
26. Reference BREC's response to KIUC 1-43, April 20, 2012 minutes of BREC's Board, the attached "Smelter Mitigation Plan Update to the Board of Directors, April 2012," p.8. The document indicates the rural class would face rate increases, net of the MSRM, ranging from 9.3% to 11.8% in the various scenarios. Reconcile this information with the Wolfram testimony, and with the company's response to AG 1-87, which indicate the rurals would experience no rate impact.
27. Reference BREC's Updated Response to KIUC 1-43, "Financial Forecast 2012-2026; Presentation June 15, 2012," p. 2. This particular model carries the express major assumption that both smelter contracts will continue beyond 2023. Explain whether BREC has a financial model that utilizes the assumptions that one or both smelters would leave by 2014. If so, please provide a copy, or if it is already filed of record, please identify where. If BREC does not have such a model, please state why not.
28. Reference the BREC response to AG 1-78, and to the Wolfram pre-filed testimony beginning at p. 7. Mr. Wolfram attempts to justify the change of methodology for calculating the ECR from the existing \$/kWh to the proposed total adjusted revenue methodology based in part upon the assertion that the ECR costs for the 2012 plan are all fixed. Reconcile this assertion with the company response to KIUC 1-43, February 21, 2012 minutes of the Board of Directors' meeting, the attached "Big Rivers Environmental Surcharge (ES) Rate Formula," dated February 21, 2012, p. 5, which indicates, *inter alia*, that 32% of the proposed costs in the 2012 plan are variable.

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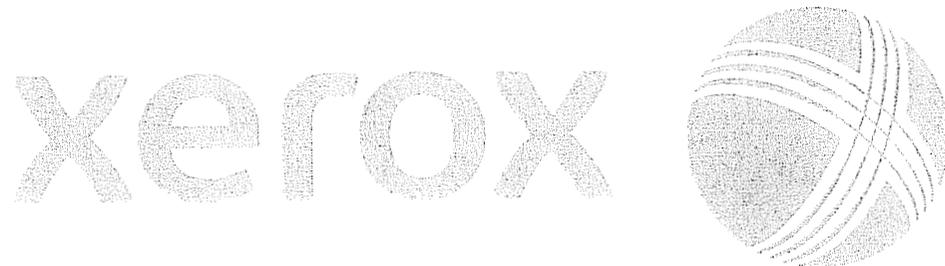
- a. Has the company considered revising the ECR methodology to have two components, one for variable costs using the kWh methodology, and the second for fixed costs utilizing the total adjusted revenue methodology? If not, why not?
 - b. Does the company agree that such an approach would provide a more just and equitable means of allocating costs?
 - c. Would the company agree to consider such an option? If not, why not?
29. Reference BREC's response to KIUC 1-43, the March 16, 2012 Board of Directors' minutes, attachment entitled "Smelter Mitigation Plan," dated March 2012, p. 4. Please provide a complete explanation of what this chart depicts, and explain whether the data referenced therein comports in all ways with BREC's application, and all of its responses to data requests.
- a. Regarding the cost data set forth on the left side of that page, provide a breakdown in terms of dollars and cents that will appear on the monthly bills of all three members' average ratepayers, in all classes. For purposes of this question, "average ratepayer" is defined as the average level of consumption.
30. Provide an update on Phase 2 of BREC's transmission expansion programs.
31. Reference BREC's Confidential Updated Response to KIUC 1-43, {BEGIN CONFIDENTIAL} [REDACTED]

[REDACTED]

e. [REDACTED] {END CONFIDENTIAL}

KWalton

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COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF:

APPLICATION OF BIG RIVERS)	
ELECTRIC CORPORATION FOR A	)	CASE NO. 2012-00063
GENERAL ADJUSTMENT IN RATES)	

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.'s
FIRST SET OF DATA REQUESTS TO
BIG RIVERS ELECTRIC CORPORATION

Dated: May 21, 2012

DEFINITIONS

1. "Document(s)" is used in its customary broad sense and includes electronic mail and all written, typed, printed, electronic, computerized, recorded or graphic statements, memoranda, reports, communications or other matter, however produced or reproduced, and whether or not now in existence, or in your possession.
2. "Study" means any written, recorded, transcribed, taped, filmed, or graphic matter, however produced or reproduced, either formally or informally, a particular issue or situation, in whatever detail, whether or not the consideration of the issue or situation is in a preliminary stage, and whether or not the consideration was discontinued prior to completion whether preliminary or final, and whether or not referred to in Big Rivers' direct testimony.
3. If any document requested herein was at one time in existence, but has been lost, discarded or destroyed, identify such document as completely as possible, including the type of document, its date, the date or approximate date it was lost, discarded or destroyed, the identity of the person (s) who last had possession of the document and the identity of all persons having knowledge of the contents thereof.
4. "Person" means any natural person, corporation, professional corporation, partnership, association, joint venture, proprietorship, firm, or the other business enterprise or legal entity.
5. A request to identify a natural person means to state his or her full name and residence address, his or her present last known position and business affiliation at the time in question.
6. A request to identify a document means to state the date or dates, author or originator, subject matter, all addressees and recipients, type of document (e.g., letter, memorandum, telegram, chart, etc.), number of code number thereof or other means of identifying it, and its present location and custodian. If any such document was, but is no longer in the Company's possession or subject to its control, state what disposition was made of it.
7. A request to identify a person other than a natural person means to state its full name, the address of its principal office, and the type of entity.
8. "And" and "or" should be considered to be both conjunctive and disjunctive, unless specifically stated otherwise.
9. "Each" and "any" should be considered to be both singular and plural, unless specifically stated otherwise.
10. Words in the past tense should be considered to include the present, and words in the present tense include the past, unless specifically stated otherwise.
11. "You" or "your" means the person whose filed testimony is the subject of these interrogatories and, to the extent relevant and necessary to provide full and complete answers to any request, "you" or "your" may be deemed to include any person with information relevant to any interrogatory who is or was employed by or otherwise associated with the witness or who assisted, in any way, in the preparation of the witness' testimony.
12. "BREC" means Big Rivers Electric Corporation and/or any of their officers, directors, employees, or agents who may have knowledge of the particular matter addressed.

INSTRUCTIONS

1. If any matter is evidenced by, referenced to, reflected by, represented by, or recorded in any document, please identify and produce for discovery and inspection each such document.
2. These interrogatories are continuing in nature, and information which the responding party later becomes aware of, or has access to, and which is responsive to any request is to be made available to Kentucky Industrial Utility Customers. Any studies, documents, or other subject matter not yet completed that will be relied upon during the course of this case should be so identified and provided as soon as they are completed. The Respondent is obliged to change, supplement and correct all answers to interrogatories to conform to available information, including such information as it first becomes available to the Respondent after the answers hereto are served.
3. Unless otherwise expressly provided, each interrogatory should be construed independently and not with reference to any other interrogatory herein for purpose of limitation.
4. The answers provided should first restate the question asked and also identify the person(s) supplying the information.
5. Please answer each designated part of each information request separately. If you do not have complete information with respect to any interrogatory, so state and give as much information as you do have with respect to the matter inquired about, and identify each person whom you believe may have additional information with respect thereto.
6. In the case of multiple witnesses, each interrogatory should be considered to apply to each witness who will testify to the information requested. Where copies of testimony, transcripts or depositions are requested, each witness should respond individually to the information request.
7. The interrogatories are to be answered under oath by the witness(es) responsible for the answer.
8. Responses to requests for revenue, expense and rate base data should provide data on the basis of Total Company as well as Intrastate data, unless otherwise requested.

**FIRST SET OF DATA REQUESTS OF
KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.
BIG RIVERS ELECTRIC CORPORATION
Case No. 2012-00063**

- Q1.1. See Spreadsheet Financial Forecast (2012-2026) Base Case (No Env Comp) 02-.xls, Worktab = PCM, Cell N77. This cell points to another excel spreadsheet that was not supplied with the set of Corporate Financial Model ("CFM") scenario spreadsheets previously supplied. Furthermore, there are other cells within that same spreadsheet that point to other excel spreadsheets, for example, cell N82 in the same WorkTab points to a Monthly Resource Report worktab in another excel spreadsheet. We request the Company to supply every spreadsheet that is referenced within each CFM scenario that the Company previously supplied, and to identify where the external spreadsheets are referenced within the CFM scenario spreadsheets.
- Q1.2. Refer to the five corporate financial model scenario Excel workbooks provided by the Company in response to the KIUC Motion to Dismiss.
- a. Please confirm that the NPV spreadsheet for each scenario quantifies the annual revenue requirement of all variable expenses, off system sales (OSS) revenues, and incremental fixed debt service used to finance the capital expenditures of the scenarios.
 - b. Please confirm that the NPV spreadsheet for each scenario quantifies the incremental fixed debt service using a levelized methodology over 28 years using the coupon interest rate and no TIER.
 - c. Please explain why the incremental fixed debt service does not include a TIER. If the Company agrees that the incremental fixed debt service should include a TIER, then please provide revised scenarios including a TIER.
 - d. Please explain why the Company used a levelized methodology for the fixed debt service rather than an annual revenue requirement methodology consistent with the manner in which it will recover the build or buy costs from customers through the ECR.
 - e. Please provide the inputs to the CFM base case and five scenarios obtained from ACES and all workpapers and other analyses used to convert the ACES data to inputs for the CFM base case and five scenarios, including all assumptions, data, computations, and electronic spreadsheets with formulas intact.
 - f. Please confirm that the NPV spreadsheet for each of the two loss of Smelter load scenarios reflect no loss of Smelter revenues under their KPSC approved contracts after 2013, even though the Company assumed that the available generation freed up from the closure of the Smelters could under their KPSC approved contracts be sold into the market and reflected both the additional OSS revenues and the other effects on variable expenses in the revenue requirement.
 - g. Please indicate whether the Company still believes that it correctly modeled the two loss of Smelter load scenarios without consideration of the loss of the Smelter revenues under their KPSC approved contracts and explain why it believes that the scenarios either are correct or incorrect.

- h. Please provide revised NPV spreadsheets for the two loss of Smelter load scenarios to reflect the loss of Smelter revenues under their KPSC approved contracts after 2013. Provide all assumptions, data, computations, and workpapers, including electronic spreadsheets with formulas intact.
 - i. Please explain why the Company limited its CFM scenarios to 15 years (from 2012 through 2016) instead of a longer horizon, such as 20, 25, or 28 years, or a shorter horizon such as ten years.
- Q1.3. If ACES performed any cases other than those used in the CFM base case and five scenarios, please provide a detailed description of the other cases performed, and provide the same information as requested in the prior question for those other cases.
- Q1.4. Please supply all documents, memos, letters and emails that were sent back and forth between the Company and ACES concerning either input or output data associated with the base case and five scenarios, as well as any other cases that ACES performed.
- Q1.5. Please provide all assumptions, data, computations and workpapers, including electronic spreadsheets with formulas intact used to populate the CFM base case and each of the five scenarios.
- Q1.6. Please provide a narrative description of how the CFM model was populated with data associated with each generating unit environmental upgrade.
- Q1.7. Assuming the environmental upgrade assumptions were sourced to Sargent & Lundy, provide the workpapers that came from Sargent & Lundy. If the environmental upgrade assumptions were sourced elsewhere, still provide the workpapers that were developed in whatever process was used to create the environmental upgrade assumptions.
- Q1.8. Whatever the source of the environmental upgrade assumptions, provide any spreadsheets developed for the purpose of converting the environmental upgrade assumptions to the format required to be input into the CFM. Please provide the workpapers electronically with all formulas intact.
- Q1.9. For all environmental upgrades evaluated but rejected, please provide all workpapers associated with those upgrades, and provide inputs in the format that could be inserted into the CFM model. Please provide the workpapers electronically with all formulas intact.
- Q1.10. For each generating unit and purchase that is part of the Company's resources, supply the following information:
 - a. Owner of the resource
 - b. If the Company has partial or full ownership, specify the ownership %
 - c. Operator of the resource
 - d. If a purchase
 - i. Capacity the company is entitled to
 - ii. Energy the company is entitled to
 - iii. Capacity cost

- iv. Energy cost
- e. If a unit
 - i. Min cap, max cap
 - ii. Heat rates Incremental and average
 - iii. Avail and forced outage rates
 - iv. Fuel type
 - v. Startup cost
 - vi. Minimum down time
 - vii. Maximum up time
 - viii. Ramp rate
 - ix. Operating constraints, if any, for example, must run
 - x. Can it be used for quick start or spinning reserves
 - xi. Fuel constraints if any
 - xii. Any other operational data
 - xiii. Emissions data (rates, costs, etc)

Q1.11. Supply the Company's most recently completed resource expansion plan covering the next 30 years or whatever length of time that the Company performs its planning based on an IRP process, or whatever process that the Company uses to develop a long run expansion plan. Provide this electronically in excel format with all formulas intact. This spreadsheet should show all calculations. In other words, if there is any category such as hydro capacity made up of a set of hydro units that sum to a total, provide the breakdown and summation to derive the total. Also, if there is a calculation of reserve margin, please provide the calculation with all components used in the calculation. For example, the target reserve margin, load, capacity (by resource) should all be readily identifiable.

Berry Testimony

Q1.12. Please provide all models, worksheets, analyses, etc electronically, with all formulas intact that led to the development of the results found in Mr. Berry's Exhibits 2 through 6.

DePriest Testimony

Q1.13. Page 13 - Please provide copies of all models and worksheets, electronically, with all formulas intact that S&L used to generate the "capital and O&M cost estimates used in the compliance study."

Q1.14. Mr. DePriest mentioned that S&L compiled cost data from recent S&L FGD, SCR, and ACI, dry sorbent injection, and other comparable projects.

- a. Please provide a description of each project the data was compiled from.

b. Please provide the compiled results containing the data used in the Big Rivers Study.

- Q1.15. If not provided in response to the above, please provide the analyses, electronically and with all formulas intact, of the models/worksheets that were used to calculate costs for each of the technology alternatives, and to determine the NPV of each technology over a projected 20-year life (See page 13, line 19 of Mr. DePriest's testimony).
- Q1.16. Please provide all economic data provided by Big Rivers to S&L (See page 13, line 22 of Mr. DePriest's testimony).

Hite Testimony

- Q1.17. Page 7 discusses that Big Rivers acquired forward pricing data from PACE Global, which included forward hourly energy prices, monthly coal prices, monthly natural gas prices, and monthly allowance prices. Please provide all documents, memos, letters and emails that went back and forth between PACE Global and Big Rivers regarding these analyses, including the engagement letter, contract documents, data assumption documents, model result analyses, etc.
- Q1.18. Provide copies of all models and spreadsheets developed containing input assumptions and output results. Provide these electronically, with all formulas intact.
- Q1.19. Provide copies of all written reports, memos, emails or documents of any type that PACE Global produced regarding this project, as well as any that Big Rivers produced related to the analyses that PACE Global performed.
- Q1.20. Page 8 discusses that Big Rivers received production cost results from ACES Power Marketing. Please provide all documents, memos, letters and emails that went back and forth between ACES and Big Rivers regarding these analyses, including the engagement letter, contract documents, data assumption documents, model result analyses, etc.
- Q1.21. Provide copies of all models and spreadsheets developed containing input assumptions and output results. Provide these electronically, with all formulas intact.
- Q1.22. Provide copies of all written reports, memos, emails or documentation of any type that either ACES or PACE Global produced regarding this project, as well as any that Big Rivers produced related to the analyses that either ACES or PACE Global performed.
- Q1.23. Please identify the production cost model used, and provide the Documentation Manual for whatever production cost model ACES used in its production cost runs.
- Q1.24. Please explain the process by which parties would have to go through to acquire the ACES model used, and the costs associated with acquiring the model, and what alternatives exist in case parties would like to run alternative analyses.
- Q1.25. Please explain why this production cost model was selected.

- Q1.26. Please discuss why an optimal resource plan analysis was not conducted that would have evaluated more options including the potential retirement of the coal units being upgraded, conversion to gas, or replacement with combined cycle resources.
- Q1.27. Please identify the models used by Pace Global, and provide the Documentation Manuals for all of the models that Pace Global used in its analyses.
- Q1.28. Please explain the process by which parties would have to go through to acquire the models Pace Global used, and the costs associated with acquiring the model, and what options exist in case parties or the Commission would like to run alternative analyses.
- Q1.29. Please explain why these models were selected by Pace Global to be used in this analysis.
- Q1.30. Please explain what sensitivity analyses, other than the two loss of Smelter load scenarios, were performed. Please provide justification for why these sensitivity analyses were performed, and if none were performed other than the loss of Smelter load scenarios, please explain why not.
- Q1.31. Please explain why Big Rivers provided so little explanation of the production cost analyses that were performed, and why the Chief Financial Officer was selected to provide such a brief discussion of this topic.
- Q1.32. Please discuss in detail the process by which Big Rivers developed its input assumptions that were used in its production cost analyses and in the development of forward price assumptions.
- Q1.33. What process was used to ensure that the assumptions that were used by ACES in its production cost modeling analyses, and the assumptions that were used by PACE Global were consistent, and provide a comparison of the assumptions that were used in both of the analyses.
- Q1.34. Please describe the manner in which the results developed by PACE Global were incorporated in the production cost analysis that ACES performed.
- Q1.35. Please provide the results electronically with all formulas intact as provided to ACES by PACE Global.
- Q1.36. Please provide a copy of all emails, documents or memos prepared, sent, issued or received during the last six months by Mr. Bailey, Mr. Blackburn, Mr. Berry, Mr. Shaw or Mr. Hite and/or any of the General Managers of any of the three member cooperatives regarding Big Rivers' plan for compliance with federal environmental laws and regulations including, but not limited to, considerations of the "build", "partial build" and "buy" options referenced on page 6 of Mr. Hite's Direct Testimony.
- Q1.37. Please provide all workpapers and/or preliminary model runs associated with the "build", "partial build" and "buy" options referenced on page 6 of Mr. Hite's Direct Testimony including, but not limited to, documents and/or data associated with other environmental compliance options considered by Big Rivers, but not discussed in Mr. Hite's Direct Testimony.
- Q1.38. Please provide a copy of all emails, documents or memos prepared, sent, issued or received during the last two years by Mr. Bailey, Mr. Blackburn, Mr. Berry, Mr. Shaw or Mr. Hite and/or any of the General Managers of any of the three member cooperatives regarding Big Rivers' business plan in the event that one or both of the Smelters gives notice that they intend to cease operations on the Big Rivers' system.

- Q1.39. Please provide a copy of all emails, documents or memos prepared, sent, issued or received during the last two years by Mr. Bailey, Mr. Blackburn, Mr. Berry, Mr. Shaw or Mr. Hite and/or any of the General Managers of any of the three member cooperatives regarding consideration of mergers with another utility, the sale of Big Rivers to a third party, or the sale of any of Big Rivers' generating units.
- Q1.40. Please provide a list of all entities that Big Rivers has entered a confidentiality agreement with in the last two years.
- Q1.41. Please provide a copy of all presentations during the last two years made by the Company and/or its outside advisors to the Big Rivers Board of Directors regarding the potential financial impact of existing or proposed environmental regulations.
- Q1.42. Please provide a copy of all presentations that the Company has made or plans to make to the "various institutional investors" referenced on page 15 of Mr. Hite's Direct Testimony.
- Q1.43. Please provide a copy of all minutes from the Company's Board of Directors meetings since January 2010 through the most recent month available. This is a continuing request and the response should be supplemented as each additional month is available.
- Q1.44. Please provide the current balance (as of April 2012 or May 2012, if available) in the Economic Reserve Fund and the Rural Economic Reserve ("RER") fund. This should be considered a continuing request and updates should be provided monthly as actual information for each succeeding month is available.
- Q1.45. Please provide the Company's projections of the balances in the Economic Reserve Fund and the Rural Economic Reserve Fund for each month during the remainder of 2012 (after the most recent month for which actual information was provided in response to the preceding question), and for each month during 2013 and subsequent years. Provide all assumptions, data, and computations, including all electronic spreadsheets with formulas intact.
- Q1.46. In the event that Big Rivers were to fail to achieve the target MFIR under its Indenture such that Big Rivers was precluded from issuing debt under its Indenture, how would that affect Big Rivers' choice of environmental compliance options?
- Q1.47. Assume that the interest rate on debt issued by Big Rivers would increase due to capital market conditions, a credit downgrade of Big Rivers, or any other reason or combination of reasons.
- a. In the event that the interest rate that Big Rivers would incur on debt issued for the purpose of funding capital expenditures for environmental compliance were to be higher than Big Rivers' official forecasted interest rate of 5.50%, please indicate how the increased interest rate would alter Big Rivers' proposed plan of compliance, if at all.
- Q1.48. Please provide a complete copy of all existing contracts between Big Rivers and the City of Henderson, Henderson Municipal Power and Light, or any other entity related to the City of Henderson.
- Q1.49. Please provide all excel spreadsheets (with formulas intact) and other workpapers supporting the development of Mr. Wolfram's Exhibit Number 6. Include the support for the projected draw down of the MRSM and the RER by year by rate schedule.

Q1.50. For each of the years 2012 and 2016, please provide the following information in an excel spreadsheet:

- a. Total 12 month adjusted revenues, as used in the Company's proposed ES Tariff
- b. For each of rate schedules RDS, LIC, QFS and LICX, by rate schedule, provide
 - i. Base rate revenues
 - ii. FAC revenues
 - iii. Non-FAC PPA revenues
 - iv. Fuel revenues in base rates
- c. For the Smelter rate schedule, provide
 - i. Base Fixed Energy revenues
 - ii. FAC revenues
 - iii. Non-FAC PPA revenues
 - iv. Fuel revenues in base rates

Q1.51. For the 12 months ending March 31, 2012 (or the most recent 12 month period available), please provide the following information in an excel spreadsheet:

- a. Total 12 month adjusted revenues, as used in the Company's proposed ES Tariff
- b. For each of rate schedules RDS, LIC, QFS and LICX, by rate schedule, provide
 - i. Base rate revenues
 - ii. FAC revenues
 - iii. Non-FAC PPA revenues
 - iv. Fuel revenues in base rates
- c. For the Smelter rate schedule, provide
 - i. Base Fixed Energy revenues
 - ii. FAC revenues
 - iii. Non-FAC PPA revenues
 - iv. Fuel revenues in base rates

Q1.52. Please provide for 2012 and 2016 the Smelter revenue and credit amounts for each of the categories 1 through 17 listed on lines 5 through 21 of page 15 of Mr. Wolfram's testimony in an excel spreadsheet.

Q1.53. Please provide for the 12 months ending March 31, 2012 (or the most recent 12 month period available), the Smelter revenue and credit amounts for each of the categories 1 through 17 listed on page 15 of Mr. Wolfram's testimony in an excel spreadsheet.

Q1.54. Please provide the Company's estimated 2016 ES revenue requirement, separated into variable and fixed costs. Please provide the results for both the current ECR revenue requirements approved in Case No. 2007-00460 and for the projects being requested for approval in this case (the "2012 Plan") in an excel spreadsheet.

Respectfully submitted,

Michael L. Kurtz, Esq.
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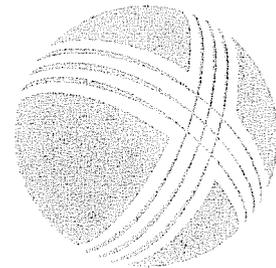
**CO-COUNSEL FOR ALCAN PRIMARY PRODUCTS
CORPORATION**

May 21, 2012

KWalton

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COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF:

APPLICATION OF BIG RIVERS ELECTRIC) CASE NO. 2012-00063
CORPORATION FOR APPROVAL OF ITS)
2012 ENVIRONMENTAL COMPLIANCE)
PLAN, FOR APPROVAL OF ITS AMENDED)
ENVIRONMENTAL COST RECOVERY)
SURCHARGE TARIFF, FOR CERTIFICATES)
OF PUBLIC CONVENIENCE AND)
NECESSITY, AND FOR AUTHORITY TO)
ESTABLISH A REGULATORY ACCOUNT)

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.'s
FIRST SET OF DATA REQUESTS TO
SIERRA CLUB

Dated: July 30, 2012

DEFINITIONS

1. "Document(s)" is used in its customary broad sense and includes electronic mail and all written, typed, printed, electronic, computerized, recorded or graphic statements, memoranda, reports, communications or other matter, however produced or reproduced, and whether or not now in existence, or in your possession.
2. "Study" means any written, recorded, transcribed, taped, filmed, or graphic matter, however produced or reproduced, either formally or informally, a particular issue or situation, in whatever detail, whether or not the consideration of the issue or situation is in a preliminary stage, and whether or not the consideration was discontinued prior to completion whether preliminary or final, and whether or not referred to in Big Rivers' direct testimony.
3. If any document requested herein was at one time in existence, but has been lost, discarded or destroyed, identify such document as completely as possible, including the type of document, its date, the date or approximate date it was lost, discarded or destroyed, the identity of the person (s) who last had possession of the document and the identity of all persons having knowledge of the contents thereof.
4. "Person" means any natural person, corporation, professional corporation, partnership, association, joint venture, proprietorship, firm, or the other business enterprise or legal entity.
5. A request to identify a natural person means to state his or her full name and residence address, his or her present last known position and business affiliation at the time in question.
6. A request to identify a document means to state the date or dates, author or originator, subject matter, all addressees and recipients, type of document (e.g., letter, memorandum, telegram, chart, etc.), number of code number thereof or other means of identifying it, and its present location and custodian. If any such document was, but is no longer in the Company's possession or subject to its control, state what disposition was made of it.
7. A request to identify a person other than a natural person means to state its full name, the address of its principal office, and the type of entity.
8. "And" and "or" should be considered to be both conjunctive and disjunctive, unless specifically stated otherwise.
9. "Each" and "any" should be considered to be both singular and plural, unless specifically stated otherwise.
10. Words in the past tense should be considered to include the present, and words in the present tense include the past, unless specifically stated otherwise.
11. "You" or "your" means the person whose filed testimony is the subject of these interrogatories and, to the extent relevant and necessary to provide full and complete answers to any request, "you" or "your" may be deemed to include any person with information relevant to any interrogatory who is or was employed by or otherwise associated with the witness or who assisted, in any way, in the preparation of the witness' testimony.
12. "Sierra Club" means Sierra Club and/or any of their officers, directors, employees, or agents who may have knowledge of the particular matter addressed.

INSTRUCTIONS

1. If any matter is evidenced by, referenced to, reflected by, represented by, or recorded in any document, please identify and produce for discovery and inspection each such document.
2. These interrogatories are continuing in nature, and information which the responding party later becomes aware of, or has access to, and which is responsive to any request is to be made available to Kentucky Industrial Utility Customers. Any studies, documents, or other subject matter not yet completed that will be relied upon during the course of this case should be so identified and provided as soon as they are completed. The Respondent is obliged to change, supplement and correct all answers to interrogatories to conform to available information, including such information as it first becomes available to the Respondent after the answers hereto are served.
3. Unless otherwise expressly provided, each interrogatory should be construed independently and not with reference to any other interrogatory herein for purpose of limitation.
4. The answers provided should first restate the question asked and also identify the person(s) supplying the information.
5. Please answer each designated part of each information request separately. If you do not have complete information with respect to any interrogatory, so state and give as much information as you do have with respect to the matter inquired about, and identify each person whom you believe may have additional information with respect thereto.
6. In the case of multiple witnesses, each interrogatory should be considered to apply to each witness who will testify to the information requested. Where copies of testimony, transcripts or depositions are requested, each witness should respond individually to the information request.
7. The interrogatories are to be answered under oath by the witness(es) responsible for the answer.
8. Responses to requests for revenue, expense and rate base data should provide data on the basis of Total Company as well as Intrastate data, unless otherwise requested.

**FIRST SET OF DATA REQUESTS OF
KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC. TO
SIERRA CLUB
Case No. 2012-00063**

Q1.1. Please provide all spreadsheets, models and workpapers, with all formulas intact, and all referenced spreadsheets included, that were used in the development of the results presented in Ms. Wilson's Tables 1 and 12 of her testimony. This should include the cash flow models that were used, as discussed on page 31 of Ms. Wilson's testimony.

Respectfully submitted,

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**COUNSEL FOR KENTUCKY INDUSTRIAL UTILITY
CUSTOMERS, INC.**

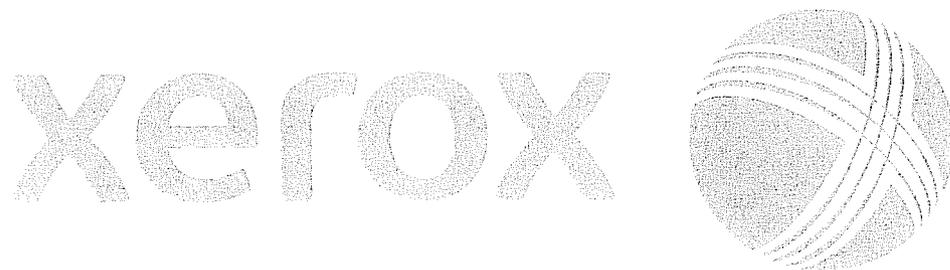
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**CO-COUNSEL FOR ALCAN PRIMARY PRODUCTS
CORPORATION**

July 30, 2012

KWalton

 1st Set of Data Request to BREC.pdf
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BOEHM, KURTZ & LOWRY

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Via Overnight Mail

May 21, 2012

Mr. Jeff Derouen, Executive Director
Kentucky Public Service Commission
211 Sower Boulevard
Frankfort, Kentucky 40602

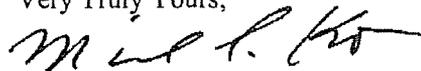
Re: Case No. 2012-00063

Dear Mr. Derouen:

Please find enclosed the original and ten (10) copies of KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.'s FIRST SET OF DATA REQUESTS TO BIG RIVERS ELECTRIC CORPORATION for filing in the above-referenced matter.

By copy of this letter, all parties listed on the Certificate of Service have been served. Please place these documents of file.

Very Truly Yours,



Michael L. Kurtz, Esq.

Kurt J. Boehm, Esq.

BOEHM, KURTZ & LOWRY

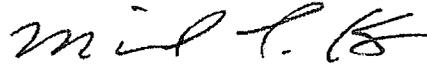
MLKkew

Attachment

cc: Certificate of Service
Quang Nyugen, Esq.
Faith Burns, Esq.
David C. Brown, Esq.

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing was served by electronic mail (when available) and by mailing a true and correct copy by regular, U.S. Mail, unless other noted, this 21ST day of May, 2012 to the following



Michael L. Kurtz, Esq.
Kurt J. Boehm, Esq.

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85 Second Street
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**COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION**

IN THE MATTER OF:

APPLICATION OF BIG RIVERS)	
ELECTRIC CORPORATION FOR A	)	CASE NO. 2012-00063
GENERAL ADJUSTMENT IN RATES)	

**KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.'s
FIRST SET OF DATA REQUESTS TO
BIG RIVERS ELECTRIC CORPORATION**

Dated: May 21, 2012

DEFINITIONS

1. "Document(s)" is used in its customary broad sense and includes electronic mail and all written, typed, printed, electronic, computerized, recorded or graphic statements, memoranda, reports, communications or other matter, however produced or reproduced, and whether or not now in existence, or in your possession.
2. "Study" means any written, recorded, transcribed, taped, filmed, or graphic matter, however produced or reproduced, either formally or informally, a particular issue or situation, in whatever detail, whether or not the consideration of the issue or situation is in a preliminary stage, and whether or not the consideration was discontinued prior to completion whether preliminary or final, and whether or not referred to in Big Rivers' direct testimony.
3. If any document requested herein was at one time in existence, but has been lost, discarded or destroyed, identify such document as completely as possible, including the type of document, its date, the date or approximate date it was lost, discarded or destroyed, the identity of the person (s) who last had possession of the document and the identity of all persons having knowledge of the contents thereof.
4. "Person" means any natural person, corporation, professional corporation, partnership, association, joint venture, proprietorship, firm, or the other business enterprise or legal entity.
5. A request to identify a natural person means to state his or her full name and residence address, his or her present last known position and business affiliation at the time in question.
6. A request to identify a document means to state the date or dates, author or originator, subject matter, all addressees and recipients, type of document (e.g., letter, memorandum, telegram, chart, etc.), number of code number thereof or other means of identifying it, and its present location and custodian. If any such document was, but is no longer in the Company's possession or subject to its control, state what disposition was made of it.
7. A request to identify a person other than a natural person means to state its full name, the address of its principal office, and the type of entity.
8. "And" and "or" should be considered to be both conjunctive and disjunctive, unless specifically stated otherwise.
9. "Each" and "any" should be considered to be both singular and plural, unless specifically stated otherwise.
10. Words in the past tense should be considered to include the present, and words in the present tense include the past, unless specifically stated otherwise.
11. "You" or "your" means the person whose filed testimony is the subject of these interrogatories and, to the extent relevant and necessary to provide full and complete answers to any request, "you" or "your" may be deemed to include any person with information relevant to any interrogatory who is or was employed by or otherwise associated with the witness or who assisted, in any way, in the preparation of the witness' testimony.
12. "BREC" means Big Rivers Electric Corporation and/or any of their officers, directors, employees, or agents who may have knowledge of the particular matter addressed.

INSTRUCTIONS

1. If any matter is evidenced by, referenced to, reflected by, represented by, or recorded in any document, please identify and produce for discovery and inspection each such document.
2. These interrogatories are continuing in nature, and information which the responding party later becomes aware of, or has access to, and which is responsive to any request is to be made available to Kentucky Industrial Utility Customers. Any studies, documents, or other subject matter not yet completed that will be relied upon during the course of this case should be so identified and provided as soon as they are completed. The Respondent is obliged to change, supplement and correct all answers to interrogatories to conform to available information, including such information as it first becomes available to the Respondent after the answers hereto are served.
3. Unless otherwise expressly provided, each interrogatory should be construed independently and not with reference to any other interrogatory herein for purpose of limitation.
4. The answers provided should first restate the question asked and also identify the person(s) supplying the information.
5. Please answer each designated part of each information request separately. If you do not have complete information with respect to any interrogatory, so state and give as much information as you do have with respect to the matter inquired about, and identify each person whom you believe may have additional information with respect thereto.
6. In the case of multiple witnesses, each interrogatory should be considered to apply to each witness who will testify to the information requested. Where copies of testimony, transcripts or depositions are requested, each witness should respond individually to the information request.
7. The interrogatories are to be answered under oath by the witness(es) responsible for the answer.
8. Responses to requests for revenue, expense and rate base data should provide data on the basis of Total Company as well as Intrastate data, unless otherwise requested.

**FIRST SET OF DATA REQUESTS OF
KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.
BIG RIVERS ELECTRIC CORPORATION
Case No. 2012-00063**

- Q1.1. See Spreadsheet Financial Forecast (2012-2026) Base Case (No Env Comp) 02-.xls, Worktab = PCM, Cell N77. This cell points to another excel spreadsheet that was not supplied with the set of Corporate Financial Model ("CFM") scenario spreadsheets previously supplied. Furthermore, there are other cells within that same spreadsheet that point to other excel spreadsheets, for example, cell N82 in the same WorkTab points to a Monthly Resource Report worktab in another excel spreadsheet. We request the Company to supply every spreadsheet that is referenced within each CFM scenario that the Company previously supplied, and to identify where the external spreadsheets are referenced within the CFM scenario spreadsheets.
- Q1.2. Refer to the five corporate financial model scenario Excel workbooks provided by the Company in response to the KIUC Motion to Dismiss.
- a. Please confirm that the NPV spreadsheet for each scenario quantifies the annual revenue requirement of all variable expenses, off system sales (OSS) revenues, and incremental fixed debt service used to finance the capital expenditures of the scenarios.
 - b. Please confirm that the NPV spreadsheet for each scenario quantifies the incremental fixed debt service using a levelized methodology over 28 years using the coupon interest rate and no TIER.
 - c. Please explain why the incremental fixed debt service does not include a TIER. If the Company agrees that the incremental fixed debt service should include a TIER, then please provide revised scenarios including a TIER.
 - d. Please explain why the Company used a levelized methodology for the fixed debt service rather than an annual revenue requirement methodology consistent with the manner in which it will recover the build or buy costs from customers through the ECR.
 - e. Please provide the inputs to the CFM base case and five scenarios obtained from ACES and all workpapers and other analyses used to convert the ACES data to inputs for the CFM base case and five scenarios, including all assumptions, data, computations, and electronic spreadsheets with formulas intact.
 - f. Please confirm that the NPV spreadsheet for each of the two loss of Smelter load scenarios reflect no loss of Smelter revenues under their KPSC approved contracts after 2013, even though the Company assumed that the available generation freed up from the closure of the Smelters could under their KPSC approved contracts be sold into the market and reflected both the additional OSS revenues and the other effects on variable expenses in the revenue requirement.
 - g. Please indicate whether the Company still believes that it correctly modeled the two loss of Smelter load scenarios without consideration of the loss of the Smelter revenues under their KPSC approved contracts and explain why it believes that the scenarios either are correct or incorrect.

- h. Please provide revised NPV spreadsheets for the two loss of Smelter load scenarios to reflect the loss of Smelter revenues under their KPSC approved contracts after 2013. Provide all assumptions, data, computations, and workpapers, including electronic spreadsheets with formulas intact.
 - i. Please explain why the Company limited its CFM scenarios to 15 years (from 2012 through 2016) instead of a longer horizon, such as 20, 25, or 28 years, or a shorter horizon such as ten years.
- Q1.3. If ACES performed any cases other than those used in the CFM base case and five scenarios, please provide a detailed description of the other cases performed, and provide the same information as requested in the prior question for those other cases.
- Q1.4. Please supply all documents, memos, letters and emails that were sent back and forth between the Company and ACES concerning either input or output data associated with the base case and five scenarios, as well as any other cases that ACES performed.
- Q1.5. Please provide all assumptions, data, computations and workpapers, including electronic spreadsheets with formulas intact used to populate the CFM base case and each of the five scenarios.
- Q1.6. Please provide a narrative description of how the CFM model was populated with data associated with each generating unit environmental upgrade.
- Q1.7. Assuming the environmental upgrade assumptions were sourced to Sargent & Lundy, provide the workpapers that came from Sargent & Lundy. If the environmental upgrade assumptions were sourced elsewhere, still provide the workpapers that were developed in whatever process was used to create the environmental upgrade assumptions.
- Q1.8. Whatever the source of the environmental upgrade assumptions, provide any spreadsheets developed for the purpose of converting the environmental upgrade assumptions to the format required to be input into the CFM. Please provide the workpapers electronically with all formulas intact.
- Q1.9. For all environmental upgrades evaluated but rejected, please provide all workpapers associated with those upgrades, and provide inputs in the format that could be inserted into the CFM model. Please provide the workpapers electronically with all formulas intact.
- Q1.10. For each generating unit and purchase that is part of the Company's resources, supply the following information:
 - a. Owner of the resource
 - b. If the Company has partial or full ownership, specify the ownership %
 - c. Operator of the resource
 - d. If a purchase
 - i. Capacity the company is entitled to
 - ii. Energy the company is entitled to
 - iii. Capacity cost

- iv. Energy cost
- e. If a unit
 - i. Min cap, max cap
 - ii. Heat rates Incremental and average
 - iii. Avail and forced outage rates
 - iv. Fuel type
 - v. Startup cost
 - vi. Minimum down time
 - vii. Maximum up time
 - viii. Ramp rate
 - ix. Operating constraints, if any, for example, must run
 - x. Can it be used for quick start or spinning reserves
 - xi. Fuel constraints if any
 - xii. Any other operational data
 - xiii. Emissions data (rates, costs, etc)

Q1.11. Supply the Company's most recently completed resource expansion plan covering the next 30 years or whatever length of time that the Company performs its planning based on an IRP process, or whatever process that the Company uses to develop a long run expansion plan. Provide this electronically in excel format with all formulas intact. This spreadsheet should show all calculations. In other words, if there is any category such as hydro capacity made up of a set of hydro units that sum to a total, provide the breakdown and summation to derive the total. Also, if there is a calculation of reserve margin, please provide the calculation with all components used in the calculation. For example, the target reserve margin, load, capacity (by resource) should all be readily identifiable.

Berry Testimony

Q1.12. Please provide all models, worksheets, analyses, etc electronically, with all formulas intact that led to the development of the results found in Mr. Berry's Exhibits 2 through 6.

DePriest Testimony

Q1.13. Page 13 - Please provide copies of all models and worksheets, electronically, with all formulas intact that S&L used to generate the "capital and O&M cost estimates used in the compliance study."

Q1.14. Mr. DePriest mentioned that S&L compiled cost data from recent S&L FGD, SCR, and ACI, dry sorbent injection, and other comparable projects.

- a. Please provide a description of each project the data was compiled from.

b. Please provide the compiled results containing the data used in the Big Rivers Study.

Q1.15. If not provided in response to the above, please provide the analyses, electronically and with all formulas intact, of the models/worksheets that were used to calculate costs for each of the technology alternatives, and to determine the NPV of each technology over a projected 20-year life (See page 13, line 19 of Mr. DePriest's testimony).

Q1.16. Please provide all economic data provided by Big Rivers to S&L (See page 13, line 22 of Mr. DePriest's testimony).

Hite Testimony

Q1.17. Page 7 discusses that Big Rivers acquired forward pricing data from PACE Global, which included forward hourly energy prices, monthly coal prices, monthly natural gas prices, and monthly allowance prices. Please provide all documents, memos, letters and emails that went back and forth between PACE Global and Big Rivers regarding these analyses, including the engagement letter, contract documents, data assumption documents, model result analyses, etc.

Q1.18. Provide copies of all models and spreadsheets developed containing input assumptions and output results. Provide these electronically, with all formulas intact.

Q1.19. Provide copies of all written reports, memos, emails or documents of any type that PACE Global produced regarding this project, as well as any that Big Rivers produced related to the analyses that PACE Global performed.

Q1.20. Page 8 discusses that Big Rivers received production cost results from ACES Power Marketing. Please provide all documents, memos, letters and emails that went back and forth between ACES and Big Rivers regarding these analyses, including the engagement letter, contract documents, data assumption documents, model result analyses, etc.

Q1.21. Provide copies of all models and spreadsheets developed containing input assumptions and output results. Provide these electronically, with all formulas intact.

Q1.22. Provide copies of all written reports, memos, emails or documentation of any type that either ACES or PACE Global produced regarding this project, as well as any that Big Rivers produced related to the analyses that either ACES or PACE Global performed.

Q1.23. Please identify the production cost model used, and provide the Documentation Manual for whatever production cost model ACES used in its production cost runs.

Q1.24. Please explain the process by which parties would have to go through to acquire the ACES model used, and the costs associated with acquiring the model, and what alternatives exist in case parties would like to run alternative analyses.

Q1.25. Please explain why this production cost model was selected.

- Q1.26. Please discuss why an optimal resource plan analysis was not conducted that would have evaluated more options including the potential retirement of the coal units being upgraded, conversion to gas, or replacement with combined cycle resources.
- Q1.27. Please identify the models used by Pace Global, and provide the Documentation Manuals for all of the models that Pace Global used in its analyses.
- Q1.28. Please explain the process by which parties would have to go through to acquire the models Pace Global used, and the costs associated with acquiring the model, and what options exist in case parties or the Commission would like to run alternative analyses.
- Q1.29. Please explain why these models were selected by Pace Global to be used in this analysis.
- Q1.30. Please explain what sensitivity analyses, other than the two loss of Smelter load scenarios, were performed. Please provide justification for why these sensitivity analyses were performed, and if none were performed other than the loss of Smelter load scenarios, please explain why not.
- Q1.31. Please explain why Big Rivers provided so little explanation of the production cost analyses that were performed, and why the Chief Financial Officer was selected to provide such a brief discussion of this topic.
- Q1.32. Please discuss in detail the process by which Big Rivers developed its input assumptions that were used in its production cost analyses and in the development of forward price assumptions.
- Q1.33. What process was used to ensure that the assumptions that were used by ACES in its production cost modeling analyses, and the assumptions that were used by PACE Global were consistent, and provide a comparison of the assumptions that were used in both of the analyses.
- Q1.34. Please describe the manner in which the results developed by PACE Global were incorporated in the production cost analysis that ACES performed.
- Q1.35. Please provide the results electronically with all formulas intact as provided to ACES by PACE Global.
- Q1.36. Please provide a copy of all emails, documents or memos prepared, sent, issued or received during the last six months by Mr. Bailey, Mr. Blackburn, Mr. Berry, Mr. Shaw or Mr. Hite and/or any of the General Managers of any of the three member cooperatives regarding Big Rivers' plan for compliance with federal environmental laws and regulations including, but not limited to, considerations of the "build", "partial build" and "buy" options referenced on page 6 of Mr. Hite's Direct Testimony.
- Q1.37. Please provide all workpapers and/or preliminary model runs associated with the "build", "partial build" and "buy" options referenced on page 6 of Mr. Hite's Direct Testimony including, but not limited to, documents and/or data associated with other environmental compliance options considered by Big Rivers, but not discussed in Mr. Hite's Direct Testimony.
- Q1.38. Please provide a copy of all emails, documents or memos prepared, sent, issued or received during the last two years by Mr. Bailey, Mr. Blackburn, Mr. Berry, Mr. Shaw or Mr. Hite and/or any of the General Managers of any of the three member cooperatives regarding Big Rivers' business plan in the event that one or both of the Smelters gives notice that they intend to cease operations on the Big Rivers' system.

- Q1.39. Please provide a copy of all emails, documents or memos prepared, sent, issued or received during the last two years by Mr. Bailey, Mr. Blackburn, Mr. Berry, Mr. Shaw or Mr. Hite and/or any of the General Managers of any of the three member cooperatives regarding consideration of mergers with another utility, the sale of Big Rivers to a third party, or the sale of any of Big Rivers' generating units.
- Q1.40. Please provide a list of all entities that Big Rivers has entered a confidentiality agreement with in the last two years.
- Q1.41. Please provide a copy of all presentations during the last two years made by the Company and/or its outside advisors to the Big Rivers Board of Directors regarding the potential financial impact of existing or proposed environmental regulations.
- Q1.42. Please provide a copy of all presentations that the Company has made or plans to make to the "various institutional investors" referenced on page 15 of Mr. Hite's Direct Testimony.
- Q1.43. Please provide a copy of all minutes from the Company's Board of Directors meetings since January 2010 through the most recent month available. This is a continuing request and the response should be supplemented as each additional month is available.
- Q1.44. Please provide the current balance (as of April 2012 or May 2012, if available) in the Economic Reserve Fund and the Rural Economic Reserve ("RER") fund. This should be considered a continuing request and updates should be provided monthly as actual information for each succeeding month is available.
- Q1.45. Please provide the Company's projections of the balances in the Economic Reserve Fund and the Rural Economic Reserve Fund for each month during the remainder of 2012 (after the most recent month for which actual information was provided in response to the preceding question), and for each month during 2013 and subsequent years. Provide all assumptions, data, and computations, including all electronic spreadsheets with formulas intact.
- Q1.46. In the event that Big Rivers were to fail to achieve the target MFIR under its Indenture such that Big Rivers was precluded from issuing debt under its Indenture, how would that affect Big Rivers' choice of environmental compliance options?
- Q1.47. Assume that the interest rate on debt issued by Big Rivers would increase due to capital market conditions, a credit downgrade of Big Rivers, or any other reason or combination of reasons.
- a. In the event that the interest rate that Big Rivers would incur on debt issued for the purpose of funding capital expenditures for environmental compliance were to be higher than Big Rivers' official forecasted interest rate of 5.50%, please indicate how the increased interest rate would alter Big Rivers' proposed plan of compliance, if at all.
- Q1.48. Please provide a complete copy of all existing contracts between Big Rivers and the City of Henderson, Henderson Municipal Power and Light, or any other entity related to the City of Henderson.
- Q1.49. Please provide all excel spreadsheets (with formulas intact) and other workpapers supporting the development of Mr. Wolfram's Exhibit Number 6. Include the support for the projected draw down of the MRSM and the RER by year by rate schedule.

Q1.50. For each of the years 2012 and 2016, please provide the following information in an excel spreadsheet:

- a. Total 12 month adjusted revenues, as used in the Company's proposed ES Tariff
- b. For each of rate schedules RDS, LIC, QFS and LICX, by rate schedule, provide
 - i. Base rate revenues
 - ii. FAC revenues
 - iii. Non-FAC PPA revenues
 - iv. Fuel revenues in base rates
- c. For the Smelter rate schedule, provide
 - i. Base Fixed Energy revenues
 - ii. FAC revenues
 - iii. Non-FAC PPA revenues
 - iv. Fuel revenues in base rates

Q1.51. For the 12 months ending March 31, 2012 (or the most recent 12 month period available), please provide the following information in an excel spreadsheet:

- a. Total 12 month adjusted revenues, as used in the Company's proposed ES Tariff
- b. For each of rate schedules RDS, LIC, QFS and LICX, by rate schedule, provide
 - i. Base rate revenues
 - ii. FAC revenues
 - iii. Non-FAC PPA revenues
 - iv. Fuel revenues in base rates
- c. For the Smelter rate schedule, provide
 - i. Base Fixed Energy revenues
 - ii. FAC revenues
 - iii. Non-FAC PPA revenues
 - iv. Fuel revenues in base rates

Q1.52. Please provide for 2012 and 2016 the Smelter revenue and credit amounts for each of the categories 1 through 17 listed on lines 5 through 21 of page 15 of Mr. Wolfram's testimony in an excel spreadsheet.

Q1.53. Please provide for the 12 months ending March 31, 2012 (or the most recent 12 month period available), the Smelter revenue and credit amounts for each of the categories 1 through 17 listed on page 15 of Mr. Wolfram's testimony in an excel spreadsheet.

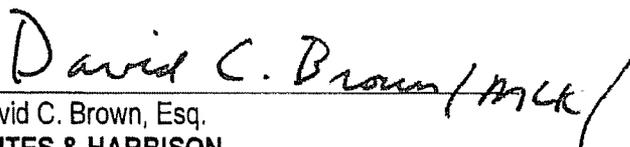
Q1.54. Please provide the Company's estimated 2016 ES revenue requirement, separated into variable and fixed costs. Please provide the results for both the current ECR revenue requirements approved in Case No. 2007-00460 and for the projects being requested for approval in this case (the "2012 Plan") in an excel spreadsheet.

Respectfully submitted,



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CUSTOMERS, INC.**



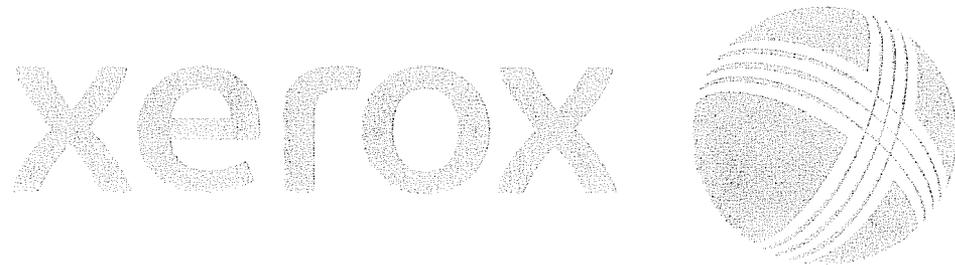
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**CO-COUNSEL FOR ALCAN PRIMARY PRODUCTS
CORPORATION**

May 21, 2012

KWalton

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**COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION**

In the Matter of:

**Application of Big Rivers Electric Corporation for Approval)
of its 2012 Environmental Compliance Plan, Approval of its) CASE NO. 2012-00063
Amended Environmental Cost Recovery Surcharge Tariffs,)
and for the Certificates of Public Convenience and Necessity,)
and the Authority to Establish a Regulatory Account)**

**BEN TAYLOR AND SIERRA CLUB’S REQUEST FOR
INFORMATION TO KENTUCKY INDUSTRIAL UTILITY CUSTOMERS**

Intervenors Ben Taylor and Sierra Club (collectively “Movants”), pursuant to the Kentucky Public Service Commission’s (“Commission”) Orders of April 30, June 19, and July 19, 2012, propound the following requests for information on the Kentucky Industrial Utility Customers (“KIUC”) regarding Big Rivers Electric Corporation’s application for certificates of public convenience and necessity and approval of its 2012 compliance plan that is the subject of the above captioned proceeding.

KIUC shall answer these requests for information in the manner set forth in the April 30 Order and by no later than the August 6, 2012 deadline set forth in the Appendix of the June 19 Order. Please produce the requested documents in electronic format at the offices of Sierra Club, 85 Second Street, 2nd Floor, San Francisco, CA 94105 or at such other location as may be mutually agreed upon between counsel of record.

Intervenors reserve the right to serve supplemental, revised, or additional discovery requests as permitted in this proceeding.

DEFINITIONS

“CCR” means coal combustion residuals

“Company” refers to Big Rivers Electric Cooperative, and its affiliates, employees, and authorized agents.

“CPCN” means certificate of public convenience and necessity

“FGD” means flue gas desulfurization

“Hg” means mercury

“NAAQS” means National Ambient Air Quality Standards

“NO_x” means nitrogen oxides

“NPV” means net present value

“NPVRR” means net present value of revenue requirements

“O&M” means operation and maintenance

“SCR” means selective catalytic reduction technology

“SO₂” means sulfur dioxide

“316(b)” refers to Section 316(b) of the Clean Water Act

PRIVILEGE OR CONFIDENTIALITY

If you claim a privilege including, but not limited to, the attorney-client privilege or the work product doctrine, as grounds for not fully and completely responding to any interrogatory or request for production, describe the basis for your claim of privilege in sufficient detail so as to permit the Commission to adjudicate the validity of the claim if called upon to do so. With respect to documents for which a privilege is claimed, produce a “privilege log” that identifies the author, recipient, date and subject matter of the documents or interrogatory answers for

which you are asserting a claim of privilege and any other information pertinent to the claim that would enable the Intervenor or the Commission to evaluate the validity of such claims.

To the extent that you can legitimately claim that any interrogatory response or responsive document is entitled to confidentiality, the Intervenor is willing to enter into a confidentiality agreement that would protect such response or document from public disclosure.

REQUESTS FOR INFORMATION

1. Please execute a PaR model run of the Company's Build case with the following changes:
 - a. Refer to page 22 lines 17-18 of the direct testimony of Philip Hayet, which states that the Company's results do not include all incremental O&M costs shown in Exhibit Berry-2. Please add in these additional O&M costs that are identified in the Hayet testimony that were not included in the Company's original run.
 - b. Please change the Company's environmental capital expenditures given in real 2011\$ to nominal dollars in the calculation of NPVRR as follows:

	2012	2013	2014	2015	2016	2017	2018	2019	2020
Wilson FGD	\$1.78	\$27.73	\$56.19	\$49.50	\$7.41	\$0.00	\$0.00	\$0.00	\$0.00
Green 2 SCR	\$0.99	\$20.09	\$44.95	\$16.64	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
HMPL 1 SO ₂ (Gross)	\$0.15	\$1.13	\$1.57	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
HMPL 2 SO ₂ (Gross)	\$0.15	\$1.13	\$1.57	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Reid 1 NG	\$0.10	\$1.11	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Wilson Hg	\$0.00	\$1.21	\$4.90	\$5.45	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Green 1 Hg	\$0.00	\$0.60	\$4.09	\$4.82	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Green 2 Hg	\$0.00	\$0.60	\$4.09	\$4.82	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Coleman 1 Hg	\$0.00	\$0.40	\$4.90	\$4.45	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Coleman 2 Hg	\$0.00	\$0.40	\$4.90	\$4.45	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Coleman 3 Hg	\$0.00	\$0.40	\$4.90	\$4.45	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
HMPL 1 Hg	\$0.00	\$0.00	\$0.00	\$0.25	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
HMPL 2 Hg	\$0.00	\$0.00	\$0.00	\$0.25	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

- c. Please add the capital expenditures recommended by Sargent & Lundy to comply with the forthcoming NAAQS revisions, the CCR rule, and the 316(b) rule, in nominal dollars as follows:

	2012	2013	2014	2015	2016	2017	2018	2019	2020
Green 1 NAAQS	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$87.41	\$0.00	\$0.00	\$0.00
Green 1 CCR	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$15.11	\$0.00	\$0.00	\$0.00
Green 1 316(b)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1.11	\$0.00	\$0.00	\$0.00
Green 2 CCR	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$15.11	\$0.00	\$0.00	\$0.00
Green 2 316(b)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1.11	\$0.00	\$0.00	\$0.00
HMPL 1 CCR	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$15.11	\$0.00	\$0.00	\$0.00
HMPL 2 CCR	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$15.11	\$0.00	\$0.00	\$0.00
Coleman 1 CCR	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$13.67	\$0.00	\$0.00	\$0.00
Coleman 1 316(b)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1.44	\$0.00	\$0.00	\$0.00
Coleman 2 CCR	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$13.67	\$0.00	\$0.00	\$0.00
Coleman 2 316(b)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1.44	\$0.00	\$0.00	\$0.00
Coleman 3 CCR	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$13.67	\$0.00	\$0.00	\$0.00
Coleman 3 316(b)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1.44	\$0.00	\$0.00	\$0.00

d. Please add the additional O&M expenditures associated with the technologies recommended by Sargent & Lundy to comply with the forthcoming NAAQS revisions, the CCR rule, and the 316(b) rule, in nominal dollars as follows:

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Green 1 NAAQS	\$ -	\$ 2,330,869	\$ 2,376,845	\$ 2,424,382	\$ 2,472,870	\$ 2,522,327	\$ 2,572,774	\$ 2,624,229	\$ 2,676,714	\$ 2,730,248	\$ 2,784,853
Green 1 CCR	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Green 1 316(b)	\$ -	\$ 199,635	\$ 203,572	\$ 207,644	\$ 211,797	\$ 216,033	\$ 220,353	\$ 224,760	\$ 229,256	\$ 233,841	\$ 238,518
Green 2 CCR	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Green 2 316(b)	\$ -	\$ 199,635	\$ 203,572	\$ 207,644	\$ 211,797	\$ 216,033	\$ 220,353	\$ 224,760	\$ 229,256	\$ 233,841	\$ 238,518
HMPL 1 CCR	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
HMPL 2 CCR	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Coleman 1 CCR	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Coleman 1 316(b)	\$ -	\$ 269,776	\$ 275,098	\$ 280,600	\$ 286,212	\$ 291,936	\$ 297,775	\$ 303,730	\$ 309,805	\$ 316,001	\$ 322,321
Coleman 2 CCR	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Coleman 2 316(b)	\$ -	\$ 269,776	\$ 275,098	\$ 280,600	\$ 286,212	\$ 291,936	\$ 297,775	\$ 303,730	\$ 309,805	\$ 316,001	\$ 322,321
Coleman 3 CCR	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Coleman 3 316(b)	\$ -	\$ 269,776	\$ 275,098	\$ 280,600	\$ 286,212	\$ 291,936	\$ 297,775	\$ 303,730	\$ 309,805	\$ 316,001	\$ 322,321

Respectfully submitted,



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Dated: July 30, 2012

CERTIFICATE OF SERVICE

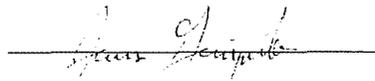
I certify that I mailed a copy of Ben Taylor and Sierra Club's Request for Information from Kentucky Industrial Utility Customers by first class mail on July 30, 2012 to the following:

James M. Miller, Esq.
Tyson Kamuf
Sullivan, Mountjoy, Stainback & Miller, PSC
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