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February 3, 2014

Via Personal Delivery

Mr. Jeff Derouen, Executive Director
Case No. 2013-00259
Kentucky Public Service Commission
211 Sower Blvd.
Frankfort, KY 40601

Re: Case No. 2013-00259 Sonia McElroy and Sierra Club's Post Hearing Brief (Public)

Dear Mr. Derouen,

Enclosed please find one (1) original and ten (10) copies of the public, redacted version of Sonia McElory and Sierra Club's Post Hearing Brief, filed today in the above-referenced matter via personal delivery. The Post Hearing Brief contains information subject to petitions for confidential treatment filed by Mark Gross, counsel for East Kentucky Power Cooperative, on October 18, 2013, November 7, 2013, November 12, 2013, November 14, 2013, December 17, 2013, and January 24, 2014. One (1) original confidential version of this Post-Hearing Brief will be filed with the Commission via personal delivery today by local counsel, Joe Childers. By copy of this letter, all parties listed on the Certificate of Service have been served via USPS and e-mail. Please place this document of file.

Sincerely,

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COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

AN APPLICATION OF EAST KENTUCKY POWER COOPERATIVE, INC. FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR ALTERATION OF CERTAIN EQUIPMENT AT THE COOPER STATION AND APPROVAL OF A COMPLIANCE PLAN AMENDMENT FOR ENVIRONMENTAL SURCHARGE COST RECOVERY	)	CASE NO. 2013-00259

Post-Hearing Brief of Sonia McElroy and Sierra Club

Public Version

February 3, 2014

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GLOSSARY

316(b)	Cooling Water Intake Structures
CPCN	Certificate of Public Convenience and Necessity
CCR	Coal Combustion Residuals
CSAPR	Cross-State Air Pollution Rule
DSM	Demand Side Management
ELG	Effluent Limitation Guidelines
EPA	Environmental Protection Agency
GHG	Greenhouse Gas
IRP	Integrated Resource Plan
LMP	Locational Marginal Pricing
MATS	Mercury and Air Toxics Rule
NAAQS	National Ambient Air Quality Standards
NPV	Net Present Value
O&M	Operation and Maintenance
PPA	Power Purchase Agreement
RFP	Requests for Proposals

INTRODUCTION

In this proceeding, East Kentucky Power Cooperative ("EKPC" or "the Company") has inexplicably rejected opportunities to save ratepayer money, reduce risk, and begin diversifying its generation portfolio. In particular, faced with the choice of whether to retrofit or replace the 49-year-old coal-fired Cooper Unit 1, EKPC received a bid from [redacted] for a [redacted]. In testimony, Sierra Club expert Jeff Loiter further demonstrated that EKPC could replace more than 100% of the projected energy generation, and all of the capacity, from Cooper Unit 1 if the Company invested the money it would spend retrofitting and operating Unit 1 on energy efficiency and demand response instead. Rather than pursue these favorable alternatives, however, EKPC persists in its proposal to retrofit Cooper Unit 1 by reducing the exhaust from that unit through pollution controls that the Company previously installed on Cooper Unit 2, an option that costs more, exposes EKPC and its ratepayers to more risk, and continues the Company's reliance on a single fuel – coal – for more than 80% of its energy generation. While the Commission cannot order EKPC to pursue the lower cost, lower risk wind and DSM options, the Commission also should not, and legally cannot, approve on this record the Company's effort to make its customers pay for the higher cost, higher risk Cooper Unit 1 retrofit proposal.

EKPC's request for a certificate of public convenience and necessity ("CPCN") for the Cooper Unit 1 retrofit suffers from at least three fatal flaws. First, EKPC has not demonstrated that it needs Cooper Unit 1. Instead, the Company's integration into PJM has significantly lowered its capacity and reserve requirements, and EKPC will have sufficient energy generation to meet the latest PJM load forecast from 2015 through 2020 (on average) even if EKPC retires both Cooper Unit 1 and the Dale Station. Second, EKPC has failed to demonstrate that the

Cooper Unit 1 retrofit would avoid wasteful duplication, as the Company significantly overestimated the value of the unit, arbitrarily dismissed at least one higher net present value ("NPV") proposal, and failed to even consider the ability of demand side management ("DSM") to provide energy and capacity at a lower cost. Third, EKPC repeatedly failed to disclose in its application and/or in response to data requests highly relevant information regarding the NPV of competing proposals, potential costs of future environmental regulations, and the Company's purported reason for rejecting the [redacted] (generation from which an EKPC post-hearing data response showed [redacted]. For each of these reasons, Sierra Club urges the Commission to deny the CPCN for EKPC's unnecessary and unjustified Cooper Unit 1 retrofit proposal.

I. FACTUAL BACKGROUND

A. EKPC's 2012 IRP Identifies Cooper Unit 1 and Dale Units 1-4, As Currently Configured, As Not Able To Comply with the MATS Rule.

EKPC's application for a CPCN to construct pollution control equipment at Cooper unit 1 has its origins in EKPC's 2012 Integrated Resource Plan ("IRP").[1] As explained in the IRP, EKPC owns and operates approximately 3,000 MW of capacity.[2] Most of EKPC's capacity and energy comes from coal-fired units at the Dale, Cooper, and Spurlock Stations;[3] "over 80% of its energy supply is coal-based."[4] Cooper unit 1 has a nameplate capacity of 116 MW and went into service in 1965.[5] Cooper 1 represents approximately 4% of EKPC's total generating capacity.[6]

[1] Direct Testimony of Anthony Campbell at 3.
[2] EKPC IRP at 54.
[3] In addition to the coat-fired units, EKPC owns natural gas peaking units at the Smith Station and landfill gas facilities. *Id.* at 55.
[4] Direct Testimony of James Read at 9.
[5] EKPC 2012 IRP at 54.
[6] EKPC Ex. 1b at 2.

In the 2012 IRP, EKPC stated that Cooper unit 1 and Dale units 1-4, as currently configured, are not able to meet the emission limits in the Mercury and Air Toxics Rule ("MATS").[7] When EKPC developed its 2012 IRP, EKPC was a balancing authority, responsible for balancing supply and demand in its service territory and maintaining adequate capacity reserves to ensure reliability.[8] EKPC assumed that if Cooper unit 1 and Dale units 1-4 were retired, they would need to be replaced with an equivalent 300 MW of capacity.[9] As a result, in 2012, EKPC issued a Request for Proposals ("RFP") seeking up to 300 MW of new resources.[10]

B. After Fully Integrating into PJM, EKPC No Longer Needs the Capacity And Energy From Cooper Unit 1.

On December 20, 2012, after EKPC received the RFP bids, the Commission authorized EKPC to join PJM.[11] EKPC became fully integrated into PJM in June 2013.[12] PJM integration has important consequences for how EKPC operates. EKPC has transferred to PJM responsibility for ensuring reliability. PJM sets the capacity reserve margins that EKPC must meet, and the reserve margins are dramatically lower now, going from 12% of winter peak down to 3% of its summer peak.[13] EKPC noted that the "300 MW [represented by Dale and Cooper unit 1] could be retired without any replacement capacity . . . The replacement capacity issue became strictly an economic issue when EKPC joined PJM, and no longer had reliability impacts."[14]

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[7] EKPC 2012 IRP at 6.
[8] Rebuttal Testimony of Julia Tucker at 1.
[9] EKPC Ex. 1a at 1.
[10] EKPC Ex. JJT-1 at 3.
[11] *In re Application of East Kentucky Our Cooperative, Inc. to Transfer Functional Control of Certain Transmission Facilities to this PJM Interconnection*, LLC, Case No. 2012-00169, Order dated December 20, 2012.
[12] EKPC Response to Staff Initial Information Request 13(b).
[13] Rebuttal Testimony of Julia Tucker at 2.
[14] Direct Testimony of Julia Tucker at 4.

While PJM integration does not necessarily change EKPC's load, PJM now forecasts EKPC's load. The new PJM load forecasts project much lower load growth, and lower winter and summer peak demand, than EKPC's 2012 forecast.[15] Based on PJM's most recent load forecast, EKPC could retire Cooper unit 1 and Dale and still be capable of self-generating sufficient energy to satisfy its load.[16]

Moreover, EKPC now sells all of its capacity and energy into the PJM market and buys all of the capacity and energy it needs to meet its load from the PJM market.[17] EKPC's units must compete with all the other resources in the PJM market for dispatch, but EKPC benefits from the ability to purchase capacity and energy from the market cheaper than EKPC's own resources. Cooper unit 1 does not compete well with other PJM resources and its capacity factor has significantly decreased, as shown in the table below.

Cooper Unit 1 Capacity Factor before and after Full Integration into PJM[18]

Month	Capacity Factor in 2012, prior to Integration into PJM	Capacity Factor in 2013, after Integration into PJM	% Decrease in Capacity Factor Between Same Month in 2012 & 2013
6 (June)	55.09	27.40	-50%
7 (July)	54.35	32.20	-41%
8 (August)	54.46	43.63	-20%
9 (September)	34.84	7.44	-79%
10 (October)	73.56	17.66	-76%
11 (November)	73.58	36.82	-50%
12 (December)	64.56	28.21	-56%

C. EKPC Issues an RFP That Excludes Demand Response.

[15] *Compare* Sierra Club Ex. 17, PJM 2014 Load Forecast Report *with* Sierra Club Ex. 15, EKPC 2012 Load Forecast; *see also* Sierra Club Second Supplemental Response to Staff Information Request 7.
[16] *See infra* Section II.
[17] Sierra Club Ex. 1a at 10.
[18] All capacity factors in this table are taken directly from EKPC Response to the Commission's Information Request at Hearing Held on 01/14-15/14, Request 6.

More than a year before EKPC was integrated into PJM, the Company issued an RFP to replace the capacity that would be lost if Cooper unit 1and Dale units 1-4 were retired.[19] The RFP specified that the earliest on-line date for new resources would be October 2015, but EKPC would consider an on-line date as late as October 2017.[20] The RFP noted certain constraints for bids: "EKPC is not soliciting and will not accept capacity from PJM demand response resources."[21]

D. Brattle's Analysis of the RFP Bids Shows That the [redacted] Has the Highest NPV per MW Year.

By August 30, 2012, EKPC received over 100 bids in response to the 2012 RFP, including several proposals to retrofit Cooper unit 1 submitted by EKPC's Power Production Business Unit.[22] The Brattle Group, which EKPC had hired to assist with developing the RFP and evaluating the bids received, calculated the NPV of each project in order to have a metric to compare the disparate projects. Brattle defined NPV this way: "the present value of the energy and capacity resources offered by a proposal can be expected to provide less the present value of the costs that would be incurred to obtain the energy and capacity."[23] [redacted] and also calculated the NPV per MW-year to capture the differences in size and duration of the various proposals. All other things being equal, the higher the NPV, the better.

[19] EKPC Ex. JJT-1 at 3.
[20] EKPC Ex. JJT-1 at 3.
[21] *Id.*
[22] EKPC Ex. 1a at 3; EKPC Application at 5.
[23] EKPC Ex. 1a at 4.
[redacted]

Brattle sorted the bids into six categories and selected the project in each of the six categories with the highest NPV per megawatt year.[25] These six projects, plus one additional project, made up the Short List projects which were evaluated in further detail.[26]

On January 28, 2013, Brattle recommended moving forward with the proposed retrofit of Cooper unit 1.[27] That same day, David Crews, EKPC's Senior Vice President for Power Supply, recommended to Tony Campbell, EKPC's Chief Executive Officer ("CEO"), that EKPC pursue the retrofit project.[28] Approximately 2 weeks later, EKPC's Board of Directors approved selection of the retrofit project.[29]

Curiously, EKPC never mentions the NPVs for the retrofit project compared to the alternatives in any of the key documents recommending the proposed project. Despite the fact that "the principal selection criterion for the Short List was the net present value of the proposals,"[30] a comparison of the short list projects' NPVs appears nowhere in the application, direct testimony, or supporting exhibits. Instead, EKPC mentions only the NPV of the proposed project.[31] In response to a data request from the Staff, EKPC finally identified the NPVs of the six short-listed projects as follows:

[25] EKPC Ex. 1a at 6; *see also* Direct Testimony of Julia Tucker at 8.
[26] *Id.*
[27] *Id.* at 1, 14.
[28] EKPC Ex. 1b.
[29] EKPC Ex. 2.
[30] EKPC Ex. 1a at 5.
[31] *E.g.*, EKPC Application at 6; Ex. 1a at 12.

[redacted]

The proposal with the highest NPV– the [redacted] – was a [redacted]

EKPC subsequently revised the NPVs after discussions with the bidders. This second list also shows the [redacted] as having the highest NPV:

[redacted]

At the hearing, Mr. Crews stated that [redacted] EKPC proceeded to offer throughout this proceeding a series of shifting and unsupported excuses for rejecting the [redacted]

[32] EKPC Response to Staff Initial Request 7a.
[33] EKPC Ex. 1a at 6.
[34] *Id.*
[35] EKPC Response to Staff Second Request 1b.
[redacted]. Mr. Read, head of the Brattle team, indicated in discovery and rebuttal testimony that a third revision to the NPV calculations led the [redacted] to have an NPV and NPV per MW-year lower than the Cooper unit 1 retrofit project. EKPC Response to Staff Third Request 1; Rebuttal Testimony of James Read at 15. Mr. Crews acknowledged at the hearing, however, that he had not seen the revised NPVs prior to recommending selection of the retrofit project. [redacted] In short, EKPC claims that it did not learn of Mr. Read's revised NPV for the [redacted] project until after it had made its final decision to move forward with the retrofit project

E. Sierra Club's Testimony.

On August 21, 2013, EKPC filed its application seeking a CPCN and cost recovery for the Cooper 1 retrofit project. The Commission granted Sierra Club's motion to intervene on October 18, 2013. The Sierra Club submitted direct and supplemental direct testimony from Mr. Tyler Comings and Mr. Jeffrey Loiter. Mr. Loiter testified that EKPC could retire Cooper unit 1 and Dale Station units 1-4 without jeopardizing reliability, given that the capacity EKPC owns exceeds the capacity reserve margins established by PJM.[37] Mr. Loiter noted that the purpose of the RFP was to compare retiring Cooper unit 1 to various options, so in evaluating the option to keep Cooper unit 1 running, EKPC should examine the entire capital and O&M costs to run Cooper unit 1. The full capital and O&M costs greatly exceed the $15 million capital and $2.67 million O&M costs for the retrofit project.[38] Mr. Loiter testified that even though the RFP expressly excluded bids involving demand response, EKPC could save energy and reduce demand equal to all of the energy and capacity generated by Cooper unit 1. Mr. Loiter calculated that if EKPC invested all the money to be spent on the retrofit project and O&M expenses at Cooper unit 1 in energy efficiency and demand response instead, it could save 646,808 MWh and reduce demand by 117 MW by 2021.[39]

Mr. Comings testified that the NPV analysis purporting to justify the retrofit project relies upon an arbitrary energy price and the omission of all future environmental costs. [redacted]

[37] Direct Testimony of Jeffrey Loiter at 4-5.
[38] Supplemental Direct Testimony of Jeffrey Loiter at 2-3.
[39] *Id.* at 2.

[redacted][41] Since such a price increase would be anomalous given recent price [redacted]), Mr. Comings developed an alternative energy price forecast. Mr. Comings used the ratio of the broker energy prices projected by EKPC to EKPC's own natural gas price forecast to calculate an implied heat rate, and then extended this implied heat rate to future years.[42] In addition to using unreasonably high energy prices, EKPC assumed that PJM capacity prices would [redacted]. In reality, the capacity price [redacted][43]

Furthermore, Mr. Comings reviewed EKPC's estimates of the cost for Cooper unit 1 to comply with the forthcoming CCR, ELG, and 316(b) rules, which range from approximately $19 million under lenient rules to $100 million under strict rules.[44] Mr. Comings also calculated a mid-level cost for Cooper unit 1 to comply with any greenhouse gas regulations issued in the future. Mr. Comings testified that EKPC omitted all of these costs to comply with future environmental rules from its economic analysis.

Over a 10-year period, the adjusted energy price and lenient environmental compliance costs lead to a negative NPV for the retrofit project,[45] while the project barely breaks even after

[40] Direct Testimony of Tyler Comings at 12.
[41] *Id.*
[42] *Id.* at 14.
[43] *Id.* at 23-24.
[44] Supplemental Direct Testimony of Tyler Comings at 4-7.
[45] *Id.* at 10.

25 years using those same adjustments.[46] Once a cost to comply with greenhouse gas regulations is incorporated, the retrofit project is significantly uneconomic over a 10 or 25-year period.[47]

F. EKPC's Rebuttal Testimony.

EKPC submitted rebuttal testimony from James Read, Julia Tucker, and Isaac Scott. Mr. Read challenged Mr. Coming's energy price forecast,[48] but did not provide any evidence to support the Woods Mackenzie forecast used by EKPC. Mr. Read noted that if one arbitrarily splits the difference between the forecast used by EKPC and Mr. Coming's alternative forecast, the NPV of the retrofit project would be slightly positive in one scenario, roughly zero in another scenario, and substantially negative in a third scenario.[49] Mr. Read also claimed that even if EKPC retrofits Cooper unit 1, it could still retire that unit at any time in the future.[50] However, Mr. Read conducted no economic analysis of the cost to retire Cooper unit 1 early and replace it with another resource.

Ms. Tucker claimed that although Cooper unit 1 is not needed for reliability purposes, EKPC needs its capacity and energy as an economic hedge.[51] Mr. Scott criticized Mr. Loiter's calculations of the energy savings and demand reduction that EKPC could achieve if the money to retrofit and run Cooper unit 1 were instead spent on DSM.[52] But Mr. Scott's critique centered primarily around his lack of understanding of Mr. Loiter's methodology, about which EKPC did not bother to seek clarification regarding during discovery. And while Mr. Scott purported to set forth a different methodology, he did not re-calculate the estimated savings under his preferred methodology or offer any explanation as to how the results might be different.

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[46] *Id.* at 9.
[47] *Id.* at 8-10.
[48] Rebuttal Testimony of James Read at 4-6.
[49] *Id.* at 13.
[50] *Id.* at 7, 16.
[51] Rebuttal Testimony of Julia Tucker at 3-4.
[52] Rebuttal Testimony of Isaac Scott at 5-14.

G. The Hearing.

On January 14 and 15, 2014, the Commission held a hearing regarding EKPC's application. At the hearing, EKPC entered the testimony of six witnesses. Intervenor KIUC did not present any witnesses. Sierra Club entered the testimony of Tyler Comings and Jeffrey Loiter. Among other things, two significant facts emerged during the hearing. [redacted] The Commission asked Mr. Crews to produce the referenced study. In its response to this post-hearing data request, EKPC acknowledged that no such written study existed and EKPC was forced to prepare a study in order to satisfy the post-hearing data request.[55] The new study, prepared approximately one year after EKPC selected the retrofit project, [redacted].[56]

ARGUMENT

I. LEGAL BACKGROUND

Under Kentucky law, EKPC cannot proceed with the retrofit project until it receives a certificate that "public convenience and necessity require the service or construction."[57] Before

[53] [redacted]

[55] EKPC Response to Commission's Information Request at Hearing Held on 01/14-15/14, Request 13.

[56] [redacted]

[57] KRS § 278.020(1).

the Commission can grant such a certificate, an applicant must demonstrate that there is: (1) a need for the facility, and (2) "an absence of wasteful duplication resulting from the construction of the new system or facility."[58] Need can be found to exist only if the applicant shows that there is a "substantial inadequacy of existing service."[59] The requirement to avoid "wasteful duplication" forecloses "excessive investment in relation to productivity or efficiency, [or] an unnecessary multiplicity of physical properties."[60] In order to satisfy the "absence of wasteful duplication" standard, "the applicant must demonstrate that a thorough review of all alternatives has been performed."[61]

Commission decision-making is guided by the overall requirement that utility rates are "fair, just, and reasonable."[62] As the Commission recently explained, it has "long recognized that least cost is one of the fundamental foundations utilized when setting rates that are fair, just, and reasonable."[63] However, the "selection of a proposal that ultimately costs more than an alternative does not necessarily result in wasteful duplication" if there is a reasoned basis for doing so after all relevant factors have been balanced.[64]

In a CPCN proceeding the applicant bears the burden of proving that the statutory standards of public convenience and necessity, and of fair, just, and reasonable rates, have been

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[58] *Kentucky Utilities Co. v. Public Service Com'n*, 252 S.W.2d 885, 890 (Ky. 1952); *In the Matter of Application of Kentucky Utilities Co. for Certificates of Public Convenience and Necessity*, KPSC Case No. 2011-00161,Dec. 5, 2011 Order, at 18-19.

[59] *Id.*

[60] *Id.*

[61] *In the Matter of: Application of Kentucky Utilities Co.* at 19.

[62] KRS § 278.030(1); KRS § 278.040; *Kentucky Public Service Com'n v. Com. ex rel. Conway*, 324 S.W.3d 373, 377 (Ky. 2010).

[63] *In the Matter of: Joint Application of Louisville Gas & Electric and Kentucky Utilities Co.*, Case No. 2011-00375 (Ky. PSC 2012); *In the Matter of: Application of Kentucky Power Co.*, Case No. 2009-00545, 2010 WL 2640998 (Ky. PSCP.S.C. 2010); *see also Public Serv. Comm'n of Ky. vs. Continental Tel. Co. of Ky.*, 692 S.W.2d 794, 799 (1985) (identifying "providing the lowest possible cost to the ratepayers" as an "important objective[]" for the Commission).

[64] *In the Matter of: Application of Kentucky Utilities Co.* at 19.

satisfied.[65] Where an applicant has not carried its burden of proof, the Commission must deny the application even in the absence of evidence specifically refuting the applicant's claims.[66] In reviewing a CPCN application, the Commission has the authority to "issue or refuse to issue the certificate, or issue it in part and refuse it in part."[67]

II. THE COMMISSION SHOULD DENY THE APPLICATION BECAUSE EKPC HAS NOT DEMONSTRATED A NEED FOR COOPER UNIT 1.

As established by the record, EKPC does not need Cooper 1's capacity for reliability purposes or to meet its reserve margin requirements. While EKPC attempts to justify the Project for purposes of maintaining Cooper 1 as a "financial hedge," the Company has failed to demonstrate a likelihood that Cooper 1 would in fact act as such a hedge, let alone that Cooper 1 is the most economical and least risky hedge available. Because EKPC has not established "substantial inadequacy of existing service" that creates a need for the Project,[68] the Commission should deny the Application.

A. The Record Demonstrates that Cooper 1 Is Not Needed for Capacity or Reliability Purposes.

EKPC misleadingly premises its application on an "anticipated capacity need" or "shortfall" of 300 MW, based on the retirement, rather than retrofitting, of Cooper 1 and the Dale power plant in order to comply with MATS.[69] However, as confirmed by ample evidence throughout the record, EKPC does not need Cooper 1 in order to meet its capacity requirements or to ensure reliability.

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[65] *See Energy Regulatory Comm'n v. Kentucky Power Co.*, 605 S.W.2d 46, 50 (Ky. App. 1980) ("Applicants before an administrative agency have the burden of proof.").
[66] *Id.* at 50-51.
[67] KRS § 278.020(1).
[68] *Kentucky Utilities Co.*, 252 S.W.2d at 890.
[69] *See, e.g.*, Application at 2, 4, 7; Tucker Dir. at 4.

EKPC first identified the so-called 300-MW "capacity gap" in its April 2012 IRP,[70] and shortly thereafter the Company issued its RFP to address that purported need.[71] The 2012 IRP, however, was prepared prior to EKPC's integration into PJM, and did not account for changes in EKPC's capacity requirements resulting from integration.[72]

As a result of integration, EKPC's capacity needs have changed in two important ways. First, EKPC's capacity requirement is now based on its summer peak load, rather than its higher winter peak.[73] Second, EKPC's reserve margin requirement dropped substantially, from 12 percent to 3 percent.[74] As a result, the Company's 2014, post-integration capacity reserve requirement is at least 350 MW less than it was in 2011.[75]

Consequently, following EKPC's integration into PJM, filling the so-called "capacity gap" became "an option, not a requirement."[76] As a member of PJM, EKPC now views replacement capacity as "strictly an economic issue," and admits that the anticipated retirement of 300 MW of capacity "no longer ha[s] reliability impacts."[77] Indeed, EKPC's own consultant in the proceeding approving PJM integration explained that integration would result in "significantly less planning reserves needed by EKPC, and produce[] cost savings by maintaining a lower reserve margin."[78]

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[70] App. at 1-2.
[71] App. Exh. 1A at 1-2.
[72] EKPC Response to PSC Initial Request 1.
[73] Tucker Dir. at 4, lines 11-12; Tucker Rebuttal at 2, lines 6-8. As noted by Company Witness Tucker during her cross examination, this is because PJM's summer peak is sufficient to cover PJM's winter peak. Tucker Cross Examination, 1/14/14 at 14:19.00.
[74] Tucker Rebuttal at 2, lines 8-9.
[75] *See* EKPC Response to Intervenors' Initial Request No. 24(b) and (f). In response to PSC Staff Data Request 13b, the Company claimed it "would have just under 400 MW of excess capacity as compared to its PJM capacity obligation, assuming no existing capacity was retired."
[76] EKPC Response to PSC Request 1.1; EKPC Response to PSC Request 2.2 ("a capacity gap is no longer anticipated in 2016").
[77] Tucker Dir. at 4, lines 16-19.
[78] PSC Order in Case No. 2012-00169 at 6 (granting EKPC's integration into PJM).

B. EKPC Has Not Met Its Burden of Proof That Cooper 1 Is Needed as a Financial Hedge.

While EKPC does not need Cooper 1 for capacity or reliability reasons, the Company contends that it should hedge against possible volatility in the PJM energy markets by maintaining sufficient generation to meet its net energy requirements without relying on open market purchases.[79] EKPC has no legal obligation to meet all of its energy and capacity requirements internally.[80] Even as a purely economic issue, however, EKPC's argument is flawed for two reasons: first, the Company can likely meet its energy requirements internally even without Cooper 1; and second, even if EKPC could not meet its energy requirements internally, EKPC has not demonstrated that Cooper 1 is the most economical hedge available to its customers.

1. EKPC Can Meet Forecasted Energy Requirements Without Cooper 1.

EKPC's application is based on a 2012 load forecast that suggests an 8,256 GWh shortfall from 2015 through 2020 if EKPC retires both Cooper 1 and Dale. EKPC has not committed to the retirement of Dale, but even assuming such retirement, any energy shortfall that may have existed under EKPC's 2012 load forecast disappears under the more recent PJM load forecast. For instance, EKPC's load forecast projects annual sales of over 13,285 GWh in 2015, rising to over 14,286 GWh in 2020.[81] In contrast, the 2014 PJM Load Forecast anticipates a much slower growth rate for EKPC's load—12,157 GWh in 2015 rising to only around 12,410

[79] *See* Tucker Rebuttal at 2, lines 10-22; EKPC Response to Staff Request 1.13.
[80] *See, e.g.*, Tucker Cross Examination, 1/14/14 at 14:37:20.
[81] EKPC Response to Intervenors' Initial Request 24(g).

GWh in 2020.[82] The significant gap between EKPC's forecast and PJM's forecast is demonstrated in Figure 1, below.

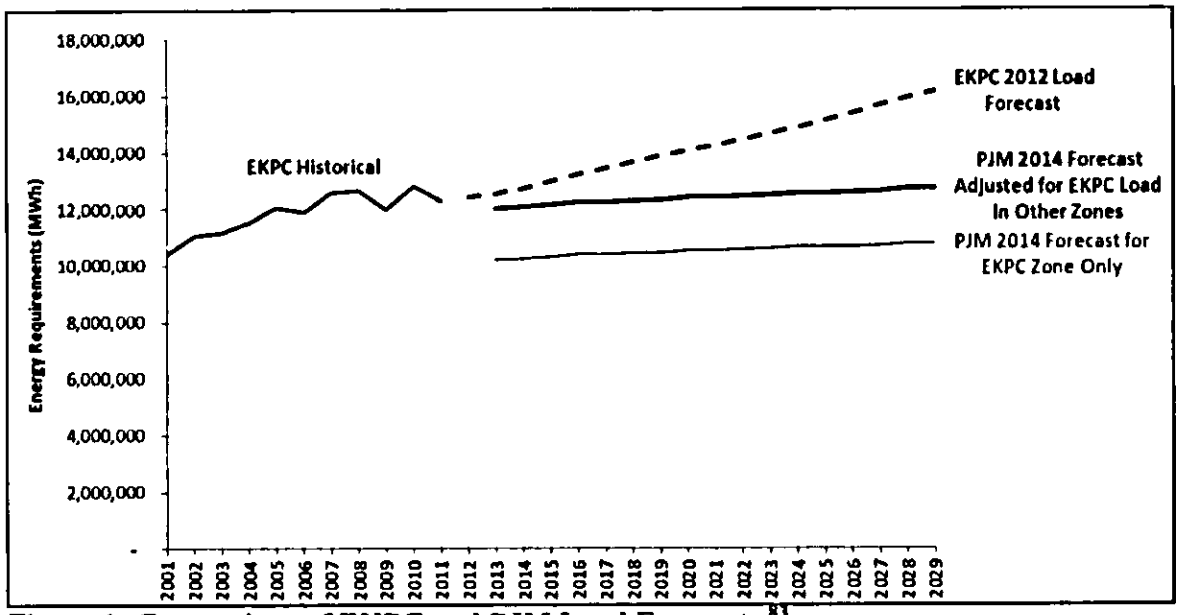

Figure 1: Comparison of EKPC and PJM Load Forecasts.[83]

The substantially lower PJM 2014 forecast is consistent with the fact that EKPC has adjusted its forecast downwards every two years since 2004.[84]

[redacted]

[82] At the hearing, Witness Tucker pointed out that PJM's forecasts for EKPC are not directly comparable to EKPC's forecasts because PJM's forecasts do not account for portions of EKPC's load that occur in other zones. Tucker Cross Examination, 1/14/14 at 14:45:00. In a post-hearing data production, EKPC states that the load for which EKPC is the load-serving entity is about 18 percent higher than the load on the EKPC transmission system. EKPC Response to Commission's Post-Hearing Request 11. In order to create an "apples to apples" comparison between EKPC's and PJM's forecasts, we have adjusted the numbers for the PJM forecast upwards by 18 percent.

[83] SC Ex. 15, EKPC 2012 Load Forecast Report; SC Ex. 17, 2014 PJM Forecast; and EKPC Post-Hearing Response to Commission's Post-Hearing Request 11.

[84] *See* Tucker Cross Examination, 1/14/14 at 14:25.

[redacted].[85] For the same period, PJM forecasts that EKPC will require approximately 73,725 GWh to meet its energy needs.[86] Thus, based on the PJM forecast (adjusted to match EKPC's total load), *even without Cooper 1 and Dale*, EKPC can likely produce 100 percent of its generation needs with generation from its own portfolio. EKPC's contention that Cooper 1 is needed to meet its own energy requirements thus does not hold water.

2. Even If EKPC Could Not Meet Its Net Energy Requirements Internally, The Company Has Not Demonstrated That Cooper 1 Would Serve As A Financial Hedge.

Moreover, even if EKPC is capable of meeting its generation needs internally, it does not necessarily follow that EKPC customers are best served by doing so through the continued operation of Cooper unit 1. When PJM market prices are below the dispatch costs of EKPC's plants, it is in EKPC customers' interest for the Company to meet its energy requirements through purchases from the PJM market. Indeed, EKPC identified the benefit of potential market purchases to its customers in the PJM integration docket, stating that "[b]y decreasing impediments to trade and fully participating in PJM's integrated regional energy market, EKPC will be able to purchase more power at lower costs to substitute for higher-cost generation on its own system."[87]

The available evidence shows that such competition has led to a significant decline in the operation of Cooper 1 and 2, which apparently have running costs that are higher than the PJM market dispatch price for a significant portion of the time. For example, in September 2012,

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[85] *See* "Energy Tab" of the [redacted]

[86] *See* SC Ex. 17, 2014 PJM Forecast (with forecast adjusted upwards by 18 percent to account for load served in other zones, based on EKPC Response to Commission Post-Hearing Request 11).

[87] PSC Order in Case No. 2012-00169 at 5-6.

Cooper 1 operated at a 35 percent capacity factor, while in September 2013 (post-integration), it dropped to a 7 percent capacity factor.[88] As illustrated in Figure 2 below, Cooper 1 (the dark line) has experienced such year-over-year decline in monthly dispatch in every month since EKPC became integrated into PJM.

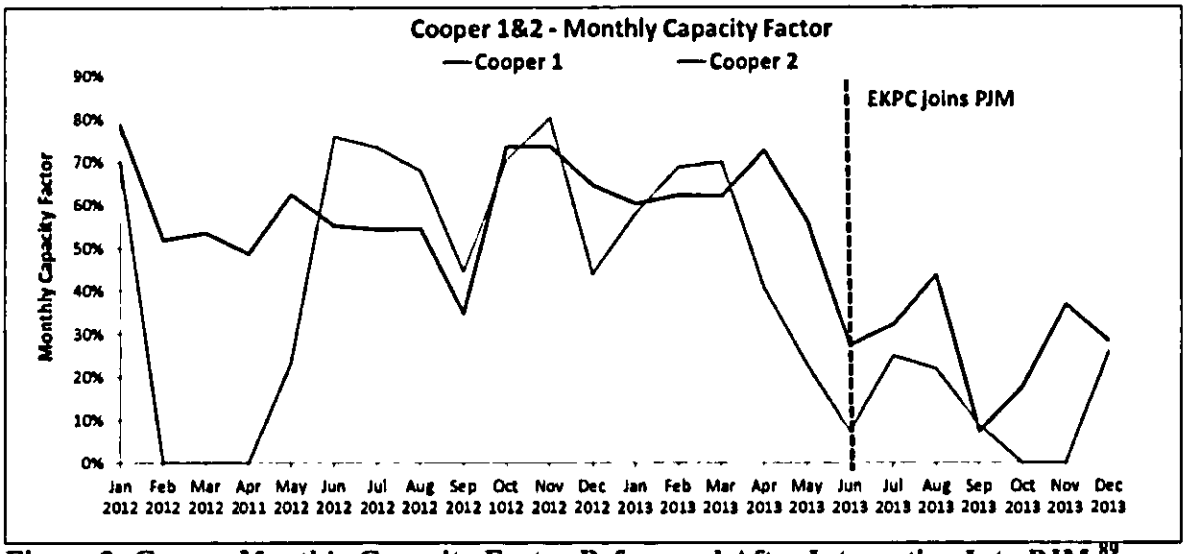

Figure 2: Cooper Monthly Capacity Factor Before and After Integration Into PJM.[89]

The dramatic drop in generation from Cooper unit 1 can be seen in Figure 3 below.

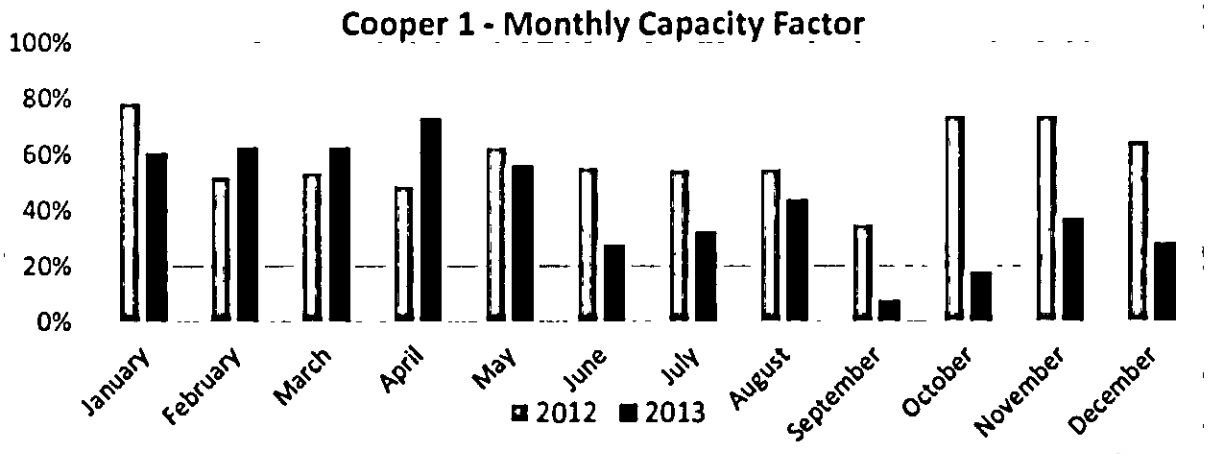

Figure 3: Cooper 1 Monthly Capacity Factor Before and After Integration Into PJM.[90]

[88] EKPC Response to Commission Post-Hearing Request 6.
[89] EKPC Response to Commission Post-Hearing Request 6.

And Cooper 1 can be expected to dispatch even less if MATS controls are installed. This is because Cooper 1's current dispatch price—comprised of its variable operating costs and its fuel costs—does not yet include the variable operating costs of the MATS controls at issue in this case. According to EKPC, operating those controls will raise Cooper 1's dispatch price by another $4.45 per MWh.[91] The dispatch price of Cooper 2, on the other hand, already includes the costs of operating the pollution controls. Consequently, the change in Cooper 2's dispatch before and after integration into PJM serves as a useful illustration of how Cooper 1's dispatch may further decline if the controls are installed: since integration, Cooper 2's average capacity factor has fallen to a mere 14.2%, as the Figure below indicates.[92]

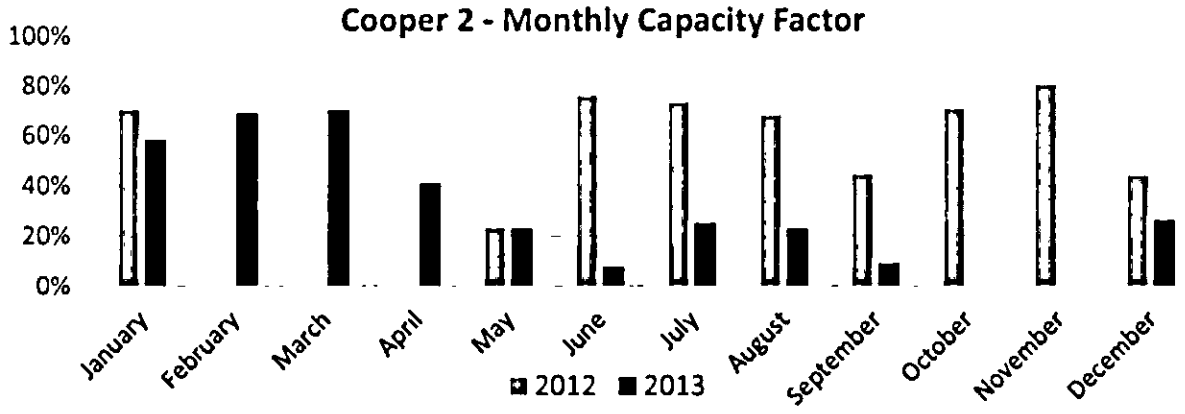

Figure 4: Cooper 2 Monthly Capacity Factor Before and After Integration Into PJM.[93]

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[90] EKPC Response to Commission Post-Hearing Request 6.

[91] *See* App. Ex 1A at 8; Ex BA-1 at 40.

[92] EKPC Response to Commission Post-Hearing Request 6. Note that Cooper's actual post-PJM dispatch is far less than EKPC forecasted in its Net Present Value modeling, in which EKPC projects that Cooper 2 will ramp up to 60 percent in 2016 and higher after that. EKPC Response 13c vii and xii - RFP-Unit-data - CONFIDENTIAL.xls, "Thermal Unit Generation" for Cooper 2. Company Witness Tucker noted during her cross examination that decreases in Cooper 1's dispatch benefit EKPC's customers because it means EKPC is buying less expensive energy from PJM. Tucker Cross Examination, 1/14/14 at 15:55:30 (noting that "those savings by [dispatching less] run directly back to our customers" because they are "receiving the benefit of buying cheaper than we generate").

[93] EKPC Response to Commission Post-Hearing Request 6.

In addition, Cooper 1 can only serve as an economical hedge if the sale of capacity and energy from Cooper 1 to the PJM market can recapture the capital costs of the project, Cooper 1's fixed and variable operating costs, and any other environmental or non-environmental capital costs the unit may face in the future.[94] If prior performance of the two Cooper units is any indication of how Cooper 1 will operate once controls are installed, however, Cooper 1 does not appear likely to recoup its costs in the PJM market.[95] In sum, evidence in the record does not support EKPC's claim that Cooper 1 will be an effective hedge against market price fluctuations.

3. EKPC Has Not Shown That Cooper 1 Would Be a More Prudent Financial Hedge Than Wind Or Energy Efficiency.

[94] Comings Dir. at 10, lines 13-15.

[95] During the hearing, the attorney for KIUC, Mike Kurtz, tried to make the case that the Project was economical by comparing the revenue Cooper 1 could generate in the PJM capacity markets to the costs of operating the unit. Hearing 1/15/14, 11:04:00-11:20:00. Mr. Kurtz estimated that Cooper 1 could generate approximately $1.9M in revenue from bidding in to the PJM capacity market. *Id.* at 11:19:00. He further estimated fixed operating costs of approximately $1.6M by subtracting variable O&M costs of $2.6M from EKPC's estimated revenue requirements for the Project (also called the environmental surcharge) of $3.6M. *Id.* He then looked at the difference between the fixed operating costs ($1.6M) and capacity revenue ($1.9M) and concluded that the Project is economical even if Cooper 1 never runs. *Id.*

This argument is flawed for several reasons. First, EKPC significantly understated its estimated total revenue requirements for the Project. Post-Hearing Data Response 12 revises the anticipated environmental surcharge associated with the Project upwards by $1M, for a new total annual revenue requirement of $4.6M. This means that—even without considering other costs associated with keeping Cooper 1 operational—the unit will have fixed O&M costs associated with the Project of around $2M, exceeding the revenue Cooper 1 can generate on the capacity market, according to Mr. Kurtz.

More importantly, Mr. Kurtz's back-of-the-envelope analysis ignores a host of other costs associated with maintaining and operating Cooper 1, beyond the costs of operating the retrofit controls. Cooper's operating costs include variable O&M, fixed O&M, fuel costs, and depreciation, as well as any other capital additions required to keep the plant operable. Exhibit 13, EKPC response to SC's Supplemental Request 6 (compelled through the Commission's 12/10/13 order) provides forecasted operating costs for the Cooper plant in 2016 alone of over $77M. *See also* EKPC Post Hearing Data Response 1. This number does not include interest and any capital additions required to keep the plant operational. Excluding interest, EKPC forecasts operating and capital costs at Cooper of over $107M in 2016, $83M in 2017, $105 in 2018, $146M in 2019, and $153.7M in 2020. *See* Exh. 13. (Note that, because the Company did not provide these costs on a per-unit basis, we are unable to determine from the data what proportion of these costs should be allocated to Cooper 1.)

Finally, Mr. Kurtz assumed that the $2.6M in variable O&M costs would be incurred only if Cooper 1 dispatches, so EKPC would have to spend that $2.6M on any replacement resource. But other resources may have lower variable O&M costs than Cooper 1 even if Cooper's running costs are at or below the market clearing price. There is no valid reason for assuming that all alternative resources would have the same variable O&M costs as Cooper unit 1; a wind project, for example, would likely have lower variable O&M costs.

Just as importantly, EKPC has not demonstrated that available investment alternatives—particularly wind and energy efficiency—would not provide a more cost-effective, prudent, and lower-risk financial hedge against energy market volatility than Cooper 1 would.

As established in the testimony of Sierra Club witnesses Comings and Loiter, and as discussed in detail in Section III, below, both [redacted] and energy efficiency are more cost-effective investments than the Project. In addition to being more cost-effective [redacted] and energy efficiency can also act as financial hedges to market prices, and the evidence in this case suggests that either could better serve this function than Cooper 1. Because wind power has no fuel costs and so is not subject to fuel price volatility, wind supplies a high degree of long-term price stability. [redacted][97]

[redacted]

[97] Note that the wind PPA energy costs decrease in real dollar terms because the PPA costs escalate at a lower rate than the assumed inflation (2% annual PPA cost compared to 2.5% annual inflation).

Given these price differentials, Witness Comings concludes that the [redacted] would provide "an attractive hedge against the energy market."[99]

Aside from providing EKPC with some price stability, investing in wind would also serve as a hedge by diversifying EKPC's coal-heavy fleet. As EKPC's CEO, Mr. Campbell, admitted in his direct testimony, the "Project does not help us achieve one of our strategic objectives, which is to diversify our fuel portfolio."[100] Company witness Read further noted that "[r]educing the concentration of coal-fired generation in the EKPC portfolio would tend to reduce uncertainty about the future value of the EKPC portfolio...."[101] By adding much-needed diversity to EKPC's fleet, wind energy would supply protection against both future environmental compliance costs and fluctuations in fuel costs at EKPC's coal plants.[102]

[98] Direct Testimony of Tyler Comings at 26, Figure 10.
[99] Comings Dir. at 25, lines 23-24 and 26 lines 1-2.
[100] Campbell Dir. at 4, line 5-6.
[101] EKPC Response to Club Request 1.35.
[102] Comings Dir. at 27.

Finally, EKPC has not provided evidence that Cooper 1 will be available to act as a hedge in the event of market spikes, even if called upon to do so. Coal-fired generation is highly inflexible due to extended ramp up and ramp down times. For example, despite record peak demand and short-term price spikes due to the unusual polar vortex experienced in early January 2014, the Dale coal plant did not serve as a hedge because it could not be ramped up in time. In order for Cooper 1 to be available to serve as a hedge during price spikes, EKPC would need to keep Cooper 1 on-line even if it is not economical for most hours. In contrast, because wind has near-zero fuel and operating costs, it dispatches whenever it is available.

Energy efficiency and demand response ("demand-side management" or "DSM") can also serve as a financial hedge against fluctuations in load and market energy and fuel prices with less risk than supply-side resources.[103] While ratepayers must pay the capital costs and fixed operating costs of a supply-side project regardless of whether the project ends up being needed to serve customer load, DSM resources can be developed and deployed incrementally to match actual conditions.[104] However, as discussed in greater detail in Section IV, below, EKPC did not consider DSM as a potential alternative to the Project, and thus has not proven that Cooper 1 could serve as a better hedge than DSM.

Because EKPC has not demonstrated that Cooper 1 is capable of functioning as a financial hedge, nor that alternative resources such as wind and energy efficiency (or some combination thereof) could not serve this function more economically and at lower risk to EKPC customers, the Commission should deny EKPC's Application.

III. EKPC HAS NOT MET ITS BURDEN OF PROVING THAT THE PROPOSED RETROFIT PROJECT IS THE LEAST-COST, LOWEST-RISK ALTERNATIVE.

[103] *See* Tucker Cross Examination, 1/14/14 at 16.04.00.

[104] Loiter Dir. at 15.

In its application, EKPC identifies the Cooper 1 retrofit project as the "least cost" option at least four times.[105] The Company, however, failed to justify that claim, as it both over-projected the benefits and under-projected the costs of retrofitting, rather than retiring, Cooper 1. In addition, at the time EKPC decided to pursue the retrofit project, the available evidence showed that [redacted] than the retrofit project, and the testimony of Mr. Loiter shows that DSM would also be a lower cost replacement for Cooper 1. Yet EKPC provided no supported basis for rejecting the [redacted], and failed to even evaluate DSM as an altemative. As such, the Company simply has not met its burden of demonstrating that it has satisfied "the fundamental principle of least cost" resource planning contained in the CPCN statute, KRS 278.020(1),[106] or that a "thorough review of all altematives has been performed."[107]

While EKPC may belatedly argue that a non-least cost altemative can be selected, the Company must present a substantial justification for doing so.[108] EKPC failed to do so here. Retrofitting Cooper 1 will not further EKPC's stated goal of diversifying its supply portfolio, carries significant environmental compliance risks, and entails all the risks of a self-build option. Given that the retrofit project is not the least-cost altemative, and there is no substantial justification for selecting the retrofit project, the Commission should deny the CPCN.

A. EKPC Has Overestimated the Economic Value of Cooper Unit 1 by Relying on Unreasonably High Energy and Capacity Prices.

The first major flaw in EKPC's NPV analysis of the Cooper 1 retrofit project is that the Company, and its consultant Brattle, used unreasonably high capacity and energy prices, thereby

[105] See EKPC Application at 2, 4, 6, and 7.
[106] Case No. 2009-00545, *Application of Kentucky Power Co. for Approval of Renewable Energy Purchase Agreement*, Order dated June 28, 2010 at 5.
[107] *In the Matter of: Application of Kentucky Utilities Co.* at 19.
[108] Case No. 2011-00161, *Application of Kentucky Utilities Company for Certificates of Public Convenience and Necessity*, Order dated December 15, 2011 at 19.

overstating the value of Cooper 1 both as a stand-alone project and in comparison to other alternatives. Brattle calculated the NPV as the present value of revenues from a project minus the present value of the costs.[109] In practice, for virtually all projects, most revenues come from capacity revenues and energy revenues, which in turn depend in large part on capacity and energy prices. In Brattle's NPV calculations, capacity and energy revenues are the only revenue sources. Accordingly, capacity and energy prices are two of the most important inputs in the NPV calculation.

[redacted] However, the PJM capacity auction cleared at $59 per megawatt day for the 2016-2017 delivery year,[113] [redacted] Using the actual capacity prices would lower capacity revenues for the retrofit project to a much greater extent than for the wind project, since the retrofit receives far more capacity credits than does the wind project. As a result, Brattle's inflated capacity prices benefitted the retrofit project over the wind project and other renewables.

Additionally, Brattle used an energy price forecast that was unsupported and contains an

[109] EKPC Ex. 1a at 4-5.

[redacted]

[112] Confidential Direct Testimony of Tyler Comings at 23; SC Hearing Ex. 25; [redacted]

arbitrary [redacted]. That forecast, which was obtained from ACES, merged two separate forecasts. [redacted]

Historically, it has been unusual for energy prices to [redacted] In addition, the 42% forecasted energy price spike is inconsistent with [redacted] even though natural gas prices and market energy prices have been tightly correlated in recent years.[118] Such a dramatic increase in such a short interval cries out for an explanation. Yet no such explanation was forthcoming, as EKPC placed no evidence in the record to substantiate its forecast, and could not identify in response to data requests any assumptions or inputs that went into that forecast.[119] Instead, the Company simply relied on the claim that Wood Mackenzie is a reputable firm while failing to present a witness from either Wood Mackenzie or ACES. As such, there was no way for the intervenors, Staff, or the Commission to evaluate or verify the bases for the energy price forecast that played such an important role in the NPV analysis here.[120]

[redacted]

[119] EKPC Response to Sierra Club Initial Information Request 19(e); EKPC Response to Sierra Club Supplemental Information Request 15(a)-(d).

[120] By contrast, in a recent proceeding in Indiana that Synapse presented testimony in, Wood Mackenzie provided the inputs and assumptions that went into the price forecast used by the utility in that case, along with a witness who testified regarding the development of that forecast. Sierra Club Response to EKPC's Post-Hearing Information Request 1.

At the hearing, EKPC's counsel suggested that the dramatic price increase in 2018-2020 could be attributable to future coal plant retirements. But all plants must comply with the MATS rule by April 2016 at the latest, so any coal plants that retire because of MATS will have to cease operating by April 2016. The [redacted] and therefore should reflect already announced and expected coal plant retirements as a result of MATS. So the MATS rule cannot explain th[redacted]. Moreover, if the [redacted] is attributable to future environmental rules other than MATS, that would directly contradict EKPC's position that future environmental rules are speculative and need not have been incorporated into the NPV analysis.

Counsel for EKPC also suggested that th[redacted] in energy prices could stem from future carbon regulations. But the Wood Mackenzie forecast is specifically identified as the [redacted] Moreover, EKPC stated in discovery responses that "EKPC has not used estimated costs to comply with any future greenhouse gas regulations in calculating the NPV for the ductwork project or any other project considered as part of the RFP process."[123] If EKPC used a market energy price that reflected future carbon regulations, that would directly contradict EKPC's position that future carbon regulations are speculative and were properly omitted from the NPV analyses.[124]

In response to this anomalous [redacted] in forecasted energy prices, Mr. Comings developed an alternative forecast using EKPC's natural gas price forecast and the broker energy prices from ACES. Mr. Comings calculated the implied relationship between the two, and

[redacted]

[123] EKPC Response to Sierra Club Supplemental Information Request 34d.

[124] *See, e.g.*, EKPC Response to Sierra Club Initial Information Request 62; EKPC Response to Sierra Club Supplemental Information Request 34; EKPC Response to Sierra Club Supplemental Information Request 38.

extended that relationship out into the future to forecast post-2017 energy prices.[125] While Mr. Comings' methodology for generating an altemative energy forecast is simple, it has three main virtues relative to the forecasts used by EKPC: (1) Mr. Coming explained his methodology, whereas no one has testified as to how the Wood Mackenzie forecast was generated; (2) Mr. Coming's energy forecast is consistent with EKPC's natural gas price forecast, whereas EKPC's energy price forecast is inconsistent with its own gas forecast; and (3) Mr. Coming's energy forecast contains no unexplained, dramatic price spike. As such, the Commission should use Mr. Coming's energy price forecast in evaluating the Cooper 1 retrofit project.

B. EKPC Underestimated The Economic Cost of Cooper Unit 1 By Unreasonably Assuming That Cooper Unit 1 Will Incur No Future Environmental Compliance Costs.

EKPC's NPV analysis is further flawed due to the Company's assumption that Cooper 1 will incur no additional environmental compliance costs in the next 25 years. Such assumption is unjustified and contrary to information that EKPC provided to both the U.S. EPA and the U.S. Congress. The zero environmental cost assumption also further biases EKPC's analysis in favor of the retrofit project, as the environmental standards at issue would impose far higher costs on a coal unit such as Cooper 1 than on wind, DSM, or other energy resources.

EKPC acknowledges that the EPA has proposed several environmental rules, including the cooling water intake rule ("316(b)"), the coal combustion residuals ("CCR") rule, and the effluent limitations guidelines ("ELG") rule.[126] EKPC also acknowledges that it is aware that for each of these rules, there is either a settlement agreement or a consent decree legally obligating

[125] Confidential Direct Testimony of Tyler Comings at 14.
[126] EKPC Responses to Sierra Club Supplemental Information Requests 35, 36, 37.

EPA to issue the final rule in 2014.[127] The Company, however, assumed that these rules will not create any costs for Cooper 1 on the theory that these rules are uncertain and speculative and, therefore, no costs can be estimated.

EKPC's rationale does not hold water. As EKPC's consultant, Mr. Read, stated, "the backdrop to a long-term power supply decision is uncertainty – uncertainty about load growth, uncertainty about power and fuel market prices, and uncertainty about the related issues of demand response, environmental regulation, and renewable energy."[128] The question is not whether future environmental costs are uncertain; as Mr. Read noted, virtually all future prices and costs are uncertain. Instead, the question is how to prudently manage uncertainty.

In the face of uncertainty, EKPC used sensitivity analyses for some variables, such as market energy prices.[129] But EKPC singled out future environmental costs for entirely different treatment. EKPC, after claiming that future environmental costs are too uncertain to speculate about, predicts with certainty that Cooper unit 1 will have no future environmental costs. That is

[127] EKPC Response to Sierra Club Supplemental Information Requests 35(c) (acknowledging that EPA is required to file with the District Court for the District of Columbia a schedule for finalizing the CCR rule); EKPC Response to Sierra Club Supplemental Information Requests 36(b) (acknowledging that a consent decree entered by the District Court for the District of Columbia requires EPA to issue the final ELG rule by May 22, 2014); EKPC Response to Sierra Club Supplemental Information Requests 37(b) (acknowledging that a settlement agreement required EPA to issue the final 316(b) rule by November 14, 2013). EPA secured an extension of the deadline beyond November 2013, and, according to EPA's website, the agency still needs additional time to finalize the 316(b) rule. *See* http://water.epa.gov/lawsregs/lawsguidance/cwa/316b/. While it is possible that these deadlines could be extended by a few months or even a year, such delay would have little impact on economic analyses evaluating 10 to 25 year periods. Given the settlement agreement and consent decrees requiring EPA to issue final rules, and given the long-term power supply decision EKPC is making, it is unreasonable to assume that the rules will not be finalized and go into effect during the planning period at issue in this proceeding.

[128] EKPC Ex. 1a at 10.

[129] EKPC Response to Commission's Information Request at Hearing Held on 01/14-15/14, Request 10 (providing the probability inputs used in the RTSim modeling).

patently unreasonable, as shown by both EKPC's own approach to other variables, and by the approach that other utilities have taken to estimating compliance costs.[130]

EKPC's assumption that Cooper unit 1 will face zero future environmental compliance costs also cannot be reconciled with the Company's statements to EPA that it will cost Cooper Station tens of millions of dollars to comply with the proposed 316(b), CCR, and ELG rules. Despite EKPC's discovery responses stating that "no costs can be developed in detail" for these three rules, it turns out that EKPC in fact estimated a range of costs to comply with each of these rules.[131] Table 3 below contains the compliance cost estimates for CCR and 316(b) from EKPC and for NAAQS/CSAPR from Synapse:

Table 3: Cost for Cooper Unit 1 to Comply with Forthcoming Environmental Rules

Rule	Costs under Lenient Final Rule, $M[132]	Costs under Strict Final Rule, $M[133]
CCR	10.7	51.5
NAAQS & CSAPR	7.3	33
316(b)	.8	15.2
Total, $2020	**18.8**	**99.7**
Total, present value	**14.9**	**79.2**

If the most lenient version of each proposed rule is finalized, Cooper unit 1 would incur approximately $14.9 million in additional capital costs.[134] If the strictest version of each rule is finalized, Cooper unit 1 would incur approximately $79.2 million in additional capital costs.[135]

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[130] *E.g., Application of Kentucky Power Company for a CPCN*, Case No. 2012-00578, Order dated October 7, 2013 at 31 (noting that Kentucky Power perform sensitivity analyses that included, among other things, variations in the carbon price and the timing of carbon prices).

[131] For example, EKPC came up with two cost estimates for the CCR rule (one estimate for a Subtitle C rule and another estimate for a Subtitle D or D prime rule). EKPC could have assigned probabilities to each of those scenarios by, for example, weighing the Subtitle C scenario at 50%, or 33%, or 10%, depending on EKPC's view of the likelihood of that scenario occurring.

[132] Supplemental Direct Testimony of Tyler Comings at 4-7.

[133] *Id.*

[134] Supplemental Direct Testimony of Tyler Comings at 6-7.

[135] *Id.*

These numbers underestimate the total environmental compliance costs because they include only capital costs and omit the additional operation and maintenance expenses to run the environmental controls. EKPC never provided these cost estimates to its consultant, Mr. Read.[136]

These cost estimates exclude any future costs to comply with greenhouse gas regulations, for which EKPC again assumed there will be zero cost. As the Commission recently noted, "carbon standards for existing power plants," which President Obama has ordered the U.S. EPA to propose in June 2014 and to finalize in June 2015,[137] "are expected to increase the constraints on utilities . . . that rely heavily on coal-fired generation."[138] Indeed, EKPC's CEO is so concerned about the impact of greenhouse gas regulations on EKPC's coal fleet that he traveled to Washington, D.C. to provide testimony to a House subcommittee that "most if not all coal-fired units will be forced to retire as a result of the regulation of GHG emissions . . ."[139] Yet EKPC did not include any cost for Cooper unit 1 to comply with greenhouse gas regulations, even in scenarios analyzing the unit's economics over a 25-year period.[140]

EKPC's failure to factor any cost for future environmental regulations into its NPV analysis is not only unsupported and inconsistent with what the Company has told EPA and Congress; it also biases the NPV analysis in favor of the Cooper 1 retrofit compared to other options. Coal-fired units such as Cooper unit 1 face higher environmental compliance costs than the wind and natural gas projects on the Short List, and also than DSM. By failing to include in

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[136] Cross Examination of Jerry Purvis, January 14, 2014 Hearing Tr. at 12:20.03 to 12:20:53.
[137] Presidential Memorandum of June 25, 2013, Power Sector Carbon Pollution Standards, 78 Fed. Reg. 39535 (2013).
[138] *In the Matter of Application of Big Rivers Electric Corporation for an Adjustment of Rates,* KPSC Case No. 2012-00535, Oct. 29, 2013 Order at 54.
[139] SC Ex. 5 at summary page and 6.
[140] EKPC Response to Sierra Club Supplemental Information Request 34d.

the NPV analyses any estimate of the cost to comply with future environmental standards, EKPC systematically biased the NPV results in favor of the retrofit project.

C. The Retrofit Project Is Barely A Breakeven Proposition, Or Is Significantly Uneconomic, If The NPV Analysis Uses Reasonable Capacity, Energy, And Environmental Compliance Prices.

In light of EKPC's reliance on unreasonably high capacity and energy prices and omission of future environmental costs, Mr. Comings recalculated the 10 and 25 year NPVs for the retrofit project. Mr. Comings' supplemental direct testimony contained the following results:

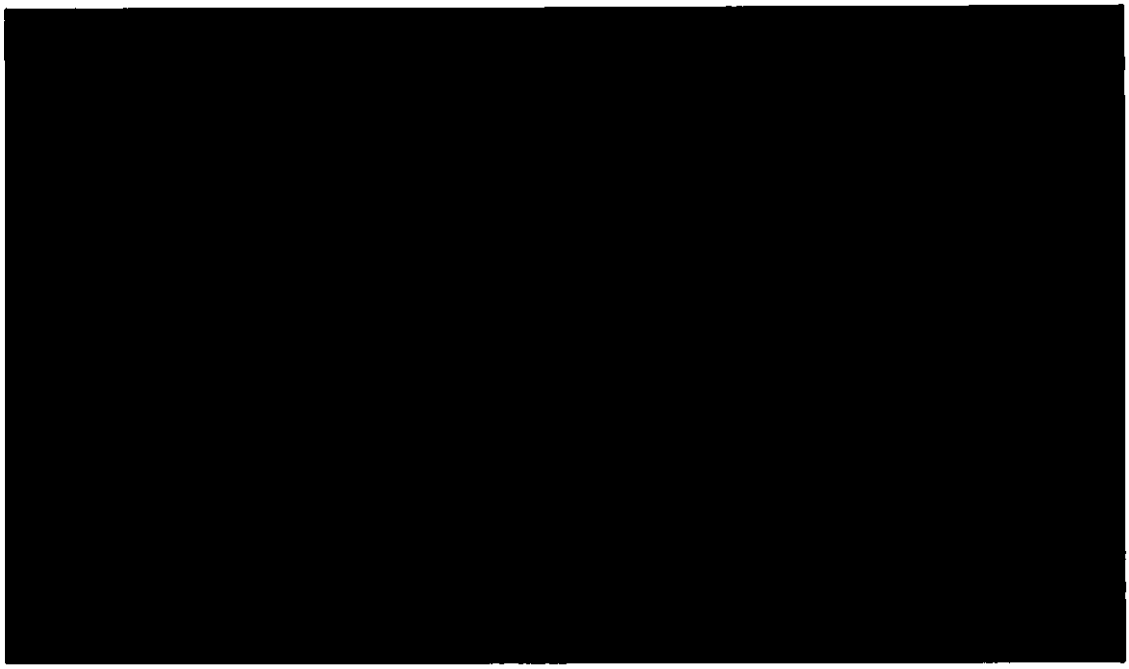
[redacted]

[redacted]

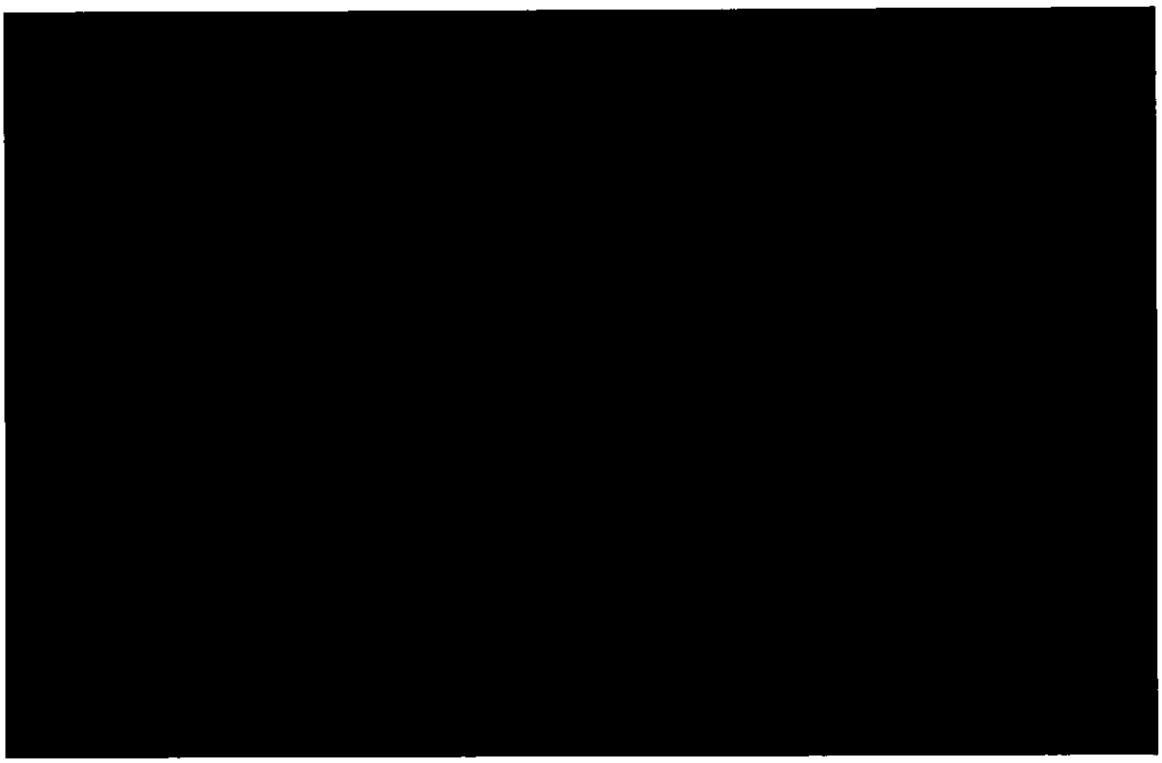
[redacted]

[141] Supplemental Direct Testimony of Tyler Comings at 10. The supporting calculations used to create the figure can be found in PSC 5 - CONFIDENTIAL_Proposal Evaluation_Energy Production - Synapse alt supp.xls.

[142] Supplemental Direct Testimony of Tyler Comings at 9. The supporting calculations used to create the figure can be found in PSC 5 - CONFIDENTIAL_Proposal Evaluation_Energy Production - Synapse alt supp.xls.



[redacted]



Source: Comings Testimony.

Mr. Read offered two points in his rebuttal. First, he noted that splitting the difference between the two forecasts would result in the retrofit project having a positive NPV if there are lenient environmental rules; a roughly $0 NPV if there are strict environmental rules; and a negative NPV only with strict environmental rules and carbon costs.[143] But, just as there is no basis in the record for the energy price forecast used by EKPC in this proceeding, there is also no basis in the record for simply selecting a forecast halfway in between EKPC's forecast and the one presented by Mr. Comings. Instead, the only supported and transparent forecast, and the only one that is consistent with the natural gas price forecast used by EKPC, is the one presented by Mr. Comings. In addition, Mr. Read's rebuttal demonstrates that splitting the difference between the two forecasts means that the project is economic only if all future environmental

[143] Rebuttal Testimony of James Read at 13.

rules impose costs on the low end of the range of possible costs and there is no future cost on carbon.[144]

Mr. Read next contends that the negative NPV that Mr. Comings describes would never come to pass because EKPC could simply retire Cooper 1 in the future before having to incur costs from future environmental regulations. While it is true that EKPC could retrofit Cooper unit 1 and then later retire the unit to avoid future environmental costs, that misses the fact that EKPC would then have to incur the expense for replacing Cooper 1 after having already spent money to retrofit it. EKPC conducted no economic analysis of retiring Cooper unit 1 before 2026, so it is entirely speculative what the NPV would be of retrofitting Cooper unit 1, retiring it prior to 2026, and then spending additional money on a replacement resource. But such scenario certainly does not suggest that it was reasonable for EKPC to ignore such likely future costs. Retrofitting the unit and then retiring it prematurely also carries an opportunity cost – the missed opportunities, such as the [redacted], that EKPC could have pursued instead of the retrofit.

Moreover, EKPC's argument that it could retire Cooper unit 1 early in the face of new environmental rules implicitly acknowledges that the retrofit involves significant regulatory uncertainty and risk. By contrast, [redacted] provides certainty in the face of those regulatory risks; the wind PPA is virtually immune from the pending environmental rules that could require early retirement of Cooper unit 1 if the unit is retrofit.

D. EKPC Arbitrarily Rejected The [redacted]

Even if EKPC's NPV analysis for the Cooper 1 retrofit project were reasonable, the record shows that the Company arbitrarily rejected the [redacted]

[144] *See id.*

[redacted] When Mr. David Crews recommended the retrofit project to EKPC's CEO, and when EKPC's Board approved the retrofit project, [redacted] [146] Despite being aware that least-cost is a central pillar of prudent utility planning, EKPC selected the retrofit project when the only information it had seen indicated that the retrofit project was not the least-cost altemative.[147]

Throughout this proceeding, EKPC has provided a series of shifting and unsupported reasons for why it rejected the [redacted]. First, EKPC stated that [redacted] Moreover, Mr. Read acknowledged that the intermittent nature of wind does not pose the same problems now that EKPC is part of PJM.[150]

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[145] EKPC response to Staff Initial Information Request 7a; EKPC response to Staff's Second Said of Information Requests 1b.
[redacted]

[147] Mr. Read, head of the Brattle team, indicated in discovery and rebuttal testimony that the NPVs listed above were revised a third time. EKPC Response to Staff Third Request 1; Rebuttal Testimony of James Read at 15. In particular, Mr. Read stated that he recalculated the NPV for the wind project to use hourly generation and energy prices in place of the all-hours energy prices and average monthly generation used in the initial calculations. Rebuttal Testimony of James Read at 15. According to Mr. Read, the revised calculations showed the [redacted] project having an NPV and NPV/MW-year well below the retrofit project. However, Mr. Crews stated at the hearing that he had not seen the revised NPVs prior to recommending selection of the retrofit project. [redacted] In short, EKPC claims that it did not learn of Mr. Read's revised NPV for the [redacted] project until after it had made its final decision to move forward with the retrofit project.

[148] EKPC Ex. 1a at 12.

[149] EKPC Response to Sierra Club Supplemental Information Request 19a.

[150] Cross Examination of James Read, January 14, 2014 Hearing Tr. at 6:48:14 to 6:50:13.

[redacted], too, no analysis was provided in response to a data request to substantiate the claim.[152] At the hearing, EKPC offered another reason, as [redacted][3] In response to a post-hearing data request, however, EKPC acknowledged that no such analysis existed, stating that "Subsequent to the statements made at the public hearing, EKPC has concluded that there were no written transmission studies related to the [redacted] wind project proposal."[154] So nearly a year after EKPC rejected the [redacted] in favor of the retrofit project, EKPC commissioned a study by ACES to substantiate, after the fact, EKPC's rejection of the wind project. There is only one "small" problem with the [redacted] transmission study: it contradicts Mr. Crew's claims as [redacted]

[151] EKPC Response to Sierra Club Supplemental Information Request 18b.
[152] EKPC response to Sierra Club Supplemental Information Request 19a
[153] [redacted].
[154] EKPC Response to the Commission's Post-Hearing Data Request 13 at 1.
[155] *Id.* at 4.
[156] *Id.* at 4.
[157] *Id.* at 4-6.

[redacted]

provides no rational basis for rejecting the project. Whether a project is economic in a particular hour, or in a few particular hours, is irrelevant. Virtually all plants lose money in some hours; for example, when Cooper unit 1 is not dispatched, its fixed costs for those hours may exceed its revenues. The relevant metric for evaluating a project is its NPV, which captures the overall economics of a project during all hours of a given analysis period. [redacted]

[158] EKPC Ex. 1a at 6.
[159] EKPC Response to the Commission's Post-Hearing Data Request 13 at 8.
[160] Rebuttal Testimony of James Read at 15.
[161] Rebuttal Testimony of James Read at 15.

[redacted]

In short, EKPC has provided no credible and supported basis for rejecting the [redacted]. In addition, the Company makes no mention of the benefits – such as diversification and low environmental risk – that the [redacted] project would provide. As such, the record shows that the required "thorough review of all alternatives" did not take place.

E. EKPC Failed to Evaluate DSM, Which is a Lower Cost Alternative to the Retrofit and Continued Operation of Cooper 1.

EKPC also failed to engage in the requisite "thorough review of all alternatives" by neglecting to evaluate increased DSM (i.e. energy efficiency and demand response) as an alternative to continued operation of Cooper 1. The Commission has found that a CPCN proceeding is a proper one in which to evaluate increased DSM, holding that "the CPCN authority provided the Commission pursuant to KRS 278.020 also effectively treats cost-effective energy efficiency as a priority resource."[164] And the testimony of Mr. Loiter shows that EKPC could replace more than 100% of the projected energy generation, and all of the capacity, from Cooper Unit 1 if the Company invested the money it would spend retrofitting and operating Unit 1 in DSM instead. Yet EKPC did not even evaluate energy efficiency, and the Company specifically excluded demand response from the types of bids it would accept in response to the 2012 RFP. The Company's failure to consider this low cost, priority resource renders the CPCN application fatally flawed.

1. Commission and State of Kentucky policy strongly favor DSM

[162] EKPC Response to Staff Information Request 7a; EKPC Response to Staff Supplemental Information Request 1b.
[163] Rebuttal Testimony of James Read at 15.
[164] *In re: Consideration of the New Federal Standards of the Energy Independence and Security Act of 2007*, KPSC Case No. 2008-00408, Oct. 6, 2011 Order, at 21.

In contrast to EKPC's exclusion of demand response from the RFP and summary dismissal of energy efficiency, the Commission has frequently and consistently endorsed the importance of DSM as a way to reduce costs for ratepayers. For example, the Commission recently recounted that:

> For over 30 years, the Commission has historically noted the importance of energy efficiency (conservation) as a ratemaking standard. "It is intended to minimize the 'wasteful' consumption of electricity and to prevent consumption of scarce resources...
>
> In recent years the Commission has emphasized the importance of energy efficiency, and has often considered it and DSM in conjunction with a requested increase in the customer charge.

In the Matter of Application of Kentucky Utilities Company for an Adjustment of its Electric Rates, KPSC Case No. 2012-00221, Dec. 20, 2012 Order at pp. 7, 8, and 11 (citations omitted). Similarly, the Commission has found that "as greater constraints are placed on utilities whose primary source of energy is coal-fired generation, EE/DSM and conservation have become more important," and identified President Obama's Presidential Memorandum directing EPA to propose carbon pollution standards for existing power plants as yet another reason for utilities to prioritize DSM. *In the Matter of Application of Big Rivers Electric Corporation for an Adjustment of Rates*, KPSC Case No. 2012-00535, Oct. 29, 2013 Order at pp. 53-54.

The State of Kentucky has similarly identified DSM as a priority resource most recently in the Kentucky Department for Energy Development and Independence's May 2013 Action Plan for Energy Efficiency ("Action Plan").[165] The Action Plan sought to advance the Kentucky Governor's 2008 Energy Strategy, which "identified energy efficiency as the first and foremost vehicle to accomplish" the objectives of "ensur[ing] Kentucky's energy security, creat[ing] jobs

[165] Exhibit SC 32.

and maintain[ing] low-cost, reliable energy into the future."[166] After a series of meetings with stakeholders including EKPC, the Action Plan established utility DSM energy saving targets of 0.2% in 2012, 0.3% in 2013, 0.5% in 2014, and 1% per year for each year from 2015 through 2025.[167]

2. DSM is a Lower Cost Alternative to the Retrofit and Continued Operation of Cooper Unit 1

Consistent with these policies in favor of DSM, Sierra Club presented the testimony of Mr. Loiter regarding the levels of energy and peak demand savings EKPC could achieve by investing the money that EKPC would spend retrofitting and operating Cooper 1 in DSM instead. Mr. Loiter concluded that EKPC could achieve total savings from energy efficiency of 181,745 MWh by 2017 and 646,808 MWh by 2021 from the money that would otherwise go towards operating Cooper 1 over those years.[168] In addition, the energy efficiency efforts funded by such spending from 2014 through 2017 would have a total lifetime energy savings of 1.4 million MWh.[169] By contrast, Cooper 1 is projected to generate only 890,000 MWh of energy from 2014 through 2017.[170] Mr. Loiter also calculated that such energy efficiency investment would lead to peak demand reduction of 26 MW by 2017 and 94 MW by 2021.[171] If the $15 million for the Cooper 1 retrofit project were instead invested in demand response, EKPC could achieve another 22 MW of peak demand reduction, bringing the total reduction to 48 MW by

[166] Exhibit SC 32 at 9, citing Governor Beshear's *Intelligent Energy Choices for Kentucky's Future: Kentucky's 7-Point Strategy for Energy Independence* (2008).
[167] Exhibit SC 32 at 55.
[168] Loiter Supplemental Testimony at 2.
[169] *Id.* at 4.
[170] *Id.*
[171] Id. at p. 4.

2017 and 117 MW by 2021.[172] In short, EKPC could replace all of Cooper 1's energy and capacity with DSM.

Mr. Loiter's method for estimating the savings figures set forth in his testimony was straightforward. First, Mr. Loiter identified a subset of five existing or new EKPC energy efficiency programs and calculated the average cost per annual MWh of energy saved for those five programs based on the costs for the programs that EKPC reported in its 2012 IRP.[173] He then multiplied that average cost per annual MWh of energy saved by the fixed and variable O&M costs and fuel costs for operating Cooper 1 to estimate the total amount of savings that could be achieved.[174] Mr. Loiter explained at hearing that he selected the five efficiency programs that he used in his calculations in order to make sure he had "decent coverage of a range of end uses and customer types" and that he focused on new, rather than existing, programs so that his calculations would reflect what EKPC was projected as its future costs of DSM.[175]

Mr. Loiter further testified that the levels of savings estimated in his testimony were "certainly achievable" by EKPC.[176] The 181,745 MWh of savings from 2014 through 2017 represents 1.3% of load in 2017, or an average incremental savings of approximately 0.3% per year.[177] The savings through 2021 represent 4.2% of load in that year, or average incremental savings of 0.5% per year.[178] As Mr. Loiter explained:

> There is an extensive amount of industry experience and a large body of published literature that supports my contention that annual savings of the scale I

[172] Id. at 2.
[173] Loiter Direct Testimony at 14; Exhibit SC 28; Cross Examination of Jeffrey Loiter, January 15, 2014 Hearing Tr. at 17:29:58 to 17:30:49.
[174] Loiter Direct Testimony at 13-14.
[175] Cross Examination of Jeffrey Loiter, January 15, 2014 Hearing Tr. at 17:28:49 to 17:29:56.
[176] Loiter Supplemental Testimony at 3.
[177] Id. at 3-4.
[178] Id.

> estimate are widely achievable in many jurisdictions, by a variety of administrators, and under a range of funding models.[179]

In fact, the 0.3% to 0.5% average incremental savings per year is less than the 1.22% savings projected for Ohio, 0.58% projected for Indiana, and the 1% achieved by Michigan from energy efficiency programs in 2012.[180]

Finally, it is important to note that Mr. Loiter underestimated the amount of savings that EKPC could achieve by investing the money spent retrofitting and operating Cooper 1 in DSM instead in at least two ways. First, Mr. Loiter did not factor into his calculations the non-environmental capital spending that would be needed to keep Cooper 1 running.[181] Second, the estimates did not include any benefit that EKPC could gain from bidding the demand reduction that could be achieved into the PJM capacity auction.[182] Either or both of those sums of money could be used to further increase investments in DSM or to otherwise benefit ratepayers.

3. EKPC Failed to Rebut Sierra Club's Demonstration that DSM Is a Lower Cost Alternative to Retrofit and Continued Operation of Cooper 1.

In rebuttal, EKPC never directly challenges the contention that 0.3% to 0.5% of incremental savings per year identified by Mr. Loiter are readily achievable by the Company or that the Company could use the money needed to retrofit and continue operating Cooper 1 to invest in DSM. Instead, EKPC raises a couple of "concerns" about Mr. Loiter's calculations, contends that the Company's planned 0.15% per year energy savings is already "aggressive," and suggests that higher levels of savings would somehow require that ratepayers be "coerced" into participating. None of these arguments hold water.

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[179] Loiter Supplemental Testimony at 5.
[180] Loiter Direct Testimony at pp. 12-13; Exhibit SC 29.
[181] Redirect of Jeffrey Loiter, January 15, 2014 Hearing Tr. at 17:56:44 to 17:57:47.
[182] Redirect of Jeffrey Loiter, January 15, 2014 Hearing Tr. at 17:57:48 to 17:58:14.

With regards to the calculations, EKPC's first concern is that Mr. Loiter did not explain why he selected the five energy efficiency programs that were used to calculate an average cost per annual MWh of energy saved.[183] But, as noted above, Mr. Loiter explained at hearing that he selected the five programs in order to get a fair representation of end uses and customer types, and so that he could use the costs and savings that EKPC was projecting for the future.[184] EKPC could have asked in a data request how those five programs were selected, but neglected to do so. EKPC also did not identify any other programs or combination of programs that it thought Mr. Loiter should have used. EKPC witness Isaac Scott did offer significantly lower estimated level of savings, but that was based solely on the use of the Company's least cost-effective energy efficiency program.[185] By contrast, Mr. Scott acknowledges that Mr. Loiter's calculations were not based on the most cost effective EKPC efficiency program[186] but, instead, used a set of five programs with varying levels of cost effectiveness.

Mr. Scott's second concern with Mr. Loiter's calculations is that he purportedly used an "average levelized cost" of the five programs, rather than a "combined levelized cost."[187] But as clearly stated in his direct testimony and accompanying workbook, and as Mr. Scott conceded at hearing, Mr. Loiter calculated an average cost per annual MWh of energy savings, not a levelized cost.[188] And Mr. Scott neither calculated the "combined levelized cost" that he

[183] Rebuttal Testimony of Isaac Scott at p. 6; Cross Examination of Isaac Scott, January 15, 2014 Hearing Tr. at 9:49.00 to 9:49:23.
[184] Cross Examination of Jeffrey Loiter, January 15, 2014 Hearing Tr. at 17:28:49 to 17:29:56.
[185] Rebuttal Testimony of Isaac Scott at 8.
[186] Rebuttal Testimony of Isaac Scott at 6-7.
[187] Rebuttal Testimony of Isaac Scott at 7.
[188] Direct Testimony of Jeffrey Loiter at 14; Exhibit SC 28; Cross Examination of Isaac Scott, January 15, 2014 Hearing Tr. at 9:57:45 to 9:59:29.

contends Mr. Loiter should have used, nor was he able to state at hearing that use of such cost would have made a difference.[189]

Next, Mr. Scott contends that the current levels of DSM savings that EKPC is obtaining are already aggressive, with the implication that the Company should not be expected to do more.[190] It is true that the Staff Report on EKPC's 2012 IRP agreed with EKPC's claim that its current DSM plans are "aggressive but reasonable." But the Staff also urged EKPC to "endeavor" to achieve the "theoretical" savings identified in the IRP "to the greatest extent possible."[191] Yet EKPC is planning to achieve less than one-third of the "theoretical" savings level identified by the Staff,[192] so plainly there is far more work for the Company to do on DSM.

In addition, the record is clear that EKPC is not achieving or planning to achieve anywhere near the level of savings that is achievable. For example, EKPC's 2012 and 2013 energy savings were 0.12% and 0.13% of sales, respectively.[193] By 2017, the Company is seeking to save a cumulative total of less than 0.8%, which averages out to approximately 0.15% per year.[194] Such small levels of savings are well below what is being achieved in numerous states near Kentucky, such as Ohio, Indiana, Michigan, Tennessee, North Carolina.[195] They are also well below the savings targets identified in the Kentucky 2013 Action Plan, which quickly ramp up from 0.2% in 2012 to 1% per year in 2015 and thereafter through 2025.[196] As Mr. Loiter explains, EKPC has not provided a reasonable and supported basis for concluding that its

[189] Cross Examination of Isaac Scott, January 15, 2014, Hearing Tr. at 10:07:17 to 10.08:23.
[190] Rebuttal Testimony of Isaac Scott at 2.
[191] Direct Testimony of Jeffrey Loiter at 9.
[192] Id. at 8-9.
[193] These percent figures were calculated by dividing the 2012 and 2013 MWh savings reported in EKPC's Response to Information Request at the Hearing Number 14 and the 2012 and 2013 load figures reported in Exhibit SC 14, EKPC Response to SC 1-24.
[194] Direct Testimony of Jeffrey Loiter at 9.
[195] Direct Testimony of Jeffrey Loiter at 12-13; Exhibit SC 29.
[196] Exhibit SC 32 at 55.

customers cannot achieve the same levels of efficiency that are being achieved in numerous other states.[197]

At the hearing, Mr. Scott rejected the relevance of the DSM savings achievements in Michigan (where utilities have ramped up their savings from 0.3% in 2008 to 1.0% in 2012)[198] on the grounds that Michigan has a law requiring utilities to achieve certain levels of energy savings from DSM programs, while Kentucky does not.[199] According to Mr. Scott, such a statutory requirement could remove barriers to and create incentives for DSM, thereby making savings more achievable in states with statutory requirements than those without. Such a response is ironic, given that EKPC opposed a statutory energy efficiency requirement in the stakeholder process for the 2013 Kentucky Action Plan, calling instead for voluntary goals.[200] In addition, EKPC's response ignores the fact that the Commission has the authority to approve DSM programs that include recovery of the full cost of the programs and of lost revenues, and "incentives designed to provide financial rewards to the utility for implementing cost-effective demand side management programs." KRS 278.285(2). Given the Commission's statutory authority, and EKPC's opposition to an energy efficiency standard, the Company's claim that it cannot achieve the levels of savings being achieved in states such as Michigan rings hollow.

Finally, Mr. Scott offered the inconsistent, and false, claims that Sierra Club is contending that "education alone will lead to higher participation" in DSM programs and also that customers can be "coerced" or "compelled" into participating in DSM programs.[201] Education certainly plays a very important role in increasing participation in DSM programs, but

[197] Direct Testimony of Jeffrey Loiter at 10-12.
[198] Exhibit SC 29.
[199] Cross Examination of Isaac Scott, January 15, 2014 Hearing Tr. at 10:45:45 to 10:47:02.
[200] Exhibit SC 32 at p. 50; Cross Examination of Scott Drake, January 15, 2014 Hearing Tr. at 14:31:03 to 14:35:07.
[201] Rebuttal Testimony of Isaac Scott at 2-3, 16.

it is far from the only step needed for DSM to be successful. Instead, as Mr. Loiter explained in his supplemental testimony, incentives, technical assistance, training of trade allies, and account management are just some of the ways that DSM program performance can be increased.[202]

As for EKPC's attempt to equate a call for increased DSM savings with coercion of ratepayers, the Commission said it best in a proceeding involving Kentucky Power Company:

> The Commission realizes that customer participation in DSM is voluntary and that Kentucky Power cannot compel greater participation; however, the Commission believes that most well-informed customers would choose to participate in DSM programs to avoid higher energy bills. Therefore, the Commission strongly encourages Kentucky Power to promote its DSM programs, educate applicable customers who would qualify for DSM program participation, and work to increase participation levels in its DSM programs. The Commission also strongly encourages Kentucky Power to educate its customers about the need for greater energy efficiency due to the rising cost of electric energy and the strain that the demand of electric usage at peak times places on both the Kentucky Power and the American Electric Power systems. We believe that Kentucky Power should make every effort to educate its customers that participation in demand-side programs represents one way in which the customers can impact the extent to which ever-increasing energy costs increase their electric bills.

In re Application of Kentucky Power Co., KPSC Case No. 2011-00300, Jan. 23, 2012 Order at p. 9. EKPC has a great opportunity here to invest some resources into such education and other steps needed to increase participation in its DSM programs in order to save ratepayer money and reduce risk. EKPC's failure to explore that opportunity provides yet another reason why the Company's unnecessary, more expensive, and riskier Cooper 1 retrofit proposal should be rejected.

IV. EKPC FAILED TO DISCLOSE RELEVANT EVIDENCE IN ITS APPLICATION AND DISCOVERY RESPONSES.

[202] Supplemental Testimony of Jeffery Loiter at 6.

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 interveners 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. 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, Commission Staff and Sierra Club propounded specific discovery so that it could either review and verify or challenge EKPC's analyses and conclusions. However, EKPC's responses to such requests for information were obstructive, evasive, and incomplete. As explained below, EKPC withheld information responsive to discovery requests regarding future environmental costs at Cooper unit 1, did not even disclose the NPVs of its short-listed altematives in its application, and provided shifting, unsupported, and often disproven justifications for rejecting the [redacted] Having withheld critical information and provided multiple, unsupported explanations for key decisions,

EKPC has failed to meet its burden of proving that after considering all reasonable alternatives, the retrofit project is the least-cost alternative. As such, the Commission should deny the Company's request for CPCN because EKPC's systematic obfuscation flies in the face of its regulatory burden.

A. Despite Telling EPA That Pending Environmental Regulations Would Cost Cooper 1 Tens Of Millions Of Dollars, EKPC Assumed Zero Future Environmental Costs In Its Application And Claimed That Such Costs Were Too Speculative To Estimate.

EKPC's economic analysis submitted to the Commission with its application omitted all future environmental compliance costs for all of the bids. In particular, the analysis performed by Brattle that led to selection of the retrofit project included no costs for Cooper unit 1 to comply with forthcoming environmental standards, such as the pending CCR, ELG, and 316(b) rules.[203] To probe whether EKPC truly expected to incur no future environmental costs at Cooper unit 1, Intervenors asked "whether EKPC has prepared or caused to be prepared any study of the costs to bring Cooper Unit 1 and Cooper Unit 2 (either individually or jointly), or the Dale Station into compliance with the regulatory options being considered in EPA's proposed effluent limitations guidelines."[204] Intervenors asked the same question with respect to the proposed CCR and 316(b) rules.[205] EKPC provided identical responses to all three questions, stating that "EPA has not promulgated the final rule . . . Therefore, no costs can be developed in detail to address or be factored into a NPV analysis."[206]

Intervenors then posed the question in a slightly different way, asking whether "EKPC reviewed any documents relating to the potential costs at Cooper Unit 1 and/or Cooper Unit 2 to

[203] EKPC Responses to Sierra Club Initial Information Requests 59-62.
[204] Sierra Club Initial Information Request 59.
[205] Sierra Club Initial Information Requests 60, 61.
[206] EKPC Response to Sierra Club Initial Information Requests 59-61.

comply with the forthcoming" ELG, CCR, and 316(b) rules.[207] EKPC objected to answering,[208] and provided a response only after the Commission granted Sierra Club's motion to compel.[209] EKPC then produced documents submitted to EPA in which EKPC provided detailed estimates of the cost to comply with each proposed rule.[210] EKPC should have included these cost estimates in its application (rather than claiming that Cooper 1 would face zero future environmental costs) or, at a minimum, provided these documents in response to Sierra Club's initial information requests 59-61. By providing the documents only after the Commission granted the Sierra Club's motion to compel (which was after the deadline for Intervenors to submit direct testimony), EKPC forced Intervenors to spend additional time and resources on supplemental testimony to incorporate the new information.

Just as EKPC included no cost to comply with pending environmental rules, EKPC included no compliance costs for future greenhouse gas regulations.[211] When Sierra Club asked EKPC about potential greenhouse gas regulations, EKPC stated that it had not prepared any estimate of the range of costs that Cooper unit 1 may incur to comply with greenhouse gas regulations;[212] furthermore, EKPC objected to "identifying any level of compliance costs as it require speculation concerning the future rulemaking.[213] Such statements stand in stark contrast to the testimony of EKPC's CEO, Mr. Anthony Campbell, to Congress in which he stated that if

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[207] Sierra Club Supplemental Information Requests 31-33.
[208] EKPC Response to Sierra Club's Supplemental Information Requests 31-33.
[209] EKPC Additional Response to Sierra Club's Supplemental Information Requests 31-33.
[210] Letter from Jerry Purvis, EKPC to EPA (Aug. 15, 2011) (providing estimates of the cost for Cooper Station to comply with the proposed 316(b) rule), produced in EKPC Additional Response to Sierra Club Supplemental Information Request 31; Letter from Jerry Purvis, EKPC to EPA (Nov. 19, 2010) (providing estimates of the cost for Cooper Station to comply with the proposed CCR rule), produced in EKPC Additional Response to Sierra Club Supplemental Information Request 32; letter from Jerry Purvis, EKPC to EPA (September 20, 2013) (providing estimates of the cost for Cooper Station to comply with the proposed ELG rule), produced in EKPC Additional Response to Sierra Club Supplemental Information Request 33.
[211] EKPC Response to Sierra Club Supplemental Information Request 34d.
[212] EKPC Response to Sierra Club Supplemental Information Request 34.
[213] EKPC Response to Sierra Club Supplemental Information Request 38b

EPA follows through with its intentions to regulate greenhouse gases from existing power plants, "most if not all coal-fired units will be forced to retire as a result of the regulation of GHG emissions . . ."[214] EKPC never disclosed this testimony to the Commission in its filing or testimony, and never mentioned it in its discovery responses regarding potential greenhouse grass regulations. Mr. Campbell's testimony came to light only after the Sierra Club discovered it. This is yet another example of EKPC telling EPA and Congress that pending environmental rules will impose substantial costs on EKPC's coal fleet, but then turning around and telling the Commission and the parties that pending environmental rules are speculative and will impose no relevant costs.

B. EKPC Was Not Open And Transparent Regarding The NPVs Of The Short List Projects.

EKPC was not transparent regarding the NPVs for the short list projects. While claiming that NPV was the primary factor in its analysis, EKPC failed to even identify the NPV for any short listed project, except the retrofit project, in its application and direct testimony. In response to discovery requests from Staff, EKPC produced three different sets of NPVs, with significantly different results each time.[215] Faced with three different lists of NPVs, Sierra Club asked EKPC to clarify the matter by listing the five highest NPVs for each analysis period EKPC used.[216] EKPC responded that "Mr. Read sees no purpose to ranking proposals on the basis of arbitrary analysis periods"[217]—even though Sierra Club asked about the very analysis periods EKPC used.

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[214] SC Ex. 5 at summary page and 6.

[215] EKPC produced the first list of NPVs for the Short List projects in response to Staff Initial Request 7a. The second list, with a significantly different NPV for one of the bids, was produced in response to Staff Supplemental Request 1b. The third revision to the NPVs for the short list projects was made in response to Staff's Third Set of Information Requests 1 and was referenced in the Rebuttal Testimony of James Read.

[216] Sierra Club Supplemental Information Request 7.

[217] EKPC Response to Sierra Club Supplemental Information Request 7.

Such obfuscation again hindered the ability of Sierra Club to carry out discovery and submit testimony regarding a critical element of EKPC's analysis.

C. EKPC Failed To Answer Discovery Questions Regarding Why It Rejected The [redacted] And The Reason It Provided At The Hearing Runs Counter To The Evidence In The Record.

EKPC never revealed in its application that that the [redacted] project had a [redacted] than the Cooper 1 retrofit project. In addition, EKPC failed to provide in response to data requests the shifting reasons the Company ended up giving for rejecting the project.

Sierra Club asked EKPC to provide "the following information for the years 2008-2013: ... A list of all wind energy project s or power purchase agreements EKPC considered but rejected participation in" and "for each such wind energy project, explain why EKPC decided not to participate in it."[218] On this critical issue, EKPC's response to that request was that "None of those projects proved to be viable."[219]

However, when asked at the hearing why EKPC rejected the [redacted] Mr. Crews provided an entirely different answer, [redacted] Prior to the hearing, EKPC never provided that rationale to Intervenors, despite their having asked for it. Mr. Crews conceded at the hearing that "I would have to say that we may not have been fully responsive to this question."[221] And, as discussed above, it turned out after the hearing that no study supporting the deliverability claim existing and, instead, that ACES' opinion was that after some short-term—but not insurmountable—hurdles, energy from the [redacted] could be transmitted into PJM.

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[218] Sierra Club Initial Information Request 12.
[219] EKPC Response to Sierra Club Supplemental Information Request 12(c).
[220] [redacted]
[221] Cross Examination of David Crews, January 15, 2014 Hearing Tr. at 14:12:20 to 14:12:25.

In addition to the [redacted] Prior to the hearing, EKPC provided no explanation for not pursuing the [redacted] project, even though Sierra Club asked EKPC in discovery to explain why it "decided not to participate in" any wind project.[224] [redacted], but EKPC provided no evidence in the record to substantiate that claim.[225] Instead, the only evidence in the record shows that the [redacted].[226]

V. THE COMMISSION SHOULD DENY EKPC'S CPCN APPLICATION AND REQUIRE THAT ANY FUTURE CPCN CONSIDER ENVIRONMENTAL COMPLIANCE COSTS SO THAT RENEWABLES AND ENERGY EFFICIENCY ARE EVALUATED ON A LEVEL PLAYING FIELD.

The record in this proceeding clearly shows that EKPC conducted a flawed least-cost planning analysis to bolster its Proposed Project and missed or ignored numerous warning signs indicating that any capital expenditures at the Cooper coal-fired power plant were both unnecessary and not cost effective. In addition, EKPC blindly rejected a [redacted] that, based on the information known and available to the Company at the time that it conducted the analysis and today, had a higher NPV. Given these glaring errors, the Commission should reject EKPC's request for a CPCN and require that any future CPCN applications filed by

[222] EKPC Response to Commission's Information Request at Hearing Held on 01/14-15/14, Request 13 at 7.
[223] *Id.* at 8.
[224] Sierra Club Initial Information Request 12(c)(ii).
[225] Cross Examination of David Crews, January 15, 2014 Hearing Tr. at 14:03:00 to 14.03:10.
[226] EKPC Response to Commission's Information Request at Hearing Held on 01/14-15/14, Request 13 at 8.

EKPC include environmental compliance costs as part of any economic analysis so that demand response and renewables are considered on a level playing field with other resources.

The entire proceeding is based on a false premise – that if EKPC retired Cooper 1 and Dale in order to comply with MATS the Company would have a 300 MW capacity gap. This false premise resulted from EKPC's 2012 IRP, which identified this supposed capacity gap, and it 2012 RFP, which sought resource options to fill this supposed gap, failing to account for how the Company's capacity needs would change upon integration into PJM.[227] After EKPC's integration into PJM, EKPC's capacity requirements switched from a winter peak to a summer peak and its reserve margin requirements dropped from 12% to 3%.[228] This meant that filling the previous "capacity gap" became "an option, not a requirement"[229] as the Company "no longer ha[s] reliability" problems.[230]

The proposed project is also not needed as a financial hedge against the energy market. That is because, based on the PJM forecast (adjusted to match EKPC's total load), even without Cooper 1 and Dale, EKPC can likely self-produce 100 percent of its generation needs.[231] Moreover, EKPC has not demonstrated that other alternatives, such as wind and energy efficiency, would not provide a more cost-effective, prudent, and lower-risk financial hedge against energy market volatility than Cooper 1 would. Because wind power has no fuel costs and is not subject to fuel price volatility, wind supplies a high degree of long-term price stability. [redacted]

[227] *See* EKPC Response to PSC Initial Request 1.
[228] *See* EKPC Response to Intervenors' Initial Request No. 24(b) and (f).
[229] EKPC Response to PSC Request 1.1; EKPC Response to PSC Request 2.2 ("a capacity gap is no longer anticipated in 2016").
[230] Julia Tucker Direct Testimony at 4, lines 16-19.

[redacted][233].

In addition to the complete lack of need for the project, EKPC's analysis had major red flags that the Company simply ignored. [redacted][234] The only justification that EKPC gave for this arbitrary jump is that one should trust the Wood Mackenzie name. Since the jump post-dates MATS compliance deadlines and does not include a carbon price,[235] there is no rationale for this jump. This is important because until this arbitrary spike occurs, Cooper Unit 1 [redacted].[236] The pre-filed direct testimony of Mr. Comings explained how after correcting this spike the project's 10-year market valuation [redacted] from [redacted] in NPV to [redacted] in NPV, representing [redacted].[237] With this correction the project would not break-even until [redacted].[238]

There were also issues with the capacity forecast. The capacity price forecast overestimated the value of the proposed project, for the 2016-2017 year, as the capacity price forecast was [redacted] then what occurred in the PJM capacity auction.

Ignoring this red flag was especially imprudent given that Cooper Unit 1 production, along with all other EKPC units, has nose-dived since joining PJM. Since PJM integration, EKPC's capacity factor has fallen from approximately 70% in May 2013 to as low as 10% in September 2013.[239] Given how poorly Cooper Unit 1 dispatches compared to other units in the

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[232] *See* PSC 5 Confidential_Proposal Evaluation_Energy Calculated.xls, "Proposals Analysis" tab, "AO_1."
[233] Note that the [redacted]
[234] Tyler Comings Direct Testimony (Nov. 27, 203) at pg. 12.
[235] Shown [redacted]
[236] Tyler Comings Direct Testimony (Nov. 27, 203) at pg. 17.
[237] Tyler Comings Direct Testimony at p. 7.
[238] *Id.*
[239] EKPC Response to Commission Post-Hearing Request 6.

PJM system,[240] EKPC should have probed the validity of the capacity prices, since it so essential to the value of the Proposed Project.

All of the analyses and decisions made by EKPC with respect to this proposed project were based on the underlying assumption that Cooper 1 would have to pay zero dollars to comply with future environmental regulations.[241] EKPC's management never took a careful look at the advantages and disadvantages of making altemative choices to meet the applicable environmental regulations such as retiring and replacing the coal unit with cleaner energy resources. In so doing, there was never any serious consideration of whether replacement of the coal unit was a more economical resource option for ratepayers than spending $16 million on its aging, barely used coal unit. As such, EKPC's analysis does not meet the basic tenets of prudency.

The most glaring of these omissions is EKPC's assumption that it would cost zero dollars to comply with future climate regulations. EKPC's CEO, Mr. Anthony Campbell, presented congressional testimony in which he stated that "'most if not all coal-fired units will be forced to retire as a result of the regulation of GHG emissions."[242] When confronted with his congressional statements and President Obama's directive to the U.S. EPA to finalize regulations addressing greenhouse gas emissions from existing coal-fired power plants by June 2015,[243] prior to the scheduled completion of the proposed project, Mr. Campbell stated that he prays that

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[240] *Id.*

[241] *See* EKPC Response to Environmental Intervenors Supplemental Request 39c (the Company stated, "no additional costs to make Cooper unit 1 compliance with undetermined environmental rules were included.")

[242] *See* Hearing Exhibit SC-5, Congressional Testimony of Mr. Tony Campbell, President and CEO of East Kentucky Power Cooperative to United States House of Representatives' Subcommittee on Energy and Power (Nov. 14, 2013).

[243] *See* Hearing Exhibit SC-6, Memorandum from President Obama to the Administrator of the Environmental Protection Agency (June 25, 2013). President Obama directed the Administrator of the U.S. Environmental Protection Agency to issue proposed carbon pollution regulations for existing coal plants by no later than June 1, 2014 and to finalize those regulations by no later than June 1, 2015.

Congress intervenes and preempts agency regulation.[244] EKPC's Chief Operating Officer is aware that the U.S. EPA is slated to issue carbon regulations that would force the retirement of Cooper 1, according to his congressional testimony, before the proposed project is scheduled to come on line.[245] It is the definition of imprudent to refuse to account for those regulations in the least-cost planning analysis as it could subject EKPC and its ratepayers to an estimated net liability of $85 million[246] for this project and hope does not change that.

Recognizing the potential magnitude of risk associated with future carbon regulation, utilities across the country are beginning to assess carbon regulatory risk, and to evaluate and pursue options for mitigating that risk.[247] Since over 80% of EKPC's generation comes from coal-fired power plants,[248] EKPC and its ratepayers have significant exposure in the event those emissions are regulated or taxed. It is in the best interest of the ratepayers for EKPC to factor that likelihood into it planning and to begin taking cost effective steps now to reduce risk.

A critical aspect of managing carbon regulatory risks is to evaluate options for hedging exposure to those risks. At present, the primary means by which utilities can hedge carbon

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[244] Cross Examination of Anthony Campbell, January 14, 2014 Hearing Tr. at 10:47:00 – 10:54:49.

[245] Cross Examination of Anthony Campbell, January 14, 2014 Hearing Tr. at 10:47:00 – 10:54:49.

[246] *See* Tyler Comings Supplemental Testimony - Confidential Version (Dec. 27, 203) at pg. 10.

[247] In November 2012, the Georgia Public Service Commission approved Georgia Power Advanced Solar Initiative, which is an innovative solar energy purchase program that will contract for 210 MW of solar capacity by the end of 2014, http://www.georgiapower.com/about-energy/energy-sources/solar/asi/advanced-solar-initiative.cshtml; Georgia Power purchases 250 MW of wind energy from EDP Renewables North America's wind farms in southwest Oklahoma, http://www.atlantaprogressivenews.com/interspire/news/2013/04/25/georgia-power-buys-wind-energy-from-oklahoma.html; in September 2013, three utilities filed contracts with the Massachusetts Department of Public Utilities to purchase 565 megawatts of electricity from six wind farms in Maine and New Hampshire, http://www.bostonglobe.com/business/2013/09/22/suddenly-wind-competitive-with-conventional-power-sources/g3RBhfV440kJwC6UyVCjhI/story.html; in January 2014, Kansas City Power & Light announced its plans to buy 400 megawatts of power from two new wind turbine facilities, increasing its wind energy portfolio to 939 megawatts, http://www.kansascity.com/2014/01/07/4735806/kcpl-will-increase-wind-power.html.

[248] *See* Hearing Exhibit SC-1, Letter from Mr. Read of Brattle Group to EKPC, which was exhibit 1a to EKPC's Application for Certificate of Public Convenience and Necessity.

regulatory risks is by focusing future resource development on low-carbon resources, including energy efficiency and renewable energy.

Instead of trying to protect its ratepayers from this exposure, EKPC ran headlong in the other direction. First, EKPC explicitly stated it was arbitrarily[249] not accepting demand response resources through its RFP process.[250] The pre-filed direct and supplemental testimonies of Mr. Loiter explained how if EKPC invested the same amount of money into efficiency as it is projected to spend to run Cooper 1 it would result in greater energy "production."[251] From 2014 through 2017, Cooper Unit 1 would generate a total of about [redacted], but the efficiency that EKPC could acquire for the costs of running Cooper Unit 1 for those four years would be at least 1.4 million MWh over the lifetime of the efficiency measures.[252] It was imprudent of EKPC to arbitrarily exclude demand resources, since exploration of such resources would have shown the Company that it could hedge its exposure to carbon risk while increasing "production" for the same amount of money it would take to pursue the proposed project.

Second, EKPC blindly pursued its self-build proposal, because based on the information known and available to the Company at the time that it made its decision to move forward with the proposed project,[253] there was a projects on the short-list with higher net present values than the proposed self-build project. The [redacted] had a NPV of [redacted][254] This is substantially higher than the [redacted] for the selected self-build option. The decision to forego pursing this option is especially troubling when

[249] When Sierra Club asked EKPC to explain why the RFP was limited to supply-side resources, it simply stated that it "was evaluating the loss of large, central station supply." See EKPC Response to SC 1-58b; see also Jeff Loiter Direct Testimony (Nov. 27, 2013) at 7.

[250] *See* EKPC Response to SC 1-58b; see also Jeff Loiter Direct Testimony (Nov. 27, 2013) at 7.

[251] *See* Jeff Loiter Supplemental Testimony – Confidential Version (Dec.. 27, 2013) at 4.

[252] *See* Jeff Loiter Supplemental Testimony – Confidential Version (Dec.. 27, 2013) at 4.

[253] See discussion supra at footnote 36, which details how at the time EKPC decided not to pursue [redacted] its only NPV analysis consisted of the one [redacted]

[254] *See* hearing Exhibit SC-21; EKPC Response to Staff Second Request 1b.

viewed through the lens of its fundamentally flawed analysis, including the Company's failure to account for future environmental regulations, such as carbon regulation, its belief that it was realistic to see a [redacted] in the energy price market forecast [redacted] its failure to reassess its capacity forecast, which the latest PJM auction shown was [redacted][255]

Environmental Intervenors understand that the cost associated with this proposed project is relatively small compared to other capital projects. But the simple truth is that EKPC failed to meet its burden.[256] EKPC has not shown that there is need or "substantial inadequacy of existing service" as this project is not needed for capacity or as a financial hedge against the energy market.[257] In addition, EKPC has failed to prove that there was not "wasteful duplication" because it did not thoroughly review all altematives since it excluded demand resources and arbitrarily rejected a [redacted] Therefore, the Commission must deny EKPC's request for a CPCN. In addition, the Commission should require that any future CPCN applications filed by EKPC consider demand response as an altemative resource and include environmental compliance costs as part of supporting NPV analysis, so that energy efficiency and renewable energy are evaluated on a level playing field against other resources.

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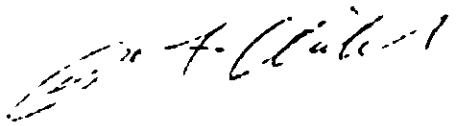
[255] *See* hearing Exhibit SC-21; EKPC Response to Staff Second Request 1b.

[256] *See Energy Regulatory Comm'n v. Kentucky Power Co.*, 605 S.W.2d 46, 50 (Ky. App. 1980) ("Applicants before an administrative agency have the burden of proof.").

[257] *Kentucky Utilities Co. v. Public Service Com'n*, 252 S.W.2d 885, 890 (Ky. 1952); *In the Matter of Application of Kentucky Utilities Co. for Certificates of Public Convenience and Necessity*, KPSC Case No. 2011-00161,Dec. 5, 2011 Order, at pp. 18-19.

[258] *Id.*

Respectfully submitted,



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CERTIFICATE OF SERVICE

I certify that I had filed with the Commission and served via U.S. Mail and electronic mail the Post-Hearing Brief of Sonia McElroy and Sierra Club on February 3, 2014 to the following:

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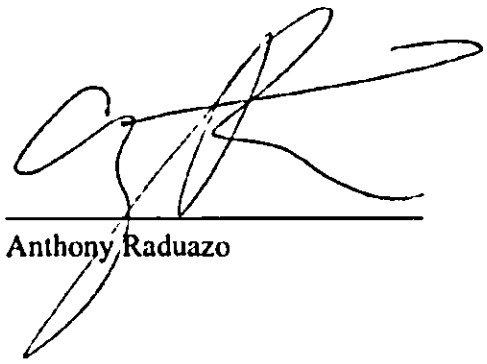

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