COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR A GENERAL ADJUSTMENT IN RATES	)))	**CASE NO. 2011-00036**

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO BIG RIVERS ELECTRIC CORPORATION FIRST DATA REQUEST PSC CASE NO. 2011-00036 June 22, 2011

Request BREC-5

Please refer to the testimony of Mr. Baron, page 6, and beginning at line 1. Mr. Baron states, in part: "[G]iven the unique characteristics of the Smelter customers, it is appropriate to fully eliminate the present rate subsidies received by the Rural rate class."

a. Please state which of the following items fall within the class of "present rate subsidies received by the Rural rate class" that would be "fully eliminated" by the KIUC proposal:
   (1) Base Energy Charges, calculated pursuant to Section 4.2 of the Smelter Agreements, related to Base Fixed Energy under the Smelter Agreements;
   (2) TIER Adjustment Charges calculated pursuant to Section 4.7 of the Smelter Agreements;
   (3) Restructuring Amount calculated pursuant to Section 16.5 of the Smelter Agreements.
   (4) Retail Fee calculated pursuant to Section 4.12 of the Smelter Agreements;
   (5) Surcharge calculated pursuant to Section 4.11 of the Smelter Agreements;
   (6) Taxes calculated pursuant to Section 4.15 of the Smelter Agreements;
   (7) Credits from the Economic Reserve under the Member Rate Stability Mechanism calculated pursuant to Big Rivers' proposed tariff, Original Sheet Nos. 51-53; and
   (8) Credits from the Rural Economic Reserve under the Member Rate Stability Mechanism calculated pursuant to Big Rivers' proposed tariff, Original Sheet Nos. 57-58;
b. Please identify any other items not listed in subparagraph a, above, that fall within the class of "present rate subsidies received by the Rural rate class" that would be eliminated by the KIUC proposal.

RESPONSE:

First, it is important to understand that, while the KIUC methodology begins (i.e., the first step) with the full elimination of present rate subsidies, the KIUC proposal continues to provide millions of dollars of subsidies to Rural customers at proposed rates and continues to require Smelters to pay millions of dollars in subsidies. As shown on Table 4 of Mr. Baron's testimony, the Rural class continues to receive $6 million in subsidies at proposed rates and the Smelters continue to pay $7.7 million in subsidies at proposed rates. As a result, KIUC's proposal reduces, but does not eliminate the subsidies being received by the Rural class.

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Also, in KPSC Case No. 2010-00043, Big Rivers' witness William Blackburn testified on cross-examination on September 15, 2010 that the Smelter rates included many charges that are not based on any cost of service or other cost basis. For example, Mr. Blackburn testifies as follows:

> *Q. Okay. So is it fair to say the $7.2 million subsidy payment, the $4.2 million subsidy payment, the contingent $4.2 million subsidy payment depending on fuel, and the $1.9 million subsidy payment which is the adder onto the Large Industrial rate, would all those additional non-cost payments, is it fair to say that the Smelter rate is not a cost-based?*
>
> *A. The Smelter rate starts with a costs-based rate, and these things are added to it.*

A copy of the transcript is provided on the attached CD. The cited testimony appears on page 4 at lines 7 to 11.

With regard to the calculation of subsidies, Mr. Baron used results of the KIUC 6 CP class cost of service study that reflected Smelter revenues less allocated expenses divided by allocated rate base to determine an earned rate of return and then compared this to the average Big Rivers' rate of return. This is the standard methodology to calculate present rate subsidies and Mr. Baron understands that it was also the method used by Big Rivers' witness Steven Seelye to calculate the $11.1 million in subsidies being received by Rural customers at present rates based on the Big Rivers' class cost of service study (Seelye Direct Testimony at page 18, line 24), except that Mr. Baron did not reduce test year Smelter Tier Adjustment revenues by 50% as was done by Big Rivers.

With specific regard to the impact of the specific items listed in Parts 1 through 8 of this question, Mr. Baron utilized the identical test year Rural, Large Industrial and Smelters revenues presented and used by Mr. Seelye in preparing the Company's class cost of service study and thus in Mr. Seelye's computation of the $11.1 million in Rural subsidies (except for Mr. Baron's elimination of Big Rivers' 50% TIER Adjustment pro-forma adjustment). Thus, to the extent that revenues produced by any of the items in Parts 1 through 8 of this question were included in the Company's test year revenues, Mr. Baron included these same items as well. Also, to the extent that any revenues produced by any of the items in Parts 1 through 8 of this question were excluded from the Company's test year revenues in this case, Mr. Baron excluded these same items as well (notwithstanding Mr. Baron's elimination of Big Rivers TIER Adjustment pro-forma adjustment). With regard to the receipt of credits by Rural customers as a result of the Economic Reserve or the Rural Economic Reserve (Parts 7 and 8 of this question), it is Mr. Baron's

COMMONWEALTH OF KENTUCKY
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understanding that these amounts affect the balance sheet but do not affect test year revenues and thus would not be included in any calculation of test year present rate subsidies.

Witness: Stephen J. Baron

KPSC Case No. 2010-00043, Hearing dated September 15, 2010

Start timestamp: 11:32:51

Q. Good Morning Mr. Blackburn.

A. Morning.

Q. I'd like to ask you some questions about your testimony on the Stipulation and the Stipulation and follow-up from a few of the questions Mr. Raff asked also. This is simple. But let me just ... it is fair to say that in Big Rivers' opinion MISO is making the best of a bad situation in the sense that even though it is more expensive than status quo, it is the least-cost way to comply with these federal laws.

A. Yes sir, it is legally the least-cost way.

Q. Does Big Rivers have any motive ... or is there any reason why you and your Members, the three distribution co-ops that own Big Rivers would seek anything other than the last cost method of compliance?

A. No sir.

Q. KIUC filed testimony in this case, do you recall?

A. Yes sir.

Q. Did KIUC ever challenge MISO as being the least-cost?

A. Yes sir.

Q. We did?

A. I believe that you raised some questions early on about the cost of MISO.

Q. Would it be fair to characterize Mr. Morey's testimony, Dr. Morey that MISO is the least-cost option even though it is more expensive than what Big Rivers had portrayed.

A. Yes sir.

Q. Okay. So KIUC did not challenge MISO, did not challenge Big Rivers joining MISO?

A. That is correct, just the cost.

Q. Yeah. Our testimony shows that it was, even though it was costly, it was the least-cost.

A. Yes sir, that is correct.

Q. So, because KIUC did not challenge Big Rivers joining MISO in our testimony, was the Stipulation in any way a quid pro quo for KIUC's agreement that we would not oppose MISO since in fact we never challenged MISO?

A. That is correct, you never challenged MISO and you agreed in the Stipulation agreement that it was the least-cost option and Big Rivers should submit the Stipulation and seek transfer of the function and control of our transmission system.

Q. Now the only action from the Commission you are seeking is essentially approval of Big Rivers to join MISO.

A. That is correct.

Q. The other elements in the Stipulation are essentially agreements between Big Rivers and the Smelters and KIUC as to what will happen, what will happen in the future in terms of asking the Commission for an amendment to the contract, asking the Commission to approves these demand-response programs. But none of those are seeking a Commission order right now?

A. That is correct.

Q. Now, would Big Rivers have made those commitments to modify the contract? Do you feel on a stand-alone basis that it is reasonable to modify the Smelter contracts in the way that is laid out in the Stipulation even if ... do you think it's reasonable on its own merit?

A. I would like to ask you to rephrase the question ... on a stand-alone basis not being in MISO?

Q. No, no no. The contract amendment to remove MTEP, the transmission expansion costs from the TIER adjustment, do you feel that's reasonable on its own?

A. Yes sir.

Q. So, you did not do that as a quid pro quo for KIUC agreeing not to oppose MISO, because we never opposed MISO.

A. That is correct, we did not.

Q. Let me ask you about the grandfathering. Is it true that Big Rivers and its Members agree that the MISO transmission expansion, the MTEP, the multi-value projects, these big ticket items for transmission expansion ... Big Rivers and its Members believe that's a system cost?

A. Yes sir.

Q. The GFA status that was granted by FERC that can be terminated by FERC at some point in the future?

A. Yes sir.

Q. Do you know how Dairyland and the other co-ops have had their native load treated in terms of GFA status?

A. I know that there were instances in which grandfathered agreements were not, agreements were not grandfathered.

Q. Okay. Let me ask you about the smelters rates and cost of service. The Smelters in the contracts that were negotiated and approved by the Commission in the Unwind, the Smelters have agreed to pay certain subsidy payments to the other customer classes, the Rural and the Large Industrial.

A. There are some additional payments that are made, that's correct.

Q. The first is $/mWh on average over the life of the contract?

A. Yes.

Q. That is $7.3 million per year?

A. Yes.

Q. Is there any cost basis for that $7.3 million added charge that the Smelters are paying?

A. No sir.

Q. I'm sorry.

A. No.

Q. The additional subsidy payments that the Smelters have agreed to pay are 0.60¢/mWh charge.

A. Yes sir.

Q. Okay. What is that on an annual basis, 7.3 x .6?

A. $4.4 million.

Q. Okay. $4.4 million of additional ... is there any cost justification for that charge that the Commission approved?

A. It was a negotiated number.

Q. Okay, but there is no cost basis for it is there?

A. No.

Q. And there is another $4.2 million contingent subsidy payment that the Smelters would be responsible for depending of fuel prices?

A. Yes sir.

Q. Okay. So that would be $4.2 plus $4.2 plus $7.3 million of total potential Smelter subsidy payments?

A. Yes sir.

Q. And those are not cost-based?

A. They were negotiated numbers, that is correct.

Q. Plus the Smelters have agreed to pay the Large Industrial tariff rate plus .25¢/mWh, is that right?

A. That is correct.

Q. And that is an additional ... how many millions of dollars is that?

A. That would be a quarter or fourth of $7.3, just give me a moment, $1.9, close to $2 million.

Q. Almost $2 million of additional subsidy payment.

A. Uh huh.

Q. Is there any cost basis for that payment?

A. No, it was a negotiated number as well.

Q. Okay. So is it fair to say with the $7.2 million subsidy payment, the $4.2 million subsidy payment, the contingent $4.2 million subsidy payment depending on fuel, and the $1.9 subsidy payment which is the adder onto the Large Industrial rate, would all those additional non-cost payments, is it fair to say that the Smelter rate is not a cost-based?

A. The Smelter rate starts with a costs-based rate, and these things are added to it.

Q. So when Mr. Raff was asking you questions about the GFA and the allocation of the Smelter load and asked if the Smelters caused this cost, there were other aspects of the smelter contracts that are clearly not cost-based, would that be fair?

A. Yes that is fair.

Q. In fact the Smelters pay the highest generation and transmission rate of any customers on the system, isn't that right?

A. Adjusted for load factor, that is correct.

Q. And when we speak of rural customers, that is basically all of your customers except for your large ... 16 or 18 largest industrials plus the two Smelters?

A. The rural system is the commercial and residential load, it does not include the direct serves off of the Big Rivers' transmission system, that is correct.

Q. That's the 16 or 18 largest industrials?

A. Yes.

Q. So rural means residential, farm, grocery store, pharmacy, small industrial, Wal-Mart, Burger King, it means everybody else?

A. Yes sir.

Q. If Big Rivers wanted to allocated the MTEP costs the transmission expansion costs directly to the Smelters because the Smelters were not grandfathered, could you do that through base rates? Considering that the Smelter base rate is the large industrial base rate plus .25¢/mWh?

A. I would like to ask you to restate your questions, please.

Q. Suppose it was your goal to allocate the MTEP costs directly to the Smelters because the Smelters were not grandfathered, could you do that through base rates considering the Smelter base rate is the Large Industrial rate plus this almost $2 million subsidy payment.

A. The way the contracts are currently structured, we cannot allocate that to the Smelters through base rates.

Q. Okay. Would there be any way to directly allocated to the Smelters through the fuel adjustment clause?

A. No sir.

Q. Would there be any way to allocate directly to the Smelters through the purchase power adjustment?

A. No there would not.

Q. Which would bring us to the TIER Adjustment?

A. Correct.

Q. Okay. What is the TIER Adjustment charge that was part of the Unwind that the Commission approved?

A. Sure. The TIER adjustment mechanism was placed into the contracts, basically the Smelter agreements say that the TIER adjustment will support Big Rivers' obtaining a TIER of 1.24 and within a bandwidth ... currently it's up to a dollar, I think it is $1.95/mWh now, Big Rivers may charge an additional amount to the aluminum Smelters up to that ceiling amount in order to obtain a TIER of 1.24. If are above a TIER of 1.24, then Big Rivers would reduce the charge of the TIER amount significantly down so that our TIER would be the 1.24. If there were a circumstance in which Big Rivers TIER was still above 1.24 and we had taken the mechanism, the TIER Adjustment down to zero, then there could be a refund across the entire system so that Big Rivers would achieve a TIER of 1.24.

Q. So is it fair to say that this $1.95/mWh or about $14 million in the first several years, then the TIER Adjustment goes up to $2.95/mWh?

A. That is the next step, that's correct.

Q. And that is a charge that only the Smelters pay?

A. That is correct.

Q. And that is a charge that is intended to not guarantee, but to help ensure that Big Rivers will meet its TIER for debt service, credit rating and other purposes?

A. It is not a guaranty, but it does support that, that's correct.

Q. In fact, you are at the top of the TIER Adjustment today and you're still not earning the desired TIER?

A. That is correct. We are at the top of the adjustment and we are not at 1.24.

Q. The Stipulation says that Big Rivers and the Smelters will ask the Commission sometime in the near future to modify the contracts to exclude the MTEP the transmission expansion from the TIER Adjustment?

A. Yes, that is correct.

Q. And all were saying is we will ask the Commission and the Commission will decide?

A. That is correct.

Q. Okay. If MTEP was in the TIER Adjustment today, it would not be collected from the Smelters because you are at the top of the TIER Adjustment?

A. That's right.

Q. This does not ... the contract amendment that Big Rivers and the Smelters have agreed to would not deny Big Rivers the ability to recovery MTEP costs would it? Would it not just make it, make it necessary for you to file rate cases to recover those costs?

A. Correct. We have not excluded any of Big Rivers' options that's available to Big Rivers to recover the cost.

Q. And, if MTEP is excluded from the TIER Adjustment, that opens up the TIER Adjustment to help support Big Rivers credit in all the other ways?

A. That is correct.

Q. And if you used the TIER Adjustment to recover MTEP costs, whatever they may be, and it would just tend to reach you to the top of the TIER Adjustment quicker than you would otherwise get all else equal, and therefore deny you the ability to recover other costs from the TIER Adjustment?

A. That is correct.

Q. Was MISO ... Big Rivers joining MISO something that was known during the time of the contract negotiations?

A. During the time of the contract negotiations? I am assuming you are referring to the negotiations that lead up to the Unwind?

Q. Yes.

A. transaction ... No, I think Mr. Bailey has addressed that earlier on when Big Rivers became aware and he became aware.

Q. So there would have been no way for Big Rivers and the Smelters to negotiate about how MTEP would be treated in the TIER Adjustment during the negotiation because MISO was an unknown event at that time?

A. It was an unknown event at that time.

Q. If Big Rivers wanted to help control MTEP and reduce its affect as a system cost, would one of the options be for Big Rivers to intervene at FERC or file Comments with MISO or be involved in the MISO Stakeholder process?

A. Yes sir.

Q. Would it be helpful, do you think, to help control the MTEP system costs for the Large Industrial customers to be supportive of Big Rivers' position?

A. I am sure. Yes sir.

Q. What about the Attorney General?

A. Sure.

Q. What about the Commission actually supporting Big Rivers' position ... so reduce the MTEP system costs like other commissions have weighed in at FERC?

A. I am sure the Commission is as interested in helping Big Rivers control our costs as they can be.

Q. Would that be something you would consider in the future as sort of a Kentucky coalition to help make sure that the costs allocated to Big Rivers are reasonable from a Kentucky prospective?

A. It sounds very good Mr. Kurtz, but I am not in a position to make policy for Big Rivers and what it would choose to do.

Q. Let me ask you finally about the demand response. The way the Stipulation is drafted is Big Rivers will only agree to work with the Smelters and the Large Industrials on demand response provided it ... Big Rivers is economically neutral, maybe that is not the exact words, but isn't that the basic?

A. Big Rivers has not harmed or its member _____

Q. Okay. And so this would only be something that would be done if the Smelters or Large Industrial customer felt it was advantageous to cut their production, shift their manufacturing to take advantage of market pricing that MISO offers, it would help them, but not hurt Big Rivers, that's the intent of it?

A. The intent is for it not to harm Big Rivers and its Members.

Q. And the Industrial Customers would only do it if it was a benefit to them?

A. That's correct.

Q. So from a net economic point of view, from a Kentucky point of view, if Big Rivers is not hurt, and the Large Industrials were helped, that would be a good thing, wouldn't it?

A. Yes sir.

Q. And if Big Rivers were to be harmed by this, then you don't have ... the Commission wouldn't approve it and Big Rivers would not do it?

A. That is correct, we would not do it.

Q. Thank you Mr. Chairman, that you Mr. Blackburn.

End timestamp: 11:49:28

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR A GENERAL ADJUSTMENT IN RATES	)))	**CASE NO. 2011-00036**

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO BIG RIVERS ELECTRIC CORPORATION FIRST DATA REQUEST PSC CASE NO. 2011-00036 June 22, 2011

Request BREC-6
Please refer to the testimony of Mr. Baron, page 31, Table 3. Please confirm that absent use of the Rural Economic Reserve and the patronage rotation, KIUC is proposing a 16.67% Rural class rate increase, a 0.08% Large Industrial class rate increase, and a 0.08% Smelter class rate increase.

RESPONSE:

Yes, these are correct calculations.

Witness: Stephen J. Baron

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC	)	
CORPORATION FOR A GENERAL	)	**CASE NO. 2011-00036**
ADJUSTMENT IN RATES	)	

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO
BIG RIVERS ELECTRIC CORPORATION
FIRST DATA REQUEST
PSC CASE NO. 2011-00036
June 22, 2011

Request BREC – 7
Please provide electronic copies of Schedules 1, 4, 6, 7, 8, 9 and 10 of Exhibit CWK-1 to the direct testimony of Mr. King, with cells and formulas intact, along with all computer models, workpapers and other documents that support these schedules. If the model(s) employed by Mr. King is proprietary, please provide all data and files necessary to recreate Mr. King's calculations.

RESPONSE:

See attached on enclosed CD.

Witness: Charles W. King

Big Rivers Electric Corporaton

Annual Depreciation Expense Based on April 30, 2010 Plant in Service

Account	Description	April 30, 2010 Plant Balance	Recommended Depreciation Rate	Annual Depreciation Expense		
				KIUC Recommended	Existing BREC Rates	Proposed BREC Rates
		(1)	(2)	(3)	(4)	(5)
340	Land	475,968				
311	Structures	124,375,974	1.17%	1,456,976	2,126,829	1,717,828
312	Boiler Plant	667,206,536	1.54%	10,248,087	11,942,997	12,543,396
312 A-K	Boiler Plant - Env Compl	574,184,346	1.95%	11,206,160	10,852,084	13,074,185
312 L-P	Short-Life Production Plant -Environmental	3,208,938	19.31%	619,761	60,649	648,949
312 V-Z	Short-Life Production Plant -Other	868,755	19.31%	167,788	16,419	125,054
314	Turbine	225,272,354	1.54%	3,459,508	3,739,521	4,309,293
315	Electric Eqpt	60,355,721	1.08%	654,448	965,692	1,202,952
316	Misc Eqpt	3,014,912	3.77%	113,706	55,173	113,919
341	CT - Structures	154,233	1.17%	1,804	3,563	1,804
342	CT - Fuel Holders & Access.	1,436,912	9.10%	130,751	33,336	130,751
343	CT - Prime Movers	4,915,886	3.02%	148,408	121,422	148,408
344	CT - Generators	1,102,964	0.50%	5,511	24,596	5,511
345	CT - Access. Elec. Eqpt.	317,726	2.05%	6,510	7,085	6,510
	Subtotal	1,666,891,222		28,219,418	29,949,367	34,028,559
Difference from KUIC Recommendation					**(1,729,949)**	**(5,809,141)**

Sources
(1) AG 1-104 - "Deprec Summary 2010-12-16 FINAL.xls"
(2) Schedule 10
(3) Col (1)*Col (2)
(4) & (5) AG 1-104 - "Deprec Summary 2010-12-16 FINAL.xls"

Big Rivers Electric Corporations
Burns & McDonnell Life Span Estimates

Unit	Installation Date	Estimated Retirement Date	Average Service Life	Study Date	Estimated Remaining Unit Life
(1)	(2)	(3)	(4)	(5)	(6)
Coleman 1	1969	2035	66	2010	25
Coleman 2	1970	2035	65	2010	25
Colemen 3	1972	2035	63	2010	25
Green 1	1979	2042	63	2010	32
Green 2	1981	2042	61	2010	32
HMP&L 1	1973	2035	62	2010	25
HMP&L 2	1974	2035	61	2010	25
Reid 1	1966	2036	70	2010	26
Wilson 1	1986	2051	65	2010	41

Source:
(2) & (3) Response to Item KIUC 1-7
(4)=(3)-(3)
(6)=(3)-(5)

Big Rivers Electric Corporation
Development of Account Composite Remaining Life Spans

Account	Orignial Cost 4/30/2010	Remaining Life Span	Life Years
311 - Structures			
Reid	3,181,843	26	82,727,917
Coleman	18,937,203	25	473,430,085
Green	26,723,028	32	855,136,902
Wilson	73,000,144	41	2,993,005,918
HMPL	421,179	25	10,529,475
Reid/HMPL Shared	553,336	26	14,386,739
Reid/Gree/HMPL Shared	933,221	32	29,863,082
Central Machine Shop Green	693,610	32	22,195,513
	124,443,565	36.01	4,481,275,631
312 - Boiler Plant			
Central lab	29,686	59	1,741,602
Reid	7,218,409	26	187,678,638
Coleman	74,518,359	25	1,862,958,983
Green	161,734,476	32	5,175,503,237
Wilson	407,220,726	41	16,696,049,769
HMPL	16,483,318	25	412,082,957
Reid/HMPL Shared	2,504,162	26	65,108,206
Reid/Gree/HMPL Shared	366,885	32	11,740,324
Barges	1,186,253	59	69,593,495
	671,262,275	36.47	24,480,715,609
312 -Boiler Plant - Env Compl			
Env - Central Lab	220,241	58	12,778,004
Env - Reid	5,046,851	26	131,218,129
Env - Coleman	121,851,087	25	3,046,277,173
Env - Green	114,693,688	32	3,670,198,026
Env - Wilson	262,004,068	41	10,742,166,803
Env - HMPL - SCR	35,338,718	25	883,467,949
Env - Reid/HMPL Shared	1,899,173	26	49,378,491
Env - Green/HMPL Shared	15,438	32	494,025
Env - HMPL - SCR	36,983,181	26	961,562,702
	578,052,445	33.71	19,484,763,297
314 - Turbine			
Reid	4,310,531	26	112,073,795
Coleman	32,415,575	25	810,389,371
Green	57,679,599	32	1,845,747,175
Wilson	126,942,316	41	5,204,634,936
HMPL	4,509,416	25	112,735,388
Reid/HMPL Shared	226,351	26	5,885,137
Reid/Gree/HMPL Shared	18,495	32	591,845
	226,102,282	35.79	8,092,057,647
315 - Electric Equipment			
Reid	1,494,659	26	38,861,126
Coleman	7,557,766	25	188,944,154
Green	16,091,240	32	514,919,671
Wilson	35,017,398	41	1,435,713,333
HMPL	171,384	25	4,284,607
Central Machine Shop Green	43,548	32	1,393,538
	60,375,995	36.18	2,184,116,429
316 - Misc. Equipment			
Central lab	56,008	41	2,296,331
Reid	1,227	26	31,904
Coleman	755,850	25	18,896,241
Green	779,448	32	24,942,331
Wilson	666,432	41	27,323,714
HMPL	328,836	25	8,220,905
Reid/HMPL Shared	296,710	26	7,714,458
Reid/Gree/HMPL Shared	38,962	32	1,246,782
Central Machine Shop Green	107,700	32	3,446,394
	3,031,173	30.29	91,822,730
Reid Combustion Turbine			
340 Land	475,968		-
341 Structures	154,233	21.32	3,288,195
342 Fuel Holders & Access.	1,436,912	21.48	30,869,902
343 Prime Mover	4,915,886	21.30	104,728,841
344 Generators	1,102,964	21.50	23,713,719
345 Access Elec. Equipment	317,726	21.24	6,749,434
	7,927,719	21.36	169,350,091

Big Rivers Electric Corporation
Interim Life Table

311 Structures & Improvements

Remaining Life Year	Surviving Plant	Interim Retirements @.00066	Life Years	Remaining Life
1	124,443,565	82,133	41,066	
2	124,361,432	82,079	123,118	
3	124,279,354	82,024	205,061	
4	124,197,329	81,970	286,896	
5	124,115,359	81,916	368,623	
6	124,033,443	81,862	450,241	
7	123,951,581	81,808	531,752	
8	123,869,773	81,754	613,155	
9	123,788,019	81,700	694,451	
10	123,706,319	81,646	775,639	
11	123,624,673	81,592	856,719	
12	123,543,080	81,538	937,692	
13	123,461,542	81,485	1,018,558	
14	123,380,057	81,431	1,099,316	
15	123,298,626	81,377	1,179,968	
16	123,217,249	81,323	1,260,512	
17	123,135,926	81,270	1,340,950	
18	123,054,656	81,216	1,421,281	
19	122,973,440	81,162	1,501,506	
20	122,892,278	81,109	1,581,624	
21	122,811,169	81,055	1,661,635	
22	122,730,113	81,002	1,741,540	
23	122,649,112	80,948	1,821,339	
24	122,568,163	80,895	1,901,032	
25	122,487,268	80,842	1,980,619	
26	122,406,427	80,788	2,060,100	
27	122,325,638	80,735	2,139,475	
28	122,244,903	80,682	2,218,745	
29	122,164,222	80,628	2,297,909	
30	122,083,593	80,575	2,376,968	
31	122,003,018	80,522	2,455,921	
32	121,922,496	80,469	2,534,769	
33	121,842,027	80,416	2,613,511	
34	121,761,612	80,363	2,692,149	
35	121,681,249	80,310	2,770,682	
36.01	121,600,939		4,378,911,242	
			4,428,465,766	35.59

Big Rivers Electric Corporation
Interim Life Table

312 Boiler Plant

Remaining Life Year	Surviving Plant	Interim Retirements @.00308	Life Years	Remaining Life
1	671,262,275	2,067,488	1,033,744	
2	669,194,787	2,061,120	3,091,680	
3	667,133,667	2,054,772	5,136,929	
4	665,078,896	2,048,443	7,169,550	
5	663,030,453	2,042,134	9,189,602	
6	660,988,319	2,035,844	11,197,142	
7	658,952,475	2,029,574	13,192,229	
8	656,922,901	2,023,323	15,174,919	
9	654,899,579	2,017,091	17,145,271	
10	652,882,488	2,010,878	19,103,342	
11	650,871,610	2,004,685	21,049,188	
12	648,866,925	1,998,510	22,982,866	
13	646,868,415	1,992,355	24,904,434	
14	644,876,060	1,986,218	26,813,947	
15	642,889,842	1,980,101	28,711,460	
16	640,909,741	1,974,002	30,597,031	
17	638,935,739	1,967,922	32,470,714	
18	636,967,817	1,961,861	34,332,565	
19	635,005,957	1,955,818	36,182,639	
20	633,050,138	1,949,794	38,020,991	
21	631,100,344	1,943,789	39,847,676	
22	629,156,555	1,937,802	41,662,747	
23	627,218,752	1,931,834	43,466,260	
24	625,286,919	1,925,884	45,258,267	
25	623,361,035	1,919,952	47,038,824	
26	621,441,083	1,914,039	48,807,983	
27	619,527,044	1,908,143	50,565,797	
28	617,618,901	1,902,266	52,312,321	
29	615,716,635	1,896,407	54,047,606	
30	613,820,228	1,890,566	55,771,706	
31	611,929,661	1,884,743	57,484,672	
32	610,044,918	1,878,938	59,186,558	
33	608,165,980	1,873,151	60,877,415	
34	606,292,829	1,867,382	62,557,294	
35	604,425,447	1,861,630	64,226,248	
36	602,563,816	773,909	27,473,765	
36.47	601,789,907		21,947,277,922	
			23,155,363,304	34.50

Big Rivers Electric Corporation
Interim Life Table

312 A-K Boiler Plant Equipment - Environmental

Remaining Life Year	Surviving Plant	Interim Retirements @.00158	Life Years	Remaining Life
1	578,052,445	913,323	456,661	
2	577,139,122	911,880	1,367,820	
3	576,227,242	910,439	2,276,098	
4	575,316,803	909,001	3,181,502	
5	574,407,803	907,564	4,084,039	
6	573,500,238	906,130	4,983,717	
7	572,594,108	904,699	5,880,541	
8	571,689,409	903,269	6,774,520	
9	570,786,140	901,842	7,665,658	
10	569,884,298	900,417	8,553,963	
11	568,983,881	898,995	9,439,443	
12	568,084,886	897,574	10,322,102	
13	567,187,312	896,156	11,201,949	
14	566,291,156	894,740	12,078,990	
15	565,396,416	893,326	12,953,232	
16	564,503,090	891,915	13,824,681	
17	563,611,175	890,506	14,693,343	
18	562,720,669	889,099	15,559,227	
19	561,831,571	887,694	16,422,337	
20	560,943,877	886,291	17,282,681	
21	560,057,585	884,891	18,140,265	
22	559,172,694	883,493	18,995,096	
23	558,289,202	882,097	19,847,181	
24	557,407,105	880,703	20,696,526	
25	556,526,401	879,312	21,543,137	
26	555,647,090	877,922	22,387,021	
27	554,769,167	876,535	23,228,185	
28	553,892,632	875,150	24,066,635	
29	553,017,482	873,768	24,902,377	
30	552,143,714	872,387	25,735,419	
31	551,271,327	871,009	26,565,765	
32	550,400,318	869,633	27,393,424	
33	549,530,686	334,280	10,864,084	
33.77	549,196,406		18,546,362,640	
			19,009,730,260	32.89

Big Rivers Electric Corporation
Interim Life Table

314 Turbines

Remaining Life Year	Surviving Plant	Interim Retirements @.00226	Life Years	Remaining Life
1	225,272,354	509,116	254,558	
2	224,763,238	507,965	761,947	
3	224,255,273	506,817	1,267,042	
4	223,748,457	505,672	1,769,850	
5	223,242,785	504,529	2,270,379	
6	222,738,256	503,388	2,768,637	
7	222,234,868	502,251	3,264,630	
8	221,732,617	501,116	3,758,368	
9	221,231,501	499,983	4,249,857	
10	220,731,518	498,853	4,739,106	
11	220,232,665	497,726	5,226,121	
12	219,734,939	496,601	5,710,911	
13	219,238,338	495,479	6,193,483	
14	218,742,860	494,359	6,673,845	
15	218,248,501	493,242	7,152,003	
16	217,755,259	492,127	7,627,967	
17	217,263,132	491,015	8,101,742	
18	216,772,117	489,905	8,573,337	
19	216,282,212	488,798	9,042,759	
20	215,793,415	487,693	9,510,016	
21	215,305,722	486,591	9,975,114	
22	214,819,131	485,491	10,438,062	
23	214,333,639	484,394	10,898,866	
24	213,849,245	483,299	11,357,533	
25	213,365,946	482,207	11,814,072	
26	212,883,739	481,117	12,268,490	
27	212,402,622	480,030	12,720,793	
28	211,922,592	478,945	13,170,989	
29	211,443,647	477,863	13,619,085	
30	210,965,784	476,783	14,065,089	
31	210,489,002	475,705	14,509,007	
32	210,013,296	474,630	14,950,847	
33	209,538,666	473,557	15,390,615	
34	209,065,109	472,487	15,828,319	
35	208,592,622	186,211	6,517,372	
35.79	208,406,411		7,458,733,615	
			7,745,174,427	34.38

Big Rivers Electric Corporation
Interim Life Table

315 Electric Equipment

Remaining Life Year	Surviving Plant	Interim Retirements @.00112	Life Years	Remaining Life
1	60,355,721	67,598	33,799	
2	60,288,122	67,523	101,284	
3	60,220,600	67,447	168,618	
4	60,153,152	67,372	235,800	
5	60,085,781	67,296	302,832	
6	60,018,485	67,221	369,714	
7	59,951,264	67,145	436,445	
8	59,884,119	67,070	503,027	
9	59,817,049	66,995	569,458	
10	59,750,053	66,920	635,741	
11	59,683,133	66,845	701,874	
12	59,616,288	66,770	767,858	
13	59,549,518	66,695	833,693	
14	59,482,823	66,621	899,380	
15	59,416,202	66,546	964,919	
16	59,349,656	66,472	1,030,310	
17	59,283,184	66,397	1,095,553	
18	59,216,787	66,323	1,160,649	
19	59,150,464	66,249	1,225,598	
20	59,084,216	66,174	1,290,399	
21	59,018,041	66,100	1,355,054	
22	58,951,941	66,026	1,419,563	
23	58,885,915	65,952	1,483,925	
24	58,819,963	65,878	1,548,141	
25	58,754,084	65,805	1,612,212	
26	58,688,280	65,731	1,676,137	
27	58,622,549	65,657	1,739,917	
28	58,556,892	65,584	1,803,552	
29	58,491,308	65,510	1,867,043	
30	58,425,798	65,437	1,930,388	
31	58,360,361	65,364	1,993,590	
32	58,294,997	65,290	2,056,647	
33	58,229,707	65,217	2,119,561	
34	58,164,489	65,144	2,182,332	
35	58,099,345	65,071	2,244,959	
36	58,034,274	5,850	210,595	
36.18	58,034,274		2,099,404,085	
			2,139,974,653	35.46

Big Rivers Electric Corporation
Development of KIUC Recommended Depreciation Rates

Account	Net Salvage Factor	Original Cost 4/30/2010	Accumulated Depreciation	Total To Be Accrued	Remaining Life	Annual Accrual	Rate
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
311 - Structures	-4.50%	124,375,974	78,124,758	51,848,135	35.59	1,456,976	1.17%
312 - Boiler Plant	-5.03%	667,206,536	347,237,018	353,510,387	34.50	10,248,087	1.54%
							868754.5
312 -Boiler Plant - Env Compl	-1.96%	574,184,346	216,926,144	368,523,800	32.89	11,206,160	1.95%
							868754.5
312 Short-lived Boiler Plant	0.00%	4,077,693	376,213	3,701,480	4.70	787,549	19.31%
314 - Turbine	-8.17%	225,272,354	124,744,924	118,942,644	34.38	3,459,508	1.54%
315 - Electric Equipment	2.98%	60,355,721	35,350,377	23,204,131	35.46	654,448	1.08%
316 - Misc. Equipment	0.55%	3,014,912	42,128	2,956,346	26.00	113,706	3.77%
Reid Combustion Turbine							
340 Land		475,968					
341 Structures	0.0%	154,233	115,766	38,467	21.32	1,804	1.17%
342 Fuel Holders & Access.	-134.8%	1,436,912	564,590	2,808,983	21.48	130,751	9.10%
343 Prime Mover	-38.3%	4,915,886	3,637,977	3,161,718	21.30	148,408	3.02%
344 Generators	0.0%	1,102,964	984,479	118,484	21.50	5,511	0.50%
345 Access Elec. Equipment	0.0%	317,726	179,425	138,301	21.24	6,510	2.05%
		7,455,761	5,482,337	6,265,953		293,985	

Sources:
(1) Table ES-1
(2) Response to Item KIUC 1-4, "Active Property Records.xls" and AG 1-104 - "Depree Summary 2010-12-16 FINAL.xls"
(3) Response to Item KIUC 1-4, "Acct 1089 Accum Depr by RUS Account at 04-30-10.xls"
(4) ((2)-(3)) - ((1)x(2))
(5) Schedules 4-8
(6) (4)/(5)
(7) (6)/(1)

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC	)	
CORPORATION FOR A GENERAL	)	**CASE NO. 2011-00036**
ADJUSTMENT IN RATES	)	

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO
BIG RIVERS ELECTRIC CORPORATION
FIRST DATA REQUEST
PSC CASE NO. 2011-00036
June 22, 2011

Request BREC - 8
Please refer to the testimony of Mr. King beginning at page 8 line 16. Does Mr. King agree that the version of the Burns & McDonnell Depreciation Study used by him in his testimony is not the final version of the Burns & McDonnell Depreciation Study, which was filed by Big Rivers on April 15, 2011, in response to KIUC 1-33, on CD 1 of 5? If your response is "yes,' please update your testimony to reflect the information contained in that final version of the Burns & McDonnell Depreciation Study. If your response is "no," please explain.

RESPONSE:

The references to Table II-2 on lines 22-26 on page 8 of Mr. King's testimony were to the version of the depreciation study that was filed with Mr. Kelly's testimony on March 1, 2011. In the April 15 version that table has been renumbered to Table II-3, and the remaining lives on that revised table match those contained in the text beginning at page II-4 of the report.

Witness: Charles W. King

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR A GENERAL ADJUSTMENT IN RATES	)))	**CASE NO. 2011-00036**

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO BIG RIVERS ELECTRIC CORPORATION FIRST DATA REQUEST PSC CASE NO. 2011-00036 June 22, 2011

Request BREC - 9

Referring to Schedule 1 of Exhibit CWK-1 to the direct testimony of Mr. King, please explain why the subtotal for April 30, 2010 Plant Balance does not match the subtotal for Big Rivers April 30, 2010 production plant balance reflected in the spreadsheet entitled "Deprec Summary 2010-12-16 FINAL.xls" provided by Big Rivers in response to AG 1-104.

RESPONSE:

It appears that an earlier version of Exhibit_____(CWK-1) was filed, one that had incorrect totals for the respective CT accounts. The enclosed CD contains the correct version that should have been filed on May 24. This version was used by the other KIUC witnesses to derive depreciation expense

Witness: Charles W. King

Big Rivers Electric Corporaton

Annual Depreciation Expense Based on April 30, 2010 Plant in Service

Account	Description	April 30, 2010 Plant Balance	Recommended Depreciation Rate	Annual Depreciation Expense		
				KIUC Recommended	Existing BREC Rates	Proposed BREC Rates
		(1)	(2)	(3)	(4)	(5)
340	Land	475,968				
311	Structures	124,375,974	1.17%	1,456,976	2,126,829	1,717,828
312	Boiler Plant	667,206,536	1.54%	10,248,087	11,942,997	12,543,396
312 A-K	Boiler Plant - Env Compl	574,184,346	1.95%	11,206,160	10,852,084	13,074,185
312 L-P	Short-Life Production Plant -Environmental	3,208,938	19.31%	619,761	60,649	648,949
312 V-Z	Short-Life Production Plant -Other	868,755	19.31%	167,788	16,419	125,054
314	Turbine	225,272,354	1.54%	3,459,508	3,739,521	4,309,293
315	Electric Eqpt	60,355,721	1.08%	654,448	965,692	1,202,952
316	Misc Eqpt	3,014,912	3.77%	113,706	55,173	113,919
341	CT - Structures	154,233	1.17%	1,804	3,563	1,804
342	CT - Fuel Holders & Access.	1,436,912	9.10%	130,751	33,336	130,751
343	CT - Prime Movers	4,915,886	3.02%	148,408	121,422	148,408
344	CT - Generators	1,102,964	0.50%	5,511	24,596	5,511
345	CT - Access. Elec. Eqpt.	317,726	2.05%	6,510	7,085	6,510
	Subtotal	1,666,891,222		28,219,418	29,949,367	34,028,559
Difference from KUIC Recommendation					**(1,729,949)**	**(5,809,141)**

Sources
(1) AG 1-104 - "Deprec Summary 2010-12-16 FINAL.xls"
(2) Schedule 10
(3) Col (1)*Col (2)
(4) & (5) AG 1-104 - "Deprec Summary 2010-12-16 FINAL.xls"

Big Rivers Electric Corporations
Burns & McDonnell Life Span Estimates

Unit	Installation Date	Estimated Retirement Date	Average Service Life	Study Date	Estimated Remaining Unit Life
(1)	(2)	(3)	(4)	(5)	(6)
Coleman 1	1969	2035	66	2010	25
Coleman 2	1970	2035	65	2010	25
Colemen 3	1972	2035	63	2010	25
Green 1	1979	2042	63	2010	32
Green 2	1981	2042	61	2010	32
HMP&L 1	1973	2035	62	2010	25
HMP&L 2	1974	2035	61	2010	25
Reid 1	1966	2036	70	2010	26
Wilson 1	1986	2051	65	2010	41

Source:
(2) & (3) Response to Item KIUC 1-7
(4)=(3)-(3)
(6)=(3)-(5)

Big Rivers Electric Corporation
Development of Account Composite Remaining Life Spans

Account	Orignial Cost 4/30/2010	Remaining Life Span	Life Years
311 - Structures			
Reid	3,181,843	26	82,727,917
Coleman	18,937,203	25	473,430,085
Green	26,723,028	32	855,136,902
Wilson	73,000,144	41	2,993,005,918
HMPL	421,179	25	10,529,475
Reid/HMPL Shared	553,336	26	14,386,739
Reid/Gree/HMPL Shared	933,221	32	29,863,082
Central Machine Shop Green	693,610	32	22,195,513
			-
	124,443,565	36.01	4,481,275,631
			-
312 - Boiler Plant			-
Central lab	29,686	59	1,741,602
Reid	7,218,409	26	187,678,638
Coleman	74,518,359	25	1,862,958,983
Green	161,734,476	32	5,175,503,237
Wilson	407,220,726	41	16,696,049,769
HMPL	16,483,318	25	412,082,957
Reid/HMPL Shared	2,504,162	26	65,108,206
Reid/Gree/HMPL Shared	366,885	32	11,740,324
Barges	1,186,253	59	69,593,495
			-
	671,262,275	36.47	24,480,715,609
			-
312 - Boiler Plant - Env Compl			-
Env - Central Lab	220,241	58	12,778,004
Env - Reid	5,046,851	26	131,218,129
Env - Coleman	121,851,087	25	3,046,277,173
Env - Green	114,693,688	32	3,670,198,026
Env - Wilson	262,004,068	41	10,742,166,803
Env - HMPL - SCR	35,338,718	25	883,467,949
Env - Reid/HMPL Shared	1,899,173	26	49,378,491
Env - Green/HMPL Shared	15,438	32	494,025
Env - HMPL - SCR	36,983,181	26	961,562,702
			-
	578,052,445	33.71	19,484,763,297
			-
314 - Turbine			-
Reid	4,310,531	26	112,073,795
Coleman	32,415,575	25	810,389,371
Green	57,679,599	32	1,845,747,175
Wilson	126,942,316	41	5,204,634,936
HMPL	4,509,416	25	112,735,388
Reid/HMPL Shared	226,351	26	5,885,137
Reid/Gree/HMPL Shared	18,495	32	591,845
			-
	226,102,282	35.79	8,092,057,647
			-
315 - Electric Equipment			-
Reid	1,494,659	26	38,861,126
Coleman	7,557,766	25	188,944,154
Green	16,091,240	32	514,919,671
Wilson	35,017,398	41	1,435,713,333
HMPL	171,384	25	4,284,607
Central Machine Shop Green	43,548	32	1,393,538
			-
	60,375,995	36.18	2,184,116,429
			-
316 - Misc. Equipment			-
Central lab	56,008	41	2,296,331
Reid	1,227	26	31,904
Coleman	755,850	25	18,896,241
Green	779,448	32	24,942,331
Wilson	666,432	41	27,323,714
HMPL	328,836	25	8,220,905
Reid/HMPL Shared	296,710	26	7,714,458
Reid/Gree/HMPL Shared	38,962	32	1,246,782
Central Machine Shop Green	107,700	32	3,446,394
			-
	3,031,173	30.29	91,822,730
			-
Reid Combustion Turbine			-
340 Land	475,968		-
341 Structures	154,233	21.32	3,288,195
342 Fuel Holders & Access.	1,436,912	21.48	30,869,902
343 Prime Mover	4,915,886	21.30	104,728,841
344 Generators	1,102,964	21.50	23,713,719
345 Access Elec. Equipment	317,726	21.24	6,749,434
			-
	7,927,719	21.36	169,350,091

Big Rivers Electric Corporation
Interim Life Table

311 Structures & Improvements

Remaining Life Year	Surviving Plant	Interim Retirements @.00066	Life Years	Remaining Life
1	124,443,565	82,133	41,066	
2	124,361,432	82,079	123,118	
3	124,279,354	82,024	205,061	
4	124,197,329	81,970	286,896	
5	124,115,359	81,916	368,623	
6	124,033,443	81,862	450,241	
7	123,951,581	81,808	531,752	
8	123,869,773	81,754	613,155	
9	123,788,019	81,700	694,451	
10	123,706,319	81,646	775,639	
11	123,624,673	81,592	856,719	
12	123,543,080	81,538	937,692	
13	123,461,542	81,485	1,018,558	
14	123,380,057	81,431	1,099,316	
15	123,298,626	81,377	1,179,968	
16	123,217,249	81,323	1,260,512	
17	123,135,926	81,270	1,340,950	
18	123,054,656	81,216	1,421,281	
19	122,973,440	81,162	1,501,506	
20	122,892,278	81,109	1,581,624	
21	122,811,169	81,055	1,661,635	
22	122,730,113	81,002	1,741,540	
23	122,649,112	80,948	1,821,339	
24	122,568,163	80,895	1,901,032	
25	122,487,268	80,842	1,980,619	
26	122,406,427	80,788	2,060,100	
27	122,325,638	80,735	2,139,475	
28	122,244,903	80,682	2,218,745	
29	122,164,222	80,628	2,297,909	
30	122,083,593	80,575	2,376,968	
31	122,003,018	80,522	2,455,921	
32	121,922,496	80,469	2,534,769	
33	121,842,027	80,416	2,613,511	
34	121,761,612	80,363	2,692,149	
35	121,681,249	80,310	2,770,682	
36.01	121,600,939		4,378,911,242	
			4,428,465,766	35.59

Big Rivers Electric Corporation
Interim Life Table

312 Boiler Plant

Remaining Life Year	Surviving Plant	Interim Retirements @.00308	Life Years	Remaining Life
1	671,262,275	2,067,488	1,033,744	
2	669,194,787	2,061,120	3,091,680	
3	667,133,667	2,054,772	5,136,929	
4	665,078,896	2,048,443	7,169,550	
5	663,030,453	2,042,134	9,189,602	
6	660,988,319	2,035,844	11,197,142	
7	658,952,475	2,029,574	13,192,229	
8	656,922,901	2,023,323	15,174,919	
9	654,899,579	2,017,091	17,145,271	
10	652,882,488	2,010,878	19,103,342	
11	650,871,610	2,004,685	21,049,188	
12	648,866,925	1,998,510	22,982,866	
13	646,868,415	1,992,355	24,904,434	
14	644,876,060	1,986,218	26,813,947	
15	642,889,842	1,980,101	28,711,460	
16	640,909,741	1,974,002	30,597,031	
17	638,935,739	1,967,922	32,470,714	
18	636,967,817	1,961,861	34,332,565	
19	635,005,957	1,955,818	36,182,639	
20	633,050,138	1,949,794	38,020,991	
21	631,100,344	1,943,789	39,847,676	
22	629,156,555	1,937,802	41,662,747	
23	627,218,752	1,931,834	43,466,260	
24	625,286,919	1,925,884	45,258,267	
25	623,361,035	1,919,952	47,038,824	
26	621,441,083	1,914,039	48,807,983	
27	619,527,044	1,908,143	50,565,797	
28	617,618,901	1,902,266	52,312,321	
29	615,716,635	1,896,407	54,047,606	
30	613,820,228	1,890,566	55,771,706	
31	611,929,661	1,884,743	57,484,672	
32	610,044,918	1,878,938	59,186,558	
33	608,165,980	1,873,151	60,877,415	
34	606,292,829	1,867,382	62,557,294	
35	604,425,447	1,861,630	64,226,248	
36	602,563,816	773,909	27,473,765	
36.47	601,789,907		21,947,277,922	
			23,155,363,304	34.50

Big Rivers Electric Corporation
Interim Life Table

312 A-K Boiler Plant Equipment - Environmental

Remaining Life Year	Surviving Plant	Interim Retirements @.00158	Life Years	Remaining Life
1	578,052,445	913,323	456,661	
2	577,139,122	911,880	1,367,820	
3	576,227,242	910,439	2,276,098	
4	575,316,803	909,001	3,181,502	
5	574,407,803	907,564	4,084,039	
6	573,500,238	906,130	4,983,717	
7	572,594,108	904,699	5,880,541	
8	571,689,409	903,269	6,774,520	
9	570,786,140	901,842	7,665,658	
10	569,884,298	900,417	8,553,963	
11	568,983,881	898,995	9,439,443	
12	568,084,886	897,574	10,322,102	
13	567,187,312	896,156	11,201,949	
14	566,291,156	894,740	12,078,990	
15	565,396,416	893,326	12,953,232	
16	564,503,090	891,915	13,824,681	
17	563,611,175	890,506	14,693,343	
18	562,720,669	889,099	15,559,227	
19	561,831,571	887,694	16,422,337	
20	560,943,877	886,291	17,282,681	
21	560,057,585	884,891	18,140,265	
22	559,172,694	883,493	18,995,096	
23	558,289,202	882,097	19,847,181	
24	557,407,105	880,703	20,696,526	
25	556,526,401	879,312	21,543,137	
26	555,647,090	877,922	22,387,021	
27	554,769,167	876,535	23,228,185	
28	553,892,632	875,150	24,066,635	
29	553,017,482	873,768	24,902,377	
30	552,143,714	872,387	25,735,419	
31	551,271,327	871,009	26,565,765	
32	550,400,318	869,633	27,393,424	
33	549,530,686	334,280	10,864,084	
33.77	549,196,406		18,546,362,640	
			19,009,730,260	32.89

Big Rivers Electric Corporation
Interim Life Table

314 Turbines

Remaining Life Year	Surviving Plant	Interim Retirements @.00226	Life Years	Remaining Life
1	225,272,354	509,116	254,558	
2	224,763,238	507,965	761,947	
3	224,255,273	506,817	1,267,042	
4	223,748,457	505,672	1,769,850	
5	223,242,785	504,529	2,270,379	
6	222,738,256	503,388	2,768,637	
7	222,234,868	502,251	3,264,630	
8	221,732,617	501,116	3,758,368	
9	221,231,501	499,983	4,249,857	
10	220,731,518	498,853	4,739,106	
11	220,232,665	497,726	5,226,121	
12	219,734,939	496,601	5,710,911	
13	219,238,338	495,479	6,193,483	
14	218,742,860	494,359	6,673,845	
15	218,248,501	493,242	7,152,003	
16	217,755,259	492,127	7,627,967	
17	217,263,132	491,015	8,101,742	
18	216,772,117	489,905	8,573,337	
19	216,282,212	488,798	9,042,759	
20	215,793,415	487,693	9,510,016	
21	215,305,722	486,591	9,975,114	
22	214,819,131	485,491	10,438,062	
23	214,333,639	484,394	10,898,866	
24	213,849,245	483,299	11,357,533	
25	213,365,946	482,207	11,814,072	
26	212,883,739	481,117	12,268,490	
27	212,402,622	480,030	12,720,793	
28	211,922,592	478,945	13,170,989	
29	211,443,647	477,863	13,619,085	
30	210,965,784	476,783	14,065,089	
31	210,489,002	475,705	14,509,007	
32	210,013,296	474,630	14,950,847	
33	209,538,666	473,557	15,390,615	
34	209,065,109	472,487	15,828,319	
35	208,592,622	186,211	6,517,372	
35.79	208,406,411		7,458,733,615	
			7,745,174,427	34.38

Big Rivers Electric Corporation
Interim Life Table

315 Electric Equipment

Remaining Life Year	Surviving Plant	Interim Retirements @.00112	Life Years	Remaining Life
1	60,355,721	67,598	33,799	
2	60,288,122	67,523	101,284	
3	60,220,600	67,447	168,618	
4	60,153,152	67,372	235,800	
5	60,085,781	67,296	302,832	
6	60,018,485	67,221	369,714	
7	59,951,264	67,145	436,445	
8	59,884,119	67,070	503,027	
9	59,817,049	66,995	569,458	
10	59,750,053	66,920	635,741	
11	59,683,133	66,845	701,874	
12	59,616,288	66,770	767,858	
13	59,549,518	66,695	833,693	
14	59,482,823	66,621	899,380	
15	59,416,202	66,546	964,919	
16	59,349,656	66,472	1,030,310	
17	59,283,184	66,397	1,095,553	
18	59,216,787	66,323	1,160,649	
19	59,150,464	66,249	1,225,598	
20	59,084,216	66,174	1,290,399	
21	59,018,041	66,100	1,355,054	
22	58,951,941	66,026	1,419,563	
23	58,885,915	65,952	1,483,925	
24	58,819,963	65,878	1,548,141	
25	58,754,084	65,805	1,612,212	
26	58,688,280	65,731	1,676,137	
27	58,622,549	65,657	1,739,917	
28	58,556,892	65,584	1,803,552	
29	58,491,308	65,510	1,867,043	
30	58,425,798	65,437	1,930,388	
31	58,360,361	65,364	1,993,590	
32	58,294,997	65,290	2,056,647	
33	58,229,707	65,217	2,119,561	
34	58,164,489	65,144	2,182,332	
35	58,099,345	65,071	2,244,959	
36	58,034,274	5,850	210,595	
36.18	58,034,274		2,099,404,085	
			2,139,974,653	35.46

Big Rivers Electric Corporation
Development of KIUC Recommended Depreciation Rates

Account	Net Salvage Factor	Original Cost 4/30/2010	Accumulated Depreciation	Total To Be Accrued	Remaining Life	Annual Accrual	Rate
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
311 - Structures	-4.50%	124,375,974	78,124,758	51,848,135	35.59	1,456,976	1.17%
312 - Boiler Plant	-5.02%	667,206,536	347,237,018	353,510,387	34.50	10,248,087	1.54%
312 -Boiler Plant - Env Compl	-1.96%	574,184,346	216,926,144	368,523,800	32.89	11,206,160	1.95%
312 Short-lived Boiler Plant	0.00%	4,077,693	376,213	3,701,480	4.70	787,549	19.31%
314 - Turbine	-8.17%	225,272,354	124,744,924	118,942,644	34.38	3,459,508	1.54%
315 - Electric Equipment	2.98%	60,355,721	35,350,377	23,204,131	35.46	654,448	1.08%
316 - Misc. Equipment	0.55%	3,014,912	42,128	2,956,346	26.00	113,706	3.77%
Reid Combustion Turbine							
340 Land		475,968					
341 Structures	0.0%	154,233	115,766	38,467	21.32	1,804	1.17%
342 Fuel Holders & Access.	-134.8%	1,436,912	564,590	2,808,983	21.48	130,751	9.10%
343 Prime Mover	-38.3%	4,915,886	3,637,977	3,161,718	21.30	148,408	3.02%
344 Generators	0.0%	1,102,964	984,479	118,484	21.50	5,511	0.50%
345 Access Elec. Equipment	0.0%	317,726	179,425	138,301	21.24	6,510	2.05%
		7,455,761	5,482,237	6,265,953		292,985	

Sources:
(1) Table ES-1
(2) Response to Item KIUC 1-4, "Active Property Records.xls" and AG 1-104 - "Depree Summary 2010-12-16 FINAL.xls"
(3) Response to Item KIUC 1-4, "Acct 1089 Accum Depr by RUS Account at 04-30-10.xls"
(4) ((3)-(3)) - ((1)x(2))
(5) Schedules 4-8
(6) (4)/(5)
(7) (6)/(1)

868754.5

868754.5

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR A GENERAL ADJUSTMENT IN RATES	)))	**CASE NO. 2011-00036**

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO BIG RIVERS ELECTRIC CORPORATION FIRST DATA REQUEST PSC CASE NO. 2011-00036 June 22, 2011

Request BREC - 10

Referring to Schedule 1 of Exhibit CWK-1 to the direct testimony of Mr. King, to the extent not already provided in your response to Item 7, please provide the source and calculations for the following:

a. Account 343 CT –Prime Movers
b. Account 344 CT –Generators
c. Account 345 CT –Access. Elec. Eqpt.

RESPONSE:

The source and calculations for these accounts is Schedule 10. See the attachment to Data Request No. 9.

Witness: Charles W. King

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR A GENERAL ADJUSTMENT IN RATES	)))	**CASE NO. 2011-00036**

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO BIG RIVERS ELECTRIC CORPORATION FIRST DATA REQUEST PSC CASE NO. 2011-00036 June 22, 2011

Request BREC - 11
Referring to Schedule 4 of Exhibit CWK-1 to the direct testimony of Mr. King, please explain why the total for Account 312 –Boiler Plant does not match Big Rivers' April 30, 2010 account balance found in Table ES-1, page ES-6 of the Burns & McDonnell Depreciation Study.

RESPONSE:

Big Rivers' records from which the plant-by-plant account data on Schedule 4 were drawn do not reconcile with the account totals in ES-1.

Witness: Charles W. King

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR A GENERAL ADJUSTMENT IN RATES	)))	**CASE NO. 2011-00036**

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO BIG RIVERS ELECTRIC CORPORATION FIRST DATA REQUEST PSC CASE NO. 2011-00036 June 22, 2011

Request BREC - 12

Referring to Schedule 4 of Exhibit CWK-1 to the direct testimony of Mr. King, to the extent not already provided in your response to Item 7, please provide the source and calculations for the following items under Account 312 –Boiler Plant:

a. Reid
b. Coleman
c. Green
d. HMPL

RESPONSE:

See attached on enclosed CD.

Witness: Charles W. King

Big Rivers Electric

Year-End Accumulated Depreciation

As of 9/30/10

RUS Account	Accumulated Depreciation	Accumulated Account 1089 and 1119
311	(78,124,758)	1,165,758
312 A-K	(216,926,144)	7,332,299
312	(347,237,018)	20,440,410
314	(124,744,924)	5,303,095
315	(35,350,377)	879,979
316	(42,128)	0
340	0	0
341	(115,766)	2,192
342	(564,590)	2,432
343	(3,637,977)	86,909
344	(984,479)	(1,489)
345	(179,425)	1,649
350	0	0
352	(3,658,099)	131,536
353	(51,190,577)	10,492,200
354	(4,854,417)	(35,731)
355	(22,009,958)	8
356	(23,394,456)	25
389	0	0
390	(1,786,210)	558,380
391.067	282,102	564,769
391	(436,114)	397,905
392.2	(995,277)	(469,349)
392.3	(625,460)	304,363
393	(69,468)	(854)
394	(385,947)	22,886
395	(160,195)	(8,429)
396	(392,925)	(85,931)
397	(1,640,029)	48,413
398	(3,925)	58,940
	(919,228,540)	**47,192,369**

Sub Acs	AC 101/104/105	AC 1081-1087	AC 1088 Substations	AC1088 Poles/Lines
3010	420			
3020	66,476			
3101	83,342			
3102	1,124,665			
3103	1,110,712			
3104	2,218,858			
3111	3,181,843	(3,232,441)		
3112	18,937,203	(16,133,135)		
3113	26,723,028	(19,779,140)		
3114	73,000,144	(39,245,655)		
3115	421,179			
3116	553,336	(100,245)		
3117	933,221	(294,693)		
3119	693,610	(433,395)		
312A	220,241	(4,921)		
312B	5,046,851	(1,839,730)		
312C	121,851,087	(10,319,856)		
312D	114,693,688	(68,034,986)		
312E	262,004,068	(126,129,925)		
312F	35,338,718			
312G	1,899,173	(82,620)		
312J	15,438	(4,094)		
312K	36,983,181			
3120	29,686	(399)		
3121	7,218,409	(6,002,801)		
3122	74,518,359	(37,389,006)		
3123	161,734,476	(106,837,293)		
3124	407,220,726	(215,093,770)		
3125	16,483,318	0		
3126	2,504,162	(251,389)		
3127	366,885	(88,583)		
3128	1,186,253	(15,929)		
3129	0	0		
3141	4,310,531	(3,722,070)		
3142	32,415,575	(19,235,879)		
3143	57,679,599	(39,122,600)		
3144	126,942,316	(66,355,292)		
3145	4,509,416			
3146	226,351	(34,684)		

3147	18,495	(8,465)	
3151	1,494,659	(1,011,521)	
3152	7,557,766	(5,614,584)	
3153	16,091,240	(11,635,282)	
3154	35,017,398	(17,915,927)	
3155	171,384		
3159	43,548	(29,082)	
3160	56,008	(769)	
3161	1,227	(17)	
3162	755,850	(10,374)	
3163	779,448	(11,190)	
3164	666,432	(9,147)	
3165	328,836		
3166	296,710	(4,073)	
3167	38,962	(535)	
3169	107,700	(1,511)	
3401	475,968	0	
3410	154,233	(117,958)	
3420	1,436,912	(567,022)	
3430	4,915,886	(3,724,886)	
3440	1,102,964	(982,990)	
3450	317,726	(181,074)	
3500	13,004,635		
3501	558,665		
3520	5,683,123	(3,270,266)	
3521	20,369	(21,589)	
3522	157,305	(139,132)	
3524	679,442	(358,648)	
3525	185,107		
3530	71,959,838	(37,790,029)	
3531	3,031,650	(2,134,147)	
3532	5,485,536	(4,444,591)	
3533	5,947,214	(4,551,870)	
3534	22,364,145	(12,762,140)	
3535	6,511,341		
3540	8,134,239	(4,705,521)	
3541	146,747	(113,165)	
3545	312,558		
3550	41,244,643	(22,076,259)	306,914
3551	234,314	(240,621)	
3555	79,207		
3560	40,878,570	(23,305,585)	

3561	86,901	(88,897)		
3565	104,571			
3890	407,251	0		
3900	3,944,895	(2,344,590)		
3910	611,181	(282,626)		
3912	7,013,902	(834,019)		
3913	0	0		
3916	1,895	(16)		
3917	3,060	(25)		
3922	1,699,130	(525,928)		
3923	1,257,240	(929,823)		
3930	98,766	(68,615)		
3940	717,086	(408,833)		
3950	221,279	(151,766)		
3960	321,665	(184,937)		
3961	183,074	(122,057)		
3970	1,639,437	(1,688,442)		
3980	162,019	(62,799)		
3986	0	0		
3987	1,625	(66)		
Totals	1,921,369,520	(945,217,940)	0	306,914
	AC 106			
General Ledger Totals	1,942,858,228	(947,426,155)	0	306,914
	(21,488,708)	2,208,215	0	0

	General Ledger
108	**(816,037,007)**
108	**(5,573,931)**
109	**(116,284,362)**
109	**(7,604,542)**
	(945,499,842)

AC1089	AC1111	AC 1119	Plant in Service
			420
			66,476
			83,342
			1,124,665
			1,110,712
			2,218,858
95,725			3,181,843
344,361			18,937,203
318,039			26,723,028
354,162			73,000,144
	(71,812)	2,440	421,179
14,964			553,336
12,126			933,221
23,942			693,610
			220,241
78,378			5,046,851
377,147			121,851,087
1,823,278			114,693,688
3,947,311			262,004,068
	(4,929,262)	882,520	35,338,718
2,863			1,899,173
			15,438
	(12,913,050)	220,801	36,983,181
0			29,686
694,194			7,218,409
3,889,899			74,518,359
5,177,116			161,734,476
10,227,599			407,220,726
	(1,998,260)	350,395	16,483,318
101,514			2,504,162
(307)			366,885
			1,186,253
			0
307,534			4,310,531
1,476,196			32,415,575
2,069,198			57,679,599
1,039,402			126,942,316
	(1,569,028)	410,678	4,509,416
			226,351

86			18,495
142,312			1,494,659
110,787			7,557,766
389,109			16,091,240
219,740			35,017,398
	(23,959)	279	171,384
17,753			43,548
0			56,008
0			1,227
0			755,850
0			779,448
0			666,432
0	(4,513)	0	328,836
0			296,710
0			38,962
0			107,700
			475,968
2,192			154,233
2,432			1,436,912
86,909			4,915,886
(1,489)			1,102,964
1,649			317,726
			13,004,635
			558,665
133,160			5,683,123
(244)			20,369
(1,378)			157,305
(0)			679,442
			185,107
10,046,506			71,959,838
161,962			3,031,650
199,013			5,485,536
2			5,947,214
84,716			22,364,145
			6,511,341
(35,731)			8,134,239
			146,747
			312,558
			41,244,643
8			234,314
			79,207
			40,878,570

25			86,901
			104,571
			407,251
558,380			3,944,895
564,769			611,181
472,663			7,013,902
(74,759)			0
			1,895
			3,060
(469,349)			1,699,130
304,363			1,257,240
(854)			98,766
22,886			717,086
(8,429)			221,279
(20,714)			321,665
(65,216)			183,074
48,413			1,639,437
58,940			162,019
			0
			1,625
45,325,256	(21,509,883)	1,867,113	1,921,369,520
		47,192,369	
65,754,852	(22,618,851)	2,019,842	
(20,429,596)	1,108,968	(152,729)	(21,488,708)

Accumulated Deprecation	Net Plant	Plant in Service	Accumulated Deprecation
0	420	420	0
0	66,476	66,476	0
0	83,342		
0	1,124,665		
0	1,110,712		
0	2,218,858	4,537,577	0
(3,136,716)	45,127		
(15,788,774)	3,148,429		
(19,461,102)	7,261,926		
(38,891,493)	34,108,651		
(69,372)	351,807		
(85,281)	468,056		
(282,567)	650,654		
(409,453)	284,156	124,443,565	(78,124,758)
(4,921)	215,320		
(1,761,352)	3,285,499		
(9,942,708)	111,908,379		
(66,211,709)	48,481,980		
(122,182,613)	139,821,455		
(4,046,741)	31,291,977		
(79,757)	1,819,416		
(4,094)	11,345		
(12,692,249)	24,290,932	578,052,445	(216,926,144)
(399)	29,288		
(5,308,607)	1,909,802		
(33,499,107)	41,019,253		
(101,660,176)	60,074,300		
(204,866,171)	202,354,555		
(1,647,865)	14,835,453		
(149,874)	2,354,287		
(88,890)	277,995		
(15,929)	1,170,324		
0	0	671,262,275	(347,237,018)
(3,414,536)	895,994		
(17,759,683)	14,655,892		
(37,053,402)	20,626,197		
(65,315,890)	61,626,426		
(1,158,350)	3,351,066		
(34,684)	191,667		

(8,379)	10,116	226,102,282	(124,744,924)
(869,209)	625,449		
(5,503,797)	2,053,969		
(11,246,173)	4,845,066		
(17,696,188)	17,321,211		
(23,680)	147,704		
(11,329)	32,219	60,375,995	(35,350,377)
(769)	55,239		
(17)	1,210		
(10,374)	745,476		
(11,190)	768,258		
(9,147)	657,285		
(4,513)	324,323		
(4,073)	292,637		
(535)	38,427		
(1,511)	106,189	3,031,173	(42,128)
0	475,968	475,968	0
(115,766)	38,467	154,233	(115,766)
(564,590)	872,322	1,436,912	(564,590)
(3,637,977)	1,277,909	4,915,886	(3,637,977)
(984,479)	118,484	1,102,964	(984,479)
(179,425)	138,301	317,726	(179,425)
0	13,004,635		
0	558,665	13,563,300	0
(3,137,107)	2,546,016		
(21,833)	(1,464)		
(140,511)	16,794		
(358,648)	320,794		
0	185,107	6,725,346	(3,658,099)
(27,743,523)	44,216,316		
(1,972,186)	1,059,465		
(4,245,578)	1,239,958		
(4,551,867)	1,395,347		
(12,677,424)	9,686,722		
0	6,511,341	115,299,725	(51,190,577)
(4,741,252)	3,392,988		
(113,165)	33,582		
0	312,558	8,593,544	(4,854,417)
(21,769,345)	19,475,298		
(240,613)	(6,298)		
0	79,207	41,558,164	(22,009,958)
(23,305,585)	17,572,985		

(88,872)	(1,971)		
0	104,571	41,070,042	(23,394,456)
0	407,251	407,251	0
(1,786,210)	2,158,685	3,944,895	(1,786,210)
282,143	893,324		
(361,355)	6,652,547		
(74,759)	(74,759)	7,013,902	(436,114)
(16)	1,879		
(25)	3,034	616,135	282,102
(995,277)	703,853	1,699,130	(995,277)
(625,460)	631,780	1,257,240	(625,460)
(69,468)	29,297	98,766	(69,468)
(385,947)	331,139	717,086	(385,947)
(160,195)	61,083	221,279	(160,195)
(205,651)	116,014		
(187,274)	(4,200)	504,739	(392,925)
(1,640,029)	(591)	1,639,437	(1,640,029)
(3,859)	158,160		
0	0		
(66)	1,559	163,645	(3,925)
(919,228,540)	1,002,140,980	1,921,369,520	(919,228,540)

(17,265,142)	0	0

Net Plant	RUS Account	Accumulated AC1089	Accumulated AC1119
420	301	0	0
66,476	302	0	0
4,537,577	310	0	0
46,318,807	311	1,163,319	2,440
361,126,301		6,228,978	1,103,321
324,025,257	312	20,090,016	350,395

101,357,358	314	4,892,417	410,678
25,025,619	315	879,701	279
2,989,045	316	0	0
475,968	340	0	0
38,467	341	2,192	0
872,322	342	2,432	0
1,277,909	343	86,909	0
118,484	344	(1,489)	0
138,301	345	1,649	0
13,563,300	350	0	0
3,067,247	352	131,536	0
64,109,148	353	10,492,200	0
3,739,128	354	(35,731)	0
19,548,206	355	8	0

17,675,586	356	25	0
407,251	389	0	0
2,158,685	390	558,380	0
6,577,788		397,905	0
898,237	391	564,769	0
703,853		(469,349)	0
631,780	392	304,363	0
29,297	393	(854)	0
331,139	394	22,886	0
61,083	395	(8,429)	0
111,814	396	(85,931)	0
(591)	397	48,413	0
159,720	398	58,940	0
1,002,140,980		45,325,256	1,867,113
0		0	0

Accumulated AC 1089 and 1119
0
0
0
1,165,758
7,332,299
20,440,410

5,303,095

879,979

0
0
2,192
2,432
86,909
(1,489)
1,649

0

131,536

10,492,200

(35,731)

8

25
0
558,380
397,905
564,769
(469,349)
304,363
(854)
22,886
(8,429)
(85,931)
48,413
58,940
47,192,369

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR A GENERAL ADJUSTMENT IN RATES	)))	**CASE NO. 2011-00036**

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO BIG RIVERS ELECTRIC CORPORATION FIRST DATA REQUEST PSC CASE NO. 2011-00036 June 22, 2011

Request BREC - 13

Referring to Schedule 10 of Exhibit CWK-1 to the direct testimony of Mr. King, to the extent not already provided in your response to Item 7, please provide the source and calculations for the following:

a. Net Salvage Factor for Account 311 –Structures
b. Accumulated Depreciation for Account 312 –Boiler Plant
c. Accumulated Depreciation for Account 312 -Boiler Plant –Env Compl.
d. Total to be Accrued for all accounts

RESPONSE:

a. The net salvage factor for this account was taken from the B&M report work papers. It is the same factor as recommended by B&M.

b&c. The source of these numbers was the Big Rivers data for each account for each plant in Attachment 12.1. The reserves in these data files do not reconcile with the reserves in Table ES-1.

d. The formula is
(Original cost * (1-net salvage factor)) – Accumulated depreciation

Witness: Charles W. King

Big Rivers Electric

Year-End Accumulated Depreciation

As of 9/30/10

RUS Account	Accumulated Depreciation	Accumulated Account 1089 and 1119
311	(78,124,758)	1,165,758
312 A-K	(216,926,144)	7,332,299
312	(347,237,018)	20,440,410
314	(124,744,924)	5,303,095
315	(35,350,377)	879,979
316	(42,128)	0
340	0	0
341	(115,766)	2,192
342	(564,590)	2,432
343	(3,637,977)	86,909
344	(984,479)	(1,489)
345	(179,425)	1,649
350	0	0
352	(3,658,099)	131,536
353	(51,190,577)	10,492,200
354	(4,854,417)	(35,731)
355	(22,009,958)	8
356	(23,394,456)	25
389	0	0
390	(1,786,210)	558,380
391.067	282,102	564,769
391	(436,114)	397,905
392.2	(995,277)	(469,349)
392.3	(625,460)	304,363
393	(69,468)	(854)
394	(385,947)	22,886
395	(160,195)	(8,429)
396	(392,925)	(85,931)
397	(1,640,029)	48,413
398	(3,925)	58,940
	(919,228,540)	**47,192,369**

Sub Acs	AC 101/104/105	AC 1081-1087	AC 1088 Substations	AC1088 Poles/Lines
3010	420			
3020	66,476			
3101	83,342			
3102	1,124,665			
3103	1,110,712			
3104	2,218,858			
3111	3,181,843	(3,232,441)		
3112	18,937,203	(16,133,135)		
3113	26,723,028	(19,779,140)		
3114	73,000,144	(39,245,655)		
3115	421,179			
3116	553,336	(100,245)		
3117	933,221	(294,693)		
3119	693,610	(433,395)		
312A	220,241	(4,921)		
312B	5,046,851	(1,839,730)		
312C	121,851,087	(10,319,856)		
312D	114,693,688	(68,034,986)		
312E	262,004,068	(126,129,925)		
312F	35,338,718			
312G	1,899,173	(82,620)		
312J	15,438	(4,094)		
312K	36,983,181			
3120	29,686	(399)		
3121	7,218,409	(6,002,801)		
3122	74,518,359	(37,389,006)		
3123	161,734,476	(106,837,293)		
3124	407,220,726	(215,093,770)		
3125	16,483,318	0		
3126	2,504,162	(251,389)		
3127	366,885	(88,583)		
3128	1,186,253	(15,929)		
3129	0	0		
3141	4,310,531	(3,722,070)		
3142	32,415,575	(19,235,879)		
3143	57,679,599	(39,122,600)		
3144	126,942,316	(66,355,292)		
3145	4,509,416			
3146	226,351	(34,684)		

3147	18,495	(8,465)	
3151	1,494,659	(1,011,521)	
3152	7,557,766	(5,614,584)	
3153	16,091,240	(11,635,282)	
3154	35,017,398	(17,915,927)	
3155	171,384		
3159	43,548	(29,082)	
3160	56,008	(769)	
3161	1,227	(17)	
3162	755,850	(10,374)	
3163	779,448	(11,190)	
3164	666,432	(9,147)	
3165	328,836		
3166	296,710	(4,073)	
3167	38,962	(535)	
3169	107,700	(1,511)	
3401	475,968	0	
3410	154,233	(117,958)	
3420	1,436,912	(567,022)	
3430	4,915,886	(3,724,886)	
3440	1,102,964	(982,990)	
3450	317,726	(181,074)	
3500	13,004,635		
3501	558,665		
3520	5,683,123	(3,270,266)	
3521	20,369	(21,589)	
3522	157,305	(139,132)	
3524	679,442	(358,648)	
3525	185,107		
3530	71,959,838	(37,790,029)	
3531	3,031,650	(2,134,147)	
3532	5,485,536	(4,444,591)	
3533	5,947,214	(4,551,870)	
3534	22,364,145	(12,762,140)	
3535	6,511,341		
3540	8,134,239	(4,705,521)	
3541	146,747	(113,165)	
3545	312,558		
3550	41,244,643	(22,076,259)	306,914
3551	234,314	(240,621)	
3555	79,207		
3560	40,878,570	(23,305,585)	

3561	86,901	(88,897)		
3565	104,571			
3890	407,251	0		
3900	3,944,895	(2,344,590)		
3910	611,181	(282,626)		
3912	7,013,902	(834,019)		
3913	0	0		
3916	1,895	(16)		
3917	3,060	(25)		
3922	1,699,130	(525,928)		
3923	1,257,240	(929,823)		
3930	98,766	(68,615)		
3940	717,086	(408,833)		
3950	221,279	(151,766)		
3960	321,665	(184,937)		
3961	183,074	(122,057)		
3970	1,639,437	(1,688,442)		
3980	162,019	(62,799)		
3986	0	0		
3987	1,625	(66)		
Totals	1,921,369,520	(945,217,940)	0	306,914
	[redacted]			
General Ledger Totals	1,942,858,228	(947,426,155)	0	306,914
	(21,488,708)	2,208,215	0	0

	General Ledger
108	**(816,037,007)**
108	**(5,573,931)**
109	**(116,284,362)**
109	**(7,604,542)**
	(945,499,842)

[illegible]	AC1111	[illegible]	Plant in Service
			420
			66,476
			83,342
			1,124,665
			1,110,712
			2,218,858
95,725			3,181,843
344,361			18,937,203
318,039			26,723,028
354,162			73,000,144
	(71,812)	2,440	421,179
14,964			553,336
12,126			933,221
23,942			693,610
			220,241
78,378			5,046,851
377,147			121,851,087
1,823,278			114,693,688
3,947,311			262,004,068
	(4,929,262)	882,520	35,338,718
2,863			1,899,173
			15,438
	(12,913,050)	220,801	36,983,181
0			29,686
694,194			7,218,409
3,889,899			74,518,359
5,177,116			161,734,476
10,227,599			407,220,726
	(1,998,260)	350,395	16,483,318
101,514			2,504,162
(307)			366,885
			1,186,253
			0
307,534			4,310,531
1,476,196			32,415,575
2,069,198			57,679,599
1,039,402			126,942,316
	(1,569,028)	410,678	4,509,416
			226,351

86			18,495
142,312			1,494,659
110,787			7,557,766
389,109			16,091,240
219,740			35,017,398
	(23,959)	279	171,384
17,753			43,548
0			56,008
0			1,227
0			755,850
0			779,448
0			666,432
0	(4,513)	0	328,836
0			296,710
0			38,962
0			107,700
			475,968
2,192			154,233
2,432			1,436,912
86,909			4,915,886
(1,489)			1,102,964
1,649			317,726
			13,004,635
			558,665
133,160			5,683,123
(244)			20,369
(1,378)			157,305
(0)			679,442
			185,107
10,046,506			71,959,838
161,962			3,031,650
199,013			5,485,536
2			5,947,214
84,716			22,364,145
			6,511,341
(35,731)			8,134,239
			146,747
			312,558
			41,244,643
8			234,314
			79,207
			40,878,570

25			86,901
			104,571
			407,251
558,380			3,944,895
564,769			611,181
472,663			7,013,902
(74,759)			0
			1,895
			3,060
(469,349)			1,699,130
304,363			1,257,240
(854)			98,766
22,886			717,086
(8,429)			221,279
(20,714)			321,665
(65,216)			183,074
48,413			1,639,437
58,940			162,019
			0
			1,625
45,325,256	(21,509,883)	1,867,113	1,921,369,520
		47,192,369	
65,754,852	(22,618,851)	2,019,842	
(20,429,596)	1,108,968	(152,729)	(21,488,708)

Accumulated Deprecation	Net Plant	Plant in Service	Accumulated Deprecation
0	420	420	0
0	66,476	66,476	0
0	83,342		
0	1,124,665		
0	1,110,712		
0	2,218,858	4,537,577	0
(3,136,716)	45,127		
(15,788,774)	3,148,429		
(19,461,102)	7,261,926		
(38,891,493)	34,108,651		
(69,372)	351,807		
(85,281)	468,056		
(282,567)	650,654		
(409,453)	284,156	124,443,565	(78,124,758)
(4,921)	215,320		
(1,761,352)	3,285,499		
(9,942,708)	111,908,379		
(66,211,709)	48,481,980		
(122,182,613)	139,821,455		
(4,046,741)	31,291,977		
(79,757)	1,819,416		
(4,094)	11,345		
(12,692,249)	24,290,932	578,052,445	(216,926,144)
(399)	29,288		
(5,308,607)	1,909,802		
(33,499,107)	41,019,253		
(101,660,176)	60,074,300		
(204,866,171)	202,354,555		
(1,647,865)	14,835,453		
(149,874)	2,354,287		
(88,890)	277,995		
(15,929)	1,170,324		
0	0	671,262,275	(347,237,018)
(3,414,536)	895,994		
(17,759,683)	14,655,892		
(37,053,402)	20,626,197		
(65,315,890)	61,626,426		
(1,158,350)	3,351,066		
(34,684)	191,667		

(8,379)	10,116	226,102,282	(124,744,924)
(869,209)	625,449		
(5,503,797)	2,053,969		
(11,246,173)	4,845,066		
(17,696,188)	17,321,211		
(23,680)	147,704		
(11,329)	32,219	60,375,995	(35,350,377)
(769)	55,239		
(17)	1,210		
(10,374)	745,476		
(11,190)	768,258		
(9,147)	657,285		
(4,513)	324,323		
(4,073)	292,637		
(535)	38,427		
(1,511)	106,189	3,031,173	(42,128)
0	475,968	475,968	0
(115,766)	38,467	154,233	(115,766)
(564,590)	872,322	1,436,912	(564,590)
(3,637,977)	1,277,909	4,915,886	(3,637,977)
(984,479)	118,484	1,102,964	(984,479)
(179,425)	138,301	317,726	(179,425)
0	13,004,635		
0	558,665	13,563,300	0
(3,137,107)	2,546,016		
(21,833)	(1,464)		
(140,511)	16,794		
(358,648)	320,794		
0	185,107	6,725,346	(3,658,099)
(27,743,523)	44,216,316		
(1,972,186)	1,059,465		
(4,245,578)	1,239,958		
(4,551,867)	1,395,347		
(12,677,424)	9,686,722		
0	6,511,341	115,299,725	(51,190,577)
(4,741,252)	3,392,988		
(113,165)	33,582		
0	312,558	8,593,544	(4,854,417)
(21,769,345)	19,475,298		
(240,613)	(6,298)		
0	79,207	41,558,164	(22,009,958)
(23,305,585)	17,572,985		

(88,872)	(1,971)		
0	104,571	41,070,042	(23,394,456)
0	407,251	407,251	0
(1,786,210)	2,158,685	3,944,895	(1,786,210)
282,143	893,324		
(361,355)	6,652,547		
(74,759)	(74,759)	7,013,902	(436,114)
(16)	1,879		
(25)	3,034	616,135	282,102
(995,277)	703,853	1,699,130	(995,277)
(625,460)	631,780	1,257,240	(625,460)
(69,468)	29,297	98,766	(69,468)
(385,947)	331,139	717,086	(385,947)
(160,195)	61,083	221,279	(160,195)
(205,651)	116,014		
(187,274)	(4,200)	504,739	(392,925)
(1,640,029)	(591)	1,639,437	(1,640,029)
(3,859)	158,160		
0	0		
(66)	1,559	163,645	(3,925)
(919,228,540)	1,002,140,980	1,921,369,520	(919,228,540)

(17,265,142)	0	0

Net Plant	RUS Account	[illegible]	[illegible]
420	301	0	0
66,476	302	0	0
4,537,577	310	0	0
46,318,807	311	1,163,319	2,440
361,126,301		6,228,978	1,103,321
324,025,257	312	20,090,016	350,395

101,357,358	314	4,892,417	410,678
25,025,619	315	879,701	279
2,989,045	316	0	0
475,968	340	0	0
38,467	341	2,192	0
872,322	342	2,432	0
1,277,909	343	86,909	0
118,484	344	(1,489)	0
138,301	345	1,649	0
13,563,300	350	0	0
3,067,247	352	131,536	0
64,109,148	353	10,492,200	0
3,739,128	354	(35,731)	0
19,548,206	355	8	0

17,675,586	356	25	0
407,251	389	0	0
2,158,685	390	558,380	0
6,577,788		397,905	0
898,237	391	564,769	0
703,853		(469,349)	0
631,780	392	304,363	0
29,297	393	(854)	0
331,139	394	22,886	0
61,083	395	(8,429)	0
111,814	396	(85,931)	0
(591)	397	48,413	0
159,720	398	58,940	0
1,002,140,980		45,325,256	1,867,113
0		0	0

Accumulated Depreciation
0
0
0
1,165,758
7,332,299
20,440,410

5,303,095

879,979

0
0
2,192
2,432
86,909
(1,489)
1,649

0

131,536

10,492,200

(35,731)

8

25
0
558,380
397,905
564,769
(469,349)
304,363
(854)
22,886
(8,429)
(85,931)
48,413
58,940
47,192,369

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR A GENERAL ADJUSTMENT IN RATES	)))	**CASE NO. 2011-00036**

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO BIG RIVERS ELECTRIC CORPORATION FIRST DATA REQUEST PSC CASE NO. 2011-00036 June 22, 2011

Request BREC-14.
Referring to Attachment 1 to the direct testimony of Dr. Coomes, please provide a copy of the "2008 report" referenced on p. 1.

RESPONSE

The 2008 report, "The Estimated Economic and Fiscal Impacts of a Shut-down of Kentucky's Two Aluminum Smelters", dated 1/22/08, is provided on the enclosed CD.

Witness: Paul Coomes

The Estimated Economic and Fiscal Impacts of a Shut-down of Kentucky's Two Aluminum Smelters

by
Paul A. Coomes, Ph.D.
Consulting Economist

a research report for
Century Aluminum and Rio Tinto

January 22, 2008

Executive Summary

Kentucky has two aluminum smelters, one near Hawesville and the other about fifty miles west at Sebree. These smelters are major employers and taxpayers in the greater Owensboro-Henderson-Evansville regional economy. Should electricity prices rise sufficiently these two plants could be closed, as have several this decade in Oregon, Washington and Ohio. The effects of smelter shut-downs on small communities in the Northwest and Ohio are clear, with rising unemployment, a falling tax base, and newspaper reports of spillovers to housing and retail markets, as well as increased social problems.

The two Kentucky smelters together employ around 1,400 persons, who collectively earn over $115 million annually in wages, salaries, and benefits. I have used regional data and industry-specific multipliers to estimate the negative economic and fiscal impacts of such a possible shut-down. I estimate that the total net annual loss in the region would be 5,000 jobs and $193 million in wages and salaries. State and local governments in Kentucky would lose nearly $17 million annually. These estimates are for the economic and fiscal categories most easily quantified. There would be many other negative impacts, though they are harder to measure with any precision. Local real estate and retail markets would likely be depressed, unemployment and crime rates would rise, retraining and social services costs would increase, and many ancillary tax revenues would fall as economic activity in the region diminished.

Background and Methodology

There are two aluminum smelters in Kentucky, one operated by Century near Hawesville and the other by Rio Tinto (formerly Alcan) at Sebree. Smelters can demand as much electricity load as a mid-sized city. With low cost power available to many new international aluminum smelters, the economic viability of these two Kentucky smelters depends critically on the cost of electricity. Shutting down the smeltering operations would jeopardize the viability of related business activities, both upstream and downstream. Among the supporting industries that would be affected are river barges (that bring in alumina), electricity producers, engineering firms, maintenance contractors,

trucking firms, and the other vendors to the smelting plants. Downstream, the smelters supply raw aluminum to rolling and extruding mills in the region, which are clustered to support wire plants, auto parts plants, can factories, and other heavy aluminum users in the region. The Southwire Rod and Cable Mill, adjacent to the Hawesville smelter, could be immediately shut-down if the smelter were to close, since its current business model depends upon the low costs associated with immediate access to molten aluminum that meets its stringent purity specifications.

The smelters and related aluminum processing operations are among the largest employers in the Owensboro-Henderson-Evansville economic area. The two companies are interested in learning about and documenting the regional economic importance of the operations, so they can better communicate the ramifications of rising electricity costs should prices reach a threshold such that the smelting operations were financially threatened. The purpose of this report is to document and communicate the regional economic and fiscal importance of these aluminum plants.

Importance to Hancock and Henderson counties, entire region

It is not hard to see in publicly available data how important aluminum is to the regional economy. In the next two tables, I have organized information on the largest industrial employers in Hancock and Henderson counties, as currently displayed on the web site of the Kentucky Cabinet for Economic Development. I have highlighted in red the firms that produce or process aluminum. Note that in Hancock County three out of four of the top employers are aluminum-related. The Century smelter is the second largest manufacturing employer in the county. Similarly, in Henderson County two of the top four manufacturing employers are aluminum-related. The Rio Tinto (listed under its former name, Alcan) smelter is the fourth largest employer in Henderson County.

Largest Industrial Employers, Hancock County

Firm	Products	Employment	Date established
Aleris Rolled Products	Coils, aluminum tubing & flexible conduits	848	1966
Century Aluminum of Kentucky LLC	Aluminum castings, sows & smelting	771	1967
Domtar Corporation	Fine paper and mills bleach pulp.	470	1967
Southwire Company Kentucky Plant	Aluminum wire strand & aluminum redraw rod &	280	1969
Dal-Tile Corp	Quarry tile	110	1959
Roll Coater Inc	Steel & coil painting & coating service	100	1989
McElroy Metal Inc	Steel fabricating	25	1964
Precision Roll Grinders Inc	Roller repair & precision cylindrical grinding	25	1998
Yager Materials LLC	Ready-mixed concrete	16	1964
Maxwell Brothers Lumber Co	Sawing rough lumber, cross ties, pallet cants	16	1984
Hancock County Ready-Mix	Sand & gravel, ready-mix concrete	15	1964
Crescent Paper Tube Co Inc	Paper tubes	10	1990
Southern Shores Terminal	River terminal	8	1999
Wroe Pallet & Skids Corp	Wooden pallets & skids	7	1985
Bluegrass Industrial Minerals LLC	Processes raw sand into high quality silica	5	2005

Source: Kentucky Economic Development Cabinet, December 2007 (www.thinkkentucky.com/edis/cmnty/cmntyindex.htm)

There are about 368,000 private sector jobs in the region, of which 71,000 are in the manufacturing sector. Due to confidentiality laws, the federal statistical agencies do not disclose enough data to accurately measure the total aluminum-related employment and payroll in the region. But using some published and unpublished estimates, it seems likely that primary aluminum and aluminum-processing operations account for about 4,000 of the region's manufacturing jobs. Clearly, aluminum production and processing are critical to the health of the regional economy.

Largest Industrial Employers, Henderson County

Firm	Products	Employment	Date established
Tyson Foods Inc	Chicken slaughtering, processing & packaging	1,350	1995
Gibbs Die Casting Corp	Aluminum & magnesium die castings, headquarters	1,000	1966
Dana Corporation	Truck axles & brake components	700	1970
Alcan Primary Metal Group	Aluminum extrusion billets & ingots	629	1972
Vincent Industrial Plastics Inc	Custom plastic injection molding, decorating and assembly, injection mold	300	1981
Sunspring America Inc	Nonferrous & zinc die castings and PVD coating	285	1956
Accuride Corp	Truck wheels & rims	234	1973
Brenntag Mid-South Inc	Chemical blending, industrial chemical distribution	175	1947
Sights Denim Systems Inc	Denim finishing	171	1995
Audubon Metals LLC	Heavy-media separator and secondary specification aluminum alloy producer.	160	1996
Atlantis Plastics Inc	Thermoplastics & plastic injection molding, finishing, fabricating & subcontract	147	1951
Sitex Corporation	Headquarters and uniform supply service	130	1961
Columbia Sportswear Company	Distribution facility	130	2004
Cresline Plastic Pipe Co Inc	Plastic pipe & fittings	120	1966
Service Tool & Plastics	Injection molded plastics	120	1977
Sonoco	Aluminum & steel can ends	120	1967
Hugh E Sandefur Industries Inc	Vocational rehabilitation, manufacturing plant producing corrugated products;	100	1967
Royster's Machine Shop LLC	Machine shop: general & CNC machining, drilling, boring, cutting, honing,	95	1975
J-Ron Inc	Machine shop: mill & lathe work, plastic injection molding, CNC & EDM	80	1980
Weyerhaeuser Co	Recycled linerboard	74	1994

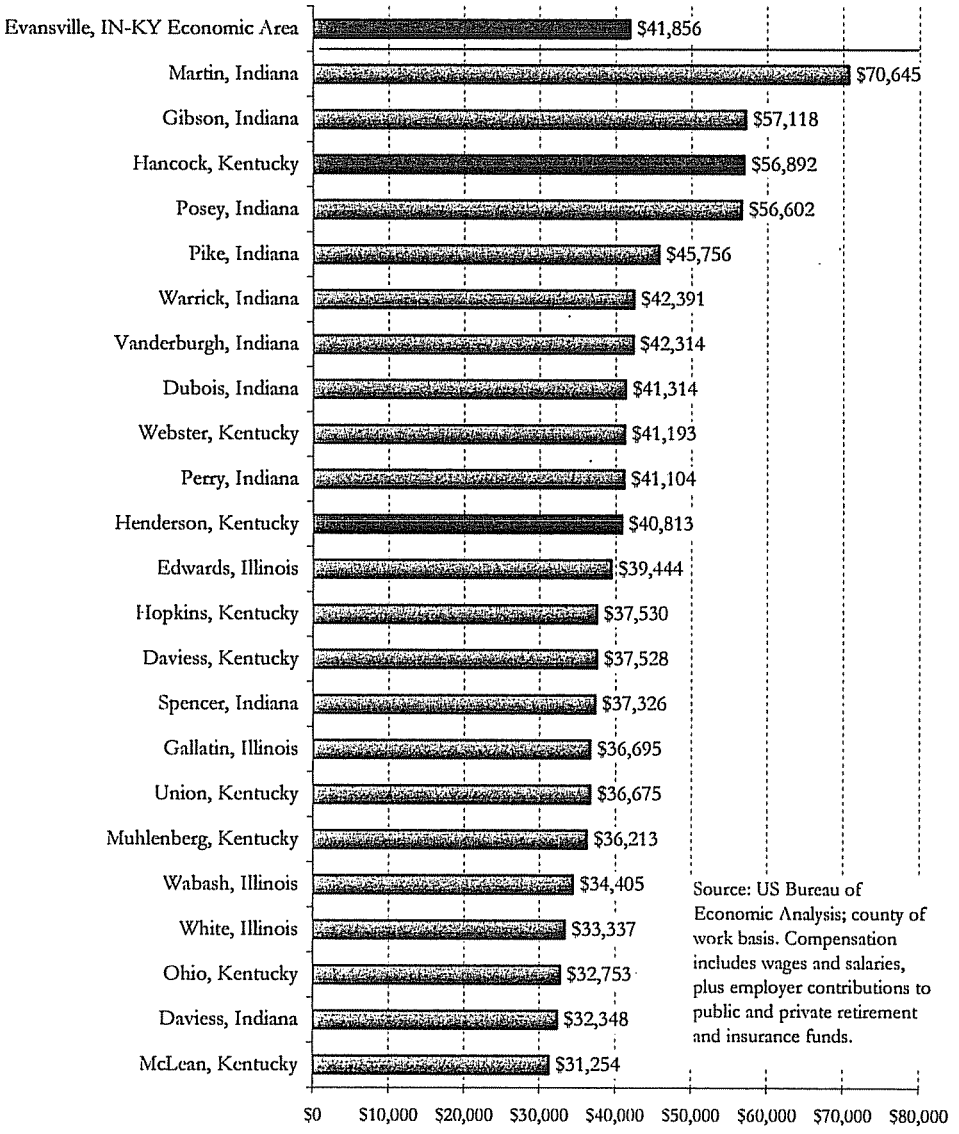
Source: Kentucky Economic Development Cabinet, December 2007 (www.thinkkentucky.com/edis/cmnty/cmntyindex.htm)

Moreover, the two smelter operations are crucial components of the tax and economic base in Hancock and Henderson counties. The Century operation in Hawesville accounts for over twenty percent of all wages and salaries earned in Hancock County, contributing a similar share of the county's occupational tax receipts. The Hawesville plant also accounts for about fifteen percent of all property taxes collected to support the Hancock County Public School system and county government operations. The Alcan operation accounts for almost five percent of wages and salaries in (much more populated) Henderson County, and about three percent of all property taxes collected for public schools and county government. Rio Tinto is the largest single taxpayer in Henderson County.

The importance of the aluminum-related jobs in the region stems from (a) their large number, (b) their linkages to other jobs in upstream and downstream industries, and (c) their high average pay and benefits. Average pay at the Rio Tinto and Century facilities is $54,000 per job. Company-provided benefits for health insurance, unemployment insurance, worker's compensation insurance, vacations, retirement, payroll taxes and the like boost this to over $80,000 per job.

The concentration of many such aluminum-related jobs in Hancock and Henderson counties puts those two in the top half in the region in terms of earnings per job. The relationship is particularly easy to see in Hancock County, as the county is lightly populated and aluminum is the most important industry. At $56,892, Hancock is third highest among counties in the region in terms of total compensation per job. Henderson County ranks near the middle in terms of compensation per job. Warrick County, home to the large Alcoa smelter and electricity plant, ranks sixth highest.

Average Compensation per Job, 2005
Evansville-Owensboro-Henderson Economic Area



Case study: smelter shut-downs in the Northwest and Ohio

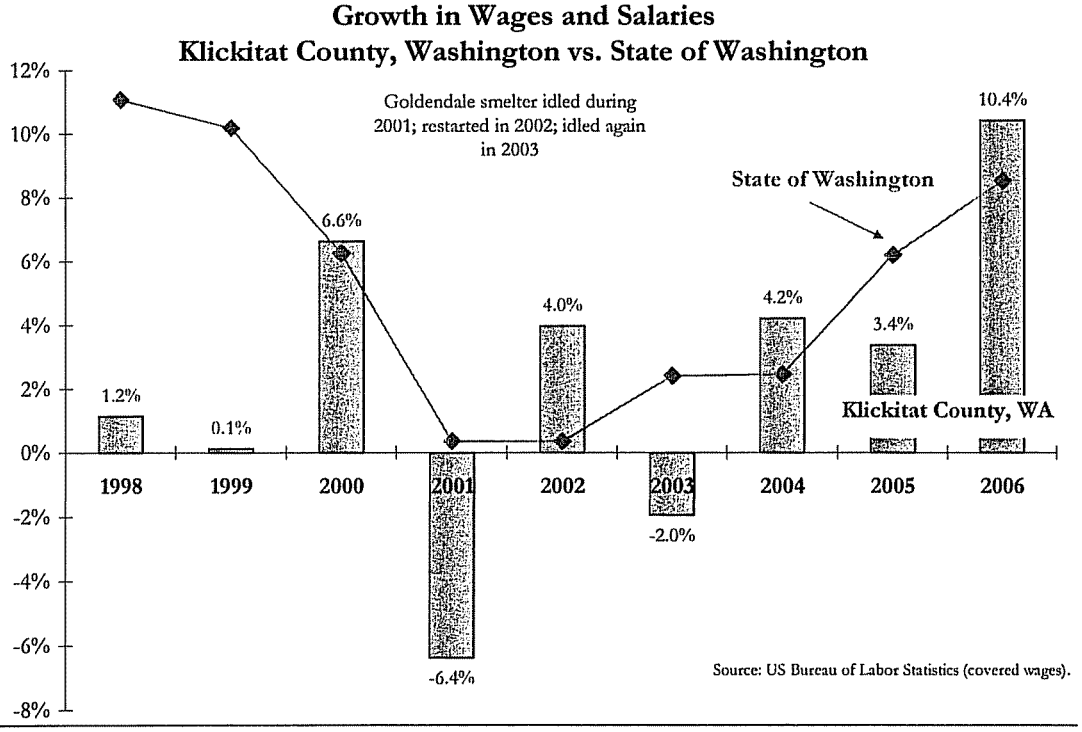
One indication of the regional economic importance of an aluminum smelter is the effect that plant closures have had on small and mid-sized communities in Washington, Oregon, Montana, and Ohio. Some of the plants idled this decade are in heavily populated areas, with many other major employers, and hence the effect of a shut-down would be harder to detect in county-level economic data. But several are in lightly populated counties, and a plant shut-down should ripple hard through the local community.

Northwest Smelters Idled or Closed Permanently This Decade

Company (location)	County	County Population	idled or shut-down quarter	restart quarter
Alcoa Intalco (Ferndale, Washington)	Whatcom	174,066	2001 I	2002 II
Alcoa (Wenatchee, Washington)	Douglas	33,261	2001 I	2004 IV
Glencore (Vancouver, Washington)	Clark	379,985	2000 II	
Golden Northwest (Goldendale, Washington)	Klickitat	19,393	2000 IV	
Kaiser (Mead, Washington)	Spokane	427,287	2001 I	
Reynolds (Longview, Washington)	Cowlitz	94,544	2001 I	
Kaiser (Tacoma, Washington)	Pierce	740,472	2000 II	
Golden Northwest (Dalles, Oregon)	Wasco	23,579	2000 IV	
Reynolds (Troutdale, Oregon)	Multnomah	675,438	2000 II	
Glencore (Columbia Falls, Montana)	Flathead	79,476	2001 I	2002 II

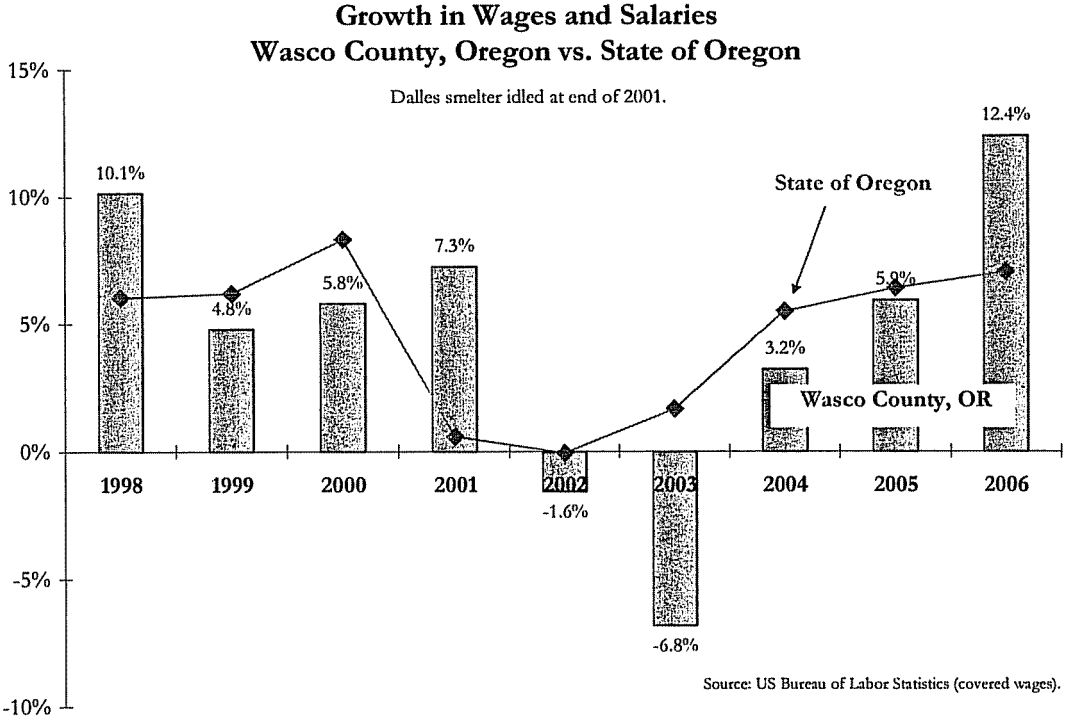
The table provides summary data for ten smelters in the Northwest that were idled this decade. The dates were provided by Century Aluminum. County population estimates are for July 2003, and are from the US Bureau of Economic Analysis.

For example, Klickitat County in southern Washington has less than 20,000 residents. Payrolls fell dramatically in the county when the Goldendale smelter was idled in 2001,

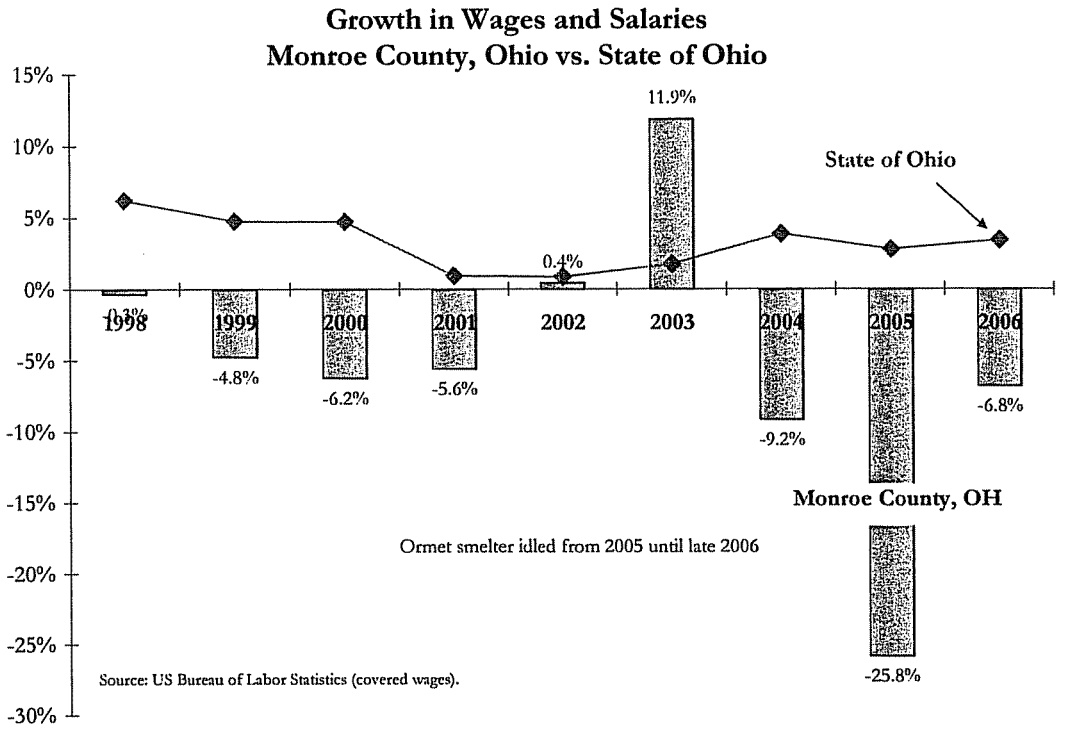


rose in 2002 when it was briefly restarted, and then fell in 2003 when it was idled again. Overall, wages and salaries in the county were $11 million lower in 2001 than in 2000. While this was a recessionary period nationally, note that payrolls in the State of Washington never failed to grow from year to year.

Similarly, the idling of the Dalles smelter in northern Oregon had a pronounced negative effect on payroll growth in Wasco County. While the State of Oregon posted payroll growth in 2003, Wasco County payrolls fell by 6.8 percent. Overall, wages and salaries in the county fell from $268 million to $245 million between 2001 and 2003. Some of the negative ripple effects in a county are offset by unemployment insurance payments to laid off workers. UI payments to unemployed workers living in Wasco County averaged about $3.7 million annually during the 1990s, but jumped to over $10 million in 2002 and 2003. This softened, but did not eliminate, the blow to the local economy.



We can also now see the effects of the closure of the large Ormet facility in Hannibal Ohio. The company emerged from bankruptcy in April 2005, but the Hannibal smelter lines had been operating well below capacity for two years prior. The facility was essentially idle from 2005 until late 2006, when it was restarted to take advantage of rising aluminum prices. Monroe County only has a population of about 15,000, so the local economy is very sensitive to the production and employment decisions of the major industry. BLS data show that wage and salary payments by all employers in Monroe County, Ohio were off about 9 percent in 2004, 26 percent in 2005, and 7 percent in 2006.

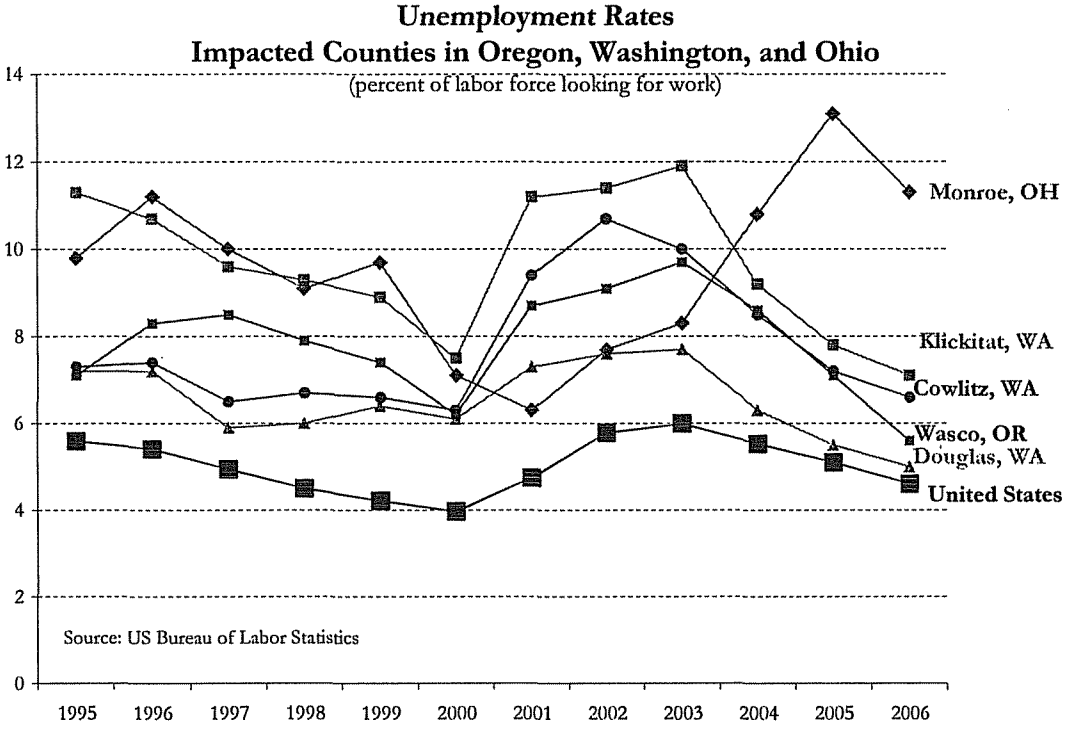


The effect of losing a large employer, particularly in a lightly populated county, goes far beyond the loss of payrolls. Often the company is the primary force in the local housing market, the largest contributor of property taxes to the local school system, the largest contributor of health care benefits and therefore the largest indirect customer of the local hospital, and the largest contributor of dollars and time to local charities. Moreover, when a large plant closes, not only do public revenues fall but public costs go up. Other statewide employers and employees must contribute to pay for the unemployment benefits to laid off workers, increased Medicaid costs as families lose income and health insurance coverage, and overall increased social services costs. Crime rates tend to rise with unemployment, as do alcohol and drug addiction. Local community and technical colleges see enrollments surge as laid off workers try to retrain. And major community investments must be made in economic development efforts to replace the lost engines.

The linkage between smelter closures and local unemployment is clear from the public data on the Northwestern and Ohio counties most impacted. In the next chart I provide the official estimates of unemployment rates in some of the counties in Oregon, Washington, and Ohio where an aluminum smelter shut-down during the first part of the decade. The national unemployment rate is also shown as a reference. One can see the effects of the 2001-02 recession, though the national unemployment rate only rose from four to six percent, before falling in 2004.

The unemployment rates in the five smaller impacted counties rose much higher. While all started with a higher pre-recession unemployment rate than did the US as a whole, note that the increase in the county unemployment rates was dramatic during 2001-03.

Klickitat County saw its unemployment rate rise by over three percentage points, from 8.9 to 11.9 percent. Wasco and Cowlitz counties saw a rise of about four percentage points. Monroe County, Ohio saw its unemployment rate double, from 6.3 percent in 2001 to a peak of over 13 percent in 2005. All rates remain above the national average.



The shut-downs in these counties are attributed to rising electricity prices and global competition. The current sensitivity of US aluminum smelting operations to world production capacity, electricity prices, and labor costs is evident in the declining number of viable operations. There are only around a dozen smelters now in operation in the US, including the two in Kentucky. This is down from over thirty smelters just twenty-five years ago. Moreover, aluminum prices are currently at near record highs. Given that there are so few US smelters operating during a time of such high aluminum prices suggests that production costs in the US have become uncompetitive relative to other countries.

Methodology

Because the aluminum and related manufacturing operations serve primarily national and international markets, they bring new dollars into the regional economy. In this sense, a shut-down of the two smelters would have large and predictable negative economic and fiscal impacts in western Kentucky, southern Indiana and throughout the two states. The activity supports thousands of jobs and millions of dollars in payrolls, and ultimately large tax revenues for Kentucky and Indiana state and local governments.

I use standard regional economic impact methods to evaluate the economic and fiscal impacts of the loss of the two plants. Region-specific economic multipliers were obtained from the federal government for the primary aluminum production industry. This industry

is defined according to the North American Industrial Classification System (NAICS) code 331312. The official definition is as follows:

> This U.S. industry comprises establishments primarily engaged in (1) making aluminum from alumina and/or (2) making aluminum from alumina and rolling, drawing, extruding, or casting the aluminum they make into primary forms (e.g., bar, billet, ingot, plate, rod, sheet, strip). Establishments in this industry may make primary aluminum or aluminum-based alloys from alumina.
>
> *www.census.gov/epcd/naics02/def/ND331312.HTM#N331312*

The multiplier set provides estimates of induced and indirect effects on sales, jobs, and payrolls for export-based expansions or contractions of any of 500 local industries. For example, the labor earnings multiplier for the primary aluminum production industry in the Evansville-Henderson-Owensboro economic area is 2.524, meaning that for every dollar of new export-based payroll created at a local aluminum smelter another $1.524 in payrolls are created in other sectors around the region. The job multiplier for the primary aluminum sector in the area is 3.549, meaning that for every new export-based job created at a smelter, another 2.549 jobs are created elsewhere in the region. (Similarly, for an aluminum rod mill, classified under NAICS 331319, the labor earnings multiplier is 3.058, and the job multiplier is 3.599.)

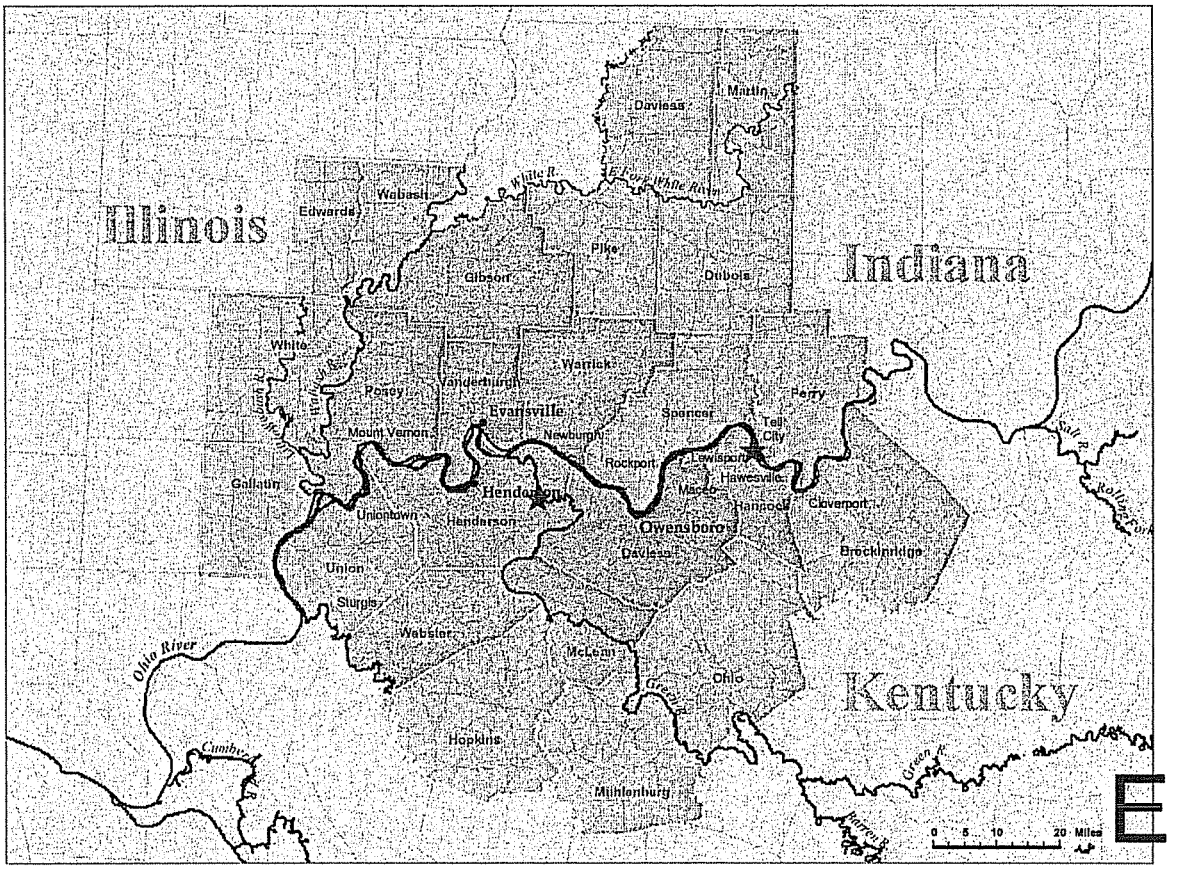
Regional economists often make the distinction between the indirect and induced components of a multiplier, and in some cases make separate estimates for each. The indirect effects refer to the linkages between the exporting industry (aluminum) and their industrial vendors (electricity, barges, tools, computers, insurance). When the directly impacted industry expands it raises its purchases from its vendors, thus lifting their employment and payrolls. The induced effects refer to the impact of the new export-based sales on the local economy through the rounds of re-spending of the additional consumer income caused by the expansion. Regional sales of cars, groceries, building supplies, banking services, and so on are all sensitive to growth in disposable income. In this study, I use only a total multiplier for the regional aluminum industry, one that summarizes both the indirect and induced effects on the economy.

There are no good national sources of data on which to make estimates of the fiscal impacts of a regional expansion or contraction. However, there are plentiful data available from state and local governments. I have compiled several years of tax receipts data from Kentucky and Indiana state governments, as well as tax information from city and county governments in the region. By comparing the growth in tax receipts to the growth in payrolls historically, I calculate 'effective' tax rates and use those to estimate the loss of income, sales, and occupational taxes due to the simulated loss of aluminum industry payrolls. The tax calculations are discussed in more detail in the section following our analysis of geographic issues.

Geographic Issues

While Hancock and Henderson counties are the sites for the plants, the economic and fiscal impacts will permeate a much larger region. In this section, I discuss various geographic measures and explain how the choice of study impact region was made.

Both counties are part of the greater Evansville-Owensboro-Henderson Economic Area, a 23-county region in Kentucky, Indiana, and Illinois, as defined by the US Bureau of Economic Analysis. The latest definitions for economic areas were released in 2004, and are based primarily on commuting patterns data from the 2000 Census. Hancock County



is also part of the Owensboro MSA, a three county designation. Henderson County is part of the Evansville-Henderson MSA, a six county designation.

The map shows the component counties, major cities, road and water features in the economic area. The red stars denote the approximate position of the Century and Alcan smelter plants All the counties shaded in gray or green are part of the economic area, while those with the darker green shading are also part of the Evansville-Henderson or Owensboro Metropolitan Statistical Areas. The economic area classification was developed by the US Bureau of Economic Analysis, and assigns all US counties to some regional economy. This broader definition is very useful in analyzing the markets for

labor, industrial supplies, major retail purchases, television and print media, air transportation, higher education, and major medical and professional services.

The latest population estimates are provided in the accompanying table. Note that the complete economic area has a population of about 756,000, with the Evansville-Henderson MSA accounting for 46 percent of the total, and the Owensboro MSA accounting for 15 percent of the total. Henderson County, right across the Ohio River from Evansville, has the fifth largest population of any county in the economic area. Hancock County has the third lowest population of any county.

Population of Evansville IN-KY Economic Area, 2006

Geocodes	County	Residents
18051	Gibson, IN	33,396
18129	Posey, IN	26,765
18163	Vanderburgh, IN	173,356
18173	Warrick, IN	57,090
21010	Henderson, KY	45,666
21233	Webster, KY	14,083
21780	Evansville, IN-KY Metropolitan Statistical Area	350,356
21059	Daviess, KY	93,613
21091	Hancock, KY	8,636
21149	McLean, KY	9,844
36980	Owensboro, KY Metropolitan Statistical Area	112,093
17047	Edwards, IL	6,617
17059	Gallatin, IL	6,159
17185	Wabash, IL	12,457
17193	White, IL	15,078
18027	Daviess, IN	30,220
18037	Dubois, IN	41,212
18101	Martin, IN	12,093
18123	Perry, IN	18,843
18125	Pike, IN	12,855
18147	Spencer, IN	20,596
21107	Hopkins, KY	46,830
21177	Muhlenberg, KY	31,561
21183	Ohio, KY	23,844
21225	Union, KY	15,371
57054	Evansville, IN-KY Economic Area	756,185

Source: US Census Bureau

The Evansville area also has a number of important aluminum operations, though it is beyond the scope of this study to analyze them. Warrick County, for example, is home to the giant Alcoa plant upstream from Evansville on the Ohio River. The plant has 2,100 employees, pays over $7 million in local property taxes annually, and purchases over $100 million in goods and services from vendors in the region. (www.alcoa.com/locations/usa_warrick/en/pdf/2007ReportToTheCommunity.pdf). The region as a whole is one of the biggest concentrations of aluminum production and downstream processing in the US. The plants are linked indirectly through the transportation, energy, auto parts sectors that are prevalent regionally.

Taxes and fiscal impacts

The plants generate an array of taxes for state and local governments. The value of real estate and tangible property is quite large, and thus the plants generate substantial property taxes for the state of Kentucky and Hancock and Henderson county governments, including the two county public school systems. The workers associated with the plant spend much of their income in the regional economy, generating state

income, state sales, and local occupational taxes. I provide estimates of all these tax flows below.

Additional tax impacts are also likely, though much harder to quantify. For example, proprietors and corporations around the region will be liable for state individual and corporate income taxes, and for some 'net profits' taxes in cities and counties where these are levied, e.g., the City of Owensboro, Kentucky. Gasoline taxes, coal severance taxes, unemployment insurance taxes, insurance premiums taxes, building permit fees, motor vehicle sales taxes, and many other business tax categories would see some decline due to plant shut-downs. Employees would pay less in the way of gasoline taxes, motor vehicle sales taxes, and there would be dampening effect on the regional real estate market. These categories are much harder to measure than the income and general sales taxes, but fortunately are not as important dollar-wise as the main taxes I do measure in this report.

Estimates of new Kentucky and Indiana state individual income and sales tax revenues are calculated by multiplying effective tax rates times the new regional payrolls. The ratios of state individual income taxes or sales taxes collected to wages and salaries are very stable historically. Using these ratios, or effective tax rates, is superior to using published nominal tax rates, as the amount of income or sales subject to taxation is always less than total income received and retail spending that occurs.

For example, groceries and prescription drugs are exempt from state sales tax in Kentucky, and hence one cannot simply multiply the statutory sales tax rate of six percent times expected retail sales. Similarly, individual income tax rates apply to 'adjusted gross income' or 'taxable income', rather than total income. In Kentucky, residents can deduct such things as medical expenses, mortgage interest payments, charitable contributions, and many other items from their gross income before calculating their tax liability. Looking at historical tax collections as a percentage of payrolls is a more reliable way to estimate the amount of taxes likely to be generated from future payroll growth. An appendix provides a summary of the effective tax rate calculations used in the impact assessment.

Impacts

In this section, I display and explain my estimates of the economic and fiscal impacts of the two aluminum smelters. I am essentially simulating what would happen if the two operations were removed from the region. In the first table, I organize data and estimates of the direct impacts of the two plants. That is, I am considering only the jobs, payrolls and taxes paid by the operations, and am not yet considering any spinoff effects in the regional economy.

Direct Annual Economic and Fiscal Impacts of Shut-down Two Aluminum Smelter Plants in Western Kentucky

	Direct Impacts	
1	Total jobs	1,413
2	Average pay per job	$54,013
3	Total wages and salaries	$76,320,358
4	Occupational taxes to Hancock and Henderson counties	$475,375
5	Kentucky state income taxes paid by employees	$3,707,423
6	Property and other taxes to Hancock and Henderson county governments	$274,540
7	Property and other taxes to Hancock and Henderson county public schools	$678,471
8	Property taxes to State of Kentucky	$677,424
9	Corporate income and license taxes, State of Kentucky	$3,758,000
10	Other taxes (fuel, sales, energy), State of Kentucky	$3,464,124
11	Subtotal: local governments in Kentucky	$1,428,386
12	Subtotal: Kentucky state government	$11,606,971
13	Total Kentucky state and local governments	$13,035,357

Source: RioTinto/Alcan and Century, except for Kentucky income tax, which is estimated by author.

The plants employ over 1,400 persons and have a combined annual payroll of over $76 million, excluding benefits. The companies and their employees pay over $11 million in taxes to Kentucky state government, and $1.4 million to county governments and local public school districts. All the entries except that on line 5 were provided by the two companies that own and operate the smelters. The companies do not know the amount of Kentucky state income taxes actually paid by their employees, since employees file income tax returns from their place of residence. Companies do withhold state income taxes from workers paychecks, but have no way of knowing how much additional tax employees end up paying, or how big of a tax refund they receive each year. To estimate the Kentucky state income taxes paid, I applied an effective income tax rate, one that was calculated by dividing Kentucky state income taxes paid by Kentucky wages and salaries earned. The rate is 4.86 percent of payrolls.

In the second table, I provide estimates of the total effects – direct plus spinoff. Here I use the economic multipliers to estimate the loss in jobs and payrolls regionally. Then I

use effective tax rates to estimate the additional loss in income and sales taxes to Kentucky state government.

Total Annual Economic and Fiscal Impacts of Shut-down Two Aluminum Smelter Plants in Western Kentucky

		Total Impacts
1	Lost jobs in region	5,015
2	Lost annual payroll in region	$192,663,112
3	Lost property taxes - county governments	$274,540
4	Lost property taxes - schools	$678,471
5	Lost property taxes - Kentucky state government	$677,424
6	Lost occupational taxes - local governments	$475,375
7	Lost Kentucky state income tax receipts	$5,461,885
8	Lost Kentucky state sales tax receipts	$2,018,434
9	Lost other Kentucky state taxes	$7,222,124
10	Subtotal: local governments in Kentucky	$1,428,386
11	Subtotal: Kentucky state government	$15,379,867
12	Total Kentucky state and local governments	$16,808,253

I estimate the total job loss in the region to be over 5,000 jobs, and the payroll loss to be $193 million annually. The total loss to Kentucky state government is much more than when considering only the direct impacts. I estimate that Kentucky would lose a total of $15.3 million in income and sales taxes due if the plants shut-down.

The Southwire rod mill employs around 250 persons, with a payroll of about $12 million annually. Should it also close, the additional negative economic impact in the region would be 890 jobs and $36 million in payroll. Kentucky state and local governments would lose at least an additional $1.5 million tax revenues annually.

References

US Bureau of Economic Analysis, *Regional Multipliers: A User Handbook for the Regional Input-Output Modeling System (RIMS II)*, 3rd edition, March 1997. http://www.bea.gov/bea/ARTICLES/REGIONAL/PERSINC/Meth/rims2.pdf

Kentucky Cabinet for Economic Development, "Profile of the Aluminum Industry in Kentucky", by Rene True, May 2005. www.thinkkentucky.com/kyedc/pdfs/Aluminum_Report.pdf

APPENDIX
State Individual Income and Sales Tax Revenues

I have calculated effective tax rates for both Kentucky and Indiana income and sales taxes, summarized in the table on the next page. I show these in two ways, one as a percentage of total regional wages and salaries, and second as a percentage of just the wages and salaries earned in each state. The effective state tax rate is obviously much smaller when the entire regional payroll is considered, since each state makes up only a fraction of the region. In the fiscal impact estimates provided, I use these state effective tax rates calculated as a percentage of the total regional payroll. Since the economic multiplier effects are analyzed over the entire 23-county economic area, we see the effect of the aluminum operations on wages and salaries throughout the region. Hence, the regional effective tax rates are more applicable.

Note that the Kentucky effective income tax rate is 1.51 percent. This means that Kentucky state government can expect to receive (lose) in income taxes that percentage of wages and salaries *in the region* when payrolls grow (shrink). Similarly, the Kentucky effective sales tax rate is 1.05 percent of wages and salaries in the region. The effective tax rates for Indiana state government are higher than for Kentucky state government, reflecting the higher proportion of payrolls, income taxes, and sales taxes on the Indiana side of the regional economy. The Kentucky effective income tax rate is higher than the effective sales tax rate, while in Indiana the effective sales tax rate is higher than the effective income tax rate. This reflects both Kentucky's higher income tax rate (topping at 6% compared to Indiana's which tops out at 3.4%), and the concentration of retail activity in Evansville.

Payrolls, State Income and Sales Tax Collections

County	Total Wages and Salaries, by County of Work (000) 2002	2003	2004	2005	State Income Tax, by County of Residence, 2003-05	State Sales Tax, by County of Sales, 2002-04
Edwards, Illinois	$87,446	$90,907	$95,688	$89,124		
Gallatin, Illinois	$38,589	$37,782	$40,907	$39,947		
Wabash, Illinois	$114,401	$113,448	$116,327	$111,630		
White, Illinois	$126,645	$129,351	$139,362	$145,731		
Daviess, Indiana	$256,773	$271,752	$291,220	$307,252	$34,167,461	$33,558,524
Dubois, Indiana	$853,414	$876,122	$926,429	$952,941	$70,249,934	$90,253,049
Gibson, Indiana	$513,141	$607,323	$685,589	$721,926	$44,031,362	$19,349,124
Martin, Indiana	$291,398	$320,210	$337,627	$355,263	$12,031,421	$7,870,134
Perry, Indiana	$176,820	$190,700	$205,553	$210,494	$22,080,591	$22,294,476
Pike, Indiana	$110,852	$115,985	$118,012	$114,574	$15,804,985	$3,631,982
Posey, Indiana	$381,375	$363,654	$388,818	$405,063	$41,435,217	$18,591,018
Spencer, Indiana	$231,135	$233,684	$232,911	$234,556	$27,376,425	$14,073,354
Vanderburgh, Indiana	$3,681,110	$3,754,300	$3,835,301	$3,976,329	$257,546,613	$409,747,139
Warrick, Indiana	$482,644	$483,899	$505,666	$512,861	$98,595,176	$18,758,270
Daviess, Kentucky	$1,234,149	$1,262,503	$1,305,724	$1,355,484	$191,506,805	$144,707,159
Hancock, Kentucky	$199,188	$195,236	$191,198	$190,662	$16,351,011	$8,615,342
Henderson, Kentucky	$671,676	$707,680	$712,218	$720,713	$87,386,408	$71,172,956
Hopkins, Kentucky	$506,715	$520,808	$541,003	$580,141	$82,007,794	$56,377,605
McLean, Kentucky	$41,511	$43,327	$45,756	$47,640	$16,228,715	$7,749,184
Muhlenberg, Kentucky	$281,595	$282,920	$285,291	$284,742	$43,133,053	$22,341,670
Ohio, Kentucky	$149,296	$160,420	$174,913	$189,066	$30,354,070	$14,073,550
Union, Kentucky	$169,559	$165,660	$166,579	$174,574	$26,773,725	$16,663,691
Webster, Kentucky	$123,383	$113,869	$116,020	$129,220	$24,254,023	$6,353,833
Evansville, IN-KY Economic Area	$10,722,815	$11,041,540	$11,458,112	$11,849,933	$1,141,314,790	$986,182,061
Kentucky subtotal - 9 counties	$3,377,072	$3,452,423	$3,538,702	$3,672,242	$517,995,604	$348,054,991
Indiana subtotal - 10 counties	$6,978,662	$7,217,629	$7,527,126	$7,791,259	$623,319,186	$638,127,070
Kentucky effective tax rate, collections as percent of Economic Area payroll					***1.51%***	***1.05%***
Kentucky effective tax rate, collections as percent of KY payroll					***4.86%***	***2.49%***
Indiana effective tax rate, collections as percent of Economic Area payroll					***1.81%***	***1.92%***
Indiana effective tax rate, collections as percent of IN payroll					***2.77%***	***2.94%***

Sources: Wages and salaries from the US Bureau of Economic Analysis (www.bea.gov). State income and sales tax data are from the Indiana and Kentucky Departments of Revenue. Kentucky sales tax collection data only available for 2003; I assume it is representative of 2002 through 2004, and multiply by three. Also. county sales tax collections data adjusted up to account for out-of-state collections (primarily due to multi-county establishments, e.g., Walmarts).

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR A GENERAL ADJUSTMENT IN RATES	)))	**CASE NO. 2011-00036**

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO BIG RIVERS ELECTRIC CORPORATION FIRST DATA REQUEST PSC CASE NO. 2011-00036 June 22, 2011

Request BREC-15.
Please identify and provide each analysis, workpaper, calculation, input and document that Dr. Coomes relies upon to support Attachment 1 to his direct testimony.

RESPONSE

All data sources, methods, and calculations have been documented within the report (Attachment 1) on the enclosed CD.

Witness: Paul Coomes

The Estimated Economic and Fiscal Impacts of a Shut-down of Kentucky's Two Aluminum Smelters

by
Paul A. Coomes, Ph.D.
Consulting Economist

a research report for
Century Aluminum and Rio Tinto

January 22, 2008

Executive Summary

Kentucky has two aluminum smelters, one near Hawesville and the other about fifty miles west at Sebree. These smelters are major employers and taxpayers in the greater Owensboro-Henderson-Evansville regional economy. Should electricity prices rise sufficiently these two plants could be closed, as have several this decade in Oregon, Washington and Ohio. The effects of smelter shut-downs on small communities in the Northwest and Ohio are clear, with rising unemployment, a falling tax base, and newspaper reports of spillovers to housing and retail markets, as well as increased social problems.

The two Kentucky smelters together employ around 1,400 persons, who collectively earn over $115 million annually in wages, salaries, and benefits. I have used regional data and industry-specific multipliers to estimate the negative economic and fiscal impacts of such a possible shut-down. I estimate that the total net annual loss in the region would be 5,000 jobs and $193 million in wages and salaries. State and local governments in Kentucky would lose nearly $17 million annually. These estimates are for the economic and fiscal categories most easily quantified. There would be many other negative impacts, though they are harder to measure with any precision. Local real estate and retail markets would likely be depressed, unemployment and crime rates would rise, retraining and social services costs would increase, and many ancillary tax revenues would fall as economic activity in the region diminished.

Background and Methodology

There are two aluminum smelters in Kentucky, one operated by Century near Hawesville and the other by Rio Tinto (formerly Alcan) at Sebree. Smelters can demand as much electricity load as a mid-sized city. With low cost power available to many new international aluminum smelters, the economic viability of these two Kentucky smelters depends critically on the cost of electricity. Shutting down the smeltering operations would jeopardize the viability of related business activities, both upstream and downstream. Among the supporting industries that would be affected are river barges (that bring in alumina), electricity producers, engineering firms, maintenance contractors,

trucking firms, and the other vendors to the smelting plants. Downstream, the smelters supply raw aluminum to rolling and extruding mills in the region, which are clustered to support wire plants, auto parts plants, can factories, and other heavy aluminum users in the region. The Southwire Rod and Cable Mill, adjacent to the Hawesville smelter, could be immediately shut-down if the smelter were to close, since its current business model depends upon the low costs associated with immediate access to molten aluminum that meets its stringent purity specifications.

The smelters and related aluminum processing operations are among the largest employers in the Owensboro-Henderson-Evansville economic area. The two companies are interested in learning about and documenting the regional economic importance of the operations, so they can better communicate the ramifications of rising electricity costs should prices reach a threshold such that the smelting operations were financially threatened. The purpose of this report is to document and communicate the regional economic and fiscal importance of these aluminum plants.

Importance to Hancock and Henderson counties, entire region

It is not hard to see in publicly available data how important aluminum is to the regional economy. In the next two tables, I have organized information on the largest industrial employers in Hancock and Henderson counties, as currently displayed on the web site of the Kentucky Cabinet for Economic Development. I have highlighted in red the firms that produce or process aluminum. Note that in Hancock County three out of four of the top employers are aluminum-related. The Century smelter is the second largest manufacturing employer in the county. Similarly, in Henderson County two of the top four manufacturing employers are aluminum-related. The Rio Tinto (listed under its former name, Alcan) smelter is the fourth largest employer in Henderson County.

Largest Industrial Employers, Hancock County

Firm	Products	Employment	Date established
Aleris Rolled Products	Coils, aluminum tubing & flexible conduits	848	1966
Century Aluminum of Kentucky LLC	Aluminum castings, sows & smelting	771	1967
Domtar Corporation	Fine paper and mills bleach pulp.	470	1967
Southwire Company Kentucky Plant	Aluminum wire strand & aluminum redraw rod &	280	1969
Dal-Tile Corp	Quarry tile	110	1959
Roll Coater Inc	Steel & coil painting & coating service	100	1989
McElroy Metal Inc	Steel fabricating	25	1964
Precision Roll Grinders Inc	Roller repair & precision cylindrical grinding	25	1998
Yager Materials LLC	Ready-mixed concrete	16	1964
Maxwell Brothers Lumber Co	Sawing rough lumber, cross ties, pallet cants	16	1984
Hancock County Ready-Mix	Sand & gravel, ready-mix concrete	15	1964
Crescent Paper Tube Co Inc	Paper tubes	10	1990
Southern Shores Terminal	River terminal	8	1999
Wroe Pallet & Skids Corp	Wooden pallets & skids	7	1985
Bluegrass Industrial Minerals LLC	Processes raw sand into high quality silica	5	2005

Source: Kentucky Economic Development Cabinet, December 2007 (www.thinkkentucky.com/edis/cmnty/cmntyindex.htm)

There are about 368,000 private sector jobs in the region, of which 71,000 are in the manufacturing sector. Due to confidentiality laws, the federal statistical agencies do not disclose enough data to accurately measure the total aluminum-related employment and payroll in the region. But using some published and unpublished estimates, it seems likely that primary aluminum and aluminum-processing operations account for about 4,000 of the region's manufacturing jobs. Clearly, aluminum production and processing are critical to the health of the regional economy.

Largest Industrial Employers, Henderson County

Firm	Products	Employment	Date established
Tyson Foods Inc	Chicken slaughtering, processing & packaging	1,350	1995
Gibbs Die Casting Corp	Aluminum & magnesium die castings, headquarters	1,000	1966
Dana Corporation	Truck axles & brake components	700	1970
Alcan Primary Metal Group	Aluminum extrusion billets & ingots	629	1972
Vincent Industrial Plastics Inc	Custom plastic injection molding, decorating and assembly, injection mold	300	1981
Sunspring America Inc	Nonferrous & zinc die castings and PVD coating	285	1956
Accuride Corp	Truck wheels & rims	234	1973
Brenntag Mid-South Inc	Chemical blending, industrial chemical distribution	175	1947
Sights Denim Systems Inc	Denim finishing	171	1995
Audubon Metals LLC	Heavy-media separator and secondary specification aluminum alloy producer.	160	1996
Atlantis Plastics Inc	Thermoplastics & plastic injection molding, finishing, fabricating & subcontract	147	1951
Sitex Corporation	Headquarters and uniform supply service	130	1961
Columbia Sportswear Company	Distribution facility	130	2004
Cresline Plastic Pipe Co Inc	Plastic pipe & fittings	120	1966
Service Tool & Plastics	Injection molded plastics	120	1977
Sonoco	Aluminum & steel can ends	120	1967
Hugh E Sandefur Industries Inc	Vocational rehabilitation, manufacturing plant producing corrugated products;	100	1967
Royster's Machine Shop LLC	Machine shop: general & CNC machining, drilling, boring, cutting, honing,	95	1975
J-Ron Inc	Machine shop: mill & lathe work, plastic injection molding, CNC & EDM	80	1980
Weyerhaeuser Co	Recycled linerboard	74	1994

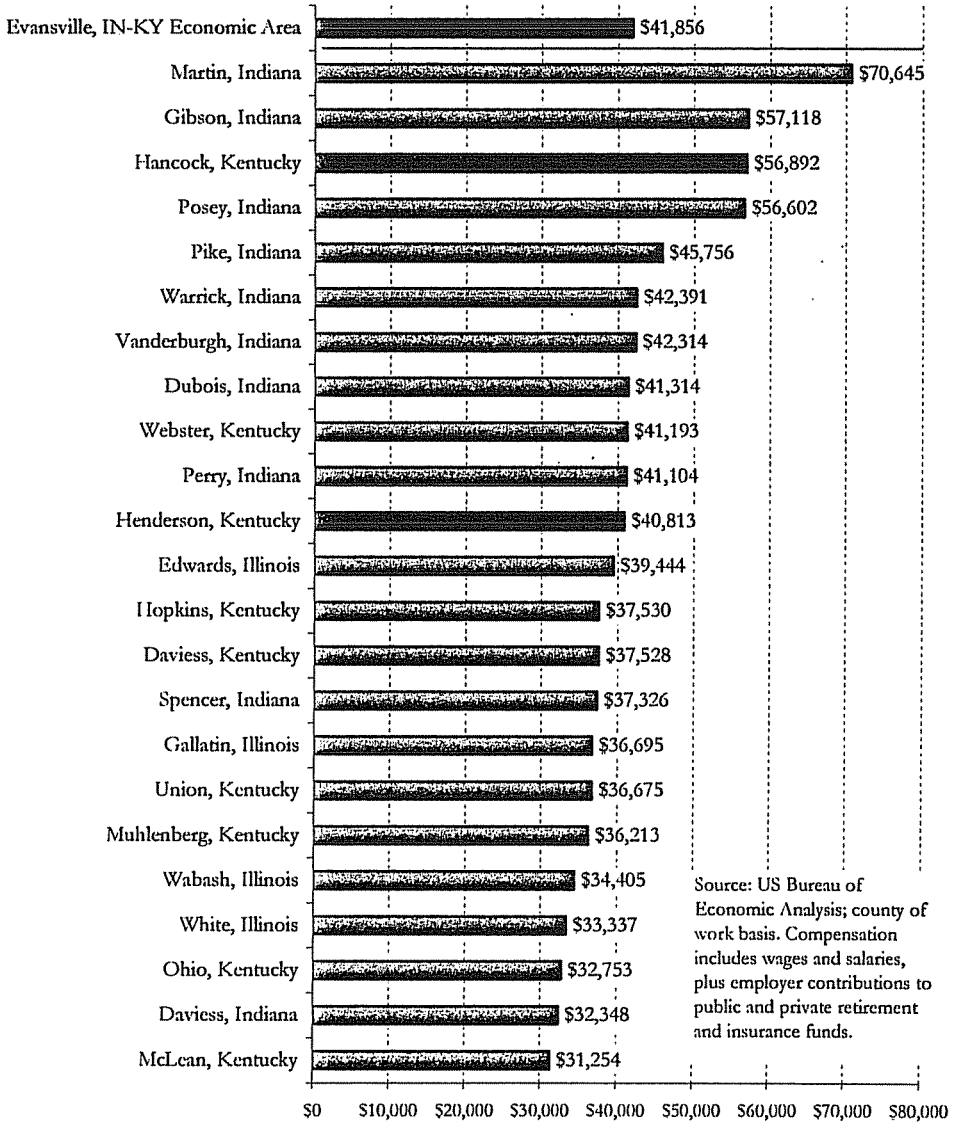
Source: Kentucky Economic Development Cabinet, December 2007 (www.thinkkentucky.com/edis/cmnty/cmntyindex.htm)

Moreover, the two smelter operations are crucial components of the tax and economic base in Hancock and Henderson counties. The Century operation in Hawesville accounts for over twenty percent of all wages and salaries earned in Hancock County, contributing a similar share of the county's occupational tax receipts. The Hawesville plant also accounts for about fifteen percent of all property taxes collected to support the Hancock County Public School system and county government operations. The Alcan operation accounts for almost five percent of wages and salaries in (much more populated) Henderson County, and about three percent of all property taxes collected for public schools and county government. Rio Tinto is the largest single taxpayer in Henderson County.

The importance of the aluminum-related jobs in the region stems from (a) their large number, (b) their linkages to other jobs in upstream and downstream industries, and (c) their high average pay and benefits. Average pay at the Rio Tinto and Century facilities is $54,000 per job. Company-provided benefits for health insurance, unemployment insurance, worker's compensation insurance, vacations, retirement, payroll taxes and the like boost this to over $80,000 per job.

The concentration of many such aluminum-related jobs in Hancock and Henderson counties puts those two in the top half in the region in terms of earnings per job. The relationship is particularly easy to see in Hancock County, as the county is lightly populated and aluminum is the most important industry. At $56,892, Hancock is third highest among counties in the region in terms of total compensation per job. Henderson County ranks near the middle in terms of compensation per job. Warrick County, home to the large Alcoa smelter and electricity plant, ranks sixth highest.

Average Compensation per Job, 2005
Evansville-Owensboro-Henderson Economic Area



Case study: smelter shut-downs in the Northwest and Ohio

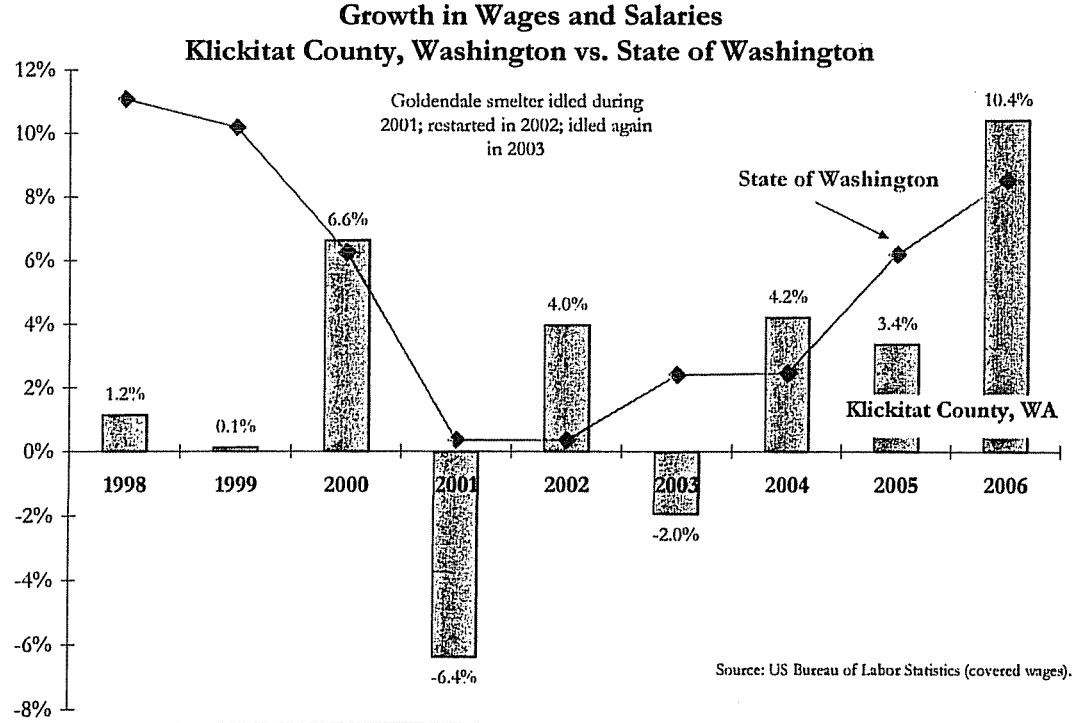
One indication of the regional economic importance of an aluminum smelter is the effect that plant closures have had on small and mid-sized communities in Washington, Oregon, Montana, and Ohio. Some of the plants idled this decade are in heavily populated areas, with many other major employers, and hence the effect of a shut-down would be harder to detect in county-level economic data. But several are in lightly populated counties, and a plant shut-down should ripple hard through the local community.

Northwest Smelters Idled or Closed Permanently This Decade

Company (location)	County	County Population	idled or shut-down quarter	restart quarter
Alcoa Intalco (Ferndale, Washington)	Whatcom	174,066	2001 I	2002 II
Alcoa (Wenatchee, Washington)	Douglas	33,261	2001 I	2004 IV
Glencore (Vancouver, Washington)	Clark	379,985	2000 II	
Golden Northwest (Goldendale, Washington)	Klickitat	19,393	2000 IV	
Kaiser (Mead, Washington)	Spokane	427,287	2001 I	
Reynolds (Longview, Washington)	Cowlitz	94,544	2001 I	
Kaiser (Tacoma, Washington)	Pierce	740,472	2000 II	
Golden Northwest (Dalles, Oregon)	Wasco	23,579	2000 IV	
Reynolds (Troutdale, Oregon)	Multnomah	675,438	2000 II	
Glencore (Columbia Falls, Montana)	Flathead	79,476	2001 I	2002 II

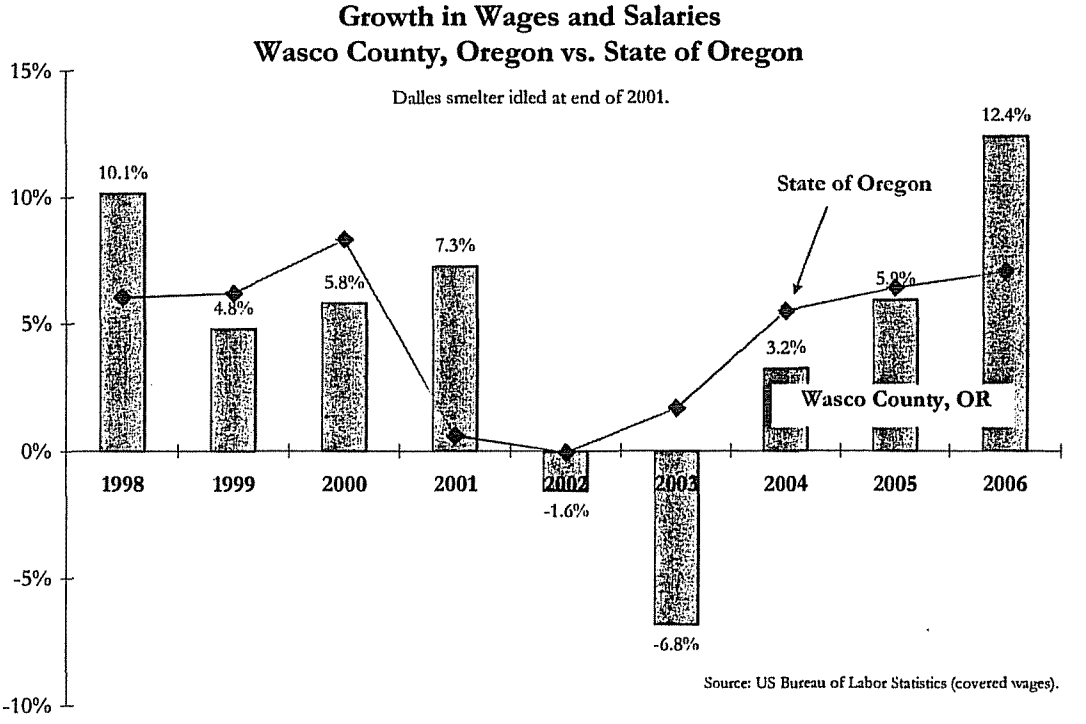
The table provides summary data for ten smelters in the Northwest that were idled this decade. The dates were provided by Century Aluminum. County population estimates are for July 2003, and are from the US Bureau of Economic Analysis.

For example, Klickitat County in southern Washington has less than 20,000 residents. Payrolls fell dramatically in the county when the Goldendale smelter was idled in 2001,

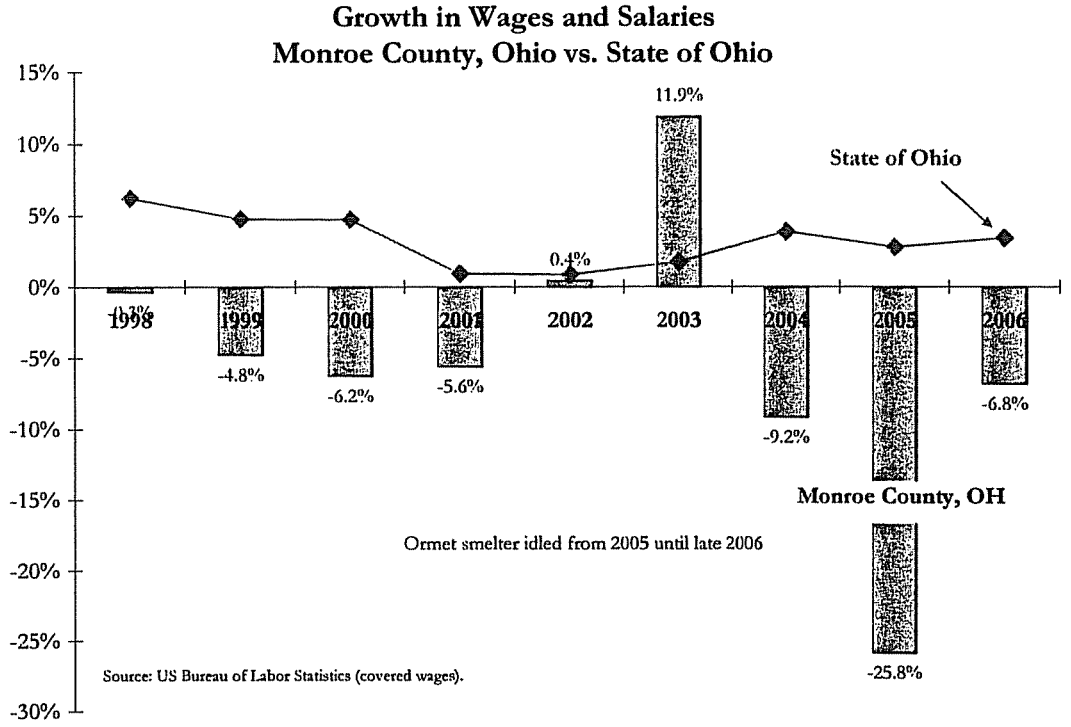


rose in 2002 when it was briefly restarted, and then fell in 2003 when it was idled again. Overall, wages and salaries in the county were $11 million lower in 2001 than in 2000. While this was a recessionary period nationally, note that payrolls in the State of Washington never failed to grow from year to year.

Similarly, the idling of the Dalles smelter in northern Oregon had a pronounced negative effect on payroll growth in Wasco County. While the State of Oregon posted payroll growth in 2003, Wasco County payrolls fell by 6.8 percent. Overall, wages and salaries in the county fell from $268 million to $245 million between 2001 and 2003. Some of the negative ripple effects in a county are offset by unemployment insurance payments to laid off workers. UI payments to unemployed workers living in Wasco County averaged about $3.7 million annually during the 1990s, but jumped to over $10 million in 2002 and 2003. This softened, but did not eliminate, the blow to the local economy.



We can also now see the effects of the closure of the large Ormet facility in Hannibal Ohio. The company emerged from bankruptcy in April 2005, but the Hannibal smelter lines had been operating well below capacity for two years prior. The facility was essentially idle from 2005 until late 2006, when it was restarted to take advantage of rising aluminum prices. Monroe County only has a population of about 15,000, so the local economy is very sensitive to the production and employment decisions of the major industry. BLS data show that wage and salary payments by all employers in Monroe County, Ohio were off about 9 percent in 2004, 26 percent in 2005, and 7 percent in 2006.

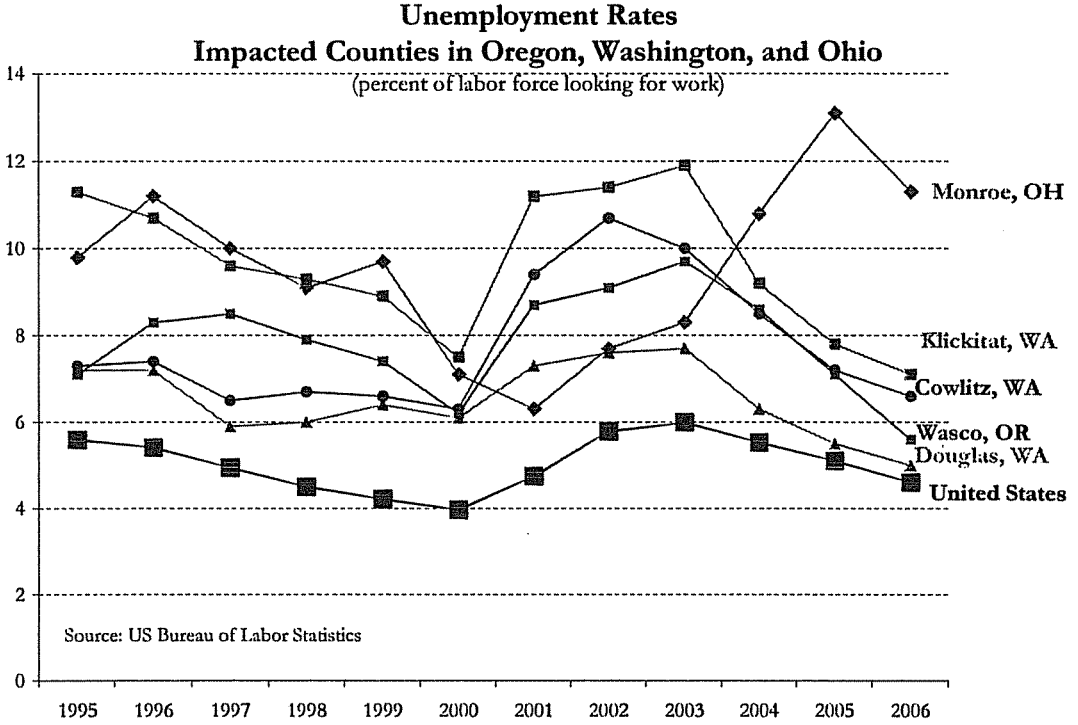


The effect of losing a large employer, particularly in a lightly populated county, goes far beyond the loss of payrolls. Often the company is the primary force in the local housing market, the largest contributor of property taxes to the local school system, the largest contributor of health care benefits and therefore the largest indirect customer of the local hospital, and the largest contributor of dollars and time to local charities. Moreover, when a large plant closes, not only do public revenues fall but public costs go up. Other statewide employers and employees must contribute to pay for the unemployment benefits to laid off workers, increased Medicaid costs as families lose income and health insurance coverage, and overall increased social services costs. Crime rates tend to rise with unemployment, as do alcohol and drug addiction. Local community and technical colleges see enrollments surge as laid off workers try to retrain. And major community investments must be made in economic development efforts to replace the lost engines.

The linkage between smelter closures and local unemployment is clear from the public data on the Northwestern and Ohio counties most impacted. In the next chart I provide the official estimates of unemployment rates in some of the counties in Oregon, Washington, and Ohio where an aluminum smelter shut-down during the first part of the decade. The national unemployment rate is also shown as a reference. One can see the effects of the 2001-02 recession, though the national unemployment rate only rose from four to six percent, before falling in 2004.

The unemployment rates in the five smaller impacted counties rose much higher. While all started with a higher pre-recession unemployment rate than did the US as a whole, note that the increase in the county unemployment rates was dramatic during 2001-03.

Klickitat County saw its unemployment rate rise by over three percentage points, from 8.9 to 11.9 percent. Wasco and Cowlitz counties saw a rise of about four percentage points. Monroe County, Ohio saw its unemployment rate double, from 6.3 percent in 2001 to a peak of over 13 percent in 2005. All rates remain above the national average.



The shut-downs in these counties are attributed to rising electricity prices and global competition. The current sensitivity of US aluminum smelting operations to world production capacity, electricity prices, and labor costs is evident in the declining number of viable operations. There are only around a dozen smelters now in operation in the US, including the two in Kentucky. This is down from over thirty smelters just twenty-five years ago. Moreover, aluminum prices are currently at near record highs. Given that there are so few US smelters operating during a time of such high aluminum prices suggests that production costs in the US have become uncompetitive relative to other countries.

Methodology

Because the aluminum and related manufacturing operations serve primarily national and international markets, they bring new dollars into the regional economy. In this sense, a shut-down of the two smelters would have large and predictable negative economic and fiscal impacts in western Kentucky, southern Indiana and throughout the two states. The activity supports thousands of jobs and millions of dollars in payrolls, and ultimately large tax revenues for Kentucky and Indiana state and local governments.

I use standard regional economic impact methods to evaluate the economic and fiscal impacts of the loss of the two plants. Region-specific economic multipliers were obtained from the federal government for the primary aluminum production industry. This industry

is defined according to the North American Industrial Classification System (NAICS) code 331312. The official definition is as follows:

> This U.S. industry comprises establishments primarily engaged in (1) making aluminum from alumina and/or (2) making aluminum from alumina and rolling, drawing, extruding, or casting the aluminum they make into primary forms (e.g., bar, billet, ingot, plate, rod, sheet, strip). Establishments in this industry may make primary aluminum or aluminum-based alloys from alumina.
>
> *www.census.gov/epcd/naics02/def/ND331312.HTM#N331312*

The multiplier set provides estimates of induced and indirect effects on sales, jobs, and payrolls for export-based expansions or contractions of any of 500 local industries. For example, the labor earnings multiplier for the primary aluminum production industry in the Evansville-Henderson-Owensboro economic area is 2.524, meaning that for every dollar of new export-based payroll created at a local aluminum smelter another $1.524 in payrolls are created in other sectors around the region. The job multiplier for the primary aluminum sector in the area is 3.549, meaning that for every new export-based job created at a smelter, another 2.549 jobs are created elsewhere in the region. (Similarly, for an aluminum rod mill, classified under NAICS 331319, the labor earnings multiplier is 3.058, and the job multiplier is 3.599.)

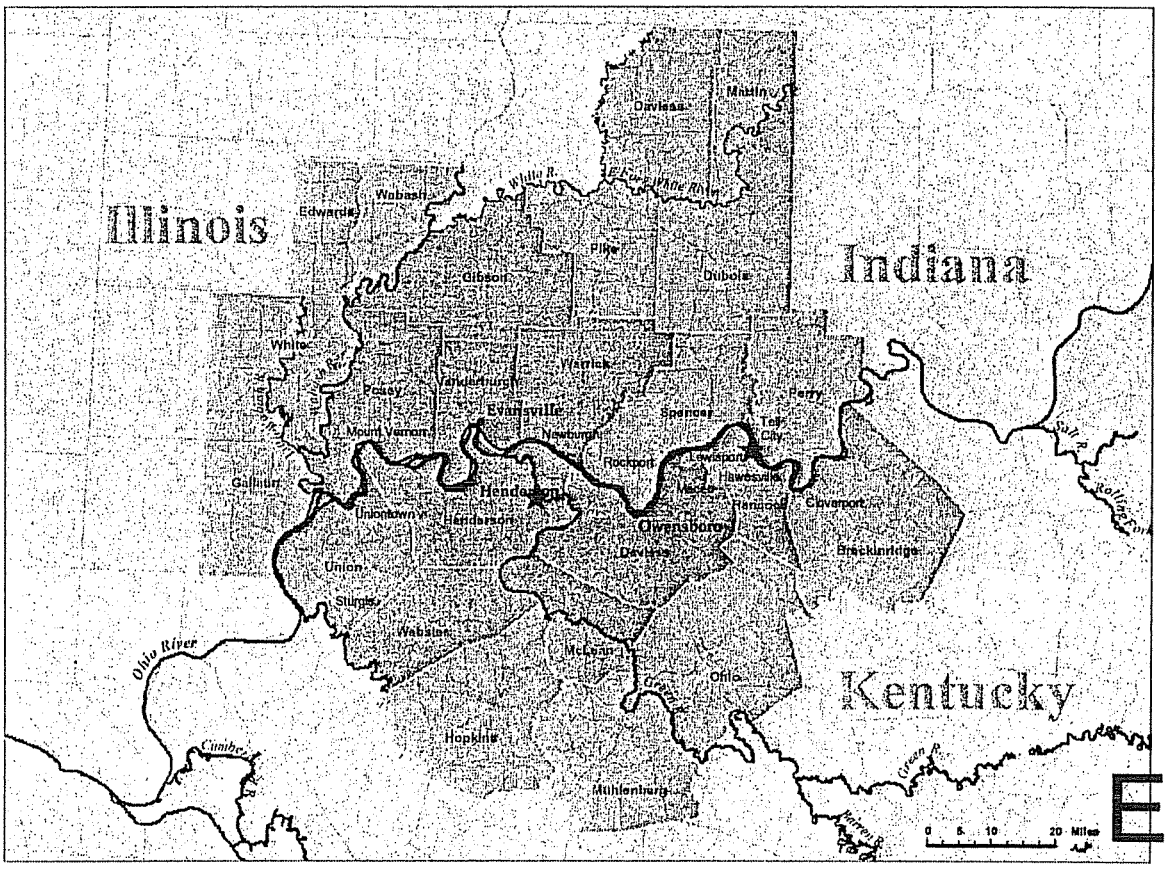
Regional economists often make the distinction between the indirect and induced components of a multiplier, and in some cases make separate estimates for each. The indirect effects refer to the linkages between the exporting industry (aluminum) and their industrial vendors (electricity, barges, tools, computers, insurance). When the directly impacted industry expands it raises its purchases from its vendors, thus lifting their employment and payrolls. The induced effects refer to the impact of the new export-based sales on the local economy through the rounds of re-spending of the additional consumer income caused by the expansion. Regional sales of cars, groceries, building supplies, banking services, and so on are all sensitive to growth in disposable income. In this study, I use only a total multiplier for the regional aluminum industry, one that summarizes both the indirect and induced effects on the economy.

There are no good national sources of data on which to make estimates of the fiscal impacts of a regional expansion or contraction. However, there are plentiful data available from state and local governments. I have compiled several years of tax receipts data from Kentucky and Indiana state governments, as well as tax information from city and county governments in the region. By comparing the growth in tax receipts to the growth in payrolls historically, I calculate 'effective' tax rates and use those to estimate the loss of income, sales, and occupational taxes due to the simulated loss of aluminum industry payrolls. The tax calculations are discussed in more detail in the section following our analysis of geographic issues.

Geographic Issues

While Hancock and Henderson counties are the sites for the plants, the economic and fiscal impacts will permeate a much larger region. In this section, I discuss various geographic measures and explain how the choice of study impact region was made.

Both counties are part of the greater Evansville-Owensboro-Henderson Economic Area, a 23-county region in Kentucky, Indiana, and Illinois, as defined by the US Bureau of Economic Analysis. The latest definitions for economic areas were released in 2004, and are based primarily on commuting patterns data from the 2000 Census. Hancock County



is also part of the Owensboro MSA, a three county designation. Henderson County is part of the Evansville-Henderson MSA, a six county designation.

The map shows the component counties, major cities, road and water features in the economic area. The red stars denote the approximate position of the Century and Alcan smelter plants All the counties shaded in gray or green are part of the economic area, while those with the darker green shading are also part of the Evansville-Henderson or Owensboro Metropolitan Statistical Areas. The economic area classification was developed by the US Bureau of Economic Analysis, and assigns all US counties to some regional economy. This broader definition is very useful in analyzing the markets for

labor, industrial supplies, major retail purchases, television and print media, air transportation, higher education, and major medical and professional services.

The latest population estimates are provided in the accompanying table. Note that the complete economic area has a population of about 756,000, with the Evansville-Henderson MSA accounting for 46 percent of the total, and the Owensboro MSA accounting for 15 percent of the total. Henderson County, right across the Ohio River from Evansville, has the fifth largest population of any county in the economic area. Hancock County has the third lowest population of any county.

Population of Evansville IN-KY Economic Area, 2006

Geocodes	County	Residents
18051	Gibson, IN	33,396
18129	Posey, IN	26,765
18163	Vanderburgh, IN	173,356
18173	Warrick, IN	57,090
21010	Henderson, KY	45,666
21233	Webster, KY	14,083
21780	Evansville, IN-KY Metropolitan Statistical Area	350,356
21059	Daviess, KY	93,613
21091	Hancock, KY	8,636
21149	McLean, KY	9,844
36980	Owensboro, KY Metropolitan Statistical Area	112,093
17047	Edwards, IL	6,617
17059	Gallatin, IL	6,159
17185	Wabash, IL	12,457
17193	White, IL	15,078
18027	Daviess, IN	30,220
18037	Dubois, IN	41,212
18101	Martin, IN	12,093
18123	Perry, IN	18,843
18125	Pike, IN	12,855
18147	Spencer, IN	20,596
21107	Hopkins, KY	46,830
21177	Muhlenberg, KY	31,561
21183	Ohio, KY	23,844
21225	Union, KY	15,371
57054	Evansville, IN-KY Economic Area	756,185

Source: US Census Bureau

The Evansville area also has a number of important aluminum operations, though it is beyond the scope of this study to analyze them. Warrick County, for example, is home to the giant Alcoa plant upstream from Evansville on the Ohio River. The plant has 2,100 employees, pays over $7 million in local property taxes annually, and purchases over $100 million in goods and services from vendors in the region. (www.alcoa.com/locations/usa_warrick/en/pdf/2007ReportToTheCommunity.pdf). The region as a whole is one of the biggest concentrations of aluminum production and downstream processing in the US. The plants are linked indirectly through the transportation, energy, auto parts sectors that are prevalent regionally.

Taxes and fiscal impacts

The plants generate an array of taxes for state and local governments. The value of real estate and tangible property is quite large, and thus the plants generate substantial property taxes for the state of Kentucky and Hancock and Henderson county governments, including the two county public school systems. The workers associated with the plant spend much of their income in the regional economy, generating state

income, state sales, and local occupational taxes. I provide estimates of all these tax flows below.

Additional tax impacts are also likely, though much harder to quantify. For example, proprietors and corporations around the region will be liable for state individual and corporate income taxes, and for some 'net profits' taxes in cities and counties where these are levied, e.g., the City of Owensboro, Kentucky. Gasoline taxes, coal severance taxes, unemployment insurance taxes, insurance premiums taxes, building permit fees, motor vehicle sales taxes, and many other business tax categories would see some decline due to plant shut-downs. Employees would pay less in the way of gasoline taxes, motor vehicle sales taxes, and there would be dampening effect on the regional real estate market. These categories are much harder to measure than the income and general sales taxes, but fortunately are not as important dollar-wise as the main taxes I do measure in this report.

Estimates of new Kentucky and Indiana state individual income and sales tax revenues are calculated by multiplying effective tax rates times the new regional payrolls. The ratios of state individual income taxes or sales taxes collected to wages and salaries are very stable historically. Using these ratios, or effective tax rates, is superior to using published nominal tax rates, as the amount of income or sales subject to taxation is always less than total income received and retail spending that occurs.

For example, groceries and prescription drugs are exempt from state sales tax in Kentucky, and hence one cannot simply multiply the statutory sales tax rate of six percent times expected retail sales. Similarly, individual income tax rates apply to 'adjusted gross income' or 'taxable income', rather than total income. In Kentucky, residents can deduct such things as medical expenses, mortgage interest payments, charitable contributions, and many other items from their gross income before calculating their tax liability. Looking at historical tax collections as a percentage of payrolls is a more reliable way to estimate the amount of taxes likely to be generated from future payroll growth. An appendix provides a summary of the effective tax rate calculations used in the impact assessment.

Impacts

In this section, I display and explain my estimates of the economic and fiscal impacts of the two aluminum smelters. I am essentially simulating what would happen if the two operations were removed from the region. In the first table, I organize data and estimates of the direct impacts of the two plants. That is, I am considering only the jobs, payrolls and taxes paid by the operations, and am not yet considering any spinoff effects in the regional economy.

Direct Annual Economic and Fiscal Impacts of Shut-down Two Aluminum Smelter Plants in Western Kentucky

	Direct Impacts	
1	Total jobs	1,413
2	Average pay per job	$54,013
3	Total wages and salaries	$76,320,358
4	Occupational taxes to Hancock and Henderson counties	$475,375
5	Kentucky state income taxes paid by employees	$3,707,423
6	Property and other taxes to Hancock and Henderson county governments	$274,540
7	Property and other taxes to Hancock and Henderson county public schools	$678,471
8	Property taxes to State of Kentucky	$677,424
9	Corporate income and license taxes, State of Kentucky	$3,758,000
10	Other taxes (fuel, sales, energy), State of Kentucky	$3,464,124
11	Subtotal: local governments in Kentucky	$1,428,386
12	Subtotal: Kentucky state government	$11,606,971
13	Total Kentucky state and local governments	$13,035,357

Source: RioTinto/Alcan and Century, except for Kentucky income tax, which is estimated by author.

The plants employ over 1,400 persons and have a combined annual payroll of over $76 million, excluding benefits. The companies and their employees pay over $11 million in taxes to Kentucky state government, and $1.4 million to county governments and local public school districts. All the entries except that on line 5 were provided by the two companies that own and operate the smelters. The companies do not know the amount of Kentucky state income taxes actually paid by their employees, since employees file income tax returns from their place of residence. Companies do withhold state income taxes from workers paychecks, but have no way of knowing how much additional tax employees end up paying, or how big of a tax refund they receive each year. To estimate the Kentucky state income taxes paid, I applied an effective income tax rate, one that was calculated by dividing Kentucky state income taxes paid by Kentucky wages and salaries earned. The rate is 4.86 percent of payrolls.

In the second table, I provide estimates of the total effects – direct plus spinoff. Here I use the economic multipliers to estimate the loss in jobs and payrolls regionally. Then I

use effective tax rates to estimate the additional loss in income and sales taxes to Kentucky state government.

Total Annual Economic and Fiscal Impacts of Shut-down Two Aluminum Smelter Plants in Western Kentucky

		Total Impacts
1	Lost jobs in region	5,015
2	Lost annual payroll in region	$192,663,112
3	Lost property taxes - county governments	$274,540
4	Lost property taxes - schools	$678,471
5	Lost property taxes - Kentucky state government	$677,424
6	Lost occupational taxes - local governments	$475,375
7	Lost Kentucky state income tax receipts	$5,461,885
8	Lost Kentucky state sales tax receipts	$2,018,434
9	Lost other Kentucky state taxes	$7,222,124
10	Subtotal: local governments in Kentucky	$1,428,386
11	Subtotal: Kentucky state government	$15,379,867
12	Total Kentucky state and local governments	$16,808,253

I estimate the total job loss in the region to be over 5,000 jobs, and the payroll loss to be $193 million annually. The total loss to Kentucky state government is much more than when considering only the direct impacts. I estimate that Kentucky would lose a total of $15.3 million in income and sales taxes due if the plants shut-down.

The Southwire rod mill employs around 250 persons, with a payroll of about $12 million annually. Should it also close, the additional negative economic impact in the region would be 890 jobs and $36 million in payroll. Kentucky state and local governments would lose at least an additional $1.5 million tax revenues annually.

References

US Bureau of Economic Analysis, *Regional Multipliers: A User Handbook for the Regional Input-Output Modeling System (RIMS II)*, 3rd edition, March 1997. http://www.bea.gov/bea/ARTICLES/REGIONAL/PERSINC/Meth/rims2.pdf

Kentucky Cabinet for Economic Development, "Profile of the Aluminum Industry in Kentucky", by Rene True, May 2005. www.thinkkentucky.com/kyedc/pdfs/Aluminum_Report.pdf

APPENDIX
State Individual Income and Sales Tax Revenues

I have calculated effective tax rates for both Kentucky and Indiana income and sales taxes, summarized in the table on the next page. I show these in two ways, one as a percentage of total regional wages and salaries, and second as a percentage of just the wages and salaries earned in each state. The effective state tax rate is obviously much smaller when the entire regional payroll is considered, since each state makes up only a fraction of the region. In the fiscal impact estimates provided, I use these state effective tax rates calculated as a percentage of the total regional payroll. Since the economic multiplier effects are analyzed over the entire 23-county economic area, we see the effect of the aluminum operations on wages and salaries throughout the region. Hence, the regional effective tax rates are more applicable.

Note that the Kentucky effective income tax rate is 1.51 percent. This means that Kentucky state government can expect to receive (lose) in income taxes that percentage of wages and salaries *in the region* when payrolls grow (shrink). Similarly, the Kentucky effective sales tax rate is 1.05 percent of wages and salaries in the region. The effective tax rates for Indiana state government are higher than for Kentucky state government, reflecting the higher proportion of payrolls, income taxes, and sales taxes on the Indiana side of the regional economy. The Kentucky effective income tax rate is higher than the effective sales tax rate, while in Indiana the effective sales tax rate is higher than the effective income tax rate. This reflects both Kentucky's higher income tax rate (topping at 6% compared to Indiana's which tops out at 3.4%), and the concentration of retail activity in Evansville.

Payrolls, State Income and Sales Tax Collections

County	Total Wages and Salaries, by County of Work (000) 2002	2003	2004	2005	State Income Tax, by County of Residence, 2003-05	State Sales Tax, by County of Sales, 2002-04
Edwards, Illinois	$87,446	$90,907	$95,688	$89,124		
Gallatin, Illinois	$38,589	$37,782	$40,907	$39,947		
Wabash, Illinois	$114,401	$113,448	$116,327	$111,630		
White, Illinois	$126,645	$129,351	$139,362	$145,731		
Daviess, Indiana	$256,773	$271,752	$291,220	$307,252	$34,167,461	$33,558,524
Dubois, Indiana	$853,414	$876,122	$926,429	$952,941	$70,249,934	$90,253,049
Gibson, Indiana	$513,141	$607,323	$685,589	$721,926	$44,031,362	$19,349,124
Martin, Indiana	$291,398	$320,210	$337,627	$355,263	$12,031,421	$7,870,134
Perry, Indiana	$176,820	$190,700	$205,553	$210,494	$22,080,591	$22,294,476
Pike, Indiana	$110,852	$115,985	$118,012	$114,574	$15,804,985	$3,631,982
Posey, Indiana	$381,375	$363,654	$388,818	$405,063	$41,435,217	$18,591,018
Spencer, Indiana	$231,135	$233,684	$232,911	$234,556	$27,376,425	$14,073,354
Vanderburgh, Indiana	$3,681,110	$3,754,300	$3,835,301	$3,976,329	$257,546,613	$409,747,139
Warrick, Indiana	$482,644	$483,899	$505,666	$512,861	$98,595,176	$18,758,270
Daviess, Kentucky	$1,234,149	$1,262,503	$1,305,724	$1,355,484	$191,506,805	$144,707,159
Hancock, Kentucky	$199,188	$195,236	$191,198	$190,662	$16,351,011	$8,615,342
Henderson, Kentucky	$671,676	$707,680	$712,218	$720,713	$87,386,408	$71,172,956
Hopkins, Kentucky	$506,715	$520,808	$541,003	$580,141	$82,007,794	$56,377,605
McLean, Kentucky	$41,511	$43,327	$45,756	$47,640	$16,228,715	$7,749,184
Muhlenberg, Kentucky	$281,595	$282,920	$285,291	$284,742	$43,133,053	$22,341,670
Ohio, Kentucky	$149,296	$160,420	$174,913	$189,066	$30,354,070	$14,073,550
Union, Kentucky	$169,559	$165,660	$166,579	$174,574	$26,773,725	$16,663,691
Webster, Kentucky	$123,383	$113,869	$116,020	$129,220	$24,254,023	$6,353,833
Evansville, IN-KY Economic Area	$10,722,815	$11,041,540	$11,458,112	$11,849,933	$1,141,314,790	$986,182,061
Kentucky subtotal - 9 counties	$3,377,072	$3,452,423	$3,538,702	$3,672,242	$517,995,604	$348,054,991
Indiana subtotal - 10 counties	$6,978,662	$7,217,629	$7,527,126	$7,791,259	$623,319,186	$638,127,070
Kentucky effective tax rate, collections as percent of Economic Area payroll					***1.51%***	***1.05%***
Kentucky effective tax rate, collections as percent of KY payroll					***4.86%***	***2.49%***
Indiana effective tax rate, collections as percent of Economic Area payroll					***1.81%***	***1.92%***
Indiana effective tax rate, collections as percent of IN payroll					***2.77%***	***2.94%***

Sources: Wages and salaries from the US Bureau of Economic Analysis (www.bea.gov). State income and sales tax data are from the Indiana and Kentucky Departments of Revenue. Kentucky sales tax collection data only available for 2003; I assume it is representative of 2002 through 2004, and multiply by three. Also. county sales tax collections data adjusted up to account for out-of-state collections (primarily due to multi-county establishments, e.g., Walmarts).

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR A GENERAL ADJUSTMENT IN RATES	)))	**CASE NO. 2011-00036**

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO BIG RIVERS ELECTRIC CORPORATION FIRST DATA REQUEST PSC CASE NO. 2011-00036 June 22, 2011

Request BREC-16
Please refer to Mr. Fayne's testimony, page 9 Line 3; Exhibit HWF-1. The exhibit lists 9 smelters. The testimony notes that there are 10 smelters in the U.S. Please update the table in the exhibit to include the data for the "tenth smelter" not included in the filed Exhibit.

RESPONSE

The missing smelter is Massena East, which began operation in 2011, and is expected to produce approximately 87,000 tons and have a cost of electricity in the range of $25-$26/MWh. Please see Exhibit HWF-1 Revised included in the enclosed CD.

Witness: Henry W. Fayne

Exhibit HWF-1 Revised

ALUMINUM SMELTERS
COST OF ELECTRICITY
FOR THE YEAR 2011

	Smelter	Company Owner	Smelter Production (000 TPY)	Cost of Electricity [1] ($/Mwh)
1	Mt. Holly	Century	229.0	52.26
2	Ferndale	Italco	143.5	49.71
3	Hawesville	Century	199.2	45.22
4	Sebree	Alcan	196.0	43.45
5	New Madrid	Noranda	263.0	39.45
6	Warrick	Alcoa	271.9	31.81
7	Massena East	Alcoa	87.0	26.00
8	Hannibal	Ormet	180.9	24.20
9	Massena West	Alcoa	130.0	23.01
10	Wenatchee	Alcoa	99.9	13.48
	TOTAL USA		**1,800.4**	**37.01**
	GLOBAL (Excl USA & China)		**25,403.7**	**26.28**

[1] For the Hawesville and Sebree smelters, the cost reflected reflects actual charges from Kenergy for the year 2010. For all other smelters, the data was provided by CRU, an independent business analysis and consultancy group focused on mining, metals, power, cables, fertilizer and chemical sectors.

If the rates requested by Big Rivers is approved and both smelters operate at full production, the cost of electricity for the Hawesville and Sebree smelters would be $47.86/MWh.

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR A GENERAL ADJUSTMENT IN RATES	)))	**CASE NO. 2011-00036**

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO BIG RIVERS ELECTRIC CORPORATION FIRST DATA REQUEST PSC CASE NO. 2011-00036 June 22, 2011

Request BREC-17

Please refer to Mr. Fayne's testimony, page 23, Line 15 - page 24, Line 6 and page 20, Line 14. The witness calls for a statewide solution that provides support from a larger population. Have the Smelters taken any steps in Kentucky or elsewhere to effectuate such a solution at any time since 2000? If yes, please identify and describe each such step. If no, please explain why not.

RESPONSE

Under the terms of the power agreements in effect prior to the Unwind, both smelters had competitive power prices, which made the need for a statewide solution unnecessary. To build a foundation for a possible statewide solution that would be required if electric prices continued to escalate, both smelters have had numerous informational meetings with state and local officials to explain the dynamics of the aluminum industry and the importance of reliable, predictably priced low cost electricity to support the long term viability of the smelters in Kentucky. The unanticipated magnitude of the current and future rate increases projected by Big Rivers as well as Big Rivers' recent evaluation of the impact of environmental legislation is what drives the current need for a statewide solution.

Witness: Henry W. Fayne

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR A GENERAL ADJUSTMENT IN RATES	)))	**CASE NO. 2011-00036**

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO BIG RIVERS ELECTRIC CORPORATION FIRST DATA REQUEST PSC CASE NO. 2011-00036 June 22, 2011

Request BREC-18

Refer to page 10 of Mr. Leblanc's testimony, lines 1 through 5.

a. Other than Big Rivers, its Members, the Smelters, and Kentucky Government officials, please list any other parties whom Mr. Leblanc believes should "agree on a permanent solution."

b. Please fully describe the parameters of "a permanent solution" envisioned by the Smelters.

RESPONSE

a. The parties who should agree on a permanent solution will depend on the scope and definition of the solution fashioned. For example, if the solution is intended to address all energy intensive industries in Kentucky, the solution must be supported by all parties affected, including other utilities and other industrials in addition to the parties identified in the question.

b. A permanent solution envisioned by the Smelters would provide the Smelters with a globally competitive cost of electricity over the long term.

Witnesses: Henry W. Fayne
Stephane Leblanc

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR A GENERAL ADJUSTMENT IN RATES	)))	**CASE NO. 2011-00036**

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO BIG RIVERS ELECTRIC CORPORATION FIRST DATA REQUEST PSC CASE NO. 2011-00036 June 22, 2011

Request BREC-19

Refer to page 19 of Mr. Fayne's testimony, line 10 through 14.

a. Please identify and provide a copy of all documents, including but not limited to press releases, newspaper reports, agreements, contracts, *etc.*, documenting the New York Power Authority's "approach" for maintaining the continuing operation of Alcoa's Massena smelter.

b. To Mr. Fayne's knowledge, has Alcoa maintained its commitment "to make capital intensive investments in the facilities and to maintain a minimum number of jobs"? If not, why not?

RESPONSE

a. Attachment BREC-19A includes a copy of (1) New York Power Authority (NYPA) press release dated January 29, 2008, which describes the approval of the agreement in principle; (2) Transcript of New York Governor David A. Paterson's press conference marking the approval of a new long-term contract between NYPA and Alcoa to secure North Country jobs, dated January 12, 2009; and (3) NYPA press release dated January 31,2011 discussing the agreement for Massena East. Additional press releases can be found on www.nypa.gov. (See attached on enclosed CD).

Attachment BREC-19B is a copy of the long-term contract for Massena East. (See attached on enclosed CD).

b. The new contract becomes effective in 2013. To the best of Mr. Fayne's knowledge, Alcoa is still planning to honor its commitment regarding capital investment and maintenance of jobs.

Witness: Henry W. Fayne

New York Power Authority

NEWS

NYPA Trustees Approve Agreement in Principle With Alcoa Toward Hydropower Contract and Preservation of Jobs and Capital Investment in North Country

Contact:
Michael Saltzman
914-390-8181
michael.saltzman@nypa.gov

January 29, 2008

FOR IMMEDIATE RELEASE

WHITE PLAINS—The New York Power Authority (NYPA) Tuesday took an important step toward a formal contract with Alcoa for the aluminum manufacturer's continued receipt of low-cost hydropower at its two Massena facilities and long-term commitment to Northern New York.

The NYPA Board of Trustees ratified an Agreement in Principle for the continued supply of hydropower to Alcoa from the Power Authority's St. Lawrence-Franklin D. Roosevelt Power Project. The company would commit to retain 1,065 jobs initially at its Massena operations and at least 900 jobs over a 30-year contract term beginning on July 1, 2013. It would also invest approximately $600 million for a major modernization and overhaul of its Massena East smelter (formerly owned by Reynolds Metals).

"Few assets in the North Country are of greater importance to the region's economy than the St. Lawrence-FDR project, whose low-cost electricity has been integral to Massena's aluminum manufacturing industries since the project began harnessing the power of the St. Lawrence River in 1958," said Roger B. Kelley, NYPA president and chief executive officer. "The Agreement in Principle announced last month by Governor Spitzer reflects the extraordinary value of this power for preserving jobs and promoting investment, and puts us on solid footing for a new long-term contract with Alcoa."

Kelley noted that a new contract would, for the first time, establish fixed job commitments that Alcoa would be required to meet in a manner similar to arrangements the Power Authority now has with virtually all of its business customers throughout the state. Alcoa would continue to benefit from 478 megawatts (mw) of hydropower (374 mw of firm power and 104 mw of interruptible power) over the 30-year contract term and would have an option to extend the contract for an additional 10 years under certain economic conditions.

As another first in NYPA's long relationship with Alcoa, the power rates would be linked, in part, to the price of aluminum on the world market. This would allow NYPA and Alcoa to share in the benefits of higher market prices and provide the company with protection against lower prices for its products.

Under the Agreement in Principle, Alcoa has two years from its signing of the agreement on Dec. 21,

2007 to conduct an engineering study on the proposed rebuilding of the Massena East smelter. The Agreement in Principle (or the power supply contract if it has been executed) would be canceled if the company decided not to proceed with the overhaul.

Alcoa would create a $10 million North Country Economic Development Fund after it committed to rebuild the smelter. The fund, which would be jointly administered by NYPA and another entity specified by New York State, would be used exclusively for economic development in St. Lawrence, Franklin, Essex, Jefferson, Lewis, Hamilton and Herkimer counties and for the Akwasasne Mohawk Reservation.

After the power supply contract is negotiated, it will be submitted to the NYPA trustees and the Alcoa Board of Directors for their approvals, followed by a public hearing. The contract must also be approved by Governor Spitzer.

About NYPA:

■ *NYPA uses no tax money or state credit. It finances its operations through the sale of bonds and revenues earned in large part through sales of electricity.* ■ *NYPA is a leader in promoting energy-efficiency, new energy technologies and electric transportation initiatives.* ■ *It is the nation's largest state-owned electric utility, with 18 generating facilities in various parts of the state and more than 1,400 circuit-miles of transmission lines.*

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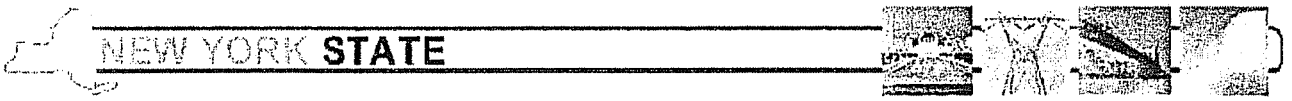

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Video Transcript

Video transcript of New York Governor David A. Paterson's press conference marking the approval of a now long-term contract between NYPA and Alcoa to secure North Country jobs, Massena, N.Y.

January 12, 2009

Wes Oberholzer, Location Manager for Massena Primary Metals:

Well good morning and welcome to our Alcoa. I'm Wes Oberholzer. I'm the Location Manager here for Massena Primary Metals. And on behalf of Alcoa and specifically the eleven hundred very hard working Alcoans that make up Massena Primary, it is an honor to have you here with us on this very special day. Where you are right now, you're in an area we call the Massena West Casthouse. And this is a plant where we take the molten aluminum that we produce and turn it into a semi-finished product. These semi-finished products find their way into end applications ranging from automobiles, to tractor trailers, to M1 Abrams tanks, to commercial aircraft. So needless to say, we are pretty proud of what we do here in Massena Primary. And it is now my honor to introduce the Governor of the State of New York, Governor Paterson. So please join me in welcoming Governor Paterson to Massena.

Governor David A. Paterson:

Thank you Wes and thank all of you for coming today to what I think will be an historic announcement. One that will make us all proud and one that will definitely show that in this area and the North Country that we are going to be going in the opposite direction that so many unfortunate areas in the country are today. I first want to recognize my colleagues in government, State Senator Joseph Grippo who joins us this morning, and Senator Darrell Aubertine is here. I want to send regrets from Assemblywoman Anne Russell who is trapped in an airport in Albany, I know that feeling, and could not make her flight up here today. Assemblywoman Dee Dee Scozzafava is here with us today. We are also happy that there will be input from the Mayor of Massena, Randy Delosh and Massena Town Supervisor, Gary Edwards. We would not want to leave out the St. Lawrence County Administrator, Karen St. Hilaire. And we understand that we will be joined as well by Chief James Ransom of the St. Regis Mohawk Tribe. I want to recognize the Executive Vice President of Alcoa and President of Primary Products, Bernt Reitan who is here this morning. We have our colleagues in labor, unfortunately the North East Regional Director of the United Steel Workers, William Pienta will not be able to join us this morning but we are joined by United Steel Workers President of Local Board 20A, Larry Richard and United Steel Workers Branch President of 450A, Richard Orton. I also want to thank my colleagues in government the President and CEO of the New York Power Authority, Richard Kessel, the Acting Chair of the Power Authority Mike Townsend; we are also joined this morning happily by one of the trustees, Eugene Nicandri and also by our upstate Empire State Development Chair, Dennis Mullen.

All through the 19th and 20th centuries New York has been moving forward with great achievements such as the Erie Canal and the power sitings right here in North Country and St. Lawrence County. And at all times we have tried to move quickly and responsively to revitalize the economy of New York State. Now we have the problem of a huge fiscal deficit, an unprecedented escalating deficit that continues to apostate a lot of our activity. But in our economic development and revitalization when we are able to get past this difficult period we still have to lay out an economic development policy and practice for the future. And that practice will really be in many respects, to bring clean and renewable energy to our different regions to replace the traditional fuels to revitalize our economy by repairing our infrastructure which has not happened in this country for nearly fifty years. We're going to have to lower the cost of doing business. We're going to have to do

something about the property taxes which are escalating in so many areas around the state where there are unfunded mandates presented by the state government. We're going to have to alleviate them. And for local governments that are too costly, we're going to have to find ways to make them more efficient. In addition, we want to certainly take a look at reforming our empire zones so that they are more structured and more effective revitalizing our economy with targeted investments in places like right here in the North Country. So in that regard, one of the most important aspects of our plan is going to be to make sure that some of our partners, our private partners are able to continue doing business in New York State and that's exactly what we're going to do this morning.

Aluminum is a very rare and very interesting metal on the periodic table, the element is number 13. In the 19th century it was considered to be the most precious of the valuable metals and in the administration of Napoleon the 3rd while he was still around when they had guest and head of state dinners they actually gave the most special guest aluminum utensils and the other guest unfortunately had to eat with gold utensils. So aluminum is going to be more than a valued commodity in our administration. It's going to be a catalyst for economic development. And so it has been that Alcoa has produced 11% of the manufacturing jobs in this area. They have created three thousand jobs when you include their suppliers. And have found the most creative ways, even more creative than Napoleon, to use aluminum.

The fact is that most of our clean energy items and areas that we are moving in terms of solar insulation, wind turbines, and weatherized doors and windows that Alcoa's produced come from aluminum itself. So it's very important that we preserve their ability to do business in this region, in this marketplace and that's where we felt we were headed last December when former Governor Elliot Spitzer came right here to announce an agreement between NYPA and Alcoa. Just last month the NYPA board of trustees has ratified that agreement, today I will sign a memorandum meaning that we now will have a contract between NYPA and aluminum for the next thirty to forty years.

The basis for this agreement is to bring opportunity for Alcoa for as long as they want it. And to bring jobs to people here in the North Country forever. And so when we look at the agreement, what will happen is NYPA will make 478 megawatts of hydropower available to Alcoa for the next thirty years with an option to extend it to forty years at a very low cost. In exchange, Alcoa will spend six hundred million dollars building a new East Plant to go along with the West Plant Casthouse where we hold this event today. And the East Plant will insure that nine hundred to a thousand jobs here at Alcoa stay right here in this region.

The construction that will be under gone by Alcoa will bring six to nine hundred jobs in the next few years in the construction industry as we build this plant and it will also create an opportunity when the plant is built that Alcoa will invest ten million dollars in the North Country Economic Development Fund to create further jobs in this area. And on top of that in building the new East Plant, it will be environmentally friendly. So I want to wish Alcoa the best as it operates right here in Massena, in St. Lawrence County and in New York State. This is an immense opportunity for all of us through the ratification and signing of this agreement. I would now like to introduce the Executive Vice President of Alcoa and the President of its Primary Products, please welcome Bernt Reitan.

Bernt Reitan, Executive Vice President of Alcoa and the President of its Primary Products:

Good morning and thank you so much Governor Paterson and on behalf of Alcoa, welcome to Massena. We have been here since 1902 that's a hundred and six years ago making aluminum, the oldest operating aluminum facility in the world. I'm thrilled that all of you could join us in celebrating yet another big day for the North Country. Long term, reliable, competitively priced power is the life blood of an aluminum smelter. It's these ingredients that have attracted Alcoa in northern New York more than a century ago. It is also why this power contract is so critical to our future in the North Country. It's not only the price we pay for power that's important but the fact that the power source is reliable and as the Governor said renewable and provides a continuous supply is vital and will become even more important in the future.

We have the New York Power Authority to thank for one of the most stable power supplies

in the country. And we have the State of New York and many of those dedicated people who serve the state to thank for allowing us to plan for the future and look forward to investing into our facilities here. As you all know, we gathered here a little over a year ago to announce that an agreement in principle had been reached between Alcoa and the New York Power Authority on a new long term hydro-power contract. Since that announcement, dedicated and hard working teams from both the Power Authority and Alcoa have labored to turn that simple agreement into the detailed contract that sits before Governor Paterson today. I want to thank the Power Authority for committing the people and resource for that to happen as well as our own teams.

Today the State of New York celebrates its commitment to the North Country and paves the way for us to take the final steps to present an investment plan to our Alcoa board. We began detail planning work on a modernization project for the East Plant Smelter immediately after we reached this agreement.

Dozens of Alcoans have devoted a lot of time and energy to that planning. There is still much work to be done but we have every intention of presenting a product that is cost effective, sustainable, good for our employees, good for this community and respectful of the environment to the Alcoa Board of Directors for their approval. While our industry and the entire world is facing some tough economic times at the moment, we firmly believe that this market will turn around and the demand for aluminum will once again escalate. And Massena has a good owner in Alcoa. We are the inventors of the aluminum process, we have been in it since 1888, we are the number one aluminum company in the world and we are strongly committed to making aluminum. Not only metal but also fabricated to aircraft parts, automotive parts and so on. We want to position ourselves to take advantage of moving forward with the Massena Modernization Project, which has been as I said, the longest serving production facility so far and now it looks like probably becoming one of the longest serving going forward. Another two generations to look forward to in Massena.

Alcoa is a global company with locations throughout the world, as you might be able to tell by my Norwegian accent. When we consider investments we look across the planet to see where we can gain the most benefit for our shareholders while maintaining our values and being a good corporate citizen.

With the spirit of cooperation we have experienced with the Governor's office, the Power Authority and our elected officials in this community we can now take the next step finalizing the engineering plans and cost estimates in order to present the entire modernization project to our Board of Directors for approval. So many people have worked hard to bring us to this contract signing today. It would be impossible to recognize them all but there are a few I want to mention. Governor Paterson, we will be ever grateful for your recognition of the process that has been made on this contract and your commitment to the people of the North Country to see it through to the end. Thank you very much for your leadership.

And Richie Kessel, although you are a new friend to us, you have already proven to be a very good friend. And we look forward to a long partnership with you and the Power Authority. Our elected officials, you have kept your eye on the prize for many years and guided and supported us and others as we worked toward today. Thank you for your commitment to the North Country and your dedication to making this happen.

And the Massena community your steadfast support has never wavered and in fact, helped carry us through to the celebration today. Thank you all very much. And my fellow Alcoans and Wes insist that he has the best work force in all Alcoa. And I can see why. I want to thank each and every one of you for the hard work you do, everyday for Alcoa. It isn't always easy but days like today make it all worth while. So thank you again Governor Paterson for coming here today to sign this important agreement. We are looking forward to a bright future in the North Country. Thank you very much..... Thank you.

Governor Paterson:

We have been joined by the Deputy Secretary for Energy in our administration Paul DeCotis. Please welcome him. Now I would like to introduce an old friend of mine who has come to work with us as President and CEO of the New York Power Authority. He was actually present right here in 1902 when the first Alcoa plant opened, Richie Kessel.

Richard Kessel, President and CEO of the New York Power Authority:

Thank you Governor it's great to be back in Massena. I've only been on the job actually less than three months and I've been here three times already and I love the North Country. And so does Governor Paterson and he will remember that back in the spring when the Governor first spoke to me about coming to the New York Power Authority he said, "You have to focus on upstate New York, there are huge challenges up there" and that was a commitment that he wanted to see followed through. And I think, you know I've worked for several Governors and the extraordinary leadership and talent of Governor Paterson, in being here today, in putting together a team that could put this all together, I think we should all give him another round of applause for the great job that he does. I'll let the 1902 remark pass by. But when I got here I did see you, we had a good meeting up there. Anyway I just wanted to recognize a few people and say a couple of words. But I do want to recognize our Chairman of the New York Power Authority, Mike Townsend and also your friend the friend of the North Country who when I first met him said, "what are you going to do for Alcoa?" Judge Nicandri, Gene Nicandri.

I also want to recognize two people in the media, one of whom I met for the first time and lectured me about what do Long Islanders know about the North Country and said "I want you to do one thing and we'll work together great and that's Alcoa," so I want to recognize John B. Johnson and Chuck Kelly for your dedication and support of this, thank you very much. And I also just want to recognize, Governor there are some terrific staff people at the New York Power Authority who helped put this together with Alcoa. Mike Huvane, Jim Yates, Don Russak, Paul Finnegan and Gil Quiniones, thank you everyone from NYPA for this great job that you did.

I just want to indicate that the Governor gave you details of this agreement, but this is what the New York Power Authority is all about, and I travel the state. I've spent more than half of my time traveling throughout upstate New York and we know what the challenges are. At NYPA our job is to help with low cost power and economic development programs that can help companies as large as Alcoa and as small as the small business technology company that's opening up in Buffalo, that's what the New York Power Authority was created to do. And our job at NYPA working with Governor Paterson and Paul DeCotis' administration is to reach into these communities whether it's Massena, Watertown, Ogdensburg or North Tonawanda, Buffalo, Syracuse, Solvay, Schenectady and see where we can help, where we can target economic development and cheaper power. Because as the Governor pointed out, one of the big problems and challenges in business is that upstate New York and practically thoughout the country right now are energy and the cost of energy. And we need to be able to bring together the cost of energy with the cleanest in an environmentally green energy to make a difference. And that's why we have a leader like Governor Paterson who last week in the State of the State released and announced a major program to combine renewable energy and energy efficiency together so that by the year 2015 we are less dependent on fossil fuel and more dependent on the kind of energy that not only is cheaper but is better for future generations, and that's really what NYPA's call is. And the Governor and I were up at the Economic Summit up in Montreal and we got to do something with Hydro-Quebec, and we are in the throws of negotiation and on behalf of the Governor to see if we can come up with a deal to bring more additional hydro power in addition to the power that we're getting from the St. Lawrence facility and the power that we're giving back, the 487 megawatts of power to Alcoa. This is all about jobs and I just want to thank all of the workers. I used to head the Long Island Power Authority and the workers do all of the great things. You know we get some of the accolades but it's the people that do the day to day work that deserve our credit so let's hear it for all the workers that make this place operate for what it is.

Finally, I want to say thank you to everyone. We're going to be back to Massena time and time again to see where else we can help. We've got a lot of things going including helping to distribute some of the aquarium money, the megawatts that have been reserved up here. Judge twenty megawatts or is it twenty-two now? I know you're trying to get the two megawatts. But we are going to be as helpful as we can be. We want to help the North Country move forward. Thank you very much, everyone.

Governor Paterson:

Representing the United Steel Workers and we have a number of steel workers here today. We would not be able to do any of this without them, Larry Richards.

Larry Richards, representing the United Steel Workers:

Good morning. First I would like to thank the Governor for including us in his schedule to come to the North Country to sign this historical document. This gets us one step closer to our goal of keeping these good paying jobs in the North Country for potentially up to 2053. There's a special meaning to me come February 19th, local 420 will be celebrating their 75th anniversary working for Alcoa. Two thousand and fifty three, two thousand and fifty three, that can be a hundred and nineteen years that must be some kind of record. Also I would like to recognize that 450 this fall will be celebrating their fiftieth anniversary with Alcoa, quite an achievement. I also would like to extend a special thank you to my union brothers and sisters in local 420 and 450 for the hard work, keeping these facilities competitive. And together we want to thank everyone for their efforts that got us here today. Thank you.

Governor Paterson:

Well last year was this Legislator's first year in the, well actually two years ago was his first year in the New York State's Senate. And what the majority leader would do in the New York State Senate is they would take whoever's the newest person and make them act as the Temporary President, which meant that they had to preside over the proceedings. As Lieutenant Governor I was the one who presided over the Senate and when I left I always turned the gavel over to this gentlemen but I always said to him that he always made me feel like Wally Pipp. And for those of you who don't know, Wally Pipp was the first baseman for the Yankees and he took a day off one day and was replaced by another player by the name of Lou Gehrig. And Wally never got to play again. And so very much like that one day I handed him the gavel and little did I know, I would never come back to preside over the Senate. So here's the man who made me feel like Wally Pipp, none other than Senator Griffo. Senator Griffo.

Joseph Griffo, New York State Senator:

Wally Pipp became Governor, see isn't that great. Great story and he has aluminum utensils at the mansion. This is, there are truly times, we are in times of challenge and in these times of challenge also lie times of opportunity and I think this is an illustration of where we take advantage of opportunity. It is a great partnership that has developed here between the public and private sector, it's because people care about the North Country. It's because people brought necessary information and people together to deal with an issue that was important. And I want to thank a number of people who have been involved in this, not only my colleagues in government and the state Legislature but also we want to give credit to the Governor.

This man has been here several times, he's a Governor who has paid attention, he is a Governor who has been responsive as a result of paying attention. And now we see a result an end result because of his leadership. So Governor I want to thank you for your leadership, your interest and for bringing a result to this equation. To Richie Kessel the new guy on the block but I think he's going to be a great guy and I think there's even more mega-watts than you're mentioning, so Judge will make you aware of that. We appreciate NYPA and their role. And to Alcoa we thank you also and the company officials here for making this commitment. But most importantly to the workers because one of the greatest resources and strength as a state is our work force, so we appreciate the hard work and the ethic, the work ethic that you perform each and everyday to make our state a better place. We couldn't get this done without you.

So today it's a great chance, a chance for a new beginning to do something that will be meaningful for the long term. So this contract we discussed it a year ago, we made the announcement, now we have the signing of the contract and Alcoa I look forward to the construction that will begin also. Because that's the next important phase here and it's critical to note that when they look at their capital projects the only two that were left I think because of the severe economic times we're in is Quebec and right here in Massena. So I

look forward to the ground breaking and thank you all very much and God bless you.

Governor Paterson:

We have with us right now in addition to the great development that we want to accrue in the areas of energy and economic development and the development of some of our precious metals and how much it's benefited this region, this region has also benefited by it's enhanced agriculture and now it's enhanced agriculture responsibility. I would like to introduce the new Chair of the New York State Senate Agriculture Committee, Darrel Aubertine.

Darrel Aubertine, Chair of the New York State Senate Agriculture Committee:

Thank you Governor and good morning to everybody, this is certainly a red letter day. It didn't happen over night but it couldn't get here quick enough as far as I was concerned. And just for the record Richie, twenty megs.

So, but today we are here to sign the agreement. The Governor is here to sign the agreement. You know this is a conversion of assets for the North Country in a lot of different ways not just energy but the people. And in discussion that I've had with Wes and other people, here at Alcoa management the labor force the assets that's here, the community, the community in general, that's where Alcoa begins. The low cost energy coupled with this labor is what's going to drive Alcoa forward. The executives at Alcoa, the leadership at Alcoa has recognized they've been here for over a hundred years and they're going to be here for another half a century a least. And today that begins with the signing of this agreement.

So Governor I want to recognize you, I want to recognize Alcoa, our local officials, the towns, the villages, organized labor, everyone who has participated in making this day a reality, because without everybody's cooperation, participation and understanding this day couldn't have happened. So I do want to congratulate everyone who has participated in this and I certainly look forward to signing this agreement, historic agreement. So thank you Governor for being here with us.

Governor Paterson:

We want to thank organized labor and we want to thank the entire work force here at Alcoa. This is the third time I've had the opportunity to visit. I took a full tour here about two years ago and I was stunned by the technology and sophisticated way in which products are turned out of this facility. Before we end, we had an event yesterday in Jefferson County and one of my dear friends in the Legislature was there and did not get recognized so we thought we would save the best for last this morning and introduce Assemblywoman Dee Dee Scozzafava.

Dee Dee Scozzafava, New York State Assemblywoman:

Good morning. What a wonderful morning it is. And we are here to sign a power contract today and the Governor is here to do it. But Governor you know that the real power in the North Country is right here in this room. It's the men and women that work in local government, state government the workers that have worked here since 1902. That's the type of energy that we in the North Country have. And that's what we have. And that's why we are here today with this agreement. It's work that occurred across government lines between county, town, village and state. It's work that occurred with labor, with management and working together towards a common goal. And when we get together and we get focused it's these types of events that can occur in the North Country. Governor and we're sure that you are going to be here more in the future, at more types of these events, because what we need here is more confidence. We can do it with the leadership of Governor Paterson. This shows what we can do here in the North Country. So congratulations to all of you here today, it's a wonderful day! We need to take advantage of every good day we have with these terrible fiscal times. So congratulations to all of you and I'm glad to be a part of it today.

Governor Paterson:

Well I thanked Richie Kessel from NYPA and our Empire State Development Upstate Chair, Dennis Mullen for the work that they did and they basically told me that that we're just getting started in the North Country. So I hope that many of will be available. I know you've got a lot of work to do around here, to come to a few more events because we are really going to enhance the capacity of this region. We are going to decrease the number of unemployed. The number of unemployed is spiked in this difficult economic period. And we had to give out some pretty bad news at our State of the State address last week. But let me make this clear, we will rebound from this conflict. We will emerge stronger and sooner than people would think because of efforts like today and people like all of you who worked so hard in this region and all around the great state of New York. Thank you for joining us for this event this morning.

New York Power Authority
Generating more than electricity

NEWS

Temporary North Country Power Discount Program to be Phased Out as Alcoa Plant Returns to Service: *Businesses and Dairy Farmers Advised that Discounts will be Gradually Withdrawn Beginning with March Utility Bills*

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January 31, 2011

FOR IMMEDIATE RELEASE

WHITE PLAINS—New York Power Authority (NYPA) President and Chief Executive Officer Richard M. Kessel announced that NYPA and National Grid are reaching out to nearly 2,900 North Country businesses and dairy farmers to notify them of plans to wind down the Temporary North Country Power Discount Program over a three-month period, beginning with monthly utility bills in March.

NYPA will be coordinating a similar phase out of the program with New York State Electric & Gas (NYSEG) for the more than 200 businesses and dairy farms in its North Country service territory that have also benefited from the initiative.

The gradual withdrawal of the temporary electricity credits under the program, which has saved the approximately 3,100 eligible businesses and dairy farms more than $10 million and an average of nine percent on their electricity bills, stems from the announcement by Alcoa earlier this month of its plans to restart the Massena East Plant and add approximately 120 jobs to the previously idled facility.

The planned restart—and resumed use of low-cost hydropower by the smelter's potlines—also sets the stage for Alcoa's consideration of the future modernization of the facility, as provided for under contractual agreement with the Power Authority, and its undertaking of major capital investments.

In a Jan. 27 joint letter (http://www.nypa.gov/services/economicdev/discountprogramletter.pdf) to the beneficiaries of the Temporary North Country Power Discount Program, Kessel and Susan M. Crossett, vice president, National Grid, described the pending restart of aluminum production at Massena East as "great news for Massena and the entire North Country economy."

In November 2009, NYPA implemented the power discount program, with the assistance of National Grid and NYSEG, to support Northern New York businesses during the economic downturn. The program has been funded from the sale of unused power from the St. Lawrence-Franklin D. Roosevelt Power Project into the state's wholesale electricity market. The power had been freed up due to the temporary curtailing of operations by Alcoa in 2009 at the Massena East plant.

The net revenues from the freed-up power were used to provide energy discounts for businesses and dairy farmers in St. Lawrence, Jefferson and Franklin counties. Specifically, the discount has been applied to the monthly utility bills of National Grid and NYSEG and listed as a NYPA Temporary Electricity Credit for the eligible businesses. Other entities, such as some dairy farms, have been receiving direct payments from the Power Authority.

The temporary power discount program will be phased out over three months to correspond with the Alcoa Massena East plant's ramping up as a result of anticipated growth in aluminum demand. The program's customers served by National Grid will see the electricity delivery credit on their March utility bills reduced from 24 percent to 18 percent. The delivery-charge credit will be lowered to 12 percent in April and six percent in May, when it will last appear on the National Grid bills.

A similar transitional period of credit reductions will be undertaken for the smaller group of eligible NYSEG customers benefiting from the temporary power discount program.

"By optimizing the use of NYPA hydropower, pending Alcoa's East Plant restart, the Temporary North Country Power Discount Program has been a great opportunity for businesses and dairy farms to reduce electric bills in difficult economic times," the Kessel/Crossett letter stated.

The joint letter also noted that both the Power Authority and National Grid have programs for promoting energy efficiency to lower electric bills.

NYPA customers interested in obtaining information on the statewide public power utility's energy-saving programs can e-mail Energy2011@nypa.gov or leave a message at the toll-free Energy 2011 Hotline: (866) 314-4110.

National Grid also stands ready to help its customers lower their energy costs more permanently through programs that are designed to provide financial incentives and technical assistance to encourage installation of high efficiency equipment. More information is available by visiting National Grid's energy efficiency Web site at www.powerofaction.com/efficiency or by calling the utility at 1-800-787-1706.

Further customer information on the Temporary North Country Power Discount Program can be obtained by contacting NYPA at 1-800-622-6972 or e-mailing PowerDiscount@nypa.gov

About NYPA:

NEW YORK POWER AUTHORITY

30 South Pearl Street
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Albany, New York 12207-3425

AGREEMENT FOR THE SALE OF FIRM AND INTERRUPTIBLE HYDROELECTRIC POWER AND ENERGY FROM THE ST. LAWRENCE-FDR POWER PROJECT TO ALCOA INC.

Service Tariff No. 22 - Schedule of Rates for Sale of Firm and Interruptible Hydroelectric Power Service

NEW YORK POWER AUTHORITY

30 South Pearl Street, 10th Floor
Albany, New York 12207-3425

AGREEMENT FOR THE SALE OF FIRM AND INTERRUPTIBLE POWER AND ENERGY TO ALCOA INC.

Alcoa Inc. ("Alcoa" or "Customer") hereby enters into this Agreement with the New York Power Authority ("Authority" or "NYPA," and collectively with Customer, the "Parties") for the sale of firm and interruptible power and energy for its facilities at 194 County Route 45 ("East Plant") and at Park Avenue East ("West Plant"), Massena, New York 13662 as follows:

WHEREAS, the existing contracts (1) between Customer, f/k/a Aluminum Company of America, and Authority for the sale of 174,000 kilowatts ("kW") of firm power and energy and 65,000 kW of interruptible power and energy by Authority to Customer, and (2) between Customer's Reynolds Metals Company subsidiary ("Reynolds") and Authority for the sale of 200,000 kW of firm power and energy and 39,000 kW of interruptible power and energy by Authority to Reynolds are both set to expire on June 30, 2013; and

WHEREAS, the Parties seek to replace the existing contracts with a single contract that will provide to Customer from the Authority's St. Lawrence-FDR Project 374,000 kW of firm power and energy and 104,000 kW of interruptible power and energy to be used by Customer at both its own facility and its Reynolds facility as it sees fit; and

WHEREAS, such Allocations shall be sold by the Authority to Customer under this Agreement for the Sale of Firm and Interruptible Power and Energy ("Agreement"); and

WHEREAS, such Allocations are subject to the tariffs of the New York Independent System Operator, Inc. ("NYISO");

NOW THEREFORE, the Parties hereto agree as follows:

I. Definitions

A. Agreement means this Agreement.

B. Allocation(s) means the allocation(s) of Firm and Interruptible Power and Energy to Customer on the terms set forth herein.

C. Authority is the New York Power Authority.

D. **Contract Demand** will be the amount set forth in Article II or such other amount as may be determined in accordance with the provisions of this Agreement.

E. **Customer** is Alcoa.

F. **Electric Service** is Power and Energy sold to Customer in accordance with this Agreement and applicable Service Tariffs and Rules.

G. **Firm and Interruptible Power and Energy** is power and associated energy from the Project as provided in Service Tariff No. 22, and allocated by Authority for business use as Preservation Power pursuant to Section 1005 (13) of the New York Public Authorities Law ("NY PAL").

H. **FERC** means the Federal Energy Regulatory Commission (or any successor organization).

I. **FERC License** means the license issued by FERC to Authority for the continued operation and maintenance of the Project, pursuant to Section 15 of the Federal Power Act.

J. **Hydro Projects** is a collective reference to the Project (defined below) and Authority's Niagara Project, FERC Project No. 2216.

K. **NYISO** means the New York Independent System Operator or any successor organization responsible for the transmission and the reliable supply of electricity in the State of New York.

L. **Project** means Authority's St. Lawrence-FDR Project, FERC Project No. 2000.

M. **Rate Year** means a twelve (12) month period starting July 1 and ending June 30 for which Electric Service is provided under this Agreement.

N. **Rebuilding of the East Plant** means the decommissioning of the existing Soderberg smelting technology and facilities at the East Plant, the construction of new prebake smelting technology and facilities at the East Plant, and the addition of new supporting facilities at the West Plant.

O. **Rules** are the applicable provisions of Authority's Rules and Regulations for Power Service (Part 454 of Chapter X of Title 21 of the Official Compilation of Codes, Rules and Regulations of the State of New York) as they are modified from time to time.

P. **Service Tariffs** are schedules or tariffs of Authority establishing rates and other conditions for sale of Electric Service to Customer, including Service Tariff No. 22 as it may be modified from time to time, except as noted herein.

Q. **Unforced Capacity** shall have the same meaning as set forth in the NYISO Market Services Tariff, as it may be modified from time to time.

II. Electric Service to be Provided

A. Contract Demands. Authority shall provide Electric Service pursuant to Service Tariff No. 22 ("ST-22") for Power and/or Energy to enable the Customer to receive its Allocation of Firm and Interruptible Power from the Project, in the amounts set forth below:

374,000 Kilowatts of Firm Power

104,000 Kilowatts of Interruptible Power

Which amounts shall be the Contract Demands.

As part of the Allocation, Authority shall provide Unforced Capacity in amounts necessary to meet Customer's NYISO Unforced Capacity obligations associated with the foregoing allocations of Firm and Interruptible Power and Energy in accordance with the rules and tariffs of the NYISO. Neither Ancillary Services (as defined in the rules and tariffs of the NYISO), nor "green" attributes or renewable energy credits (collectively referred to herein as "RECs," as may be hereinafter defined and as modified from time to time by the New York State Public Service Commission or other agency having jurisdiction over such matters) are included in such Allocation. Authority retains for its own use and benefit any such RECs associated with that portion of the Project that supports the Allocation; provided, however, that: (1) should Customer be required by federal or state law, rule or regulation to secure RECs in connection with the operation of the East and/or West Plants; and (2) such RECs are deemed transferable under applicable federal or state law, rule or regulation, then Authority shall make available such RECs to Customer on a basis consistent with the policies adopted by Authority's Trustees for all similarly situated customers.

B. Delivery Points. At 115,000 Volts at the points of interconnection of Customer's transmission lines to the Barnhart Island Switchyard of Authority at the West Plant, Massena, New York and at 13,800 Volts at the low side of Authority's stepdown substation at the East Plant and/or at 115,000 Volts at the East Plant, Massena, New York, or at such other points and voltages as agreed between Customer and Authority.

C. Reduction of Contract Demands. The foregoing Contract Demands may be reduced by Authority (i) in accordance with Schedule A for failure to meet Capital Investment, Employment or Power Utilization Commitments, or (ii) if the amount of Firm and/or Interruptible Power and Energy available for sale from the Project is reduced as required to comply with any unstayed ruling, order or decision of any

regulatory or judicial body of competent jurisdiction. Any such reduction in the Contract Demand shall be in proportion to the overall reduction in the aggregate contract demands of hydroelectric customers sold by Authority from the Project; provided, however, that in the case of (ii), Customer's Employment Commitment shall be revised in a proportionate manner for the duration of the reduction to reflect the reduction in Contract Demand.

D. Authority and Customer shall cooperate in any relocation or installation of transformers or other related facilities servicing Customer's plants that either Party reasonably deems necessary or desirable. The costs of any such relocation or installation shall be the responsibility of Customer, except in cases where Authority seeks the relocation or installation; provided however, that Authority will, if requested by Customer, consider in good faith whether its other customers receive any substantial benefit from such relocation or installation. If NYPA determines that such substantial benefits exist, it shall negotiate in good faith with Customer regarding an alternative funding arrangement. In any event, NYPA shall not be obligated to agree upon an alternative funding arrangement.

E. In the event that Customer is unable to use a portion of its Contract Demand, Authority will if requested use commercially reasonable efforts to resell the Unforced Capacity associated with the unused portion of the Allocation into the NYISO-administered markets to the extent permitted under the NYISO's tariffs and rules. Such proceeds to Authority (if any) exclusive of any energy-related proceeds associated therewith shall be credited against Customer's Billing Demand obligation.

III. Firm and Interruptible Power Commitments

Schedule A to this Agreement entitled "Capital Investment, Employment, Power Utilization Commitments and North Country Economic Development Fund" is attached to and made a part of this Agreement ("Schedule A").

IV. Rules, Regulations and Service Tariffs

The Rules and the Service Tariffs are hereby incorporated into this Agreement with the same force and effect as if herein set forth at length. In the event of any inconsistencies, conflicts or differences between the provisions of the Service Tariffs and the Rules, the provisions of the Service Tariffs shall govern. In the event of any inconsistencies, conflicts or differences between the provisions of this Agreement and the Service Tariffs, the provisions of this Agreement shall govern. Except as may be provided under Section V.G., below, Authority shall provide at least sixty (60) days prior written notice to Customer of any proposed change in the Rules or Service Tariffs, but in no event shall Authority provide less notice than that provided to similarly affected customers within New York State.

V. Power and Energy Rates, Pricing Adjustments, Other Charges and Bond Covenant

A. Base Rates and Annual Adjustment Factor: Power and energy associated with the Allocation shall be sold to Customer hereunder at base rates determined in accordance with ST-22 attached hereto, subject to the following provisions:

1. For the first Rate Year under this Agreement (July 1, 2013 through June 30, 2014), the base rates shall be the base production charge for demand and energy made effective in ST-22, and except as may be provided in Section V.G. below, shall not be changed on or before July 1, 2013.

2. Effective on the Rate Year commencing July 1, 2014 and on the start of each succeeding Rate Year through the end of this Agreement, the base rates shall be adjusted by applying an Annual Adjustment Factor to the base rates for the current Rate Year. In each case, the base rates, as so adjusted, will be applicable for the succeeding twelve (12) months ("Contract Year").

3. The Annual Adjustment Factor will be based upon a weighted average of three indices described below. For each Contract Year, the index value for the latest available calendar year ("Index Value for the Measuring Year") will be compared to the index value for the calendar year immediately preceding the latest available calendar year (the Index Value for the Measuring Year - 1"). The change for each index will then be multiplied by the indicated weights. As described in detail below, these products are then summed, producing the Annual Adjustment Factor. The Annual Adjustment Factor will be multiplied by the base rate for the current Rate Year to produce the base rates for the Contract Year, subject to a maximum adjustment of +/-2.2%.

   Index 1, "BLS Industrial Power Price" (35% weight): The average of the monthly Producer Price Index ("PPI") for Industrial Electric Power, Bureau of Labor Statistics ("BLS") Series ID WPU0543, not seasonally adjusted, as reported by the U.S. Department of Labor, BLS electronically on its internet site and consistent with its printed publication, "Producer Price Index Detailed Report". For Index 1, the Index Value for the Measuring Year will be the index for the calendar year immediately preceding July 1 of the Contract Year.

   Index 2, "EIA Average Industrial Power Price" (40% weight): The average weighted annual revenue per kWh for electric sales to the industrial sector in the ten states of CT, MA, ME, NH, NJ, NY, OH, PA, RI and VT ("Selected States") as reported by Coal and Electric Data and Renewables Division; Office of Coal, Nuclear, Electric and Alternate Fuels; Energy Information Administration ("EIA"); U.S. Department of Energy Form EIA-861 Final Data File. For Index 2, the Index Value for the Measuring Year

will be the index for the calendar year two years preceding July 1 of the Contract Year.

Index 3, "BLS Industrial Commodities Price Less Fuel" (25% weight): The monthly average of the PPI for Industrial Commodities less fuel, BLS Series ID WPU03T15M05, not seasonally adjusted, as reported by the U.S. Department of Labor, BLS electronically on its internet site and consistent with its printed publication, "Producer Price Index Detailed Report". For Index 3, the Index Value for the Measuring Year will be the index for the calendar year immediately preceding July 1 of the Contract Year.

Annual Adjustment Computation Guide and Sample Computation:

Step 1: For each of the three Indices, divide the Index Value for Measuring Year by the Index Value for the Measuring Year-1.

Step 2: Multiply the ratios determined in Step 1 by percentage weights for each Index. Sum the results to determine the weighted average. This is the Annual Adjustment Factor.

Step 3: Multiply the current Rate Year base rate by the Annual Adjustment Factor calculated in Step 2 to determine the adjusted base rate.

Step 4: Determine if the adjusted base rate is within +/- 2.2% of the current Rate Year base rate. Apply the maximum adjustment as appropriate to determine the Contract Year base rate.

The foregoing calculation shall be performed by Authority consistent with the sample presented in Appendix A to this Agreement.

Authority shall provide Customer with notice of any adjustment to the current base rate per the above and with all data and calculations necessary to compute such adjustment by June 15th of each year to be effective on July 1 of such year, commencing in 2014. The values of the latest officially published (electronically or otherwise) versions of the indices and data provided by the BLS and EIA as of June 1 shall be used notwithstanding any subsequent revisions to the indices.

If during the term of the Agreement any of the three above indices ceases to be available or ceases to be reflective of the relevant factors or of changes which the indices were intended by the Parties to reflect, Customer and Authority shall mutually select a substitute Index. The Parties agree to mutually select substitute indices within 90 days, once notified by the other party that the indices are no longer available or no

longer reflect the relevant factors or changes with the indices were intended by the Parties to reflect. Should the 90-day period cover a planned July 1 rate change, the current base rates will remain in effect until substitute indices are selected and the adjusted rates based on the substitute indices will be retroactive to the previous July 1. If unable to reach agreement on substitute indices within the 90-day period, the Parties agree to substitute the mathematic average of the PPI--Intermediate Materials, Supplies and Components (BLS Series ID WPUSOP2000) and the PPI--Finished Goods (BLS Series ID WPUSOP3000) indices for one or more indices that have ceased to be available and shall assume the percentage weighting(s) of the one or more discontinued indices as indicated in this Section V.A.3.

4. No subsequent amendment to ST-22 shall affect the determination of the base rates, including all annual adjustments, as described herein.

B. London Metals Exchange ("LME") Adjustment: Based on the quarterly average "cash buyer" price for aluminum on the London Metals Exchange ("LME Reference Price"), Customer may be subject to a quarterly adjustment ("LME Adjustment Rate"). For each $100 increment, including any fraction thereof, above the LME Reference Price of $2000, a LME Adjustment Rate will be applied to the Customer's quarterly energy consumption. The LME Adjustment Rate will be determined using the schedule of rates described below (all ranges expressed in 2008 dollars):

1. From $2000 to and including $2200, the adjustment rate will be $1.25 per MWh.

2. From $2201 to and including $2500, the adjustment rate will be $1.50 per MWh.

3. From $2501 to and including $2800, the adjustment rate will be $2.00 per MWh.

4. From $2801 and above, the adjustment rate will be $3.00 per MWh.

The rates in the above categories are additive so that, for example, if the LME Reference Price is in category 2 for a given quarter, the Customer's LME Adjustment Rate will be sum of (a) $1.25/MWh times the portion of the LME Reference Price in category 1, and (b) $1.50/MWh times the portion of the LME Reference Price in category 2.

The price ranges noted above will be adjusted each quarter beginning in the third quarter of 2008 based on the following combination of indices noted below, subject to a maximum adjustment of (a) 0.625% per quarter; and (b) 2.5% for each rolling 12 month period measured each quarter:

- Basket of indices used to determine the Annual Adjustment Factor as described herein used determine the base rates for the Contract Year (50% weight; for 2013, NYPA will calculate an Annual Adjustment Factor in the same manner as that which will apply July 1, 2014 and each year thereafter);
- PPI--Finished Goods (BLS Series ID WPUSOP3000), as reported by U.S. Department of Labor, BLS (50% weight).

The first calculation to determine if an LME Adjustment Rate applies will be performed following the first quarter of Electric Service under the Agreement (September 30, 2013) and will reflect previous adjustments, beginning with the third quarter of 2008. A sample calculation illustrating the LME Adjustment is shown in Appendix B to this Agreement.

The LME Adjustment (if any) will be billed on or about the first day of the second month following the end of the quarter for which the LME Adjustment is calculated, and payable in equal increments over three billing periods.

C. At all times the applicable rates for power and energy associated with this Allocation determined in accordance with Sections V.A. and V.B. above (the "Adjusted Rates"), shall be no lower than the rates charged by Authority for the sale of hydroelectricity for the benefit of rural and domestic customers receiving service in accordance with the Niagara Redevelopment Act, 16 U.S.C. § 836(b)(1) and NY PAL § 1005(5) (the "Rural/Domestic Rate"). This provision shall be implemented as follows: if the rates determined in accordance with Section V.A. above only, i.e., exclusive of the LME Adjustments under Section V.B. above, are lower than the Rural/Domestic Rate on an average $/MWh basis, then the base rates determined under Section V.A. above will be revised to make them equal to the Rural/Domestic Rate on an average $/MWh basis; provided, however, the base rates as so revised will have no effect until such time as the Adjusted Rates are lower than the Rural/Domestic Rate.

D. Customer agrees to compensate Authority for all transmission costs incurred as set forth in ST-22. Such charges or costs shall be in addition to the charges for power and energy.

E. Customer understands that delivery of the Allocation will be made over transmission facilities under the control of the NYISO, including those owned by Customer. Unless Customer provides Authority sixty (60) days written notice otherwise, Authority will act as the Load Serving Entity ("LSE") with respect to the NYISO, or arrange for another entity to do so on its behalf. Customer agrees and understands that it shall be responsible to Authority for all costs incurred by Authority with respect to the Allocation for the services established in the NYISO's applicable tariffs, as set forth in ST-22, whether or not such charges are

transmission-related. Such charges or costs shall be in addition to the charges for power and energy.

F. To the extent Authority incurs any taxes, assessments or other charges imposed by third parties associated with or attributable to the Allocation, Customer agrees to compensate Authority for all such costs incurred as set forth in ST-22. Such charges or costs shall be in addition to the charges for power and energy.

G. Notwithstanding any provision of this Agreement to the contrary, the power and energy charges shall be subject to increase by Authority at any time upon 30 days prior written notice to Customer if, after consideration by Authority of its legal obligations, the marketability of the output or use of the Project and Authority's competitive position with respect to other suppliers, Authority determines in its discretion that increases in rates obtainable from any other Authority customers will not provide revenues, together with other available Authority funds not needed for operation and maintenance expenses, capital expenses, and reserves, sufficient to meet all requirements specified in Authority's bond and note resolutions and covenants with the holders of its financial obligations. Authority shall use its best efforts to inform Customer at the earliest practicable date of its intent to increase the power and energy charges pursuant to this provision. Any rate increase to Customer under this subsection shall be on a non-discriminatory basis as compared to other Authority customers after giving consideration to the factors set forth in the first sentence of this subsection. With respect to any such increase, Authority shall forward to Customer with the notice of increase, an explanation of all reasons for the increase, and shall also identify the sources from which Authority will obtain the total of increased revenues and the bases upon which Authority will allocate the increased revenue requirements among its customers. Any such increase in rates shall remain in effect only so long as Authority determines such increase is necessary to provide revenues for the purposes stated in the preceding sentences.

H. Notwithstanding any provision of this Agreement to the contrary, to the extent that capital expenditures exceeding $75 million in 2008 dollars for a single capital project not reasonably foreseen at the time this Agreement is executed and which are not sustaining capital are required at the Project and which project will be completed during the term of this Agreement, Authority may on sixty (60) days' notice to Customer increase the rates established under this Agreement by allocating to Customer a pro rata share on the basis of Customer's Contract Demand and the Contract Demand of all customers supplied from the Project of the costs associated with such capital expenditures. For avoidance of doubt, this provision is not applicable to capital expenditures not reasonably foreseen and made during the term of this Agreement to sustain Authority's operations by installing or upgrading equipment using mostly incrementally improved technology, including repair and maintenance, and replacement items such as spare parts. Within thirty (30) days of the imposition of any such rate increase,

Authority shall provide Customer a report and necessary workpapers documenting the required capital expenditures.

VI. Curtailments, Interruptible Power and Substitute Energy

A. Firm Power and Energy. If hydraulic or hydrological conditions affecting the Hydro Projects require Authority to curtail the amount of Firm Power and Energy provided to Customer under this Agreement to an amount below such normal level, reductions shall be applied to all the firm power customers served from the Hydro Projects, including Customer, in proportion to their relative allocations of Firm Power and Energy from the Hydro Projects. Reductions as a percentage of the otherwise required Power and Energy deliveries will be the same for all firm Authority hydropower customers served from the Hydro Projects. Customer will receive appropriate bill credits as provided under the Rules.

If, on the basis of reports received from Authority on hydrological conditions, Customer anticipates a curtailment of Firm Power and Energy lasting six (6) months or longer and reasonably believes that both plants cannot be economically operated, Customer shall have the option of reducing Contract Demand to as low as 239,000 kW of Firm Power and Energy for up to two (2) years, or until operations at the second plant are restarted, if sooner. Terms and conditions of such restart, including the ramping up of Contract Demand, will be subject to mutual agreement between the Parties. The Parties agree that the operation of both Customer plants is desirable, and will work together towards that end.

B. Interruptible Power and Energy. Interruptions will be based on the daily measurement of the 7-day rolling average net generation at the Hydro Projects. The threshold value for interruption will be average hourly net generation below 2250 megawatt-hours per hour. Authority will provide Customer with two (2) business days' notice of interruptions, including a list of NYPA holidays. With respect to the notice discussed in this subsection and for other notices related to generation levels at the Hydro Projects, the document "NIA & STL Generation and DAM Scheduling for Alcoa and Reynolds, Hydro Notification Procedures ("Notification Procedures"), as it may be modified from time to time by agreement between the Parties, shall apply.

C. Upon written request by the Customer, Authority will provide Substitute Energy to the Customer to replace the hydroelectricity that would otherwise have been supplied.

1. Billing for Substitute Energy. For each kilowatt-hour of Substitute Energy so supplied by Authority, the Customer will pay Authority directly the difference between the average wholesale cost (including any transmission costs) incurred by Authority for supplying the Substitute Energy to the Customer during the

billing month and the energy charge in ST-22 (the Difference). Billing and payment for Substitute Energy shall be governed by the Billing and Payments provision of Section 454.6 of the Rules and shall apply directly to the Substitute Energy service supplied to the Customer.

2. Substitute Energy Provision Effect on Contract. All other provisions of the Agreement shall continue in effect with Substitute Energy being delivered in the same manner as would have otherwise been the case. The provision of Substitute Energy may be terminated by Authority or the Customer on fifteen (15) days' prior written notice.

VII. Billing

Authority shall render bills for power and energy and any other costs incurred by Authority on behalf of Customer by the 10th business day of the month for charges due for the previous month. Such bills shall include the NYISO Charges (as defined in Authority's ST-22) associated with the Allocation, subject to later adjustment consistent with any later NYISO re-billings to Authority.

VIII. Term, Termination of Service and Early Termination

Service under the Agreement shall commence on July 1, 2013 and continue until the earliest of (a) termination by Authority pursuant to Part 454 of the Rules upon required notice, or (b) June 30, 2043. Authority may cancel service hereunder or modify the quantities of power and energy associated with the Allocation only (a) if such cancellation or modification is required to comply with any unstayed ruling, order or decision of any regulatory or judicial body of competent jurisdiction (including any licensing or re-licensing order or orders of the FERC or its successor agency), or (b) as otherwise provided herein or in the Rules.

Notwithstanding the foregoing, if Customer (a) fails to complete a detailed engineering study of its proposed Rebuilding of the East Plant by January 29, 2010, (b) fails to approve the expenditure of at least $600 million for the Rebuilding of the East Plant, or (c) if having completed such detailed engineering study and approved the expenditure of at least $600 million for the Rebuilding of the East Plant, then fails to invest such funds, Authority may terminate this Agreement immediately upon ninety (90) days' written notice. Provided it has approved the expenditure of at least $600 million for the Rebuilding of the East Plant as discussed in this paragraph, Customer agrees to diligently and in good faith complete the capital investments in a timely manner and on the schedule to be provided to Authority upon completion of the detailed engineering study, all in compliance with Schedule A of this Agreement.

Notwithstanding the foregoing, and in the event the Agreement is not otherwise terminated and Customer is not in default, the Customer will have the option to extend the Agreement, upon the same terms, for an additional ten (10) years

commencing July 1, 2043 and ending on June 30, 2053, if the difference between the annual LME "cash buyer" price (defined using a 12-month rolling average) and the numbers of curtailed days, as calculated on Appendix C to this Agreement for the period July 1, 2013 through June 30, 2039, is less than zero. Alcoa shall exercise such option in writing no later than December 31, 2040. The escalator used to adjust nominal LME prices back to 2008 dollars will be PPI—Finished Goods (U.S. Department of Labor, BLS Series ID WPUSOP3000). The LME Variable defined and used in Appendix C will be a function of the total capital expenditures that Customer makes in both the East Plant and West Plant as part of the modernization of East Plant ("Modernization Capital Expenditures"). Customer agrees to maintain all documentation that supports the Modernization Capital Expenditures that Customer invests in these facilities, including both the planned investment and the actual investment, and to provide Authority such documentation upon request. When calculating the total Modernization Capital Expenditures for the purposes of determining the LME Variable (2008$) to be used in Appendix C, Customer and Authority will use the planned capital expenditures and not the actual capital expenditure; planned capital expenditures are defined as the authorized capital expenditure that Customer management approves using its standard approval policies when a project is released for construction and will not include project cost over-runs.

Notwithstanding any other provision of this Agreement to the contrary, Customer may, for any reason, permanently reduce or terminate service at any time on written notice given to Authority no less than one year in advance.

IX. Notification

Correspondence involving the administration of this Agreement shall be addressed as follows:

To: Authority

Director -- Marketing Analysis and Administration
New York Power Authority
123 Main Street
White Plains, NY 10601

To: Customer

Alcoa Inc.
Attention: Vice President -- Energy
390 Park Avenue
New York, NY 10022-4608

X. Applicable Law

This Agreement shall be governed by and construed in accordance with the laws of the State of New York to the extent that such laws are not inconsistent with the FERC License.

XI. Successors and Assigns, No Resale of Allocation

This Agreement shall be binding upon, shall inure to the benefit of, and may be performed by, the legal successors and assigns of either Party hereto; provided, however, that no assignment by either Party or any successor or assignee of such Party of its rights and obligations hereunder shall be made or become effective without the prior written consent of the other Party, which the other Party shall grant or refuse in writing within ninety (90) days of a written request for assignment by the first Party. Subject to approval by Authority, and acceptance of all provisions of this Agreement by any assignee, any assignment of this Agreement by Customer shall only be to another entity that will utilize the Allocations for the same purposes and same location as such Allocations are utilized by Customer. If Customer is unable to or does not use any portion of its Allocations for any period of time, in addition to any remedies available to Authority under Schedule A (Capital Investment, Employment, Power Utilization Commitments and North Country Economic Development Fund) any such unused Power and/or Energy (and all rights attendant thereto) shall revert to Authority for its exclusive use until utilized by Customer and Customer shall have no right to sell, transfer, assign, monetize or otherwise use such unutilized power and energy.

XII. Supplementary Provision

Section 454.2(c) of the Rules is inapplicable to this Agreement.

XIII. Previous Agreements and Communications

This Agreement shall constitute the sole and complete agreement of the Parties hereto with respect to the sale, transmission and delivery of the Allocation and supersedes all previous communications between the Parties hereto, either oral or written, with reference to said Allocation. No modifications of this Agreement shall be binding upon the Parties hereto or either of them unless such modification is in writing and is signed by a duly authorized officer of each of them.

XIV. Severability and Voidability

If any term or provision of this Agreement shall be invalidated, declared unlawful or ineffective in whole or in part by an order of the FERC or a court of competent

jurisdiction, such order shall not be deemed to invalidate the remaining terms or provisions hereof.

Notwithstanding the preceding paragraph, if any provision of this Agreement is rendered void or unenforceable or otherwise modified by a court or agency of competent jurisdiction, the entire Agreement shall, at the option of either Party and only in such circumstances in which such Party's interests are materially and adversely impacted by any such action, be rendered void and unenforceable by such affected Party.

XV. Effectiveness of Agreement

This Agreement shall become effective upon execution by both Parties.

AGREED:

ALCOA INC. (CUSTOMER)

BY: _____

Title: Executive Vice President, Alcoa & Group President, Global Primary Products

Date: 2/11/09

(Seal)
Attest by: _____

AGREED:

NEW YORK POWER AUTHORITY

BY: Michael Townsend

Title: Acting Chairman

Date: 2/24/09

(Seal)
Attest by: Angela Gonyea

BY:

Title: CORPORATE SECRETARY

Date: 2/23/2009

(Seal)
Attest by: Angela Gonyea

Schedule A

CAPITAL INVESTMENT, EMPLOYMENT, POWER UTILIZATION COMMITMENTS AND NORTH COUNTRY ECONOMIC DEVELOPMENT FUND

I. Capital Investment

Customer's Board of Directors shall take action on the investment of at least $600 million in the Rebuilding of the East Plant by January 29, 2010. Customer shall provide Authority with the construction schedule (which shall include a projected "completion date") within 10 days of the issuance of such notice to proceed, and construction shall begin prior to June 30, 2011. Customer shall be required to provide Authority with detailed reports of the construction process on a monthly basis, or as otherwise mutually agreed.

If:

A. The completion date of the Rebuilding of the East Plant is delayed by more than six (6) months for reasons reasonably within the control of Customer and assurances reasonably acceptable to Authority are not provided; or

B. If at any time, construction activity at the site of the East Plant is not active and continuous and there is no reasonable prospect of completion of the Rebuilding of the East Plant; or

C. Customer publicly announces its intention to abandon the Rebuilding of the East Plant or otherwise informs Authority that it plans to permanently discontinue construction activities,

then this Agreement may be terminated immediately by Authority upon ninety (90) days written notice.

II. Employment Commitment

A. Employment Levels.

The provision of Firm and Interruptible Power to Customer hereunder is in consideration of Customer's creation and/or maintenance of the employment level set forth in Appendix 1 of this Schedule (the "Base Employment Level"). Such Base Employment Level shall be the number of full-time positions held by employees of the Customer at the facilities identified in such Appendix 1, and shall not include part-time employees (less than 35 hours per week); provided, however, that two part-time

employees each working 20 hours per week or more shall be counted as one full-time employee.

The Base Employment Level shall not be created or maintained by transfers of employees from previously held and then eliminated positions with the Customer or its affiliates within the State of New York, except that the Base Employment Level may be filled by employees of the Customer laid off from other Customer facilities for bona fide economic or management reasons.

B. Employment Records and Reports.

A record shall be kept monthly by the Customer, and provided on a calendar year basis to Authority, of the total number of employees at Customer's facilities identified in Appendix 1, as reported to the United States Department of Labor (or as reported in such other record as agreed upon by Authority and the Customer). Such report shall be certified to be correct by the plant manager or such other person authorized by the Customer to prepare and file such report and shall be provided to Authority on or before the last day of February following the end of the most recent calendar year. Authority shall have the right to examine and audit on reasonable advance written notice all non-confidential written and electronic records and data concerning employment levels including, but not limited to, personnel records and summaries held by the Customer and its affiliates relating to employment in New York State.

III. Reductions of Contract Demand

A. Employment Levels.

If the year-end monthly average number of employees is less than 95% of the Base Employment Level set forth in this Schedule A, for the subject calendar year and is not temporary in nature and being actively addressed by Customer, the Contract Demand may be reduced by Authority subject to Paragraph III.C of this Schedule. The maximum amount of reduction will be determined by multiplying the Contract Demand by the quantity one minus the quotient of the average monthly employment during the subject calendar year divided by the Base Employment. Temporary decreases in employment resulting from production curtailment due to prolonged firm and/or interruptible power curtailment by Authority shall not be counted for the purpose of this provision. Any such reduction shall be rounded to the nearest fifty (50) kW. In the event of a reduction of the

Contract Demand to zero, this Agreement shall automatically terminate.

Customer shall provide Authority with 3 months notice of any anticipated, significant reduction in employment at either its East Plant or West Plant of at least 6 months duration.

B. Power Utilization Levels.

A record shall be kept monthly by the Customer, and provided on a calendar year basis to Authority on or before the last day of February following the end of the most recent calendar year, of the maximum demand utilized each month in the facilities receiving the power covered by this Agreement. If the average of the Customer's six (6) highest Billing Demands is less than 95% of Customer's Contract Demand in such calendar year, adjusted for prolonged firm and/or interruptible power curtailment by Authority, Authority may reduce the Contract Demand. The maximum amount by which Authority may reduce the Contract Demand shall be determined by multiplying the Contract Demand by the quantity one minus the quotient of the average of the six (6) highest Billing Demands in such calendar year divided by the Contract Demand. Any such reduction shall be rounded to the nearest megawatt. If the Contract Demand is reduced to zero, this Agreement shall automatically terminate.

C. Notice of Intent to Reduce Contract Demand.

In the event that Authority determines that the Contract Demand will be wholly or partially reduced as provided above, at least ninety (90) days prior written notice of such reduction shall be given to the Customer, specifying the amount of the reduction of Contract Demand and the reason therefore provided, however, that before making the reduction, Authority may consider Customer's scheduled or unscheduled maintenance or facilities upgrading periods when such events temporarily reduce plant employment levels or electrical demand as well as business cycle.

IV. North Country Economic Development Fund

Customer shall capitalize a $10 million North Country Economic Development Fund ("NCEDF") within ninety (90) days of the date upon which its Board of Directors approves the Rebuilding of the East Plant. The NCEDF will be exclusively used for economic development purpose in St. Lawrence County, Franklin County, Essex County, Jefferson County, Lewis County, Hamilton County, Herkimer County and the

Schedule A

Akwasasne Mohawk Reservation. Disbursements from this fund will be made public on a quarterly basis or more frequently as may be required by law then in effect. The NCEDF will be jointly administered by NYPA and an entity of or specified by the State of New York.

APPENDIX 1
of SCHEDULE A

Base Employment Level

In accordance with Article II of this Schedule A and as shown in the table below, the Customer agrees to a job commitment of 1,065 jobs beginning in 2008, to be no less than 900 over the term of the Agreement, located at the existing West Plant and the re-built East Plant, each in Massena, New York or otherwise located in St. Lawrence County, New York and shall include annual job reporting by Customer to Authority.

Years	Labor Commitment
2008-13	1,065
2014-20	1,050
2021-25	1,000
2026-36	950
2037-42	900

POWER AUTHORITY OF THE STATE OF NEW YORK
30 SOUTH PEARL STREET
ALBANY, NY 12207

Schedule of Rates for Sale of Firm and Interruptible Hydroelectric Power

Service Tariff No. 22

Date of Issue: December 16, 2008

Date Effective: July 1, 2013

Issued by James H. Yates, Senior Vice President
Power Authority of the State of New York
30 South Pearl Street, Albany, NY 12207

Table of Contents

Schedule of Rates for Sale of Firm and Interruptible Hydroelectric Power Service

I. Applicability

This Service Tariff is applicable to the sale of power and energy produced by the Authority's St. Lawrence-FDR Project to Alcoa Inc. ("Alcoa" or "Customer") or other customers engaged in aluminum smelting and related activities and as further defined in the Agreement for the Sale of Firm and Interruptible Hydroelectric Power and Energy from the St. Lawrence-FDR Power Project ("Agreement") between the Power Authority of the State of New York ("Authority" or "NYPA") and Customer.

II. Abbreviations and Terms

A. The following abbreviations are used:

kW	kilowatt(s)
kWh	kilowatt-hour(s)
MWh	megawatt-hour(s)
NYISO	New York Independent System Operator
NY PAL	New York Public Authorities Law

All other capitalized terms and abbreviations used herein shall have the same meaning as set forth in the Agreement between Customer and Authority.

III. Rates and Charges

A. The Base Production Charge (demand and energy) effective July 1, 2013 shall be:

Demand Charge: $6.23/kW-month

Energy Charge: $12.30/MWh

The base production rates set forth above shall be subject to an Annual Adjustment Factor in accordance with the Agreement and do not include any applicable costs for delivery services.

B. Minimum Monthly Charge (for Firm Service Only)

The sum of (i) the product of the Demand Charge and the Firm Power portion of Contract Demand, (ii) the product of the Energy Charge and the quantity of energy utilized, and (iii) a charge representing reimbursement to the Authority for all applicable Taxes (as defined herein) incurred by the Authority as a result of providing the Allocation to the Customer.

C. Contract Demand

The Contract Demand for Customer will be the amounts of Firm and Interruptible Power allocated to such Customer by the Authority under the Agreement unless reduced pursuant to the Agreement and/or this Service Tariff, which the Customer agrees to take and pay for.

D. Billing Period

Any period of approximately thirty (30) days, generally ending with the last day of each calendar month, but subject to the billing cycle requirements of the utility in whose service area Customer's facilities at which Power is delivered are located.

E. Niagara and St. Lawrence-FDR Hydroelectricity Rates

At all times the rates for power and energy associated with this Allocation shall be no lower than the rate charged by Authority for the sale of hydroelectricity for the benefit of rural and domestic customer receiving service in accordance with the Niagara Redevelopment Act, 16 U.S.C §836(b)(1) and NY PAL §1005(5).

IV. General Provisions

General Provisions for service supplementing or modifying the Rules and Regulations for Power Service (Part 454 of Chapter X of Title 21 of the Official Compilation of Codes, Rules and Regulations of the State of New York) with regard to deliveries to the Customer are as follows:

A. Character of Service

Alternating current, 60 hertz, three-phase.

B. Firm Power Service

Firm power and energy under this Service Tariff are power and associated energy intended to be available at all times except for limitations provided in the Agreement, the Rules and in this Service Tariff.

C. Interruptible Power Service

Interruptible Power and Energy under this Service Tariff are power and associated energy normally available continuously, but subject to interruption for extended periods because of decreased water flow as provided herein. Interruptible Power and Energy under this Service Tariff will be subject to curtailment or interruption upon two business days' notice if the seven-day rolling average of hourly net generation for the Authority at its Hydro Projects is less than 2250 megawatts for hydraulic or hydrological reasons. The Authority will provide Customer with a daily measure of the average hourly net generation during periods when the seven-day average is 2450 megawatts or below. This information will be provided on a weekly basis during periods that the seven-day average is greater than 2450 megawatts. These procedures are consistent with the document, "NIA & STL Generation and DAM Scheduling for ALCOA and Reynolds, Hydro Notification Procedures" (hereinafter, "Notification Procedures"), which has been agreed upon by NYPA and Customer.

If Customer requests that it be provided an alternate source of power and energy in lieu of the curtailed power and energy, such alternate power and energy being referred to as "Alternative Energy," Authority will provide Alternative Energy from the NYISO Day Ahead and Real Time Markets as directed by the Customer in accordance with the Notification Procedures, or as otherwise agreed upon by Authority and Customer, i.e. to acquire "3rd Party Supplemental Energy."

D. Availability of Energy

1. The Authority shall provide to Customer in any Billing Period Firm and Interruptible Energy (subject to hydrologic conditions, see subsection 2, below) in amounts equal to the amount of power and energy set forth in the Agreement. The offer of Energy for delivery shall fulfill Authority's obligations for purposes of this Provision whether or not the Energy is taken by Customer.

2. The Authority will have the right to reduce on a pro rata basis with respect to other firm hydropower customers supplied by the Hydro Projects the amount of Firm Energy provided to Customer if such reductions are necessary due to low flow (i.e., hydrologic) conditions at the Hydro Projects. Contract Demand for the affected Billing Period(s) shall reflect all such

reductions. The Authority shall be under no obligation to deliver and will not deliver any such curtailed energy to Customer in later Billing Periods. No reductions in Contract Demand shall apply for the provision of Substitute Energy.

E. Adjustment of Rates

To the extent consistent with the Agreement between Authority and the Customer, the rates contained in this ST-22 may be revised from time to time on not less than sixty (60) days written notice to Customer. Should Authority need to increase rates in order to meet all requirements specified in its bond and note resolutions and covenants with holders of its financial obligations, Authority may do so upon 30 days' prior written notice if permitted under the Agreement.

F. Delivery

For the purpose of this Service Tariff, Power and/or Energy shall be deemed to be offered when Authority is able to supply Power and Energy and NYISO transmits it to its designated points of interconnection with Customer's Transmission Agent(s). If, despite such offer, there is a failure of delivery by Customer or Customer's designated transmission agents, such failure shall not be subject to a billing adjustment pursuant to Section 454.6(d) of the Rules.

G. Payment by Customer to Authority

1. Power and Energy Rates, Taxes.

The Customer shall pay the Authority for Firm and Interruptible Power and Energy during any Billing Period the higher of either (i) the sum of a), b) and c) below or (ii) the Monthly Minimum Charge as defined herein:

a) The Demand Charge per kilowatt for Firm and Interruptible Power and Energy specified in this Service Tariff or any modification thereof applied to the Customer's Billing Demand (as defined in General Provision H.1 below) for the Billing Period; and

b) The Energy Charge specified in this Service Tariff or any modification thereof applied to the amount of firm Energy delivered by Authority to the Customer during such Billing Period as determined in General Provision H.2.

c) A charge representing reimbursement to the Authority for all applicable Taxes (as defined herein) incurred by the Authority as a result of

providing the Firm and Interruptible Power and Energy allocated to the Customer.

2. Transmission Charge.

The Customer shall compensate the Authority for all transmission costs incurred by the Authority with respect to the Allocation, including such costs that are charged pursuant to the NYISO Open Access Transmission Tariff ("OATT").

3. NYISO Charges.

With respect to all Electric Service provided to Customer in accordance with the Agreement and this Service Tariff, the Customer shall compensate the Authority for the following NYISO Charges assessed on the Authority for services provided by the NYISO or any successor organization pursuant to its OATT or other applicable tariffs (as the provisions of those tariffs maybe amended and in effect from time to time):

A. Ancillary Services 1 through 6 and any new ancillary services as may be defined and included in the OATT from time to time;

B. Marginal losses;

C. The New York Power Authority Transmission Adjustment Charge ("NTAC");

D. Congestion costs, less any associated grandfathered Transmission Congestion Contracts ("TCCs") as provided in Attachment K of the OATT; and

E. Any and all other charges, assessments or other amounts associated with deliveries to Customer or otherwise associated with the Authority's responsibilities as a Load Serving Entity for the Customer that are assessed on the Authority by the NYISO or any successor organization under the provisions of its OATT or under other applicable tariffs.

4. Other Third-Party Charges.

The Customer shall compensate the Authority for any third-party charges attributable to Customer, including without limitation, any costs incurred to comply with any programs applicable in New York State related to the payment for reliability or infrastructure upgrades, energy efficiency

programs, renewable portfolio standards or carbon emissions laws or regulations.

5. Taxes Defined.

   Under this Service Tariff, Taxes shall be any adjustment as Authority deems necessary to recover from Customer any taxes, assessments or any other charges mandated by federal, state and local agencies that are levied on the Authority or that the Authority is required to collect from Customer if and to the extent such rates, charges, taxes or assessments are not recovered by Authority pursuant to another provision of this Service Tariff.

6. The Customer shall pay for Substitute Energy, if applicable, as specified in the Agreement between the Customer and Authority.

7. Bills computed under this Service Tariff are due and payable by electronic wire transfer in accordance with the Rules. Such wire transfer shall be made to J P Morgan Chase NY, NY / ABA021000021 / NYPA A/C # 008-030383, unless otherwise indicated in writing by Authority. In the event that there is a dispute on any items of a bill rendered by Authority, Customer shall pay such bill and adjustments, if necessary, will be made thereafter.

H. Billing

The following billing provisions shall apply to the sum of all the meters used to determine the Customer's load:

1. Demand – The Billing Demand will be the highest sixty (60) minute integrated demand measured during the Billing Period. Should service be interrupted during the Billing Period, the Billing Demand will be adjusted pursuant to Section 454.6(d) of the Rules.

2. Energy – Unless separately metered, the kilowatt-hours charged by Authority to Customer (billed usage) will be the total number of kilowatt-hours recorded on the Customer's meters for the Billing Period as adjusted per NYISO procedures for losses or unaccounted for energy which shall be equal to the energy billed to NYPA by the NYISO on the Customer's behalf.

   The Customer's billed hourly usage shall be allocated among their available energy types hourly in the following order:

a. Firm Energy (hydroelectric, plus any Substitute Energy)
b. Firm Incremental Energy (from Contract FD-4)
c. Interruptible Energy (hydroelectric; when available)
d. 3rd Party Supplemental Energy
e. Alternative Energy

For each of the NYPA-supplied energy types, the amount of hourly energy available will be determined using the Customer's actual metered monthly load factor and Contract Demand for that energy type up to but not exceeding their hourly billed usage, where load factor is the average of the hourly kilowatt-hours recorded on the Customer's meters during the Billing Period divided by the Billing Demand.

In cases where the Customer's hourly billed energy quantity exceeds the quantities available for Firm, Firm Incremental, Interruptible, 3rd Party Supplemental or Alternative Energy, the Customer will be responsible for purchases from the NYISO balancing market which is settled in the NYISO "Real Time Market" as that term is defined and as modified from time to time in the NYISO OATT.

In cases where the Customer's hourly billed energy does not require full utilization of 3rd Party Supplemental or Alternative Energy, the Customer will be entitled to the revenue received from the NYISO for sales of these energy amounts into the NYISO balancing market which is settled in the NYISO Real Time Market.

Any quantity of unused hourly Firm or Interruptible energy types will not be charged to the Customer, nor will the Customer receive the proceeds from any balancing market sales of those energy types.

I. Electrical Fluctuations

The power and energy taken hereunder shall not be used in such a manner as to cause unusual fluctuations or disturbances on Authority's system. Customer shall provide, at its expense, suitable apparatus which will reasonably limit such fluctuations. In the event that unreasonable fluctuations or disturbances, including without limitation harmonic currents resulting in actionable interference with communications systems or in harmonic resonance of now existing facilities, are caused by Customer's facilities, Authority shall immediately notify Customer of the circumstances and Authority shall then have the right to discontinue the delivery of power and energy under this contract upon 30 days prior written notice until conditions causing such fluctuations or disturbances are corrected by Customer. Despite such discontinuance of

service Customer shall be obligated to pay the amounts due for power and energy under this contract, including the minimum bills for such power.

J. Adjustment of Charges

1. Power Factor

For service provided under this and any other Service Tariff or agreement Customer shall maintain not less than ninety-seven and one-half percent (97.5%) power factor at the point of delivery. The Billing Demand under this Service Tariff will be increased one-half percent (1/2%) for each one-half percent (1/2%) by which the average power factor at which energy is supplied during such Billing Period is less than ninety-seven and one-half percent (97.5%). Average power factor will be computed to the nearest one-half percent (1/2%) according to the following formula:

$$\text{Average Power Factor} = \frac{kWh}{\sqrt{kWh^2 + k\,\text{var}\,h^2}}$$

The data used in the above formula shall be obtained from meters which are ratcheted to prevent reverse registration.

2. Adjustment for Transformer Losses

If delivery is made at a transmission voltage but metered on the low-voltage side of Customer's substation, the meter readings will be increased by two percent (2%) to compensate for transformer losses; provided, however, that this percentage may be reduced to reflect improvements in loss rates should new transformers be put in use at Customer's plants.

K. Conflicts.

In the event of any inconsistencies, conflicts or differences between the provisions of this Service Tariff and the Rules, the provisions of this Service Tariff shall govern. In the event of any inconsistencies, conflicts or differences between the provisions of the Agreement and the Service Tariff, the provisions of the Agreement shall govern.

Appendix A

Sample Computation for Annual Adjustment Factor
(hypothetical values for July 1, 2014 implementation)

Step 1. Determine the Index Value for the Measuring Year and Measuring Year - 1 for Each Index.

Index 1.

PRODUCER PRICE INDEX - INDUSTRIAL POWER

	Measuring Year (2013)	Measuring Year -1 (2012)
January	171.2	167.8
February	172.8	167.6
March	171.6	168.2
April	173.8	168.6
May	175.1	171.6
June	185.7	180.1
July	186.4	182.7
August	184.7	179.2
September	185.5	181.8
October	175.5	170.2
November	172.2	168.8
December	171.8	166.6
Average	**177.2**	**172.8**
Ratio of MY/MY-1		**1.03**

Index 2.

EIA INDUSTRIAL RATE

STATE	REVENUES ($000)	SALES MWh	AVG. RATE (cents/kwh)
Measuring Year (2012)			
CT	590,972	6,814,757	
MA	1,109,723	13,053,806	
ME	328,594	4,896,176	
NH	304,363	2,874,495	
NJ	1,412,665	15,687,873	
NY	2,001,588	26,379,314	
OH	3,695,978	78,496,166	
PA	3,682,192	63,413,968	
RI	152,533	1,652,593	
VT	155,903	2,173,679	
TOTAL	13,434,511	215,442,827	**6.24**
Measuring Year -1 (2011)			
CT	579,153	6,678,462	
MA	1,076,431	12,662,192	
ME	310,521	4,626,886	
NH	298,276	2,817,005	
NJ	1,370,285	15,217,237	
NY	1,891,501	24,928,452	
OH	3,622,058	76,926,243	
PA	3,571,726	61,511,549	
RI	144,144	1,561,700	
VT	152,785	2,130,205	
TOTAL	13,016,880	209,059,931	**6.23**
	Ratio of MY/MY-1		**1.00**

Index 3.

PRODUCER PRICE INDEX - INDUSTRIAL COMMODITIES LESS FUEL

	Measuring Year (2013)	Measuring Year -1 (2012)
January	190.1	187.2
February	190.9	188.0
March	191.6	188.7
April	192.8	189.9
May	194.7	191.8
June	195.2	192.3
July	195.5	192.3
August	196.0	193.1
September	196.1	193.2
October	196.2	193.8
November	196.6	193.7
December	196.7	194.0
Average	**194.4**	**191.5**
Ratio of MY/MY-1		**1.02**

Sample Computation for Annual Adjustment Factor
(hypothetical values for July 1, 2014 implementation)

Step 2. Determine Annual Adjustment Factor by Summing the Weighted Indices.

Index	Ratio of MY to MY-1	Weight	Weighted Factors
PPI Industrial Power	1.03	0.35	0.361
EIA Industrial Rate	1.00	0.40	0.400
PPI Industrial Commodities less fuel	1.02	0.25	0.255
Annual Adjustment Factor			**1.016**

Step 3. Apply Annual Adjustment Factor to Calculate Adjusted Base Rate.

	Demand $/kw	Energy $/mwh
Current Rate Year base rate	6.23	12.30
Adjusted base rate	6.33	12.50

Step 4. Apply Cap of +/- 2.2% to Determine Contract Year Base Rate.

	Demand $/kw	Energy $/mwh
Current Rate Year base rate, -2.2%	6.09	12.03
Current Rate Year base rate, +2.2%	6.37	12.57
Contract Year base rate	**6.33**	**12.50**

Appendix B

Sample Calculation for LME Adjustment

For adjustment applicable after 3rd Quarter 2013

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
		Adjustment Factor				LME Reference Price					Weighted LME Adjustment Rate				
Year	Quarter	Annual Adjustment Factor	PPI Finished Goods	Average	Effective Adjustment Factor	Tier I	Tier II	Tier III	Tier IV	Hypothetical LME Price	$1.25/MWh	$1.50/MWh	$2.00/MWh	$3.00/MWh	Weighted $/MWh
2008 Base Year						$ 2,000.00	$ 2,200.00	$ 2,500.00	$ 2,800.00						
2013	3rd Q					$ 2,255.41	$ 2,480.95	$ 2,819.27	$ 3,157.58						
2013	4th Q	1.009	1.016	1.01250	1.00625	$ 2,269.51	$ 2,496.46	$ 2,836.89	$ 3,177.31	$2,593.45	2.27	0.97	-	-	4.29

(5) Average of cols. (3) and (4).
(6) Minimum of 1.00625 and col. (5). For annual period, cap is 1.025.
(7) - (10) 2008 are the base year LME Reference Prices that are esclated through the sample period.
The 4th Quarter prices are col (6) times the 3rd Quarter prices.
(11) Average daily market price for the 4th Quarter.
(12) (Col (11) - col. (7)) / 100, if positive, but not greater than col. ((8) - col. (7)) / 100.
(13) (Col (11) - col. (8)) / 100, if positive, but not greater than col. ((9) - col. (8)) / 100.
(14) (Col (11) - col. (9)) / 100, if positive, but not greater than col. ((10) - col. (9)) / 100.
(15) (Col (11) - col. (10)) / 100, if positive.
(16) (Col. (12) * LME Rate (1.25) + col. (13) * LME Rate (1.50) + col (14) * LME Rate (2.00) + col (15) * LME Rate (3.00)

Appendix C

Calculation Regarding Customer Option to Extend Agreement

If Sum of Modernization Capital Expenditures** Falls between	Then "LME Variable" (2008$) =
$600 - $665 million	$2,500
$665 - $765 million	$2,600
$765 - $865 million	$2,700
$865 - $965 million	$2,800
$965 - $1,065 million	$2,900
$1,065 - $1,165 million	$3,000
$1,165 - $1,265 million	$3,100
$1,265 - $1,365 million	$3,200

**** Modernization Capital Expenditures Include:**

> Upgraded Massena East Smelter

> Demolition of the Old Massena Facilities that is Completed through 2020

> Investments in Massena West Carbon Assets to Provide Anodes to Massena East

> Investments in Massena West Casthouse to Support Massena East Molten Aluminum Production

Additional detail included on Tab "Appendix C - Capital Investment"

	Average of the Monthly Average LME-Cash Prices from July-2013 through June-2039 (Nominal)	minus	**Average of the monthly LME Reference Price of "LME Variable" (2008$) from the above table, adjusted to Nominal using PPI - Finished Goods as published by the Bureau of Labor Statistics (BLS Series ID WPUSOP3000)**	times	**900**	=	**A**
	Average Number of Days per 12-month period, beginning July-2013 continuing through June-2039, that Interruptible-Hydro or Firm-Hydro is Curtailed	minus	**136 day reference number**	times	**655**	=	**B**
If	**A**	minus	**B**	**Is less than**	**0**	**then**	**Extend Contract 10 Years**

Example

	Monthly Avg LME-Cash Price		Monthly Avg Escalated LME-Cash Reference Price				
	2,535	minus	2,500	times	900	=	31,500
	Avg Annual Days Interruptible (or Firm) is Curtailed		Reference Number				
	200	minus	136	times	655	=	41,920

Added Revenue		Added Costs			**Extend Contract 10 Years?**
31,500	minus	41,920	=	-10,420	

Appendix C

The Modernization Capital Expenditures used in Appendix C will be a function of the total capital expenditures that Customer makes at both East Plant and West Plant as part of the modernization of East Plant. These investments include but are not limited to the following:

A) East Plant Smelter Upgrade: This will include everything in the "Main Project", which will be presented to the Alcoa Board of Directors, and any other project required for that plant's continued existence, such as:
   Outfall compliance / "Water Vision" implementation
   Ore Unloading / Transportation improvements
   Corrections of deficiencies

B) Demolition Old East Plant Completed Through 2020

C) Additions and Modifications to West Plant Carbon Assets to Support the New East Plant Smelter:
   Replace Butt Crushing Dust Collector
   Rebuild Stripping Press
   Cast Iron Cleaning
   Refurbish Ball Mill
   Anode Handling Cranes
   Dry Scrubber
   Upgrade Green Mill PLC/SCADA
   Coke Unloading/Storage/Blending
   Rebuild 3 Mixers
   Install Bake Furnace FTM's
   Rebuild Anode Bake Furnace #5*
   Install New Anode Formers*
   Revise Coke Fines Feed*
   Replace Preheaters*
   Upgrade Anode Cooling*
   * These items are presently included in the Main Project but we currently evaluating the option of accelerating the installation of these items so they are up and running in advance of the new East Plant smelter.

D) Additions and Modifications to the West Plant Casthouse Assets to Support the New East Plant Smelter:
   Closed Loop Water Recycle
   Increase Billet Output Phase 1 (includes tooling, inspection, sawing, banding, homogenization, cooling, racks, etc.)
   Increase Billet Output Phase 2 (includes additional equipment beyond Phase 1)
   Installation of New Automated Sow Caster (East/West Location TBD)

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR A GENERAL ADJUSTMENT IN RATES	)))	**CASE NO. 2011-00036**

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO
BIG RIVERS ELECTRIC CORPORATION
FIRST DATA REQUEST
PSC CASE NO. 2011-00036
June 22, 2011

Request BREC-20
Referring to the direct testimony of Mr. Fayne at p. 18, lines 9-13, please provide a copy of any and all orders reflecting the action of the Missouri Public Service Commission as described in the referenced testimony.

RESPONSE

Please see our response to STAFF-3.

Witness: Henry W. Fayne

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR A GENERAL ADJUSTMENT IN RATES	)))	**CASE NO. 2011-00036**

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO
BIG RIVERS ELECTRIC CORPORATION
FIRST DATA REQUEST
PSC CASE NO. 2011-00036
June 22, 2011

Request BREC-21
Referring to the direct testimony of Mr. Fayne at p. 18, lines 15-20, please provide a copy of any and all orders reflecting the action of the Public Utilities Commission of Ohio as described in the referenced testimony.

RESPONSE

Please see our response to STAFF-3.

Witness: Henry W. Fayne

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR A GENERAL ADJUSTMENT IN RATES	)))	**CASE NO. 2011-00036**

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO BIG RIVERS ELECTRIC CORPORATION FIRST DATA REQUEST PSC CASE NO. 2011-00036 June 22, 2011

Request BREC-22
Referring to the direct testimony of Mr. Fayne at p. 18, line 22-p. 19, line 2, please provide a copy of any and all orders reflecting the action of the Public Service Commission of West Virginia as described in the referenced testimony.

RESPONSE

Please see our response to STAFF-3.

Witness: Henry W. Fayne

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR A GENERAL ADJUSTMENT IN RATES	)))	**CASE NO. 2011-00036**

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO BIG RIVERS ELECTRIC CORPORATION FIRST DATA REQUEST PSC CASE NO. 2011-00036 June 22, 2011

Request BREC-23
Referring to the direct testimony of Mr. Fayne at p. 19, lines 2-6, please provide a copy of the legislation described in the referenced testimony.

RESPONSE

Please see attached, as Exhibit BREC-23, a copy of West Virginia Senate Bill 656. (Attached on the enclosed CD).

Witness: Henry W. Fayne

ENROLLED

COMMITTEE SUBSTITUTE

FOR

Senate Bill No. 656

(Senators McCabe, Hall, Kessler, Deem, Jenkins, Green, Stollings and Boley, *original sponsors*)

[Passed March 9, 2010; in effect ninety days from passage.]

AN ACT to amend the Code of West Virginia, 1931, as amended, by adding thereto a new section, designated §24-2-1j, relating to special rates for energy-intensive industrial consumers of electric power; setting forth legislative findings on energy- intensive industrial consumers of electric power; defining certain terms; enabling the Public Service Commission to establish special rates for energy-intensive industrial consumers of electric power; setting forth factors that the Public Service Commission may take into consideration in establishing special rates for energy-intensive industrial consumers of electric power, in addition to factors that may already be considered by the Public Service Commission in its rate-setting process; authorizing the Public Service Commission to adopt mechanisms reasonably designed to assure appropriate flexibility and predictability of special rates; establishing procedures for application to the Public Service Commission for a special rate; setting forth data and information to be included in an application for a special rate; establishing qualifications for eligibility for a special rate; and requiring Public Service Commission to determine whether any excess revenue or revenue shortfall created by a special rate authorized pursuant to this section should be allocated among any other customers of the utility.

Be it enacted by the Legislature of West Virginia:
That the Code of West Virginia, 1931, as amended, be amended by adding thereto a new section, designated §24-2-1j, to read as follows:

ARTICLE 2. POWERS AND DUTIES OF PUBLIC SERVICE COMMISSION.

§24-2-1j. Special rates for energy intensive industrial consumers of electric power.

(a) The Legislature hereby finds that:

(1) West Virginia enjoys relatively low cost electric power rates for residential customers, business and industry and these relatively low rates constitute a competitive economic advantage for West Virginia;

(2) West Virginia has many energy intensive industrial consumer of electric power, and has the

ability to retain its existing energy intensive industrial consumers of electric power and attract additional energy intensive industrial consumers of electric power in the future, through the adoption of policies and the establishment of rates that enhance and preserve the attractiveness of West Virginia as a place for energy intensive industrial consumers to do business;
(3) Energy intensive industrial consumers of electric power create jobs, provide a substantial tax base and enhance the productive capacity, competitiveness and economic opportunities of West Virginia and all of its citizens;
(4) Energy intensive industrial consumers of electric power help keep power rates low for all consumers of electric power, including residential customers, by providing a large consumption base over which the cost of producing electric power may be spread from time to time;
(5) It is in the best interests of West Virginia, the citizens of West Virginia, electric public utilities in West Virginia, and all consumers of electric power in West Virginia, including residential customers, to encourage the continued development, construction, operation, maintenance and expansion in West Virginia of industrial plants and facilities which are energy intensive consumers of electric power, thereby increasing the creation, preservation and retention of jobs, expanding the tax base, helping keep power rates low for all consumers of electric power, and enhancing the productive capacity, competitiveness and economic opportunities of all citizens of West Virginia; and
(6) To encourage the continued development, construction, operation, maintenance and expansion in West Virginia of industrial plants and facilities which are energy intensive consumers of electric power, the commission may establish special rates under this section that in its judgment are necessary or appropriate for the continued, new or expanded operation of energy intensive industrial consumers and that can reasonably be expected to support the long-term operation of energy intensive industrial consumers, and that do not impose an unreasonable burden upon electric public utilities or their other customers.
(b) As used in this section:
(1) "Energy intensive industrial consumer" means an industrial facility, plant or enterprise that has a contract demand of at least fifty thousand kilowatts of electric power at its West Virginia facilities under normal operating conditions.
(2) "Special rate" means a rate set for an energy intensive industrial consumer pursuant to this section.
(c) In addition to any authority of the Commission to allow special rates or contracts under any other provision of the code or rule, and in addition to all other factors which the commission may consider in setting rates for consumers of electric power, including, but not limited to the Commission's responsibilities under subsection (b), section one, article one of this chapter, and notwithstanding any other provisions of this code to the contrary, in setting a special rate the commission may take into consideration fluctuations in market prices for the goods or products produced by the energy intensive industrial consumer of electric power, or other variables or factors which may be relevant to or affect the continuing vitality of the energy intensive industrial consumer of electric power in dynamic markets. In setting a special rate by reference

to fluctuations in market prices for the goods and products produced by an energy intensive industrial consumer of electric power, the commission may establish variable rates including, but not limited to, ceilings and floors on the special rate, banking or crediting mechanisms, caps, limits or other similar types of safeguards that are intended by the commission, in its reasonable judgment, to provide appropriate flexibility and predictability in the special rate over time, to permit the energy intensive industrial customer the ability to make the capital investments and other commitments necessary to support the continued operation of the facility.

(d) An energy intensive industrial consumer wishing to apply for a special rate shall first enter into negotiations with the utility that provides it with electric power, regarding the terms and conditions of a mutually agreeable special rate. If the negotiations result in an agreement between the energy intensive industrial consumer and the utility, the energy intensive industrial consumer and the utility shall make a joint filing with the commission seeking approval of the proposed special rate. If the negotiations are unsuccessful, the energy intensive industrial consumer may file a petition with the commission to consider establishing a special rate. The commission shall have the authority to establish a special rate upon the filing of either a joint filing or a petition pursuant to this section.

(e) In order to qualify for a special rate, an energy intensive industrial consumer shall:

(1) Have a contract demand of at least fifty thousand kilowatts of electric power at its West Virginia facilities under normal operating conditions;

(2) Create or retain at least twenty-five full time jobs in West Virginia;

(3) Have invested not less than $500,000 in fixed assets, including machinery and equipment, in West Virginia;

(4) Provide reasonable evidence that due to market conditions in the industry in which the energy intensive industrial consumer operates, or other factors bearing on investment in and operation of the industrial facility or facilities, without the special rate the operation or continued operation of the industrial facility or facilities is threatened or not economically viable under reasonable assumptions and projections regarding the market and the operation of the industrial facility or facilities;

(5) Provide reasonable evidence that, with the special rate, the energy intensive industrial consumer intends to operate the industrial facility or facilities in West Virginia for an extended period of time, and that the operation or continued operation of the industrial facility or facilities for an extended period of time appears economically viable, under reasonable assumptions and projections regarding the market in which the energy intensive industrial consumer operates and regarding the operation of the industrial facility or facilities; and

(6) Provide information and data setting forth how the energy intensive industrial consumer meets the qualifications of this section, and how the special rate advances the policy goals set forth in subsection (a) of this section.

(f) The Commission shall determine whether any excess revenue or revenue shortfall created by a special rate authorized pursuant to this section should be allocated among any other customers of the utility. In making that determination, the Commission shall consider all relevant factors,

including whether such allocation is just, reasonable, and fairly balances the interests of other customers, the utility, and the customer receiving the special rate.

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR A GENERAL ADJUSTMENT IN RATES	)))	**CASE NO. 2011-00036**

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO BIG RIVERS ELECTRIC CORPORATION FIRST DATA REQUEST PSC CASE NO. 2011-00036 June 22, 2011

Request BREC-24
Referring to the direct testimony of Mr. Fayne at p. 19, lines 6-8, please provide a detailed description of the "efforts" to which the testimony refers, including any "additional mechanisms" which are being considered.

RESPONSE

During the first quarter of 2011, Century, with support of the Governor and the Public Service Commission, participated in proposing legislation that would provide tax credits to energy intensive industrials to supplement whatever relief could be provided through the regulatory process. The legislation was defeated. However, there is growing support to introduce similar legislation in the next session.

Witness: Henry W. Fayne

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR A GENERAL ADJUSTMENT IN RATES	)))	**CASE NO. 2011-00036**

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO BIG RIVERS ELECTRIC CORPORATION FIRST DATA REQUEST PSC CASE NO. 2011-00036 June 22, 2011

Request BREC-25

Please refer to Mr. Fayne's testimony, Exhibit HWF-1. Please identify and provide each analysis, workpaper, calculation, input and document relied upon by Mr. Fayne that demonstrates that: "If the rates requested by Big Rivers is (sic) approved and both smelters operate at full production, the cost electricity for the Hawesville and Sebree smelters would be $47.86/MWh."

RESPONSE

The $47.86/MWh is the cost of electricity for the smelters for the month of September 2011 as shown in Big Rivers financial forecast provided in response to Data Request KIUC-1-43.

Witness: Henry W. Fayne

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC	)	
CORPORATION FOR A GENERAL	)	**CASE NO. 2011-00036**
ADJUSTMENT IN RATES	)	

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO
BIG RIVERS ELECTRIC CORPORATION
FIRST DATA REQUEST
PSC CASE NO. 2011-00036
June 22, 2011

Request BREC-26
Refer to page 8, line 18 of Mr. Fayne's testimony. What is the transportation cost premium or advantage in $/pound that the Smelters currently are experiencing as a result of being located where they are in the United States?

RESPONSE

The Midwest premium, as reported in Platts, is currently approximately $0.085 per pound.

Witness: Henry W. Fayne

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR A GENERAL ADJUSTMENT IN RATES	)))	**CASE NO. 2011-00036**

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO BIG RIVERS ELECTRIC CORPORATION FIRST DATA REQUEST PSC CASE NO. 2011-00036 June 22, 2011

Request BREC-27
Please refer to pages 14-15 of Dr. Morey's testimony. Please provide the PJM West NYMEX/CME prices utilized, and indicate which contract month they represent, what CME market date they were for, and whether they are close-of-day prices.

RESPONSE.

Monthly NYMEX/CME forward prices for the period May 2011 – December 2013 were obtained for the PJM West hub,[1] and are shown below.

NYMEX/CME Forward Prices: PJM West

	2011	2012	2013
January		58.00	59.35
February		58.00	59.35
March		51.10	52.50
April		51.10	52.50
May	49.40	50.05	51.75
June	54.50	55.25	56.50
July	63.20	64.15	66.00
August	63.20	64.15	66.00
September	52.60	53.05	54.50
October	48.65	50.70	52.25
November	48.90	50.70	52.25
December	53.20	50.70	52.25

Witness: Mathew J. Morey

[1] See http://www.cmegroup.com/trading/energy/electricity/pjm-western-hub-peak-calendar-month-real-time-lmp.html. This data was obtained in April of 2011, and the forecast has been updated since that time. As such, the exact data shown above is no longer listed on the cmegroup.com website.

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR A GENERAL ADJUSTMENT IN RATES	)))	**CASE NO. 2011-00036**

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO BIG RIVERS ELECTRIC CORPORATION FIRST DATA REQUEST PSC CASE NO. 2011-00036 June 22, 2011

Request BREC-28
Please refer to page 14 of Dr. Morey's testimony. Please explain how the BREC-MISO interface price was determined for the months in the test year when Big Rivers was not in the MISO market. Please identify and provide each analysis, workpaper, calculation, input and document that he relies upon to arrive at these prices.

RESPONSE

The BREC-MISO interface price for the period of January 1, 2010 to October 31, 2010 when BREC was not an integrated member of MISO was obtained from the Midwest ISO website.[2] Files utilized include 2009_Jul-Dec_RT_LMP.csv, 2010_Jan-Jun_RT_LMP.csv, 2010_Jul-Sep_RT_LMP.csv, and 2010_OCT-DEC_RT_LMP.csv. These files are contained on the CD accompanying this response. For a more thorough discussion of how this data was used, refer to the document labeled Wholesale Market Price Analysis.doc on the CD accompanying this response.

Witness: Mathew J. Morey

[2] See http://www.midwestmarket.org/publish/Folder/67519_1178907f00c_-7fef0a48324a?rev=1.

Wholesale Market Price Analysis

The following discussion outlines how wholesale market prices are utilized in Dr. Morey's testimony.

1. Hourly LMP data was obtained for the PJM West Hub[1] and for the BREC Interface[2] for the historical period November 2009 – October 2010.

2. The historical hourly LMPs were averaged over months for All Hours and Peak Hours for each location, where the Peak period is defined to be the 12-hour period from hour-ending 9 through hour-ending 20, on weekdays only.

Average Historical LMPs: PJM West Hub

		All Hours	Peak Hours
November	2009	33.04	38.62
December	2009	43.12	47.86
January	2010	51.92	52.77
February	2010	44.36	48.28
March	2010	37.26	42.03
April	2010	38.31	45.90
May	2010	42.33	52.33
June	2010	49.00	62.30
July	2010	60.43	86.12
August	2010	51.84	68.30
September	2010	44.27	56.71
October	2010	35.79	42.64

Average Historical LMPs: BREC Interface

		All Hours	Peak Hours
November	2009	27.47	33.72
December	2009	33.03	37.38
January	2010	41.66	46.88
February	2010	39.84	42.44
March	2010	30.14	33.55
April	2010	30.47	37.18
May	2010	34.58	47.44
June	2010	36.01	48.02
July	2010	40.89	58.01
August	2010	38.60	52.59
September	2010	28.36	39.39
October	2010	26.11	30.80

3. The ratio of the average price in Peak Hours:All Hours was then computed using the PJM West hub data.

Average Historical LMPs: PJM West Hub

		All Hours	Peak Hours	Ratio
November	2009	33.04	38.62	1.17
December	2009	43.12	47.86	1.11
January	2010	51.92	52.77	1.02
February	2010	44.36	48.28	1.09
March	2010	37.26	42.03	1.13
April	2010	38.31	45.90	1.20
May	2010	42.33	52.33	1.24
June	2010	49.00	62.30	1.27
July	2010	60.43	86.12	1.43
August	2010	51.84	68.30	1.32
September	2010	44.27	56.71	1.28

[1] See ftp://www.pjm.com/pub/account/lmpmonthly/. Files utilized include 200911-rt.csv through 201010-rt.csv.

[2] See http://www.midwestmarket.org/publish/Folder/67519_1178907f00c_-7fef0a48324a?rev=1. Files utilized include 2009_Jul-Dec_RT_LMP.csv, 2010_Jan-Jun_RT_LMP.csv, 2010_Jul-Sep_RT_LMP.csv, and 2010_OCT-DEC_RT_LMP.csv.

October	2010	35.79	42.64	1.19

4. Monthly NYMEX/CME forward prices for the period May 2011 – December 2013 were obtained for the PJM West hub.[3] These are peak-hour prices.

NYMEX/CME Forward Prices: PJM West

	2011	2012	2013
January		58.00	59.35
February		58.00	59.35
March		51.10	52.50
April		51.10	52.50
May	49.40	50.05	51.75
June	54.50	55.25	56.50
July	63.20	64.15	66.00
August	63.20	64.15	66.00
September	52.60	53.05	54.50
October	48.65	50.70	52.25
November	48.90	50.70	52.25
December	53.20	50.70	52.25

5. The monthly price ratios computed in step 3 were then used to convert the monthly NYMEX/CME peak-hour forward prices to an all-hours equivalent. Thus, a forecast of average monthly prices across all hours for the PJM West hub was derived.

NYMEX/CME Forward Prices: PJM West					**Inferred All-Hours Forward Price: PJM West**		
	2011	2012	2013	Ratio	2011	2012	2013
January		58.00	59.35	1.02		57.07	58.40
February		58.00	59.35	1.09		53.29	54.53
March		51.10	52.50	1.13		45.30	46.54
April		51.10	52.50	1.20		42.65	43.81
May	49.40	50.05	51.75	1.24	39.96	40.48	41.86
June	54.50	55.25	56.50	1.27	42.87	43.46	44.44
July	63.20	64.15	66.00	1.43	44.35	45.02	46.31
August	63.20	64.15	66.00	1.32	47.97	48.69	50.09
September	52.60	53.05	54.50	1.28	41.07	41.42	42.55
October	48.65	50.70	52.25	1.19	40.83	42.55	43.85
November	48.90	50.70	52.25	1.17	41.83	43.37	44.70
December	53.20	50.70	52.25	1.11	47.93	45.68	47.07

6. Using the All-Hours historical average prices for PJM West hub and the BREC Interface, as computed in step 2, the ratio of PJM West:BREC was computed, and then averaged by season.[4]

[3] See http://www.cmegroup.com/trading/energy/electricity/pjm-western-hub-peak-calendar-month-real-time-lmp.html.

[4] Summer is defined to be June through October; all other months are defined as Winter.

Average Historical All-Hour LMPs

		PJM	BREC	Ratio	Avg Ratio
November	2009	33.04	27.47	0.83	0.82
December	2009	43.12	33.03	0.77	0.82
January	2010	51.92	41.66	0.80	0.82
February	2010	44.36	39.84	0.90	0.82
March	2010	37.26	30.14	0.81	0.82
April	2010	38.31	30.47	0.80	0.82
May	2010	42.33	34.58	0.82	0.82
June	2010	49.00	36.01	0.73	0.71
July	2010	60.43	40.89	0.68	0.71
August	2010	51.84	38.60	0.74	0.71
September	2010	44.27	28.36	0.64	0.71
October	2010	35.79	26.11	0.73	0.71

7. The seasonal average ratio computed in step 6 was then applied to the inferred all-hour forward prices for the PJM West Hub to obtain inferred all-hour forward prices for the BREC Interface.

	Inferred All-Hours Forward Price: PJM West				**Inferred All-Hours Forward Price: BREC**		
	2011	2012	2013	Ratio	2011	2012	2013
January		57.07	58.40	0.82		46.63	47.72
February		53.29	54.53	0.82		43.54	44.55
March		45.30	46.54	0.82		37.01	38.02
April		42.65	43.81	0.82		34.84	35.80
May	39.96	40.48	41.86	0.82	32.65	33.08	34.20
June	42.87	43.46	44.44	0.71	30.23	30.65	31.34
July	44.35	45.02	46.31	0.71	31.28	31.75	32.66
August	47.97	48.69	50.09	0.71	33.83	34.34	35.33
September	41.07	41.42	42.55	0.71	28.96	29.21	30.01
October	40.83	42.55	43.85	0.71	28.79	30.01	30.92
November	41.83	43.37	44.70	0.82	34.18	35.44	36.52
December	47.93	45.68	47.07	0.82	39.16	37.32	38.46

8. The inferred BREC Interface prices computed in step 7 were supplemented with actual data for the first four months of 2011, filling in the four empty cells shown above.

9. Using the All-Hours historical average prices for the BREC Interface, as computed in step 2, and the inferred BREC Interface forward prices, as computed in steps 7 and 8, the ratio of historical:forward BREC price was computed.

	Historical Avg LMPs	**Inferred All-Hours Forward Price: PJM West**			**Scaling Factor**		
		2011	2012	2013	2011	2012	2013
January	41.66	34.13	46.63	47.72	0.82	1.12	1.15
February	39.84	34.98	43.54	44.55	0.88	1.09	1.12
March	30.14	34.83	37.01	38.02	1.16	1.23	1.26

April	30.47	30.47	34.84	35.80	1.00	1.14	1.17
May	34.58	32.65	33.08	34.20	0.94	0.96	0.99
June	36.01	30.23	30.65	31.34	0.84	0.85	0.87
July	40.89	31.28	31.75	32.66	0.76	0.78	0.80
August	38.60	33.83	34.34	35.33	0.88	0.89	0.92
September	28.36	28.96	29.21	30.01	1.02	1.03	1.06
October	26.11	28.79	30.01	30.92	1.10	1.15	1.18
November	27.47	34.18	35.44	36.52	1.24	1.29	1.33
December	33.03	39.16	37.32	38.46	1.19	1.13	1.16

10. The monthly ratios computed in step 9 were used to scale the historical hourly BREC Interface LMP data obtained in step 1.

The result is hourly BREC Interface LMPs at expected 2011, 2012, and 2013 levels.

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR A GENERAL ADJUSTMENT IN RATES	)))	**CASE NO. 2011-00036**

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO BIG RIVERS ELECTRIC CORPORATION FIRST DATA REQUEST PSC CASE NO. 2011-00036 June 22, 2011

Request BREC-29

Refer to pages 13 and 14 of Dr. Morey's testimony, from page 13, line 16 through page 14, line 3.

a. Please identify and provide an electronic copy, or hardcopy if electronic copy is not available, of all information, documents, reports, tables, charts, and other data relied upon by Dr. Morey in preparing the dispatch simulation study, the Status Quo Case, and the Wholesale Market Case. For any electronic documents with formulae, please provide those documents with formulae intact.

b. Please identify and provide any reports prepared from the dispatch simulation study, the Status Quo Case, and the Wholesale Market Case.

RESPONSE

a. Please refer to the document labeled Simulation Analysis.doc on the CD accompanying this response. The computer code that conducts the simulation study is proprietary, and therefore, will not be provided with the spreadsheet associated with the dispatch simulation study. All input data and outputs from the simulation are being provided and any formulae that link cells in output files or summary files remain intact. In lieu of the computer code, a description of the steps necessary to conduct the dispatch simulation study is provided in Simulation Analysis.doc.

b. There was no report prepared on the basis of the dispatch simulation. The results of the dispatch simulation were used as direct input to the preparation of the testimony as filed.

Witness: Mathew J. Morey

Simulation Analysis

The following discussion describes the simulation analysis that underlies Dr. Morey's testimony. The simulation results identified and discussed below are provided in separate Microsoft Excel spreadsheets.

The simulation analysis is conducted using an optimal least-cost dispatch model. This model simulates unit dispatch on an hourly basis, as follows:

1. BREC generating units are removed from the generation stack for scheduled maintenance, if applicable to the current hour.
2. Units are removed from the generation stack using Monte Carlo draws, to simulate the impact of forced (unplanned) outages.
3. The remaining available, online units are ordered according to their marginal running costs.
4. The remaining available, online units are dispatched on a least-cost basis until total committed generation is sufficient to meet BREC's system demand in the current hour.
5. In the Wholesale Market Case only, the model continues to dispatch units not already committed to serve BREC's system demand, absent Smelter load, whenever the marginal running cost is below the BREC interface LMP, such that sales into the wholesale market are economic in the current hour.

This simulation process is conducted for three separate states of the world:

1. The Baseline scenario (referred to in Dr. Morey's testimony as the Status Quo Case), in which BREC serves the Smelter load in addition to all other load.
2. The Incremental scenario, in which BREC does not serve the Smelter load, only all other load. This scenario is an intermediate step in the simulation. Results for this intermediate step are not reported in Dr. Morey's testimony.
3. The Market scenario, (referred to in Dr. Morey's testimony as the Wholesale Market Case) in which BREC does not serve the Smelter load, but mitigates its lost sales with sales to the MISO wholesale market, whenever it is economic to do so.

By observing the difference between the Market and the Incremental scenarios, it is possible to quantify the load each BREC unit can be expected to sell into the MISO wholesale market, absent the Smelter load, and the hour frequency with which each unit does so (i.e., the unit is not already committed to serve BREC's system demand, absent Smelter load, and has a marginal running cost below the prevailing BREC interface LMP).

The optimal least-cost dispatch model has been simplified in the following ways:

- Generator ramp rates are disregarded; all units are presumed to have their maximum output available whenever the unit is dispatchable (i.e., whenever the unit is not offline for maintenance or unplanned outage).
- Generator start-up and shut-down costs are disregarded.
- All hours are dispatched independently.

- The impacts of generator location and congestion are disregarded.

Simulation Model Inputs
The generator inputs to the model are shown in Exhibit MJM-2.

Generator min and max output (MW), min and max heat rates (Btu/kWh), and expected forced outage rates are as specified in documentation supplied by BREC.[1]

Annual Fuel Costs ($/MMBtu), by generating unit, for 2011 – 2013 are computed from the fuel cost data supplied by BREC.[2]

Annual Variable O&M Costs ($/MWh), by generating unit, are computed for 2011 by dividing BREC's budgeted Non-Fuel Variable Operations Expenses[3] by projected unit output for 2011. Variable O&M costs are then assumed to remain constant in 2012 and 2013 for the Wilson plant, and grow by 2.5% per year for all other plants.

Marginal running costs for each unit are computed by multiplying the unit's maximum heat rate by its fuel cost, and adding variable O&M.

In addition to the generator inputs shown in Exhibit MJM-2, the model also utilizes an annual schedule of unit maintenance outages. This unit maintenance schedule is derived from documentation supplied by BREC.[4]

Unit forced outages are simulated using a Monte Carlo method, using the expected forced outage rates described above. For each year and scenario, 20 draws are made.

The model further utilizes as input data actual hourly system loads and actual hourly BREC interface LMPs for the period November 2009 through October 2010. The hourly system load data was supplied by BREC, and was differentiated by Smelter load and Mass Market load.[5] The BREC interface LMP data was downloaded from the MISO website.[6, 7]

Simulation Model Results
The optimal least cost dispatch model simulates how the BREC system would be dispatched in each hour of the year, in each of the three separate states of the world (or scenarios) outlined above.

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[1] Expected forced outage rates are shown in BREC Data Responses 2nd Set.pdf.
[2] See Attachments to KIUC1-129.
[3] Budgeted Non-Fuel Variable Operations Expenses are shown in BREC Data Responses 2nd Set.pdf.
[4] Actual unit maintenance schedules for 2011-2013 are shown in BREC Data Responses 2nd Set.pdf.
[5] Mass Market load data was provided in monthly files 01-2006 mass mem.xls through 09-2010 mass mem.xls; Smelter load was provided in smelter2006-2010.xls.
[6] See http://www.midwestmarket.org/publish/Folder/67519_1178907f00c_-7fdf0a48324a?rev=1. Files utilized include 2009_Jul-Dec_RT_LMP.csv, 2010_Jan-Jun_RT_LMP.csv, 2010_Jul-Sep_RT_LMP.csv, and 2010_OCT-DEC_RT_LMP.csv.
[7] For a discussion of how the wholesale market data was used, see the accompanying Wholesale Market Price Analysis.doc.

This analysis is conducted separately for the years 2011, 2012, and 2013, to capture the effects of changes in LMPs, fuel costs, variable O&M costs, and expected forced outage rates over time.

Given the above, the dimensions of the model output are as follows:

- 8760 hours per year
- by 12 generation sources (10 BREC generating units + MISO market + total)
- by 20 forced outage draws
- by 3 analysis scenarios
- by 3 analysis years

In each of these dimensions, the model computes the generator's output (MW), and total production costs ($).

Monthly and annual summary results for each year, scenario and generator are obtained by averaging the hourly results across the 20 forced outage draws, then averaging across hours within the month, then summing across months in the year.

Simulation Output Files

The full simulation results are contained in Simulation Results 2011.xls, Simulation Results 2012.xls, and Simulation Results 2013.xls. Each of these files is organized as follows:

- Each analysis year is contained in a unique spreadsheet file.
- Each spreadsheet file contains separate sheet tabs for the three analysis scenarios, plus a fourth sheet tab representing BREC sales into MISO.
- Each analysis scenario contains 8760 x 2 rows (production cost and output) of hourly results, and 240 columns (12 generation sources x 20 forced outage draws).
- These output data span the row range 50:17576, and the column range A:IH.
- Results are averaged across forced outage draws in columns IJ:IU.
- Results are averaged across hours in the range A1:M48.

Simulation Summary

Further computations using the simulation results carried forward from the above-listed output files are performed in Margin Analysis.xls. Specifically:

- On the first sheet tab, hourly BREC Interface LMPs for the years 2011-2013 are computed from the historical hourly BREC Interface LMP data and the scaling factors developed using the method outlined in Wholesale Market Price Analysis.xls.doc.
- On the subsequent three sheet tabs, impact analysis is conducted for each of the analysis years (2011, 2012 and 2013). Hourly sales to market, by generating unit and forced outage draw, are obtained by subtracting the unit output quantities from the Incremental scenario from the Market scenario. This difference represents the MWh sales BREC could have made into the MISO wholesale market. Next, the annual MWh sales, revenues, costs, and margins associated

with these wholesale transactions are computed. Sales and revenues are averaged across the 20 forced outage draws.

- On the last sheet tab, the annual results are summarized for the BREC system as a whole. These figures are subsequently reported in Dr. Morey's Exhibit MJM-3.

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC	**)**	
CORPORATION FOR A GENERAL	**)**	**CASE NO. 2011-00036**
ADJUSTMENT IN RATES	**)**	

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO
BIG RIVERS ELECTRIC CORPORATION
FIRST DATA REQUEST
PSC CASE NO. 2011-00036
June 22, 2011

Request BREC-30
Refer to page 6, line 7 of Dr. Morey's testimony. Please provide the simulation used in dispatching Big Rivers' generation against hourly market prices. Please identify and provide all documents, inputs and assumptions used and relied upon by Dr. Morey in establishing the hourly market prices.

RESPONSE

Please see response to BREC 29 and the files provided on the CD accompanying this response.

Respondent: Mathew J. Morey

Simulation Analysis

The following discussion describes the simulation analysis that underlies Dr. Morey's testimony. The simulation results identified and discussed below are provided in separate Microsoft Excel spreadsheets.

The simulation analysis is conducted using an optimal least-cost dispatch model. This model simulates unit dispatch on an hourly basis, as follows:

1. BREC generating units are removed from the generation stack for scheduled maintenance, if applicable to the current hour.
2. Units are removed from the generation stack using Monte Carlo draws, to simulate the impact of forced (unplanned) outages.
3. The remaining available, online units are ordered according to their marginal running costs.
4. The remaining available, online units are dispatched on a least-cost basis until total committed generation is sufficient to meet BREC's system demand in the current hour.
5. In the Wholesale Market Case only, the model continues to dispatch units not already committed to serve BREC's system demand, absent Smelter load, whenever the marginal running cost is below the BREC interface LMP, such that sales into the wholesale market are economic in the current hour.

This simulation process is conducted for three separate states of the world:

1. The Baseline scenario (referred to in Dr. Morey's testimony as the Status Quo Case), in which BREC serves the Smelter load in addition to all other load.
2. The Incremental scenario, in which BREC does not serve the Smelter load, only all other load. This scenario is an intermediate step in the simulation. Results for this intermediate step are not reported in Dr. Morey's testimony.
3. The Market scenario, (referred to in Dr. Morey's testimony as the Wholesale Market Case) in which BREC does not serve the Smelter load, but mitigates its lost sales with sales to the MISO wholesale market, whenever it is economic to do so.

By observing the difference between the Market and the Incremental scenarios, it is possible to quantify the load each BREC unit can be expected to sell into the MISO wholesale market, absent the Smelter load, and the hour frequency with which each unit does so (i.e., the unit is not already committed to serve BREC's system demand, absent Smelter load, and has a marginal running cost below the prevailing BREC interface LMP).

The optimal least-cost dispatch model has been simplified in the following ways:

- Generator ramp rates are disregarded; all units are presumed to have their maximum output available whenever the unit is dispatchable (i.e., whenever the unit is not offline for maintenance or unplanned outage).
- Generator start-up and shut-down costs are disregarded.
- All hours are dispatched independently.

- The impacts of generator location and congestion are disregarded.

Simulation Model Inputs
The generator inputs to the model are shown in Exhibit MJM-2.

Generator min and max output (MW), min and max heat rates (Btu/kWh), and expected forced outage rates are as specified in documentation supplied by BREC.[1]

Annual Fuel Costs ($/MMBtu), by generating unit, for 2011 – 2013 are computed from the fuel cost data supplied by BREC.[2]

Annual Variable O&M Costs ($/MWh), by generating unit, are computed for 2011 by dividing BREC's budgeted Non-Fuel Variable Operations Expenses[3] by projected unit output for 2011. Variable O&M costs are then assumed to remain constant in 2012 and 2013 for the Wilson plant, and grow by 2.5% per year for all other plants.

Marginal running costs for each unit are computed by multiplying the unit's maximum heat rate by its fuel cost, and adding variable O&M.

In addition to the generator inputs shown in Exhibit MJM-2, the model also utilizes an annual schedule of unit maintenance outages. This unit maintenance schedule is derived from documentation supplied by BREC.[4]

Unit forced outages are simulated using a Monte Carlo method, using the expected forced outage rates described above. For each year and scenario, 20 draws are made.

The model further utilizes as input data actual hourly system loads and actual hourly BREC interface LMPs for the period November 2009 through October 2010. The hourly system load data was supplied by BREC, and was differentiated by Smelter load and Mass Market load.[5] The BREC interface LMP data was downloaded from the MISO website.[6, 7]

Simulation Model Results
The optimal least cost dispatch model simulates how the BREC system would be dispatched in each hour of the year, in each of the three separate states of the world (or scenarios) outlined above.

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[1] Expected forced outage rates are shown in BREC Data Responses 2nd Set.pdf.
[2] See Attachments to KIUC1-129.
[3] Budgeted Non-Fuel Variable Operations Expenses are shown in BREC Data Responses 2nd Set.pdf.
[4] Actual unit maintenance schedules for 2011-2013 are shown in BREC Data Responses 2nd Set.pdf.
[5] Mass Market load data was provided in monthly files 01-2006 mass mem.xls through 09-2010 mass mem.xls; Smelter load was provided in smelter2006-2010.xls.
[6] See http://www.midwestmarket.org/publish/Folder/67519_1178907f00c_-7fdf0a48324a?rev=1. Files utilized include 2009_Jul-Dec_RT_LMP.csv, 2010_Jan-Jun_RT_LMP.csv, 2010_Jul-Sep_RT_LMP.csv, and 2010_OCT-DEC_RT_LMP.csv.
[7] For a discussion of how the wholesale market data was used, see the accompanying Wholesale Market Price Analysis.doc.

This analysis is conducted separately for the years 2011, 2012, and 2013, to capture the effects of changes in LMPs, fuel costs, variable O&M costs, and expected forced outage rates over time.

Given the above, the dimensions of the model output are as follows:

- 8760 hours per year
- by 12 generation sources (10 BREC generating units + MISO market + total)
- by 20 forced outage draws
- by 3 analysis scenarios
- by 3 analysis years

In each of these dimensions, the model computes the generator's output (MW), and total production costs ($).

Monthly and annual summary results for each year, scenario and generator are obtained by averaging the hourly results across the 20 forced outage draws, then averaging across hours within the month, then summing across months in the year.

Simulation Output Files

The full simulation results are contained in Simulation Results 2011.xls, Simulation Results 2012.xls, and Simulation Results 2013.xls. Each of these files is organized as follows:

- Each analysis year is contained in a unique spreadsheet file.
- Each spreadsheet file contains separate sheet tabs for the three analysis scenarios, plus a fourth sheet tab representing BREC sales into MISO.
- Each analysis scenario contains 8760 x 2 rows (production cost and output) of hourly results, and 240 columns (12 generation sources x 20 forced outage draws).
- These output data span the row range 50:17576, and the column range A:IH.
- Results are averaged across forced outage draws in columns IJ:IU.
- Results are averaged across hours in the range A1:M48.

Simulation Summary

Further computations using the simulation results carried forward from the above-listed output files are performed in Margin Analysis.xls. Specifically:

- On the first sheet tab, hourly BREC Interface LMPs for the years 2011-2013 are computed from the historical hourly BREC Interface LMP data and the scaling factors developed using the method outlined in Wholesale Market Price Analysis.xls.doc.
- On the subsequent three sheet tabs, impact analysis is conducted for each of the analysis years (2011, 2012 and 2013). Hourly sales to market, by generating unit and forced outage draw, are obtained by subtracting the unit output quantities from the Incremental scenario from the Market scenario. This difference represents the MWh sales BREC could have made into the MISO wholesale market. Next, the annual MWh sales, revenues, costs, and margins associated

with these wholesale transactions are computed. Sales and revenues are averaged across the 20 forced outage draws.

- On the last sheet tab, the annual results are summarized for the BREC system as a whole. These figures are subsequently reported in Dr. Morey's Exhibit MJM-3.

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC	**)**	
CORPORATION FOR A GENERAL	**)**	**CASE NO. 2011-00036**
ADJUSTMENT IN RATES	**)**	

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO
BIG RIVERS ELECTRIC CORPORATION
FIRST DATA REQUEST
PSC CASE NO. 2011-00036
June 22, 2011

Request BREC-31
Please provide the forecasted monthly average MISO market prices that Dr. Morey used in his analysis.

RESPONSE

Please refer to the document labeled Wholesale Market Price Analysis.doc on the CD accompanying this response.

Witness: Mathew J. Morey

Wholesale Market Price Analysis

The following discussion outlines how wholesale market prices are utilized in Dr. Morey's testimony.

1. Hourly LMP data was obtained for the PJM West Hub[1] and for the BREC Interface[2] for the historical period November 2009 – October 2010.

2. The historical hourly LMPs were averaged over months for All Hours and Peak Hours for each location, where the Peak period is defined to be the 12-hour period from hour-ending 9 through hour-ending 20, on weekdays only.

Average Historical LMPs: PJM West Hub

		All Hours	Peak Hours
November	2009	33.04	38.62
December	2009	43.12	47.86
January	2010	51.92	52.77
February	2010	44.36	48.28
March	2010	37.26	42.03
April	2010	38.31	45.90
May	2010	42.33	52.33
June	2010	49.00	62.30
July	2010	60.43	86.12
August	2010	51.84	68.30
September	2010	44.27	56.71
October	2010	35.79	42.64

Average Historical LMPs: BREC Interface

		All Hours	Peak Hours
November	2009	27.47	33.72
December	2009	33.03	37.38
January	2010	41.66	46.88
February	2010	39.84	42.44
March	2010	30.14	33.55
April	2010	30.47	37.18
May	2010	34.58	47.44
June	2010	36.01	48.02
July	2010	40.89	58.01
August	2010	38.60	52.59
September	2010	28.36	39.39
October	2010	26.11	30.80

3. The ratio of the average price in Peak Hours:All Hours was then computed using the PJM West hub data.

Average Historical LMPs: PJM West Hub

		All Hours	Peak Hours	Ratio
November	2009	33.04	38.62	1.17
December	2009	43.12	47.86	1.11
January	2010	51.92	52.77	1.02
February	2010	44.36	48.28	1.09
March	2010	37.26	42.03	1.13
April	2010	38.31	45.90	1.20
May	2010	42.33	52.33	1.24
June	2010	49.00	62.30	1.27
July	2010	60.43	86.12	1.43
August	2010	51.84	68.30	1.32
September	2010	44.27	56.71	1.28

[1] See ftp://www.pjm.com/pub/account/lmpmonthly/. Files utilized include 200911-rt.csv through 201010-rt.csv.

[2] See http://www.midwestmarket.org/publish/Folder/67519_1178907f00c_-7fef0a48324a?rev=1. Files utilized include 2009_Jul-Dec_RT_LMP.csv, 2010_Jan-Jun_RT_LMP.csv, 2010_Jul-Sep_RT_LMP.csv, and 2010_OCT-DEC_RT_LMP.csv.

October	2010	35.79	42.64	1.19

4. Monthly NYMEX/CME forward prices for the period May 2011 – December 2013 were obtained for the PJM West hub.[3] These are peak-hour prices.

NYMEX/CME Forward Prices: PJM West			
	2011	2012	2013
January		58.00	59.35
February		58.00	59.35
March		51.10	52.50
April		51.10	52.50
May	49.40	50.05	51.75
June	54.50	55.25	56.50
July	63.20	64.15	66.00
August	63.20	64.15	66.00
September	52.60	53.05	54.50
October	48.65	50.70	52.25
November	48.90	50.70	52.25
December	53.20	50.70	52.25

5. The monthly price ratios computed in step 3 were then used to convert the monthly NYMEX/CME peak-hour forward prices to an all-hours equivalent. Thus, a forecast of average monthly prices across all hours for the PJM West hub was derived.

NYMEX/CME Forward Prices: PJM West					Inferred All-Hours Forward Price: PJM West		
	2011	2012	2013	Ratio	2011	2012	2013
January		58.00	59.35	1.02		57.07	58.40
February		58.00	59.35	1.09		53.29	54.53
March		51.10	52.50	1.13		45.30	46.54
April		51.10	52.50	1.20		42.65	43.81
May	49.40	50.05	51.75	1.24	39.96	40.48	41.86
June	54.50	55.25	56.50	1.27	42.87	43.46	44.44
July	63.20	64.15	66.00	1.43	44.35	45.02	46.31
August	63.20	64.15	66.00	1.32	47.97	48.69	50.09
September	52.60	53.05	54.50	1.28	41.07	41.42	42.55
October	48.65	50.70	52.25	1.19	40.83	42.55	43.85
November	48.90	50.70	52.25	1.17	41.83	43.37	44.70
December	53.20	50.70	52.25	1.11	47.93	45.68	47.07

6. Using the All-Hours historical average prices for PJM West hub and the BREC Interface, as computed in step 2, the ratio of PJM West:BREC was computed, and then averaged by season.[4]

[3] See http://www.cmegroup.com/trading/energy/electricity/pjm-western-hub-peak-calendar-month-real-time-lmp.html.

[4] Summer is defined to be June through October; all other months are defined as Winter.

Average Historical All-Hour LMPs

		PJM	BREC	Ratio	Avg Ratio
November	2009	33.04	27.47	0.83	0.82
December	2009	43.12	33.03	0.77	0.82
January	2010	51.92	41.66	0.80	0.82
February	2010	44.36	39.84	0.90	0.82
March	2010	37.26	30.14	0.81	0.82
April	2010	38.31	30.47	0.80	0.82
May	2010	42.33	34.58	0.82	0.82
June	2010	49.00	36.01	0.73	0.71
July	2010	60.43	40.89	0.68	0.71
August	2010	51.84	38.60	0.74	0.71
September	2010	44.27	28.36	0.64	0.71
October	2010	35.79	26.11	0.73	0.71

7. The seasonal average ratio computed in step 6 was then applied to the inferred all-hour forward prices for the PJM West Hub to obtain inferred all-hour forward prices for the BREC Interface.

	Inferred All-Hours Forward Price: PJM West				**Inferred All-Hours Forward Price: BREC**		
	2011	2012	2013	Ratio	2011	2012	2013
January		57.07	58.40	0.82		46.63	47.72
February		53.29	54.53	0.82		43.54	44.55
March		45.30	46.54	0.82		37.01	38.02
April		42.65	43.81	0.82		34.84	35.80
May	39.96	40.48	41.86	0.82	32.65	33.08	34.20
June	42.87	43.46	44.44	0.71	30.23	30.65	31.34
July	44.35	45.02	46.31	0.71	31.28	31.75	32.66
August	47.97	48.69	50.09	0.71	33.83	34.34	35.33
September	41.07	41.42	42.55	0.71	28.96	29.21	30.01
October	40.83	42.55	43.85	0.71	28.79	30.01	30.92
November	41.83	43.37	44.70	0.82	34.18	35.44	36.52
December	47.93	45.68	47.07	0.82	39.16	37.32	38.46

8. The inferred BREC Interface prices computed in step 7 were supplemented with actual data for the first four months of 2011, filling in the four empty cells shown above.

9. Using the All-Hours historical average prices for the BREC Interface, as computed in step 2, and the inferred BREC Interface forward prices, as computed in steps 7 and 8, the ratio of historical:forward BREC price was computed.

	Historical Avg LMPs	**Inferred All-Hours Forward Price: PJM West**			**Scaling Factor**		
		2011	2012	2013	2011	2012	2013
January	41.66	34.13	46.63	47.72	0.82	1.12	1.15
February	39.84	34.98	43.54	44.55	0.88	1.09	1.12
March	30.14	34.83	37.01	38.02	1.16	1.23	1.26

April	30.47	30.47	34.84	35.80	1.00	1.14	1.17
May	34.58	32.65	33.08	34.20	0.94	0.96	0.99
June	36.01	30.23	30.65	31.34	0.84	0.85	0.87
July	40.89	31.28	31.75	32.66	0.76	0.78	0.80
August	38.60	33.83	34.34	35.33	0.88	0.89	0.92
September	28.36	28.96	29.21	30.01	1.02	1.03	1.06
October	26.11	28.79	30.01	30.92	1.10	1.15	1.18
November	27.47	34.18	35.44	36.52	1.24	1.29	1.33
December	33.03	39.16	37.32	38.46	1.19	1.13	1.16

10. The monthly ratios computed in step 9 were used to scale the historical hourly BREC Interface LMP data obtained in step 1.

The result is hourly BREC Interface LMPs at expected 2011, 2012, and 2013 levels.

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC	)	
CORPORATION FOR A GENERAL	)	**CASE NO. 2011-00036**
ADJUSTMENT IN RATES	)	

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO
BIG RIVERS ELECTRIC CORPORATION
FIRST DATA REQUEST
PSC CASE NO. 2011-00036
June 22, 2011

Request BREC-32
Refer to page 10, line 20 of Dr. Morey's testimony. Please provide the publicly available wholesale market information relied upon by Dr. Morey in preparing this portion of his testimony.

RESPONSE

Please refer to the document labeled Wholesale Market Price Analysis.doc on the CD accompanying this response.

Witness: Mathew J. Morey

Wholesale Market Price Analysis

The following discussion outlines how wholesale market prices are utilized in Dr. Morey's testimony.

1. Hourly LMP data was obtained for the PJM West Hub[1] and for the BREC Interface[2] for the historical period November 2009 – October 2010.

2. The historical hourly LMPs were averaged over months for All Hours and Peak Hours for each location, where the Peak period is defined to be the 12-hour period from hour-ending 9 through hour-ending 20, on weekdays only.

Average Historical LMPs: PJM West Hub

		All Hours	Peak Hours
November	2009	33.04	38.62
December	2009	43.12	47.86
January	2010	51.92	52.77
February	2010	44.36	48.28
March	2010	37.26	42.03
April	2010	38.31	45.90
May	2010	42.33	52.33
June	2010	49.00	62.30
July	2010	60.43	86.12
August	2010	51.84	68.30
September	2010	44.27	56.71
October	2010	35.79	42.64

Average Historical LMPs: BREC Interface

		All Hours	Peak Hours
November	2009	27.47	33.72
December	2009	33.03	37.38
January	2010	41.66	46.88
February	2010	39.84	42.44
March	2010	30.14	33.55
April	2010	30.47	37.18
May	2010	34.58	47.44
June	2010	36.01	48.02
July	2010	40.89	58.01
August	2010	38.60	52.59
September	2010	28.36	39.39
October	2010	26.11	30.80

3. The ratio of the average price in Peak Hours:All Hours was then computed using the PJM West hub data.

Average Historical LMPs: PJM West Hub

		All Hours	Peak Hours	Ratio
November	2009	33.04	38.62	1.17
December	2009	43.12	47.86	1.11
January	2010	51.92	52.77	1.02
February	2010	44.36	48.28	1.09
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April	2010	38.31	45.90	1.20
May	2010	42.33	52.33	1.24
June	2010	49.00	62.30	1.27
July	2010	60.43	86.12	1.43
August	2010	51.84	68.30	1.32
September	2010	44.27	56.71	1.28

[1] See ftp://www.pjm.com/pub/account/lmpmonthly/. Files utilized include 200911-rt.csv through 201010-rt.csv.

[2] See http://www.midwestmarket.org/publish/Folder/67519_1178907f00c_-7fef0a48324a?rev=1. Files utilized include 2009_Jul-Dec_RT_LMP.csv, 2010_Jan-Jun_RT_LMP.csv, 2010_Jul-Sep_RT_LMP.csv, and 2010_OCT-DEC_RT_LMP.csv.

October	2010	35.79	42.64	1.19

4. Monthly NYMEX/CME forward prices for the period May 2011 – December 2013 were obtained for the PJM West hub.[3] These are peak-hour prices.

NYMEX/CME Forward Prices: PJM West			
	2011	2012	2013
January		58.00	59.35
February		58.00	59.35
March		51.10	52.50
April		51.10	52.50
May	49.40	50.05	51.75
June	54.50	55.25	56.50
July	63.20	64.15	66.00
August	63.20	64.15	66.00
September	52.60	53.05	54.50
October	48.65	50.70	52.25
November	48.90	50.70	52.25
December	53.20	50.70	52.25

5. The monthly price ratios computed in step 3 were then used to convert the monthly NYMEX/CME peak-hour forward prices to an all-hours equivalent. Thus, a forecast of average monthly prices across all hours for the PJM West hub was derived.

NYMEX/CME Forward Prices: PJM West					Inferred All-Hours Forward Price: PJM West		
	2011	2012	2013	Ratio	2011	2012	2013
January		58.00	59.35	1.02		57.07	58.40
February		58.00	59.35	1.09		53.29	54.53
March		51.10	52.50	1.13		45.30	46.54
April		51.10	52.50	1.20		42.65	43.81
May	49.40	50.05	51.75	1.24	39.96	40.48	41.86
June	54.50	55.25	56.50	1.27	42.87	43.46	44.44
July	63.20	64.15	66.00	1.43	44.35	45.02	46.31
August	63.20	64.15	66.00	1.32	47.97	48.69	50.09
September	52.60	53.05	54.50	1.28	41.07	41.42	42.55
October	48.65	50.70	52.25	1.19	40.83	42.55	43.85
November	48.90	50.70	52.25	1.17	41.83	43.37	44.70
December	53.20	50.70	52.25	1.11	47.93	45.68	47.07

6. Using the All-Hours historical average prices for PJM West hub and the BREC Interface, as computed in step 2, the ratio of PJM West:BREC was computed, and then averaged by season.[4]

[3] See http://www.cmegroup.com/trading/energy/electricity/pjm-western-hub-peak-calendar-month-real-time-lmp.html.

[4] Summer is defined to be June through October; all other months are defined as Winter.

Average Historical All-Hour LMPs

		PJM	BREC	Ratio	Avg Ratio
November	2009	33.04	27.47	0.83	0.82
December	2009	43.12	33.03	0.77	0.82
January	2010	51.92	41.66	0.80	0.82
February	2010	44.36	39.84	0.90	0.82
March	2010	37.26	30.14	0.81	0.82
April	2010	38.31	30.47	0.80	0.82
May	2010	42.33	34.58	0.82	0.82
June	2010	49.00	36.01	0.73	0.71
July	2010	60.43	40.89	0.68	0.71
August	2010	51.84	38.60	0.74	0.71
September	2010	44.27	28.36	0.64	0.71
October	2010	35.79	26.11	0.73	0.71

7. The seasonal average ratio computed in step 6 was then applied to the inferred all-hour forward prices for the PJM West Hub to obtain inferred all-hour forward prices for the BREC Interface.

	Inferred All-Hours Forward Price: PJM West				**Inferred All-Hours Forward Price: BREC**		
	2011	2012	2013	Ratio	2011	2012	2013
January		57.07	58.40	0.82		46.63	47.72
February		53.29	54.53	0.82		43.54	44.55
March		45.30	46.54	0.82		37.01	38.02
April		42.65	43.81	0.82		34.84	35.80
May	39.96	40.48	41.86	0.82	32.65	33.08	34.20
June	42.87	43.46	44.44	0.71	30.23	30.65	31.34
July	44.35	45.02	46.31	0.71	31.28	31.75	32.66
August	47.97	48.69	50.09	0.71	33.83	34.34	35.33
September	41.07	41.42	42.55	0.71	28.96	29.21	30.01
October	40.83	42.55	43.85	0.71	28.79	30.01	30.92
November	41.83	43.37	44.70	0.82	34.18	35.44	36.52
December	47.93	45.68	47.07	0.82	39.16	37.32	38.46

8. The inferred BREC Interface prices computed in step 7 were supplemented with actual data for the first four months of 2011, filling in the four empty cells shown above.

9. Using the All-Hours historical average prices for the BREC Interface, as computed in step 2, and the inferred BREC Interface forward prices, as computed in steps 7 and 8, the ratio of historical:forward BREC price was computed.

	Historical Avg LMPs	**Inferred All-Hours Forward Price: PJM West**			**Scaling Factor**		
		2011	2012	2013	2011	2012	2013
January	41.66	34.13	46.63	47.72	0.82	1.12	1.15
February	39.84	34.98	43.54	44.55	0.88	1.09	1.12
March	30.14	34.83	37.01	38.02	1.16	1.23	1.26

April	30.47	30.47	34.84	35.80	1.00	1.14	1.17
May	34.58	32.65	33.08	34.20	0.94	0.96	0.99
June	36.01	30.23	30.65	31.34	0.84	0.85	0.87
July	40.89	31.28	31.75	32.66	0.76	0.78	0.80
August	38.60	33.83	34.34	35.33	0.88	0.89	0.92
September	28.36	28.96	29.21	30.01	1.02	1.03	1.06
October	26.11	28.79	30.01	30.92	1.10	1.15	1.18
November	27.47	34.18	35.44	36.52	1.24	1.29	1.33
December	33.03	39.16	37.32	38.46	1.19	1.13	1.16

10. The monthly ratios computed in step 9 were used to scale the historical hourly BREC Interface LMP data obtained in step 1.

The result is hourly BREC Interface LMPs at expected 2011, 2012, and 2013 levels.

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR A GENERAL ADJUSTMENT IN RATES	)))	**CASE NO. 2011-00036**

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO BIG RIVERS ELECTRIC CORPORATION FIRST DATA REQUEST PSC CASE NO. 2011-00036 June 22, 2011

Request BREC-33
Please refer to page 18 of the testimony of Dr. Morey. Please identify and provide each analysis, workpaper, calculation, input and document that he relies upon to support this 26% market price increase statement.

RESPONSE

Please refer to the spreadsheet labeled Results Summary.xls on the CD accompanying this response. (CONFIDENTIAL CD filed under seal).

Witness: Mathew J. Morey

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC	)	
CORPORATION FOR A GENERAL	)	**CASE NO. 2011-00036**
ADJUSTMENT IN RATES	)	

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO
BIG RIVERS ELECTRIC CORPORATION
FIRST DATA REQUEST
PSC CASE NO. 2011-00036
June 22, 2011

Request BREC-34
Please refer to page 19 of the testimony of Dr. Morey. Please identify and provide each analysis, workpaper, calculation, input and document that he relies upon to support this assertion of a 22% contribution decline.

RESPONSE

Please refer to the spreadsheet labeled Results Summary.xls on the CD accompanying this response. (CONFIDENTIAL CD filed under seal).

Witness: Mathew J. Morey

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR A GENERAL ADJUSTMENT IN RATES	)))	**CASE NO. 2011-00036**

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO
BIG RIVERS ELECTRIC CORPORATION
FIRST DATA REQUEST
PSC CASE NO. 2011-00036
June 22, 2011

Request BREC-35
On page 6 lines 7 through 11 of his testimony, Dr. Morey asserts that the reason for his lower estimate of market sales compared to Smelter sales was "because BREC generation units are frequently out of the market." Please identify and provide each analysis, workpaper, calculation, input and document that he relies upon to support this assertion.

RESPONSE

Please refer to the spreadsheet labeled Margin Analysis.xls on the CD accompanying this response. The frequencies with which BREC generation units are in and out of the market are reported in the range C8774:L8778 on each of the three annual results pages (sheet tabs 2011, 2012 and 2013). (CONFIDENTIAL CD filed under seal).

Witness: Mathew J. Morey

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR A GENERAL ADJUSTMENT IN RATES	)))	**CASE NO. 2011-00036**

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO
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Request BREC-36
On page 6 line 21, Dr. Morey asserts that the "existence of transmission constraints would limit flows out of the BREC zone to MISO". Please identify and provide each analysis, workpaper, calculation, input and document that he relies upon to support this assertion.

RESPONSE

Transmission facilities have flow limits. When the flow through a facility approaches or reaches its limited, that facility is said to be "congested." If and when there is congestion on transmission lines that connect BREC's generation with the rest of the MISO market region, such congestion would constrain the flows and therefore the amounts of energy that BREC could sell to the MISO market.

My analysis did not consider transmission flow limits. My analysis assumed no constraints on BREC's ability to sell energy from its generation units when it is economic to do so (i.e., when the market price is above the marginal running cost of BREC's generating units). Consequently, the results of the simulations provide an overestimate of the margin contribution made by BREC's sales to the MISO wholesale market.

Witness: Mathew J. Morey

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR A GENERAL ADJUSTMENT IN RATES	)))	**CASE NO. 2011-00036**

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO BIG RIVERS ELECTRIC CORPORATION FIRST DATA REQUEST PSC CASE NO. 2011-00036 June 22, 2011

Request BREC-37

In his testimony on page 13, beginning at line 4, Dr. Morey uses the term "substantial" to characterize the flow constraints on some transmission lines that could decrease the quantities of sales to the market. In reaching that conclusion, did he consider the Phase 1 and 2 transmission build-out designed to allow Big Rivers to transmit excess generation to the Big Rivers system borders (*see* page 6.4 of *Big Rivers' Integrated Resource Plan*, P.S.C. Case No. 2010-00443, and *Application of Big Rivers Electric Corporation for a Certificate of Public Convenience and Necessity to Construct a 161 kV Electric Transmission Line in Ohio County, Kentucky*, PSC Case No. 2007-00177) and the potential future benefits of Vectren Energy's 345 kV transmission line (*see Application of Southern Indiana Gas & Electric Co. D/B/A Vectren Energy Delivery of Indiana, Inc. for a Certificate to Construct an Electric Transmission Line from Its A. B. Brown Plant to the Big Rivers Reid EHV Station*, Kentucky State Board on Electric Generation and Transmission Siting, Case No. 2010-00223)?

RESPONSE

The existence of additional transmission lines that would reduce congestion or constraints that could limit the flows of energy from BREC's generating units to the MISO market for sale at wholesale would not change the operating characteristics and cost characteristics of BREC's generating units. My analysis assumes no transmission constraints on BREC's generation sales into the MISO market. My analysis also did not consider the impact on market prices of a significant increase in the number of MWh BREC sells in the wholesale market, which would lower the market price BREC would receive for those MWh. To the extent that additional transmission lines would permit BREC to sell a greater number of MWh to the wholesale market, thus increasing the revenues it would receive from off-system sales, there would also be an off-setting decrease in the market price that BREC would receive for those MWh.

Witness: Mathew J. Morey

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

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Request BREC-38

Please identify and provide electronic copies of Exhibit MJM-3 to the direct testimony of Dr. Morey, with cells and formulas intact, along with all computer models, workpapers and other documents that he relies upon to support this exhibit. Also, please provide any assumptions utilized in this Exhibit that are not stated in the direct testimony.

RESPONSE

The basis of Exhibit MJM-3 is provided on the accompanying CD in the spreadsheet labeled Results Summary.xls. Also, see response to BREC 29 for the remainder of the material relevant to this request. (CONFIDENTIAL CD filed under seal).

Witness: Mathew J. Morey

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR A GENERAL ADJUSTMENT IN RATES	)))	**CASE NO. 2011-00036**

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO BIG RIVERS ELECTRIC CORPORATION FIRST DATA REQUEST PSC CASE NO. 2011-00036 June 22, 2011

Request BREC-39
Please refer to Exhibits MJM-2 and LK-10. Please identify any data in those exhibits that were taken from or derived from material that Big Rivers filed under a petition for confidential treatment, and state what efforts KIUC has taken or plans to take to remove such data from the public record.

RESPONSE:

On June 9, 2011, KIUC filed revised redacted versions of MJM-2 and LK-10 with the Commission with instructions that the previously filed versions be removed from the docket. KIUC also served all parties with the revised redacted version of MJM-2 and LK-10 with instructions to destroy or return to KIUC the previously served version.

Witness: Counsel

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC	)	
CORPORATION FOR A GENERAL	)	**CASE NO. 2011-00036**
ADJUSTMENT IN RATES	)	

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO
BIG RIVERS ELECTRIC CORPORATION
FIRST DATA REQUEST
PSC CASE NO. 2011-00036
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Request BREC-40
With the relatively high market prices for primary aluminum, please identify and explain the steps, if any, that each Smelter has taken to hedge its long position in the market.

RESPONSE

The determination of whether or not to hedge the sale of aluminum is complex because of the costs and risks associated with such activity. For example, with hedging the company assumes counterparty risk, LME price risk to the extent that the cost of raw materials varies with the LME price, cost of production risk including the future cost of energy, production risk to the extent that the hedge is physical, and market value risk depending on the impact of mark-to-market accounting and the credit support required. Moreover, world-wide operations for both Rio Tinto and Century Aluminum provide a natural hedge. For the reasons described above, Rio Tinto's strategy is generally not to hedge. Century's corporate policy is not to sell forward its production (on either a physical or financial basis), due to the reasons described above. Century does, however, from time to time, seek to limit downside price risk by purchasing put options, which effectively lock in a minimum price. Consistent with its policy, Century has purchased put options (to protect a portion of its U.S. production) for 2011 and the first half of 2012.

Witness: Henry W. Fayne

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF BIG RIVERS ELECTRIC CORPORATION FOR A GENERAL ADJUSTMENT IN RATES	)))	**CASE NO. 2011-00036**

KENTUCKY INDUSTRIAL UTILITY CUSTOMERS RESPONSE TO BIG RIVERS ELECTRIC CORPORATION FIRST DATA REQUEST PSC CASE NO. 2011-00036 June 22, 2011

Request BREC-41
Please identify and provide, by Smelter and by month, a list of the cash payments received by each Smelter from Big Rivers, Kenergy Corp., or a subsidiary or affiliate of the former E.ON U.S., LLC arising out of, related to, or in connection with the Big Rivers unwind transaction as referred to by Mr. Fayne on page 21 of his testimony.

RESPONSE

KIUC respectfully objects to this Item 41 on the ground that the information requested is not relevant to the issues presented in this docket and is confidential and proprietary to each Smelter. KIUC further objects to that portion of the request asking for payments from Big Rivers and for payments to the Smelters from the escrow account held by PNC Bank on the ground that Big Rivers has such information in its possession. Without waiving the foregoing objections, KIUC states the following:

(1) The Smelters received no payments from Kenergy;

(2) E.ON payments to the smelters at closing were disclosed to the Staff and the Attorney General in Case No. 2007-00445 under a petition of confidentiality. Please refer to the confidential response of E.ON to Item 83 of the Attorney General's Supplemental Request for Information in that docket.

Witness: Counsel