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Coal Power Plants
Marke/Surrebuttal
Public Counsel
ER-2019-0335

SURREBUTTAL TESTIMONY

OF

GEOFF MARKE

Submitted on Behalf of the Office of the Public Counsel

UNION ELECTRIC COMPANY
D/B/A AMEREN MISSOURI

FILE NO. ER-2019-0335

February 14, 2020

**BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF THE MISSOURI**

In the Matter of the Union Electric Company d/b/a)
Ameren Missouri's Tariffs to Decrease Its) File No. ER-2019-0335
Revenues for Electric Service)

AFFIDAVIT OF GEOFF MARKE

STATE OF MISSOURI)
) ss
COUNTY OF COLE)

Geoff Marke, of lawful age and being first duly sworn, deposes and states:

1. My name is Geoff Marke. I am a Regulatory Economist for the Office of the Public Counsel.
2. Attached hereto and made a part hereof for all purposes is my rebuttal testimony.
3. I hereby swear and affirm that my statements contained in the attached testimony are true and correct to the best of my knowledge and belief.



Geoff Marke
Chief Economist

Subscribed and sworn to me this 14th day of February 2020.



TIFFANY HILDEBRAND
My Commission Expires
August 8, 2023
Cole County



Tiffany Hildebrand
Notary Public

My commission expires August 8, 2023.

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SURREBUTTAL TESTIMONY

OF

GEOFF MARKE

UNION ELECTRIC COMPANY

d/b/a Ameren Missouri

CASE NO. ER-2019-0335

1 **I. INTRODUCTION**

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

3 A. Geoff Marke, PhD, Chief Economist, Office of the Public Counsel (“OPC” or “Public
4 Counsel”), P.O. Box 2230, Jefferson City, Missouri 65102.

5 **Q. Are you the same Geoff Marke that filed direct and rebuttal testimony?**

6 A. Yes.

7 **Q. What is the purpose of your surrebuttal testimony?**

8 A. I respond to Ameren Missouri witness Matt Michels’ rebuttal testimony pertaining to Ameren
9 Missouri’s past, present, and future planning for its Coal Power Generating Plants.

10 My silence regarding any issue should not be construed as an endorsement of, agreement
11 with, or consent to any other party’s filed position.

12 **II. Coal-Fired Power Plants**

13 **Q. In response to Sierra Club witness Avi Allison’s direct testimony that Ameren Missouri
14 should not continue to invest in its existing coal-fired generating units, Mr. Michels
15 testifies in his rebuttal testimony that Ameren Missouri recently evaluated the future of
16 each of its coal-fired units in its 2017 IRP analysis, and will do so again as part of its 2020
17 IRP analysis. Is there a major ratemaking consideration of which the Commission should
18 be aware that neither Mr. Allison nor Mr. Michels address?**

19 A. Yes. If Ameren Missouri retires any of its coal-fired power plants in the near future, long before
20 it has fully recovered its investment in them in rates, then either Ameren Missouri or its retail
21 customers will bear the heavy economic burden of those stranded assets. To provide some

1 perspective, Table 1 includes the most current plant-in-service values, accumulated
 2 depreciation reserves, and unrecovered balances of Ameren Missouri’s coal-fired generating
 3 power plant.¹

4 Table 1: Projected individual and total unrecovered rate base of Ameren Coal-Powered Generation²

End of year	Sioux	Labadie	Rush Island	Meramec	Total Unrecovered
2019	\$801,365,034	\$1,127,912,523	\$555,120,712	\$158,350,249	\$2,642,748,518
2020	\$716,072,778	\$1,090,330,354	\$535,457,715	\$112,863,875	\$2,454,724,721
2021	\$658,840,001	\$1,052,748,184	\$515,794,718	\$67,377,500	\$2,294,760,403
2022	\$601,607,224	\$1,015,166,015	\$496,131,721	\$21,891,126	\$2,134,796,086
2023	\$544,374,448	\$977,583,845	\$476,640,106		\$1,998,598,399
2024	\$487,372,553	\$940,001,676	\$457,261,415		\$1,884,635,643
2025	\$430,383,387	\$902,419,507	\$437,882,724		\$1,770,685,618
2026	\$373,394,222	\$864,837,337	\$418,504,033		\$1,656,735,592
2027	\$316,405,057	\$827,255,168	\$399,125,342		\$1,542,785,567
2028	\$259,415,892	\$789,672,999	\$379,762,377		\$1,428,851,267
2029	\$202,426,726	\$752,090,829	\$360,411,104		\$1,314,928,659
2030	\$145,437,561	\$714,508,660	\$341,081,994		\$1,201,028,215
2031	\$88,470,484	\$676,926,490	\$321,758,838		\$1,087,155,813
2032	\$31,508,121	\$639,344,321	\$302,435,683		\$973,288,125
2033	-\$25,454,242	\$601,762,152	\$283,112,527		\$859,420,437
2034		\$564,179,982	\$263,789,371		\$827,969,353
2035		\$526,597,813	\$244,466,215		\$771,064,028
2036		\$489,015,643	\$225,143,060		\$714,158,703
2037		\$451,433,474	\$205,819,904		\$657,253,378

¹ These net plant values (original plant-in-service less projected accumulated depreciation reserve) values are derived from Staff’s workpapers to its preliminary true-up accounting schedules.

² From this data, OPC utilized the currently authorized depreciation rates from Case No. ER-2014-0258 to adjust the accumulated depreciation reserves on an yearly basis though the end of the facilities useful life as used in the 2014 and 2019 depreciation studies performed on behalf of Ameren Missouri by Gannett Fleming. It should be noted that that this table assumes: 1.) there are no additions or retirements included in this analysis, original plant-in-service is held static in this exercise; 2.) for the accounts that are amortized, once the account became fully accrued depreciation accrual was shut off, meaning for all accounts plant-in-service equals the accumulated depreciation reserve. Values of stranded assets do not account for any retirement/dismantlement costs (e.g., soil reclamation, abatement, removal of cooling/exhaust stack); 3.) plant-in-service values also do not include any costs for environmental upgrades or any other replacements that may be needed to achieve projected life of facilities based on the 2019 depreciation study; 4.) The projected retirement year values represent a full year (December 31); 5.) Depreciation rates used for annual accrual of reserves throughout are the current ordered rates from Case No. ER-2014-0258 for each facility location; and 6.) The table does not address the recovery of unrecovered assets at time of retirement.

2038		\$413,851,305	\$186,496,748		\$600,348,053
2039		\$376,269,135	\$167,173,592		\$543,442,727
2040		\$338,686,966	\$147,850,436		\$486,537,402
2041		\$301,104,796	\$128,527,281		\$429,632,077
2042		\$263,522,627	\$109,204,125		\$372,726,752
2043			\$89,880,969		\$89,880,969
2044			\$70,557,813		\$70,557,813
2045			\$51,234,657		\$51,234,657

1 In ratemaking parlance, these numbers represent the “return of” portion of Ameren Missouri’s
2 investment. As Mr. Michels pointed out in his testimony (and I touch on in my footnote 2)
3 there are *many* more potential costs associated with the retirement of any generating unit, not
4 least of which is replacing the generating resource itself, and the transmission capability
5 associated with those units.

6 **Q. Mr. Michels dismisses Mr. Allison’s citation of the Federal Eastern District of Missouri
7 Court case regarding environmental compliance of Rush Island for purposes of Ameren
8 Missouri’s 2017 IRP. What do you know about what has happened in that case?**

9 A. On September 30th, 2019, the U.S. Court for the Eastern District of Missouri ordered
10 remedial actions in regards to Ameren Missouri’s violation of the Clean Air Act at its Rush
11 Island Power Plant. In his concluding order Judge Rodney W. Sippel stated:

12 In the 1977 Clean Air Act Amendments, Congress struck a balance. The Act
13 allowed then-existing power plants to continue emitting high levels of
14 pollution until their owners made major modifications at those plants. At that
15 point, they would have to apply for a PSD [Prevention of Significant
16 Deterioration] permit and meet reduced emissions requirements. For thirty
17 years, Ameren benefitted from this policy, operating Rush Island without the
18 need to apply for a PSD permit. When Ameren decided to make major
19 modifications to expand Rush Island’s capacity, Ameren refused to play by
20 the rules Congress set. It did not apply for the required PSD permit, and in so

1 doing skirted PSD's requirement to install the best available technology to
2 control the pollution Rush Island emits.

3 To remedy its violation of the Clean Air Act, Ameren must now apply for a
4 PSD permit for Rush Island within ninety days, propose wet FGD [Flue Gas
5 Desulfurization] as BACT [Best Available Control Technology] in its permit
6 application, and implement BACT no later than four and one-half years from
7 this order. However, to stop there would be to abet Ameren's Clean Air Act
8 violation and to ignore harm that violation has caused. Mindful of my
9 authority to grant other appropriate injunctive relief under the Clean Air Act,
10 I cannot ignore the harm.

11 In addition to the relief I order at Rush Island, I will also order Ameren to
12 reduce its pollution at Labadie in an amount equal to Ameren's excess
13 emissions at Rush Island. Ameren may choose whether it will achieve the
14 reductions by installing DSI [Dry Sorbent Injection] or some other more
15 effective pollution control at Labadie. This is not a penalty for Ameren's
16 violation of the Clean Air Act; it is an attempt to put the Plaintiffs in the place
17 they would have been had Ameren complied with PSD program requirements
18 from the start. The ton-for-ton reduction at Labadie directly remediates the
19 public harm Ameren has caused and reverses the unjust gain Ameren has
20 enjoyed from its violation of the Clean Air Act at Rush Island.

21 Accordingly,

22 **IT IS HEREBY ORDERED THAT** Defendant Ameren shall apply for a
23 Prevention of Significant Deterioration permit for the Rush Island Energy
24 Center within ninety days of the date of this Order. Ameren must propose wet
25 flue-gas desulfurization as the technology-basis for its Best Available Control
26 Technology proposal.

27 **IT IS HEREBY ORDERED THAT** Defendant Ameren shall operate Rush

1 Island Units 1 and 2 in compliance with an emissions limit that is no less
2 stringent than 0.05 lb SO₂/mmBTU on a thirty-day rolling average within
3 four and one half years of this Order.

4 **IT IS HEREBY ORDERED THAT** Defendant Ameren shall install a
5 pollution control technology at least as effective as dry sorbent injection at
6 the Labadie Energy Center within three years from the date of this Order. That
7 technology shall remain in use at Labadie until Ameren has achieved
8 emissions reductions totaling the same amount as the excess emissions from
9 Rush Island, as defined in this Order, through the time Ameren installs BACT
10 at Rush Island.

11 **IT IS HEREBY ORDERED THAT** I will retain jurisdiction over this case
12 until

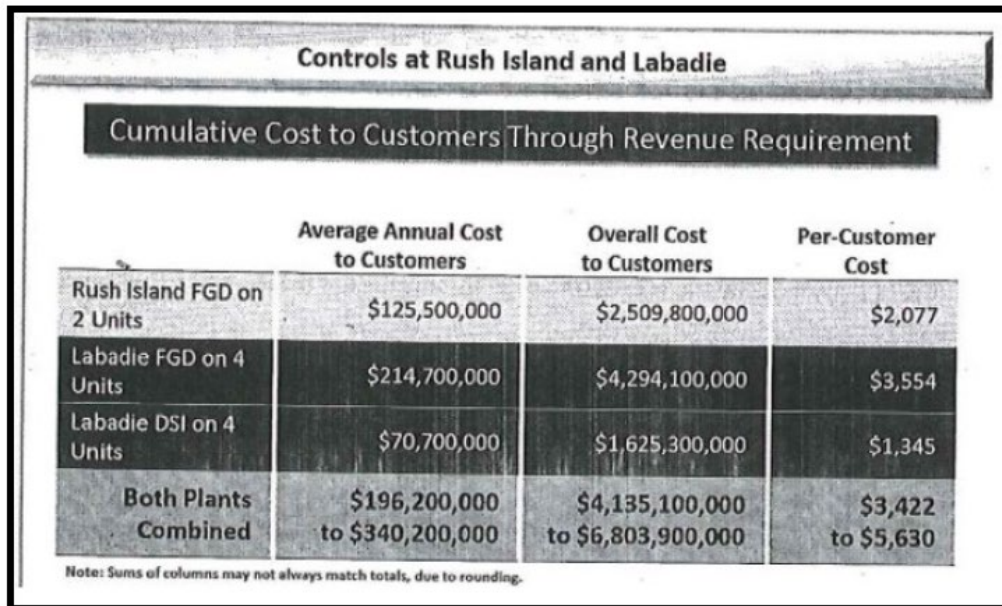
13 Ameren has fully implemented the remedies set forth in this Order.³

14 **Q. Did Ameren Missouri perform a cost impact analysis or modeling scenario for this**
15 **potential outcome when it conducted its 2017 IRP?**

16 A. No, it did not. However, in the Federal Eastern District of Missouri Court case Ameren
17 Missouri put a projected cost estimate regarding Ameren Missouri's environmental
18 compliance at Rush Island and Labadie for Judge Sippel to consider. That estimate is
19 included in Figure 1 below.

³ *U.S. v. Ameren Missouri*, 4:11 CV 77 RWS (E.D. Mo.) Memorandum Opinion & Order p. 155-157.

1 Figure 1: Ameren Missouri’s average annual, overall and per customer-estimated costs associated
2 with environmental compliance at Rush Island and Labadie.⁴



	Average Annual Cost to Customers	Overall Cost to Customers	Per-Customer Cost
Rush Island FGD on 2 Units	\$125,500,000	\$2,509,800,000	\$2,077
Labadie FGD on 4 Units	\$214,700,000	\$4,294,100,000	\$3,554
Labadie DSI on 4 Units	\$70,700,000	\$1,625,300,000	\$1,345
Both Plants Combined	\$196,200,000 to \$340,200,000	\$4,135,100,000 to \$6,803,900,000	\$3,422 to \$5,630

Note: Sums of columns may not always match totals, due to rounding.

3
4 It is unclear whether Ameren Missouri still stands by these cost estimates.

5 **Q. Has anything more recent occurred regarding this federal court litigation?**

6 A. Yes. On Wednesday, February 12, 2020 the *St. Louis Post Dispatch* reported that:

7 The Department of Justice has accused Ameren of failing to comply with its
8 September order to curb air pollution from the power utility’s coal-fired Rush
9 Island Energy Center in Jefferson County, according to court records filed last
10 week.

11 The Feb. 5 filing says that Ameren failed to provide a complete permit
12 application for major modifications to the facility that would add pollution
13 controls called scrubbers. Beyond omitting required information in its
14 application, the St. Louis-based energy company left out a corresponding

⁴ Source listed in brief is as follows: “Slides 15 and 22; Celebi Report pp. 31-33 & Fi. 17; Celebi_EXP_000023 (Fig 15, 17, 18, 28—RevReq & Rate Impact Model_FINAL.xlsx)”

1 \$5,000 fee, and only submitted a lesser \$250 fee applicable for separate,
2 minor permits, according to U.S. attorneys.

3 Additionally, the utility has “inexplicably paused” engineering and
4 preparatory work that it had previously said was necessary to comply with the
5 court order, the filing says.⁵

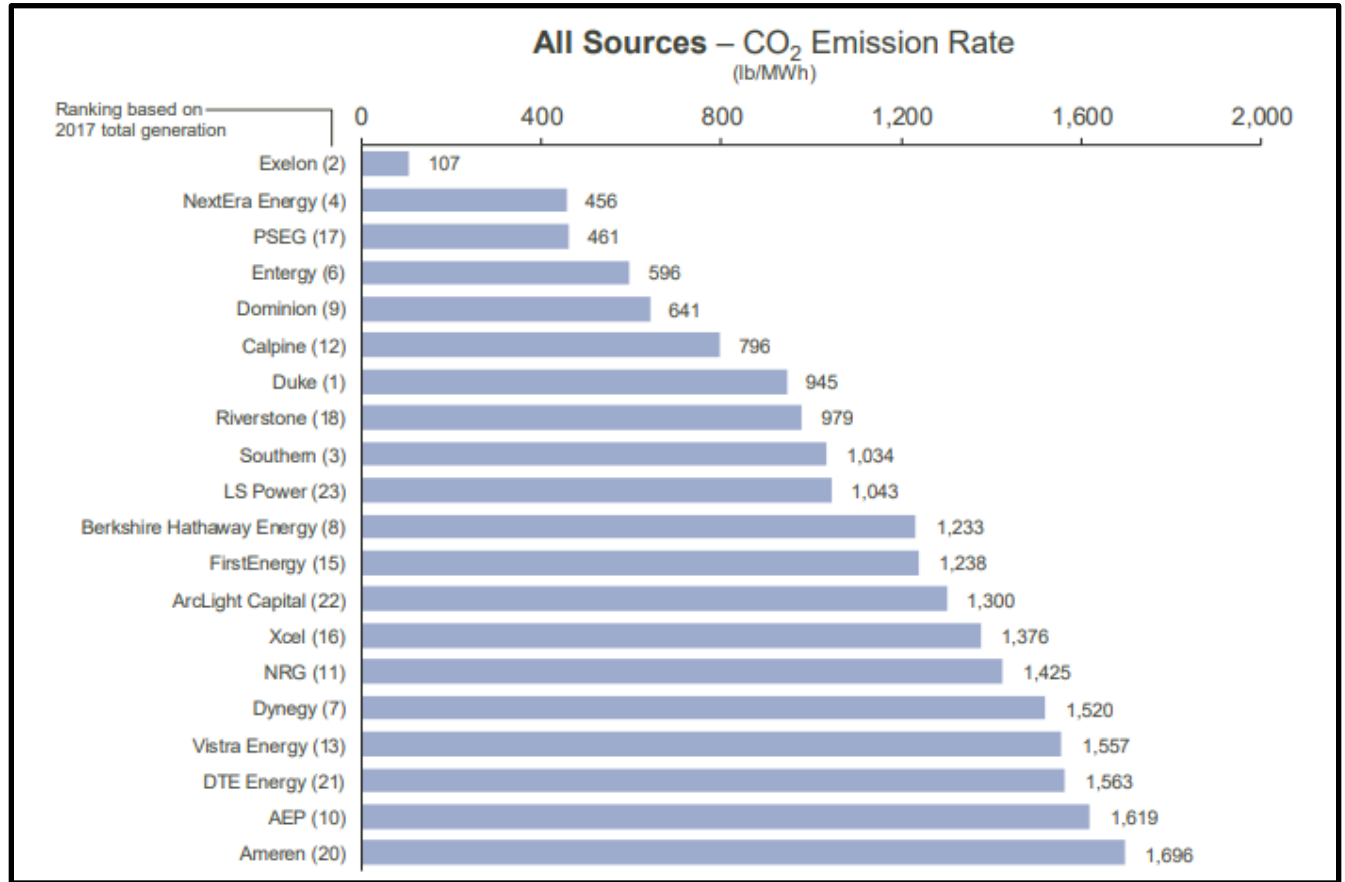
6 I do not know what to make of this information other than Ameren Missouri appears to
7 continue to raise air quality concerns due to managerial inaction from environmental
8 regulators and the Justice Department.

9 **Q. Are you aware of any other information related to the early retirement of Ameren**
10 **Missouri’s coal-fired generating plants of which the Commission should be made aware?**

11 A. Yes. Based on my cursory review of benchmarking data, relative to other utilities, Ameren
12 Missouri ranks poorly in terms of CO₂ emission rates. Figure 2 illustrates this by ranking
13 the top 20 investor owned utilities in the United States by CO₂ Emission Rate.

⁵ Gray, B. (2020) U.S. accuses Ameren of failing to comply with pollution order at Rush Island. *St. Louis Post Dispatch*.
https://www.stltoday.com/business/local/u-s-accuses-ameren-of-failing-to-comply-with-pollution/article_ba527171-7ee6-59bb-9065-f26ead1622a1.html

1 Figure 2: MJ Bradley Rankings by CO₂ Emission Rate (Top 20 Investor Owned Power Producers
2 2017.⁶



3
4 Note that Ameren is listed at the bottom with the largest emission rate. If true, this would appear
5 to be a large liability.

6 **Q. Mr. Michels testifies that Ameren Missouri’s 2017 IRP analysis suggests that early**
7 **retirement of Ameren Missouri’s Rush Island and Labadie coal-fired generating plants**
8 **would cost its ratepayers more than \$2.4 Billion. Do you agree with him?**

9 **A.** Mr. Michel’s is correct insofar as it would definitely cost a lot of money. Table 1 referenced
10 earlier, gives an idea of some of Ameren Missouri outstanding net investment in its coal-fired

⁶ M.J. Bradley (2019) Benchmarking Air Emissions: Of the 100 largest electric power producers in the United States
https://www.mjbradley.com/sites/default/files/Presentation_of_Results_2019.pdf slide 22.

1 generating plants. Given Ameren Missouri's continued noncompliance with federal
2 environmental emissions requirements, I take issue with any implication that these costs should
3 be borne by ratepayers. Early retirement of Ameren Missouri's Rush Island and Labadie
4 generating plants before the end of their useful lives would make those plants stranded assets.

5 **Q. What is a stranded asset?**

6 A. A "stranded asset" is a term that has different meanings depending on the context. Assets
7 become stranded if their expected cash flow is less than their remaining book value—in
8 other words, if the asset is expected to generate less revenues than it will cost from a point
9 in time until the end of its useful life. Regulation-based stranded assets differ from market-
10 based stranded assets. The latter simply compares the book value of an asset relative to some
11 future market value of the asset. For example, if an oil reserve has \$1 billion book value but
12 sliding demand due to carbon taxes or other environmental regulations reduces its market
13 value to \$400 million, the result is \$600 million in stranded assets. By contrast, regulation-
14 based assets are assets that are subject to cost-of-service or other rate-of-return regulation.
15 Government regulators have explicitly approved this type of asset to earn a return over a
16 defined period at some point in the past if the asset is deemed "used" and "useful."⁷ A
17 regulated supply-side asset is meant to provide service throughout its life to the captive
18 customers who are paying for its use. That is, absent government-sanctioned intervention
19 or a categorical loss in load (*i.e.*, "a death spiral"), a regulated asset should not become
20 stranded.

21 **Q. Presently, are Labadie or Rush Island stranded assets?**


22 A. No. Both plants are operational.

⁷ To ensure affordability and full utilization of the asset, the cost recovery generally is amortized throughout its expected "useful life." The asset costs are allocated to all customers on a pro-rata basis, and are generally recovered on a volumetric basis. As the number of customers change, the volumetric charge is adjusted so that the utility only recovers the value of the asset (including associated potential profit).

1 **Q. Are Ameren Missouri’s potential stranded costs for its Rush Island and Labadie power**
 2 **plants the only significant items that could impact Ameren Missouri’s retail rates in the**
 3 **near future?**

4 A. No. As the Commission is well aware, Ameren Missouri is planning a large amount of plant
 5 investment in the near future. Last year, Ameren filed its 5-year “Smart Energy Plan” which
 6 includes over \$5 billion in capital investment as seen in Figure 3.

7 Figure 3: Ameren Smart Energy Plan (SB 564 proposal) to the MO PSC Commissioners—
 8 Agenda, February 20, 2019⁸

Smart Energy Plan 5YR Total Capital Overview (Thousands \$)						
A 5-year average of 37% of capital investments will go toward grid modernization						
	2019	2020	2021	2022	2023	Grand Total
Smart, Reliable Grid Operations	\$335,042	\$451,058	\$406,117	\$391,472	\$360,506	\$1,944,195
Smart Meter Program	\$30,034	\$54,870	\$51,966	\$55,995	\$52,117	\$244,982
Non-Nuclear Generation & Environmental	\$186,348	\$176,756	\$182,326	\$196,643	\$226,609	\$968,682
Nuclear Generation	\$74,684	\$65,896	\$61,411	\$76,451	\$73,984	\$352,426
Hydro Generation	\$34,825	\$33,627	\$43,395	\$33,499	\$14,955	\$160,301
Renewable & Gas Turbine Generation	\$11,948	\$21,782	\$20,104	\$25,732	\$19,339	\$98,905
Secure & Reliable Transmission	\$141,184	\$135,658	\$153,958	\$148,264	\$154,070	\$733,134
Cyber & Technology Upgrades	\$88,542	\$89,955	\$89,849	\$89,877	\$89,873	\$448,096
Operational & Customer Support Facilities	\$54,393	\$96,518	\$58,560	\$50,817	\$53,505	\$313,793
Innovative Opportunities	\$14,302	\$9,064	\$5,799	\$4,947	\$3,852	\$37,964
Grand Total - Capital	\$971,302	\$1,135,184	\$1,073,485	\$1,073,697	\$1,048,810	\$5,302,478
Wind Asset Acquisition (two sites)		\$1,000,000				\$1,000,000
Grand Total, Including Wind	\$971,302	\$2,135,184	\$1,073,485	\$1,073,697	\$1,048,810	\$6,302,478

9
 10
 11 As I noted in my rebuttal testimony, Ameren Missouri has failed to provide any quantified
 12 benefits for ratepayers for these planned investments. I am aware of no cost-benefit ratios, no
 13 performance measures, no risk-informed distribution project evaluations or prioritizations. I

⁸ Overview of Ameren Missouri’s Smart Energy Plan, February 20, 2019 Presented by Mark Birk & Tina Shannon.
<https://psc.mo.gov/CMSInternetData/Agenda%20Presentations/2019%20Presentations/3-6-19%20Ameren%20Missouri's%20Smart%20Energy%20Plan.pdf> Slide 5.

1 have not seen a single performance benchmark offered including no reliability metrics or O&M
2 savings. Nothing.

3 The Commission should also be aware that additional costs (above and beyond the planned
4 Smart Energy investments) include, but are not limited to, over a billion in capital investment
5 related to two wind farm units and hundreds of millions in further MEEIA investments.

6 **Q. In light of this information, do you agree with Mr. Michels that Ameren Missouri's**
7 **pending 2020 IRP will sufficiently address the Sierra Club's concerns that Mr. Allison**
8 **raises?**

9 A. I do not know and I do not have a good idea on how to rectify this concern.

10 **Q. What should the Commission do then?**

11 A. I recommend that the Commission be cognizant that every incremental cost request Ameren
12 Missouri makes for novel, nontraditional rate base items or expenses, including, but not limited
13 to: solar + battery, microgrids, underground distribution lines, electric forklifts, etc., needs to
14 be judged with the knowledge that both Rush Island and Labadie represent billions in dollars
15 of immediate potential liability for both ratepayers and investors.

16 I struggle to see how Ameren Missouri can spend \$5 billion in Smart Plan investments and
17 other unique investments while remaining silent on Labadie and Rush Island. To be clear, I
18 am not suggesting that the Commission should take on a managerial role. Ameren Missouri's
19 management is well compensated and its investors are financially rewarded for the perceived
20 risks in electing to invest in the Company. I am merely recommending that the Commission
21 should not consider Ameren Missouri's separate cost requests in a vacuum.

22 There is a finite amount of money out there to solve a seemingly endless number of issues.
23 Ameren Missouri could probably address *any* problem but it cannot address *every* problem.
24 The Company needs to prioritize its investments and look out for its captive ratepayers. A
25 decrease in this case is nice, but I fear for what will follow.

1 **Q. Do you have any final comments to make on this topic?**

2 A. The Commission should be aware that Minnesota's Xcel Energy, a large IOU in the MISO
3 marketplace is also wrestling with some of the same issues posed by Sierra Club in this case.
4 Like Missouri, Minnesota's PUC opened up a docket to investigate uneconomic self-dispatch
5 this past year. Xcel responded by withdrawing its "Must-run" policy in favor of a seasonal
6 dispatch.⁹ Whether or not Ameren Missouri's existing coal contracts (or other factors) would
7 support such an outcome is not clear to me as of this writing, but it could be an option worth
8 exploring.

9 **Q. Does this conclude your testimony?**

10 A. Yes.

⁹ Storrow, B. (2020) Many utilities have a 'must-run' policy. One broke the rule. *E&E News*.
<https://www.eenews.net/stories/1062072877>