BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of an Investigation of the Cost to Missouri's Electric Utilities Resulting from Compliance with Federal Environmental Regulations	)))	File No. EW-2012-0065

Comments in Response to
Orders Directing Response to Certain Questions

INTRODUCTION

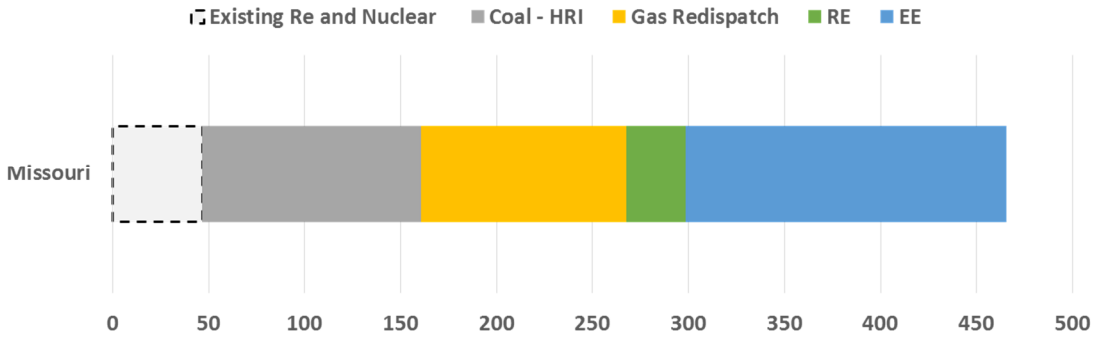
Sierra Club respectfully submits the following answers to questions posed by the Missouri Public Service Commission in File No. EW-2012-0065, *In the Matter of an Investigation of the Cost to Missouri Electric Utilities Resulting from Compliance with Federal Environmental Regulations*. With more than 2 million members and supporters nationwide, and 8,643 members in Missouri, Sierra Club is one of the nation's largest and most influential environmental organizations. Sierra Club has a long history of working cooperatively with states to meaningfully implement environmental and public health laws and regulations.

The risks of climate disruption to Missouri are dramatic. More frequent, extreme weather events such as floods and tornados are already taking a toll. In 2008, all but five Missouri counties were subject to federal storm or flood-related federal disaster declarations.[1] In 2011 and 2012, Missouri ranked 7th in the nation in federal disaster recovery spending at $2.5 billion.[2] Temperature extremes and drought are expected to cause higher heat stress on agricultural crops and livestock, decreasing yields. Crop pests are expected to increase. For example, conditions conducive to corn earworm currently occur approximately three times every 10 years in southern Missouri.[3] These conditions are expected to increase to nearly every year by the end of the century.[4]Accordingly, a huge portion of Missouri's

[1] Union of Concerned Scientists, Confronting Climate Change in the U.S. Midwest, Missouri Fact Sheet, July, 2009, http://www.ucsusa.org/assets/documents/global_warming/climate-change-missouri.pdf
[2] Daniel Weiss, et al., *States of Denial: States with the Most Federal Disaster Aid Sent Climate-Science Deniers to Congress*, Center for American Progress, Sept. 11, 2013, http://cdn.americanprogress.org/wp-content/uploads/2013/09/StateDisasterSpending-2.pdf
[3] Union of Concerned Scientists, Confronting Climate Change in the U.S. Midwest, Missouri Fact Sheet, July, 2009, http://www.ucsusa.org/assets/documents/global_warming/climate-change-missouri.pdf
[4] *Id*.

economy is at risk. Corn alone is a $1.9 billion industry in Missouri.[5] The state is one of the nation's top agricultural producers, and is second in the nation for the highest number of farms.[6]

Sierra Club would like to start by answering the PSC's question "*Is the statewide goal established by EPA for Missouri achievable?"* Based on research and analysis and our state-wide knowledge of Missouri's power sector, Sierra Club is confident that Missouri is well-positioned to reduce carbon emissions from power plants by 21% to achieve the goal articulated in U.S. EPA's draft "Clean Power Plan."[7] If Missouri implemented EPA's building blocks as calculated in EPA's "best system of emissions reduction" plan for Missouri, the carbon reductions would break down this way:



Using EPA's building blocks as a guide, Sierra Club set out to create building blocks that matched closer to Missouri's existing circumstance. Before evaluating "Building Block 1" we first accounted for the carbon reductions from coal plant retirements that are already part of utility plans. From there, we implemented Building Block 3 to match the output from Missouri's Renewable Energy Standard (RES), which calls for more clean energy deployment than what EPA estimated in its calculation of the state goal. We then added Building Block 4 to match the goals in Missouri's Energy Efficiency Investment Act (MEEIA), which matches almost exactly with EPA's building block. In our analysis, energy efficiency is assumed to displace high-carbon megawatt hours, and thus reduces carbon by more than EPA's estimate. The chart below demonstrates that Sierra Club was able to hit Missouri's goal with those steps alone, but the state could go even further with plant efficiency improvements at the remaining coal plants, with limited natural gas re-dispatch, and with even higher levels of commitment to clean energy.

[5] Missouri Economic Research and Information Center, Farm and Agribusiness, March 2009, http://www.missourieconomy.org/pdfs/missouri_farms_and_agribusiness.pdf
[6] *Id.*
[7] Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 79 Fed. Reg. 34,830 (June 18, 2014).

Commitments to reducing carbon are already happening across the state. Ameren's plan to retire the Meramec plant in 2022 (or earlier), with no need for replacement power, will single-handedly reduce the utility's emissions by 14.2% from 2012 levels. KCPL's IRP details plans to phase out some of its aging coal plants between 2016 and 2021, positioning the utility to reduce carbon by 13.6% from 2012 levels. These are significant steps toward compliance that when coupled with expanded energy efficiency programs and the addition of wind and solar will not only reduce carbon dioxide, but will play a role in improving air quality and reducing toxic water discharges into Missouri's prized lakes and rivers.

Sierra Club urges the state of Missouri to support the Clean Power Plan and comment on, and seek clarification for, provisions that will ensure Missouri can meet its targets expeditiously and cost-effectively while maintaining a reliable and diverse electric sector. With that goal in mind, Sierra Club submits the following responses to the Commission's July 30, 2014 Order Directing Response to Certain Questions.[8]

STAKEHOLDER QUESTIONS

I. Building Block 1 – Reduce CO2 emissions by 6% due to heat rate improvements

a. The EPA has estimated that a 6% reduction in the CO2 emission rate of the coal-fired EGUs in a state, on average, is a reasonable estimate of the amount of heat rate improvement that can be implemented at a reasonable cost through a combination of best practices and equipment upgrades. By plant, list (and describe) the heat rate improvements necessary to achieve a 6% improvement from most cost-effective to least cost-effective. Include the cost (both O&M and capital) for each improvement and the expected heat rate increase.

[8] On August 6, 2014, the Commission issued an order identifying additional questions concerning the EPA's treatment of nuclear generation in the Clean Power Plan. Sierra Club is still evaluating its position on the Clean Power Plan's treatment of nuclear energy and therefore declines to offer specific comments on these additional questions, except to note that Sierra Club is confident that Missouri can achieve its carbon reduction goal without increasing its reliance on expensive and potentially dangerous energy sources like nuclear generation.

Achievability of EPA's 6% Target:

The Sierra Club has done a significant amount of research into heat rate improvements at coal-fired power plants, and concludes that EPA's target of 6% relative heat rate improvement is achievable. The Sierra Club urges the commission to closely evaluate the industry studies attached to our comments to catalog the types of heat rate improvements that are achievable at coal plants, and to compare them to those identified by Missouri's utilities in response to this question.[9] Moreover, Sierra Club urges the Commission to require utilities to catalog efficiency improvements already taken at each plant, including a complete description of each improvement and the date it was undertaken. This information will provide a critically important baseline for the state to determine which additional efficiency improvement options are available, and whether Missouri's utilities have achieved expected outcomes with the improvements already implemented, creating a base of knowledge that can be shared across the industry in the state.

EPA's estimate of achievable emissions reductions associated with heat rate improvements is supported by numerous studies, and by EPA's analysis of the costs and associated improvements in heat rate that can be attributed to equipment and system upgrades.[10] EPA's 6% estimate is based on literature reviews, input from engineering experts, vendors, and plant operators, and most importantly, a detailed statistical analysis of emission data that was corrected to account for emission rate variability associated with weather, load, and operational and maintenance practices. EPA used that information to estimate the level of heat rate efficiency improvement achievable if each plant operated under recommended operation and maintenance conditions (*i.e.*, best practices). Based on that analysis, EPA concluded that an estimated 4% reduction in heat rate might be achieved on a coal-steam unit. EPA then estimated an additional 2% reduction associated with the installation and use of certain equipment upgrades.

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[9] *See e.g.*, J.F. Lesiuk, *Steam Turbine Uprates*, GE Power Systems (2000) (attached as Ex. A); Dr. Robert Peltier, *Steam turbine upgrading: Low-hanging fruit*, POWER, Vol. 150, No. 3, Apr. 2006 (attached as Ex. B); Nick Otter, *The Deployment of Clean Power Systems for Coal*, Alstom Presentation, May 16, 2007 (attached as Ex. C); Dick Storm, Storm Technologies, Inc., *Applying the Fundamentals for Best Heat Rate Performance of Pulverized Coal Fueled Boilers*, EPRI 2009 Heat Rate Conference (attached as Ex. D); Dr. Harun Bilirgen, et al., *Reducing Heat Rates of Coal-Fired Power Plants*, LEHIGH ENERGY UPDATE, Vol. 27, No. 1, Jan. 2009 (attached as Ex. E); Jack Eisenhauer & Richard Scheer, *Opportunities to Improve the Efficiency of Existing Coal-fired Power Plants*, Nat'l Energy Tech. Lab. Workshop Report, July 15-16, 2009 (attached as Ex. F); Phil DiPietro, *Improving Efficiency of Coal-fired Power Plants Near Term CO2 Reductions*, Nat'l Energy Tech. Lab. Presentation, Nov. 9, 2009 (attached as Ex. G); Sector Policies and Programs Division, Office of Air Quality Planning and Standards, U.S. E.P.A., *Available and Emerging Technologies for Reducing Greenhouse Gas Emissions from Coal-Fired Electric Generating Units*, Oct. 2010 (attached as Ex. H); Keith Burnard & Sankar Bhattacharya, *Power Generation from Coal, Ongoing Developments and Outlook*, Int'l Energy Agency, Oct. 2011 (attached as Ex. I); Prof. S. Renganathan, M.E., *Re-Engineering Concept on Enhancing the Thermal Efficiency of Thermal Power Station Boiler*, Int'l Journal of Sci. & Eng'g Research, Vol. 3, Issue 6, June 2012 (attached as Ex. J).

[10] *See* EPA, Technical Support Document for Carbon Pollution Guidelines, GHG Abatement Measures at 2-32 to 2-43 (June 2014), *available at* http://www2.epa.gov/sites/production/files/2014-06/documents/20140602tsd-ghg-abatement-measures.pdf; *see also* http://www.epa.gov/airmarkets/progsregs/epa-ipm/docs/v513/Chapter_4.pdf.

As EPA acknowledged, however, that 6% estimate is likely conservative, and most EGUs could achieve even greater reductions. Indeed, EPA excluded from its projection some of the most effective techniques for improving heat rate efficiency, such as turbine blade replacements. Overall, a greater level of efficiency improvement is likely if inexpensive equipment upgrades (4%) and more capital intensive projects, such as turbine blade replacements, are applied to EPA's initial 4% estimate associated with operations and maintenance improvements.[11]

Current Heat Rates at Missouri's Coal Plants:

Missouri's coal-fired power plants vary greatly in their heat rate, from the 9.44 MMBtu/MWh heat rate at KCPL's Iatan to the 17.13 and 18.87 MMBtu/MWh rates at the City of Independence's infrequently used plants. When viewing U.S. EPA's finding that the nations' coal plants can, on average, achieve a 6% improvement in heat rate, as it relates to Missouri's fleet, there is almost certainly a 6% heat rate improvement as averaged across the fleet. The plants and their heat rates are listed below.

Plant	**Unit**	**Nameplate Capacity (MW)**	**First Year of Operation**	**Coal Heat Rate (MMBtu/MWh)**
New Madrid	1	650	1972	9.90
Thomas Hill	3	738	1982	10.14
Columbia	5	16.5	1957	13.35
Asbury	1	212.8	1970	11.03
Blue Valley	ST1	25	1958	17.13
Missouri City	1	23	1954	18.87
Hawthorn	5	594.3	1969	10.36
Montrose	3	188	1964	11.04
Iatan	1	726	1980	9.44

[11] For a thorough evaluation of potential heat rate efficiency improvements, many of which EPA did not include in its analysis, *see* Chapter 4 of the European Commission's Integrated Pollution Prevention and Control Reference Document on Best Available Techniques for Large Combustion Plants (July 2006), *available at* http://eippcb.jrc.ec.europa.eu/reference/BREF/lcp_bref_0706.pdf.

Sikeston Power Station	1	261	1981	10.48
James River Power Station	5	105	1970	11.84
John Twitty Energy Center	ST2	300	2011	10.15
Labadie	4	621	1973	10.23
Meramec	4	359	1961	11.55
Sioux	2	549.7	1968	10.32
Rush Island	1	621	1976	10.00
Sibley	3	419	1969	10.43
Lake Road	4	90	1966	20.54
Sources		**EIA Form 860 2012**	**EIA Form 860 2012**	**EIA 923 2010-2012**

Retiring Aging Plants Instead of Investing in Heat Rate Improvements:

Sierra Club and Missouri's electric utilities agree that plants with some of the highest heat rates, and thus the greatest potential to improve, are also the plants that utilities are planning to phase out over the next several years. The Sierra Club strongly urges the state to implement a plan that encourages these retirements rather than additional capital spent on heat rate improvements for units that are planning to retire within five years of a final state plan. These retirements can reduce carbon emissions by more than 8.6 million metric tons from 2012 levels.

Owner	**Plant Name**	**Size**	**2012 Carbon Emissions (Metric Tons Per Year)**	**Plan to Retire**
AECI	Chamois	59MW	309,116	Already retired
AECI	Thomas Hill 1	180MW	1,309,927	Presented to Missouri Public Service Commission as possible compliance strategy

Ameren	Meramec	923MW	4,230,823	Board vote and PSC filing – July 2014
City of Columbia	Municipal Power Plant	39MW	61,428	Draft review of energy portfolio for City Council
City Utilities	James River 1-3	88MW	105,123	City approved conversion to gas
Independence	Blue Valley	115MW	50,056	City resolution passed 7/21/14 to stop burning coal
KCPL GMO	Sibley 1-2	105MW	256,565	2019 retirement according to 2014 Integrated Resource Plan Annual Update
KCPL	Montrose	564MW	1,974,224	Unit 1 to retire in 2016 and Units 2 and 3 in 2021, according to 2014 Integrated Resource Plan Annual Update
KCPL GMO	Lake Road	90MW	391,921	To retire in 2019 according to 2014 Integrated Resource Plan Annual Update
		TOTAL	**8,689,184**	

The retirement of these units, however, does *not* obviate the state's obligation to evaluate thermal efficiency improvements at all remaining EGUs, even when those units are among the more efficient in the state. U.S. EPA found that significant improvements in efficiency can result from reducing heat rate variability with best practices. Missouri should evaluate the numerous studies and literature U.S. EPA surveyed and cited to support its national assessment of potential heat-rate improvements, and then use that information to help identify potential variability improvements at Missouri EGUs.[12]

[12] *See e.g.*, J.F. Lesiuk, *Steam Turbine Uprates*, GE Power Systems (2000) (attached as Ex. A); Dr. Robert Peltier, *Steam turbine upgrading: Low-hanging fruit*, POWER, Vol. 150, No. 3, Apr. 2006 (attached as Ex. B); Nick Otter, *The Deployment of Clean Power Systems for Coal*, Alstom Presentation, May 16, 2007 (attached as Ex. C); Dick Storm, Storm Technologies, Inc., *Applying the Fundamentals for Best Heat Rate Performance of Pulverized Coal Fueled Boilers*, EPRI 2009 Heat Rate Conference (attached as Ex. D); Dr. Harun Bilirgen, et al., *Reducing Heat Rates of Coal-Fired Power Plants*, LEHIGH ENERGY UPDATE, Vol. 27, No. 1, Jan. 2009 (attached as Ex. E); Jack Eisenhauer & Richard Scheer, *Opportunities to Improve the Efficiency of Existing Coal-fired Power Plants*, Nat'l Energy Tech. Lab. Workshop Report, July 15-16, 2009 (attached as Ex. F); Phil DiPietro, *Improving Efficiency of Coal-fired Power Plants Near Term CO2 Reductions*, Nat'l Energy Tech. Lab. Presentation, Nov. 9, 2009 (attached as Ex. G); Sector Policies and Programs Division, Office of Air Quality Planning and Standards, U.S. E.P.A., *Available and Emerging Technologies for Reducing Greenhouse Gas Emissions from Coal-Fired Electric Generating Units*, Oct. 2010 (attached as Ex. H); Keith Burnard & Sankar Bhattacharya, *Power Generation from Coal, Ongoing Developments and Outlook*, Int'l Energy Agency, Oct. 2011 (attached as Ex. I);

II. Building Block 2 – Re-dispatch generation from coal to existing natural gas combined cycle (NGCC)

a. Is the EPA's assumption of 4.8 million MWhs for NGCC dispatch in 2012 accurate?

According to data reported to the EIA, the NGCC units listed below generated 4,904,024 MWh in 2012:

Dogwood (682.6 MW)
Owners: Keson Energy, LLC; Kansas City Board of Public Utilities; Kansas Power Pool; Independence City of MO; Missouri Joint Municipal Electric Utility Commission
Capacity Factor: 14.81% (2011); 25.14% (2012); 15.47% (2013)
Total 2012 MWh: 1,530,474

Hawthorn CC (318.8 MW)
Owner: Kansas City Power & Light Company
Capacity Factor: 8.45% (2011); 7.53% (2012); 5.99% (2013)
Total 2012 MWh: 202,301

St. Francis (506.6 MW)
Owner: Associated Electric Cooperative Inc.
Capacity Factor: 17.95% (2011); 27.59% (2012); 14.48% (2013)
Total 2012 MWh: 1,192,468

State Line CC (567.5 MW)
Owners: Westar Generating, Inc.; Empire District Electric Company
Capacity Factor: 43.76% (2011); 43.93% (2012); 46.95% (2013)
Total 2012 MWh: 1,929,326

Trigen St. Louis (18.6 MW)
Owner: Trigen-St. Louis Energy Corp
Capacity Factor: 25.12% (2011); 30.27% (2012); NA (2013)
Total 2012 MWh: 49,455

b. Are there transmission constraints (either gas in or electricity out) or operational or market constraints that make the EPA's target of 12.78 Million MWhs for NGCC problematic? Explain. If there are any constraints, what steps would be necessary to relieve them? What are the costs of those steps?

Prof. S. Renganathan, M.E., *Re-Engineering Concept on Enhancing the Thermal Efficiency of Thermal Power Station Boiler*, Int'l Journal of Sci. & Eng'g Research, Vol. 3, Issue 6, June 2012 (attached as Ex. J).

As articulated in Sierra Club's opening comments, our analysis demonstrates that by implementing a "business-as-usual" approach to coal plant retirements, and with smart compliance with the state's Renewable Energy Standard ("RES") and the Missouri Energy Efficiency Investment Act ("MEEIA"), the state can achieve its goal of 21% carbon reduction without relying on natural gas re-dispatch. The Sierra Club is evaluating options for conducting more detailed modeling, but if nothing else, this analysis demonstrates that if natural gas re-dispatch is considered after coal retirements and investments in clean energy, the amount of re-dispatch needed could be significantly less than what EPA assumes in building block 2, thus reducing if not eliminating the need for any additional gas pipelines or other infrastructure developments.

Moreover, the Clean Power Plan allows states to demonstrate compliance by achieving an average CO_2/MWh emission rate across the 2020 to 2029 time period. This affords the state a tremendous amount of flexibility, and belies the idea that "firm" natural gas capacity is needed to ensure compliance. Certainly the state should make some adequacy determinations to ensure that natural gas could be called on more often if needed, but the long averaging times do not require that operators prove "firm" capacity to ensure plants can run all the time as long as they can run enough hours during the year to displace higher-carbon resources over a long averaging time.

Finally, contrary to Ameren's suggestion,[13] adding new natural gas combined cycle generation to the company's portfolio will not directly lower the state's carbon emission rate or ensure compliance with the Clean Power Plan. In its proposed rule, EPA made clear that although new natural gas combined cycle generation to provide replacement could theoretically reduce GHG emissions, such measures have not been adequately demonstrated and are therefore not included as part of the best system of emission reduction.[14] In any case, renewable energy generation and energy efficiency are far more cost effective means to achieving compliance than the construction of expensive new natural gas combined cycle generation.

III. Building Block 3 – Increase generation from zero- and low-emitting sources

a. Is the EPA's assumption of 1.3 million MWh of renewable generation in 2012 correct?

Sierra Club believes that EPA may have underestimated the potential for renewable energy generation because the proposed rule does not explicitly account for distributed solar resources installed across the state of Missouri.

b. How could Missouri grow renewable generation from 1.3 million MWh to 2.8 million MWh? What would be the difference in cost of taking this path versus the business-as-usual path? What would be the difference in rate impact versus the business-as-usual path?

[13] Ameren Missouri, EPA's Proposed Greenhouse Gas Rule (Aug. 18, 2014) (power point presentation to the Missouri PSC).
[14] 79 Fed. Reg. at 34,875-77.

Business-as-usual:

When comparing the cost of a lower-carbon portfolio to "business-as-usual" it is critically important to fully and accurately account for all costs associated with a business-as-usual scenario. As Sierra Club has repeatedly cautioned, Missouri's very large coal fleet faces significant investment in air and water pollution controls to bring the plants into compliance with existing and proposed regulations. In its report to the Commission, PSC Staff recognized that "[b]ased on [] current information, not including effluent or coal combustion residuals (CCR) cost estimates, the overall capital cost to Missouri electric utilities and potentially their customers would be in the approximate range of $2,968,100,000 to $3,211,100,000. Including effluent and CCR cost estimates would raise the total capital cost range to $4,758,130,000 to $5,001,130,000."[15] When the cost of compliance with EPA's impending effluent limitation guidelines and coal combustion residual rule are considered, the overall environmental compliance cost to Missouri utilities balloons to approximately $12.6 billion.[16]

In light of these costs and risks facing coal-fired generation, continuing on a business-as-usual path is not tenable, and the utilities understand this. Indeed, Missouri utilities are already taking steps to mitigate business-as-usual costs by phasing out old coal-fired generation without new capacity, given that the utilities are long on capacity. Ameren, for example, recently announced the retirement of its Meramec coal-fired power plant with no new generation likely needed in its wake.[17] At the same time, wind energy is abundant and cheap. For every coal unit that is retired, Missouri ratepayers can invest the money saved on costly retrofits into abundant and inexpensive, zero-emission clean energy. [18]

Cost-saving clean energy:

In order to both protect Missouri ratepayers and evaluate the expansion of renewables in Missouri, the PSC must ensure that utilities engage in comprehensive, forward-looking planning. Failing to do so elevates the risk that large investments in retrofitting coal units will turn out to be imprudent and leave the Commission with the difficult choice of whether to pass those costs on to ratepayers or

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[15] *See In the Matter of an Investigation of the Cost to Missouri's Electric Utilities Resulting from Compliance with Federal Environmental Regulations*, File No. EW-2012-0065, Dkt. No 51 at 1.
[16] File no. EW-2012-0065, Dkt. No. 39 at 2 (Nov. 8, 2013).
[17] Jacob Barker, *Meramec coal power plant, once celebrated, draws cheers with closure announcement*, St. Louis Post-Dispatch (July 12, 2014), http://www.stltoday.com/business/local/meramec-coal-power-plant-once-celebrated-draws-cheers-with-closure/article_7472c581-5ceb-5d5f-ab7a-2d49a4c68ad2.html. Contrast this to Ameren's 2012 IRP, where the Company suggested that retiring Meramec would necessitate additional generation. *See* www.ameren.com/sites/aue/Environment/Renewables/Documents/AM2012IRPResourcePlan6.pdf at 53. Further, in its 2013 IRP Update, Ameren suggested that the continued operation of Meramec could still be in the best interests of its ratepayers if no additional environmental regulations beyond MATS were contemplated. *See* www.ameren.com/sites/aue/Environment/Renewables/Documents/2013IRPExecutiveSummary.pdf at 2.
[18] *See generally In the Matter of the Resource Plan of Kansas City Power & Light Company*, File No. EO-2014-0256, Comments of Sierra Club, Dkt. No. 14 at 2-4 (May 21, 2014).

force utility shareholders to bear them after they have already been incurred. To obviate this risk, the PSC should simply ensure that utilities follow its integrated resource planning ("IRP") rules. For example, Commission rules specify that "renewable energy resources on the utility-side of the meter, including a wide variety of renewable generation technologies" are supply-side resources and "shall be considered as supply-side resource options."[19] Accordingly, utilities are required to "collect generic cost and performance information *sufficient to fairly analyze*" renewable supply-side resource additions. CSR 240-22.040(1) (emphasis added). Unfortunately, utilities are failing to supplement supply-side resources with renewables such as low-cost wind power-purchase agreements (PPAs), as the Sierra Club noted most recently in comments filed regarding KCP&L's and GMO's 2014 IRP Updates.[20]

Beyond selecting supply-side resources to meet *capacity* needs, utilities should consider whether renewable PPAs represent low-risk, low-cost options for meeting its customers' *energy* demands. As an example, both KCP&L's and GMO's recent experiences demonstrate that long-term wind PPAs can secure energy at competitive prices.[21] When the wind is blowing and the wind energy delivered is the least-cost option, utilities can either temporarily ramp down coal and gas generation or sell any excess energy off-system. Either option could be a boon to ratepayers, who would benefit from the resulting decreased fuel and environmental compliance costs and/or from the value of the sales. These effects might also reduce the net present value rate of return ("NPVRR") of a given IRP plan.

Further, utilities must consider distributed generation technologies as candidate resource options. This Commission's rules explicitly require utilities to analyze distributed generation technologies during the IRP process: "supply-side candidate resource options that the utility passes on for further evaluation in the integration process shall represent a wide variety of supply-side resource options with diverse fuel and generation technologies, including a wide range of . . . technologies for distributed generation."[22] Unfortunately, this rule remains widely under-implemented. For example, KCP&L and GMO are required to analyze "candidate resource options" more thoroughly than other potential resource options, and to include them in one or more alternative resource plans.[23] Yet, for at least the past three years, both utilities have omitted distributed generation technologies from their lists of supply-side candidate resource options during the IRP and annual update processes.[24]

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[19] CSR 240-22.040(1); *see also* Comments of Sierra Club in File No. EO-2013-0537, Dkt. No. 39 (Nov. 8, 2013) (providing a broad range of recommendations for how the Commission should better implement its IRP rules).
[20] *See* File No. EO-2014-0256, Dkt. No. 14 and File No. EO-2014-0257, Dkt. No. 14.
[21] *See* File No. EO-2012-0323, KCP&L Notification of Preferred Resource Plan Change, Ex. A.at 5-6 (Jan. 17, 2014); File No. EO-2012-0324, GMO Notification of Preferred Resource Plan Change, Ex. A at 5-6 (Jan. 17, 2014).
[22] 4 CSR 240-22.040(4).
[23] *See* 4 CSR 240-22.040; 4 CSR 240-22.020(3).
[24] In the 2012 triennial integrated resource plan filing, File No. EO-2012-0323, the only candidate resource options KCP&L selected for further evaluation were coal, nuclear, combined cycle, combustion turbine, centralized wind, centralized solar, conversions of existing resources, and retrofits of existing resources. KCP&L 2012 IRP at Volume 4, Table 15, p. 40. GMO had a similar outcome. GMO 2012 IRP at Volume 4, Table 15, p. 40.

The Commission should order utilities to comply with 4 CSR 240-22.040(4) by evaluating a range of distributed generation technologies and analyzing whether programs to support distributed generation could lower the NPVRR for ratepayers. In particular, utilities should model resource plans that incorporate a variety of levels of renewables to supply energy in addition to existing supply-side resources that meet capacity needs. When wind is anticipated to be available, models should assume either: 1) decreased generation from other resources, such as from coal and gas units—and therefore decreased fuel and compliance costs—and/or 2) increased off-system sales. Further, utilities should develop realistic assumptions for the cost of wind in order to fairly analyze this resource, as well as evaluate distributed generation technologies as candidate resource options.

Missouri's utilities know that clean energy and energy efficiency can save customers money. Ameren is already deploying a set of efficiency programs that, once implemented over the next three years, will lead to its customers saving $500 million on energy bills. KCP&L announced in January that new wind energy and an investment in energy efficiency could save its customers $1 billion. There are stories like this from around the region. MidAmerican in Iowa, Xcel in Minnesota, and Lincoln Electric System in Nebraska have all announced significant customer savings by adding wind energy to their portfolios.

New clean energy is not just the result of state renewable energy standards; clean energy is good business and is responsive to consumer demand. Missouri's AECI is not required to meet the state's RES, yet it continues to add wind because it makes good business sense. The city of Springfield invested in nearly 5MW of solar because the investment was a smart one for the city. In 2004, voters in Columbia approved a Renewable Energy Standard for Columbia Water & Light (CWL). Independence Power & Light is currently at 5% renewable energy, and according to the city's 2011 Master Plan, IPL plans on reaching 10% renewable by 2018. Last month, the Independence City Council adopted a resolution affirming the Master Plan's 10% by 2018 goal and setting a new 15% renewable goal by 2021. If the comparison is done well to a true business-as-usual scenario, Sierra Club believes that Missouri ratepayers stand to save money if the state shifts away from coal and invests the avoided retrofit costs instead in clean energy.

c. EPA's proposed rule solicits comment on an alternative method of calculating the renewable energy target under building block 3 based on economic and technical potential of renewable energy generation in each state. Under this alternative method in the proposed rule, Missouri's RE target under building block 3 would be 12.8 TW-h of renewable energy beginning in 2020 (0.5 TW-h of Utility scale solar, 4.9 TW-h of wind generation, 0.2 TW-h of biomass, and 7.2 TW-h of hydropower) (vs. 2.7 TW-h of renewable energy generation by 2030 in the proposed method). Could Missouri achieve this alternative RE target. If so, at what cost?

At the outset, Sierra Club notes that EPA's estimate of renewable energy under building block 3 is an estimate of the renewable energy that is reasonably achievable for each state. The Clean Power Plan does not require Missouri to achieve 12.8 TWh of renewable energy beginning in 2020. That is merely an estimate of the amount of renewable energy Missouri can reasonably be expected to achieve. The proposed rule makes clear that the state ultimately has broad discretion to choose any combination of diverse carbon reduction measures, so long as the state meets its overall carbon reduction target.

Although EPA's estimate is not a firm target, Sierra Club believes that EPA's 12.8 TWh projection for renewable energy is achievable. Sierra Club notes that Missouri's RPS is already slated to add 8,503,685 MWhs of renewable energy by 2030—or approximately 70% of EPA's estimated achievable renewable energy generation. With an extension of the RPS or additional purchases to make up the difference, Sierra Club is confident Missouri would be able to achieve 12.8TWh of renewable energy by 2030, should Missouri choose to use this path a compliance option.

IV. Building Block 4 – Increase cumulative benefits of energy efficiency programs

a. What will it take for Missouri to achieve the demand-side EE targets in the proposed rule: Starting in 2017 ramp up incremental demand-side EE by 0.2% per year until it reaches 1.5% per year, and then continue achieving 1.5% incremental EE growth each year thereafter with cumulative demand-side EE savings of 9.92% of electricity sales in 2030? Please include in your response an analysis of the EPA's findings on energy efficiency potential in comparison to the utility's findings from its most recent potential study, and from actual results from MEEIA programs, if applicable.

Missouri utilities are already seeing tremendous energy savings—and customer savings—through use of the Missouri Energy Efficiency Investment Act (MEEIA). The law sets a target of offsetting 9.9% of Missouri's investor-owned electricity sales through energy conservation by 2020. If all Missouri utilities met the MEEIA goals, the state would be on track to meet its Clean Power Plan target about *nine years* ahead of schedule.[25]

Resource planning processes are again critical when considering energy efficiency. In evaluating the economics of its existing supply-side resources, utilities must allow demand-side resources to compete directly against them. To the extent that demand-side resources are less costly, utilities must incorporate them into their preferred resource plans to maximize benefits to ratepayers. Further, utilities must complete DSM potential studies, consistent with the requirements of 4 CSR 240-3.164(2). This process must allow for frequent and meaningful stakeholder input with a mechanism to address

[25] David Weiskopf, *Missouri Poised to Meet EPA Carbon Reduction Targets years Ahead of Schedule, Thanks to State Efficiency, Renewable Energy Policies*, Natural Resources Defense Council, June 17, 2014, http://switchboard.nrdc.org/blogs/dweiskopf/missouri_poised_to_meet_epa_ca.html

deficiencies along the way. This is all important because, put simply, utilities are leaving energy savings on the table.[26]

The cost of demand-side resources continues to decline. Energy efficiency and demand response are low-cost resources that provide long-term, reliable resource adequacy benefits. MEEIA's full potential should be realized in order to maximize benefits to ratepayers, utilities, local businesses, and the environment. Despite utility efforts thus far, Missouri's enormous energy efficiency resource remains largely untapped. To illustrate, in 2009, the Federal Energy Regulatory Commission's ("FERC") National Assessment of Demand Response Potential found that if demand response efforts in Missouri were expanded statewide to a level defined by the study as "achievable participation," then by 2019 demand response could cost-effectively reduce Missouri's peak load by over 14% (2,982 MW).[27] The FERC study further found that, even if the only changes to demand response efforts made in Missouri were to take then-existing programs in some parts of the country and implement them in Missouri—which the study defined as an "expanded business-as-usual" scenario—the result would be a cost-effective reduction in Missouri's peak load of 9% (1,899 MW) by 2019.[28] Moreover, in its 2013 State Energy Efficiency Scorecard, the American Council for an Energy-Efficient Economy ranked Missouri 43rd in the nation.[29] We urge the Commission to push Missouri utilities to move beyond their initial energy efficiency forays, forging a path forward where utilities can take advantage of economies of scale as they expand program offerings to ratepayers.

b. How could Missouri achieve the 8.7 million MWh of avoided generation attributable to energy efficiency used in EPA's calculation? What would be the difference in cost of taking this path versus the business-as-usual path? What would be the difference in rate impact versus the business-as-usual path?

As noted, the answer to this question requires the correct calculation of business-as-usual.[30] Additionally, the Commission should exercise its authority in IRP and rate dockets to ensure utilities are not constraining energy efficiency in its modeling. Sierra Club has commented on this in past dockets, and believes utilities are leaving cost-effective energy efficiency on the table as they constrain planning and economic models to avoid choosing EE as a resource.

V. General Questions

a. Do you agree with the methodology EPA used to come up with Missouri's proposed emissions reduction goal? If no, what about the proposed methodology do you disagree with?

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[26] *In the Matter of Union Electric Company d/b/a Ameren Missouri's Filing to Implement Regulatory Changes in Furtherance of Energy Efficiency as Allowed by MEEIA,* File No. 2012-0142, Rebuttal Test. of Philip Mosenthal, Dkt. No. 59 at 36-43 (Apr. 13, 2012).

[27] Federal Energy Regulatory Commission, National Assessment of Demand Response Potential, 134 (2009), available at http://www.ferc.gov/industries/electric/indus-act/demand-response/dr-potential/assessment.asp.

[28] *Id*. at xi, 134.

[29] http://www.aceee.org/state-policy/scorecard

[30] *See supra* Sierra Club Responses to MPSC Questions III.b. and IV.a.

EPA's proposed carbon emission reduction targets can and should be strengthened. Based on Sierra Club's initial analysis, we believe emissions can be reduced by approximately 35-40% below 2005 levels by 2020, with further reductions thereafter. More specifically, Sierra Club recommends the following improvements to EPA's emission reduction targets and methodology: [31]

1. Account for All Renewable Energy Potential: Renewable energy, especially wind and solar, have been growing at an astonishing rate and their costs have declined dramatically. For example, in 2012, wind energy and solar photovoltaics ("PV") were two of the fastest growing electric generation technologies in the United States. In that year alone, cumulative installed wind energy capacity increased by nearly 28% and cumulative installed solar photovoltaic capacity grew more than 83% nationwide. We believe that EPA should: (1) remove the limits on growth of renewable energy it has assumed, (2) change the methodology on growth to more closely match the real world, and (3) include distributed renewable energy when considering renewable potential.

2. Account for All Energy Efficiency Potential: Expanding the modeled potentials for energy efficiency would also make the standard more closely match reality. Two options for improving the methodology include: (1) increasing the efficiency growth rates on the way to the 1.5% requirement, and (2) increasing the efficiency requirement above 1.5% per year. EPA omitted other efficiency opportunities, such as transmission and distribution system efficiency improvements and line-loss reductions, but has said those could be pursued in state plans. In addition, EPA has assumed that the energy savings achieved through utility programs will decline far more quickly than the actual experience from these programs demonstrates, thereby underestimating potential energy savings significantly. The Sierra Club believes that EPA must address these issues in its final rule and adjust Block 4 accordingly.

3. Incorporate Known Coal Plant Retirements: EPA did not consider the carbon dioxide reductions that will be achieved by already-announced coal plant retirements when it set the standard. One simple approach for rectifying this omission might be for the state to apply the four pollution reduction opportunities (building blocks) that constitute the standard to the in-state generating capacity as it exists on the date that the state submits its plan to EPA. This approach would appropriately reflect retirements that have taken place in the interim. Another alternative would be to adjust EPA's calculation of the state goals by removing the 2012 coal generation for coal plants that are retiring.

4. Account for All Power Plant Efficiency: As discussed above, EPA's estimate of emissions reductions associated with heat rate improvements is unduly conservative. In particular, EPA's proposed power plant efficiency improvements ignore capital projects such as turbine blade replacements, and underestimate the pollution reductions available through operational changes. EPA should also require existing gas plants to make cost-effective efficiency upgrades. For coal plants, EPA should set the standard based on at least 7-10% efficiency improvements instead of the currently proposed 6% projection.

[31] The recommendations below reflect Sierra Club's evaluation of EPA's general methodology. We address certain Missouri-specific recommendations elsewhere in these comments. *See, e.g.*, Introduction, I.a., III.a.

5. Limit the Role of Natural Gas: EPA should ensure that the final rule does not incentivize the construction of any new fossil fuel-fired generation at any point before, during, or after the compliance period. As noted, and contrary to Ameren's suggestion, new natural gas combined cycle generation is not an acceptable compliance strategy. Moreover, while EPA has suggested a 70% capacity factor across each state's fleet of gas units is achievable, it is important to recognize that EPA is *not* requiring states to actually increase their gas fleets' capacity factors to 70%, or even to increase their utilization at all. States must simply meet the final emission target based on *any* compliance measures that EPA approves, including expanded use of renewable generation and energy efficiency. As Sierra Club has consistently maintained, renewable energy generation and energy efficiency measures are far more cost-effective means to achieving compliance than the construction of expensive new natural gas combined cycle generation.

b. Is the statewide goal established by EPA for Missouri achievable?

See supra, Sierra Club Introduction.

c. Should Missouri convert to a mass-based standard? Please explain.

See infra Sierra Club Response to Question V.d.

d. Is there an advantage of implementing a rate-based standard or a mass-based standard? Please explain. Each utility should answer these questions from both a utility-specific perspective and from a statewide perspective. EPA staff indicated that EPA may be open to allowing a state to split geographically, with one part doing mass-based and one part doing rate-based, so long as the split was along an RTO seam. Are there advantages to this approach for Missouri? What would the most advantageous split be?

In light of EPA's repeated references to calculating "equivalent" mass-based carbon reductions and its emphasis on establishing corrective measures to correct errors in projecting demand, Sierra Club believes that there should be no difference between a rate-based program and a *properly designed* mass-based program. In either case, mass should equal the emission rate multiplied by the actual generation. To convert a rate-based goal to an equivalent mass-based goal, however, the state must have an accurate projection of generation. If the same criteria are used to determine both the rate and the generation, the outcomes should be identical. Accordingly, Sierra Club has no inherent preference for a rate-based target or a mass-based target, so long as the state determines its mass-based target for a given year on the basis of the applicable rate for that year and the actual (or near-term projected) generation, and provided that the state corrects its mass-based target when actual generation is ultimately less than projected.

Without requiring states to correct their projections of generation, there is risk that states following mass-based programs will manipulate the mass-based target by overestimating generation in a future year. By overestimating generation in the target year (i.e., existing fossil fuel plants ultimately generate less than anticipated at the outset), the conversion of a rate-based goal to a mass-based goal

could yield an emission reduction target that is skewed and easier to achieve. Consequently, we generally recommend that states establish rate-based programs.

Compliance with rate-based programs can still be based on trading of "ton-based" allowances. The only advantage that one would ordinarily ascribe to a mass-based approach—the ability to establish a firm cap on emissions—is not present in EPA's proposed scheme, since new gas-fired generation would not be constrained. Under this analysis, if properly done, it would not matter whether a state used a different approach for plants in different RTOs, *as long as states properly account for "regulated" generation.*

e. Can a state compliance plan be written in such a way that actions taken to comply with the Missouri Energy Efficiency and Investment Act and/or the Renewable Energy Standard become a part of the compliance plan, without explicitly citing or referencing state statutory requirements? Please explain.

Yes, so long as the state can, without referencing the statute specifically, demonstrate to EPA that the energy savings from those actions will be measurable and enforceable for a rate-based plan. If Missouri expects its utilities to reach a 1.5% savings level starting in 2020 through actions taken under the MEIA, for example, the state could incorporate those savings into its compliance demonstration for the interim and final CO2/MWh target.[32] But to be approved, EPA will need to ensure that some entity—either the state or individual utilities—is required by law to achieve such savings. In other words, simply pointing to a voluntary target would not be enough. EPA will also need to ensure that there is some reporting and verification system, such that the state can accurately report energy efficiency savings.

If the state is using a *mass-based* target, however, and the state plans to demonstrate compliance based on reported CO_2 from the EGUs covered by the rule, EPA has suggested that energy efficiency measures need not be separately measurable and enforceable. Rather, such measures would theoretically work "in the background" by reducing CO_2 emissions from EGUs by decreasing overall demand. Under those circumstances, the utilities would be individually obligated to meet the CO_2 targets—an obligation that would, in turn, be enforced directly through the utilities' reporting of their CO2 emissions.

If such mass-based states are required to recalibrate their mass-based target on a regular basis, as Sierra Club recommends, the state would need to provide EPA with periodic verification of energy efficiency related energy savings. In other words, each time the state is required to re-translate its rate-based target to a mass-based target, it would need to provide EPA with an accurate accounting of the MWh of energy efficiency savings.

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[32] EPA, Technical Support Document for Carbon Pollution Emission Guidlines, Projecting EGU CO2 Emission Performance in State Plans at 20-28 (June 2014), Docket No. EPA-HQ-OAR-2013-0602, *available at* http://www2.epa.gov/sites/production/files/2014-06/documents/20140602tsd-projecting-egu-co2emission-performance.pdf.

f. Please identify projects that you have already implemented or started that should be considered toward satisfying the various EPA building blocks. Please include any calculation for determining credit toward compliance for each project identified.

Sierra Club urges the Commission to require utilities to submit a list of the plant efficiency projects it has conducted to create a baseline for what has been done already, and to determine whether those projects were successful in increasing plant efficiency.

g. Please identify any best practices that you have already implemented to comply with other environmental regulations, and indicate if those best practices can be considered toward satisfying the various EPA building blocks. Please include any quantification or calculation for determining credit toward compliance.

As discussed in detail above, coal plant retirements are helping operators comply with environmental and public health laws by reducing the amount of harmful air and water pollution from aging plants. Sierra Club urges the state of Missouri to draft a compliance plan that allows utility operators to take credit for the carbon reductions associated with coal plant retirements.

h. Please explain whether an Independent Operator's control over the dispatch of the generation will affect the utility's ability to control emissions and comply with EPA's proposed 111(d) requirements.

No, because environmental constraints are routinely factored into dispatch. If a plant has an SO_2 limit, for instance, that limitation is incorporated into dispatch decisions. An EGU's obligation under Section 111(d) of the Clean Air Act is merely another environmental compliance constraint, similar to the many constraints with which ISOs and EGUs regularly comply.

i. Does EPA's proposal give rise to any concerns about reliability? If so, what are those concerns?

With respect to EPA's proposed regulation of GHG emissions from existing power plants, any concerns about reliability are misplaced. As an initial matter, EPA and the Obama Administration have made clear that regulatory actions to reduce threats to public health and the environment from power generation cannot occur at the expense of reliable power supply.[33] While the Southwest Power Pool ("SPP") and industry groups have often raised concerns about potential electric system reliability impacts from major new EPA regulations affecting power plants, those dire predictions have never come to bear. SPP, for example, warned of "cascading blackouts" and models they could not "solve" if the

[33] Statement of Gina McCarthy, Nominee for the Position of Administrator of the EPA, Before the Environment and Public Works Committee, U.S. Senate, April 11, 2013; Testimony of Gina McCarthy before the FERC, Reliability Technical Conference, Docket Number AD12-1-000, November 30, 2011.

Cross State Air Pollution Rule ("CSAPR") was implemented.[34] Now, as EPA begins to refocus its efforts on implementing CSAPR in the wake of the Supreme Court's decision upholding the validity of the rule, it appears SPP's predictions were nowhere near accurate.[35] Industry groups raised similar reliability concerns in response to EPA's Mercury and Air Toxics rule, warning that the rule would require a large portion of generating capacity to be simultaneously out of service to add control equipment, retire, or otherwise to become unavailable to produce power. To date, however, implementation of new environmental rules has never actually produced any reliability problems.

This is, in large part, due to the fact that the industry has proven itself capable of responding effectively to such regulations. Indeed, electric utilities, other grid operators, non-utility energy companies, federal and state regulators, and others, have taken a wide variety of steps to ensure reliability. The U.S. electric industry has, for example, developed operating and planning requirements, system plans, operating approaches, and emergency response protocols to assure reliable electricity supply. These planning measures and protocols have allowed the industry to respond and adjust to numerous environmental regulatory changes—such as the mid-1990s when Clean Air Act amendments required significant investments in new pollution-control equipment and new additions to generating capacity—without sacrificing reliability. There is no reason to believe that those institutional planning mechanisms and protocols will be inadequate to ensure reliability in response to the Clean Power Plan. [36]

Additionally, in contrast with MATS, CSAPR, and the environmental compliance requirements ushered in by the 1990 Clean Air Act amendments, EPA's Section 111(d) proposal is inherently more flexible. Indeed, EPA's Clean Power Plan does not impose a standard that must be met solely by actions taken at each affected unit. Instead, the proposed regulation establishes standards specific to each state, based on the "degree of emission limitation achievable through the application of the best system of emission reduction." These standards vary across states in light of their own particular circumstances, and each state will have flexibility to propose its own preferred actions to accomplish the targeted reductions, as long as the plan provides reductions across the facilities in the state that are at least as effective as EPA's approach. If a state has concerns about the reliability implications of compliance with EPA guidance, the state can take that fact into account as it designs its own compliance plan, so long as the state achieves the overall emission reduction required by the rule by the relevant deadline. Missouri could, for example, propose plan elements that enable early action at some affected generating units in exchange for allowing more time for others, or the state could require greater efficiency

[34] SPP's Review of the EPA's IPM Analysis of the Cross-State Air Pollution Rule, Docket ID No. EPA-HQ-OAR-2009-0491 (Sept. 20, 2011), http://spp.org/publications/EPA%20Cross%20State%20Reliability%20Rule-Final-09202011.pdf

[35] *Envtl. Prot. Agency v. EME Homer City Generation,* 134 S.Ct. 1584 (Apr. 29, 2014).

[36] For a thorough examination of the state options and strategies for ensuring both electric system reliability and compliance with Clean Power Plan see Susan F. Tierney, Greenhouse Gas Emission Reductions from Existing Power Plants: Options to Ensure Electric System Reliability (Analysis Group May 2014), available at http://www.analysisgroup.com/uploadedFiles/Publishing/Articles/Tierney_Report_Electric_Reliability_and_GHG_Emissions.pdf.

improvements or dispatch at one unit in exchange for lighter reductions at another. So long as the state meets its carbon reduction goal, the Clean Power Plan allows the state to choose a combination of measures that will not impact reliability. These measures provide extensive opportunities for innovative SIP elements that can accommodate cost-effective environmental compliance, and alignment with economic principles underpinning electric industry structure and market design, while maintaining electric system reliability.

j. Please explain your perspective on the effect, if any, of HB 1631 on the utility's compliance strategy with the proposed 111(d) requirements.

HB 1631 requires the Missouri Air Conservation Commission to adopt an emission standard for carbon dioxide through a unit-by-unit analysis. HB 1631 also requires the Commission to consider, among other factors, the remaining useful life of the affected sources, and to consider the economic impact of the standard. None of these requirements preclude the Commission from developing a compliant State Implementation Plan under the Clean Power Plan, nor do these requirements preclude the use of any of the four building blocks under the Clean Power Plan.

k. For utilities: Describe in detail the most cost-effective way for each utility to meet the 21% reduction on its own. What would that path cost compared to a business-as-usual path?

Finding the most cost-effective path toward compliance will require additional evaluation by the PSC and DNR. Moreover, as noted above, it will require investing in system modeling, and a comparison to an accurate business-as-usual scenario,[37] instead of Missouri utilities routinely constraining their models to avoid choosing energy efficiency as a resource. These artificially created restrictions on "least-cost" planning have, in Sierra Club's view, allowed the utilities to move ahead with plans that are not least cost because they were not allowed to choose energy efficiency, which is almost always available at a lower cost than plant retrofits or new fossil generation.

As noted above, and during Sierra Club's August 18, 2014 presentation, Missouri can ensure compliance with the Clean Power Plan by investing in energy efficiency and renewable energy resources—with an emphasis on wind energy—while at the same time reducing overall system costs for both utilities and ratepayers.[38] When coupled with the phase out of aging coal plants, investments in renewable energy and energy efficiency will reduce costs for consumers when compared to business-as-usual scenarios that involve the investment of billions of dollars in aging coal plants.

The avoided cost of those costly coal plant improvements can be spent to increase and/or expedite clean energy investments and Missouri's ratepayers will still see savings. Importantly, these

[37] *See supra* Sierra Club Response to MPSC Question III.a.
[38] *See supra* Sierra Club Response to MPSC Question IV.a.

investments in Missouri-based clean energy and energy efficiency will spur local economies and create local jobs.

l. Describe in as much detail as possible the comments you intend to submit to EPA. If you have already submitted comments, please provide them.

Like this Commission and the utilities subject to its jurisdiction, Sierra Club is working diligently to evaluate the Clean Power Plan and its implications for the electric utility sector and the environment. Sierra Club will file its final comments on the proposed rule with the Commission as expeditiously as possible.

m. Under a rate-based approach, how can Missouri get credit for energy efficiency improvements made by industrial customers of IOUs that have opted out of MEEIA? If regulatory or statutory changes are necessary to get credit, what are those changes?

See infra Sierra Club Response to Question V.n.

n. Under a rate-based approach, how can Missouri get credit for energy efficiency improvements made by customers of non-IOUs under programs that are not subject to rigorous evaluation, measurement and verification? If regulatory or statutory changes are necessary to get credit, what are those changes? (see above).

State plans under Section 111(d) of the Clean Air Act will operate much as a State Implementation Plan under Section 110(a) of the Act. That is, the Section 111(d) plan would consist of a bundle of state-enacted, federally enforceable statutory and/or regulatory provisions that collectively constitute a standard or performance for existing, affected EGUs in the state. In Missouri, these provisions may, but need not, include programs and measures adopted under MEEIA. In any event, the plan must provide for sufficient monitoring and enforcement by the federal government, the State, and the public. For renewable energy and energy efficiency measures to count towards compliance in a "portfolio approach" state plan (i.e., where EGUs themselves are not fully responsible for emission reductions), or where EGUs are responsible for reaching certain CO2/MWh targets, but the state plans to allow EGUs to credit RE and EE programs towards their reported rates (i.e, the "rate adjustment" approach), the state must have rigorous evaluation, monitoring, and verification ("EM&V") measures in place or EPA will not approve those elements of the state plan. EPA addresses the options it is considering for EM&V requirements for various types of EE programs in the State Plans Consideration Technical Support Document, pp. 54-59, and provides an possible outline of the types of information that might be included in an EM&V plan for any EE programs included in a state plan (p. 59). This discussion should provide the state with guidance for the types of changes that might be necessary should the state decide to develop a rate-based plan with a portfolio approach or a rate-adjustment approach.

o. Do any of the utilities favor the idea of Missouri partnering with another state(s) on a multi-state plan. If so, which state(s) should Missouri consider partnering with? Please explain.

As noted, Sierra Club is confident that Missouri is well-positioned to achieve EPA's 21% carbon emission reduction target for the state. Sierra Club is not inherently opposed to the idea of Missouri partnering with adjacent states to develop a regional compliance plan. If Missouri decides to do so, however, that plan should be structured in a way that there is a penalty for backing out of the plan. Moreover, to the extent that the state considers developing an emissions trading program, special safeguards may be needed to ensure that pollution at Missouri EGUs do not disproportionately impact underrepresented and disadvantaged communities.

p. EPA's proposed rule established the state goals by crediting renewable energy generation in the state where it is generated. EPA is soliciting comment on how credit for renewable energy generation under 111(d) could be traded across state lines (similar to RECs) without double counting the RE credit. Do utilities have any thoughts about the appropriate method of crediting renewable energy generation and whether the credit could be traded across state lines without double counting?

The interstate nature of the electricity market and differences in the quality of renewable energy resources across a region make it important to ensure that crediting of renewable energy generation across state lines is able to occur without creating uncertainty about which state will be able to take credit for this generation. EPA has made clear that while avoiding double-counting is very important, it believes that adequate analytical techniques and tracking systems exist to prevent double-counting of renewable energy generation moving across state lines. In the State Plan Considerations Technical Support Document, at pages 87-96, EPA describes two basic alternative methodologies to measure and assign credit for renewable energy generation in light of the interstate nature of the electricity market. Under the first approach, a state can take credit for renewable energy generation that occurs outside its borders, but only if that renewable energy generation results in CO2 emission reductions at an in-state EGU. If a RPS in State A results in the development of a wind farm in State B, for example, State A will get credit for the portion of generation from the State B wind farm only to the extent that it reduces generation at an EGU in State A. EPA suggests that this could be determined through dispatch modeling or other proxy metrics such as net import factors.[39] So long as all states are taking credit only for emission reductions at their own EGUs, and are applying a uniform methodology to determine which EGUs have reduced emissions, there is no double-counting.

Alternatively, under the second approach, State A would be allowed to take credit for the avoided CO2 emissions resulting from its investment in renewable energy generation in State B regardless of whether the renewable energy generation actually reduces emissions in State A, so long as that state's policy is responsible for that renewable energy generation. In other words, if a RPS in State A leads to the development of a wind farm in State B, State A gets all of the credit for the output from

[39] In 2012, Missouri's net generation was 99% of its retail sales, thus making the state only barely a net importer of electricity.

that wind farm, even if none of the wind power is ever actually exported to State A, and thus does not actually reduce the dispatch of any EGU in State A. This approach requires cooperative multi-state accounting within a grid region to reflect the contributions of each state's clean energy incentives to bringing renewable energy resources online and allocate credit across the states. EPA's proposal has left each grid region with the discretion to determine how to allocate credit for the reduced CO2 emissions associated with renewable energy development. Missouri and its utilities should work with MISO and neighboring states to understand what tools are available to track the impact of renewable energy generation on the dispatch of affected EGUs.

Although renewable energy credits ("RECs") may be a valuable tool in avoiding double counting of renewable energy generation, it is not clear how RECs will fit into Clean Power Plan performance because current models for REC ownership do not necessarily reflect either of the two approaches detailed by EPA and described above. If, for example, a utility holds an unbundled REC—that is, one sold separately from the underlying energy—it is unlikely to have actually reduced the dispatch of any affected EGUs as a result of the purchase of the REC. Thus, under the proposed approach wherein a state gets credit only for CO2 reductions at in-state EGUs, that REC could not be used for the state to demonstrate plan performance.

q. EPA's proposed rule established the state goals by crediting RE and demand-side EE targets under building blocks 3 and 4 by adding RE generation and avoided generation from demand-side EE to the denominator. If the state elects to go with a rate-based approach, EPA is soliciting comment on the appropriate method of crediting EE/RE programs under state plans (i.e. add RE generation and avoided generation from EE to denominator, or determine emissions avoided and subtract the avoided emissions from the numerator). Do utilities have a preference on the appropriate method of crediting EE/RE programs under a rate-based approach. If so, why is one method preferred over another?

Adding RE generation and avoided generation from EE to the denominator is a relatively simple approach for crediting those resources, but may not be the most accurate representation of avoided CO2 emissions. When credited to the state-wide CO2 intensity rate, the MWh-avoided approach assumes that the MWh avoided are spread out equally among all of the in-state energy sources. Thus, if the average CO2 rate of the state's generation resources differs significantly from CO2 rate of the unit that is actually being displaced, the MWh-avoided approach could over- or under-credit RE/EE measures. Moreover, if the state uses the avoided-MWh approach from RE/EE programs to credit an individual coal EGU for purposes of meeting a mandated CO2/MWh rate, that approach may give an RE program undue credit for avoiding CO2 emissions. This is because a MWh of renewable energy, depending on the type, timing, and location, may displace resources other than coal, whereas adding the MWh to the denominator in the individual EGU's rate assumes that the avoided-MWh displaces CO2 at the rate emitted by that EGU.

Determining avoided emissions resulting from EE and RE, and then subtracting those avoided emissions from the numerator would be a more precise method for crediting renewable energy and energy efficiency measures to the state. However, for greatest accuracy, the methodology would require modeling to determine the marginal unit generation that the renewable energy or EE resource is replacing, which could increase the complexity of implementation. For renewable energy, this would require tracking of the type, timing, and location of the MWh to be converted to avoided emissions.

Sierra Club is still weighing these issues in considering which approach is most appropriate.

r. EPA's proposed rule solicits comment about whether the final rule should establish presumptive mass-based goals for each state or if states should be able to develop the mass-based goals using their own assumptions and methodologies. Do you have a preference?

EPA would be just as likely as any state to overestimate generation from existing sources if it attempts to predict generation 15 years into the future. To the extent that mass-based programs are permitted, we believe EPA should establish a specific process, as described above, for converting the rate-based goals that will be promulgated by the agency in its Emission Guidelines into mass-based limits based on actual or near-term projected generation, with a true up obligation to correct any error in a projection.

s. EPA's proposed rule solicits comment about establishing consistent national guidelines for performing EM&V in order to credit EE/RE under the rule if a state uses a rate-based approach. Do you think EPA should establish such guidelines?

Yes, EPA should establish clear guidelines.

CONCLUSION

As discussed, Sierra Club believes that EPA's Clean Power Plan targets for Missouri are readily achievable. Moreover, EPA's proposed plan presents a pivotal opportunity to diversify Missouri's electric system with clean, cost-effective energy efficiency and renewable energy generation that will produce safe and sustainable jobs for Missouri residents, while also reducing electric system costs for both utilities and ratepayers. Energy efficiency and renewable energy resources, in particular, are not only the fastest, cheapest, and safest way to reliably meet the state's growing electricity demand, but are proven, low-cost investments that will accrue tangible economic benefits for Missouri families and businesses, while also helping the state meet its carbon pollution reduction goals under the Clean Power Plan. Sierra Club respectfully urges the Commission to undertake steps necessary to plan for future compliance with the Clean Power Plan and to develop the regulatory support to ensure that such compliance can be achieved by cost-effective means.

Sierra Club appreciates the opportunity to submit these comments and looks forward to further engagement with the Commission as the Clean Power Plan planning and implementation process unfolds.

Date: August 25, 2014

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that a true and correct PDF version of the foregoing was filed on EFIS and sent by email on this 25th day of August, 2014, to all counsel of record.

/s/Henry Robertson
Henry Robertson