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	)	File No. EW-2012-0065
Compliance with Federal Environmental Regulations	)	

Wind on the Wires' Answers to "Workshop Questions and Scenarios"

COMES NOW, Wind on the Wires answers, through its undersigned policy manger/counsel, to some of the questions posted on January 4, 2016 by the Missouri Public Service Commission staff in the abovementioned docket. Wind on the Wires provides answers to questions 2 through 5, 7 through 9 and 22.

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WIND ON THE WIRES' ANSWERS TO THE FOLLOWING QUESTIONS AND SCENARIOS

2. Please provide the estimated cost of compliance with the final Section 111(d) rule based on each of the following scenarios or assumptions:

a. Missouri uses a mass-based approach and allocates allowances pro-rata based on an historical baseline using one of the following parameters:
    i. CO2 emissions
    ii. Heat input
    iii. Net Generation
b. Missouri uses a mass-based approach as described in scenario "a" and allowances are either:
    i. Irrevocable even if a unit retires or
    ii. Redistributed to existing affected units if a unit retires
c. Missouri uses a mass-based approach and allocates allowances as described in Scenario "a" and includes a set-aside for one or more of the following:
    i. Renewable energy projects
    ii. Energy efficiency projects
    iii. Existing NGCC output-based
d. Missouri uses a mass-based approach and allocates allowances based on updating output-based allocations where affected sources and potentially one or more of the following are eligible to receive allocations based on their pro-rata share of updated generation levels each compliance period:
    i. Renewable generating resources that began operation post 2012
    ii. New/uprated nuclear
    iii. Energy from qualified biomass
    iv. Energy savings from post 2012 demand-side energy efficiency measures
e. Missouri uses a mass-based approach and, similar to the RGGI regional auction model, auctions allowances with proceeds deposited into an energy efficiency investment fund. Assume a market clearing price per allowance of:
    i. $5.50;
    ii. $7.50.
f. Missouri uses a mass-based approach and allocates allowances as described in Scenarios "a" or "d" and includes a new source complement.
g. Missouri uses a mass-based approach and allocates allowances as described in Scenarios "a" and "d" and sets aside five percent (5%) of allowances for renewable energy or energy efficiency.
h. Missouri takes advantage of the Clean Energy Incentive Program.

ANSWER:

For Missouri Wind on the Wires believes the New Source Complement standard offers the lowest cost pathway to compliance based on the results from a CPP Modeling tool created by The American Wind Energy Association ("AWEA"). This tool estimates the amount of wind capacity that would be the lowest cost compliance strategy for a state. It evaluates the Mass

Based standard for existing sources/units and for the New Source Complement with or without nationwide trading. The tool uses a Monte Carlo simulation to randomly adjust natural gas and coal prices and electricity demand growth to estimate the incremental power system cost to meet electricity demand and comply with the CPP in 2030. The simulator performs 1,000 simulations in estimating the optimal wind build ranges for a state. The tool's model assumes that new fossil generation is not eligible for providing emission reductions under the existing source only standard, due to EPA's requirement that leakage to new fossil generation not be allowed under that standard. As a result, compliance strategies under a Mass Based standard for existing sources/units is limited to existing fossil sources and new non-emitting sources, while the New Source Complement standard allows new fossil generation to be part of the generation portfolio. If EPA finalizes a model trading rule that does not fully block the ability to use new fossil generation for compliance under the existing source, then the model results may differ from those shown above.

The AWEA CPP tool provided the following range of renewable/wind capacity as the optimal amount needed for Missouri's compliance for the four pathways to compliance below:

Mass Based Standard for Existing Source/Units	Wind Demand Range (MW)		Percentage of Simulations Within the Wind Demand Range
	Low	High	
with trading	3,100	5,000	85%
no trading	3,100	5,000	85%
Mass Based Standard with New Source Complement			
with trading	3,000	4,900	80%
no trading	3,100	4,900	80%

Below are two charts depicting the incremental power system cost in 2030 and how it changes relative to the renewable/wind energy's share of incremental generation Missouri adds between now and 2030.

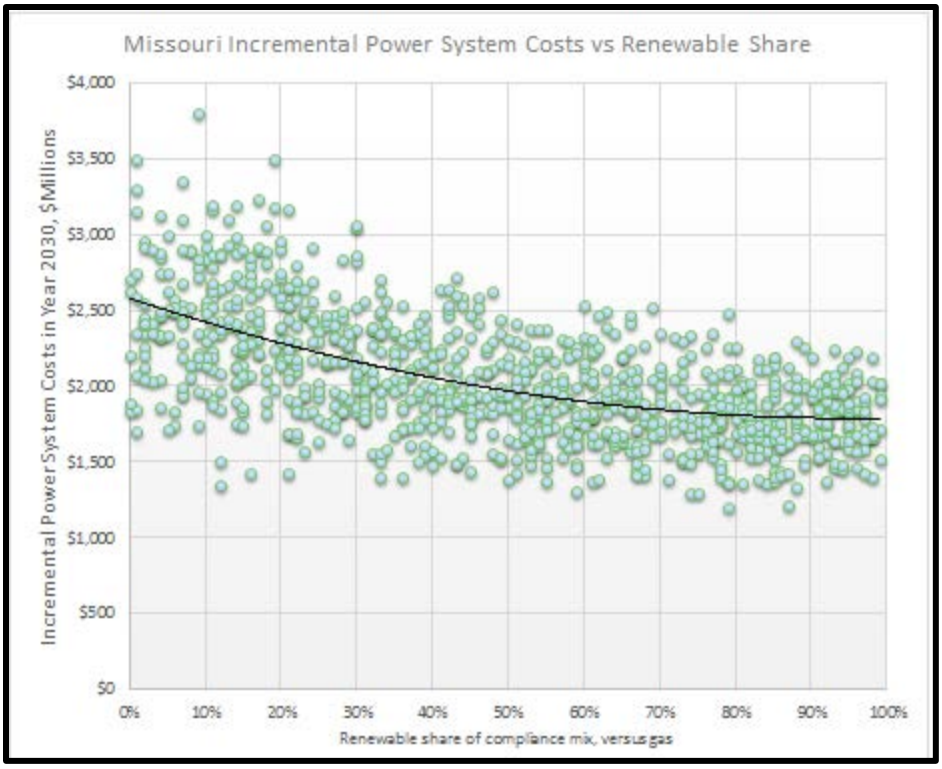

Figure 1: Mass Goal with New Source Complement Standard.

The chart above depicts how the incremental power system cost in 2030 changes relative to the percentage of renewable/wind energy the state local service entities are delivering to customers, as a share of all incremental generation added through 2030, for a Mass Goal with a new source complement standard. As the amount of renewable energy increases (moving left to right in the chart) Missouri benefits in two ways: [1] the median cost of compliance (blackline) decreases; and [2] the variability around incremental costs of compliance decreases -- thus the cost impact to Missouri ratepayers becomes more of a known amount. When there is very little renewable/wind resources being used, then compliance is being met primarily with natural gas -- shown in the far left-side of the graph. In those scenarios ratepayers are exposed to greater variability of potential compliance costs. As more wind is added - moving from left to right in the graph -- the range of potential compliance costs narrows. This reduction in variability is a result of a reduction in the use of natural gas and the fuel price risk to which it exposes the generation portfolio. Reducing this risk is valuable for utilities and their ratepayers, especially the large-user and industrial customers.

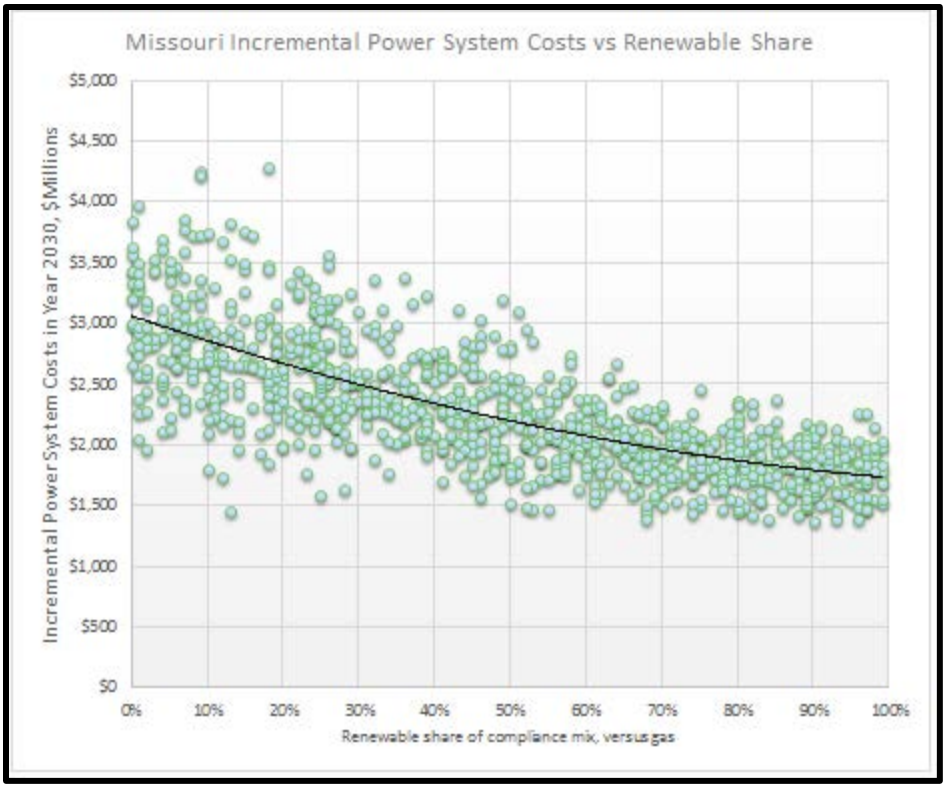

Figure 2: Mass Goal for existing units/sources only standard.

In Comparing the Mass Based existing source only standard (in Figure 2) to the New Source Complement standard (in Figure 1) it can be seen that the New Source Complement standard has a lower cost of compliance with less wind but they have comparable compliance costs if wind energy was used entirely for compliance. The black line in the graphs indicates the median cost of compliance. Comparing that line in the New Source Complement graph to the one in the Existing Units/Sources graph indicates that the New Source Complement standard has a lower cost of compliance for nearly every percentage of renewable/wind energy Missouri may use up until renewable/wind reached the 90% to 100% levels. This indicates that the new source complement is a cheaper form of compliance than the Mass Based standard for existing units/sources.

3. Please describe any anticipated reliability issues or capacity constraints if Missouri implements a compliance plan that includes the following scenarios or assumptions:

a. Missouri uses a mass-based approach and allocates allowances pro-rata based on an historical baseline using one of the following parameters:
    i. CO2 emissions
    ii. Heat input
    iii. Net Generation
b. Missouri uses a mass-based approach as described in scenario "a" and allowances are either:
    i. Irrevocable even if a unit retires or
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c. Missouri uses a mass-based approach and allocates allowances as described in Scenario "a" and includes a set-aside for one or more of the following:
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d. Missouri uses a mass-based approach and allocates allowances based on updating output-based allocations where affected sources and potentially one or more of the following are eligible to receive allocations based on their pro-rata share of updated generation levels each compliance period:
    i. Renewable generating resources that began operation post 2012
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g. Missouri uses a mass-based approach and allocates allowances as described in Scenarios "a" and "d" and sets aside five percent (5%) of allowances for renewable energy or energy efficiency.
h. Missouri takes advantage of the Clean Energy Incentive Program.

ANSWER:

Wind on the Wires is providing general comments about the electric system's ability to maintain reliability under the Clean Power Plan, and wind energy's ability to be reliably integrated into the electric grid at energy levels exceeding 20%.

A. Addressing Reliability Concerns: The Clean Power Plan provides ample compliance flexibility to ensure that reliability is maintained at all times. The availability of a market-based trading program allows affected EGU owners the opportunity to buy, sell, and bank emissions

credits or allowances. Such a program does not restrict unit-level operational decision-making beyond requiring units to hold a sufficient number of tradable permits to cover emissions. This inherent operational flexibility will allow owners and operators to meet their compliance obligations while providing an uninterrupted supply of affordable and reliable electricity.

Federal and state energy regulators, regional grid operators, and utility and market participants have proven experience in responding promptly to changing circumstances and unforeseen grid reliability issues. In addition, the EPA, DOE, and FERC have agreed to coordinate efforts to ensure reliable electricity generation and transmission during the implementation of the final rule. These agencies' coordinated effort provides substantial oversight capacity to help anticipate and avoid any grid reliability problems that may arise.[1] Additionally, grid operators and planning authorities already have many tools to protect grid reliability. These tools include legally binding reliability standards, planning and operations practices, and market design. Low-carbon resources are abundant, renewable energy resources are cost-competitive with natural gas in many areas, and the grid can reliably handle much higher levels of renewable power than envisioned under the Clean Power Plan.[2]

FERC released guidance on modeling the Clean Power Plan on January 19, 2016 that will further help evaluate system reliability.[3] The guidance establishes principles for grid operators to use when they study the Clean Power Plan, and it is equally relevant to reliability considerations with the federal plan. FERC's guidance will ensure that grid operators more accurately and transparently assess potential impacts, if any, of the federal and state plans, and take the necessary steps to address reliability issues before they occur.

The CEIP will provide for some allocation of allowances and ERCs before 2022, allowing for the creation of banked allowances prior to the first compliance period. While these banks of allowances and ERCs could further reduce reliability concerns, they are unnecessary to ensure reliability. In addition to the CEIP, states and EPA could also establish a reliability or cost containment reserve of allowances that would be available for sale above a certain price point. But it is critical that any such reserve must utilize allowances from within the mass-based budget, and not be additional to it.

Unexpected emissions increases from plants needed for reliability purposes can be offset with allowances so that the overall emissions trajectory is preserved.

B. Wind Energy Can Be Reliably Integrated at Levels Forecasted for CPP Compliance: One of the building blocks used to estimate the Best System of Emission Reductions for the Clean Power Plan is the addition of new wind resources to the generation portfolio. More than a

[1] Declaration of Eric B. Svenson, Jr. at ¶¶ 31-36, *West Virginia v. EPA*, No. 15-1363 (D.C. Cir. Dec. 8, 2015), available at http://docs.nrdc.org/legislation/files/leg_15120902a.pdf.
[2] *Id*. at ¶¶ 39-40.
[3] FERC, *Staff White Paper on Guidance Principles for Clean Power Plan Modeling* (Jan. 19, 2016), available at http://www.ferc.gov/legal/staff-reports/2016/modelingwhitepaperAD16-14.pdf.

dozen wind integration studies have been prepared by U.S. grid operators, utilities and energy experts. While most of these studies preceded and were not specifically evaluating the Clean Power Plan, the relevance of these studies to the Clean Power Plan was explained in a recent NREL publication.[4]. Those studies have found that wind energy can reliably supply at least 20-30% of our electricity, with some studies analyzing wind providing 40% of total electricity on an annual basis. For example, NREL's Renewable Energy Futures study found no reliability problems for a case in which wind and solar provide nearly 50% of total electricity.[5] A wind integration study by Nebraska utilities found minimal integration costs and no reliability concerns associated with wind providing 40% of electricity in the Southwest Power Pool.[6] As another example, in 2014 PJM studied the impacts of increasing its use of wind energy by a factor of 15, and found the "PJM system, with adequate transmission and ancillary services in the form of Regulation, will not have any significant issue absorbing the higher levels of renewable energy penetration considered in the study."[7]

A state within MISO -- Minnesota --released a comprehensive study in late 2014 that found no challenges to integrating 40% wind and solar energy in Minnesota, including a detailed examination of power system dynamics and other reliability services. The study also found no challenges for accommodating the variability associated with wind and solar providing 50% of electricity in the state, though due to time constraints the study did not include a full analysis of power system dynamics in that case.[8]

The range of potential MISO's analysis of the final CPP rule evaluated Mass Based compliance path under scenarios with approximately 120 terawatt hours ("TWh"), approximately 16%, of energy coming from wind and solar resources.[9] U.S. Department of Energy's Energy Information Administration ("EIA") released an analysis of the proposed CPP rule. For states in MISO's North and Central Region, the EIA estimated that approximately 28 to 29 thousand megawatts of new/incremental wind would be added by 2030.[10] Assuming a wind capacity factor of 35% to 40% in the North and Central MISO Regions would result in approximately 89 to 101.6 TWh of energy from new/incremental wind. Adding this to the energy output from the 13,726 MW of wind in operation at the end of 2014 would result in approximately 17.5% to 20% of the region's generation mix in 2030 coming from wind. As discussed above, plenty of reports have noted

[4] http://www.nrel.gov/docs/fy15osti/63979.pdf
[5] Available at: http://www.nrel.gov/analysis/re_futures/.
[6] Available at http://www.nepower.org/Wind_Study/final_report.pdf
[7] http://www.pjm.com/~/media/committees-groups/committees/mic/20140303/20140303-pjm-pris-final-project-review.ashx, at p. 12.
[8] Available at: https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup$documentId=%7bD607FB96-F80C-49EE-A719-39C411D5D7C3%7d&documentTitle=201411-104466-01.
[9] See CPP presentation to the PAC on January 20, 2016, slide 12; comparing amount of renewable energy in the BAU scenario to amount of renewable energy in GWS scenario.
[10] *See* Appendix A, Figure 7 -- EIA Projection for Additional Wind Build by 2025 under CPP Scenario, by Region; entire whitepaper available at: http://awea.files.cms-plus.com/AWEA%20report%20on%20EIA%20CPP%20analysis%20July%202015.pdf.

that wind energy at levels exceeding 20% can comfortably be integrated into the grid with no reliability issues.

4. If Missouri uses a mass-based approach without a new source complement and allocates fixed irrevocable allowances pro-rata based on an historical baseline without any set-asides, to what extent would your company's compliance approach likely rely upon purchasing allowances from the market and/or building new natural gas combined cycle capacity? Explain if and how this would this change if the new source complement and/or an alternative allowance allocation process were used?

ANSWER:

Wind on the Wires response addresses the strategy and benefits of using the New Source Complement standard with an allowance allocation process.

The most effective way to encourage compliance with the CPP in a manner that minimizes inefficiencies in the power market, disincentivizes emission leakage from EGUs to new carbon emitting generation, and incentivizes the construction and use of low cost resources that directly benefit Missouri is to properly allocate allowances (Wind on the Wires answer to question #5 addresses allowance allocation in detail) or use the new source complement standard to control leakage.

Leakage occurs when un-regulated new fossil generators compete against regulated facilities, creating an uneven playing field and significant market distortion that harms both ratepayers and market participants. For example, leakage can incentivize market participants to build new gas generators and operate them at high capacity factors to take advantage of their exemption from regulation, even if existing gas generators could have provided that generation at lower total cost.

Failing to control leakage is taking significant regulatory risk on the bet that EPA will approve the state plan and that EPA will not revisit the CPP rule in the future.[11] The first risk subjects the state to the federal plan or at least later revisions to the state plan, potentially interrupting the planning process and resulting in costly delays and uncertainty. The latter risk could result in stranded assets if new unregulated fossil units that were built to circumvent regulation become regulated. Either could result in a highly inefficient compliance strategy as a state must scramble to meet its target after its initial strategy became unviable.

Analysis by NRDC, using the same modeling platform the EPA used in setting its CPP emission rates, estimates that the mass-based existing approach with no leakage control provisions

[11] 80 Fed. Reg. at 64869 (2015), *see* "Out-Year Requirements: Maintaining or Improving the Level of Emission Performance Required by the Emission Guidelines."

resulted in 1,966 million short tons of annual CO_2 emission in 2030, whereas the mass-based new source complement approach with current levels of energy efficiency resulted in 1,838 million short tons of annual CO_2 emissions in 2030.[12] The new source complement results in controlling leakage of approximately 128 million short tons. The addition of an appropriate and effective allowance allocation methodology should ensure a smooth transition to compliance. The use of trading provides flexibility in complying with the CPP in those instances when a regulated electric generating unit ("EGU") is short or has unexpected changes in emission output. A market based trading program provides for buying, selling and banking of emission credits or allowances. Trading will provide some moderate reductions in the amount of coal plant retirements it is not a long term solution to the generation portfolio and operational changes utilities will need to make to ensure CO_2 emission reductions from EGU in our country.

5. Are you aware of an approach Missouri may be able use in its plan to address emissions leakage to new units while minimizing cost and reliability impacts? If so, explain the approach. If not, which approaches to address emissions leakage in the state plan would be most likely to increase cost or cause reliability concerns?

ANSWER:

Wind on the Wires has three proposed approaches for controlling emissions leakage that it submits for PSC consideration. Allowance allocation is the most effective way to address emissions leakage under a Mass Based standard. WOW would encourage the state to allocate allowances in a manner that disincentivizes emission leakage to new carbon emitting generation, does not penalize existing natural gas combined cycle generators ("NGCC"), minimizes inefficiencies in the power markets, and properly incentivizes the construction and use of new non-emitting generation resources that directly benefit Missouri.

In order to adequately address emission leakage, allowances should be allocated to new zero-emitting generation[13] and existing natural gas combined cycle generation. Fossil generation not regulated by the CPP, such as new fossil generators, should not receive any allowances as this would only exacerbate leakage by further advantaging these generators.

In addition to controlling leakage, this allocation approach provides the following benefits:

- **Reduces electricity and carbon costs for ratepayers.** Using allowance allocation to incentivize generation reduces electricity prices, particularly if the allocation is tied to emissions as that keeps allowance prices low. This in turn minimizes the impact to ratepayers and reduces the risk of leakage.

[12] US EPA Docket No. EPA-HQ-OAR-2015-0199, Natural Resource Defense Council comments, at 35-37 (Jan. 21, 2016).
[13] 80 Fed. Reg., at 64803 et seq. (Oct. 23, 2015).

- **Avoids windfall profits.** An allocation based on historic generation or emissions does not provide any marginal incentive to change behavior, and only provides a windfall profit to the owners of that generation that in many states would not necessarily flow to ratepayers.
- **Drives in-state benefits including economic development.** Allowances are likely to be allocated to resources within a state, ensuring that the value of those allowances, the investment they drive, and the electricity cost and emission reductions they drive are located in that state.
- **Proceeds used to keep electricity costs low instead of flowing to the government under an auction.** This avoids several potential problems, including revenues potentially being used for inefficient purposes and, in many states, the need to pass authorizing legislation.
- **Provides allowances to entities that need them for compliance.** Utilities and generation owners that have taken steps to reduce emissions receive the allowances they need for compliance, achieving the same goal used to justify an historic allocation.

Below are three proposed allocation approaches plus a discussion of additional considerations.

Allocation Approach 1: Allocate allowances to new non-emitting and existing NGCC generators at the *state emission rate goal* for that compliance period.

The state emission rate goal represents Missouri's EGU fleet emission rate if the EGUs were operated so as to meet the sub-category specific emission rates. Therefore, the state emission rate goal for each compliance period should exactly counter the incentive to use new fossil generators to displace existing fossil generation. For Missouri, new non-emitting resources and existing NGCC generators would receive 1,621 lbs of allowances for every MWh they produce in the first compliance period, 1,457 lbs in the second compliance period, and so on, as those are the state goal targets under the blended rate approach in those periods.[14]

For fossil generators, no allowances should be awarded to those plants that emit more than the state rate. This could either be achieved by allocating allowances to existing NGCC generators only, or by examining the compliance period emissions rate of each generator and only awarding allowances to generators with emissions rates lower than the state rate for that compliance period.[15]

There are several reasons why Missouri should not allocate allowances to generators whose emissions are higher than the state rate. First, allocating allowances to high-emitting generators

[14] From Appendix 5 at http://www.epa.gov/sites/production/files/2015-11/tsd-cpp-emission-performance-rate-goal-computation-appendix-1-5.xlsx.

[15] A disadvantage of the latter approach is that by making the state rate the threshold, if a generator's emissions rate is close to the state rate it could create uncertainty about whether the resource will receive any allowances and create an excessively strong incentive for the generator to fall below the state rate. Few generators fall close to the state rate so this impact should be small. However, the categorical approach of only allocating allowances to existing NGCC generators avoids this concern.

will incentivize them to generate more, which undermines the emission reduction goals of the CPP and therefore can harm its economic efficiency.[16] Second, generators emitting more than the state rate are not being disadvantaged by leakage to new gas, and therefore do not need any incentive to counteract that leakage.

This allocation is most effective when all allowances are used to incentivize generation from existing low-emitting and new non-emitting resources, as this helps to reduce carbon emissions and therefore carbon prices and consumer costs. Missouri could do this by continuing to allocate allowances to existing gas combined cycle and new non-emitting resources until all allowances have been allocated.

An allocation to existing non-emitting resources is typically inefficient as it does not lead to additional generation from those resources, so Wind on the Wires is not advocating for such an allocation.

Allocation Approach 2: Allocate allowances to existing NGCC and new non-emitting resources at the *state average fossil rate* in each compliance period, which is higher than the state emission rate goal used in Approach 1.

Under EPA's calculations, the state emission rate goal is reduced by contributions from renewable energy under BB3.[17] Renewable energy, however, does not affect the marginal emissions rate because, on a large integrated power system, fossil generators are almost always on the margin and renewable resources almost never on the margin.[18] Using EPA's goal-setting spreadsheet, Approach 2 would remove the impact of BB3 but retain the assumed impact of BB1 and BB2 on the state goal rates to find a reasonable estimate for the average fossil rate in each compliance period.[19] As under Approach 1, this allocation could continue until all allowances have been allocated.

Other variations on Approaches 1 and 2 include allowance allocation to existing NGCC at the lower subcategory category-specific rate for NGCC. A similar variation would allocate allowances to all EGUs whose emissions rates are lower than the subcategory-specific rate for their technology type, which has the advantage of making it possible for fossil steam and IGCC generators to earn allowances.

Allocation Approach 3: Similar to Approaches 1 and 2, but rather than awarding allowances to low- and zero-emitting resources at the state emission rate goal or fossil average rate, *award*

[16] Allocating allowances to high emitting generators under an updating allocation approach harmed economic efficiency in modeling conducted for this analysis: Table 10 at http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-05-25.pdf.

[17] Available at http://www.epa.gov/sites/production/files/2015-11/tsd-cpp-emission-performance-rate-goal-computation-appendix-1-5.xlsx.

[18] Available at http://awea.files.cms-plus.com/FileDownloads/pdfs/AWEA%20white%20paper-Cutting%20through%20Exelon's%20claims.pdf.

[19] Available at http://www.epa.gov/sites/production/files/2015-11/tsd-cpp-emission-performance-rate-goal-computation-appendix-1-5.xlsx.

allowances in proportion to how much a resource's emissions rate falls under the state emission rate goal or fossil average rate, and continue allocating at higher multiples until all allowances are allocated.

For example, under Approach 1 above, an existing NGCC generator in Missouri would be allocated 1,621 lbs/MWh during the first compliance period, which it could then use to cover its actual emissions of 950 lbs/MWh while selling the remainder to a generator with an emissions rate greater than the state rate. The allowance allocation under Approach 3 would be 671 lbs/MWh, which is the difference of 1,621 - 950. The allowances would then be allocated based on the differential rate (i.e., 671 lbs/MWh). Based on modeling analysis, this should typically result in an allocation that on average offsets the incentive for new fossil leakage vis-a-vis existing NGCC.

One advantage of this approach is that it allocates all allowances to low- and non-emitting resources, providing those resources with a stronger incentive to counteract leakage and greater reductions in electricity prices. The most effective strategies for controlling leakage will allocate all of the allowances, while strategies that do not allocate all of the allowances fall short of offsetting leakage. Moreover, by awarding more allowances to low- and non-emitting resources, in proportion to how much those resources are helping to reduce emissions, this method provides a stronger incentive to increase generation from these resources and therefore helps to meet the CPP state goal targets, reducing carbon costs and therefore consumer costs.

Additional Considerations: Under any output-based approach, a state must also decide on the timing and other mechanics of the actual allocation. Because the output-based allocation of allowances would be determined based on generation in the compliance year itself, recording and allocating allowances in advance of the compliance year would be difficult. Allowance recordation and allocation could occur at the same time as, or immediately preceding the allowance true-up that comes after a compliance period. An after-the-fact allocation would not appreciably increase uncertainty on the power system, as there will already be inherent uncertainty about the supply and demand for allowances and the exact dispatch level needed to meet the emissions cap. This inherent supply and demand uncertainty can be mitigated by the considerable data available about ongoing power system conditions and generation that would inform allowance prices and allow market participants to assess the supply and demand for allowances. There is always major uncertainty about fuel prices, electricity demand, and other factors on the power system, and electricity and carbon markets are well-equipped to assimilate all of this information, efficiently adjust prices and dispatch to respond to evolving conditions, and manage uncertainty at low cost. If there are concerns about an after-the-fact allocation, Missouri could, as an alternative, allocate allowances in advance of the compliance period based on an expected or self-projected generation level, possibly coupled with some penalty for

significant or persistent overestimation of generation like EPA proposed for the renewable energy set-aside.[20]

Conclusion: The Approaches proposed above disincentivize leakage to new generation, provide greater equivalency between mass and rate based standards, ensure that emission reductions from existing low-emitting and new zero-emitting resources are properly incentivized to build new generation so as to counter free rider problems that can undervalue emissions reductions under the mass-based approach. By using the allowance allocation to incentivize generation from low and zero-emitting resources, these approaches result in lower electricity prices for consumers.

7. Are there drawbacks to Missouri taking advantage of the Clean Energy Incentive Program? If yes, please explain.

ANSWER:

The EPA introduced the CEIP to encourage and reward early installers of certain types of renewable energy and energy efficiency measures. Under this program, wind and solar resources constructed after a state has submitted its final compliance plan can earn ERCs ("credits"), or an equivalent number of allowances for the energy produced by these generators between 2020 and 2021. These "early action" credits can be sold to EGU owners for use during the compliance period. The CEIP presents an opportunity for states to reward these early actions that will provide benefits to meeting a state's emission rate goals. These early actions will also help smooth the transition to the compliance period.

Wind on the Wires strongly supports the CEIP and its intent to incentivize early investment in wind generation and cannot see any drawbacks to Missouri's participation in the program. Wind on the Wires encourages Missouri to signal in its September 6, 2016 filing with the EPA their participation in the CEIP.

EPA states that, through the CEIP, it "seeks to drive the widespread development and deployment of wind and solar, as these broad categories of renewable technology are essential to longer term climate strategies," which is "consistent with the CAA's design that incentivizes technology and accelerates the decline in the costs of technology."[21] Wind on the Wires applauds both of these policy goals, but also suggests changes that can be made to increase the program's effectiveness in achieving these goals. EPA continues to seek comment on how to improve the CEIP from stakeholders and the American Wind Energy Association has submitted comments to EPA with suggested improvements to the current CEIP timeline. Wind on the Wires supports these comments and believes that these changes would greatly benefit states and projects participating in the CEIP.

[20] 80 Fed. Reg., at 65069 (2015).
[21] *Id*.

Missouri should take advantage of the 2-for-1 value the CEIP offers renewable energy resources. The CEIP has a matching provision by which the EPA and the state will each provide ½ credit for every eligible MWh generated by a wind or solar resource. Thus, the EPA and state matching credits will double the credits of a qualified wind farm for the energy it produces in 2020 and 2021.

In addition, the Grain Belt Express transmission line can enable Missouri to significantly capitalize on the CEIP. The Grain Belt Express would be the exact type of transmission project that would deliver into Missouri energy from new wind resources that would qualify for the CEIP. The Grain Belt can deliver up to 2.6 million MWhs per year[22] into Missouri. The matching provision would double the credits to 5.2 million ERCs which would be approximately 4.2 million allowances per year.[23]

8. Are there drawbacks to setting aside allowances for renewable energy or energy efficiency projects other than the Clean Energy Incentive Program? If yes, please explain.

ANSWER:

In setting its CPP compliance path, Missouri should establish policies that minimize CO_2 emissions leakage to new carbon emitting plants and avoids the potential for Missouri having a more difficult CPP compliance path eight years from now. The EPA is considering how it will revisit the Clean Power Plan to make changes to maintain or improve the Clean Power Plan's level of emission performance; such as reclassifying NGCC plants built between 2014 and 2024 as regulated EGUs subject to the Clean Power Plan emission rate goals.[24] Implementing policies in the state implementation plan that excessively invests in new NGCC could cause a problem if the EPA were to consider those new NGCC plants as existing plants in 2025. Set-aside allowances for renewable energy can play an important role in helping Missouri control some of that leakage, particularly if the allocation strategies discussed in response to questions 4, 5 and 7 above are not adopted. The extent of the effectiveness of a set-aside, however, is limited by the ceiling Missouri sets on the amount of allowances allocated to renewable resources. The answer below explains that a set-aside for Renewable Energy larger than 5% would be required to effectively control emissions leakage from EGUs to new carbon emitting generators. In addition, in this answer Wind on the Wires addresses what to do with unused renewable energy set-aside allowances, and also allowances for retiring fossil generators.

[22] MO PSC Docket No. EA-2014-0207, *In the Matter of Grain Belt Express Clean Line LLC for a Certificate of Convenience and Necessity*, Initial Post-Hearing Brief of Applicant Grain Belt Express Clean Line LLC (item No. 470) at 12 (Dec. 8, 2014).
[23] The 4.2 million allowance amount is based on an assumed allowance rate for Missouri of 1,621 lbs/MWh.
[24] 80 Fed. Reg. at 64869 (2015), *see* "Out-Year Requirements: Maintaining or Improving the Level of Emission Performance Required by the Emission Guidelines."

A. Renewable Energy Set Aside: The 5% renewable energy set-aside level established by the EPA was intended to offset leakage to new NGCC generators.[25] The 5% level, however, needs to be increased because key variables -- such as price of natural gas and interest rates -- have changed since the EPA performed its calculations setting the renewable energy set-aside level. A number of commenters have proposed that EPA increase the required set-aside level in the final Model Trading Rule to more effectively control leakage.

The EPAs power system modeling shows that strong anti-leakage provisions are necessary to counter the risk of leakage. NRDC's power system modeling confirms that a 10% renewable energy set-aside is insufficient to effectively contain leakage, even when combined with a strong 1,000 lbs/MWh output-based allocation to existing NGCC generation. NRDC found that this approach would only prevent 34% of the leakage that occurs in a mass-based existing source case relative to a mass-based new source complement case, or 44 million tons of the total leakage of 128 million tons.

EPA points out that an excessive output-based set-aside for gas generators could harm other generators by reducing wholesale electricity prices.[26] Renewable resources tend to reduce electricity prices by displacing the output of more expensive generators. However, zero-emission renewable resources almost never set the wholesale electricity market clearing price, unlike the NGCC generators about which EPA expresses a concern.[27] As a result, the impact a renewable energy set-aside would have on the production cost of renewable resources is unlikely to be directly reflected in electricity prices, and in the event it does impact the marginal price of electricity production, those times will be few in comparison to the number of times natural gas is likely to be setting the marginal price of electricity production. Given that natural gas generators are more likely to be setting the marginal price of electricity production than renewable resources, an excessive output-based set-aside should be avoided so as to not foster additional CO_2 emissions instead of curbing it.

As a result, Missouri should use a renewable energy set-aside level larger than 5% or adopt a dynamic formula that updates the renewable energy set-aside level based on evolving market conditions. This means greater accuracy because the set-aside levels would be made closer in time to each compliance year or period. A key concern with the set-aside calculation is that it is based on a number of factors that could greatly change between now and 2030 -- expectations of natural gas prices, interest rates, allowance prices, renewable energy costs, and other factors. Updating the renewable energy set-aside level to account for evolving market conditions would better calibrate the set-aside level to what is actually required to prevent leakage under future market conditions. Because leakage to new NGCC is likely to primarily be driven by low natural

[25] EPA, Renewable Energy Set-aside Technical Support Document, at 2 *2.0 Analytical Framework* (available at: http://www.epa.gov/sites/production/files/2015-11/documents/tsd-fp-re-setaside.pdf).
[26] Available at http://www.epa.gov/sites/production/files/2015-11/documents/tsd-fp-allowance-allocations.pdf at 9.
[27] Available at http://awea.files.cms-plus.com/FileDownloads/pdfs/AWEA%20white%20paper-Cutting%20through%20Exelon's%20claims.pdf.

gas prices, and leakage will exacerbate the problem by reducing the value of allowances being awarded to renewable resources to counteract leakage, adjusting the set-aside to account for changes in gas prices and allowance prices protects against new gas leakage as it begins to occur. This can be a key tool for preventing the risk of runaway leakage.

Updating the renewable energy set-aside level based on evolving market conditions is a workable solution as the lead time to deploy renewable energy is quite short, typically a few years or less. Moreover, other resources on the power system can and will be continually adjusting their dispatch in response to evolving market conditions, including fuel price and carbon allowance prices. As a result, using an updated renewable energy set-aside level provides adequate lead-time for decisions about generator additions and dispatch and would not significantly add to the large amount of uncertainty that is already inherent on the power system. In fact, updating the renewable energy set-aside level to ensure it remains an effective policy could actually reduce power system uncertainty.

B. Unused Renewable Energy Set-Aside Allowances Should be Rolled into the Next Compliance Period: The rule for the Federal Plan is that renewable energy set-aside allowances that are unutilized would be recycled back into a pool of allowances that would be redistributed nationally at the end of each compliance period.[28] Recycling unused allowances into a national pool of allowances makes the value of the set-aside far more dependent on highly uncertain factors like fuel prices and allowance prices, increasing risk for all market participants.[29]

States can take steps to ensure the set-asides work efficiently for all market participants. To ensure that the set-asides functions as a true set-aside they should only be made available when the required generation is developed. Thus, Missouri should not follow the Federal Plan, but instead, should roll unused renewable energy set-aside allowances into the next compliance period for use by renewable energy developers. That would provide a state greater certainty about the composition of the future generation mix.

C. Unused Fossil Allowances should be Rolled into the Renewable Energy Set-Aside: A state can also ensure that the set-asides function more efficiently by moving allowances from generators that are retiring into the renewable energy set-aside. For the Federal Plan, the EPA proposes that unused allowances from EGUs that are retired, are modified or reconstructed, or otherwise cease operations for two consecutive calendar years should be recycled into the renewable energy set-aside to help control leakage.[30] Missouri should adopt a similar approach.

In particular, the magnitude of EGU retirements is likely to be inversely correlated with future natural gas prices: low natural gas prices make existing coal generators less competitive and

[29] For a more detailed discussion, see AWEA comments to EPA at pages 40-42, available at http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2015-0199-0001

[29] For a more detailed discussion, see AWEA comments to EPA at pages 40-42, available at http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2015-0199-0001

[30] 80 Fed. Reg. at 65026 and 65027 (2015).

more likely to retire. Making more allowances available for the renewable energy set-aside if gas prices move lower than expected is valuable policy design, because as noted above, lower than expected natural gas prices greatly exacerbate the leakage to new gas by making it more competitive relative to new renewable resources. Further, this type of policy is not needed for the output-based allocation to existing gas, because existing gas generators will benefit from low gas prices just as new gas generators do. Therefore, unlike renewable energy, low gas prices will not create a differential incentive and cause leakage to new NGCC from existing NGCC.

Furthermore, Missouri should make key modifications to EPA's proposed approach,modifications that EPA may adopt itself in response to a large number of comments. First, an EGU that is retiring, being modified or reconstructed, or otherwise ceasing operations should only receive allowances for one or two years on a rolling basis after it retires or otherwise ceases generation, rather than EPA's proposal that a unit that has retired or ceased generation for two consecutive calendar years receive allowances for the entire subsequent compliance period. Providing allowances for the entire subsequent compliance period could create an unintended incentive for a large number of units to retire, undergo modifications, or cease operations at around the same time -- just after they have passed the threshold to qualify for all allowances for the next compliance period. An arbitrary cutoff date set based on calendar years, after which a unit receives all allowances for the following compliance period, inefficiently incentivizes units to either accelerate or postpone their retirement to just after that cutoff date. Incentivizing EGUs to all retire at the same time could also unnecessarily complicate power system planning, as a more staggered retirement would be easier to incorporate into generation and transmission planning. Providing allowances to retiring generators for a time period that begins on a rolling basis on the date when they retire, undergo modification, or cease operations, rather than the entire following compliance period, would provide a more uniform incentive to retire and therefore result in more staggered retirements that are driven by market factors and not an incentive to retire after arbitrary dates.

Second, rather than EPA's proposal that a unit be deemed to have ceased operations after two years of zero generation, at which point the clock begins for the unit to lose its allowances, the determination that a unit had ceased operations could be made retroactively and go back to the date when generation had effectively ceased.

Third, to further remove any incentives for gaming, Missouri should not base the determination that a unit has ceased operations on a total cessation of generation. This could inefficiently incentivize a unit to produce a very small number of MWh every two years for the sole purpose of not "ceasing operations" so it could retain its allowance allocation. Instead, Missouri could deem that any unit that drops below some fixed percentage of its 2012 generation level for a sustained period of time had ceased operations. While such a unit could retain allowances for the generation it actually produced, any other allowances would be recycled to the renewable set-aside.

These reforms should remove any incentives for gaming and provide a smoother transition path for retiring generators while still providing a sufficient incentive for an inefficient and high-emitting EGU to retire. The fact that dozens of GWs of fossil EGUs have announced plans to retire over the last several years, driven primarily by low natural gas and electricity prices, indicates that market forces are already strong enough to force inefficient EGUs into retirement. As a result, Missouri should shorten the period for which retiring generators receive allowances without incentivizing generators to decide not to retire for the sole purpose of retaining their allowances. Particularly at today's low natural gas prices, the market forces pushing coal generators into retirement are far stronger than any incentive to not retire to retain allowances.

It should be noted that the policy design questions discussed in the set-aside section above, such as properly structuring the renewable set-aside and allowance allocation to retiring EGUs, would not need to be addressed if one of the allowance allocation approaches described in Wind on the Wires answer to question #5, above, was adopted by Missouri. That method directly controls leakage and retiring generators efficiently lose their allowances, so none of these complex policy design decisions are needed under that method.

9. Are there drawbacks to auctioning allowances? If yes, please explain.

ANSWER:

Auctioning allowances can be a highly efficient policy if the auction revenue, in part or in total, is required to be reinvested in new zero emitting generation or programs that help Missouri comply with the CPP and would refund excess funds to ratepayers. An auction system would likely require authorizing legislation, particularly for the disbursement of auction revenue.

22. What transmission and/or distribution upgrade or building needs does your utility anticipate as a result of the CPP (e.g., new lines, upgrades to transformers or substations, AMI)?

ANSWER:

Transmission planning and construction that has taken place in the last few years is contributing to long term consumer savings, increased reliability and to the incorporation of new zero-emitting resources in the Midwest- including Missouri. These benefits were summarized in a recent report by the Southwest Power Pool.[31] These resources put Missouri in a much better place to comply with the Clean Power Plan than it would have otherwise been. Wind on the Wires believes that the most cost effective implementation of the CPP will include some additional transmission enhancements. Planning processes in SPP and MISO as well as AECI

[31] Available at: http://www.spp.org/documents/35297/the%20value%20of%20transmission%20report.pdf

should include scenarios that assume that the CPP is implemented. Both MISO and SPP have been engaged in such planning within their respective regions. In a recent presentation to its Planning Advisory Committee MISO indicated that transmission planning for the CPP should not be delayed. In SPP the current Integrated Transmission Plan for 2017 assumes in two of the three Futures that the CPP will be implemented. However, in the Interregional Planning coordinated between MISO and SPP no CPP future was analyzed. The same is true of the joint planning study conducted last year between SPP and AECI. The Missouri Commission should encourage the regional transmission providers that overlap in Missouri to perform new interregional studies that include futures accounting for the CPP.

The American Wind Energy Association ("AWEA") created a Clean Power Plan modeling tool that estimates the amount of wind capacity that would be the lowest cost compliance strategy for a state. Under a new source complement standard with nationwide trading, AWEAs CPP Tool estimates Missouri to need approximately 4,200 MW of wind generation with an 80% confidence range of 3,000 to 4,900MW of wind. Currently, there is 459 MW of wind generation within Missouri. While Missouri has a good enough wind resource to have the estimated need for wind built within the state, increased transmission capacity across the state and with its neighboring states will help ensure zero-emitting resources are available for delivery into the state at the most cost effective prices.

For example, the Grain Belt Express, if approved, is a high voltage direct current transmission line that would have the capability of delivering 500 MW of low-cost wind power from western Kansas into Ralls County, Missouri.

The Project will facilitate the construction of thousands of MWs of new wind generation facilities in western Kansas by connecting that state's abundant, high capacity factor and affordable wind resources with the large and growing market for renewable energy in Missouri and other states. The wind energy delivered via Grain Belt would likely qualify for the CEIP.

The Grain Belt would have the capacity to deliver up to 2.6 million MWhs per year[32] into Missouri. This results in up to 17,100,000 tons of CO_2 reductions from 2022 through 2030.

[32] MO PSC Docket No. EA-2014-0207, *In the Matter of Grain Belt Express Clean Line LLC for a Certificate of Convenience and Necessity*, Initial Post-Hearing Brief of Applicant Grain Belt Express Clean Line LLC (item No. 470) at 12 (Dec. 8, 2014).

Respectfully submitted,

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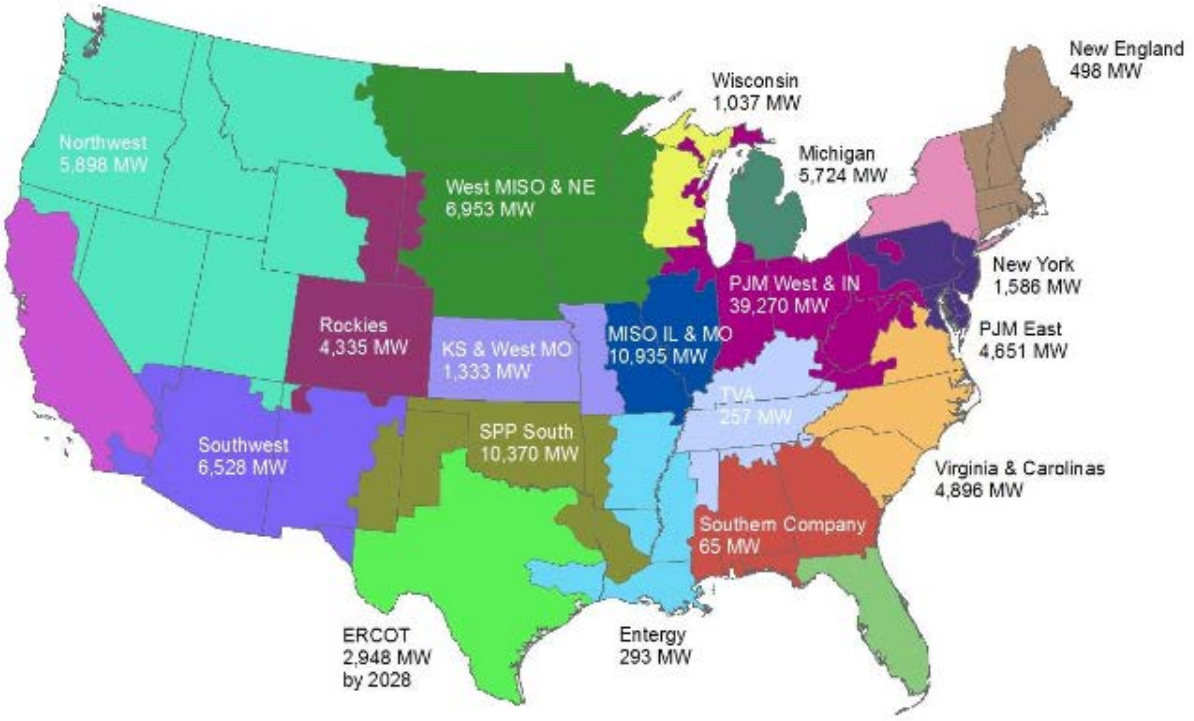
APPENDIX A

Figure 7. EIA Projection for Additional Wind Build by 2025 under CPP Scenario, by Region



SOURCE: American Wind Energy Association, "EIA Analysis Shows Wind is Most Cost-Effective Option for Clean Power Plan Compliance " (July 2015) available at: http://awea.files.cms-plus.com/AWEA%20report%20on%20EIA%20CPP%20analysis%20July%202015.pdf