# BEFORE THE MISSOURI PUBLIC SERVICE COMMISSION

| | | |
|---|---|---|
| In the Matter of an Investigation of the Cost | ) | |
| to Missouri's Electric Utilities Resulting From | ) | EW-2012-0065 |
| Compliance with Federal Environmental Regulations. | ) | |

**Dogwood Energy LLC's Reply Comments**

Dogwood Energy LLC's ("Dogwood Energy" or "Dogwood") is pleased to provide reply comments in this docket regarding the EPA's proposed Clean Power Plan. Dogwood's comments focus on issues related to a reasonable implementation of the final version of EPA's proposed rules, and do not attempt to debate the appropriateness or value of the proposed rules, as that does not seem to be the purpose of this proceeding. Dogwood Energy is the 55.5% majority share owner of the Dogwood Energy Facility located in Pleasant Hill, Missouri. The owners of the remaining 44.5% of the facility include the City of Independence, Missouri and the municipal members of the Missouri Joint Municipal Electric Utility Commission, which is comprised of numerous municipal electric utilities throughout Missouri. These comments are solely Dogwood Energy's.

## I. Summary of Dogwood's Comments

a. Dogwood Energy believes that the existing Combined Cycle generation fleet in Missouri should be able to contribute its expected share of CO2 emissions reductions under the EPA's proposed Clean Power Plan without an excessive level of additional capital investment. There is significant underutilized capacity in the current natural gas infrastructure in Missouri, such that even when there are constraints during winter

months, Combined Cycle facilities in the state should still be able to reach capacity factors approaching the implicit goal under the proposed Clean Power Plan of 70% annually.

b. If needed, Dogwood Energy believes that the existing Combined Cycle fleet could increase its capacity factor and/or its total output capacity for the purpose of further assisting the state of Missouri in meeting its CO2 emissions goals under the Clean Power Plan with only a modest level of additional expense and investment in comparison to other alternatives, such as construction of additional, new Combined Cycle facilities.

c. Like many other stakeholders in this proceeding, Dogwood Energy believes that a regional compliance plan involving other nearby states, such as Kansas and Nebraska, could provide benefits and should be diligently explored. Missouri utilities' participation in Regional Transmission Organizations (RTOs) brought significant benefits to Missouri's citizens, and the economic efficiencies of regional least-cost generation commitment and dispatch should be seriously considered in the context of meeting the requirements of the proposed Clean Power Plan in as economical a manner as possible.

d. Finally, in order to make the Clean Power Plan work in Missouri, Dogwood Energy believes that reasonably valuing and pricing CO2 emissions in an allowance market will be a necessary component, such as in the existing CAIR program for NOx and SO2. Implementation of such programs has proved workable in the past for the generator participants, the states, and the ISOs/RTOs that operate the electric grids covered by the CAIR program. Dogwood believes that with a reasonable implementation plan, the ISO/RTO systems should not require significant modification to accommodate the proposed Clean Power Plan, because such systems already allow generators to include emissions costs in their commitment and dispatch offer pricing parameters and permit

limitations on operating hours of generating facilities due to environmental-related constraints.

## II. Combined Cycle facility output in Missouri can be significantly increased as needed to meet Clean Power Plan goals by simply increasing use of the underutilized natural gas infrastructure within Missouri

a. The EPA's proposed Clean Power Plan rules reflect an expectation of increased output of Combined Cycle plants in Missouri from approximately 4.8 GWh to 12.8 GWh (a net change of 8 GWh), to reach the 70% capacity factor that is implicit in the EPA's goals, which would be similar to that of existing coal plants. This increased natural gas generation will contribute roughly one quarter of the overall emissions reductions required for Missouri under the initially proposed version of the Clean Power Plan.

b. Currently, most Combined Cycle facilities in Missouri run throughout the summer peak period at capacity factors approaching 50% or more, and then operate less frequently during the rest of the year, resulting in capacity factors between 10-40%. A typical Combined Cycle unit can achieve an Equivalent Availability Factor of 85-95% of total annual availability depending on scheduled maintenance. Forced outage factors (FOF) for Combined Cycle facilities of a few percent or less are now typical. Achieving an overall 70% capacity factor is not an unrealistic goal based on typical Combined Cycle equipment and facility design, even considering the possibility of additional maintenance that may need to be scheduled as a result of additional operating hours.

c. Natural gas infrastructure needs are typically based on winter peak operating constraints, because much of the demand for natural gas occurs for residential and

commercial heating use during winter months. In Missouri, peak winter month natural gas consumption during 2009-2013 averaged roughly 44 Bcf (during the month of January), with half of that consumption for residential customer use and another quarter of it for commercial customer use, as shown in Table 1.

**Table 1**

**Natural Gas Consumption in Missouri[1]**

| Natural Gas Monthly Consumption in the State (Average 2009- 2013) - EIA | | | | | |
|---|---|---|---|---|---|
| Month | NG Consumption (MMcf) | NG Residential (MMcf) | NG - Commercial (MMcf) | NG_Industrial (MMcf) | NG - Electric Power Consumers (MMcf) |
| 1 | 43,811 | 22,301 | 11,366 | 6,963 | 3,181 |
| 2 | 36,403 | 18,079 | 9,422 | 6,331 | 2,570 |
| 3 | 28,095 | 12,671 | 6,969 | 5,981 | 2,475 |
| 4 | 17,058 | 6,318 | 4,054 | 5,037 | 1,649 |
| 5 | 13,378 | 3,443 | 2,644 | 4,690 | 2,601 |
| 6 | 13,774 | 2,103 | 2,117 | 4,469 | 5,086 |
| 7 | 16,677 | 1,900 | 1,925 | 4,485 | 7,304 |
| 8 | 14,488 | 1,763 | 2,019 | 4,547 | 6,159 |
| 9 | 11,203 | 1,935 | 2,293 | 4,420 | 2,554 |
| 10 | 14,603 | 4,321 | 3,654 | 4,992 | 1,689 |
| 11 | 21,977 | 9,455 | 5,804 | 5,339 | 1,378 |
| 12 | 36,154 | 18,037 | 9,229 | 6,495 | 2,392 |
| Yearly Average 2009-2013 | 267,622 | 102,325 | 61,495 | 63,750 | 39,038 |

In contrast, during summer months, the total natural gas use in Missouri for residential and commercial customers is less than 10% of the winter peak usage of 44 Bcf. As a result, much of the natural gas infrastructure required to transport fuel to support

[1] Source: Energy Information Administration. Note: Data for July 2013 and October 2013 for Industrial and Commercial Users are incomplete on EIA datasets as well as October 2013 Residential Consumption. In those cases of incomplete data it was assumed that the consumption was identical to the same month of the prior year.

increasing the output of combined cycle facilities to over 70% capacity factor levels is readily available during the non-winter periods, allowing the year-round 70% average.

d. Combined Cycle facilities in the Southwest Power Pool ("SPP") already have some firm year-round transport acquired on natural gas pipelines and generally buy more on a released capacity basis when needed to meet electricity peak demand during the summer. During 2009-2013 in Missouri, on average, as shown in Table 1 above, all generating facilities consumed approximately 7.3 Bcf of natural gas during the peak summer month of July and 3.2 Bcf during the peak winter month of January. Of those totals, a significant majority of the natural gas, 5.0 Bcf during the summer peak and 2.5 Bcf during the winter peak months, were consumed in Missouri's Combined Cycle generating facilities.

e. If the output of Combined Cycle facilities in Missouri during the summer months were increased to a monthly capacity factor of 90%, the amount of summer monthly natural gas consumption for those facilities would roughly double to approximately 9 Bcf per month. Due to the reduced consumption by residential and commercial customers during the summer, this 4-5 Bcf increase, depending on the month, should be easily handled by the existing natural gas infrastructure in Missouri, which is able to transport roughly 22 Bcf more natural gas on average during the peak month of natural gas use. (43.8 Bcf – 16.7 Bcf – 5 Bcf = 22.1 Bcf in excess capacity)

f. Since peak winter demand constraints on the natural gas pipelines do not occur every day, Dogwood believes that it is reasonable to expect Combined Cycle facilities to achieve 50-60% capacity factors during the peak winter period from December through February. And, depending on the level of firm transportation already acquired on the pipelines by the owner(s) of each Combined Cycle facility, these capacity factors could

possibly be higher during the winter months on a plant -by -plant basis. As a result, even at a reduced capacity factor during winter months, natural gas infrastructure constraints should not prove to be a significant impediment to Combined Cycle facilities reaching capacity factors close to 70% in Missouri.

## III. Additional Generation Output from Combined Cycle Facilities, and the Resulting CO2 Emissions Reductions in Missouri, Could be Achieved with Modest Additional Infrastructure Investment

a. If additional generation output from Combined Cycle facilities is needed to achieve increased reductions in CO2 emissions in Missouri, either natural gas or electric generation infrastructure investments to achieve an increase in energy output from existing Combined Cycle facilities may be economically justified in comparison to other alternatives.

b. Based on the assessment of existing Combined Cycle generating capacity and the usage statistics of the existing natural gas infrastructure in Missouri provided above, Dogwood believes that any additional natural infrastructure investments for Combined Cycle facilities in Missouri should be viewed as potentially increasing annual capacity factors by up to 8-10% as a result of increasing potential winter capacity factors from 50-60% up to 90%.[2]

[2] (3 months ÷ 12 months) X 30 to 40% increase during three months = 8 to 10% annual increase.

c. Some parties in this proceeding have suggested that natural gas infrastructure improvements could cost up to $5 million per mile. Such estimates appear to be high for Missouri projects.

d. In a recent report on natural gas infrastructure, The INGAA Foundation, Inc. stated that pipeline costs currently average $155,000 per inch-mile, which is up from the average cost of $94,000 per inch-mile in their prior report. (See report at pages 5-6 at www.ingaa.org/Foundation/Foundation-Reports/2035Report.aspx) At standard pipeline sizes of 16, 20 and 24-inch diameters for significant infrastructure expansions, current pipeline construction cost estimates would range from roughly $2.5 million to $3.7 million per mile. However, it should be noted that the larger pipeline diameters can move upward of 600-700,000 mmbtu/day, which is in excess of the total daily consumption of all of the Combined Cycle facilities in Missouri, much less the needs of any one particular facility.

e. More importantly, however, due to the existing, extensive natural gas infrastructure in Missouri, it is likely that natural gas infrastructure upgrades needed to increase the output of Combined Cycle facilities will not consist of long pipe runs going back to the well heads in Oklahoma and Texas that are hundreds of miles away from Missouri. Based on Dogwood's discussions with pipeline companies, it is far more likely that only shorter pipe runs between existing pipeline facilities or at existing compressor stations would be needed to adequately enhance the existing natural gas infrastructure in Missouri, thereby reducing the potential investment needs to more manageable levels.

f. In concert with, or instead of, natural gas pipeline infrastructure investments, upgrades to existing Combined Cycle facilities to increase output may be a cost-effective investment option for incrementally reducing CO2 emissions in Missouri.

g. Over time, combustion turbine manufacturers often develop upgrade opportunities available for implementation on existing turbines, such as the Siemens 501FD3 upgrade referenced by Empire in its comments and previously implemented in part at the Dogwood Energy Facility during its last round of combustion turbine major maintenance inspections. Such upgrades can increase the output and efficiency of existing Combined Cycle facilities in Missouri at a fraction of the cost of building new Combined Cycle facilities.

h. Further, additional equipment, such as inlet chillers, could also be added at existing Combined Cycle facilities to increase summer peak output, albeit at a slightly higher production cost. Inlet chillers cool the intake air for the combustion turbines, which enables a facility's summer peak output to increase closer to its generally greater winter output rating. This type of infrastructure investment would allow increased Combined Cycle facility output during the non-winter months, and particularly during the summer, when Missouri's natural gas infrastructure is least utilized.

## IV. Missouri Should Pursue the Possibility of Developing a Multi-state / Regional Approach to the Clean Power Plan.

a. As other parties to this proceeding have suggested, Dogwood recommends serious consideration of a multi-state approach to Missouri's compliance with the Clean Power Plan. This could occur as part of a full combination with other states, such as Kansas, over which Missouri's electric utilities have contiguous service territories. Or, such approach could simply recognize the ownership of, or PPA and other contractual obligations related to, generation facilities by utilities within each state in terms of

reaching the compliance goals of each state. Dogwood Energy's facility co-owners include both utilities located in both Kansas and Missouri, and some of Dogwood's co-owners also own generation in other states, such as Nebraska, Illinois and Arkansas.

b. Further, the similar Clean Power Plan CO2 emissions rates standards of Missouri, Kansas and Nebraska may indicate that a fully integrated joint compliance plan could be more easily achieved with those states than with some of Missouri's other neighboring states.

c. Ideally, existing RTO system boundaries for efficient and economic operation of the grid could be utilized for development of a regional, multi-state plan with plant-level and/or utility-level compliance obligations that could be measured for compliance within those RTOs. This would provide the least dislocation in Missouri utilities' participation in SPP and MISO, respectively, and thereby yield significant benefits to the customers of those utilities. However, it is not clear to Dogwood at this time how a state's compliance obligations under the EPA's proposed Clean Power Plan could be split into two or three different regions, to match the differing RTO participation situations for Missouri's utilities. This would seem to be a topic worthy of further comments and discussion by Missouri agencies and stakeholders with the EPA.

## V. Pricing CO2 Emissions for Clean Power Plan Implementation Can Play an Important Role in Meeting Emissions Standards.

a. Valuing and pricing CO2 emissions in a mass-based allowance market is a reasonable regime for CO2 emissions compliance, such as in the existing CAIR program for NOx and SO2. Implementation of such programs has proved workable in the past for the

generator participants, states, and the ISOs/RTOs that operate the electric grids. Similarly, a rate-based emissions compliance regime could also work adequately if an appropriate trading mechanism is developed and implemented to provide timely transfer payments between generators for the purpose of compliance with Missouri's CO2 emissions rate standard.

b. As a result of prior experience with mass-based emissions compliance regulations, such as CAIR, the RTO systems of SPP and MISO that include Missouri utilities should not reasonably require significant modifications to accommodate Missouri's compliance with the proposed Clean Power Plan emissions rate standards. Such systems already allow generators to include emissions costs in their commitment and dispatch offer pricing parameters and to limit operating hours due to environmental-related constraints.

c. Dogwood understands that estimates developed to date by consulting firms analyzing the proposed Clean Power Plan indicate an estimated compliance cost of approximately $25 per ton of CO2 emissions in Missouri.

## VI. Summary and Conclusions.

In summary, Dogwood Energy expects that:

- Combined Cycle facility output in Missouri can be significantly increased as needed to meet EPA goals by simply increasing the use of underutilized natural gas infrastructure in Missouri.

- Additional Generation Output from Combined Cycle Facilities, and the Resulting CO2 Emissions Reductions in Missouri, Could be Achieved with Modest Additional Infrastructure Investment
- Additional Natural Gas Infrastructure Should Not Cost as Much as Some Stakeholders Estimate.
- Combined Cycle Generation Facility Upgrades May Be Better Investments than Other Alternatives, Such as the Construction of New Combined Cycle Facilities.
- Missouri Should Pursue the Possibility of Developing a Multi-state / Regional Approach to the Clean Power Plan.
- Pricing CO2 Emissions for Clean Power Plan Implementation Can Play an Important Role in Meeting Emissions Standards.

Dogwood remains available to collaborate with the other stakeholders to assist the Commission in understanding, commenting on, and working with EPA proposals and regulations.

Respectfully submitted,

CURTIS, HEINZ,
GARRETT & O'KEEFE, P.C.

/s/ Carl J. Lumley

Carl J. Lumley, #32869
130 S. Bemiston, Suite 200
Clayton, Missouri 63105
(314) 725-8788
(314) 725-8789 (Fax)
clumley@lawfirmemail.com

Attorneys for Dogwood Energy, LLC

**CERTIFICATE OF SERVICE**

A true and correct copy of the foregoing was served upon the parties identified on the attached service list on this 16 day of September, 2014, by email transmission.

/s/ Carl J. Lumley

Office of Public Counsel
Governor Office Building, Suite 650
P.O. Box 2230
Jefferson City, Missouri 65102

Office of General Counsel
Missouri Public Service Commission
200 Madison Street
P.O. Box 360
Jefferson City, Missouri 65102