



**COMMENTS OF THE MID-ATLANTIC RENEWABLE ENERGY COALITION
TO THE STATE OF DELAWARE
ON DELAWARE'S COMPLIANCE WITH THE EPA'S CLEAN POWER PLAN**

December 31, 2015

We want to express our appreciation to the Delaware Department of Natural Resources and Environmental Control for the opportunity to provide comments on Delaware's compliance with the U.S. Environmental Protection Agency's (EPA) Clean Power Plan (CPP). The Mid-Atlantic Renewable Energy Coalition (MAREC) is a nonprofit organization that was formed to help advance the opportunities for renewable energy utilization in the region where the PJM Interconnection (PJM), a Regional Transmission Organization, operates. MAREC's footprint includes Delaware and eight other jurisdictions in the region. MAREC members include wind developers, wind turbine manufacturers, service companies, non-profit organizations, and a transmission company dedicated to the growth of renewable energy technologies. MAREC members have developed, own, and/or operate thousands of megawatts (MW) of renewable energy serving the PJM territory.

We provide these comments as an initial response to Delaware's call for comments with regards to its State Implementation Plan (SIP) and look forward to providing more detailed

29 North State Street
Suite 300
Dover, Delaware 19901

tel. 302-331-4639

www.marec.us

comments in the future. We understand that Delaware is initially considering pursuing the mass-based option, since the state is participating in the Regional Greenhouse Gas Initiative. In this regard, we believe a mass-based approach makes a lot of sense. Our comments first address the benefits of wind energy to the State of Delaware to help meet its CPP compliance requirements. Finally we give our perspective on the specific questions asked by the department during its listening session.

Developing additional wind resources in the region as a major component of CPP compliance would help the state achieve compliance in a cost-effective manner. Not only does the state have a sizable wind resource, primarily located offshore, the region is poised to develop much higher levels of wind energy capacity. Beyond the wind energy that has already been deployed in the region and in adjacent areas of PJM, the continuing technical potential of the resource is very good. Technology advances in recent years have significantly expanded the areas considered “viable” for wind projects. Taller turbines, with longer blades, and advances in transmission and drivetrain technologies have revolutionized the sector and have considerably helped to drive wind energy prices down.

As far as wind energy’s value in helping Delaware meet the CPP, Delaware should seriously consider the results of the U.S. Energy Information Agency (“EIA”) economic analysis of the CPP in which it modeled a range of options for complying with EPA’s proposed rule across a variety of scenarios.¹ Wind energy consistently emerged as the lowest cost option for reducing emissions. EIA finds that wind energy plays by far the largest role in the lowest cost energy portfolio for CPP compliance, with significant wind energy deployment in nearly all regions, including the Mid-Atlantic. This strong showing by wind energy is due to recent declines in the cost of wind energy, coupled with wind’s valuable role in protecting against increases in the price of natural gas. Using zero-emission wind energy provides states with

¹ U.S. Energy Information Administration. “Analysis of Clean Power Plan.”
<http://www2.epa.gov/airmarkets/analysis-clean-power-plan>

valuable flexibility that allows far less drastic changes to the generation mix than using a resource with some emissions.

Importantly, grid operator studies, including this region's grid operator, PJM Interconnection, LLC ("PJM"), confirm that these levels of wind generation can be reliably integrated into their transmission grids. There have been more than a dozen wind integration studies by U.S. grid operators and others that have found that the electric grid can accommodate high levels of wind energy penetration. In particular, the PJM study found that integrating 30% renewable energy into its transmission system is feasible, reliable, and cost-effective.² Currently only 2% of the energy online in PJM is renewable, so the report demonstrated that the system could deal with considerably more, being reliable at both 20% and 30% scenarios.

According to the DOE's Lawrence Berkeley National Laboratory, since 2009, the cost of land-based wind energy has dropped nearly 66%, making wind increasingly competitive with traditional electricity sources.³ A recent analysis from the asset management and consulting group Lazard found that, on a levelized basis, wind has the lowest cost of energy for either conventional or alternative sources of electricity, as shown in Figure .⁴

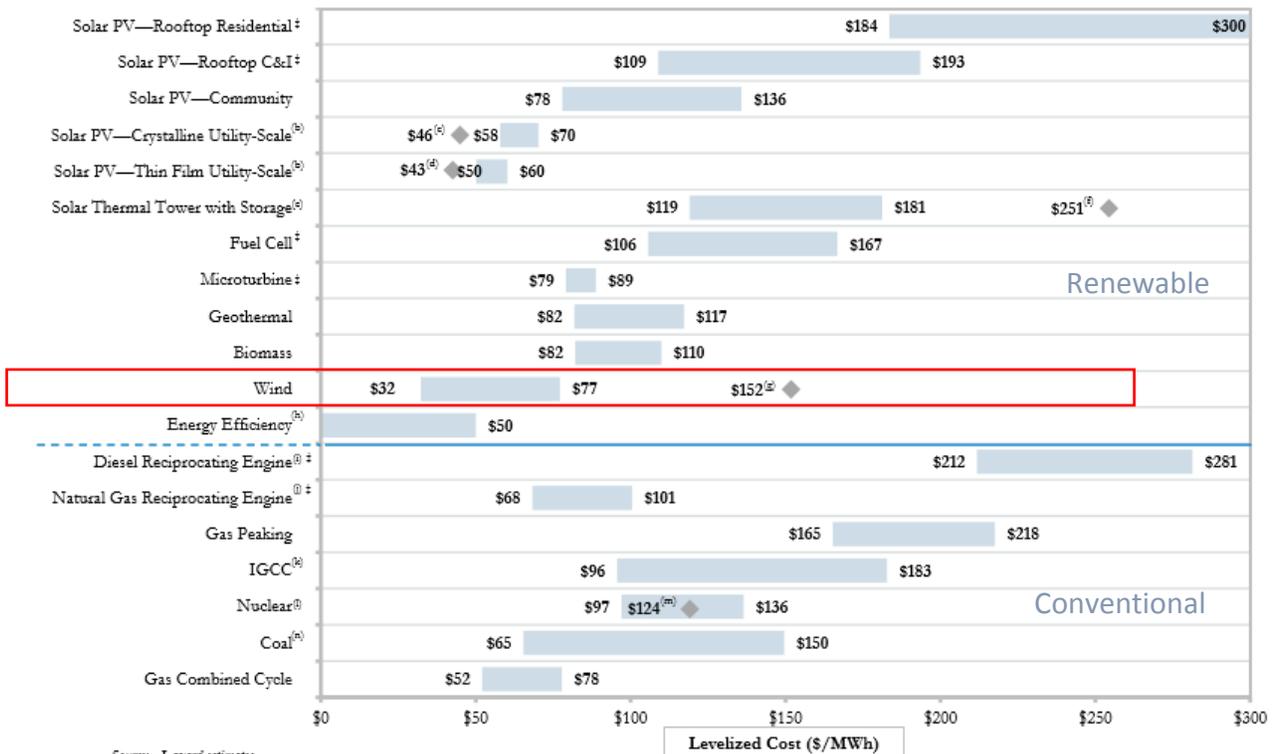
² "PJM Renewable Integration Study" prepared by GE Energy Consulting. February 2014.

<http://www.pjm.com/~media/committees-groups/committees/mic/20140303/20140303-pris-executive-summary.ashx>

³ Department of Energy (DOE)'s "2014 Wind Technologies Market Report" (released August 2015) at page 56.

<http://emp.lbl.gov/sites/all/files/lbnl-188167.pdf>

⁴ Lazard's Levelized Cost of Energy Analysis. November 2015. <https://www.lazard.com/media/2390/lazards-levelized-cost-of-energy-analysis-90.pdf>



Source: Lazard estimates.

Note: Here and throughout this presentation, unless otherwise indicated, analysis assumes 60% debt at 8% interest rate and 40% equity at 12% cost for both conventional and Alternative Energy generation technologies. Assumes diesel price of ~\$2.50 per gallon, Northern Appalachian bituminous coal price of ~\$2.00 per MMBtu and a natural gas price of ~\$3.50 per MMBtu for all applicable technologies other than Natural Gas Reciprocating Engine, which assumes ~\$5.50 per MMBtu. Analysis does not reflect potential impact of evolving regulations/rules promulgated pursuant to the EPA's Clean Power Plan. See following page for footnotes.

ARD ‡ Denotes distributed generation technology.

Figure 1: Unsubsidized Levelized Cost of Energy Source: Lazard's Levelized Cost of Energy Analysis 2015

Not only is wind energy cost-effective, but policies supporting long-term contracts for wind energy (10-20 years) can further reduce consumer rates and ensure stability by allowing projects to secure financing at more favorable rates. Long term contracts provide a valuable long term hedge against volatile fossil fuel prices. Wind can accommodate this because it produces electricity with no fuel cost. Figure shows how long-term contracts can ensure a low price even while gas prices continue to rise.⁵ MAREC would be pleased, as this process moves forward, to provide specific additional recommendations regarding long term contracts that could complement any SIP for Delaware.

⁵ Department of Energy (DOE)'s "2014 Wind Technologies Market Report" (released August 2015) at page 60. <http://emp.lbl.gov/sites/all/files/lbnl-188167.pdf>.

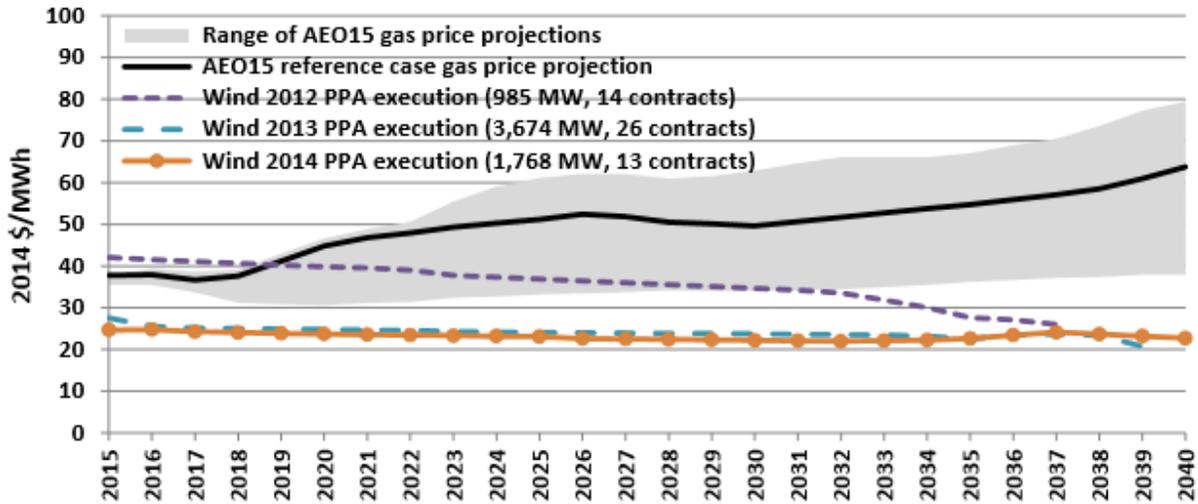


Figure 2: Effect of Long-Term Contracts on Electricity Price

Source: DOE 2014 Wind Technologies Report

The benefits of switching to wind are easily measured and verifiable – attributes essential to CPP compliance. One megawatt hour (MWh) of wind energy avoids 0.75 tons, or 1,500 pounds, of carbon dioxide emissions, on average. A typical 2 MW wind turbine avoids around 4,000-4,500 tons of carbon emissions annually, equivalent to the annual carbon emissions of more than 700 cars. In 2013 alone, wind energy saved the State of Delaware 162,000 short tons of CO₂ emissions, 216,000 pounds of SO₂ emissions, and 145,000 pounds of NO_x emissions.⁶

At the same time, policies supporting additional wind energy generation provide policymakers with greater flexibility to make decisions regarding existing coal plants and the utilization of natural gas to generate electricity. By adding a zero carbon resource to the fuel mix, greater amounts of traditional fuels, like coal, can be incorporated without surpassing CPP

⁶ American Wind Energy Association. "The Clean Air Benefits of Wind Energy." May 2014. http://awea.files.cms-plus.com/FileDownloads/pdfs/AWEA_Clean_Air_Benefits_WhitePaper%20Final.pdf

carbon limits.⁷ Wind also provides the state with more flexibility, because increasing the level of zero emitting resources, like wind, would work well with natural gas as a strong hedge to the price volatility of that fuel. When modeling the price of the power system under various price scenarios, increasing the percent of renewables decreases the range of potential prices.⁸ The graph in Figure 3 shows that not only does the average cost of the power system go down as the penetration of renewables for carbon reduction increases, but also the range between the high and low costs is substantially smaller at increased levels of renewables. This figure was produced using standard assumptions about fuel prices and load growth in the state. This tool is available for regulators so that users can test those assumptions, changing the fuel price and/or load growth to better understand the impact of renewables.⁹

⁷ U.S. Energy Information Administration. "Analysis of Clean Power Plan."
<http://www2.epa.gov/airmarkets/analysis-clean-power-plan>

⁸ American Wind Energy Association CPP Compliance Modeling Tool.

⁹ AWEA Clean Power Plan Cost Optimization and Risk Evaluation (CORE) model
<http://www.awea.org/applications/Forms/FormDisplay.aspx?FormID=42237>

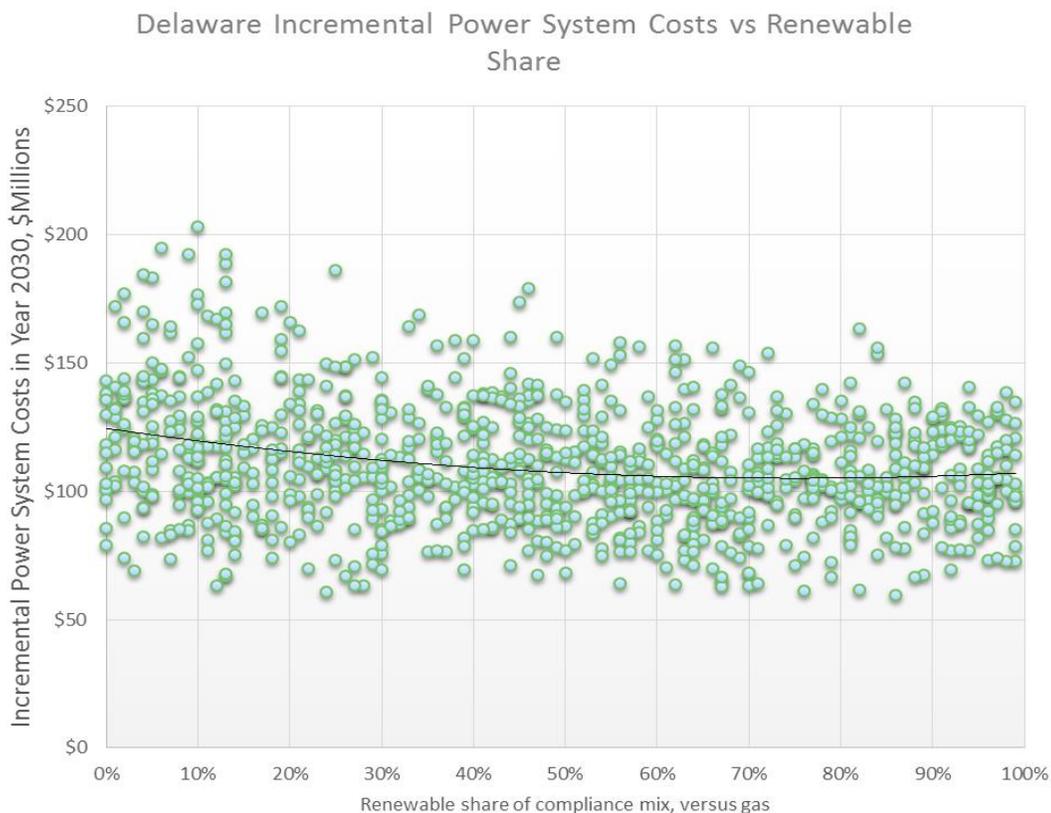


Figure 3: Results from the AWEA Clean Power Plan Cost Optimization and Risk Evaluation (CORE) model

Although the CPP does have some costs associated with it, they are far outweighed by the benefits. The CPP will ensure a reliable and flexible electricity system that allows states to make changes that best suit their needs. And finally, the pollution and climate benefits will improve public health options and save lives, especially those of children and older adults.¹⁰

At the stakeholder meeting held in November 2015, DNREC staff posed some questions about Delaware's implementation of the Clean Power Plan that we address here:

¹⁰ EPA, Clean Power Plan Fact Sheet, <http://www2.epa.gov/sites/production/files/2014-05/documents/20140602fs-benefits.pdf>

1. How do YOU want to be engaged...? a. Short term b. Long term

MAREC would like to participate over the long-term as you iron out the details of the plan.

2. State plan approaches...? a. Seeking comments and feedback on using the CPP mass-based goals. b. Comments on the potential advantages of different state plan pathways.

MAREC supports DNREC's initial consideration of a mass-based approach. While the state could implement a SIP that would utilize a rate-based approach, a mass-based approach makes sense as it would be easier to implement with regards to the measurement and verification issues of a rate-based approach. In addition, Delaware is already familiar with and has worked in a mass-based approach dealing with power plant emissions through its membership in RGGI.

3. CO₂ Emission Reductions...? a. Comments on the state emission goals post-2020.

The state emission goals are reasonable and achievable. Through its membership in RGGI and other action the state has taken to reduce its carbon footprint, Delaware is well on its way to meeting the goals.

4. Flexibility Mechanisms...?

a. Cost Containment Reserve i. Comments and feedback on how the CCR has worked to date and the current design of the CCR. ii. Comments on whether any of the CCR design elements should be reviewed and how the CCR and RGGI cap should work together when developing a CPP compliance pathway.

MAREC makes no recommendation on the CCR has worked to date and how it and the RGGI cap should work together when developing a CPP compliance pathway.

Nevertheless, it would be prudent to review the RGGI program with all of the other member states to determine whether there needs to be any programmatic changes made to accommodate the compliance requirements of the CPP.

b. Offsets i. Comments and feedback on the RGGI offsets program including potential improvements, additional offset categories, acceptance of offsets allowances not

generated from projects located in the RGGI states or listed on offset registries, and the continuation of the offsets program within the bounds of the CPP.

As indicated above, it would be prudent to review the RGGI program with all of the other member states to determine whether there needs to be any programmatic changes made to accommodate the compliance requirements of the CPP.

c. Compliance Periods i. Comments and feedback on the compliance process, including the interim control periods and possible improvements to the compliance process. ii. Comments on possibly amending the non-compliance penalty from surrendering CO₂ allowances equal to three times the number of a source's excess emissions to a CO₂ allowance penalty that may better align with the CPP's requirements, or other alternatives. iii. Comments on whether the RGGI control periods should align with the CPP interim step periods. If so, what are your suggestions for aligning with the CPP (e.g. extend the RGGI fourth control period to 2018-2021)?

As indicated above, it would be prudent to review the RGGI program with all of the other member states to determine whether there needs to be any programmatic changes made to accommodate the compliance requirements of the CPP.

5. RGGI Applicability...? a. Comments on how best to address the fact that the RGGI cap includes emissions from more regulated sources than the CPP for compliance.

As indicated above, it would be prudent to review the RGGI program with all of the other member states to determine whether there needs to be any programmatic changes made to accommodate the compliance requirements of the CPP.

6. Broadening the RGGI Trading Market...? a. Seeking comments and suggestions on the possibility of increasing the size of the current RGGI market/RGGI participating states. The RGGI states are seeking comments on possible advantages and how the RGGI states could best pursue this option.

- **Increasing the potential market will increase supply, theoretically lowering costs**
- **Since other states are able to trade, it might not be necessary to bring them into RGGI.**

7. Other a. Given the fact that the Delaware auctions 100% of the CO₂ allowances, Delaware is seeking comments on whether we should participate in the CEIP program.

We are not sure how these auctions would necessarily interfere in Delaware's participation in the CEIP program. MAREC strongly believes that the CEIP program makes a great deal of sense for any state to participate, so we strongly suggest that Delaware participate in the CEIP if at all possible. As the CEIP program is not yet a final rule, MAREC is hoping that there will be changes to the draft rule, which would include allowing earlier participation in the program by a state than currently provided for in the draft rule, to avoid the possibility that states may delay their efforts to reduce their carbon emissions required under the CPP.

MAREC appreciates the opportunity to comment on Delaware's participation in the Clean Power Plan and its development of a SIP, and we look forward to further opportunities for more detailed comments as the process moves forward.

Sincerely,



Bruce H. Burcat
Executive Director