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# Clean Power Plan

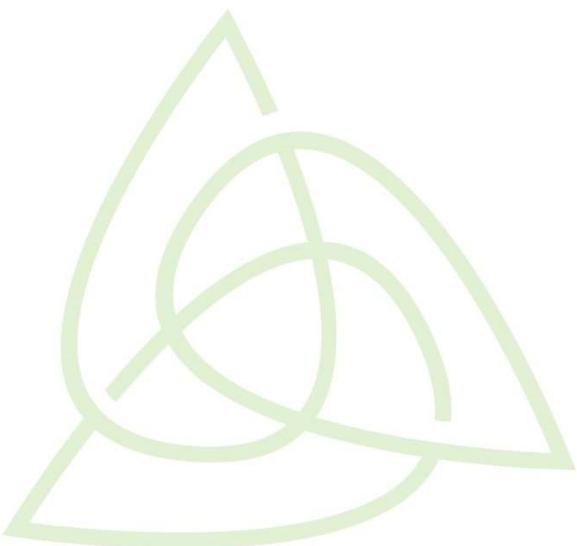
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Comments  
Submitted by Ohio  
Environmental  
Council

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November 20<sup>th</sup>, 2014

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## I. Executive Summary

For three days this summer an algal bloom in Lake Erie prevented nearly 500,000 people in the Toledo metropolitan area from accessing safe, drinkable water.<sup>1</sup> Years of accumulating phosphorus runoff from nearby farming operations was the primary culprit, but hidden in this disaster is a warning for future times.<sup>2</sup> If global warming continues unabated, algal blooms similar to the one which left Toledo residents without water will likely become more frequent and more intense.<sup>3</sup>

The United States Environmental Protection Agency's (US EPA) Clean Power Plan, proposed on June 2, 2014, is a significant first step in preventing a future that scientists predict will include more intense and more frequent heat waves, droughts, extreme weather events and algal blooms.<sup>4</sup> The proposed carbon pollution reductions in Ohio will help ensure our state is not contributing to what would otherwise be a global catastrophe, with substantial local impacts. Our comment will demonstrate that Ohio, despite deriving close to 70% of its electricity from coal, is well positioned to not only meet the proposed carbon emission reduction rate of 28%, but can achieve even greater carbon emission reductions than what the US EPA proposes without, once the plan is fully implemented, increasing electricity prices.

The flexibility given to states in the Clean Power Plan means Ohio can take advantage of many resources in order to meet the target. For example, Ohio's potential to install combined heat and power sources, use more natural gas and renewable energy sources for electric power production, and increase energy efficiency will allow the state to comfortably achieve the necessary carbon pollution reductions. Independent analysis and evidence suggest that Ohio should be able to comply with the proposed carbon pollution reductions. Thus, the US EPA's proposed carbon emission reduction rate for Ohio should not be weakened, as other organizations may recommend in their comments on this draft rule.

Preserving the Clean Power Plan's proposed emission reductions will provide substantial benefits to all Americans. Nationally, the Clean Power Plan is estimated to produce \$48 billion to \$82 billion in climate and health benefits, according to the US EPA.<sup>5</sup> Ohio, relative to other states, is projected to enjoy some of the highest reductions of particulate matter; peak 8-hour

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<sup>1</sup> Mark Zaborney, *Lake Erie crisis calls for action, panel told*, Toledo Blade, Sept. 4<sup>th</sup> 2014

<sup>2</sup> Michael Muskal, *Water ban over, Toledo drinks from tap again; Erie algae a big problem*, Los Angeles Times, Aug. 4<sup>th</sup> 2014; Brian Kahn, *Lake Erie Algae Bloom Matches Climate Change Projections*, Scientific America, Aug. 5<sup>th</sup>, 2014

<sup>3</sup> S. Lovejoy, *Scaling fluctuation analysis and statistical hypothesis testing of anthropogenic warming*, Climate Dynamics, Volume 42, Issue 9-10, pp 2339-2351; Brian Kahn, *Lake Erie Algae Bloom Matches Climate Change Projections*, Scientific America, Aug. 5<sup>th</sup>, 2014

<sup>4</sup> Pryor, S. C., D. Scavia, C. Downer, M. Gaden, L. Iverson, R. Nordstrom, J. Patz, and G. P. Robertson, 2014: Ch. 18: Midwest. Climate Change Impacts in the United States: The Third National Climate Assessment, J. M. Melillo, Terese (T.C.) Richmond, and G. W. Yohe, Eds., U.S. Global Change Research Program, 418-440. doi:10.7930/J0J1012N; <http://nca2014.globalchange.gov/report/regions/midwest>

<sup>5</sup> Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; 79 Fed. Reg. 34832 (June 2, 2014);

ozone; and sulfur deposition, air pollutants that contribute to increased levels of asthma, heart attacks, heart disease, chronic and acute bronchitis, and emphysema.<sup>6</sup> The Clean Power Plan will also continue to grow Ohio’s clean energy economy, which is already responsible for an estimated 25,000 jobs and more than \$1 billion in savings for electricity consumers.<sup>7</sup>

Top 15 States with Largest Decrease in Average Annual Total S Deposition		
State	Mean Decrease (kg S/ha-yr)	Percent decrease
Pennsylvania	1.08	17.24%
W. Virginia	0.81	13.73%
Ohio	0.60	11.98%
Maryland	0.52	12.97%
Kentucky	0.38	9.20%
Delaware	0.36	10.94%
Illinois	0.36	8.79%
Rhode Island	0.35	8.90%
New Jersey	0.35	9.63%
Tennessee	0.34	11.45%
New York	0.34	9.64%
DC	0.34	6.52%
Missouri	0.34	10.36%
Michigan	0.31	10.14%
Virginia	0.29	9.67%

Top 15 States with Largest Decreases in Average Annual PM2.5		
State	Scenario 2 (µg/m <sup>3</sup> )	Mean Decrease (µg/m <sup>3</sup> )
Ohio	7.66	0.22
Pennsylvania	5.86	0.22
DC	12.68	0.20
Maryland	6.79	0.20
W. Virginia	4.93	0.20
Illinois	7.40	0.19
Missouri	5.93	0.18
Delaware	6.57	0.18
Kentucky	5.97	0.18
Indiana	7.77	0.17
Arkansas	6.15	0.17
Tennessee	5.52	0.16
Iowa	6.22	0.16
Virginia	5.26	0.15
New Jersey	7.13	0.14

(Source: *Co-Benefits of Carbon Standards*; Harvard School of Public Health and Syracuse University May 27, 2014)

As proposed, the Clean Power Plan asks Ohio to reduce its overall carbon emission rate by 28% by 2030, and suggests the following actions, otherwise referred to as building blocks, to reach that target: increasing the efficiency of coal-fired power plants, using more renewable energy, using more natural gas to displace coal and energy efficiency.<sup>8</sup> This comment will:

- Demonstrate Ohio has the ability to achieve the overall carbon reduction emission rate and
- Recommend the US EPA explicitly indicate that CHP can be used towards Clean Power Plan compliance, among other CHP recommendations.

<sup>6</sup> Charles Driscoll, Syracuse University; Jonathan Buonocore, Harvard School of Public Health, Harvard University; Habibollah Fakhraei, Syracuse University; Kathy Fallon Lambert, Harvard Forest, Harvard University; *Co-Benefits of Carbon Standards*; May 27, 2014

<sup>7</sup> Dick Munson, *Fact: Clean Energy is Working in Ohio*, Forbes, May 15<sup>th</sup>, 2014

<sup>8</sup> Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; 79 FR 34834 (June 2, 2014)

The Ohio Environmental Council (OEC) is the most comprehensive and respected environmental advocate for a greener, healthier and prosperous Ohio. The OEC uses advocacy, legal action and partnerships to promote the creation of clean energy and green jobs, protect the health of Ohioans and maintain Ohio's natural beauty and resources. As the leading Ohio-based environmental advocate, this comment represents a consideration of precisely whether or not Ohio can comply with the Clean Power Plan. While many organizations will focus on the national implications of the rule, this comment will uniquely delve into all aspects of the Clean Power Plan as it relates to Ohio. As the body of the comment will demonstrate, Ohio is well-positioned to go above and beyond the US EPA's projections for Ohio for renewable energy, energy efficiency and natural gas.

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## I. Clean Power Plan Summary

The proposed Clean Power Plan requires all states to reduce the overall carbon emission rate of electric power plants located within each state by a certain percentage, as determined by the United States Environmental Protection Agency (US EPA).<sup>9</sup> As required by the Clean Air Act, the US EPA set the rate by determining the mixture of cost-effective technologies that reduce carbon emissions from power plants.<sup>10</sup> After examining various technologies and strategies, the US EPA determined states can cost-effectively reduce carbon emissions by using more natural gas, renewable energy, energy efficiency and by making coal-fired power plants more efficient.<sup>11</sup> These four recommendations, or building blocks, are referred to by the US EPA as the best system of emission reductions, and the US EPA applied those actions to the energy mix, energy capacity, and energy generation for each state, as those factors existed in 2012.<sup>12</sup> Nationally, applying the US EPA's suggested building blocks results in a 30% reduction in carbon emissions from 2005 levels.<sup>13</sup>

But the mixture of policies and technologies the US EPA used to set the carbon emission reduction rate is not what states have to implement; as long as a state can reduce its carbon emission rate by the US EPA's specified amount, it does not matter precisely how the state reduces its emission rate.<sup>14</sup> So while the US EPA projected Ohio to install, for instance, a certain amount of renewable energy, if Ohio chooses, it is not bound by those projections and can install more clean energy power sources than the US EPA projects.<sup>15</sup> This flexibility is crucial because it gives states several cost-effective options for compliance with the plan. Since states are solely responsible for determining how to comply with the plan and the US EPA has provided several cost-effective options, the only reason a state's compliance plan would have substantial compliance costs is because the state put together a poorly designed plan which ignored the cost-effective carbon emission options the US EPA provides.

The Clean Air Act provision which governs the Clean Power Plan requires the US EPA to create a system of emission reductions for coal-fired power plants.<sup>16</sup> There is no statutory

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<sup>9</sup> Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; 79 FR 34835 (June 2, 2014); NRDC's Summary of EPA's Clean Power Plan, June 2, 2014

<http://www.nrdc.org/air/pollution-standards/files/pollution-standards-epa-plan-summary.pdf>

<sup>10</sup> Ibid

<sup>11</sup> Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; 79 FR 34836 (June 2, 2014)

<sup>12</sup> ); NRDC's Summary of EPA's Clean Power Plan, June 2, 2014 <http://www.nrdc.org/air/pollution-standards/files/pollution-standards-epa-plan-summary.pdf>

<sup>13</sup> Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; 79 FR 34832 (June 2, 2014)

<sup>14</sup> Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; 79 FR 34892-34893 (June 2, 2014)

<sup>15</sup> Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; 79 FR 34835 (June 2, 2014)

<sup>16</sup> Legal Memorandum for Proposed Carbon Pollution Guidelines for Existing Power Plants; US EPA; June 2, 2014; <http://www2.epa.gov/sites/production/files/2014-06/documents/20140602-legal-memorandum.pdf>

requirement that emission reductions at coal-fired power plants must occur by improvements made at the plant or in-side the fence line of the property. Since the only actions which would count towards compliance with this plan would result in emission reductions at affected units, the rule is legally sound. It does not matter whether some reductions at affected power plants are the result of actions taken “outside the fence” of a plant; the only relevant factor is whether reductions occur at the plant, and increasing natural gas use, improving coal power plant efficiency, using more renewable energy and more energy efficiency will result in emission reductions at power plants.

## II. Ohio's Ability to Comply with the Clean Power Plan

### Increasing Renewable Energy Generating Capacity Building Block

One part of the US EPA's best system of emission reduction is increasing the amount of energy derived from renewable energy resources. For Ohio, the US EPA projects the state can eventually, and cost-effectively, derive 11% of the state's overall energy generation capacity from renewable energy.<sup>17</sup> In fact, Ohio can beat the US EPA's projected renewable energy target just by fully implementing its own renewable energy standards, provided that these standards return to their fully enforceable annual benchmarks beginning in 2017 and ending in 2027.<sup>18</sup> Ohio's capacity to install wind turbines, solar panels, and install combined heat and power systems fueled by renewable resources means the state can rely on renewable energy to lower its carbon pollution output.

While compliance with the US EPA's proposed carbon reduction rate is important for human health and environmental protection reasons, the economic benefits which will accrue to Ohio is another reason why renewable energy should be a substantial part of Ohio's strategy to reduce its carbon pollution. The Ohio wind industry provides a good example of how supporting clean energy can act as an economic stimulus. Over 432 megawatts of wind energy have been installed in Ohio which has led to between 2,000 to 3,000 direct and indirect jobs, \$775 million in capital investment, annual property tax payments over \$3.6 million, and annual land lease payments of over \$2.5 million.<sup>19</sup> In the final plan the state submits to the US EPA, Ohio should incorporate substantial amount of renewable energy because it will maximize the economic benefits to Ohio.

### *WRI's Analysis of Ohio Renewable Energy Generating Capacity*

The World Resources Institute (WRI) examined the potential of Ohio to reduce its carbon emission rate by using the same mix of technology and strategies the US EPA proposes for Ohio and found the state could cost-effectively reduce its carbon emission output 27% below 2011 levels by 2025.<sup>20</sup> The WRI's projected carbon emission reductions by 2025 are

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<sup>17</sup> Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; Clean Power Plan Technical Documents-Data File: *Proposed Renewable Energy (RE) Approach (XLS)*, "Calc Method Using % 2012 Gen" tab;(June 2, 2014)

<sup>18</sup> Ohio Revised Code 4928.64(B)(2); Ohio Senate Bill 310 (130<sup>th</sup> Ohio General Assembly), effective September 10, 2014, temporarily suspends Ohio's Alternative Energy Resource Standard (AERS), which contains the state's 12.5% targets for renewable resources by the year 2025. The legislation maintains the annual renewable target at 2014 levels for calendar years 2015 and 2016, and bearing no further action by the Ohio General Assembly, the annual benchmarks will resume January 1, 2017.

<sup>19</sup> State Wind Energy Statistics, Ohio, April 25, 2014, American Wind Energy Association.  
<http://www.awea.org/Resources/state.aspx?ItemNumber=5395>

<sup>20</sup> Michael Obeiter, Kristen MEEK, Rebecca Gasper; *Power Sector Opportunities for Reducing Carbon Dioxide Emissions: Ohio*; World Resources Institute, August 2013;  
[http://www.wri.org/sites/default/files/power\\_sector\\_opportunities\\_for\\_reducing\\_carbon\\_dioxide\\_emissions\\_ohio\\_0.pdf](http://www.wri.org/sites/default/files/power_sector_opportunities_for_reducing_carbon_dioxide_emissions_ohio_0.pdf)

substantially similar to the projected reductions the US EPA presumes Ohio can make by 2030 so examining WRI's report represents an accurate picture of the costs, benefits and ability of Ohio to achieve the US EPA's projected carbon emission reductions.

One of the strategies, among many the WRI suggests Ohio use to reduce its carbon emissions rate, is to increase the amount of energy derived from renewable sources like wind and solar power.<sup>21</sup> After examining the carbon emission reductions that would be achieved by fully implementing Ohio's renewable energy standard, Ohio will meet the US EPA's proposed renewable energy generation capacity goals for Ohio by 2025. If Ohio continues increasing its renewable energy generating capacity after 2025, the WRI report indicates that renewable energy can reduce Ohio's carbon emissions 11% below 2012 levels by 2030.<sup>22</sup> Renewable energy has grown substantially over the past few years and as the WRI report indicates, renewable energy can substantially reduce the overall carbon emissions output rate of Ohio's existing electric generating capacity.

#### *UCS Analysis of Ohio Renewable Energy Generating Capacity*

The Union of Concerned Scientists (UCS) also examined Ohio's capacity to cost-effectively install renewable energy and found the state can install twice the amount of renewable energy, as a percentage of electricity sales, as projected by the EPA's Clean Power Plan.<sup>23</sup> The UCS developed a modified way of calculating renewable energy for each state, essentially improving on the analysis conducted by the US EPA. The UCS analysis incorporates a national renewable energy growth rate based on the demonstrated growth that occurred between 2009 and 2013 in the US and accounts for expected renewable energy growth over the next few years. Taking those, and a variety of other factors, into account, the UCS analysis indicates Ohio can install substantially more renewable energy than the US EPA presumes.<sup>24</sup> If utilities or other organizations are not willing to do their part to reduce carbon emissions, Ohio's capacity to install cost-effective renewable energy will still allow the state to reach the US EPA's proposed carbon emissions target.

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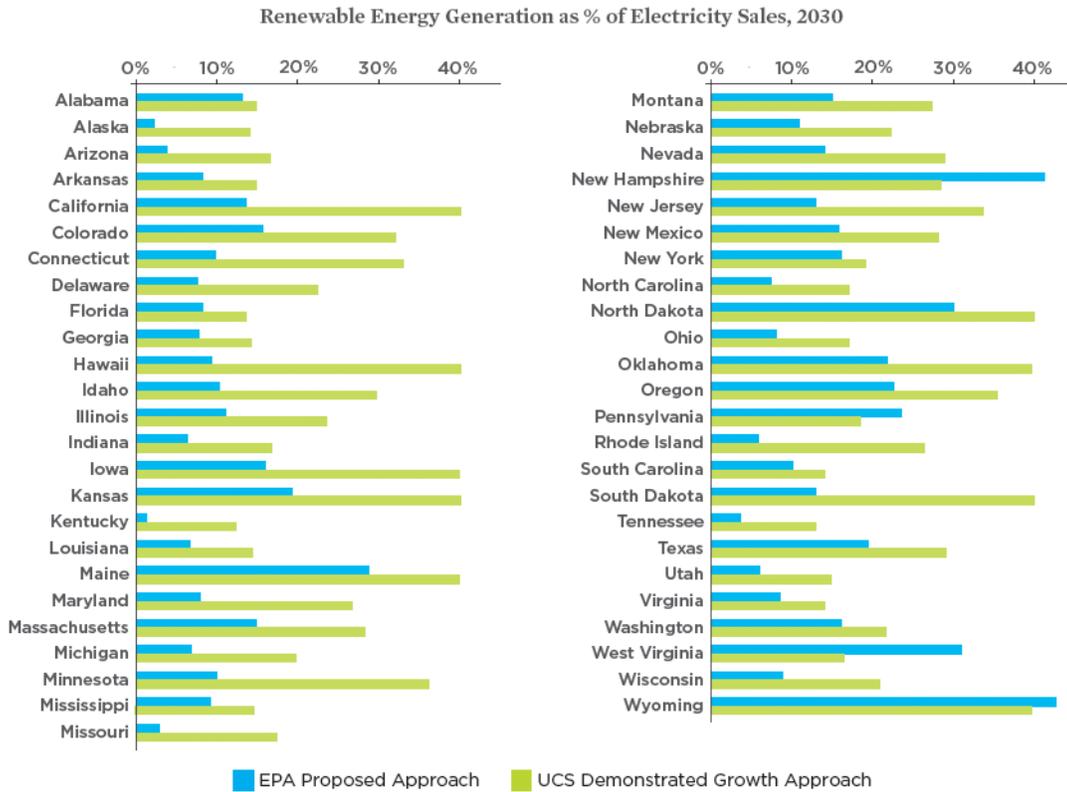
<sup>21</sup> Ibid

<sup>22</sup> Michael Obeiter, Kristen Meek, Rebecca Gasper; *Power Sector Opportunities for Reducing Carbon Dioxide Emissions: Ohio*; World Resources Institute, August 2013; [http://www.wri.org/sites/default/files/power\\_sector\\_opportunities\\_for\\_reducing\\_carbon\\_dioxide\\_emissions\\_ohio\\_0.pdf](http://www.wri.org/sites/default/files/power_sector_opportunities_for_reducing_carbon_dioxide_emissions_ohio_0.pdf)

<sup>23</sup> Rachel Cleetus, Steve Clemmer, Jeff Deyette, Seth Mullendore, Jeremy Richardson; *Strengthening the EPA's Clean Power Plan*, Policy Brief; Union of Concerned Scientists; October 14, 2014

<sup>24</sup> Ibid

(Source: Union of Concerned Scientists, *Strengthening the EPA's Clean Power Plan*)



*NREL Analysis of Ohio Renewable Energy Generating Capacity*

The National Renewable Energy Laboratory (NREL) also examined the maximum technical potential for expanding renewable energy generating capacity in Ohio.<sup>25</sup> The NREL concludes Ohio has the potential to install up to 129,143,000 MWh of wind energy; 3,712,677,000 MWh of utility-scale photovoltaic solar; and 30,064,000 MWh of rooftop photovoltaic solar power in the state.<sup>26</sup> Under the current proposal, the US EPA projects Ohio to install only 13,775,594 MWh of renewable energy by 2030.<sup>27</sup> Installing just a small amount of the projected technical potential of renewable energy for Ohio will allow the state to substantially reduce its carbon emission output. This study indicates Ohio has substantial capacity to increase the amount of renewable energy in the state. And the more carbon emissions Ohio gets from renewable energy, the less it needs to get from the other building blocks.

<sup>25</sup> Anthony Lopez, Billy Roberts, Donna Heimiller, Nate Blair, and Gian Porro; *U.S. Renewable Energy Technical Potentials: A GIS-Based Analysis*; National Renewable Energy Laboratory; July 2012; <http://www.nrel.gov/docs/fy12osti/51946.pdf>

<sup>26</sup> Ibid

<sup>27</sup> Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; *Date File: Proposed Renewable Energy (RE) Approach (XLS)*, "Calc Method Using Mwh" tab;(June 2, 2014)

## Energy Efficiency Savings Building Block

Another strategy the US EPA recommends states use to reduce their carbon emission rate is to become more energy efficient.<sup>28</sup> Overall the US EPA projects states can eventually reduce their overall energy usage by 1.5% on a yearly basis by implementing demand-side energy efficiency programs.<sup>29</sup> As with the other building blocks, Ohio not only has the capability to achieve the US EPA's projected energy-efficiency savings, but can also go above and beyond the savings the US EPA projects Ohio can achieve. Energy-efficiency programs are important because not only do the programs reduce carbon emissions, they also lead to cost savings for consumers. Energy efficiency is especially crucial to the state's compliance plan because it will encourage local job growth. The type of actions that would constitute energy-efficiency improvements would include, but are not limited to, replacing windows, adding insulation to a house, upgrading lighting, home appliances and electric motors, and installing CHP energy sources at relevant facilities. The type of jobs created by energy-efficiency policies cannot be exported out of the country or out of the state. Every dollar invested in energy efficiency creates jobs and benefits for the local economy.<sup>30</sup>

### *WRI's Analysis of Ohio Potential for Energy Efficiency Savings*

As previously discussed, the World Resources Institute examined how energy efficiency measures could decrease Ohio's carbon pollution output. The organization found that by maintaining the energy efficiency levels in Ohio's energy efficiency standard set, Ohio would be well on its way to achieving the energy efficiency savings the US EPA projects.<sup>31</sup> The US EPA projects Ohio to eventually increase its energy efficiency yearly savings rate to 1.5% a year starting in 2021 and continuing until 2030.<sup>32</sup> Ohio's current energy efficiency standard is even more aggressive than the US EPA's projections, requiring major utilities to achieve a 2% annual energy efficiency reduction between 2021 and 2025, presuming the annual benchmarks savings resume again in 2017.<sup>33</sup> If Ohio was to continue its 2% savings rate, or even if the state reduced its energy efficiency savings requirement to 1.5%, but continued the yearly savings beyond 2025, that would put Ohio on a path that would go above and beyond what the US EPA projects

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<sup>28</sup> Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; 79 FR 34871-34877 (June 2, 2014)

<sup>29</sup> Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; 79 FR 34873 (June 2, 2014)

<sup>30</sup> *How Does Energy Efficiency Create Jobs*, Fact Sheet, American Council for an Energy-Efficiency Economy, November 14, 2011, <http://aceee.org/files/pdf/fact-sheet/ee-job-creation.pdf>

<sup>31</sup> Michael Obeiter, Kristen Meek, Rebecca Gasper; *Power Sector Opportunities for Reducing Carbon Dioxide Emissions: Ohio*; World Resources Institute, August 2013; [http://www.wri.org/sites/default/files/power\\_sector\\_opportunities\\_for\\_reducing\\_carbon\\_dioxide\\_emissions\\_ohio\\_0.pdf](http://www.wri.org/sites/default/files/power_sector_opportunities_for_reducing_carbon_dioxide_emissions_ohio_0.pdf)

<sup>32</sup> Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; *Data File: GHG Abatement Scenario-1(XLS)*, 'Sorted By State' Tab-Ohio, June 2, 2014; Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; *Data File GHG Abatement Measures Appendix 5-4*, "Opt 1-Incr Savings" tab (June 2, 2014)

<sup>33</sup> Ohio Revised Code 4928.66(A)(1)(a)

Ohio can achieve. The WRI indicates that by continuing to maintain a 2% annual energy efficiency rating, Ohio would still be able to cost-effectively reduce its energy use.<sup>34</sup>

One of the reasons WRI projects Ohio will have no problem meeting and even exceeding the US EPA's projected energy efficiency savings rate, is that the WRI incorporates emission savings from using combined heat and power resources into the total projected electricity savings for the state. The WRI found the state has 9.8 GW of technical combined heat and power potential, but is only utilizing five percent of that potential.<sup>35</sup> Simply achieving 50% of the state's CHP potential would account for nearly 9% carbon emission reductions from 2011 levels.<sup>36</sup> CHP is a major carbon reduction option that Ohio should take advantage of when considering alternatives to comply with the new carbon pollution rule.

### *ACEEE's Analysis of Ohio Potential for Energy Efficiency Savings*

The American Council for Energy-Efficiency Economy (ACEEE) also examined the maximum potential for cost-effective energy efficiency reductions in Ohio. ACEEE determined Ohio's combined energy savings from residential, commercial, industrial and combined heat and power energy-efficiency programs could lead to a total energy efficiency reduction of 33% below projected energy-efficiency levels in 2025.<sup>37</sup>

Under the Clean Power Plan the US EPA projects Ohio to conserve 19,800 GWH of energy by 2030.<sup>38</sup> The ACEEE report indicates Ohio can achieve over 64,000 GWH of cost-effective energy efficiency savings by 2025, meaning Ohio can achieve three times the savings the US EPA projects.<sup>39</sup> One of the reasons why ACEEE projects substantial opportunities for conserving energy in Ohio is that ACEEE, like the WRI, includes potential savings from the deployment of combined heat and power resources in Ohio. These savings illustrate the importance of ensuring energy efficiency reductions from combined heat and power sources count towards a state's compliance obligations.

If coal plants owners choose not to make the suggested efficiency improvements, or natural gas combined cycle (NGCC) plants can't increase their utilization to the projected

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<sup>34</sup> Michael Obeiter, Kristen Meek, Rebecca Gasper; *Power Sector Opportunities for Reducing Carbon Dioxide Emissions: Ohio*; World Resources Institute, August 2013; [http://www.wri.org/sites/default/files/power\\_sector\\_opportunities\\_for\\_reducing\\_carbon\\_dioxide\\_emissions\\_ohio\\_0.pdf](http://www.wri.org/sites/default/files/power_sector_opportunities_for_reducing_carbon_dioxide_emissions_ohio_0.pdf)

<sup>35</sup> Ibid

<sup>36</sup> Ibid

<sup>37</sup> Max Neubauer, R. Neal Elliott, Amanda Korane, John A. "Skip" Laitner, Vanessa McKinney, Jacob Talbot, and Dan Trombley; *Shaping Ohio's Energy Future: Energy Efficiency Works*; American Council for an Energy Efficiency-Economy; March 2009

<sup>38</sup> Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; *Data File GHG Abatement Measures Appendix 5-4*, "Opt 1-CUM Savings Gwh" tab(June 2, 2014)

<sup>39</sup> Max Neubauer, R. Neal Elliott, Amanda Korane, John A. "Skip" Laitner, Vanessa McKinney, Jacob Talbot, and Dan Trombley; *Shaping Ohio's Energy Future: Energy Efficiency Works*; American Council for an Energy Efficiency-Economy; March 2009

amount, aggressive and robust energy efficiency programs can pick up the carbon pollution reduction slack.

### Increased Utilization of Natural Gas Combined Cycle (NGCC) Plants Building Block

Another part of the US EPA's proposed best system of emission reductions is a projection that states can achieve substantial carbon pollution reductions by increasing the utilization of existing natural gas combined cycle plants.<sup>40</sup> When used as an energy source for electric power natural gas produces half the carbon emissions of coal. So using more natural gas is a common sense way of reducing carbon emissions. Ohio especially, but most states, have existing natural gas plants, which due to various factors, are not used as much as they could be. The World Resources Institute has examined Ohio's potential for increasing the utilization of natural gas plants located within its borders and found Ohio can increase the utilization of existing NGCC plants up to and beyond the US EPA's projected utilization rates.<sup>41</sup> In contrast to the WRI, the CATF examined all NGCCs across the country and found all of them, on average, could increase their utilization levels up to and beyond the US EPA's projected utilization rate in the Clean Power Plan.

#### *WRI Analysis of Potential to Increase Utilization of Ohio-based NGCC plants*

After examining information from the Energy Information Administration, the WRI indicated that Ohio could reduce its carbon emission output by substantially increasing the utilization levels for Ohio-based NGCC plants. Specifically, the WRI found "increasing the operational capacity of existing natural gas units to 75%, would cut power sector emissions by 7% in 2020 below 2011 carbon dioxide emissions."<sup>42</sup> The US EPA's proposed rule uses 2012 as a baseline and projects Ohio can increase utilization of NGCC to 70%.<sup>43</sup> Since the presumptions WRI used in its report mirror the specifics of the Clean Power Plan, Ohio should have no problem going above and beyond the US EPA's projected natural gas utilization rate for natural gas combined cycle plants.<sup>44</sup> While a state may prove the US EPA over-projected the amount of heat rate improvements that can be achieved, so long as the emissions lost from not implementing the proposed heat rate improvements can be made up by increasing the amount of renewable energy that can be built, increasing the amount of energy-efficiency savings that can be achieved, or increasing utilization of existing NGCC plants beyond the levels projected by the US EPA, the US EPA should not lower Ohio's proposed carbon emission reduction rate.<sup>45</sup>

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<sup>40</sup> Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; 79 FR 34836 (June 2, 2014)

<sup>41</sup> Michael Obeiter, Kristen Meek, Rebecca Gasper; *Power Sector Opportunities for Reducing Carbon Dioxide Emissions: Ohio*; World Resources Institute, August 2013; [http://www.wri.org/sites/default/files/power\\_sector\\_opportunities\\_for\\_reducing\\_carbon\\_dioxide\\_emissions\\_ohio\\_0.pdf](http://www.wri.org/sites/default/files/power_sector_opportunities_for_reducing_carbon_dioxide_emissions_ohio_0.pdf)

<sup>42</sup> Ibid

<sup>43</sup> Ibid

<sup>44</sup> Ibid

<sup>45</sup> Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; 79 FR 34893 (June 2, 2014)

## *CATF Analysis of Potential to Increase Utilization of NGCC plants*

The Clean Air Task Force also examined the ability of NGCCs across the United States to achieve certain increases in natural gas plant utilization rates and found NGCCs can increase their utilization beyond the rate projected by the US EPA in the Clean Power Plan.<sup>46</sup> Before the release of the carbon pollution standards by the US EPA, the CATF found that NGCC plants had the potential to increase their utilization to between 75% and 90%, depending on various factors.<sup>47</sup> While the precise utilization rate for each NGCC is unknown, this demonstrates Ohio based NGCCs should have no issue achieving the projected carbon emission pollution reductions. Though, if NGCCs plant owners choose not to increase their utilization to the US EPA projected utilization rates, Ohio can make up the lost emission reductions by implementing more energy-efficiency measures or using more renewable energy. The carbon emission reduction rate for Ohio does not need to be altered because the state has the flexibility to use a variety of strategies to comply with the Clean Power Plan.

## Heat Rate Improvements Building Block

One part of the US EPA's best system of emission reductions is a projection that all coal fired power plants in a state, through implementing plant operation best practices and a certain amount of plant upgrades, can improve overall plant efficiency by 6%.<sup>48</sup> The US EPA has determined a 6% improvement in coal-fired power plant efficiency is both cost-effective and adequately demonstrated to the extent that it qualifies as being a part of the best system of emission reductions.<sup>49</sup> The US EPA refers to the efficiency improvements as heat rate improvements, and as the studies and models below indicate, Ohio coal-fired power plants have the potential to make substantial heat rate improvements, especially if those plants incorporate combined heat and power sources into their facilities.

## *WRI Analysis of Potential Heat Rate Improvements in Ohio*

After examining technical reports from the National Energy Technology Laboratory and consulting with researchers at Lehigh University, the WRI determined that at the very least power plants in Ohio can achieve a 2% heat rate improvement.<sup>50</sup> While that 2% carbon reduction is far less than the 6% the US EPA proposes, the 2% projection, as the WRI report

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<sup>46</sup> Conrad Schneider, Bruce Philips; *Power Switch: An Effective, Affordable Approach to Reducing Carbon Pollution from Existing Fossil-Fueled Power Plants*; Clean Air Task Force, February 2014

<sup>47</sup> Ibid

<sup>48</sup> Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; 79 FR 34859-34862 (June 2, 2014)

<sup>49</sup> Ibid

<sup>50</sup> Michael Obeiter, Kristen Meeke, Rebecca Gasper; *Power Sector Opportunities for Reducing Carbon Dioxide Emissions: Ohio*; World Resources Institute, August 2013; [http://www.wri.org/sites/default/files/power\\_sector\\_opportunities\\_for\\_reducing\\_carbon\\_dioxide\\_emissions\\_ohio\\_0.pdf](http://www.wri.org/sites/default/files/power_sector_opportunities_for_reducing_carbon_dioxide_emissions_ohio_0.pdf)

acknowledges, is an extremely conservative estimate of the heat rate improvement potential for Ohio power plants.

Overall, Ohio can achieve a substantial amount of heat rate improvement at coal-fired power plants. But if coal-fired power plant operators can conclusively demonstrate their power plants cannot make the required 6% reduction, the state can make up for the lost emission reductions not achieved by the projected heat rate improvements by going above and beyond the US EPA's projections for the other building blocks. As such, the overall carbon emission reduction rate proposed by the US EPA is achievable and does not need to be altered or reduced.

#### *Resources for the Future Analysis of Potential Heat Rate Improvements in Ohio*

Resources for the Future also examined the potential of coal-fired electric generating plants across the United States to make heat rate improvements. It found that power plants can improve their heat rates by 6%, which is same amount of efficiency improvements the US EPA projects coal-fired power plants can make.<sup>51</sup> More specifically, the organization examined the technical potential, technical costs and other factors of various generating units and examined the kind of improvements that can be made to those plants. While the analysis did not look at the specific capacity for power plants located in Ohio to make improvements, the report does indicate the capacity for coal-fired power plants to make heat rate improvements is substantial. Unless plant owners can demonstrate they have already made substantial efficiency improvements, the carbon emission reductions projected to come from heat rate improvements should be maintained. If for some reason plant owners in Ohio believe they cannot make the required improvements, Ohio can make up for the carbon emissions not achieved by heat rate improvements by conserving energy and deploying renewable energy at levels beyond that which the EPA has projected for Ohio.

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<sup>51</sup>Joshua Linn, Erin Mastrangelo, and Dallas Burtraw; *Regulating Greenhouse Gases from Coal Power Plants Under the Clean Air Act*; pg. 10;Resources for the Future; February 2013

### III. Combined Heat and Power and the Clean Power Plan

#### Overview of CHP Benefits and Opportunities in Ohio

The US EPA requests comment on “whether industrial combined heat and power approaches warrant consideration as a potential way to avoid carbon emissions, and whether the answer depends on circumstances that depend on the type of CHP in question.”<sup>52</sup> Combined heat and power provides a facility, often a large industrial or institutional user that needs electricity at all hours of the day and night, its total thermal and electric energy from a single power source located on the site. By producing energy on site, CHP eliminates losses associated with electric transmission and distribution lines.

The US EPA acknowledges combined heat and power is a desirable way for states to reduce carbon emissions when it indicates “In all types of market structures, large energy users might independently see additional energy efficiency opportunities or opportunities for self-generation using options such as combined heat and power, solar, or power purchase agreements, and states can structure their plans to allow the CO<sub>2</sub> reductions achieved at affected EGUs through such actions to assist in reaching compliance.”<sup>53</sup>

CHP is also an adequately demonstrated carbon control technology in Ohio. For instance, Broshco Fabricating Products, in Mansfield, Ohio, operates a 4.55 MW combined heat and power system which provides electricity and heat for the facility.<sup>54</sup> This is just one of many examples of CHP power sources being used to provide a facility’s electric and thermal energy.

As elaborated in the discussion of Ohio’s energy efficiency savings and renewable energy deployment potential, CHP can play a key role in helping Ohio achieve each of the US EPA’s building blocks. CHP can be integrated into coal-fired and natural gas power plants to increase their efficiency; CHP systems can be fueled by renewable resources, like biomass; and as mentioned previously, since CHP reduces energy usage, it can be used to meet the energy efficiency projections the US EPA has proposed for Ohio.

#### CHP Potential in Ohio

The tremendous technical potential for CHP in Ohio makes this approach a particularly attractive compliance strategy. As the studies below indicate, Ohio has a substantial amount of CHP capacity which can help the state achieve the US EPA’s proposed carbon pollution emission reductions. In 2013 WRI found that CHP could produce 9.8 GW of clean and efficient power in Ohio. Even realizing half of this technical potential would go a long way toward achieving the

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<sup>52</sup> Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; 79 FR 34924 (June 2, 2014)

<sup>53</sup> Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; 79 FR 34888 (June 2, 2014)

<sup>54</sup> Jessica Frohman Lubetsky; Combined Heat and Power in Ohio, Fact Sheet, The Pew Environment Group; May 2011; <http://www.midwestchptap.org/profiles/ProjectProfiles/BroshcoProducts.pdf>

state emission targets in the Clean Power Plan.<sup>55</sup> For Ohio, CHP offers a substantial amount of energy savings for compliance with the Clean Power Plan.

Furthermore, recent legislation in Ohio (Ohio Senate Bill 310 or SB 310) has made CHP an even more importance aspect of compliance than has been previously assumed. Since 2012, customers of the state's investor-owned utilities (American Electric Power, Dayton Power & Light, FirstEnergy and Duke Energy) have had the ability to qualify their CHP projects as an energy efficiency project, and even earn a rebate or incentive from their electricity provider to install and operate a CHP or Waste Heat Recovery system.<sup>56</sup> The benefit of this policy allows electric savings from such systems to be incentivized and the savings from these systems aggregated and accounted for by the utility. However, one provision of SB 310 allows certain large industrial customers (those that use at least 700,000 kwh/year) to opt out of utility-administered energy efficiency programs required by the state energy efficiency resource standard (EERS). SB 310 also provided that large industrial electricity customers who are in the service territory of a utility that has cancelled its energy efficiency programs do not, even if the energy-efficiency standards are reinstated in 2017, have to comply with any present, or future energy-efficiency savings programs. As a result of this industrial opt-out, it will be important for the state to offer some type of incentive to adopt CHP technology, because it is unlikely electric utilities will offer large industrial customers any kind of incentive to develop CHP or Waste Heat Recovery Projects otherwise.

The Center for Clean Air Policy also examined precisely how much combined heat and power deployment in each state the Clean Power Plan will encourage. It determined that as a result of Ohio's large industrial manufacturing operations, Ohio has great potential to increase CHP capacity. After examining ICF's Integrated Planning Model® (IPM) and CHPower model, the CCAP study indicates CHP can play a substantial role in reducing Ohio's carbon pollution rate. Specifically, the CCAP found the Clean Power Plan could encourage 407 MW of new CHP capacity to be installed in Ohio.<sup>57</sup> Nationwide, CCAP found that the rule could support 10 GW of new CHP deployment.

ACEEE likewise found Ohio can achieve a substantial amount of cost-effective energy savings from CHP. Specifically, the ACEEE study found Ohio could generate 949,000 MWh of electricity just by encouraging the deployment of CHP as a compliance mechanism.<sup>58</sup> This supports CHP's role in Ohio's compliance with the Clean Power Plan. Nationwide, ACEEE found that CHP is one of four energy efficiency policies, which, in combination could reduce carbon pollution by 26% from 2012 levels. These projections are consistent with the Clean Power Plan.

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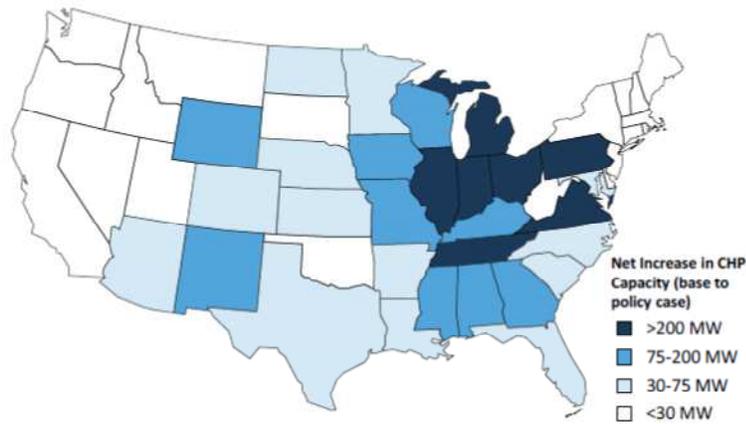
<sup>55</sup> Michael Obeiter, Kristen Meek, Rebecca Gasper; *Power Sector Opportunities for Reducing Carbon Dioxide Emissions: Ohio*; World Resources Institute, August 2013;

<sup>56</sup> Ohio Senate Bill 315

<sup>57</sup> Stacey Davis and Thomas Simchak, *Expanding the Solution Set: How Combined Heat and Power Can Support Compliance with 111(d) Standards for Existing Power Plant*, Center for Clean Air Policy, May 2014

<sup>58</sup> Sara Hayes, Garrett Herndon, James P. Barrett, Joanna Mauer, Maggie Molina, Max Neubauer, Daniel Trombley, Lowell Ungar; *Change Is in the Air: How States Can Harness Energy Efficiency to Strengthen the Economy and Reduce Pollution*; American Council for an Energy-Efficient Economy, April 2014

**Net Increases in CHP Capacity** (Source: *Expanding the Solution Set: How Combined Heat and Power Can Support Compliance with 111(d) Standards for Existing Power Plant*, Center for Clean Air Policy, May 2014)



### OEC Recommendations Concerning CHP

While CHP can provide substantial benefits for Ohio there are several issues with how the Clean Power Plan treats CHP that must be remedied so the state can take full advantage of CHP as a compliance mechanism. The following are some suggested changes the US EPA should make to the final version of the Clean Power Plan. By taking these recommendations into account, the US EPA will ensure the benefits of CHP are maximized for states:

*Clarify that CHP at unaffected units are eligible compliance strategies for EGUs*

The most important issue the US EPA must address in the final rule concerning CHP is whether CHP at unaffected units is an eligible compliance strategy for EGUs subject to the rule. It is likely states will stick to the technologies that are part of the building blocks the US EPA uses to set state targets, so making clear that CHP can be counted towards compliance with the building blocks will make states much more likely to include CHP in their compliance plans. In the explanations for each of the four building blocks the US EPA uses to set the emission target, CHP is not specifically included within the calculations for those building blocks, but at several points the US EPA suggests CHP can count toward compliance with all building blocks. The US EPA must make it explicitly clear that CHP at unaffected units will count toward compliance with the rule to encourage states to include CHP in its state implementation plan.

*Do not discount the thermal output of affected CHP systems.*

One of the key characteristics of CHP is that it produces both thermal energy and electricity from a single fuel source. As proposed, the Clean Power Plan counts 100% of the electricity generation but only 75% of the useful thermal output from an affected CHP system

toward compliance. To fully account for CHP's energy-efficiency benefits at affected units, the rule should credit all of a facility's useful thermal output. While discounting thermal output makes sense in situations where there is an issue with whether or not the thermal energy output is accurately measured, the remedy for this situation is to make sure emissions, monitoring and verification procedures are strong, not to weaken the overall incentive for states to include CHP as a compliance strategy in its implementation plan. To maximize the incentive for states to include CHP, 100% of an affected facility's CHP thermal output should be counted.

*Fully account for the avoided line losses associated with CHP at affected units*

CHP systems are desirable because they reduce the burden on electric infrastructure, specifically transmission and distribution lines. The Clean Power Plan appears to recognize this reduced burden by providing a five-percent line loss credit for affected CHP systems. We commend the US EPA for providing this credit, but note that it undercounts the savings from the reduced demand on transmission lines. The EPA should increase the line loss credit to 6 percent, as that amount more accurately reflects the average avoided line losses associated with distributed generation. Furthermore, the line loss credit in the proposed Clean Power Plan only applies to CHP systems directly affected by the rule, so to send a signal to states encouraging the deployment of CHP systems in state plans, the US EPA should apply the line loss credit to unaffected units. By increasing the line-line loss credit and making unaffected units eligible for the line loss credit, this will give states the necessary incentive to include CHP policies in its compliance plan.

*Provide more in-depth guidance to states on including combined heat and power systems in final State Implementation Plans (SIPs), including proper Evaluation, Measurement & Verification (EM&V) protocol.*

Lastly, the US EPA must provide greater guidance to states on incorporating CHP facilities into a compliance plan. Many states do not have the technical expertise to understand and take advantage of CHP as part of its compliance plan. Currently the Clean Power Plan proposed rule does not specifically indicate how unaffected CHP units could fit into a state plan and while the US EPA provides states a substantial amount of flexibility in complying with the proposed rate reduction, the US EPA should ensure states are aware of the compliance benefits of CHP by including information on the energy efficiency benefits and the estimated job benefits of the rule. That information could convince a variety of states, including Ohio, to include CHP in a state's compliance plan. Also, when developing evaluation, monitoring, and verification procedures for renewable energy and demand-side energy efficiency, the US EPA should include guidance on counting emission savings from CHP units. Doing so will give states the necessary incentive to include CHP in a state compliance plans while also alleviating states of the burden of doing their own research into calculations related to EM&V at CHP units.

## IV. Conclusion

Ohio has a duty to ensure it reduces its carbon pollution output. As the OEC's comments indicate, Ohio has several viable alternatives to achieve the US EPA's proposed carbon pollution emission reduction. The 28% carbon emission reduction rate for Ohio should not be altered because Ohio has the capacity to go above and beyond the US EPA's proposed projections for natural gas, renewable energy and energy efficiency. In addition, Ohio's capacity to deploy CHP as a supply-side energy efficiency measure provides the state with substantial resources to comply with the Clean Power Plan.

The US EPA has conducted unprecedented stakeholder outreach and provided an exceptional amount of time for various organizations to study, examine and submit comments on the rule. While initially providing 120 days to comment, the EPA, taking into account suggestions from various stakeholders, extended the deadline to comment an additional 45 days, to ensure organizations adequate time to understand the implications of the rule and convey their thoughts to the US EPA. Given the extensive stakeholder outreach and the amount of time the US EPA has given to comment, states and utilities have no excuses for failure to understand or comply with the rule. The US EPA has set reasonable targets based on cost-effective technology that can be deployed immediately. Ohio should have no problem submitting a plan to the US EPA which reduces the state's carbon pollution output to the required level, cleans up the air and encourages the development of clean energy businesses.

The Clean Power Plan is not only a crucial opportunity for Ohio and the nation to reduce its carbon pollution, but it also is an opportunity to continue Ohio's transformation to a clean energy economy. Following through on the commitment to reduce carbon pollution from existing power plants will provide multiple benefits for the environment, public health and local economies. The US EPA's allowance for state flexibility means Ohio's carbon emission reduction rate could spur thousands of new jobs in Ohio and protect vulnerable populations from harmful air pollution, all while reducing the risk of a future wrecked by global warming. A state compliance plan which includes substantial use of renewable energy, energy efficiency and combined heat and power will encourage the development and growth of clean energy in Ohio and will position the state as a leader in the clean energy economy of the future.