December 1, 2014

The Hon. Gina McCarthy
Administrator, US Environmental Protection Agency
EPA Docket Center
Mail Code 28221T
Attn: Docket ID No. EPA-HQ-OAR-2013-0602
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Attn: Docket ID No. EPA-HQ-OAR-2013-0602

Re: Iowa Environmental Council Comments on EPA's Proposed 111(d) Carbon Pollution Standards for Existing Electric Utility Generating Units

Dear Administrator McCarthy:

The Iowa Environmental Council ("Council") appreciates the opportunity to comment on the Environmental Protection Agency's proposed 111(d) rule to control carbon pollution from existing electric generating units.

As a 501(c)(3) nonprofit organization representing over 65 local, regional, and statewide organizations and hundreds of individual members, the Council works to promote public policy changes that provide a safe, healthy environment for all Iowans.

To that end, the Council strongly supports EPA's efforts to protect our nation's public and environmental health by reducing carbon pollution from existing power plants. The Council encourages EPA to adopt and implement a final rule that follows the original time frame outlined by President Obama on June 25, 2013.[1] The Council further urges EPA to strengthen the proposed rule in order to adequately reduce U.S. contributions to global climate change.

[1] *Presidential Memorandum – Power Sector Carbon Pollution Standards (*June 25, 2013), available at http://www.whitehouse.gov/the-press-office/2013/06/25/presidential-memorandum-power-sector-carbon-pollution-standards.

The Council makes the following specific suggestions (detailed below), aimed at increasing the stringency of Iowa's carbon pollution reduction requirements under the proposed rule and reducing overall carbon pollution. Adoption of these changes will result in a combination of public health, job creation, and economic benefits for Iowans:

- EPA should strengthen the overall stringency of Iowa's interim and final emissions rate target because changes underway in Iowa's electric system will put Iowa in compliance with the proposed rule before 2020.
- EPA should strengthen Building Block 3 because the proposed rule's current approach underestimates Iowa's potential for renewable energy.
- EPA should strengthen Building Block 4 because the proposed rule's current approach underestimates Iowa's energy efficiency savings potential.
- EPA should limit credit for early emissions reductions because such credit can weaken overall stringency of the proposed rule and diminish carbon emission reductions.
- EPA should provide clear and consistent guidance to states on key components of the final rule, such as how to calculate compliance, to prevent states from weakening carbon reduction requirements.

I. The Council strongly supports EPA's proposed Clean Power Plan to reduce carbon pollution from existing power plants.

Support for EPA authority. The Council strongly supports EPA's authority to regulate carbon pollution from existing fossil fuel-fired power plants under §111(d) of the Clean Air Act. The Council further supports EPA's foundational finding that greenhouse gases (e.g., carbon dioxide) endanger public health and welfare.[2]

As indicated by the EPA, existing fossil fuel-fired power plants are our nation's largest concentrated source of carbon pollution, accounting for about 1/3 of all domestic greenhouse gas emissions.[3] These emissions are a leading contributor to climate change, which poses significant threats to human and environmental health.[4]

Public health and environmental benefits. In Iowa, the health impacts of climate change are already apparent: According to a recent publication by the Natural Resources Defense Council

[2] 79 C.F.R. § 66496.

[3] U.S. Environmental Protection Agency, *News Release: EPA Proposes First Guidelines to Cut Carbon Pollution from Existing Power Plants/Clean Power Plan is flexible proposal to ensure a healthier environment, spur innovation and strengthen the economy* (June 2, 2014), available at *http://yosemite.epa.gov/opa/admpress.nsf/bd4379a92ceceeac8525735900400c27/5bb6d20668b9a18485257ceb00490c98!OpenDocument*.

[4] *See generally* U.S. Environmental Protection Agency, *Carbon Pollution Standards,* available at http://www2.epa.gov/carbon-pollution-standards.

(NRDC), "extreme rainfall events have become 35 percent more frequent in Iowa over the past 60 years"[5] and "annual average precipitation in Iowa has increased by 4.2 inches in the past century."[6] These changes have increased Iowans' risk of exposures to mold, sewage overflows from floodwaters, and drinking water contaminants.[7] Scientists from 38 Iowa colleges and universities amplified several of these and other health threats from climate change in the recently released, *Iowa Climate Statement 2014*.[8] These threats include:

- Increased respiratory problems (e.g. asthma) and decreased air quality from elevated levels of fine particulate matter air pollution, ozone, pollen/allergens, molds and indoor moisture levels;
- Increased cardiovascular problems (e.g. risk of stroke and heart attacks) from elevated heat stress and exposure to air pollutants;
- Increased incidence of new vector species (e.g., mosquitos and ticks) and new vector-borne diseases (e.g., Dengue fever and Ehrlichiosis);
- Increased incidence of mental health issues (e.g. stress, aggression, and violence) from higher temperatures, physical displacement, and loss of livelihood caused by extreme weather events;
- Increased exposures to toxic chemicals and raw sewage from more frequent heavy rain/flooding events; and
- Decreased water quality from elevated water temperatures and already high nutrient levels (i.e., harmful algae blooms).[9]

In addition to threatening environmental and human health, the impacts of climate change also pose significant economic challenges for Iowans. Economic losses from tornadoes, floods, and damage to crops exceeded $5.6 billion in Iowa from 2008-2012."[10] According to NRDC, "in

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[5]Natural Resources Defense Council, *NRDC Fact Sheet: Climate and Health in Iowa* (November 2014) at 1, available at http://www.nrdc.org/health/files/clean-power-plant-states-IA.pdf, citing T. Madsen and N. Willcox, Environment America Research and Policy Center, *When It Rains It Pours: Global Warming and the Increase in Extreme Precipitation from 1948 to 2011* (2012).

[6] *Id.* at 2, citing Madsen Midwestern Regional Climate Center, Climate Change and Variability in the Midwest (2014) available at http://mrcc.isws.illinois.edu/mw_climate/climateChange.jsp#

[7] *Id.* at 1-2, citing Ashley, S.T., and W.S. Ashley. Journal of Applied Meteorology and Climatology 47, *Flood Fatalities in the United States*, at 805-818 (2008) available at http://journals.ametsoc.org/doi/pdf/10.1175/2007JAMC1611.1; Curriero, F.C., et al. "*The Association Between Extreme Precipitation and Waterborne Disease Outbreaks in the United States, 1948–1994*." American Journal of Public Health 91 (2001): 1194-1199; and Patz, J.A., et al. "Climate Change and Waterborne Disease Risk in the Great Lakes Region of the U.S." American Journal of Preventive Medicine 35 (2008): 451-458, available at http://www.ajpmonline.org/article/S0749-3797(08)00702-2/fulltext.

[8] *Iowa Climate Statement 2014: Impacts on the Health of Iowans* (2014) available at http://cgrer.uiowa.edu/files/cgrer.uiowa.edu/files/pdf_files/Iowa%20Climate%20Statement%202014-Impacts%20on%20the%20Health%20of%20Iowans_with%20signatures.pdf

[9]*Id. See also*, Iowa Environmental Health Association and Iowa Public Health Association Letter to Governor Branstad, November 2014.

[10]Natural Resources Defense Council, *Carbon Pollution Standards Fact Sheet for Iowa: Iowa Can Create 2,500 Effiency-Related Jobs, Cut Electricity Bills and Curb Carbon Pollution* (May 2014) available at

2012, an estimated $761 million in federal taxes paid by Iowans went to clean up after extreme weather."[11]

Given both the immediate and future detrimental impacts of climate change on public health and welfare, it is clear that significant steps must be taken *now* to address carbon pollution from existing power plants and transition the U.S. to a cleaner, more efficient power sector. Therefore, the Council generally supports the proposed Clean Power Plan and EPA's timely finalization of the rule by June 1, 2015.

Economic Benefits from Clean Energy for Compliance. The Council strongly supports EPA's proposed use of 'outside the fence' measures for compliance purposes, including renewable energy and energy efficiency. Iowa's environment and economy will be enhanced to the extent that Iowa's compliance with the Clean Power Plan can encourage additional development of renewable energy and energy efficiency in Iowa. Iowa has realized significant economic benefits from clean energy development to date and the Council supports using the Clean Power Plan as an opportunity to extend and expand these benefits.

We have included a brief summary of the economic benefits realized to date as well as projections of additional benefits for wind, solar, and energy efficiency. While clean energy benefits Iowa's economy, we note that use of coal does not. In addition to the significant externalized costs from using coal (public health, climate, etc.), Iowa spends $590M annually to import coal from other states, which is a drain on the state's economy.[12]

Wind Energy

Wind energy employs Iowans in all aspects of the industry, including manufacturing, service, installation, design, engineering, and more. In 2012, the American Wind Energy Association reported that the wind industry employed between 6,000 and 7,000 Iowans. This number dropped in 2013, given a downturn in the national market for wind, to between 3,000 and 4,000. Wind energy jobs are rebounding in 2014 as wind installations increase again, according to AWEA (2014 results will not be available from AWEA until 2015). There are currently 15 manufacturing facilities producing wind turbine parts in Iowa.[13]

In addition to job creation, wind farm owners paid $16,000,000 to Iowa landowners in the form of land lease payments for wind turbines in 2013 alone.[14] Wind farms add to the property tax

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http://www.nrdc.org/air/pollution-standards/files/cps-state-benefits-IA.pdf, citing C.J. Anderson, C.J. Extreme Weather and Climate Change in Iowa: Now and Future Trends, Iowa State University Climate Science Program, December 11, 2013, http://ppc.uiowa.edu/sites/default/files/anderson.pdf

[11] *Id.*

[12] Union of Concerned Scientists, *Burning Coal, Burning Cash* (2014).

[13] AWEA, State Wind Energy Statistics: Iowa. http://www.awea.org/Resources/state.aspx?ItemNumber=5224.

[14] AWEA, State Wind Energy Statistics: Iowa.

base and increase property tax revenue for counties, which typically supports school funding and can also reduce the tax bill for homeowners and businesses. Wind turbines are gradually added to the property tax rolls, so revenue to counties increases over time. According to the Iowa Wind Energy Association, Pocahontas County has received $3M in increased property tax revenue over three years from 216 turbines located in its county. This number will grow as turbines go from the current $23.5M in partial assessed value to an estimated $189M in full assessed value in the coming years. Pocahontas County is an example of what other counties in Iowa are already experiencing with wind or could experience from expanded wind energy.

Projections for job creation and economic benefits if Iowa were to further expand its wind portfolio are very positive. For example, if Iowa were to reach the DOE 20% Wind by 2030 scenario – nearly 20,000 MW by 2030 – the state could see: 63,401 construction jobs (temporary); 9,011 operational jobs (permanent); $53 million in annual landowner payments; and, $89.6 million in annual property tax revenue.[15]

Wind energy also provides benefits to Iowa ratepayers and electric consumers. For example, regarding its recent 1,050 MW wind energy project, MidAmerican has stated that wind is a low cost generation option that result in a $10M annual rebate to Iowa customers soon after it is built.[16]

Solar Energy

Iowa's solar market is small but growing rapidly. In 2012, Iowa had 210 solar jobs. In 2013, this had grown to 680 solar jobs.[17] Iowa had approximately 2 MW of installed solar at the end of 2012 and 8 MW at the end of 2013. Solar jobs are expected to increase in 2014 as the solar market continues to expand. Looking forward, a recent analysis on solar job growth potential estimates that building 300 MW of solar over a five year period would create an average of 2,500 jobs during that time.[18]

Energy Efficiency

We are not aware of a comprehensive snapshot of current jobs associated with energy efficiency in Iowa. However, Iowa utilities are regularly saving 1% to 1.5% annually and have been achieving these savings levels for a number of years. There is a substantial infrastructure in place to support energy efficiency programs, including audit and analysis firms, retail, manufacturing, architects, and firms that handle service and installation for HVAC and other efficiency equipment. Energy efficiency programs certainly support significant direct jobs among a wide range of firms. In addition, consumer savings from energy efficiency are most frequently spent in

[15] Center for Rural Affairs, *Renewable Energy and Economic Potential in Iowa, Kansas, Nebraska, and South Dakota* (August 2009).
[16] Iowa Utilities Board Docket No. RPU-2013-0003, Direct Testimony of Dean A. Crist, May 10, 2013.
[17] The Solar Foundation, *State Solar Jobs 2013* (2014).
[18] Iowa Policy Project, *Shining Bright: Growing Solar Jobs in Iowa* (2011).

the local economy, meaning many indirect and induced jobs are supported by energy efficiency in Iowa.

Several recent analyses have been conducted on the economic benefits of using efficiency to comply with carbon pollution standards. The American Council for an Energy Efficient Economy found that using a set of energy efficiency policies to comply with carbon standards could create 5,900 net jobs in Iowa by year 2030 while saving electric customers money.[19] The Natural Resources Defense Council recently found that using energy efficiency to comply with carbon standards could create up to 2,500 jobs in Iowa by 2020 while saving electric customers money.[20] These studies are consistent with a 2008 Iowa Policy Project study indicating that high levels of energy efficiency savings (e.g., 1.5% annually) could create up to 4,473 net jobs in 2030.[21]

II. EPA Should Strengthen Iowa's Interim and Final Targets To Maximize Cost-Effective Carbon Pollution Reductions Under the Proposed Rule.

While the Council supports EPA's proposed Clean Power Plan, Iowa's interim and final carbon reduction targets should be strengthened.

Given the state's current progress toward reducing fossil fuel-fired energy dependence; the state's technical potential for clean, renewable energy generation; and the state's ability to increase energy efficiency savings, Iowa can readily and cost-effectively achieve a far more stringent carbon emissions rate. Furthermore, stronger targets are necessary to reduce the state's continued, predominant dependence on fossil fuel energy sources.

A. EPA Should Strengthen the Overall Stringency of Iowa's Interim and Final Emissions Rate Target Because Changes Underway in Iowa's Electric System Will Put Iowa in Compliance with the Proposed Rule Before 2020.

Iowa's electric system is dynamic and is already in the process of reducing its carbon emissions intensity. Since 2012 – EPA's proposed baseline year – Iowa utilities have 1) retired or announced for retirement some coal-fired power plants, 2) converted or announced for conversion some coal plants to natural gas, 3) announced and begun construction on a new,

[19] ACEEE, *Change is in the Air: How States Can Harness Energy Efficiency to Strengthen the Economy and Reduce Pollution* (April 2014).
[20] NRDC, *Carbon Pollution Standards Fact Sheet: Iowa* (May 2014).
[21] Iowa Policy Project, *Energy Efficiency Benefits the Iowa Economy* (July 2008).

natural gas plant, and 4) built or announced construction of significant new wind generation. These changes are underway and will largely be concluded by 2016 or 2017.

1. Coal Plant Retirements

In Iowa, current and planned coal plant retirements include the following units:[22]

- Walter Scott (Units 1&2) (announced January 2013; retiring by April 16, 2016)
- George Neal North (Units 1&2) (announced January 2013; retiring by April 16, 2016)
- Pella Municipal Power Plant (retired in 2013)
- Fair Station (Units 1&2) (retired in 2013)

2. Coal Plant Conversions to Natural Gas

Current and planned coal plant conversions to natural gas in the state include the following units:[23]

- Earl Wisdom (Unit 1) (Permit issued 8/2013 limits fuel to natural gas and fuel oil)
- Ames Electric Services Power Plant (Units 7&8) (announced January 2014; converting to gas)
- Riverside (Unit 5) (announced January 2013; converting to gas by April 16, 2016)
- Milton L. Kapp (Unit 2) (announced January 2014; converting to gas in 2015)

3. New, Natural Gas Plant Construction

Iowa utilities have also made decisions to increase the state's natural gas capacity since 2012:

- In 2013, Alliant Energy received regulatory approval to construct a new nominal 600 MW natural gas combined cycle plant in Marshalltown, Iowa. Construction on the facility began in the summer of 2014 and is expected to be completed in 2016 and operating in 2016 or 2017.[24] It is not clear whether this plant will be included in the 111(d) program or the 111(b) program.

4. Clean, Renewable Energy Development

Planned renewable energy developments by Iowa utilities have also expanded since the 2012 baseline year of the proposed rule:

- MidAmerican Energy announced a 1,050 MW wind generation project ("Wind VIII") in 2013, the construction of which will be completed by 2015.[25]

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[22] This list is based on the Council's review of publicly available documents, including utility filings with the Iowa Utilities Board, public announcements from utilities on coal plant retirements and conversions to natural gas, and the Iowa DNR comments to EPA responding to EPA's Notice of Availability of its 2018 Emissions Modeling Platform (submitted by DNR on June 16, 2014).

[23] *Id.*

[24] Alliant Energy, *Alliant Energy begins construction on Marshalltown Generating Station*, June 4, 2014 at http://www.alliantenergy.com/AboutAlliantEnergy/Newsroom/NewsReleases/115605. The press release indicates the facility will be approximately 650 MW, other filings have indicated it will be 600 MW.

[25] MidAmerican Energy, *Wind Energy Overview*, http://www.midamericanenergy.com/wind_overview.aspx.

- In October 2014, MidAmerican announced its intention to build an additional 162 MW of wind generation. We expect MidAmerican to receive regulatory approval and construct this wind generation in 2015.[26]

5. Continued Operation of Energy Efficiency Programs

Since 2012, Iowa utilities have also continued to develop their already mature energy efficiency programs, with energy efficiency plans approved through 2018. These programs can be expected to continue throughout the 2020-2030 time-frame.

Iowa Will Comply with the Proposed Rule with Actions Already Taken or Planned Since 2012

As a result of the actions outlined above and decided *before* the EPA proposed the Clean Power Plan, Iowa will likely be in compliance with the proposed rule before the plan performance period even begins in 2020 – and will potentially be in compliance before Iowa is required to submit a state compliance plan in 2016.

According to the Council's analysis of changes in Iowa since 2012 – coal retirements, coal conversions to gas, construction of a new natural gas plant, construction of new wind generation, and approval of ongoing energy efficiency programs – the state will be in compliance with the proposed 2030 target before 2020 and will remain in compliance during the entire 2020-2030 time frame. Assuming EPA allows activity between 2013 and 2019 to count towards the compliance obligation starting in 2020, the proposed Clean Power Plan is unlikely to impose a compliance obligation on most or all regulated entities in Iowa. In other words, simply by 1) accounting for actions taken or planned to date and by 2) continuing existing energy efficiency programs, Iowa will comply with the proposed Clean Power Plan.

The findings above were reached using a spreadsheet modeling tool developed by Synapse Energy Economics, called the *Clean Power Plan Planning Tool* ("CP3T"),[27] with the following input and assumption modifications made by the Council:[28]

- Add 4,353 GWh of incremental renewable energy generation starting in 2016. This reflects the likely generation from MidAmerican's 1,212 wind generation project using the Synapse default capacity factor of 41%;
- Maintain default assumptions based on EPA's Building Block 4 for annual energy efficiency savings, which can be expected given Iowa's longstanding energy efficiency policies;

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[26] MidAmerican Energy, *MidAmerican Energy Update: Presentation of Adam Wright* (October 2014) at http://www.midamericanenergyempoweru.com/support/pdf/2014-presentations/EMPOWER-U-2014-Wind.pdf.

[27] Clean Power Plan Planning Tool ("CP3T"). Synapse Energy Economics, Inc. Version 1.0. Available at www.synapse-energy.com. Synapse is not responsible and does not assume liability for any errors in CP3T's input data or functions, or for any of the resulting output generated by its users.

[28] Iowa Environmental Council Appendix, Best Estimate – Overall Real World, at 5.

- Add 600 MW from the natural gas combined cycle plant in 2016;
- Retire Walter Scott 1 and 2 (2016), Neal North 1 and 2 (2016), Pella (2013), Fair Station (2013), Dubuque 3 and 4 (2015) and Sutherland 1 and 3 (2015);
- Change emission rate to reflect Iowa's average emission rate for coal plants that have been converted to natural gas (2,422 lbs/MWh) for the following units: ML Kapp, Riverside, Ames 7 & 8, and Earl Wisdom 1; and
- Lower capacity for ML Kapp to 95 MW, based Alliant statements that Kapp will have a lower capacity as a natural gas unit.

With these inputs, the Synapse CP3T produces the following results[29]:

- Iowa's emissions rate drops from 1,535 lbs/MWh in 2015 to 1,293 lbs/MWh in 2016.
- Iowa's emissions rate is 1,226 lbs/MWh in 2020 and drops each year from 2020 to 2030.
- Iowa's emissions rate is 1,108 lbs/MWh in 2030.

Under the proposed rule, Iowa's emission rate target for 2030 is 1,301 lbs/MWh. Iowa will be well below this emissions rate during the entire compliance period from 2020 to 2030, and will be in this position by taking no further action after 2016, other than continuing energy efficiency programs that are very likely to continue without the Clean Power Plan.

EPA Should Strengthen Iowa's Interim & Final Targets to Set a Meaningful Compliance Obligation for the State and Ensure Cost-Effective, Achievable, and Necessary Carbon Reductions Occur

The Council applauds recent and ongoing steps by Iowa utilities, regulators, and policy makers to reduce carbon pollution. Iowa's leadership in wind energy and reduced reliance on coal-fired power plants are benefiting Iowa's environment and economy now and will continue to provide benefits in the future.

While the steps taken to date are substantial and laudable, Iowa has much further to go to reduce the state's fossil fuel energy dependence. Iowa is still heavily coal dependent (ranking among the top 10 states in use of coal per capita, according to EIA)[30] and the state's existing power plants still emit significant quantities of carbon pollution. Iowa ranks 21st highest in the nation in carbon pollution as of 2011 (Iowa power plants released 44 million tons of carbon pollution in 2011), according to air emissions tracking from the 100 largest electricity providers).[31]

[29] *Id*.
[30] U.S. Energy Information Association, *State Energy Profile Analysis: Iowa*, available at http://www.eia.gov/state/analysis.cfm?sid=IA
[31] Natural Resources Defense Council, *Carbon Pollution Standards Fact Sheet: Iowa*, *Supra*. at 2, citing Christopher Van Atten, Amlan Saha, and Lee Reynolds, Benchmarking Air Emissions of the 100 largest Electric Power Producers

Meanwhile, Iowa has the 5th lowest percent carbon reduction goal in the United States under the proposed Clean Power Plan.

EPA should strengthen Iowa's interim and final targets under the proposed rule to reflect the state's contribution to the overall carbon pollution problem in the U.S., and require Iowa utilities to take meaningful action under the proposed Clean Power Plan.

Though the potential for some type of carbon policy, whether legislative or regulatory, was likely a factor in Iowa utilities' decisions after 2012 – regarding coal retirements, coal conversions to gas, construction of a new natural gas facility, construction of new wind generation, and operation of ongoing energy efficiency programs – other factors were also involved, including other environmental regulations (e.g., Mercury and Air Toxics, Cross-State Air Pollution Rule, etc.), age of the plants, and cost.

Strengthening Iowa's target(s) will ensure that Iowa utilities are required to go beyond what they have already done or planned to do before the Clean Power Plan was proposed, and ensure the state realizes its enormous potential to cost-effectively reduce carbon pollution with renewable energy and energy efficiency.

B. EPA Should Strengthen Building Block 3 Because The Proposed Approach Underestimates Iowa's Potential For Renewable Energy.

As currently proposed, EPA's regional approach for establishing renewable energy targets under Building Block 3 significantly underestimates Iowa's cost effective renewable energy potential and the state's ability to reduce carbon pollution. The Council recommends that EPA base Building Block 3 on technical potential and economic potential for renewable energy development, instead of or in addition to the policy basis that EPA has proposed to use. The policy basis – the averaging of state RPS policies – provides a reasonable starting point for Building Block 3, but the building block should be strengthened by adding technical and economic potential analysis. The alternative approach proposed by EPA in the *Alternative RE Approach Technical Support Document* is a substantially improved approach for Building Block 3, and the Council comments on that approach in more detail below.

Iowa's Renewable Energy Target under the Proposed Building Block 3 Approach Is Less than Iowa's Current Renewable Energy Generation

in the United States, M.J. Bradley & Associates (May 2013) available at www.nrdc.org/air/pollution/benchmarking/files/benchmarking-2013.org

Under the proposed approach, EPA developed regional, renewable energy targets based on states' average RPS standards. EPA then capped renewable energy targets for states that were performing at levels over this regional average.

Overall, the proposed approach would result in 7% of total U.S. electricity sales derived from renewable energy in 2020 and 12% in 2030.[32] The proposed approach would also result in higher levels of renewable energy in most, but not all states.

For example, Iowa is one of four states where the application of the proposed approach for Building Block 3 results in *less renewable energy* during the compliance period than the state had actually installed and in operation in the 2012 baseline year:

- Under Step 4b of the building block as proposed, Iowa would generate just under 8,566 GWh of existing and incremental renewable energy in 2020, and that is held static from 2020 to 2030.
- Iowa generated approximately 14,183 gigawatt-hours (GWh) in 2012 from over 5,000 megawatts (MW) of installed wind generation.

Therefore, Iowa's proposed renewable energy target of 8,566 GWh under Building Block 3 is 5,618 GWh *less* than the 14,183 GWh actually generated in Iowa in 2012, or 60% of the state's 2012 baseline amount.

Analysis of Iowa's Carbon Reduction Potential from Existing and Under Construction Wind Supports Strengthening Building Block 3 and Iowa's Overall Targets

In addition to what was installed in 2012, utilities and other entities are currently building additional wind capacity in Iowa. For example, MidAmerican Energy has regulatory approval to construct 1,050 MW of wind generation in 2014 and 2015 and has recently applied for regulatory approval for an additional 162 MW.[33] MidAmerican plans to complete construction of this wind generation by the end of 2015. As a result, Iowa will have approximately 6,400 MW of wind generation installed and operational by the end of 2015 or beginning of 2016.

[32] See Pete Danko, National Geographic, *Does the EPA's Carbon Plan Short-Change Renewables? New Report Suggests Yes* (October 15, 2014) available at: http://energyblog.nationalgeographic.com/2014/10/15/does-the-epas-carbon-plan-short-change-renewables/

[33] See Iowa Utilities Board, Docket No. RPU-2013-0003 (MidAmerican 1,050 MW, Wind VIII) and Iowa Utilities Board, Docket No. RPU-2014-0002 (MidAmerican 162 MW, Wind IX).

The Council conducted an analysis of Iowa's compliance potential with this current and planned renewable wind generation using Synapse Energy Economics' *Clean Power Plan Planning Tool* ("CP3T").[34] The Council made the following modifications to inputs:[35]

- Iowa's 2012 actual wind generation of 14,183 GWh was maintained from 2013 to 2015 and then increased to 18,536 GWh annually to reflect the addition of MidAmerican's two wind projects (totaling 1,212 MW).
- A reasonable 41% capacity factor was assumed.

Compared to the 8,566 GWh renewable energy target for Iowa currently proposed in Building Block 3, Iowa will *actually* generate – at a minimum – 18,536 GWh in 2020. This is almost 10,000 GWh *more* than the level produced by the proposed Building Block 3 methodology.

This addition of wind generation alone reduces Iowa's emissions rate from 1,551 lbs/MWh in 2015 to 1,360 lbs/MWh in 2016.[36] Using default assumptions for load growth (the load growth projected from AEO 2013), Iowa's emissions rate is 1,425 lbs/MWh in 2030, *assuming no other compliance options* are included (no energy efficiency, no coal plant retirements or conversions, etc.).[37] In other words, Iowa will meet half or more of its emissions target well before 2020, with wind energy already existing and planned to be installed before 2020.

If the basic energy efficiency savings in Building Block 4 are also included in the CP3T model, Iowa's emissions rate is 1,294 lbs/MWh in 2020 and 1,178 lbs/MWh in 2030.[38] As the Council discusses in more detail below, these energy efficiency savings are likely to occur in Iowa because the state has a supportive policy framework where reasonably high levels of annual savings are achieved (e.g., 1% or more annually). As a result, existing/planned renewable energy and expected energy efficiency savings would allow Iowa to exceed the interim and final goal by a comfortable margin.

Iowa Has the Technical and Economic Potential to Achieve Much Higher Levels of Renewable Energy and a More Stringent Overall Target

Multiple studies examining Iowa's technical and economic potential for renewable energy development show that significantly higher levels of renewable energy generation are possible. Iowa has the technical potential to achieve levels of renewable energy development that are an order of magnitude greater than what EPA calculated in Building Block 3.

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[34] Clean Power Plan Planning Tool ("CP3T"). Synapse Energy Economics, Inc. Version 1.0. Available at www.synapse-energy.com. Synapse is not responsible and does not assume liability for any errors in CP3T's input data or functions, or for any of the resulting output generated by its users.
[35] Iowa Environmental Council Appendix, Add New/Planned Wind 2013-2019; No Efficiency, at 4.
[36] *Id.*
[37] *Id*.
[38] Iowa Environmental Council Appendix, Add New/Planned Wind 2013-2019, at 3.

The most complete recent study, the *Renewable Electricity Futures Study*, was released by the National Renewable Energy Laboratory in 2012.[39] EPA relied upon data from this study in its Alternative RE Approach Technical Support Document. In this study, NREL identified 1,723,588 GWh of wind energy potential for Iowa and 7,029,897 GWh of solar PV potential (urban utility-scale, rural utility-scale, and rooftop).[40] This translates to 571 GW of wind and 4,043 GW of solar.[41] The NREL study also identified additional potential from hydropower and bio-power. Wind and solar alone, however, account for 8,753,485 GWh of renewable energy technical potential in Iowa.

The *Renewable Electricity Futures Study* is consistent with other major national studies examining the state's potential for renewable energy development, such as the Department of Energy's *20% Wind Energy by 2030* report. In this report, DOE projected that approximately 300 GW of wind capacity would be needed to bring the U.S. to 20% wind.[42] Of this, 251 GW would be land-based and 54 GW would be offshore.[43] Certain states contributed significantly more wind capacity than others, by hosting 10 GW or more wind capacity.[44] Iowa is one of those states and, by 2030, would host approximately 20 GW of wind capacity.[45]

DOE also provided a projected schedule of wind capacity additions by state.[46] According to this schedule, Iowa was forecast to have 2,930 MW of installed capacity by 2016; 7,960 MW by 2020; and 19,910 MW by 2030.[47] Iowa is already well ahead of this schedule: Iowa will have over 6,000 MW of wind capacity by 2016, more than twice the projected amount by DOE. Therefore, Iowa's technical potential for renewable wind is not a distant or theoretical concept, but is clearly achievable and is being achieved now.

EPA's proposed renewable energy goal for Iowa under Building Block 3 does not require Iowa to develop any of the technical potential projected by DOE or NREL's analysis. Furthermore, the state's final target under the proposed rule would require Iowa to develop very little of this potential, *even if Iowa complies with the proposed rule with wind energy alone*. As discussed above, if Iowa uses no other compliance option than wind – no efficiency, no coal plant

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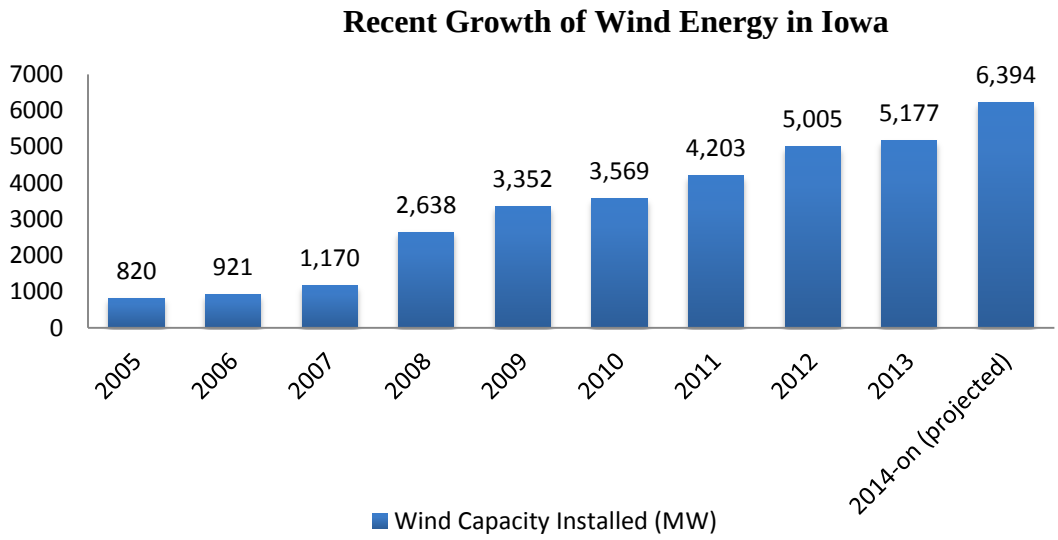
[39] NREL, *Renewable Electricity Futures Study* (2012) at http://www.nrel.gov/analysis/re_futures/.
[40] *Id.*
[41] *Id*. See also NREL, Lopez et al, *U.S. Renewable Energy Technical Potentials: A GIS-Based Analysis* (2012).
[42] U.S. Department of Energy, *20% Wind Energy by 2030*, available at http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CB4QFjAA&url=http%3A%2F%2Fwww.20percentwind.org%2F20p.aspx%3Fpage%3DReport&ei=qPB8VM_JJcL2yQTxgoDwBw&usg=AFQjCNFCbrY1tC2s4YN1emgsNMFlUM5rbA&bvm=bv.80642063,d.aWw
[43] *Id*.
[44] *Id.*
[45] NREL, *Installed Wind Nameplate Capacity by State (GW) – Land-based and Offshore* (2009).
[46] *Id.*
[47] *Id*.

retirements, no heat rate improvements, no conversions to natural gas – the wind energy that will be installed before 2020 will reduce Iowa's emissions rate to between 1,354 lbs/MWh (no load growth) to 1,425 lbs/MWh (load growth) in 2030.

Per Section II(A) of these comments, Iowa is already retiring coal plants, converting others to gas, and can be expected to realize savings from existing and ongoing energy efficiency programs. These current and planned actions, along with existing wind installed prior to 2020, are likely to meet Iowa's entire compliance obligation. As a result, it is unlikely that the proposed Clean Power Plan will require or encourage Iowa to install much or any new wind generation for compliance purposes.

Iowa Has the Policy Framework and Track Record to Achieve Much Higher Levels of Renewable Energy and a More Stringent Overall Target

Utility-scale wind energy installations began in Iowa over fifteen years ago and began to increase in size and scale annually in 2008. As the chart below indicates,[48] in some single years Iowa has added well over 500 MW of wind energy. Iowa's projected 6,400 MW of wind capacity in 2016 is still only a tiny fraction of Iowa's technical potential. There are many suitable sites in Iowa for additional wind farms, and Iowa has the policy framework in place to add more wind generation.



While additional policies are important to support continued renewable development, such as extending and expanding state and federal tax incentives for wind and solar, existing state

[48] The data for this chart is drawn from the Energy Information Administration, American Wind Energy Association, and Iowa Wind Energy Association.

policies and plans already exist to help Iowa expand the state's clean energy portfolio and comply with the 111(d) proposed rule:

- Advanced ratemaking principles provide certainty to rate-regulated utilities in Iowa and encourage development of new, renewable generation sources. This policy allows regulated utilities to secure rate principles for wind (or other renewable energy) projects in advance of construction, but recover costs after the generation asset is operational. This policy has been in place for almost fifteen years and has been used by MidAmerican Energy and Alliant Energy to construct approximately 3,500 MW of wind generation in Iowa. This policy can support construction of additional renewable energy generation.

- Current transmission build-outs that are underway will allow significant additional wind energy to be added to the grid. The Midcontinent Independent System Operator (MISO) approved a portfolio of transmission upgrades in the region intended to facilitate the construction on new wind generation (and provide other benefits), known as Multi-Value Projects.[49] Iowa, like other parts of the Upper Midwest, is home to some of the nation's best wind resources, but many of these wind resources have been constrained by lack of transmission (either because there are no transmission lines or because existing lines are at capacity). Several Multi-Value Project line upgrades are located entirely or partially in Iowa, including MVP 3, 4, 5, and 7. These lines will reduce transmission constraints for wind energy in Iowa and significantly expand opportunities for new wind development by several thousand megawatts or more. MVP 3 and 4 extend through some of Iowa's best wind resources (northwest and north central parts of the state) and are expected to be operational in approximately 2016. MVP 5 is expected to be operational in 2017 or 2018 and MVP 7 may be operational closer to 2020. Other wind-related transmission proposals are also moving through the regulatory process, such as the Clean Line Energy Partner's Rock Island Line, a high voltage direct current (HVDC) line that could enable 4,000 MW of new wind in Iowa for export to the PJM electricity market (it is unclear whether any of this wind could be used for Iowa's compliance purposes or for compliance for other states').

EPA Should Strengthen Building Block 3 by Including Technical and Economic Potential Analysis, Such as the Proposed Alternative Approach

Compared to the proposed approach for Building Block 3, the Council supports EPA's proposed Alternative RE Approach. The Alternative RE Approach relies on technical potential as a starting point for the building block and results in significantly higher levels of renewable energy. Iowa's target generation, excluding hydropower, would be:

[49] Midcontinent Independent System Operator, *Multi Value Project Portfolio Analysis*, at https://www.misoenergy.org/Planning/TransmissionExpansionPlanning/Pages/MVPAnalysis.aspx.

- 15,878 GWh in 2020,
- 20,612 GWh in 2025, and
- 30,040 GWh in 2030.[50]

These levels are considerably higher than the 8,566 GWh from 2020 to 2030 in the proposed building block and would significantly strengthen Iowa's emission reduction requirement under the proposed rule.

According to the Council's analysis using selected inputs in the M.J. Bradley & Associates' *Clean Power Plan Evaluation Tool,* EPA's proposed Alternative RE Approach, excluding existing hydropower ("Alt. w/o hydro") would change Iowa's 2020 interim target emissions rate from 1,341 lbs/MWh to 1,056 lbs/MWh and the state's final target in 2030 from 1,301 lbs/MWh to 906 lbs/MWh.[51]

While changes may appear to be a large increase in stringency from Iowa's proposed emissions rate targets for Iowa, it is both a feasible and necessary step toward strengthening Iowa's target: As noted in the Council's analysis in Section II(A) of these comments, by simply 1) accounting for actions taken or planned to date and by 2) continuing existing energy efficiency programs, Iowa's emission's rate in 2030 will be 1,109 lbs/MWh. By adopting the Alternative RE Approach, EPA would provide Iowa with a meaningful compliance obligation under the rule and would help ensure the state begins to maximize its cost effective and technically feasible carbon reduction potential. In other words, the relevant increase in stringency is not from 1301 lbs/MWh to 906 lbs/MWh, but from 1,109 lbs/MWh to 906 lbs/MWh.

The Council notes, however, that even the Alternative RE Approach does not result in high enough levels of renewable energy in Iowa. While the Alternative RE Approach begins appropriately with state technical potential for renewable energy – including the NREL Renewable Electricity Futures analysis – it applies the 'benchmark development rate' of the top 16 states. The 2012 development rate for wind energy for the top 16 states is identified at 9%, which is then multiplied by technical potential. However, EPA again caps the actual amount of renewable energy in 2030 if IPM-projected onshore wind generation is lower than the result of the benchmark rate multiplied by the technical potential.

As a result, Iowa's 15,878 GWh target for renewable energy in 2020 under the Alternate RE Approach is less than the 18,536 GWh of generation that Iowa will have, *at a minimum*, in 2020. While the 2025 and 2030 generation levels under the Alternate RE Approach are likely to be higher than what Iowa will have installed at the end of 2016, they are still not aggressive

[50] U.S. EPA, *Alternative RE Approach Technical Support Document*, Table 1.3.
[51] M.J. Bradley & Associates, LLC. *Clean Power Plan Evaluation Tool Version 2.3* (November 2014) available at: http://www.mjbradley.com/about-us/case-studies/clean-power-plan-evaluation-tool

generation levels given Iowa's recent history of wind installations or its technical potential for wind energy.

The Council recommends the following with respect to the EPA's Alternative RE Approach for Building Block 3.

- EPA should individualize the development rate for leading states. Iowa's development rate should not be capped by an averaging of other states that are not similarly situated.
- EPA should use technical potential as more than a starting point that can be later eliminated. EPA should increase the generation levels for states with very high levels of technical potential *and* very high levels of renewable energy installations.
- EPA should provide clear, step-by-step calculations for the Building Block 3 generation levels for all states. It is not clear how EPA derived Iowa's generation levels included in the Alternative RE Approach Technical Support Document (e.g., Table 1.3).

Finally, the Council urges EPA to adopt the Alternative Goal-setting Equation Approach for renewable energy, outlined in the October 28, 2014 Notice of Data Availability. Specifically, EPA should displace fossil fuel-fired generation in order of emissions rate when calculating state targets to reflect increases in renewable energy & energy efficiency. Doing so would help to strengthen Iowa's targets, according to analysis by the Council: Using the M.J. Bradley & Associates' *Clean Power Plan Evaluation Tool* and selecting the "Alternate Goal Setting Equation (BB3&4) Approach , Option 3 (RE/EE Replaces Fossil Sources in Order of Emissions Rate, coal->o/g->ngcc)," Iowa's interim target would change from 1,341 lbs/MWh to 1,265 lbs/MWh and the state's final target in 2030 would change from 1,301 lbs/MWh to 1,194 lbs/MWh.[52] Again, this strengthening is necessary and significant to ensure Iowa is required to make meaningful carbon reductions under the proposed rule.

C. EPA Should Strengthen Building Block 4 to Because the Proposed Approach Underestimates Iowa's Energy Efficiency Potential.

Like renewable energy, the Council strongly supports the inclusion of demand side energy efficiency as a compliance tool under the proposed Clean Power Plan. However, EPA has underestimated Iowa's potential for cost-effective, energy efficiency savings under Building Block 4. EPA should strengthen the state's energy efficiency target under Building Block 4, and maximize Iowa's potential to reduce carbon emissions.

When calculating states' potential for carbon reductions and developing state targets under the proposed regulation, EPA determined that states could achieve a 1.5% annual incremental

[52] See M.J. Bradley & Associates, Supra.

savings from energy efficiency measures. This 1.5% annual savings rate is significantly less than states' demonstrated capabilities:

- Currently, five states are already achieving net incremental energy savings either at or above EPA's annual savings target of 1.5% (Massachusetts, Arizona, Rhode Island, New York and Vermont).[53]
- Two states have achieved incremental savings of over 2% (Rhode Island and Massachusetts).[54]
- Twelve additional states have Energy Efficiency Resource Standards that will require them to achieve a 1.5% incremental savings target in the near future.[55]

While Iowa is not among the states currently achieving a 1.5% savings on a statewide basis, Iowa's second-largest utility, Interstate Power & Light/Alliant Energy, has achieved a 1.4% savings level in 2012 and a 1.5% savings level in 2013 and may achieve 1.5% again in 2014.[56] Furthermore, a February 2012 energy efficiency potential study commissioned by Iowa's investor-owned utilities suggests that Iowa could meet and exceed this savings level.[57]

In *Assessment of Energy and Capacity Savings Potential in Iowa*, Cadmus Group found that Iowa has the technical potential between 2013 and 2023 to save 8,446 GWh, of which 6,872 GWh is cost-effective or economic potential.[58] The technical potential would save 24% of base sales cumulatively, and the economic potential would save 19% of base sales cumulatively.[59] These ten year potential savings numbers translate to a technical potential to save over 2% annually and an economic potential to save just under 2% annually.[60] However, the study did not include important sources of energy efficiency savings.

The Cadmus study (like EPA's analysis of energy efficiency potential in Building Block 4 of the proposed rule) did not include Iowa's energy savings potential from measures like building

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[53] American Council for an Energy Efficient Economy, *2014 State Energy Efficiency Scorecard* (October 2014) available at http://www.aceee.org/sites/default/files/publications/researchreports/u1408.pdf

[54] See *Id.*

[55] Resources for the Future, *Expert Forum on EPA's Clean Power Plan*, available at http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCMQFjAA&url=http%3A%2F%2Fwww.rff.org%2Fcenters%2Fenergy_and_climate_economics%2FPages%2F4-Improving-Energy-Efficiency.aspx&ei=q_R8VIT7LsmiyASm1IDwBQ&usg=AFQjCNEL3KCihUSTjljVfEl9DwhKRFdguA&bvm=bv.80642063,d.aWw

[56] Interstate Power and Light Co., *Annual Report for 2013 Energy Efficiency Plan*, Docket No. EEP-08-1 (May 1, 2014) at 1; Interstate Power and Light Co., *Annual Report for 2012 Energy Efficiency Plan*, Docket No. EEP-08-1 (May 1, 2013) at 1. Both reports available at http://www.state.ia.us/government/com/util/energy/energy_efficiency/ee_plans_reports.html.

[57] The Cadmus Group, *The Assessment of Energy and Capacity Savings Potential in Iowa* (February 2012) available at https://efs.iowa.gov/cs/groups/external/documents/docket/mdaw/mty5/~edisp/139264.pdf

[58] *Id.*

[59] *Id.*

[60] *See generally, Id*.

codes, use of combined heat and power, etc. For example, combined heat and power (topping cycle only) offers the technical potential to save an additional 9,823 GWh in the commercial and industrial sectors in just the Alliant and MidAmerican service territories.[61] The savings potential from combined heat and power is larger than the energy efficiency technical potential identified by Cadmus by other conventional efficiency measures (lighting, HVAC, motors and drives, etc.). The significant amount of savings that these efficiency measures would provide, if included in the proposed rule, demonstrates that additional, cost effective energy efficiency measures exist that would allow Iowa to meet a more aggressive energy efficiency target than the currently proposed 1.5% annual savings by 2020.

Given the demonstrated ability of several states to achieve greater energy efficiency savings than 1.5% and Iowa's technical potential for expanded energy efficiency savings outlined in the Cadmus Study, the Council encourages EPA to strengthen Iowa's energy efficiency target in Building Block 4, by increasing Iowa's annual incremental savings rate to 2% and the pace of improvement to 0.25% (per the approach EPA invites specific comment on, detailed in §34875 of the proposed rule, that would "reflect an estimate of the additional electricity savings achievable from state policies not reflected in the 1.5 percent rate and the 0.20 percent per year pace of improvement, such as building energy codes and state appliance standards…"[62]).

According to the Council's analysis using selected inputs in the M.J. Bradley & Associates' *Clean Power Plan Evaluation Tool*, increasing Iowa's annual incremental savings rate ("maximum ramp-up level") from 1.5% to 2% and the pace of improvement ("ramp-up step") from 0.2% to 0.25% would change Iowa's 2020 interim emissions rate target under the proposed rule from 1,341 lbs/MWh to 1,316 lbs/MWh and the state's final goal in 2030 from 1,301 lbs/MWh to 1,262 lbs/MWh.[63]

While the above modifications result in a modest increase to Iowa's targets, they are important changes for EPA to make: Per the Council's previous statements in Section II(A) of these comments, strengthening Iowa's targets will ensure that the state has a meaningful compliance obligation under the proposed rule. It will also help ensure that Iowa is maximizing cost-effective and technically feasible energy efficiency savings.

As the Council urges EPA to consider savings achievable from building codes, combined heat and power, state appliance standards, etc., when setting Iowa's targets, the Council further urges EPA to include them in the overall energy efficiency target setting for Building Block 4:

[61] Direct Testimony of Graeme Miller, Iowa Utilities Board Docket No. EEP-2012-0001 and Docket No. EEP-2012-0002.
[62] 79 Fed. Reg. 34875 (June 18, 2014)
[63] *See* M.J. Bradley, Supra.

According to a recent report by the American Council for an Energy-Efficient Economy (ACEEE), if every state incorporated "four of the most common and effective energy efficiency policy options available to a state," including *1) implementing an energy efficiency savings target; 2) enacting national model building codes; 3) constructing combined heat and power systems; and 4) adopting efficiency standards for products/equipment*, these end-use energy efficiency measures alone could achieve close to the EPA's proposed 30% carbon pollution reductions by 2030 (from 2005 levels).[64] ACEEE also found that these energy efficiency measures could achieve significant carbon reductions at no net cost to the economy.[65]

> If every state adopted the four policies in our scenario, in 2030 carbon dioxide emissions from the power sector would be reduced by 26% relative to 2012 emissions, and power demand would be reduced by 25% relative to 2012. The nation would avoid 600 million tons of carbon dioxide emissions, save over 925 million MWh of electricity, and obviate the need for 494 power plants in 2030.[66]

In addition to increasing the stringency of Building Block 4 by increasing Iowa's energy efficiency savings to 2% annually and incorporating building codes and other efficiency opportunities into Building Block 4 target setting, EPA should also strengthen Building Block 4 by updating EPA's underlying cost data:

In a recent March 2014 report, ACEEE determined that the average cost to run an energy efficiency program in 20 states from 2009-2012, was 2.8 cents/kWh, "about one-half to one-third the cost of alternative new electricity resource options."[67] This is significantly less than the EPA's assumed cost of energy efficiency programs under the proposed rule (about 3.25 cents/kWh, according to analysis by the Union of Concerned Scientists).[68] EPA should update cost data to reflect current assumptions of energy efficiency costs, thus maximizing the Iowa's carbon reductions.

EPA should also ensure that states receive full credit for their current energy efficiency savings under the proposed rule:

- Like renewable generation, energy efficiency savings do not displace fossil fuel-fired generation demand under the EPA's proposed goal-setting calculations. As previously stated in Section II(B) of these comments, in order to capture the true potential of cost

[64] American Council for an Energy Efficient Economy, *Change is in the Air: How How States Can Harness Energy Efficiency to Strenghthen the Economy and Reduce Pollution* (April 2014) available at http://aceee.org/files/pdf/summary/e1401-summary.pdf
[65] *Id.*
[66] *Id*. at 2.
[67] See American Council for an Energy Efficient Economy, *New Report Finds Energy Efficiency is America's Cheapest Energy Resource* (March 25, 2014) available at http://www.aceee.org/press/2014/03/new-report-finds-energy-efficiency-a
[68] Sam Gomberg, Union of Concerned Scientists, *Debunking an Attack on Energy Efficiency and the Clean Power Plan* (November 2014) available at http://blog.ucsusa.org/energy-efficiency-epa-clean-power-plan-nera-study-729

effective, energy efficiency measures, the Council encourages EPA to adopt the method for calculating energy efficiency savings outlined by EPA in the recent, October 28, 2014 Notice of Data Availability, which displaces fossil fuel energy demand with added energy efficiency.

III. EPA should strengthen Building Blocks 3 &4 Because the "Best System of Emissions Reduction" under §111(d) should be technology-forcing.

State targets under the Clean Power Plan were established after EPA determined the emission reductions that were achievable under a "best system of emission reduction (BSER)." As currently proposed, EPA has defined the "best system of emission reduction," as a system of building blocks, including heat rate improvements at coal plants, as well as "outside the fence" measures, such as:

- increased deployment of natural gas capacity,
- increased use of clean, renewable energy, and
- increased use of demand side, energy efficiency measures.

The Council supports the building blocks identified by EPA under the BSER and its interpretation of §111(d) as supporting a systems-based approach and "outside the fence" measures to establish state targets. As discussed in Section II(B&C) of these comments, however, the proposed BSER underestimates Iowa's technological capabilities to reduce carbon emissions cost effectively via renewable energy development and energy efficiency savings.

§111(d) of the Clean Air Act requires that EPA develop, "the best system of emission reduction which (taking into account the costs and non-air quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated."[69] When determining whether a system is "adequately demonstrated," courts have interpreted this §111(d) language as requiring EPA to "look toward what may fairly be projected for the regulatory future, rather than the state of the art at the present.."[70] This §111(d) language has been further interpreted to be "technology-forcing."[71] According to the EPA's legal memorandum on the proposed Clean Power Plan:

[69] U.S. Environmental Protection Agency, *Background on Establishing NSPS Under the Clean Air Act*, available at http://www.epa.gov/region9/air/listening/BackgroundEstablishingNewSourcePerformanceStds.pdf
[70] Clean Power Plan Proposed Rule Legal Memorandum, pg. 38, citing *Portland Cement Ass'n v. Ruckelshaus*, 486 F.2d 375, 391-92 (D.C. Cir. 1973) (citations omitted).
[71] See Clean Power Plan Proposed Rule Legal Memorandum, pg. 39.

> EPA may identify as the best system of emission reduction adequately demonstrated, a system that would form the basis for emission standards that could be achieved by some, but not necessarily all, of the existing sources in the category. This approach is consistent with the technology-forcing purposes of section 111…[72]

The Council urges EPA to strengthen Building Blocks 3 & 4 based on the technology-forcing principles of §111(d). As stated previously, analysis indicates that Iowa could achieve significantly more stringent carbon reductions utilizing the state's unrealized renewable energy and energy efficiency savings potential. The fact that all existing sources under the proposed rule cannot readily achieve these reductions, should not preclude EPA from setting more stringent targets under Building Blocks 3 & 4, especially given the lengthy plan performance period (nearly a decade) and the potential for technological advancements during this time.

IV. EPA must balance credit for early emissions reductions with the overall stringency of the proposed rule.

There are important and related issues regarding credit for early action in the proposed rule. These include:

- Credit for actions states have taken to reduce emissions prior to the 2012 baseline year, if any;
- Credit for actions states have taken to reduce emissions between the 2012 baseline year and the submission of a state plan in 2016; and,
- Credit for and/or additional incentives for states to take action between 2016 (or even 2015) and the beginning of the compliance period in 2020.

The Council supports providing states with some level of appropriate credit for early action prior to the baseline year and/or submission of a state plan. In addition, the Council supports providing states with incentives to implement carbon pollution reductions between 2015 and 2020 and to remove all incentives to delay possible carbon pollution reductions until 2020 or later.

However, the Council strongly encourages EPA to balance credit for early action and credit or incentives to act between 2015 and 2020 with the overall stringency of the Clean Power Plan. If too much credit is provided for actions before 2020, the Clean Power Plan will result in too few activities to reduce carbon pollution after 2020. Because the Council believes the overall stringency of the Clean Power Plan should be increased for Iowa, we do not support recognition of additional early action without an increase in stringency. The Council also believes stringency could be increased without recognizing additional early action. If stringency is significantly

[72] Clean Power Plan Proposed Rule Legal Memorandum, pg. 39

increased, we support finding ways to recognize additional early action and provide incentives to act between 2015 and 2020.

Allowing Credit/Banking for All Emission Reductions Achieved Between 2012 -2020 would Improperly Weaken the Proposed Regulation

While EPA is accepting comments on an optional approach that would count emission reductions achieved prior to 2020 toward state compliance, EPA acknowledges that "total emissions to the atmosphere would likely be greater under this approach, unless the pre-2020 emission reductions that can be counted toward the state goal are limited to reductions that would not have occurred in the absence of the CAA section 111(d) program."[73]

Allowing states/utilities to: 1) bank credit for all emission reductions achieved from 2012 – 2020, and 2) apply that credit toward meeting emission performance targets during the plan performance period (2020-2029) would dramatically weaken the proposed rule since reductions during the 2012-2020 time period were not factored into EPA's established state targets. As detailed in Section III(A), if Iowa were to receive credit for all its recently added and currently planned renewable wind generation between 2012-2019, the state would currently be in compliance with its 2030 rate based target of 1,301 lbs/MWh.

The Council modeled the impact of allowing banking of renewable energy generated between 2013 and 2019 and allowing use of banked renewable energy during the 2020-2030 compliance period.[74] The banking could take the form of renewable energy credits or certificates banked at a 1 to 1 ratio of megawatt-hours to credits. We calculated that approximately 22,000 renewable energy credits could be banked between 2013 and 2019 with wind generation above the 2012 baseline (14,183 GWh). This would include energy generated by MidAmerican Energy's addition of 1,212 MW of wind during the 2013-2019 time frame.

With 22,000 renewable energy credits, approximately 2,000 could be used for each of the years in the 2020-2030 compliance period. We modeled the application of these credits on our "Best Estimate" of the real world, which accounts for actions that have occurred or are announced to occur in the 2013 to 2019 time frame (coal plant retirements, conversions to gas, etc.).[75] If this type of approach for banking were allowed, Iowa would be below the emissions target for the entire 2020 to 2030 time period, *even if no energy efficiency were achieved*. In other words, the Clean Power Plan would not require any additional actions during the compliance period. The banked credits from 2013 to 2019, along with other actions that have happened or will happen during the 2013 to 2019 time frame, would be enough to ensure Iowa meets the emissions target.

[73] 79 FR 34919
[74] Iowa Environmental Council Appendix, Impact of Banking of Renewable Energy, No Energy Efficiency, at 7.
[75] *Id*.

The Council suggests that EPA not allow banking of credits (renewable energy, energy efficiency, etc.) as part of the Clean Power Plan if the overall level of stringency is not increased. If EPA decides to significantly increase stringency, the Council believes some level of banking may be appropriate to consider, as a way to encourage action between 2015 and 2020 and as a way to increase flexibility for compliance.

Implicit Credit for Early Action on Renewable Energy and Coal Retirements

The Council encourages EPA to consider whether there is an appropriate balance between the implicit credit that states' have already received under the proposed regulation and overall stringency and long-term carbon reductions, as it makes a determination about how/whether to award states for taking early action.

As discussed in Section III(A), the proposed rules already build in implicit early credit for states, like Iowa, who are out-performing regional neighbors in renewable energy development.

In 2012, Iowa had already achieved its regionally-based renewable target of 15.114% (or 8,565,921 MWh), with over 25% of its energy generation derived from renewables (14,183,424 MWh). EPA has implicitly credited such achievement in its goal computation, capping annual renewable goals for over-performing states during 2017-2029 at the regional generation target (15.114% (8,565,921 MWh for Iowa) and not applying a growth factor to their actual renewable generation in 2012.

Calculating renewable generation using this regional approach significantly reduces overall carbon reduction requirements for states who have been early leaders in implementing clean, renewable energy. By using adjusted, regionally-based renewable energy generation targets to establish Iowa's emissions rate goal for 2030, EPA set Iowa's final emissions goal at 1,301 lbs/MWh. This amounts to a 16% reduction from its current emissions rate of 1,552 lbs/MWh. If EPA had used Iowa's actual renewable energy generation in 2012 to establish its emission reduction goal for 2030, Iowa's goal would have been more stringent: 1,168 lbs/MWh**.** This amounts to a 25% reduction in Iowa's current emissions rate.

In addition to renewable energy development, the proposed regulation rewards states that retire coal plants that were in operation in the 2012 baseline year but are then retired or converted to natural gas prior to 2020. As discussed previously in Section II(A), Iowa utilities have or are in the process of retiring and converting to gas a number of coal units in Iowa that were included in the 2012 baseline.

The combination of these coal plant retirements and conversions and the proposed methodology with Building Block 3 results in a 2030 emissions rate target that is not stringent and a target that Iowa will likely be in compliance with before 2020. The Council believes EPA could improve the balance between credit for early action and overall stringency in the final rule in order to ensure carbon reductions occur in Iowa both prior to 2020 and between 2020 and 2030.

V. EPA should provide clear and consistent guidance to states on key components of the final rule, such as how to calculate compliance, to prevent state's from diminishing carbon reduction requirements.

While it is important for states to retain flexibility under the proposed rule, such flexibility must have limits – particularly regarding state's abilities to develop their own evaluation, measurement and compliance calculations.

Similar to the approach EPA used in setting states' interim and final goals, which applied the same methodology across states, EPA should strengthen the proposed rule by providing a consistent approach for states to calculate compliance. Leaving states with discretion regarding compliance calculations (e.g, permitting states to calculate energy efficiency and renewable energy using an avoided emissions or an avoided generation approach) may result in states seeking the compliance calculation most favorable to them – and potentially weaken actual carbon reductions.

EPA should also provide further clarity about "what counts" toward compliance. For example, as currently proposed under the rule, "emission reductions that existing state requirements, programs, and measures achieve during a plan performance period as a result of actions taken after a specified date may be recognized in determining emission performance under a state plan."[76] EPA proposes that the "specified date" would be "the date of proposal of these emissions guidelines."[77]

The Council interprets this language as only permitting states to count emission reductions beginning in 2020 from programs/measures that were implemented on or after June 18, 2014. However, further clarity is needed regarding what emission reductions count toward state compliance.

[76] 79 FR 34918
[77] 79 FR 34918

Finally, further clarity is needed regarding the treatment of natural gas combined cycle plants built between 2013 and 2019, such as Alliant Energy's 600 MW NGCC plant (currently under construction) in Marshalltown, Iowa.

VI. Concluding Comments

In summary, the Council encourages EPA to strengthen the overall stringency of Iowa's interim and final emissions rate targets under the rule. According to analysis by the Council using *M.J. Bradley's Clean Power Plan Evaluation Tool*, if 1) EPA's proposed Alternative RE Approach, excluding existing hydropower was selected ("Alt. w/o hydro") and 2) Iowa's annual incremental savings rate ("maximum ramp-up level") was increased from 1.5% to 2% and the pace of improvement ("ramp-up step") from 0.2% to 0.25%, Iowa's interim target would change from 1,341 lbs/MWh to 1,041 lbs/MWh and the state's final target in 2030 would change from 1,301 lbs/MWh to 887 lbs/MWh.[78]

Given the state's cost effective and technically feasible renewable energy and energy efficiency potential, the nearly decade-long plan performance period, the potential for technological advancements from now until 2030, and the technology-forcing intent of §111(d) of the Clean Air Act, the Council believes Iowa could meet such a strengthened emissions rate target. Meeting a stronger emissions rate target will improve the environmental benefits from the proposal as well as the economic benefits from increased clean energy development in Iowa.

Ralph Rosenberg
Executive Director

[78] *See* M.J. Bradley, Supra.

REFERENCE CASE and BACKGROUND

The Reference Case is the set of Synapse default assumptions on the Clean Power Plan for Iowa. This includes the application of Building Blocks 3 and 4 from the EPA proposal, no application of Building Blocks 1 or 2 as well as the inclusion of load growth (based on AEO 2013). The Reference Case results in an emissions rate in 2030 that is similar to the 2012 baseline rate (load growth largely offsets improvements made from energy efficiency, and other building blocks do not result in reductions). The Reference Case can be used to compare the additional scenarios that follow, which test adjustments in renewables, efficiency, coal plant retirements, coal plant conversions to gas, and new construction of NGCC. The Synapse tool can test whether annual peak demand and annual generation requirements are met, whether the emission rate is met, and whether a mass-based emissions limit is met. For simplicity, we included only the key outputs of the annual emissions rate and annual generation from all sources. We also included all of our inputs to the model for each scenario.

The Reference Case emissions rates are 1,667 lbs/MWh in 2020 and 1,535 lbs/MWh in 2030.

INPUTS (Per the Iowa Environmental Council):					
RENEWABLES	**ENERGY EFFICIENCY**	**NON-111(D) GENERATION**	**2012 EXPORTS**	**DISPLACEMENT ORDER**	**CO2 PRICE**	**Unit-Specific Adjustments**
- Use 111d defaults – wind reduced from 14,183 GWh to 8,566 GWh - 100% on shore wind - Use default capacity factor for wind of 41%	- 111d defaults for energy efficiency performance - Synapse default for cost - 2013 AEO for load growth	- Add nothing	- Add nothing	- Leave defaults	- None	- No heat rate improvements - No NGCC increase to 70% - No changes to units operating in 2012

OUTPUTS:

111(d) Emissions Rate		**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
CP3T	*lbs/MWh*	1,553	1,539	1,542	1,551	1,553	1,733	1,711	1,688	1,667	1,646	1,627	1,611	1,597	1,582	1,570	1,560	1,552	1,542	1,535
EPA Target	*lbs/MWh*									1,398	1,382	1,367	1,353	1,341	1,331	1,322	1,313	1,307	1,301	1,301

Annual Generation		**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Coal	*GWh*	33,055	32,101	32,279	32,942	33,055	32,965	32,965	32,965	33,055	32,965	32,965	32,965	33,055	32,965	32,965	32,965	33,055	32,965	32,965
NGCC	*GWh*	1,437	1,434	1,434	1,434	1,437	1,434	1,434	1,434	1,437	1,434	1,434	1,434	1,437	1,434	1,434	1,434	1,437	1,434	1,434
O/G Steam	*GWh*	305	304	304	304	305	304	304	304	305	304	304	304	305	304	304	304	305	304	304
Other Fossil	*GWh*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nuclear - 111(d)	*GWh*	252	251	251	251	252	251	251	251	252	251	251	251	252	251	251	251	252	251	251
Renewables less Unbundled RECs	*GWh*	14,183	14,183	14,183	14,183	14,183	8,566	8,566	8,566	8,566	8,566	8,566	8,566	8,566	8,566	8,566	8,566	8,566	8,566	8,566
New EE	*GWh*	0	0	0	0	0	481	1,029	1,636	2,241	2,804	3,326	3,808	4,251	4,656	5,023	5,353	5,647	5,905	6,128
Non-111(d)	*GWh*	5,023	5,011	5,011	5,011	5,023	5,011	5,011	5,011	5,023	5,011	5,011	5,011	5,023	5,011	5,011	5,011	5,023	5,011	5,011
Imports	*GWh*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	*GWh*	54,256	53,285	53,463	54,126	54,256	49,012	49,560	50,167	50,879	51,335	51,857	52,339	52,890	53,187	53,554	53,884	54,285	54,436	54,659
Sales	*GWh*	49,142	48,171	48,348	49,012	49,481	50,006	50,456	50,994	51,337	51,732	52,176	52,473	52,736	52,962	53,169	53,359	53,552	53,751	53,938
Sales + Exports	*GWh*	54,256	53,285	53,463	54,126	54,595	55,120	55,570	56,109	56,452	56,846	57,290	57,587	57,851	58,076	58,283	58,473	58,667	58,865	59,053

MAINTAIN WIND BASELINE – NO EPA REDUCTIONS

This scenario models the impact of maintaining Iowa's 2012 level of renewable energy generation of 14,183 GWh. This amount of renewable energy is included in the EPA's proposed 2012 baseline calculation but then reduced in the application of the proposed Building Block 3 to 8,566 GWh. This scenario maintains 14,183 GWh of renewable energy generation for every year from 2012 to 2030.

The resulting emissions rate is 1,484 lbs/MWh in 2020 and 1,360 lbs/MWh in 2030.

INPUTS (Per the Iowa Environmental Council):						
RENEWABLES	**ENERGY EFFICIENCY**	**NON-111(D) GENERATION**	**2012 EXPORTS**	**DISPLACEMENT ORDER**	**CO2 PRICE**	**Unit-Specific Adjustments**
- Wind generation: 'User Input' with value of "0", which eliminates the reduction from the baseline. - 100% on-shore wind - Default capacity factor of 41%	- 111d defaults for energy efficiency performance - Synapse default for cost - 2013 AEO for load growth	- Add nothing	- Add nothing	- Leave defaults	- None	- No heat rate improvements - No NGCC increase to 70% - No changes to units operating in 2012

OUTPUTS:

111(d) Emissions Rate		**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
CP3T	*lbs/MWh*	1,553	1,539	1,542	1,551	1,553	1,536	1,520	1,501	1,484	1,466	1,450	1,434	1,419	1,406	1,393	1,383	1,373	1,366	1,360
EPA Target	*lbs/MWh*									1,398	1,382	1,367	1,353	1,341	1,331	1,322	1,313	1,307	1,301	1,301

Annual Generation		**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Coal	*GWh*	33,055	32,101	32,279	32,942	33,055	32,965	32,965	32,965	33,010	32,858	32,780	32,595	32,399	32,237	32,077	31,936	31,819	31,776	31,741
NGCC	*GWh*	1,437	1,434	1,434	1,434	1,437	1,434	1,434	1,434	1,437	1,434	1,434	1,434	1,437	1,434	1,434	1,434	1,437	1,434	1,434
O/G Steam	*GWh*	305	304	304	304	305	304	304	304	305	304	304	304	305	304	304	304	305	304	304
Other Fossil	*GWh*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nuclear - 111(d)	*GWh*	252	251	251	251	252	251	251	251	252	251	251	251	252	251	251	251	252	251	251
Renewables less Unbundled RECs	*GWh*	14,183	14,183	14,183	14,183	14,183	14,183	14,183	14,183	14,183	14,183	14,183	14,183	14,183	14,183	14,183	14,183	14,183	14,183	14,183
New EE	*GWh*	0	0	0	0	0	481	1,029	1,636	2,241	2,804	3,326	3,808	4,251	4,656	5,023	5,353	5,647	5,905	6,128
Non-111(d)	*GWh*	5,023	5,011	5,011	5,011	5,023	5,011	5,011	5,011	5,023	5,011	5,011	5,011	5,023	5,011	5,011	5,011	5,023	5,011	5,011
Imports	*GWh*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	*GWh*	54,256	53,285	53,463	54,126	54,256	54,630	55,178	55,785	56,452	56,846	57,290	57,587	57,851	58,076	58,283	58,473	58,667	58,865	59,053
Sales	*GWh*	49,142	48,171	48,348	49,012	49,481	50,006	50,456	50,994	51,337	51,732	52,176	52,473	52,736	52,962	53,169	53,359	53,552	53,751	53,938
Sales + Exports	*GWh*	54,256	53,285	53,463	54,126	54,595	55,120	55,570	56,109	56,452	56,846	57,290	57,587	57,851	58,076	58,283	58,473	58,667	58,865	59,053

ADD NEW/PLANNED WIND 2013-2019

This scenario maintains the 2012 baseline of 14,183 GWh and also adds 4,353 GWh to reflect construction of MidAmerican Energy's 1,050 MW and 162 MW wind projects. These projects are being built and generating electricity between 2013 and 2016, but for simplicity we model the generation starting only in 2016. At a capacity factor of 41% (Synapse default), 1,212 MW of wind would generate 4,353 GWh annually (1,212 x 8760 x.41). This results in a total of 18,536 GWh of wind annually starting in 2016 or 2017 (depending on construction timing, etc.).

This scenario results in an emissions rate of 1,294 lbs/MWh in 2020 and 1,178 lbs/MWh in 2030.

INPUTS (Per the Iowa Environmental Council):						
RENEWABLES	**ENERGY EFFICIENCY**	**NON-111(D) GENERATION**	**2012 EXPORTS**	**DISPLACEMENT ORDER**	**CO2 PRICE**	**Unit-Specific Adjustments**
- User input for new RE generation - "0" for 2012-2015 - "4,353" for 2016-2030 - 100% on-shore wind - Default capacity value (41%)	- 111d defaults for energy efficiency performance - Synapse default for cost - 2013 AEO for load growth	- Add nothing	- Add nothing	- Leave defaults	- None	- No heat rate improvements - No NGCC increase to 70% - No changes to units operating in 2012

OUTPUTS:

111(d) Emissions Rate		**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
CP3T	*lbs/MWh*	1,553	1,539	1,542	1,551	1,360	1,348	1,331	1,314	1,294	1,277	1,263	1,248	1,234	1,221	1,210	1,199	1,190	1,184	1,178
EPA Target	*lbs/MWh*									1,398	1,382	1,367	1,353	1,341	1,331	1,322	1,313	1,307	1,301	1,301

Annual Generation		**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Coal	*GWh*	33,055	32,101	32,279	32,942	29,041	29,102	29,005	28,935	28,657	28,505	28,427	28,242	28,046	27,884	27,724	27,583	27,466	27,423	27,388
NGCC	*GWh*	1,437	1,434	1,434	1,434	1,437	1,434	1,434	1,434	1,437	1,434	1,434	1,434	1,437	1,434	1,434	1,434	1,437	1,434	1,434
O/G Steam	*GWh*	305	304	304	304	305	304	304	304	305	304	304	304	305	304	304	304	305	304	304
Other Fossil	*GWh*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nuclear - 111(d)	*GWh*	252	251	251	251	252	251	251	251	252	251	251	251	252	251	251	251	252	251	251
Renewables less Unbundled RECs	*GWh*	14,183	14,183	14,183	14,183	18,536	18,536	18,536	18,536	18,536	18,536	18,536	18,536	18,536	18,536	18,536	18,536	18,536	18,536	18,536
New EE	*GWh*	0	0	0	0	0	481	1,029	1,636	2,241	2,804	3,326	3,808	4,251	4,656	5,023	5,353	5,647	5,905	6,128
Non-111(d)	*GWh*	5,023	5,011	5,011	5,011	5,023	5,011	5,011	5,011	5,023	5,011	5,011	5,011	5,023	5,011	5,011	5,011	5,023	5,011	5,011
Imports	*GWh*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	*GWh*	54,256	53,285	53,463	54,126	54,595	55,120	55,570	56,109	56,452	56,846	57,290	57,587	57,851	58,076	58,283	58,473	58,667	58,865	59,053
Sales	*GWh*	49,142	48,171	48,348	49,012	49,481	50,006	50,456	50,994	51,337	51,732	52,176	52,473	52,736	52,962	53,169	53,359	53,552	53,751	53,938
Sales + Exports	*GWh*	54,256	53,285	53,463	54,126	54,595	55,120	55,570	56,109	56,452	56,846	57,290	57,587	57,851	58,076	58,283	58,473	58,667	58,865	59,053

ADD NEW/PLANNED WIND 2013-2019; NO EFFICIENCY

This scenario maintains the 2012 baseline of 14,183 GWh and adds 4,353 GWh to reflect construction of MidAmerican Energy's 1,050 MW and 162 MW wind projects. These projects are being built and generating electricity between 2014 and 2016, but for simplicity we model the generation starting only in 2014. This scenario also eliminates any energy efficiency. The goal of this scenario is to understand the impact of the minimum amount of wind generation Iowa will have in operation in 2020 while doing nothing else for compliance (no energy efficiency, no heat rate improvements, no additional natural gas, etc.).

The resulting emissions rate is 1,392 lbs/MWh in 2020 and 1,425 lbs/MWh in 2030.

INPUTS (Per the Iowa Environmental Council):						
RENEWABLES	**ENERGY EFFICIENCY**	**NON-111(D) GENERATION**	**2012 EXPORTS**	**DISPLACEMENT ORDER**	**CO2 PRICE**	**Unit-Specific Adjustments**
- User input for new RE generation - "0" for 2012-2015 - "4,353" for 2016-2030 - 100% on-shore wind - Default capacity value (41%)	- No energy efficiency. User input of "0" in each year for cumulative EE	- Add nothing	- Add nothing	- Leave defaults	- None	- No heat rate improvements - No NGCC increase to 70% - No changes to units operating in 2012

OUTPUTS:

111(d) Emissions Rate		**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
CP3T	*lbs/MWh*	1,553	1,539	1,542	1,551	1,360	1,369	1,377	1,386	1,392	1,399	1,406	1,411	1,415	1,419	1,422	1,425	1,427	1,425	1,425
EPA Target	*lbs/MWh*									1,398	1,382	1,367	1,353	1,341	1,331	1,322	1,313	1,307	1,301	1,301

Annual Generation		**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Coal	*GWh*	33,055	32,101	32,279	32,942	29,041	29,583	30,033	30,572	30,898	31,309	31,753	32,050	32,297	32,540	32,746	32,936	33,055	32,965	32,965
NGCC	*GWh*	1,437	1,434	1,434	1,434	1,437	1,434	1,434	1,434	1,437	1,434	1,434	1,434	1,437	1,434	1,434	1,434	1,437	1,434	1,434
O/G Steam	*GWh*	305	304	304	304	305	304	304	304	305	304	304	304	305	304	304	304	305	304	304
Other Fossil	*GWh*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nuclear - 111(d)	*GWh*	252	251	251	251	252	251	251	251	252	251	251	251	252	251	251	251	252	251	251
Renewables less Unbundled RECs	*GWh*	14,183	14,183	14,183	14,183	18,536	18,536	18,536	18,536	18,536	18,536	18,536	18,536	18,536	18,536	18,536	18,536	18,536	18,536	18,536
New EE	*GWh*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-111(d)	*GWh*	5,023	5,011	5,011	5,011	5,023	5,011	5,011	5,011	5,023	5,011	5,011	5,011	5,023	5,011	5,011	5,011	5,023	5,011	5,011
Imports	*GWh*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	*GWh*	54,256	53,285	53,463	54,126	54,595	55,120	55,570	56,109	56,452	56,846	57,290	57,587	57,851	58,076	58,283	58,473	58,609	58,502	58,502
Sales	*GWh*	49,142	48,171	48,348	49,012	49,481	50,006	50,456	50,994	51,337	51,732	52,176	52,473	52,736	52,962	53,169	53,359	53,552	53,751	53,938
Sales + Exports	*GWh*	54,256	53,285	53,463	54,126	54,595	55,120	55,570	56,109	56,452	56,846	57,290	57,587	57,851	58,076	58,283	58,473	58,667	58,865	59,053

Iowa Environmental Council Comments on EPA's Proposed 111(d) Carbon Pollution Standards for Existing Electric Utility Generating Units - APPENDIX

BEST ESTIMATE – OVERALL REAL WORLD

This scenario is intended to evaluate the impact of changes in the overall electric system that have been made in 2013 and 2014 or that have been announced and will be completed in 2015, 2016 or 2017. We focused on utility actions that have a regulatory requirement of some type involved (e.g., legal settlement, regulatory order, permit change, etc.). This scenario models wind energy that has been or will be added by 2016; coal plants that have been retired in 2013 or 2014 or will be retired in 2015 or 2016; coal plants that have been converted to natural gas or will be converted by 2016; Alliant Energy's construction of a new 600 MW NGCC unit; and ongoing utility efficiency programs that are approximately the same as EPA assumptions in Building Block 4. This scenario is our best estimate of the electric system in Iowa by 2019 based on decisions made prior to June 1, 2014 (e.g., prior to release of the Clean Power Plan).

This scenario results in an emissions rate of 1,226 lbs/MWh in 2020 and 1,108 lbs/MWh in 2030.

INPUTS (Per the Iowa Environmental Council):						
RENEWABLES	**ENERGY EFFICIENCY**	**NON-111(D) GENERATION**	**2012 EXPORTS**	**DISPLACEMENT ORDER**	**CO2 PRICE**	**Unit-Specific Adjustments**
- Add 4,353 in 2016 - 100% on-shore wind - Default capacity factor	- 111d defaults for energy efficiency performance - Synapse default for cost - 2013 AEO for load growth	- Add 600 MW New NGCC in 2016, carry it to every year through 2030	- Add nothing	- Leave defaults	- None	- Coal plant retirements (see below) - Coal plant conversions to gas (see below) - Adjustments to capacity (see below) - No heat rate improvements - No NGCC increase to 70%

Unit Specific Calibrations: Coal retirements are based on recent announcements by utilities (publicly and in regulatory filings), legal settlements between utilities and EPA, and the Iowa DNR's comments to EPA on IPM data. The emissions rate and annual capacity factor for coal plants that convert to gas (Kapp, Riverside, etc.) is an unknown. We assumed the average OGST emissions rate calculated by EPA in the 2012 baseline for Iowa, which reflects the emission rate of 4 coal units that have recently converted to natural gas. We retained the annual capacity factor for the units converted to gas, although it is likely the capacity factor will change (and go down) when these units operate on gas instead of coal.

UNIT-SPECIFIC INPUTS (Per the Iowa Environmental Council):					
COAL RETIREMENTS	**CONVERSIONS TO GAS**	**REDUCED CAPACITY**			
- WSEC 1 – 2016 - WSEC 2 – 2016 - Neal North 1 – 2016 - Neal North 2 – 2016 - Pella – 2013 - Fair Station – 2013 - Fair Station – 2013 - Dubuque 3 – 2015 - Dubuque 4 – 2015 - Sutherland 1 – 2015 - Sutherland 3 – 2015	Changed the emissions rate to 2,422 lbs/MWh starting in 2015 for the following plants, to reflect conversion from coal to gas (2,422 is the Iowa average emissions rate for OGST plants, which are all coal plants that have recently converted from coal to gas): - Kapp - Riverside - Ames 7 - Ames 8 - Earl Wisdom 1	Kapp capacity is lowered to 95 MW starting in 2015 (per Alliant filing in Iowa Utilities Board Docket No. 2014-EPB-0001, indicating that it would lower the capacity after switching to natural gas because of limited fuel availability and other factors)			

OUTPUTS:

111(d) Emissions Rate		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
CP3T	*lbs/MWh*	1,553	1,537	1,540	1,535	1,293	1,281	1,264	1,247	1,226	1,209	1,194	1,179	1,164	1,151	1,140	1,129	1,120	1,113	1,108
EPA Target	*lbs/MWh*									1,398	1,382	1,367	1,353	1,341	1,331	1,322	1,313	1,307	1,301	1,301

Annual Generation		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Coal	*GWh*	33,055	32,101	32,279	32,556	26,447	26,516	26,418	26,349	26,063	25,919	25,841	25,656	25,452	25,297	25,137	24,997	24,872	24,837	24,801
NGCC	*GWh*	1,437	1,434	1,434	1,434	1,437	1,434	1,434	1,434	1,437	1,434	1,434	1,434	1,437	1,434	1,434	1,434	1,437	1,434	1,434
O/G Steam	*GWh*	305	304	304	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Fossil	*GWh*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nuclear - 111(d)	*GWh*	252	251	251	251	252	251	251	251	252	251	251	251	252	251	251	251	252	251	251
Renewables less Unbundled RECs	*GWh*	14,183	14,183	14,183	14,183	18,536	18,536	18,536	18,536	18,536	18,536	18,536	18,536	18,536	18,536	18,536	18,536	18,536	18,536	18,536
New EE	*GWh*	0	0	0	0	0	481	1,029	1,636	2,241	2,804	3,326	3,808	4,251	4,656	5,023	5,353	5,647	5,905	6,128
Non-111(d)	*GWh*	5,023	5,011	5,011	5,011	7,922	7,902	7,902	7,902	7,922	7,902	7,902	7,902	7,922	7,902	7,902	7,902	7,922	7,902	7,902
Imports	*GWh*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	*GWh*	54,256	53,285	53,463	53,435	54,595	55,120	55,570	56,109	56,452	56,846	57,290	57,587	57,851	58,076	58,283	58,473	58,667	58,865	59,053
Sales	*GWh*	49,142	48,171	48,348	49,012	49,481	50,006	50,456	50,994	51,337	51,732	52,176	52,473	52,736	52,962	53,169	53,359	53,552	53,751	53,938
Sales + Exports	*GWh*	54,256	53,285	53,463	54,126	54,595	55,120	55,570	56,109	56,452	56,846	57,290	57,587	57,851	58,076	58,283	58,473	58,667	58,865	59,053

IMPACT OF BANKING OF RENEWABLE ENERGY, NO ENERGY EFFICIENCY

This scenario models the impact of allowing the banking of renewable energy (e.g., renewable energy credits or certificates) between 2013 and 2019 and use of the banked renewable energy during the 2020-2030 compliance period. We used the previous "Best Estimate – Overall Real World" scenario as the starting point. To highlight the impact of banking, we zeroed out energy efficiency for the time frame. We calculated that approximately 22,000 renewable energy credits are likely to be banked from 2013 to 2019 (2,000 GWh in 2014, 2,500 GWh in 2015, 4,353 GWhs in each of next 4 years). We then assumed the 22,000 credits could be spread evenly over the compliance period, with 2,000 used each year from 2020 to 2030. The scenario demonstrates that if banking is allowed, Iowa could do nothing further and fully comply with the proposed emissions rate – including no further energy efficiency. The banked renewable energy credits from wind energy that is already built or will be built by 2016, along with other actions that have been taken or will be taken by 2016, allow Iowa to more than meet the proposed emissions rate from 2020 to 2030.

The resulting emissions rate is 1,237 lbs/MWh in 2020 and 1,288 lbs/MWh in 2030.

INPUTS (Per the Iowa Environmental Council):						
RENEWABLES	**ENERGY EFFICIENCY**	**NON-111(D) GENERATION**	**2012 EXPORTS**	**DISPLACEMENT ORDER**	**CO2 PRICE**	**Unit-Specific Adjustments**
- Add 4,353 GWh for 2016-2019 - Add 6,353 GWh starting in 2020 and each year to 2030 (4,353 GWh actual plus 2,000 banked credits per year) - 100% on-shore wind - Default capacity factor	- No energy efficiency. User input of "0" in each year for cumulative EE	- Add 600 MW New NGCC in 2016, carry it to every year through 2030	- Add nothing	- Leave defaults	- None	- No heat rate improvements - No NGCC increase to 70% - Use of unit-specific adjustments from "Best Estimate" scenario above (coal plant retirements, etc.)

OUTPUTS:

111(d) Emissions Rate		**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
CP3T	*lbs/MWh*	1,553	1,537	1,540	1,535	1,293	1,304	1,313	1,323	1,237	1,245	1,254	1,260	1,265	1,270	1,273	1,277	1,280	1,284	1,288
EPA Target	*lbs/MWh*									1,398	1,382	1,367	1,353	1,341	1,331	1,322	1,313	1,307	1,301	1,301

Annual Generation		**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Coal	*GWh*	33,055	32,101	32,279	32,556	26,447	26,997	27,447	27,985	26,304	26,723	27,167	27,464	27,703	27,953	28,160	28,349	28,519	28,742	28,929
NGCC	*GWh*	1,437	1,434	1,434	1,434	1,437	1,434	1,434	1,434	1,437	1,434	1,434	1,434	1,437	1,434	1,434	1,434	1,437	1,434	1,434
O/G Steam	*GWh*	305	304	304	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Fossil	*GWh*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nuclear - 111(d)	*GWh*	252	251	251	251	252	251	251	251	252	251	251	251	252	251	251	251	252	251	251
Renewables less Unbundled RECs	*GWh*	14,183	14,183	14,183	14,183	18,536	18,536	18,536	18,536	20,536	20,536	20,536	20,536	20,536	20,536	20,536	20,536	20,536	20,536	20,536
New EE	*GWh*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-111(d)	*GWh*	5,023	5,011	5,011	5,011	7,922	7,902	7,902	7,902	7,922	7,902	7,902	7,902	7,922	7,902	7,902	7,902	7,922	7,902	7,902
Imports	*GWh*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	*GWh*	54,256	53,285	53,463	53,435	54,595	55,120	55,570	56,109	56,452	56,846	57,290	57,587	57,851	58,076	58,283	58,473	58,667	58,865	59,053
Sales	*GWh*	49,142	48,171	48,348	49,012	49,481	50,006	50,456	50,994	51,337	51,732	52,176	52,473	52,736	52,962	53,169	53,359	53,552	53,751	53,938
Sales + Exports	*GWh*	54,256	53,285	53,463	54,126	54,595	55,120	55,570	56,109	56,452	56,846	57,290	57,587	57,851	58,076	58,283	58,473	58,667	58,865	59,053