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U.S. Environmental Protection Agency
Mailcode: 2822T
1200 Pennsylvania Ave., NW
Washington, D.C. 20460

Re: Docket ID No. EPA-HQ-OAR-2013-0602
Comments of MidAmerican Energy Company on the Proposed Carbon Emission
Guidelines for Existing Stationary Sources: Electric Utility Generating Units

To Whom It May Concern:

MidAmerican Energy Company ("MidAmerican"), a wholly-owned subsidiary of Berkshire Hathaway Energy Company, is a multi-jurisdictional utility providing electric and natural gas retail service to approximately 739,000 electric customers and approximately 719,000 natural gas customers in Iowa, Illinois, Nebraska and South Dakota. MidAmerican owns or operates electric generating facilities utilizing hydroelectric, wind, natural gas, nuclear and coal resources. Renewables make up a larger percentage of MidAmerican's nameplate generation capacity than any other rate-regulated utility in the country with approximately 32% of its nameplate generating capacity being renewable. Notwithstanding this significant focus on renewable generation, MidAmerican believes a diversified generating portfolio is important to ensuring reliable, reasonably priced electricity. The remainder of MidAmerican's generating capacity is made up of approximately 44% coal, 18% natural gas and oil, and 6% nuclear and other. MidAmerican has implemented an "all of the above" strategy in its electric generation portfolio.

MidAmerican's facilities, operations and customers will be impacted by EPA's proposed Clean Power Plan and its comments focus on MidAmerican's individual experiences, observations and concerns.

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Introduction

MidAmerican's comments encompass EPA's proposed Clean Power Plan, including the Notice of Data Availability published October 28, 2014. The comments first review the components of the Best System of Emission Reduction and recommend changes to each component based on MidAmerican's experiences with heat rate improvements, utilization of natural gas resources, renewable energy development, and end-use energy efficiency programs. Second, MidAmerican's comments describe a number of important issues EPA should consider to ensure the final rule is designed to achieve realistic and sustainable results. Finally, MidAmerican identifies several technical errors in the data EPA used to formulate its proposal, which should be corrected in the final rule.

Notwithstanding the significant legal issues that are likely to be raised regarding the Clean Power Plan, MidAmerican's comments focus on the rule as proposed and provide suggestions to improve the rule, assuming it is implemented.

I. Best System of Emission Reductions

MidAmerican supports the flexible compliance concepts in EPA's proposed Clean Power Plan; EPA should continue to ensure the intended flexibility is carried through in the final rule. The methodology for determining the Best System of Emission Reduction ("BSER") should be carefully examined to ensure that it is firmly based on realistic assumptions for implementation and achievement of emissions reductions. MidAmerican provides the following comments and recommendations on the building blocks which comprise BSER in order to highlight challenges with the proposed rule and offer constructive solutions.

A. Building Block 1: Heat Rate Improvements

1. EPA should revise Building Block 1 to target no greater than a 1% average heat rate improvement across the existing coal-fueled generating fleet

MidAmerican agrees that efficient operation of existing fossil-fueled units contributes to carbon dioxide ("CO₂") emissions reductions. In the Clean Power Plan, EPA proposes to require up to a 6% heat rate improvement at existing coal-fueled facilities as the first step towards achieving the rule's emission goals. The basis for the 6% heat rate improvement is assessed by the EPA as the average net heat rate improvement available to each electric generating unit ("EGU") in calendar year 2012. This assumption is based, in part, on Sargent and Lundy's ("S&L") 2009 report, *Coal-Fired Power Plant Heat Rate Reductions*. EPA's statistical analysis finds that a 6% heat rate improvement for their coal study population can be achieved through two types of changes: best practices that have the potential to improve heat rate by 4%, and equipment upgrades that have the potential to improve heat rate by 2%.¹

MidAmerican believes that EPA's analytical assumptions for heat rate improvement projects are not practicable and in some cases technically infeasible because efficiency improvements may already be completed or in place at existing coal-fueled units which are expected to continue

¹ GHG Abatement Measures TSD at 2-34.

operating after 2020, because new emissions control equipment installed for compliance with other environmental programs will require additional station power use and reduce plant efficiency from the level used as a baseline in EPA's goal-setting calculation, and because implementation of Building Blocks 2 and 3 may offset emissions reductions achieved by Building Block 1.

Energy Efficiency Improvements at Existing Units

MidAmerican has reviewed its EGUs in light of EPA's analytical heat rate assumptions. Minimizing heat rate (maximizing unit efficiency) is a key operating objective for MidAmerican's coal-fueled generating units. MidAmerican, like many utilities, has an economic incentive to improve operating efficiencies and therefore already exercises best operating practices and implements capital projects to improve heat rate where economically justified. A number of the equipment upgrades or changes suggested in the S&L report were implemented by MidAmerican on generating units during or before 2012, including turbine section replacements, which provide the most significant opportunity to improve heat rate at a coal-fueled facility. Other efficiency improvement projects, such as cooling system heat loss recovery, flue gas heat recovery, low-rank coal drying, expanded use of energy efficiency equipment and combined heat and power operations, have been deemed to be technically infeasible for MidAmerican's units. Some of MidAmerican's units were the first coal-fueled units in the country to specifically undertake greenhouse gas best achievable control technology ("BACT") reviews subsequent to the issuance of the GHG BACT requirements; these BACT reviews affirmed that these measures were not feasible.²

Efficiency improvements represent only part of the investment MidAmerican has made to improve the environmental performance of its coal-fueled generating fleet. MidAmerican has also installed air quality control equipment to meet environmental requirements under such rules as the Mercury and Air Toxics Standards. This equipment improves the quality of flue gas exiting the stack, but also requires station power for operation. The increased station power consumption reduces plant efficiency and increases net plant heat rate. Coal facilities that placed this equipment in service after 2012 will need some amount of energy efficiency improvement just to restore plant efficiency to the baseline level used in the EPA's calculations.

Interactions among Building Blocks Counteract Heat Rate Improvements

The interaction among Building Blocks 1, 2 and 3 may serve to counteract heat rate improvements that can reasonably be achieved. Many renewable technologies, such as wind and solar, produce intermittent generation. To manage the variability and uncertainty inherent with intermittent renewable resources, system operators must have sufficient resources with operational flexibility held in reserve to quickly respond to fluctuations in load. Natural-gas fueled resources are designed to respond to changes in load more readily than coal-fueled resources, which operate most efficiently at or near full load. As coal-fueled units operate at lower loads to accommodate the generation shifts brought about by Building Blocks 2 and 3,

² George Neal Units 3 and 4 completed the GHG BACT process in 2011. See MidAmerican's greenhouse gas Best Available Control Technology analysis for its George Neal South operating unit, "Air Construction Permit Application," PN-10-658 (Dec. 10, 2010; amended January 26, 2011). Available at <https://programs.iowadnr.gov/airqualityconstructionpermits/Pages/PSD/PSDSearchResult.aspx> (last accessed Nov. 19, 2014). The technical infeasibility conclusions for Neal Unit 4 would apply to other units for similar reasons.

their overall efficiency declines. As a consequence, the heat rates of the coal-fueled generating assets will be negatively impacted.

As a result of these factors and its experience with heat rate improvement opportunities, MidAmerican estimates that less than a 1% improvement in the average fleet-wide heat rate of MidAmerican's coal-fueled units may be economically practicable and/or technically feasible if *all* identified heat-rate improvement opportunities were ultimately implemented. Accordingly, MidAmerican recommends that EPA should adjust Building Block 1 to require no more than a 1% heat rate improvement across the existing coal-fueled generating fleet.

2. EPA should not include heat rate improvement opportunities from non-coal fueled units as part of BSER

MidAmerican supports EPA's determination to not include heat rate improvements on non-coal-fueled units as part of BSER. Generally, as EPA noted, the opportunities for heat rate improvements on natural gas combined-cycle ("NGCC") and oil-fueled units are extremely limited³ and the most significant improvements may result in a unit triggering the applicability of the modified and reconstructed sources provisions of Section 111(b) or New Source Review requirements. MidAmerican believes the potential for heat rate improvements at non-coal fueled resources is limited and the potential modifications to make those improvements will not be economically justified. Depending on the underlying combustion turbine type and model, best case heat rate improvements are less than 1%. Furthermore, owners of these facilities have existing economic incentives to exercise best operating practices; any estimated future improvements in heat rate due to operating practices is likely minimal. In addition, as a consequence of the U.S. NGCC fleet's relative young age and advanced design, the potential for improving the heat rate on these facilities is likely to be very small.

B. Building Block 2: Increased Utilization of NGCC Units

As the second component of BSER, EPA proposes that the utilization of existing NGCC resources will increase up to 70% capacity factors. In turn, the increased utilization of NGCC resources will displace utilization of existing coal-fueled units, thereby reducing overall emissions. This generation shift is anticipated to occur by 2020. In general, MidAmerican supports the use of resource dispatch as a mechanism for achieving carbon emission reductions. However, MidAmerican has identified several data discrepancies that, once adjusted, will improve the accuracy of the assumptions that inform Building Block 2. MidAmerican recommends EPA consider the following adjustments to Building Block 2 to incorporate data that more appropriately characterize existing NGCC resources.

1. EPA should utilize maximum dependable capacity ratings rather than nameplate capacity to estimate a more realistic amount of energy available for re-dispatch from NGCCs

EPA's analysis evaluates the capability of combined cycle resources based on capacity values posted in the 2012 eGRID report. These capacity values are facility nameplate capacities, which

³ Clean Power Plan ("CPP"). 79 Fed. Reg. at 34877.

do not accurately represent the actual net dispatchable capability of these resources. In the case of MidAmerican's Greater Des Moines Energy Center, by using nameplate capacity, the unit's capability is overestimated by 17% (576 MW of nameplate capacity versus 492 MW of accredited capacity). As a result, a 70% capacity factor for this unit actually results in a net capacity factor of 82% – a significant difference. EPA should recalculate Building Block 2 on the basis of maximum dependable capacity ratings as determined by the 2012 NERC GADS summer net dependable capacity ratings to provide a more accurate accounting of the energy likely to be available for re-dispatch from existing NGCC units.

2. EPA should assume an emission rate for re-dispatched existing NGCC units that is no more stringent than a New Source Performance Standard emission rate

In the development of BSER, EPA's calculations result in an assumption that all existing NGCCs re-dispatched to a 70% capacity factor would operate at a national-average emission rate of 865 lb CO₂/MWh. This emission rate is significantly more stringent than the proposed greenhouse gas emission standard for new sources.⁴ An existing source performance standard should not be more stringent than what EPA determined to be BSER for the new source performance standard for the same pollutant. EPA should adjust Building Block 2 so that existing NGCCs are assumed to operate at an emission rate of 1,000 lb CO₂/MWh.

3. EPA should not expand BSER to require the installation of new NGCC units, the co-firing of natural gas at existing coal-fueled units, or the regional implementation of Building Block 2; nor should EPA assume a minimum level of generation shift from coal to natural gas resources for states

In a notice of data availability ("NODA") issued for the proposed Clean Power Plan on October 28, 2014, EPA solicited additional comments on a number of issues, including whether Building Block 2 should contain further requirements to utilize natural gas generation resources. EPA reiterates its request for comment on whether the scope of Building Block 2's contribution to BSER should be broadened to include construction of new NGCC units and/or co-firing natural gas with coal. While MidAmerican understands that EPA is considering these two elements as ways to reduce perceived disparities between those states with little or no NGCC capacity and those with significant NGCC capacity, expanding the portion of BSER based on Building Block 2 to include re-dispatch to new NGCC and/or co-firing natural gas increases the stringency of emission reduction targets overall and reduces the flexibility states have to achieve their emission goals. The way to address the inadequacies associated with the application of BSER on a state by state basis is to allow greater flexibility in compliance, *not* to make the BSER formula more complex. Accordingly, MidAmerican does not believe either new NGCC resources or co-firing should be included in EPA's determination of BSER, but MidAmerican does believe that both options are valid tools states could use in their compliance plans to achieve emissions reductions required by application of BSER to their respective generating fleets.

⁴ Standards of Performance for Greenhouse Gas Emissions from New Stationary Sources: Electric Utility Generating Units; Proposed Rule. 79 Fed. Reg. 1430 *et seq.* January 8, 2014.

EPA has already concluded that due to the costs associated with the additional use of natural gas, the capital investment costs, and the unevenly distributed nature of costs of pipeline infrastructure expansion needed to accommodate a significant build-out of new NGCC sources, “there would be a higher cost for CO₂ reductions achievable from re-dispatch to new NGCC capacity than from other options...”⁵ Therefore, EPA did not include a re-dispatch to new NGCC sources as part of the basis for BSER. MidAmerican agrees with this conclusion. MidAmerican further believes that EPA should not establish a minimum value for the amount of generation shift that can be achieved via Building Block 2. Such a mandate interferes with EPA’s expressed desire to provide the states flexible compliance mechanisms and impedes principles of cooperative federalism by dictating certain resource utilization outcomes. Resource utilization decisions are the purview of state economic regulators and should be maintained as state determinations.

MidAmerican does not support the inclusion of co-firing natural gas in the EPA’s determination of the BSER. There are significant technical and environmental constraints that would prevent wholesale adoption of co-firing. For example, MidAmerican’s Walter Scott Energy Center Unit 4, which achieved commercial operation in 2007, is restricted by permit to firing on coal and #2 fuel oil. It would take significant permitting and equipment modifications to enable the unit to reach full load, let alone start up, on natural gas. Even if the equipment changes were economically feasible, there is insufficient natural gas infrastructure in the facility’s vicinity to provide firm gas supplies necessary to co-fire the unit on coal and natural gas.

EPA also requested comments on whether to establish emission targets under Building Block 2 on a regional basis.⁶ EPA states the purpose of a regional approach would be to address the concern that states with little existing natural gas infrastructure do not have the same opportunities to shift generation to lower-emitting NGCC units. However, resource selections are determined, in part, on a utility’s customer load. New resources are added only if there is sufficient load to justify the need for additional resources or in response to a state’s energy policies. There may be circumstances where projected load growth can be met at lower costs by installation of a combustion turbine but installation of a more costly NGCC would be required in order to meet targets based on a regional application of Building Block 2. This regional approach reduces states’ flexibility to accomplish emission reductions and could force customers to pay for additional resources simply to accomplish a shift to natural gas resources. A regional application of Building Block 2 to advance the use of natural gas may also serve to discourage increased utilization of renewable energy and end-use energy efficiency programs. MidAmerican’s experience in developing and operating renewable energy over the last decade demonstrates that significant emission reductions can be achieved without dictating quotas for certain types of generating resources. Maintaining this flexibility in resource planning is critical for states and utilities as they implement the final rule. MidAmerican does not believe that EPA should adopt a regional approach to Building Block 2.

⁵ CPP, 79 Fed. Reg. at 34876-77.

⁶ *See Id.* at 34865, 34899; and Notice of Data Availability (“NODA”), 79 Fed. Reg. at 64550.

C. Building Block 3: Increased Utilization of Zero-Emitting Resources

MidAmerican supports EPA's inclusion of renewable energy, based on an average of regional renewable portfolio standards, in its BSEB determination. MidAmerican's experience as a leader in renewable energy development demonstrates that renewable energy may be a cost-effective and meaningful way to help achieve compliance with state 111(d) targets. MidAmerican recommends the following adjustments to Building Block 3 to recognize the importance of renewable energy in reducing greenhouse gas emissions and clarify how states may utilize renewable energy resources for compliance purposes.

1. EPA should allow states to use renewable energy credits as a compliance mechanism for purposes of 111(d)

In the State Plan Considerations TSD, EPA contemplates a rate-based tradable credit system whereby "a state would issue adjustment credits based on avoided CO₂ emissions achieved through end-use energy efficiency and renewable energy measures".⁷ EPA also discusses tradable renewable energy credits ("RECs") in the context of state renewable portfolio standards ("RPS").⁸ MidAmerican understands that the proposed rule includes the ability for states to take credit for 111(d) compliance as well as RPS requirements without duplicating compliance credit.⁹ The final rule should make this more explicit. This is important because under current market mechanisms, RECs may be generated and traded *independent from* a state RPS.

MidAmerican submits that the use of RECs as the tradable instrument under a rate-based trading program is an appropriate compliance mechanism to implement Building Block 3; EPA should allow states to utilize REC trading programs to demonstrate compliance with the Clean Power Plan. The following components of a rate-based trading mechanism should be incorporated as a compliance option in the final rule.

a. RECs may be surrendered by the generator or sold to another regulated entity for surrender

MidAmerican, like many utilities, owns and operates both affected fossil-fueled facilities and renewable energy facilities. Utilities should be able to utilize RECs associated with their renewable generation to demonstrate compliance with emissions reduction requirements by surrendering RECs. EPA should acknowledge in the final rule that states have the flexibility to expand or implement REC trading such that RECs may be sold at market value to any entity or state needing additional environmental attributes to demonstrate compliance. Incorporating a tradable-REC program into a rate-based compliance mechanism takes advantage of existing tools and resources, which minimizes a state's need to develop novel mechanisms to demonstrate compliance. In addition, REC purchases and sales may be a low-cost compliance option which helps offset compliance costs and minimizes customer rate impacts.

⁷ State Plan Considerations TSD at 7, n.2.

⁸ See, e.g., State Plan Considerations TSD at 61 *et seq.*

⁹ CPP. 79 Fed. Reg. at 34913.

b. A single REC may be utilized for compliance with multiple programs so long as it is used for only one state's 111(d) compliance program

In recognizing the interstate nature of the electric grid in general and the interstate transfer of renewable energy credits in particular, EPA indicated a desire to avoid double-counting RECs. MidAmerican agrees that RECs should not be double counted for purposes of compliance with Section 111(d) emission targets. However, RECs bundle together a number of environmental attributes associated with renewable energy generation; a reduction in carbon emissions attributable to renewable energy generation is but one stick in that bundle. The final rule should specify that a single REC can be utilized for multiple programs so long as it is not utilized for compliance with more than one state's Section 111(d) compliance plan. For example, the same REC can be assigned attributes to comply with a state's RPS or voluntary programs, as well as a 111(d) program. This approach provides maximum flexibility to states and regulated parties, recognizes the importance of renewable energy generation in reducing greenhouse gas emissions from the power sector, and encourages additional renewable energy development.

c. Companies should be able to bank RECs for future compliance

The proposed rule discusses how market-based emissions budget trading programs such as the Regional Greenhouse Gas Initiative "offer[] flexibility to regulated parties" through provisions including allowance banking.¹⁰ EPA requested comment on ways to provide credit for early action¹¹ and MidAmerican believes the ability to bank RECs, without expiration, is one such appropriate method. EPA should clarify in the final rule that RECs generated beginning January 1, 2013, and not yet sold may be banked and utilized for compliance beginning in 2020. Without the ability to bank RECs, there is little incentive to develop renewable energy projects before 2020, resulting in a loss of incremental environmental benefits that accompany the installation of renewable energy generation.

2. EPA should include existing renewable energy generation in the goal-setting calculation and EPA should allow states to include existing renewables in their compliance plans; EPA should not establish a renewable energy "floor" based on 2012 generation

In its proposal, EPA included existing non-hydro renewable generation in its calculation of each state's base-year megawatt hours. While this effectively makes targets more stringent for states with significant existing renewable resources by including megawatt hours from renewable generation in the goal-setting calculation, EPA also proposes to allow states to include existing renewables for compliance purposes beginning in 2020. This approach appropriately recognizes companies and customers with a long history supporting the installation of renewable energy. The exclusion of existing renewables from BSER would result in significantly increased costs and would exacerbate many issues related to increased deployment of renewables and the need to develop new fossil or other baseload resources in accordance with demand. It is critically important that EPA retain in its final rule the flexibility for states to utilize existing renewable resources for compliance purposes.

¹⁰ CPP. 79 Fed. Reg. at 34881.

¹¹ NODA. 79 Fed. Reg. at 64545.

EPA notes in the proposal that for some states, the renewable energy generation targets developed using the BSER methodology are less than the states' reported renewable energy generation amounts for 2012; EPA then requests comment on whether the approach for quantifying the renewable energy generation component of each state's goal should be modified to include a floor based on the reported 2012 renewable energy generation in that state.¹² MidAmerican believes that EPA should not establish a renewable energy "floor" based on 2012 generation. Such an outcome penalizes states for early actions and sends the message that voluntary reductions should be avoided.

3. EPA should not finalize either proposed alternative methodology to establish state renewable energy targets

EPA proposed to establish each state's renewable energy target under Building Block 3 based on an average of regional RPS requirements. EPA proposed an alternative methodology based on the technical and market potential for renewables in each state. In the NODA, EPA proposed an additional method by which renewable targets would be established based on regional potential and allocated to states in a region according to some to-be-defined criterion.¹³ MidAmerican agrees that the misalignment between the renewable generation reflected in a state's goal-setting calculation and the renewable generation available for compliance with the emission goals must be corrected. MidAmerican does not believe, however, that either proposed alternative to the Building Block 3 methodology appropriately resolves this misalignment. Both alternatives concern the technical potential to install renewable energy, yet renewable energy potential is not equivalent to renewable energy availability. MidAmerican believes that technical potential is not an appropriate metric for determining renewable energy targets under the Clean Power Plan; EPA's alternative methodologies should not be adopted.

The technical potential data are based on NREL's "U.S. Renewable Energy Technical Potential: A GIS based analysis" (July 2012). In general, the bulk of the estimated renewable potential is solar photovoltaic (PV) energy. This is followed by wind and, to a much lesser extent, hydropower and geothermal. In the case of estimating total solar potential, the results of the NREL study are based on (a) solar power density multiplied by (b) estimated applicable acreage, and (c) an adjustment for solar insolation. The two key factors are power density and available land, both of which are greatly over estimated. For example, NREL's methodology is based on a power density of 32.9 and 48 MW per square kilometer for concentrating solar power (CSP) and utility scale single axis solar PV, respectively. However, NREL's more recent report on actual solar power densities of utility scale projects in the United States are 26.3 and 30 MW per square kilometer for CSP and single axis utility scale PV, respectively.¹⁴ Based on the NREL data alone, solar potential is greatly overestimated.

Furthermore, the available land area for technical potential is based on NREL GIS exclusion criteria. The exclusionary zones used by NREL appear to focus primarily on federal lands such

¹² CPP, 79 Fed. Reg. at 34868.

¹³ See NODA, 79 Fed. Reg. at 64551.

¹⁴ See "Land-Use Requirements for Solar Power Plants in the United States," National Renewable Energy Laboratory, June 2013.

as federal parks, federal wilderness, national conservation areas and the like.¹⁵ The study does not address various additional constraints to renewable energy development that exist across the states. In Iowa, for example, locations of viable wind projects are influenced by proximity to potential habitat for protected and other sensitive species such as the Indiana bat and bald eagle, as well as state recreation areas and conservation lands, farmsteads, and lands that may pose geotechnical limitations to construction. These constraints may significantly reduce land areas available for development of additional renewable energy in Iowa and have not been appropriately considered in these alternatives.

MidAmerican recommends that EPA evaluate whether it can improve the regional RPS approach by simply applying the proposed targets to a state's retail electricity sales rather than total in-state electric generation. Applying the renewable energy targets to a state's retail sales may effectively solve compliance issues, especially those created by the export or import of renewable energy, and more closely align the final rule with the existing state RPS policies upon which the rule relies.

4. EPA should not adjust state goals to shift 2012 generation from fossil-fueled resources from the application of Building Blocks 3 and 4

In the NODA, EPA proposes to adjust state goals to incorporate reductions in fossil generation as a result of increased utilization of renewable energy and energy efficiency as a way to “reflect the full potential, under BSER, for incremental RE and EE to replace fossil steam generation.”¹⁶ EPA thus proposes two ways to calculate a generation shift resulting from the application of Building Blocks 3 and 4, either by replacing all historical fossil generation on a pro rata basis or by replacing historical fossil generation on a prioritized basis. EPA requests comment on which approach better reflects the BSER. In MidAmerican's view, neither approach reflects the BSER and EPA should not adopt either one. BSER is a system of emissions reduction – it is not a system of generating-source elimination, nor is it a system of maximum emissions reductions.

MidAmerican believes that the approach EPA used in the June 2014 proposal is appropriate and should not be changed in the final rule. EPA explains that the change in methodology proposed in the NODA may be warranted in order to ensure consistency in application among the various building blocks. However, such an understanding assumes that incremental renewable generation and incremental generation avoided through energy efficiency are equivalent to fossil generation. In reality, incremental renewable energy and energy efficiency cannot meet baseload requirements due to the variable nature of these resources. The best system of emission reduction is most appropriately based on a system that augments – not replaces – historical fossil generation. This allows states to achieve meaningful emissions reductions by prioritizing operation of less carbon-intensive resources while using baseload fossil generation to backstop functionality and reliability of the national electric system.

¹⁵ *Id.* at 27.

¹⁶ NODA, 79 Fed. Reg. at 64552.

D. Building Block 4: Demand-Side Energy Efficiency

MidAmerican supports the inclusion of energy efficiency resources as an effective way to reduce load and therefore carbon emissions from fossil-fueled EGUs. MidAmerican first implemented its Iowa energy efficiency program in 1994, and MidAmerican's plan was reviewed by EPA in the development of the proposed rule.¹⁷ With its two decades of successful energy efficiency plan implementation, resulting in significant cost savings to customers, MidAmerican carefully examined how energy efficiency is utilized in the development of state 111(d) targets. MidAmerican recommends EPA consider the following adjustment to Building Block 4 to recognize the importance of energy efficiency in reducing greenhouse gas emissions and clarify how states may utilize energy efficiency resources for compliance purposes.

1. EPA should revise Building Block 4 to require no more than a 1% annual incremental savings rate

MidAmerican has actively worked with its customers in Iowa to advance energy conservation measures and manage peak loads since 1994, and more recently in South Dakota and Illinois. While results have varied over the years as a result of market and industry conditions, MidAmerican has substantial experience in delivering energy conservation programs and an informed understanding of available and achievable conservation programs. Every five years, MidAmerican commissions independent demand-side resource potential assessments used to inform the development of the company's energy efficiency plans. It has been MidAmerican's experience that the level of achievable energy efficiency savings can vary significantly both between states and from year to year based on a number of factors. The make-up of the electric customer base in a state, how customers use electricity, the types and longevity of energy efficiency programs offered previously, adoption and enforcement of building codes, new technologies, economic conditions, natural gas prices, the adequacy and types of utility generation and rates customers pay for electricity all affect the achievable savings attributed to energy efficiency programs. None of MidAmerican's three states has shown a capability to deliver sustained savings at 1.5% of retail sales or to increase savings at 0.2% annually, as currently contemplated.

MidAmerican's most recent energy efficiency plans were approved by state regulators in 2013 and 2014; these plans include a comprehensive set of programs that will help customers manage energy use, reduce costs, protect the environment and increase business competitiveness. In Iowa, MidAmerican's energy efficiency plan is projected to cost \$381 million between 2014 and 2018, while achieving a projected average 1.19% savings per year over the plan period.

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¹⁷ See GHG Abatement Measures TSD at 5-72.

**MidAmerican Energy Company’s Energy Efficiency Program
(Retail Customers in Iowa)**

Year	Total Cost (\$million)	\$/MWh	Energy Savings (% Retail Load)
<i>Actual</i>			
2004	23.5	217	0.68%
2005	26.5	219	0.71%
2006	30.0	187	0.90%
2007	30.3	185	0.87%
2008	34.3	198	0.92%
2009	39.9	181	1.22%
2010	42.3	193	1.12%
2011	48.7	238	1.05%
2012	49.7	198	1.28%
2013	64.6	240	1.33%
<i>Projected</i>			
2014	70.9	292	1.16%
2015	73.7	285	1.21%
2016	76.1	296	1.19%
2017	78.8	303	1.19%
2018	81.3	310	1.19%

Even with more than 20 years’ experience implementing energy efficiency programs, MidAmerican is not projected to achieve a 1.5% incremental savings rate over the current plan period. Like EPA, MidAmerican seeks to effectuate significant energy efficiency savings. However, MidAmerican must demonstrate that energy efficiency program elements meet a cost-benefit test in order to receive regulatory approval for that program element in each of its three jurisdictions. If an energy efficiency measure does not provide more benefits to customers than it costs, state regulators will not approve it for inclusion in the company’s energy efficiency plans.

To account for the technical and economic challenges associated with implementing energy efficiency savings, MidAmerican suggests that EPA adjust Building Block 4 to require a 1% per year maximum energy efficiency savings, which is a reasonable yet aggressive target based on MidAmerican’s experience.

II. Other Considerations

In addition to the building block modifications recommended above, MidAmerican has identified a number of issues that warrant clarification from EPA in order to provide the flexibility intended by the rule. These issues are discussed below.

A. EPA Should Preserve Maximum Flexibility for the States to Develop Compliance Plans

In the proposed rule, EPA provided states the flexibility to choose among compliance options, whether the state will apply a rate-based or mass-based emissions standard, and whether to

develop individual or multistate compliance plans. MidAmerican appreciates and supports this inherent flexibility, provided it is achieved in practice as intended. The following elements should be included in the final rule to recognize states' primacy under Section 111(d) and allow the greatest flexibility to design compliance programs that will meet the 2030 emission targets.

1. EPA should phase in Building Blocks 1 and 2, eliminate interim goals, and provide a mechanism to credit emissions-reducing activities that take place prior to 2020

MidAmerican recommends introducing greater flexibility in the application of Building Blocks 1 and 2 by eliminating the requirement that the full magnitude of emission reductions from these building blocks be achieved by 2020. Under the current proposal, the methodology for establishing the interim emission rate goal requires that emission reductions occur by 2020 that are equal to the BSER assumptions for heat rate improvements and increased utilization of natural gas. In states with significant coal and/or natural gas resources, this results in a substantial step change in emission reductions required by 2020. Thereafter, emission reductions are assumed to occur through 2030 based on the BSER assumptions for further increased renewables and energy efficiency. Accordingly, though there is a "glide path" available for compliance from 2020 to 2029, in many cases this is preceded by steep emission reduction required by 2020.

Such a sudden and steep transition from coal- to natural gas- fueled resources has the potential to result in the costly and unnecessary stranding of assets and does not fully account for the remaining useful life of existing coal-fired resources. Section 111(d) clearly provides the EPA administrator to develop regulations that allow states to consider, among other factors, the remaining useful life of the existing source to which the standard applies.¹⁸ While, arguably, EPA will allow the states to take remaining useful life of assets into consideration in their state plans, states should be explicitly provided the option in the final rule. MidAmerican suggests that EPA specifically add to proposed section 60.5740(11), supporting material, a fifth subsection for "materials demonstrating the state's analysis of the remaining useful life of the existing source to which such standard applies" to address situations where affected EGUs have made recent emission control retrofits or have significant remaining book life. Furthermore, this change in resource mix may create transmission system stability and reliability issues. Fixing these issues may require building and/or expanding high voltage transmission lines and substations, which requires lengthy regulatory approval processes.

Allowing states to phase in these components of BSER over the entire 10-year interim period provides an appropriate response to the concerns identified above and establishes parity for the timing of requirements among the four building blocks. Such an approach could provide relief to states with significant reduction requirements by 2020, as currently proposed, without jeopardizing the ability of states to meet the final emission rate goals. This approach would also allow states to take into account their unique circumstances, such as the timing of coal retirements, when proposing how they will meet the final goal.

¹⁸ See Clean Air Act Section 111(d)(1)(B).

In addition to phasing in Building Blocks 1 and 2 over the full interim period, MidAmerican supports the proposal contained in the October 2014 NODA that would allow states to take credit for early actions which achieved emission reductions. Providing full credit for these early actions recognizes the important emissions reductions states have already achieved and it continues to incent incremental reductions between the date of the proposal and the date of compliance. MidAmerican supports an outcome whereby the final rule clearly states that early emission reductions occurring prior to 2020 can be credited towards compliance with the 2030 target. Such reductions should not need to relate directly to the proposed building blocks so long as they contribute to achieving a state's emissions target. For example, development of renewable energy and implementation of energy efficiency programs, as identified in Building Blocks 3 and 4, will certainly continue prior to 2020 and should be credited towards compliance with the 2030 targets. But other actions, such as retirement of fossil-fueled EGUs, will also occur prior to 2020. Unit retirement is not tied directly to EPA's proposed building blocks, but states should be able to credit the emissions reductions following such retirements, regardless of their reasons, towards compliance with their 2030 emission goals.

2. EPA should allow averaging among companies owned by the same ultimate parent

The proposed rule is silent on the ability of subsidiary companies owned by the same parent company to utilize all of those assets' emissions and generation to demonstrate compliance within a state. MidAmerican believes it would be beneficial for EPA to clarify in the final rule that, to the extent permitted by state affiliated interest rules, compliance aggregation among subsidiaries is permissible. For example, Berkshire Hathaway Energy Company entities MidAmerican Energy Company, MidAmerican Wind, and MidAmerican Renewables each operate assets in Illinois which are expected to be impacted by the state's Section 111(d) compliance plan. MidAmerican Renewables' indirect subsidiary Cordova Energy Company owns the Cordova Energy Center, an affected NGCC unit. MidAmerican Wind owns the Bishop Hill II wind facility. MidAmerican Energy Company is a joint owner in the Quad Cities Nuclear Power Station and also implements an energy efficiency program for its retail electric customers served in the state. MidAmerican believes that in order to afford the state and the Berkshire Hathaway Energy-owned companies the flexibility intended by EPA, it should be able to aggregate with the Berkshire Hathaway Energy subsidiaries the emissions and generation from Cordova Energy Center, the renewable generation from Bishop Hill II wind farm, the applicable generation from its share of Quad Cities Nuclear Power Station, and the energy efficiency savings achieved for its Illinois customers to demonstrate its compliance obligation in Illinois. MidAmerican therefore requests that EPA acknowledge in the final rule that such averaging is an acceptable practice between affiliates to demonstrate compliance with their obligations under Section 111(d).

3. EPA should allow states to establish baseline emissions from an average of multiple years

MidAmerican believes that greater flexibility can be provided to states by allowing them to establish baseline emissions over an average of multiple years. As proposed, the Clean Power Plan utilizes calendar year 2012 actual emissions and generation data as baseline emissions for

each state. EPA states this is because 2012 was the most recent year for which it had complete data at the time of analysis.¹⁹ EPA notes that it considered the possibility of using average fossil generation and emission rate values over a baseline period but determined that there would be little variation in the results compared to a 2012 base year data set due to the rate-based nature of the goal.²⁰ EPA concludes that because two critical variables, technology-specific emission rate reduction capability and total NGCC capacity installed to date, do not vary significantly, the benefits of an expanded baseline year are dampened.²¹ In reality, many variables affect the amount of generation and emissions in a particular year, including the level of hydroelectric generation, unit outages, natural gas prices and weather variability. Notwithstanding EPA's conclusions, the baseline generation assumptions *do* impact the ultimate emission target goals. MidAmerican therefore recommends that EPA allow the use of a three-year averaging approach to set baseline emissions, which is more representative of long-term operating conditions.

In Iowa, for example, a baseline of emissions averaged over the years 2010 through 2012 results in a 2030 emissions target of 1,397 lb CO₂/MWh. This rate is not significantly different from the 2030 target resulting from a single-year baseline but accounts for operational variations that may occur from year to year. MidAmerican recommends use of period 2010 through 2012, which represent the most recent available data.

4. EPA should allow states the flexibility to allocate responsibility for meeting a state's emission reduction goal among that state's affected entities as it sees fit

As described in the State Plan Considerations TSD, EPA proposes to “give states broad discretion to develop state plans that best suit their circumstances and policy objectives.”²² This should include the recognition that affected entities within a state will not begin at the same starting point regarding carbon-reducing actions that are already in effect. Individual utilities – and their customers – may have implemented a number of measures which have already reduced carbon emissions. Under the Clean Power Plan, states are able to incorporate these actions into their compliance plans so long as emissions reductions achieved post-2020 can be attributed to these measures.²³ In the final rule, EPA should specifically allow states to determine how their compliance obligations will be allocated among all affected entities, thus allowing states to conclude that entities which implemented early actions that will achieve ongoing and long-term emission reductions will not be required to contribute further towards a state's emissions reduction goal.

¹⁹ Goal Computation TSD at 4. MidAmerican appreciates EPA making available the 2010 and 2011 emission and generation data in the October 28, 2014 NODA in order to evaluate alternative baseline years.

²⁰ *Id.* at 4.

²¹ *Id.* at 4.

²² State Plan Considerations TSD at 3.

²³ MidAmerican argues elsewhere that emission reductions from certain “early actions” should be creditable toward 2030 compliance beginning in 2013, the year following EPA's baseline emissions year.

5. EPA should not take a position on whether to adjust the final rule for different types of generating unit owners

EPA requests comments on whether there are special considerations affecting small rural cooperatives or municipal utilities that merit adjustments to the proposal.²⁴ MidAmerican believes that all load serving entities in a state should be subject to similar requirements and recommends that EPA not create an exception or special treatment within the final rule for different types of utility owners. In the event that EPA does carve out an exception or create special considerations for those types of sources, EPA must also adjust state emission targets in order to prevent undue compliance burdens for investor-owned utilities.

MidAmerican operates five EGUs that are partially owned by a number of other, smaller utilities such as municipal utilities or rural electric cooperatives. Joint ownership in a large generating unit is often a low-cost way for smaller utilities to provide load to their customers without the significant investment costs associated with constructing, operating and maintaining individual generating resources. Ownership rights and responsibilities, including environmental compliance obligations, are governed by joint-ownership agreements. Creating special classes of utility owner/operator in the final rule will interfere with these contractual joint-owner relationships. Given the complexities in the types and makeup of utility companies that are affected by the rule, MidAmerican believes that EPA should not take a position on whether to adjust emission rates in the final rule to account for certain types of utilities. Rather, that type of determination should be left to the states as they develop their compliance plans.

6. EPA should continue to allow states the flexibility to select a rate-based approach or a mass-based approach to emissions reductions for inclusion in state compliance plans

MidAmerican supports EPA's flexible approach to state compliance plans by allowing states to implement the rate-based emission goals or convert emission rates to mass-based goals. In each state, there may be discrete advantages to either a rate-based or a mass-based emission standard. Under EPA's proposed rate-based standard, states can continue to accommodate future load growth. Under a mass-based standard, states may be able to more readily account for unit retirements and other significant mass emissions reductions.

MidAmerican has reviewed EPA's Notice of Additional Information Regarding the Translation of Emission Rate-Based CO₂ Goals to Mass-Based Equivalents issued November 6, 2014, but cannot yet determine if this approach provides significant benefits over the previously proposed rate-based mechanism. In fact, it appears that the two standards do not correlate well. As a general observation, MidAmerican notes that implementation of the guidance on rate to mass conversion results in a greater reduction in emissions. Where the rate-based reduction from 2012 levels would be 24%, a mass-based conversion would result in a reduction of 31% from 2012 levels by 2030. MidAmerican requests that EPA's final rule retain the flexibility for states to select which emissions standard best suits their circumstances.

²⁴ CPP, 79 Fed. Reg. at 34887.

7. EPA’s use of the Integrated Planning Model does not assess the impact of the proposed rule on system reliability because the model is not capable of incorporating operating reserve requirements, actual transmission system constraints, or variable resources with sufficient granularity

EPA completed modeling of its proposed regulation using the Integrated Planning Model (IPM). IPM has broad capabilities in modeling the impact of environmental regulations and renewable portfolio standards within the electric sector. To this end, IPM is a useful tool when deployed to broadly assess impacts of environmental policies including the tradeoff between emission benefits and costs within the electric sector. However, as with any model, IPM has its limitations. Specifically, IPM lacks sufficient granularity to reasonably simulate the operational implications, on an appropriate geographical and temporal scale, of EPA’s proposed regulation under section 111(d), and consequently, IPM insufficiently evaluates how operational reliability considerations affect the tradeoff between emissions benefits and electric sector costs.

Operating Reserves

The IPM analysis models resource adequacy by implementing a reserve margin, which is a percentage applied to net peak load, within the modeled region, that identifies necessary resource additions over the simulation period. As described in EPA’s documentation for IPM v.5.13, the reserve margin requirement encourages building beyond forecasted peak load to ensure reliability of the electric generation system within the modeled region. IPM forecasts the capacity needed at the time of peak load (one hour in the year). However, it does not ensure that generating plants are dispatched to maintain sufficient operating reserves among all hours in the year. In fact, IPM lacks the ability to simulate dispatch of generating assets in a way that ensures sufficient operating reserves are being carried consistent with regional reliability standards, which extend beyond resource adequacy criteria. In practice, operating reserve requirements impact how resources are dispatched and therefore affect actual emission rates.

Transmission Constraints

The IPM assumes significant coal unit retirements by 2020, but does not adequately model transmission constraints or system reliability that may be associated with retiring and adding generation resources. Instead, the IPM limits the ability to transfer power between regions to certain values for each transfer path as a way to represent the effect of major transfer path constraints. This recognizes known transmission capacity constraints but because the actual transmission system is not modeled, simulation results from the IPM cannot predict the performance of the transmission system itself. This is particularly true if a significant quantity of existing generation is retired and new replacement generation is proposed for installation at unspecified locations. Therefore, claims that the analysis performed by the EPA demonstrates that implementation of “the proposed rule will not raise significant concerns over regional resource adequacy or raise the potential for interregional grid problems”²⁵ may be overstated or inaccurate.

Variable Resources

The model used by EPA is similarly insufficient to address reliability issues associated with increased wind and other variable resources. Generation may only be added if it does not

²⁵ CPP, 79 Fed. Reg. at 34900.

compromise the stability or reliability of the transmission system. Assessing the impact of new generation requires detailed system impact and facilities studies. The hourly outputs of variable resources are typically modeled in production cost programs using a variety of simulation methods. The outcomes of these simulations are used to assess the range and probabilities of possible impacts. However, variable resources are represented in IPM in one or more simulations where their output is modeled as an average expected value. This mechanism does not accurately simulate transfers across constrained paths because constraints are expected to occur at the resources' respective maximum outputs. Given that IPM does not accurately simulate variable resource performance, EPA's conclusion that the proposed rule will not raise significant concerns over regional resource adequacy or raise the potential for interregional grid problems is not supported.²⁶

To accommodate this complexity, EPA should allow states the flexibility to leverage existing resource and transmission planning processes to ensure reliability is not compromised as a result of complying with EPA's Clean Power Plan. In the event that unanticipated reliability events are predicted to occur as the Clean Power Plan is implemented, EPA should include some type of reliability safety valve that suspends compliance for those states or entities which make adequate demonstrations.

8. EPA should allow states to utilize non-BSER mechanisms in compliance plans

MidAmerican supports the flexibility included in the proposed rule that would allow states to "include measures in their plans beyond those that the EPA included in its determination of the BSER."²⁷ MidAmerican agrees these types of measures may be appropriate to include in a state plan to achieve carbon emission reductions from affected EGUs. EPA's proposal should retain this flexibility for states.

Many states are experiencing increased implementation of Distributed Generation ("DG") resources, particularly adoption of roof top solar installations in residential markets. DG represents an important component in any emission reduction plan and MidAmerican currently employs utility sponsored programs which support its continued growth. EPA should explicitly recognize DG and other emerging technologies as eligible resources for demonstrating compliance with state compliance plans and targets.

9. EPA's alternate BSER proposal is not significantly different to warrant adoption

In addition to the proposed state-specific emission rate-based goals discussed above, EPA developed a set of alternate goals reflecting less stringent application of the building blocks and a shorter implementation period.²⁸ Specifically, the alternate goals reflect a four percent potential improvement in heat rate at coal fueled units, increased utilization of existing natural gas resources up to 65% capacity factors, and a value of one percent used for annual incremental

²⁶*Id.*

²⁷ *Id.* at 34923.

²⁸ *Id.* at 34898.

savings achievable through energy efficiency programs. Renewable energy during the years 2020 through 2024 is added at the same rate. The alternate proposal also includes a shortened implementation period to five years (2020-2024). Though EPA's proposed alternate proposal would alleviate some of the challenges with the BSER proposal, the proposed changes are not significant enough to appreciably mitigate the issues and do not address many of the fundamental ways in which the proposed BSER is not realistic, as detailed above. In addition, the shorter timeframe compounds many issues in terms of the length of time needed for resource planning, market transformation, and system reliability upgrades. Accordingly, MidAmerican recommends that EPA modify BSER in accordance with the recommendations throughout this letter and maintain the 2030 compliance date.

B. EPA Should Provide Additional Clarity in the Final Rule

1. EPA should clarify the applicability definition to specifically exempt simple-cycle combustion turbines

The Clean Power Plan applies the same applicability criteria proposed in the January 8, 2014, New Source Performance Standards rule. MidAmerican, through its parent Berkshire Hathaway Energy, submitted comments on the New Source Performance Standards rule requesting that EPA clearly exempt simple-cycle combustion turbines from the list of applicable sources.²⁹ MidAmerican reiterates that request for the Clean Power Plan and existing sources.

Assuming that the proposed exemption criterion is intended to be equivalent to a capacity factor concept (i.e., the exemption would apply to units operating at less than or equal to a 33% capacity factor), it is likely that the proposed exemption will be insufficient under certain circumstances. Simple-cycle combustion turbine units, some of which are permitted for output greater than that equaling a 33% capacity factor, are typically used to meet demand and ensure reliability during system peak load. It is precisely during these periods of high demand – when simple-cycle turbines are utilized for system reliability – that a capacity factor limitation may be exceeded and render the unit subject to 111(d) requirements.

While EPA finds that simple-cycle combustion turbines historically do not supply more than one-third of their potential electrical output to the grid, this may not be the case nationally in the future as utilities implement other compliance obligations³⁰ and as renewables integration becomes increasingly necessary under the Clean Power Plan. Simple-cycle turbines are primarily used to meet peak demand or to backstop variable resources; this will be especially true as one of the components of EPA's BSER determination is to increase the utilization of renewable energy generation. Such a move will increase reliance on simple-cycle turbines to help balance this variable generation, particularly so as the utilization of existing NGCC resources increases under the Clean Power Plan. MidAmerican therefore recommends that EPA adopt a categorical exemption for simple-cycle combustion turbines.

²⁹ See Comments of Berkshire Hathaway Energy Company on Greenhouse Gas New Source Performance Standards (May 9, 2014). Submitted to Docket No. EPA-HQ-OAR-2013-0495, Document No. EPA-HQ-OAR-2013-0495-10052. Available at <http://www.regulations.gov> (last accessed November 21, 2014).

³⁰ E.g., Mercury and Air Toxics Standards and Regional Haze.

2. EPA should clarify that states may choose to include new NGCC units in their Section 111(d) compliance plans

MidAmerican supports EPA's indications that new NGCC units, constructed in compliance with Section 111(b), may also be included in states' Section 111(d) compliance plans. EPA should confirm in the final rule that states have the flexibility to include new NGCC units in their compliance plans. EPA should also clarify when, if ever, NGCC units built after the effective date of the 111(d) rule may be subject to that rule rather than 111(b) and how the emissions from those units will be treated within the state goals. These clarifications are necessary in order for states to adequately develop Section 111(d) compliance plans.

III. Technical Corrections

EPA used Integrated Planning Model ("IPM") output files based on EPA Base Case v.5.13, which was "designed and developed for use in analyzing policy scenarios starting in 2016,"³¹ in its evaluation of the Clean Power Plan. MidAmerican has reviewed this data and identified the following data discrepancies for several of its operating units that need correcting:

1. EPA assumes that George Neal North Unit 3 and Walter Scott Energy Center Unit 3 will both retire prior to 2020. As these units have recently been retrofitted with emissions controls including dry scrubbers, baghouses and activated carbon injection, MidAmerican will not retire either unit prior to 2020.
2. EPA assumes that Riverside Generating Station Boiler 9 will retire prior to 2020. However, this unit is dual-fueled (coal and natural gas), and will be limited to natural gas operations by April 16, 2015. There are no plans to retire the unit prior to 2020.

MidAmerican appreciates the opportunity to provide comments to EPA on its Clean Power Plan proposal.

Sincerely,



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³¹ "Guide to IPM Output Files, EPA Base Case v.5.13" (2014). CPP Docket ID EPA-HQ-OAR-2013-0602-0211.