Comments of the Center for Climate and Energy Solutions on Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; Proposed Rule
United States Environmental Protection Agency
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This document constitutes the comments of the Center for Climate and Energy Solutions (C2ES) on the proposed standards of performance for greenhouse gas (GHG) emissions from existing electric utility generating units (Proposal), also known as the Clean Power Plan, proposed by the U.S. Environmental Protection Agency (EPA) and published in the Federal Register on June 18, 2014. C2ES is an independent, nonprofit, nonpartisan organization dedicated to advancing practical and effective policies and actions to address our global climate change and energy challenges. As such, the views expressed here are those of C2ES alone and do not necessarily reflect the views of members of the C2ES Business Environmental Leadership Council (BELC). In addition, the comments made in this document pertain to existing sources in the specific sector addressed by the Proposal and may not be appropriate for other industrial sectors or for new electric utility generating units.

OVERARCHING ISSUES

Benefits of a market-based greenhouse gas reduction policy

C2ES believes a market-based policy – such as emissions averaging among companies, a cap-and-trade system, an emissions tax, or a clean energy standard with tradable credits – would be the most efficient and effective way of reducing GHG emissions by harnessing market forces to spur clean energy innovation, development, and deployment. Properly designed market-based policies create an appropriate division of labor in addressing climate change, with the law establishing the overarching goal of reducing GHG emissions, and the private sector determining how best to achieve that goal. Under market-based policies, the government neither specifies a given company's emission level nor requires the use of any given technology – both of these determinations are made by economic forces.

Beyond providing an incentive for the use of best available technologies, market-based policies provide a direct financial incentive for inventors and investors to develop and deploy lower-cost, clean energy technologies, and leave the private market to determine technology winners and losers. Market-based policies can be designed to minimize transaction costs for companies and their customers in moving from high-emitting technologies to low-emitting technologies; to prevent manufacturers in countries without GHG limits from gaining a competitive advantage over U.S. manufacturers; and to reverse any regressive impacts of increased energy rates. At the federal level, market-based policies have been used to reduce sulfur dioxide emissions at a fraction of the originally estimated cost, while

at the state level they have been used successfully in renewable energy programs and cap-and-trade programs for greenhouse gases and nitrogen oxides.

However, enactment of federal legislation that would establish a comprehensive market-based policy to reduce GHG emissions is not likely in the near-term. Given the urgency of addressing the rising risks that climate change poses to U.S. economic, environmental, and security interests, C2ES believes that in the absence of Congressional action to reduce GHG emissions, EPA must proceed using its existing authorities under the Clean Air Act.

The Clean Power Plan should enable and encourage an eventual nationwide GHG reduction program

C2ES recognizes that from both a political and legal standpoint, the Clean Power Plan must enable and empower each state to develop its own carbon-cutting plan. However, we also understand that a national GHG program would be a more cost-effective approach since it would encourage the least-cost reduction in overall emissions, regardless of where in the nation that reduction is available. We therefore appreciate the explicit and implicit encouragement included in the Proposal for states to join together in multi-state compliance plans, as well as coordinate outside of formal partnerships.

In addition to the existing encouragement for interstate cooperation, such as the extended deadline for a multi-state plan, we suggest that EPA keep an eye toward an eventual nationwide GHG reduction program when developing the final Clean Power Plan. We recognize that such a program is not feasible in the near term and that it would require legislation. However, we encourage EPA to take steps now to make such a nationwide program easier to develop. For example, EPA should do what it can through the Clean Power Plan to encourage consistent, or at least easily translatable and comparable, measurement, recordkeeping, and verification (MR&V) protocols used by states to track the impacts of energy efficiency programs. Interstate consistency in this arena would make it easier to account for efficiency programs on an apples-to-apples, national basis in a broader program down the road. Consistent methodologies would also be helpful for tracking renewable energy generation, especially when it is transmitted across state lines, and when accounting for new natural gas generation. These topics are discussed later in these comments.

The Clean Power Plan also has the potential to drive policy and technological innovation, both critical components in the path toward a future nationwide program. By enabling states to choose their own policy path toward carbon reductions, discussed further below, the Clean Power Plan could foster the development of several unique state-level carbon cutting programs. When Congress is in a position to consider comprehensive climate legislation, it will therefore have a number of state examples to draw from. The Clean Power Plan is also likely to drive technological innovation as states encourage the development and deployment of low cost solutions. These technologies will also aid in the creation of

future climate legislation as we understand more about their costs and effectiveness.

The Clean Power Plan contains several important elements of state flexibility

C2ES commends the significant level of state flexibility EPA has built into the Proposal. The Clean Power Plan acknowledges in several ways that each state is in a different position in terms of energy resources, policy history, politics, economy, and other variables. Each state can greatly benefit by being free to decide what structures and measures it will use to meet its target emission rate or target mass-based emission budget (if applicable), which the Clean Power Plan enables.

First, we applaud the development of a unique target emission rate for each state that accounts for its existing policies and resource availability. While some aspects of the target calculations could be improved, as discussed below, a one-size-fits-all target for all states would not have been appropriate. Instead, the application of consistent formulae across states that apply consistent methodologies to the unique variables of each state results in achievable and equitable target emission rates.

Second, we appreciate the significant flexibility enabled through the option of converting a state's target emissions rate to a mass-based standard. This option should make it more straightforward for states to comply through a mass-based emissions allowance program, such as cap and trade. While there has been some uncertainty among states and other stakeholders regarding the exact formula and variables to be used to convert a rate-based target to a mass-based target, we are confident that EPA and states can work together over the next seven months to establish a clear, consistent, and fair conversion methodology.

Third, and of critical importance, we commend EPA for allowing each state to choose how it will achieve its emissions target. It is crucial that each state reduces the GHG emissions of its power sector, but the path each state takes to get there need not be consistent. The most cost-effective and politically palatable implementation strategy will vary from state to state, meaning if EPA were to be more prescriptive in the Clean Power Plan some states could be prevented from pursuing optimal programs for their situation. Further, the varying experiences of states implementing the Clean Power Plan will provide valuable lessons to policymakers at all levels of government to inform an eventual national debate as they develop new programs or refine existing programs.

While some adjustments to state targets will result from updated information provided by states and other stakeholders, the key is for states to use their targets to drive improved coordination of state efforts in their planning process. EPA provides flexibility for that to happen.

State flexibility is critical to enable states that choose to do so to comply through market-based mechanisms. We encourage EPA to ensure states are explicitly given

full flexibility in this regard such that there is no question that states can implement the Clean Power Plan, completely or in part, through a cap-and-trade system, a carbon tax, or any other mix of pricing mechanisms.

EPA should release model provisions to guide states

C2ES and many other stakeholders appreciate the level of flexibility given to each state in determining how to reduce GHG emissions from its power sector. This flexibility enables states to account for their unique circumstances and existing programs to reduce emissions at minimal costs. Several states that have already been working to reduce GHG emissions in their power sectors are well positioned to leverage existing programs to implement the Clean Power Plan. However, many other states do not have the administrative infrastructure or institutional knowledge to easily develop and implement a state plan. Because of this, additional assistance from EPA, either directly or by encouraging multi-state forums during the implementation process, would make it more likely for many states to establish a plan in the timeframe proposed.

We recognize that EPA is not in a position to release a full model rule. A one-size-fits-all model plan for states to adopt is precisely what the flexibility in the Proposal was designed to avoid, and the resources necessary for such an endeavor would likely be better put to use elsewhere. However, we encourage EPA to explore the development of certain "model provisions" in lieu of a model rule. There are several critical issues that states are likely to struggle over, and model provisions targeting these issues could not only ease the burden on state regulators, but encourage consistency, or at least compatibility, across state lines, thereby enabling interstate credit trading and other forms of cooperation while building a network to more easily connect in future congressional action. We expect such model provisions or recommendations from collaborative processes established or recognized by EPA to be popular among states. EPA could conduct a faster plan review process when plans are built on these collaborative processes.

In deciding what issues to target through model provisions, EPA should consider measures for which state models do not already exist, as well as programs that are inconsistent across state lines and can benefit from collaboration. For example, a model cap-and-trade program may not be helpful for states since models already exist in California and the Regional Greenhouse Gas Initiative (RGGI). However, states could also choose to use direct carbon pricing, such as a carbon tax, to implement the Clean Power Plan. Since there is no model of a carbon tax at the state level, it would be helpful for EPA to release a model provision to show how such a tax could be designed and implemented. EPA may wish to consider working with states to establish a methodology any state could use to determine the specific carbon price that would be sufficient to achieve compliance. This model provision could also show what steps states would need to take to demonstrate to EPA that the necessary cuts are being made.

Additionally, states are likely to struggle in developing an accounting method to demonstrate when emission cuts are being made through energy efficiency programs, both on an intrastate and interstate basis. States currently use varying MR&V protocols to assign emission cuts to energy efficiency, and consistency here would ease cooperation among states. Guidance on this point could also help ensure efficiency programs can only earn credit when they result in real emission reductions, and that such reductions are not double counted. Furthermore, states could benefit from assistance in accounting for energy efficiency programs that lead to emission cuts in other states, discussed further below.

Renewable energy crediting is another area in which states could use assistance to foster interstate consistency. Currently there are several Renewable Energy Credit (REC) markets across the country, with inconsistent rules and protocols. We acknowledge that EPA should not use the Clean Power Plan to force states into using a certain REC protocol. However, suggesting best practices through a model provision would help improve interstate consistency and the ability to trade RECs across regions, thereby improving the cost effectiveness of the Clean Power Plan. Additional guidance on this topic could also help prevent the double counting of renewable generation.

A patchwork of inconsistent measures designed to achieve the same goal (e.g., a carbon tax in two neighboring states that operate through different mechanisms) will impair state cooperation, will make it more difficult for power companies and other businesses to operate across state lines, and will make a nationally consistent GHG program more difficult to establish. EPA could help prevent these problems by developing a set of model provisions or collaborative processes in the planning period that states are encouraged to use with the promise of faster plan review. In addition to model provisions, EPA could help states develop their plans by holding a series of workshops or webinars on critical topics.

GENERATION IN THE CLEAN POWER PLAN

Renewable generation projections should be based on market potential

C2ES encourages EPA to choose its listed alternative method to project renewable energy generation: Base it on technical and market potential. Though since the market potential of renewable generation in a state is necessarily limited by the technical potential, it may be more clear to base these projections on market potential alone. While we do see advantages to basing projections on states' existing commitments, we believe the proposed approach, basing the projection on regional renewable portfolio standard (RPS) benchmarks, is flawed for the reasons discussed below.

First, the Proposal treats all RPS policies as though they are more or less identical, but this is not the case. A few state RPS policies, such as that of New York, allow large hydropower generators to qualify for credit, while most other RPS policies do

not. Several states have credit multipliers in place to encourage utilities to contract for certain types of renewable generation, such as in-state generation or solar photovoltaic electricity. This means that simply looking at the target percentage of each state does not provide an accurate sense of how much non-hydro renewable generation each intends to pursue. Additionally, RPS policies do not necessarily indicate the level of renewable generation a state government believes is achievable in its state due to imports. For example, Missouri may have set its RPS based on the amount of wind power available for export from Great Plains states, rather than the amount of renewable potential within Missouri itself. Although the Proposal acknowledges that Missouri would still be able to take credit for imported renewable electricity, this could leave exporting states with limited options in increasing their own renewable electricity consumption.

Second, basing renewable generation targets on regional benchmarks leads to states being expected to make significantly varying investments in new projects. Three states, Iowa, Minnesota, and South Dakota, have already met their renewables targets in terms of percentage of total generation. Some states that have already made major investments in renewable generation, such as California and Colorado, still have a relatively long way to go to hit their projections. In several cases, neighboring states are projected to have significantly different levels of renewable generation in 2030 despite similar starting points. For example, West Virginia has a 2030 projection of 12.5 percent, from a starting point of 1.8 percent renewable generation. Neighboring Kentucky is starting from 0.4 percent, but its 2030 target is only 1.9 percent. It is difficult to understand why neighboring states would be expected to achieve renewable percentages that differ by a factor of over six.

Instead of this regional benchmarking approach, we encourage EPA to pursue its listed alternative of basing renewable generation targets on the market potential of each state. Since this approach accounts for resource availability and the electricity market situation, regional differences are still factored in. This approach should result in ambitious, yet achievable and realistic, targets for each state without producing the inconsistent results of the regional benchmarking approach.

Unaffected generators should be allowed to opt-in

The Clean Power Plan proposes that only large power plants that sell a significant amount of their generation through the electrical grid, known as affected generators, be regulated. While C2ES supports this approach generally, we encourage EPA to allow power plants that would otherwise not be covered to opt-in to a state's compliance plan. This would enable states to encourage the operators of otherwise uncovered power plants to earn some type of credit by reducing emissions. For example, small, diesel generators in rural Alaska would not be covered by the Clean Power Plan since they are small and not connected to the state's electrical grid. However, some of these generators could be replaced by cleaner sources, such as small run-of-the-river hydroelectric projects. Such improvements could be encouraged by states as they implement the Clean Power

Plan if unaffected generators are allowed to opt-in to the state plan. This change could also allow the agricultural sector to play a role in the case of animal agricultural operations that capture biogenic methane and use it to generate electricity.

Interim targets should account for a phase-in period to shift from coal to existing gas plants

As discussed in the October 27, 2014 Notice of Data Availability (NODA), EPA is soliciting comment on whether to include a phase-in period for building block 2 of the Best System of Emission Reduction (BSER) determination, as it does for the renewables element of building block 3, as well as for building block 4. We recommend that EPA include a phase-in period, which would have the effect of reducing the burden on many states to achieve sharp emissions reductions in the early years of the Clean Power Plan.

Easing the emissions "glide path" in the first few years of the interim compliance period gives states time to focus on long-term infrastructure needs. Although EPA has determined that, on an average basis, many states have significant excess capacity at existing natural gas plants, this may not necessarily mean all of this capacity is available to displace coal-fired electricity on a year-round basis. Some states may have strong seasonal variations in demand for natural gas electricity, for example to accommodate high air conditioning demand during the summer in the Southwest. Other states may not have the natural gas pipeline capacity to allow power plants to run at 70 percent capacity in months when demand is high for gas as a heating fuel. These concerns are surmountable with new or upgraded infrastructure, but this will take time to deploy. Building block 2 should be shaped in a way that accounts for this time.

Critically, this approach would enable states to make investments in deeper cuts that may not be achievable as quickly as a shift from coal to gas. Specifically, states would be able to develop increased renewable generation capacity, including new transmission lines where necessary, to reduce fossil fuel consumption. Such development requires a significant amount of planning, permitting, and construction time. If states are forced to move too quickly to comply with a strict interim target, they are likely to prioritize solutions that are faster than large-scale renewable generation deployment, such as the construction of new natural gas power plant capacity. While new natural gas capacity would be preferable to coal, forcing this type of investment too quickly in order to meet the interim target may deter consideration of investment in zero-emitting capacity in later years, and thereby reduce the lasting impact of the Proposal.

While we appreciate EPA's willingness to explore softening the emissions glide path for states, we are not suggesting that any change to this effect should loosen the 2030 targets or the cumulative effect of the Proposal over the course of the next decade, because loosening the targets would likewise reduce the incentive to invest

in zero-emitting capacity. If the interim targets are loosened, we recommend that EPA consider ways to tighten the final targets such that there is no net increase to cumulative emissions between 2020 and 2030 relative to the Proposal.

The treatment of new natural gas generation should be clarified

It is unclear to us how, or even whether, new natural gas generation can be factored into a state's plan to implement the Clean Power Plan. It is clear that new plants can be excluded entirely from the state's plan, should a state choose this approach. However, should a state wish to fold new natural gas plants into its plan, it is unclear whether it would be allowed to do so. We have understood EPA officials to say that states would indeed be able to include new plants when calculating their emission rates, and the release of the Rate to Mass Conversion TSD shows further commitment to this approach. However, page 3-35 of the Regulatory Impact Analysis notes: "While this new NGCC capacity cannot be directly counted towards the average emissions rate used for compliance, it can displace some generation from covered sources and thus indirectly lower the average emissions rate from covered sources."

Additional clarity on this point would be appreciated. We recognize that, in any case, new power plants would be subject to the New Source Performance Standard for New Electricity Generating Units through Section 111(b) of the Clean Air Act.

The Clean Power Plan should ensure nuclear generation can play a prominent role in our clean energy future

C2ES appreciates that both new and existing nuclear generation play an important role in the Clean Power Plan. As a reliable, zero-carbon, baseload electricity source, nuclear energy is a critical element in our clean energy future.[1] As such, we believe there are a few adjustments that can be made to the Proposal to help ensure existing nuclear generating units are maintained and new nuclear generation is not discouraged. New nuclear generation is addressed in the following comment.

EPA should amend the Proposal to ensure the retirement of existing nuclear generating units is discouraged in all cases. In many scenarios, the proposed methodology for including at-risk nuclear generation in a state's emission rate calculation, both for setting its target and determining the actual emission rate, would discourage retirement to a limited extent. However, in cases where a state's target emission rate is greater than the emission rate of the generation source that would replace retired nuclear, the Proposal actually serves to encourage retirement.

Consider the case of Illinois, where nuclear generation is a considerable portion of the electricity portfolio. Since Illinois is also a coal-heavy state with limited natural gas combined cycle generator (NGCC) capacity, its target emission rate is relatively high (1,271 lbs CO_2 / MWh). Since Appendix 1 of the Goal Computation TSD shows excess capacity at existing NGCC plants, a retired nuclear generation unit could be

replaced by NGCC generation (at existing units). If this were to happen, the emission rate of Illinois, as calculated under EPA's proposed methodology, would go down. From the perspective of the state's emission rate, the loss of 6 percent of the retired unit's generation from the denominator is more than offset by the addition of 100 percent of the generation from the NGCC units used to replace it since the emissions added to the numerator, 865 lbs CO_2 / MWh in this case, are significantly lower than the state's calculated average of 1,838 lbs CO_2 / MWh. Using 2012 data provided in Appendix 1 of the Goal Computation TSD, our analysis shows that the calculated emission rate of Illinois would fall to 1,774 lbs CO_2 / MWh if a 1 GW nuclear generation unit retires and is replaced by existing NGCC generation, sending the opposite of the intended signal.

In Illinois, as in all states according to our analysis, the Proposal discourages states from retiring nuclear generation to the extent that it would be replaced by new NGCC generation not covered in the state's plan. In this scenario, 6 percent of the retired generation would be removed from the denominator of the state's emission rate calculation with no other changes since the new NGCC plant would be outside the scope of the state's plan, meaning the emissions rate would always rise. However, if states factor new NGCC plants into their plans, nuclear retirement could be encouraged for the reason discussed in the above paragraph.

We assume EPA's intention is to discourage the retirement of nuclear generation in all cases. To address this, we suggest EPA explore the option of including 100 percent of existing generation, rather than only 6 percent, in each state's target rate calculation, and subsequently in each state's own calculations of its actual emissions rate. According to our analysis, this would discourage states from retiring nuclear generation regardless of the state's target emission rate or the type of generation that would replace the lost nuclear generation. This would also make the treatment of existing nuclear and non-hydro renewable generation logically consistent.[2] EPA may also wish to consider additional options between 6 and 100 percent.

The Clean Power Plan should recognize the amount of time and money necessary to develop and construct a new nuclear unit

We encourage EPA to explore methods to soften the somewhat arbitrary distinction between new nuclear plants under construction and those in the early stages of planning. Aside from the five units under construction in Georgia, South Carolina, and Tennessee, we appreciate how much progress a state could make toward its 2030 target emission rate by building a new nuclear plant or uprating an existing plant. Since additional nuclear generation in these cases is not factored into a state's target emission rate, 100 percent of such generation would go toward helping the state achieve its target. While we acknowledge the five units under construction should be factored into the target emission rates for those three states to ensure additional progress is made, we do not believe there should be such a sharp distinction here. In essence, Georgia, South Carolina, and Tennessee would have been better off delaying construction until the target emission rates were set. We do

not purport to have a perfect solution to this problem, but encourage EPA to explore options to adjust the Proposal to encourage new generation without effectively penalizing states that have taken early action. A solution to this issue will send a strong message to states that they should not avoid taking action to reduce greenhouse gas emissions in other sectors while awaiting future regulations under Section 111(d).

If the final rule follows the Proposal and factors only 6 percent of existing nuclear generation into emission rate calculations, one option may be for EPA to also consider the 6 percent "at-risk" factor when considering the five units under construction. As we have seen from recent retirements, a variety of factors can be involved (e.g., relicensing decisions, economic competitiveness, mechanical issues), not all of which are tied directly to the age of the plant. As such, it may be fairer to factor only 94 percent of each under-construction unit's projected generation into the relevant state's target emission rate, allowing for a 6 percent chance that the unit does not generate electricity as anticipated.[3] This adjustment would still virtually require Georgia, South Carolina, and Tennessee to take any action feasible to ensure the five units are completed as planned. Additionally, this would allow these states to take some benefit from these units, in the form of 6 percent of the units' zero-carbon generation being factored into the state emission rate denominators that had not been factored into the target emission rate. This provides some compliance benefit for these states taking early action to reduce GHG emissions from their power sectors while still requiring them to take significant additional steps. If the final includes a factor higher than 6 percent for existing generation, this same factor could also be considered when inserting under-construction generation into a state's target.

Additionally, the extended timeline of nuclear plant construction, including the licensing and permitting process, should be acknowledged in the Clean Power Plan. According to recent history, the full process to construct a new nuclear power plant takes about ten years.[4] Since state plans will not be approved until 2017 at the very earliest and the Clean Power Plan runs until 2030, a new nuclear plant being considered as part of a state's compliance strategy would only have a few years of operation, at most, before the certainty of the plan expires. Without assurance of post-2030 targets, a nuclear developer may find the Clean Power Plan too uncertain to make an investment decision in the early years of the Plan's operation. Further, a nuclear energy developer considering a new plant after 2020 would not be assured of any benefits from the Clean Power Plan's 2030 targets.

To account for this, we suggest that EPA explore a couple of options. First, EPA could set a timeline for releasing post-2030 target emission rates. Ideally, this timeline and the post-2030 targets would be released as soon as feasible to enable nuclear developers and other relevant stakeholders an ample amount of time to plan for new generation. Second, EPA could allow borrowing of credit from nuclear generation that occurs after 2030 in cases where construction is well underway prior to 2030. This would ensure that nuclear generation developers can benefit

from helping states meet their 2030 target emission rate even if construction is not yet complete. Any credit nuclear plant owners claim through this approach would be debited from post-2030 generation to ensure each megawatt-hour of nuclear generation is only counted once.

The treatment of at-risk nuclear generation should be clarified

If the Proposal's treatment of at-risk nuclear is maintained in the final rule, it is unclear to us how at-risk nuclear generation will be factored into a state's calculated emission rate. Specifically, it is not entirely clear whether the 6 percent at-risk figure is an average, such that a state will always include 6 percent of its existing nuclear generation into the denominator of its emission rate, or if it is marginal, such that all loss of existing nuclear generation, up to 6 percent, is to be removed from a state's emission rate denominator. Additional clarity on this point would be appreciated.

Due to the year-to-year variability of hydropower, a single year should not be used as a baseline

The Clean Power Plan should take a different approach to a baseline year (2012) to account for the year-to-year variability in hydropower in a number of states. Although existing hydropower is ostensibly not included in the Proposal, its variability impacts the amount of fossil generation necessary to meet demand. Since each state's target emission rate builds from its power generation system as it functioned in 2012, annual variations in hydro generation mean a snapshot taken of single year may not be an accurate representation.

Due to its heavy reliance on hydropower and relatively small power generation system, Idaho provides a particularly striking example of this concern. According to data in the Goal Computation TSD, Idaho's power system emission rate in 2012 was 250 pounds per megawatt-hour. In 2013, Idaho generated about 1.8 million fewer megawatt-hours from hydro resources than in 2012. Assuming no other changes from 2012 and that this shortfall needs to be made up through NGCC generation, the state's emission rate in 2013 would be 400 pounds per megawatt-hour. According to EIA, other states that generated at least 1 million fewer megawatt-hours from hydro resources between 2012 and 2013 are California, Montana, Oregon, South Dakota, and Washington. On the other side, states that generated at least 1 million more megawatt-hours from hydro resources between 2012 and 2013 are Alabama, Georgia, Kentucky, North Carolina, South Carolina, and Tennessee. Due to the impacts on fossil generation these shifts would have, typical hydropower variability can have a significant effect on a state's emission rate.[5]

Using an average of 2011-2013 data may soften the impact of this variability, though we do not have a preference for a specific approach. In the October 27, 2014 NODA addressing stakeholder comments on the Clean Power Plan, EPA notes that it explored a 3-year average and that the overall impact was minimal and state-specific impacts varied in direction. Despite this, we encourage EPA to use a baseline

methodology that accurately accounts for the power generation system in each state regardless of the magnitude of the practical change compared to the Proposal.

In addition to changing the "starting point" for each state, this adjustment could have an impact on states' target emission rates by changing the available NGCC capacity in EPA's goal computation calculations. In South Dakota, for example, where hydro generation was nearly 2 million megawatt-hours lower in 2013 than 2012, some of the NGCC capacity EPA projects will displace coal may instead need to be leveraged to replace lost hydropower generation, meaning its target emission rate may be unrealistically low. In contrast, Alabama's hydro generation was over 5 million megawatt-hours greater in 2013 than in 2012, meaning additional NGCC capacity may be available to displace coal, which suggests a lower target emission rate may be warranted.[6]

ENERGY EFFICIENCY IN THE CLEAN POWER PLAN

The treatment of interstate effects should ensure investment in energy efficiency is encouraged to the maximum extent feasible in all states

In the preamble, the Clean Power Plan states:

> The EPA is proposing that, for demand-side EE measures, consistent with the approach that the EPA used in determining the BSER, a state could take into account in its plan only those CO_2 emission reductions occurring (or projected to occur) in the state that result from demand-side EE measures implemented in the state.[7]

From this, it appears as though a state would not be able to take credit for the emission reductions associated with a drop in imported electricity driven by energy efficiency programs. Since the flow of electricity does not follow state borders, several states import a significant percentage of their electricity. This means that efficiency programs in one state often lead to emission reductions in another state. We strongly encourage EPA to allow, and craft an accounting protocol for, states to take credit for driving emission reductions in other states.

Without such a provision, states that import a significant amount of electricity will have little incentive to reduce consumption if this would not impact their Clean Power Plan compliance. It is important that importing states have such an incentive because a state that exports a significant amount of electricity would not have much incentive to cut consumption since this would affect a relatively small amount of its generation.

There are several options to determine the magnitude and location of emission reductions driven by energy efficiency programs. For a discussion of this topic, we refer you to the C2ES brief *Cross-State Electricity Load Reductions Under EPA's Proposed Clean Power Plan*, which is included as an attachment to these comments.[8]

States have a strong interest in claiming credit for emission reductions that occur across state lines and will likely be open to working with EPA to determine an appropriate accounting protocol. The more difficult side of the equation will be determining how to debit exporting states for emission reductions that another state is claiming. Due to these interstate effects, simply measuring emissions and generation within a state may not be enough to show that reductions are being made. In cases of reduced emissions through reduced generation, a state may have to demonstrate what steps it took to cut generation to prevent two states claiming credit for the same emission reduction. Making sure there are no inadvertent disincentives will ensure effective efficiency programs that could even exceed EPA's targets.

New load that results in net emission reductions should not be discouraged

In general, C2ES supports the Clean Power Plan's significant reliance on demand reduction as a cost-effective means of reducing GHG emissions. However, we are concerned that the Proposal could discourage uses of electricity that result in a net reduction in emissions. For example, many states are developing and implementing policies to promote electric vehicles (EVs). In nearly every case, these vehicles reduce net emissions by reducing gasoline combustion, though they do result in higher power plant emissions. There are other examples in the transportation sector, such as truck-stop electrification, port electrification, and mass transit powered by electricity, in addition to examples in the industrial sector, such as the use of an electric arc furnace in place of a coal-fired boiler.

In at least some states, EV load growth alone could be significant between now and 2030. California has a target of 1.5 million EVs on the road by 2025. Assuming 12,000 miles per year for each of these EVs and a vehicle efficiency of 3.3 miles / kilowatt-hour, this would mean additional load of nearly 5.5 million megawatt-hours, or nearly 3 percent of California's current load according to Appendix 1 of the Goal Computation TSD. These EVs would represent an even higher portion of the state's power sector emissions since California's average power sector emission rate of 698 pounds per megawatt-hour (according to Appendix 1 of the Goal Computation TSD) is lower than the emission rate of the generators that would be fueling this additional load, which are likely to be NGCC plants with an emission rate close to 900 pounds per megawatt-hour.

Such increases in electricity consumption could make Clean Power Plan compliance more difficult for states regardless of whether they choose a rate-based or mass-based target. Since a state can count avoided demand in its emission rate calculation, demand added by EVs could offset gains in efficiency. Additionally, states with a target emission rate below the emission rate of the marginal generator, assuming it is an existing generator covered by the Clean Power Plan (or a new generator covered by the state's plan), will be moving away from their compliance target with each additional megawatt-hour delivered to an EV. This is true even in a mass-based system because each projected megawatt-hour of generation will be

multiplied by the target emission rate to calculate the allowable mass of emissions, but the impact of EV load will factor in the marginal emission rate.[9] Because of this, states may choose to limit EV programs to prevent making Clean Power Plan compliance more difficult.

To avoid this, we suggest that EPA explore ways to let states account for carbon-cutting load differently from more traditional load growth. One possibility may be to allow states to classify electricity emissions as not belonging in the power sector, where appropriate. For example, if a state chooses to go through the necessary accounting it should be able to classify power plant emissions associated with EVs as being within the transportation sector, and therefore not subject to the Clean Power Plan – a rule focused, by design, on power sector emissions. We suggest that states be required to show that such fuel switching results in a net reduction in GHG emissions to ensure the overall carbon reduction goal of the Clean Power Plan is still being met. While this approach would remove the disincentive to add EVs, we are cautious of the unintended consequences. We recognize that the lines between sectors are not always clear (e.g., electricity used to power transportation or an industrial facility) and would not like to see the Proposal altered in such a way that could result in a significant portion of electricity consumption being removed from its coverage.

If a state is complying through a mass-based target, this issue could be solved if the state is able to adjust its allowance upward to account for EV and other carbon-cutting load. In the case of states with relatively stringent target emission rates, this would require more than an increase in the projected electricity generation to completely offset EV load due to the relationship between the target emission rate and the emission rate of the marginal generator used to serve EV load. Under the Proposal, it appears a state would be able to increase its mass-based carbon budget in proportion to its target emission rate. For example, in California the state would be able to add 537 pounds to its 2030 carbon budget for each megawatt-hour of additional projected EV load. However, if this load were served by an affected NGCC generator, each megawatt-hour of additional demand would add about 900 pounds to its carbon budget. This means that California would be discouraged from adding EV load, even were it to use a mass-based compliance strategy that accounts for projected demand through the method proposed by EPA. However, the difference between a state's target emission rate and the emission rate of the marginal generator (in California's case, 900 – 537 = 363 pounds per megawatt-hour) may not be high enough to actually deter investments in EVs and other carbon-cutting load. We encourage EPA work with states with ambitious EV programs to develop a solution that appropriately balances the concerns presented.

Note that we are not suggesting that states be authorized to count emission reductions that occur through the displacement of gasoline with electricity in their compliance plans, as this would essentially mean counting transportation emission reductions in a power sector rule. We are suggesting that any electricity load that

cuts emissions on a systemwide basis be accounted for in a manner that avoids discouraging the growth of such load, or at least minimizes this discouragement.

All reductions in end-use electricity consumption should be recognized

As they reduce demand for fossil generation, we recognize that all energy efficiency and demand reduction measures are implicitly recognized in the Proposal. Due to the importance of energy efficiency in reducing emissions from the power sector and putting downward pressure on electricity bills, we appreciate that in many cases energy efficiency measures are also explicitly credited in the Proposal as essentially a form of zero-carbon electricity generation.

We encourage EPA to ensure that all reductions in electricity demand achieved through energy efficiency policies can be fully counted in the denominator of the state's power sector emission rate, assuming proper MR&V protocols are followed. In addition to energy efficiency resource standards, qualifying demand reduction measures should include appliance standards, building standards, incentives for combined heat and power (CHP) or waste heat to power (WHP), and all financial policy tools a state may use to reduce demand, including grants, tax credits, and loans.

If a state implements the Clean Power Plan in a manner that involves tradable emission or generation credits, we encourage EPA to allow states to fully account for, and assign credits to, demand reductions at large industrial or commercial facilities that are otherwise voluntary. For example, if a water utility reduces its electricity demand by reducing the demand for water (thereby reducing demand for pumping and treatment), this reduction should be creditable to the state's emission rate denominator.

Efficiency programs put in place prior to June 2014 should not be treated differently than those adopted after June 2014

We suggest that EPA amend the Proposal as necessary to ensure all energy efficiency measures that reduce consumption in 2020 and beyond are fully credited, regardless of when the measures were put in place. According to the Technical Support Document on Projecting EGU CO_2 Emission Performance in State Plans, reductions will only be credited if driven by a measure put in place in June 2014 and beyond:

> As discussed in the preamble, and explained in section III.B.2 of this TSD, EPA is proposing that emission reductions that occur in 2020 and later due to actions taken pursuant to an existing state requirement, program, or measure could be applied toward meeting the required level of emission performance in a state plan **if these actions occur after proposal of the emission guidelines** (e.g., as of June 2014 and in subsequent years). [emphasis added]

We do not agree that a distinction should be made on whether measures were implemented before or after the Proposal was released. Many states have been adopting and implementing energy savings measures for years, and greenhouse gas emission reductions are often cited as one of the reasons for these measures. We recognize that compliance obligations for the Proposal begin in 2020, but do not think states should be unnecessarily penalized for steps taken prior to 2014 to reduce electricity consumption, to the extent that these steps are still driving reductions in 2020 and beyond. The removal of this distinction will put efficiency on more equal footing with renewable electricity generation, which will contribute to a state's calculated emission rate starting in 2020 regardless of when the generator was built or when the policy was put in place to drive renewable development.

States should not be encouraged to delay investments in efficiency

We are concerned that the Proposal establishes a perverse incentive for states to forego energy efficiency measures between now and 2020, and suggest EPA explore means to avoid this. With the exception of efficiency policies adopted prior to 2014 discussed above, we understand that all demand reduction that occurs in 2020-2029 can count toward a state's interim compliance target even if it was driven by a policy put in place prior to 2020. For example, if a state adopts a new building code in 2015 that is projected to cut demand in 2020 by 1 GWh, that state will be able to include that 1 GWh in its 2020 emission rate calculation even though the policy was adopted in 2015.

However, we are concerned that states still have an incentive to delay efficiency measures until 2020 due to the decay of their effectiveness. According to the Technical Support Document on GHG Abatement Measures, the effectiveness of energy efficiency programs tends to deteriorate by about 5 percentage points each year, and this effect must be included when states calculate the impact of these programs on their power sector emission rates. If a state adopts a program that saves 1 GWh in 2015, it will likely only be able to claim about 750 MWh of savings by 2020. Since savings become more valuable in 2020 as they begin to contribute to Clean Power Plan compliance, a state may be encouraged to defer the implementation of pending efficiency programs until 2020 in order to count the full benefit of the programs toward compliance.

When considering cumulative power sector emissions, this result would be problematic. Emissions avoided in 2015 are at least as valuable as those made in 2020. Because of this, EPA should explore adjustments to the Proposal to ensure states are not encouraged to delay energy efficiency programs. One possible solution would be to allow states to bank demand reductions that decay prior to 2020.

To illustrate this, consider again an investment in 1 GWh of efficiency savings in 2015 that deteriorates at 5 percentage points each year.[10] The reductions would be:

2015: 1000 MWh
2016: 950 MWh (50 fewer than 2015)
2017: 900 MWh (100 fewer than 2015)
2018: 850 MWh (150 fewer than 2015)
2019: 800 MWh (200 fewer than 2015)
2020: 750 MWh (250 fewer than 2015)
Cumulative decay: 750 MWh

Starting in 2020, the state would be able to take credit for 750 MWh of reduced demand for Clean Power Plan compliance, which would continue to decline by 5 percentage points per year. Between 2015 and 2020, this state also reduced an additional 750 MWh that would be lost to decay by 2020. According to the Proposal, this state would not be able to take credit for this reduced demand for compliance purposes. Under the proposed solution, the state would be able to bank these reductions and apply them toward compliance, on a one-time basis, for any compliance year starting in 2020. This solution would remove the incentive for delaying efficiency programs without double crediting investments since the program, on a deteriorated basis, would still count toward compliance starting in 2020. In terms of how much credit a state can apply toward its emission rate starting in 2020, this solution makes a state indifferent as to whether the program is adopted prior to 2020 or beginning in 2020.

There is no need to make a similar adjustment for renewable investments made between now and 2020 because the situations are not analogous. In general, renewable generation sources have a long lifespan and do not decay over time. An investment in 100 MW of renewable generation in 2015, for example, would still be generating 100 MW in 2020, and could thus the initial investment would fully contribute to the state's 2020 compliance.

EPA should explore methods to encourage more aggressive efficiency programs

We urge EPA to explore ways to encourage states to set standards that are more aggressive than those that appear in the Clean Power Plan. Specifically, we encourage EPA to recognize that some approaches to energy efficiency that are especially aggressive are not necessarily guaranteed to deliver projected benefits if costs or the rebound effect are greater than anticipated. By using adaptive management, states have the capacity to adjust efficiency targets as they go to account for changes in technology, behavior, and the economy. We are not suggesting that EPA change its proposed determination of building block four, but that EPA enable states to build flexibility, or "adaptive management," into their efficiency strategies as part of their plans, especially if they choose to be aggressive in driving demand reduction programs beyond assumptions made in the BSER determination.

ADDITIONAL COMMENTS

Increased methane leakage should be addressed

In recent years, several reports have been published that show a wide range of possible methane leakage rates associated with the production, transmission, storage, and distribution of natural gas. Since methane has a much higher global warming potential than carbon dioxide, this leakage could significantly offset emission reductions that will be driven by a shift from coal to natural gas power generation. On the other hand, the shift away from coal may reduce the emissions of coal mine methane. The net effect on methane emissions is unclear. Since the Clean Power Plan will accelerate the shift from coal to gas by design, EPA should establish an accurate estimate of any net additional methane leakage caused by the Proposal. This estimate should appear in any evaluation of the Clean Power Plan to ensure it is properly factored into the cost-benefit analysis. We encourage EPA to separately continue taking steps as suggested in the Administration's methane strategy to reduce methane leakage throughout the natural gas value chain to maximize the benefit of the Clean Power Plan.

Possible error in TSD for Translation of the Clean Power Plan Emission Rate-Based CO_2 Goals to Mass-Based Equivalents

We appreciate that EPA responded to the popular request for guidance on the rate to mass target conversion calculation by issuing a TSD. We believe there is an error in the approach the TSD takes to "quantifying a generation level for use in the translation to a mass-based equivalent for existing affected sources." According to the TSD and associated Excel spreadsheet, incremental renewable energy (RE) and generation avoided through energy efficiency (EE) are subtracted from a state's fossil generation in each compliance year. However, this does not match the approach EPA took in setting each state's target emission rate in the Proposal. In Appendix 1 of the Goal Computation TSD, target emission rates are calculated by dividing 2012 fossil emissions by total generation in the target year, which includes 2012 fossil generation, at-risk nuclear, and EE and RE in the target year. There is no downward adjustment to fossil generation to account for incremental EE and RE.

This results in mass targets that are too low because the amount of generation in each state for each year is lower than it should be according to the Goal Computation TSD. We acknowledge that the NODA suggests adjusting the Proposal such that RE and EE are assumed to displace fossil generation rather than supplement it, which seems to be the approach taken in the Rate-to-Mass TSD. However, the result is a mélange of one approach to setting a rate-based target and an incompatible approach to calculating an amount of generation to which that rate-based target should apply. Additionally, this approach does not allow for existing NGCC capacity to be ramped up to meet growing demand, which could easily happen in a state like California where NGCC capacity is projected to be below 70

percent after building block 2 is applied according to the Goal Computation TSD. We request that EPA ensure consistency across these methodologies.

NOTES

[1] Doug Vine and Timothy Juliani (2014), *Climate Solutions: The Role of Nuclear Power*, Center for Climate and Energy Solutions, available at: http://www.c2es.org/docUploads/nuclear-energy-brief-

[2] We do not see a downside to accounting for hydropower in the same way for consistency, but do not otherwise have an opinion on the treatment of existing hydropower in the Clean Power Plan.

[3] Multiplying under construction nuclear capacity by 0.94 would be in addition to the 0.90 capacity factor already included in the Proposal. This approach would therefore consider under construction plants as having a 94 percent chance of operating at a 90 percent capacity factor through the life of the Clean Power Plan.

[4] The Center for Strategic & International Studies recently issued a report that cites 8-9 years for the combined design and construction of a new nuclear power plant. The CSIS Commission on Nuclear Energy Policy in the United States (2013), Restoring U.S. Leadership in Nuclear Energy, available at http://csis.org/files/publication/130719_Wallace_RestoringUSLeadershipNuclearEnergy_WEB.pdf. Vogtle units 3 and 4, currently under construction in Georgia, are projected to take 12 and 13 years, respectively, to complete. Southern Company, Nuclear Energy: Overview, Timeline – Vogtle 3 & 4, http://www.southerncompany.com/what-doing/energy-innovation/nuclear-energy/home.cshtml (last visited October 6, 2014).

[5] U.S. Energy Information Administration, Electricity Data Browser Report 1.13: Net generation from hydroelectric (conventional), by state by sector (last visited November 25, 2014).

[6] Ibid.

[7] 79 Fed. Reg. 34830, 34922 (June 18, 2014).

[8] Also available at http://www.c2es.org/publications/cross-state-electricity-load-reductions-under-epas-proposed-clean-power-plan.

[9] Consider the case of California as an example, with an average power sector emission rate of 698 lbs CO_2 / MWh. Since California's zero-carbon generators will always be operating at their maximum capacity regardless of load and the state has excess natural gas combined cycle (NGCC) capacity, per EPA's TSD on Goal Computation, the marginal generator for new EV load would most likely be an existing NGCC plant, with an emission rate close to 900 lbs CO_2 / MWh. Under a mass-based approach, California would be able to add 537 pounds to its 2030 mass target for each additional megawatt-hour of projected generation. However, each new megawatt-hour of EV load will add about 900 pounds to its total amount of power sector emissions. This means that the state would be discouraged from adding new EV load as it makes the Clean Power Plan target more difficult to reach and would require cuts elsewhere.

[10] As illustrated in Figure 1: Generalized Distribution of First-Year Savings over Time, EPA Technical Support Document: GHG Abatement Measures.