Response to EPA: Considerations in the Design of a Program to Reduce Carbon Pollution from Existing Power Plants

December 5, 2013

The Alliance to Save Energy (Alliance) and American Council for an Energy-Efficient Economy (ACEEE) are pleased to provide input to the Environmental Protection Agency (EPA) as it develops carbon dioxide (CO_2) emissions guidelines for existing power plants under Section 111(d) of the Clean Air Act. Our organizations have found in study after study that energy efficiency has been, remains, and will continue to be the nation's most abundant, reliable, cleanest, and cost-effective energy resource.

If not for energy efficiency and energy productivity gains since the 1970s, the United States would need to consume about 50% more energy—with concomitant impacts on environmental quality as well as on energy bills and energy reliability—to support our current gross domestic product (GDP). Energy efficiency can be thought of as our "first fuel." Many of these gains have come in the electric power sector, where a growing number of states have enacted and expanded end-use energy efficiency programs that have yielded significant cost-effective energy savings that also mitigate emissions from the electric power sector. Energy efficiency continues to offer large potential for cost-effectively delivering multiple economic, environmental, energy security, and reliability benefits.

The Alliance and ACEEE strongly support the recognition and encouragement of energy efficiency as an emissions reduction strategy and a means to help achieve compliance with air quality regulations that will lower the cost of compliance. As detailed below in response to EPA's questions to stakeholders, our organizations believe that the Clean Air Act allows and EPA ought to incorporate in its emissions guidelines proposal:

- A system-based approach to setting the standard that considers the entire electricity system rather than a source-based approach that only includes measures that can be taken within the fence lines of individual regulated electric generating units;
- Flexibility for states to apply system-based compliance strategies, including end-use energy efficiency policies, programs, and measures, recognizing the varied and significant experience many states have in this area;
- Ability for states to use a mass-based system of compliance, which could accommodate various emission reduction strategies, such as energy efficiency;
- Guidance to states on criteria that states must meet in their implementation plans, including model rules or similar guidance to assist states that have modest resources and limited experience with energy efficiency programs; and
- Guidance on and attention to evaluation, measurement, and verification (EM&V) of energy savings and emissions reductions, including for modeling-based methods appropriate for smaller, dispersed end-use energy efficiency activities.

Our more detailed descriptions of these recommendations and responses to EPA's "Considerations in the Design of a Program to Reduce Carbon Pollution from Existing Power Plants" questions follow.

End-use energy efficiency measures can achieve low-cost greenhouse gas reductions from the power sector and are readily deployable on a large scale. ACEEE and the Alliance believe that emissions guidelines to be issued by the EPA under Section 111(d) of the Clean Air Act to regulate carbon CO_2 emissions from existing power plants should incorporate the benefits of end-use energy efficiency in order to ensure meaningful emission reductions at the lowest possible cost to states, utilities, power plants, and, indeed, electricity ratepayers. ACEEE and the Alliance make the following recommendations for the treatment of end-use energy efficiency in rulemaking for existing power plants:

- **Setting an emission limit—**The "best system of emission reduction" (BSER) should be based on a system approach, i.e., what can be achieved by the power sector as a whole, including what can be achieved through the use of end-use energy efficiency (as opposed to a plant-by-plant, supply-side approach limited to actions at the sites of regulated sources).
- **Including end-use energy efficiency as a compliance mechanism—**Emission reductions from the power sector as a whole, including reductions from end-use energy efficiency, should be counted toward compliance with a performance standard. EPA should afford states the ability to use mass-based approaches and should provide pertinent model guidance.
- **Establishing a baseline—**Many states have adopted policies that will result in increasing efficiency for years to come. Savings from measures installed after a base year, even if due to existing policies such as energy efficiency resource standards, should count as emissions reductions and should not be included in the calculation of a baseline for purposes of 111(d). In contrast, savings realized from installed efficiency measures and other policy impacts achieved in the base year or earlier should be included in a baseline, and those savings should not count.
- **Determining the types of energy efficiency programs and measures to count—** EPA should offer states model rule guidance with sufficient detail for states with little experience and few resources to develop adequate implementation plans, but EPA also should afford flexibility in the energy efficiency programs and measures that can comply with 111(d) because states differ in their economic structures, strengths, and past experience. Such flexibility in what can be included in a state's portfolio will allow states to identify lower-cost greenhouse gas reductions and employ new technological improvements as they become available in future years.
- **Identifying an approach to evaluation, measurement, and verification—**EPA should issue model guidance on EM&V that is structured as a "menu" of acceptable approaches based on extensive state experience and recognizing differences among the states. This guidance could be modified over time to improve consistency across states. EPA also should *allow the use of model-based evaluation of energy savings and emissions impacts* as it does for transportation measures under State Implementation Plans (SIPs) and transportation conformity programs. Many energy efficiency measures are small, widely

dispersed activities more resembling individual vehicles than conventional regulated stationary sources. EPA's own experience in modeling end-use efficiency impacts in the context of power-sector emissions modeling could be used to inform guidance in this area.

Answers to Questions Posed by EPA in "Considerations in the Design of a Program to Reduce Carbon Pollution from Existing Power Plants"

1. What is state and stakeholder experience with programs that reduce CO_2 emissions in the electric power sector?

States bring to the 111(d) arena significant and growing experience with implementing demand-side management (DSM) energy efficiency programs that deliver pollution avoidance benefits as well as cost-effective energy savings and energy reliability benefits. The *2013 ACEEE State Energy Efficiency Scorecard* places total national electric demand-side management program budgets at $5.9 billion in 2012.[1] Additionally, the Consortium for Energy Efficiency's *2012 State of the Efficiency Program Industry* report notes that U.S. electric ratepayer DSM programs yielded 36,596 GWh of gross incremental electricity savings (i.e., savings in that year from new investments made in that year) from about $5.7 billion in investments in 2011, thus avoiding almost 26 million metric tons of CO_2 emissions.[2] When the impacts of previous years' DSM investments are added to impacts of 2011 expenditures, the Consortium for Energy Efficiency estimates gross savings of 117,404 GWh in 2011, avoiding nearly 83 million metric tons of CO_2. Criteria and hazardous air pollutant emissions were also reduced.[3]

DSM approaches complement emissions-reducing energy efficiency measures that can be taken at the electrical generating unit (EGU) level and in transmission and distribution (T&D) systems (e.g., conservation voltage reduction). Synergies arise when DSM and demand response measures reduce resistive losses in T&D, while also offering grid resilience, reliability, and power quality co-benefits.

States use various policy mechanisms to implement electric sector DSM programs, including: energy efficiency resource standards (EERS), which are in place in about half the states covering about two-thirds of electricity usage; the inclusion of energy efficiency in renewable electricity standards (RES, also called renewable portfolio standards, RPS); loading order priority for cost-effective energy efficiency; and rate design and financial incentive approaches. Utility and

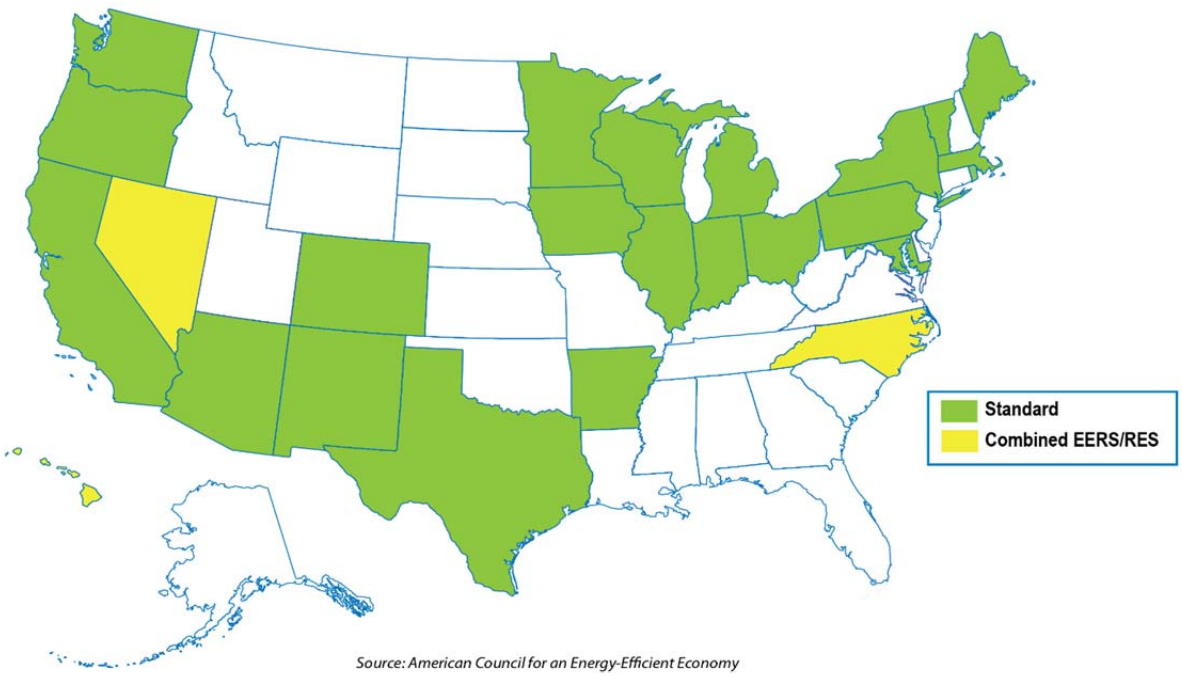
[1] Downs, A. et al. 2013. *The 2013 State Energy Efficiency Scorecard.* American Council for an Energy-Efficient Economy. Washington, D.C.

[2] Foster, H.J., Patrick Wallace, and Nicolas Dahlberg. 2013. *2012 State of the Efficiency Program Industry: Budgets, Expenditures, and Impacts*. Consortium for Energy Efficiency. The EPA Greenhouse Gas Equivalency Calculator at http://www.epa.gov/cleanenergy/energy-resources/calculator.html#results was used to estimate CO_2 avoidance. More accurate CO_2 avoidance figures can be developed using marginal generation and emissions methodologies, such as the pending EPA AVERT tool (which EPA could consider indicating as an acceptable quantification tool), or dispatch modeling developed by or for states, utilities. and regional transmission organizations. Shenot, J. 2013. *Quantifying the Air Quality Impacts of Energy Efficiency Policies and Programs.* Regulatory Assistance Project.

[3] Since the 2000s, a number of states have included energy efficiency measures in their NAAQS SIPs in accordance with EPA guidance. Efforts to expand this approach include EPA's 2012 "Roadmap on Incorporating EE/RE Measures in State Implementation Plans" with associated outreach and tool development, and pilot implementation by Maryland, Massachusetts, and New York.

quasi-utility[4] ratepayer-funded DSM programs typically have to meet cost-effectiveness criteria and EM&V standards. Recent efficiency potential studies have placed potential emission reductions from DSM programs on the order of 1.5% to 2% per year.[5] A real example of these reductions exists in Vermont, which in 2011 reached annual electricity savings of 2.12%.[6] Similar and related policies (RES, rate design and utility regulatory approaches, and financial incentives) also have impacts on combined heat and power, district energy, and renewable energy deployment and corresponding effects on CO_2 as well as on criteria and hazardous air pollutant emissions.

EERS Policy Approaches by State (As of July 2013)[7]



Twenty-five states have enacted long-term (3+ years) binding energy savings targets, or Energy Efficiency Resource Standards (EERS). These 25 states make up 61% of electricity sales in the United States. If each of these states maintains its current EERS target out to 2020, the overall savings would be approximately 236,000 GWh by 2020, equivalent to over 6.3% of 2011 sales nationwide, or the combined electricity consumption of Maryland, Washington, Minnesota, Vermont, and Rhode Island.

The Regional Greenhouse Gas Initiative (RGGI) represents another successful approach to abating CO_2 emissions in the electric power sector. Nine states currently participate in RGGI, voluntarily agreeing to cap power sector CO_2 emissions through a tradable allowance mechanism

[4] For example, Efficiency Vermont and the District of Columbia Sustainable Energy Utility.

[5] A 2013 ACEEE study estimated the achievable electricity savings from the implementation of an energy efficiency resource standard in Louisiana to cost-effectively reach 1.7% by 2023 (Molina M., et al., 2013. *Louisiana's 2030 Energy Efficiency Roadmap: Saving Energy, Lowering Bills, and Creating Jobs.*, ACEEE. Washington, D.C.*)*. Similar savings were found in a 2009 ACEEE report on Ohio (Neubauer, M. et al. 2009. *Shaping Ohio's Energy Future: Energy Efficiency Works*. ACEEE. Washington, D.C.).

[6] Downs, A. et al. 2013. *The 2013 State Energy Efficiency Scorecard.* ACEEE. Washington, D.C

[7] American Council for an Energy-Efficient Economy. 2013. *Policy Brief: State Energy Efficiency Resource Standards (EERS).* Washington, D.C. http://aceee.org/files/pdf/policy-brief/eers-07-2013.pdf

that affords states considerable latitude in implementation and expenditure of revenues. RGGI reported that investments of auction proceeds thus far are yielding $1.3 billion in lifetime energy bill savings, 27,000 GWh of generation avoidance, and 12 million short tons of CO_2 emissions avoidance.[8] Studies have also indicated significant regional economic and employment benefits in participating states.[9] California has also embarked on explicitly regulating power plant CO_2 emissions as part of its broader AB 32 program in addition to having a long-standing strong program of energy efficiency policies and incentives.

The RGGI states provide EPA with models for using energy efficiency in state-based CO_2 abatement. Based on modeling conducted during the RGGI development period, it was shown that energy efficiency offers significant benefits for reducing the costs of compliance.[10] As a result, the RGGI model rule required states to use substantial portions of allowance auction revenues for energy efficiency. Many of the states have devoted all or the majority of such funds to efficiency.[11] RGGI's experience clearly demonstrates that in the first successful CO_2 regulatory program for existing power plants implemented in the Western Hemisphere, end-use energy efficiency became an integral part of the policy design and in state implementation efforts.

Non-ratepayer/non-utility state and local policies—such as enhanced building energy codes, appliance standards, building benchmarking and disclosure ordinances, tax and other fiscal incentives, home weatherization and other retrofit programs, and public sector energy performance and procurement initiatives—are additional approaches that can provide electricity savings that yield reduced emissions of CO_2 and criteria and hazardous air pollutants. Energy savings performance contracts (ESPCs) provide an important means for implementing facility energy savings and achieving concomitant emissions avoidance with financing of up-front costs.

The combination of ratepayer DSM and other efficiency policies can achieve large energy savings and emissions reductions. It is notable that Massachusetts relies on energy efficiency as the single largest source of greenhouse gas (GHG) reductions under its Clean Energy and Climate Plan for 2020; energy efficiency is projected to represent fully one-third of the 2020 requirement to reduce GHG emissions by 25% compared to 1990.[12]

ISO-New England, the regional transmission organization serving the New England states, projects that there will be no net increase in electricity demand in the six New England states through 2022 as compared to a 14 to 15% increase if the planned energy efficiency investments were not made. This is illustrated in the following figure.[13]

[8] Regional Greenhouse Gas Initiative, Inc. 2013. *Regional Investment of RGGI CO_2 Allowance Proceeds, 2011*. RGGI. http://rggi.org/docs/Documents/2011-Investment-Report.pdf

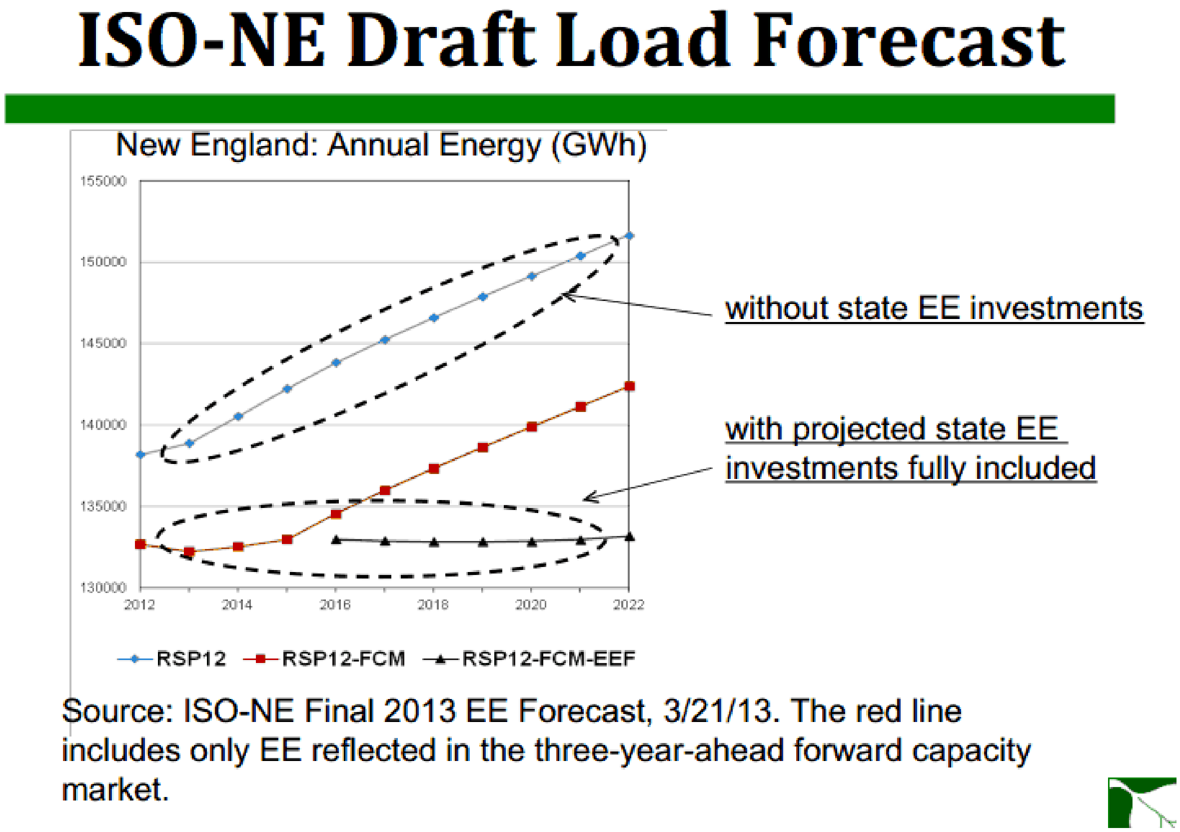
[9] Hibbard, P.J. et al. 2011. *The Economic Impacts of the Regional Greenhouse Gas Initiative on Ten Northeast and Mid-Atlantic States: Review of the Use of RGGI Auction Proceeds from the First Three-Year Compliance Period.* Analysis Group.

[10] Prindle, W. et al. 2006. *Energy Efficiency's Role in a Carbon Cap-and-Trade System: Modeling Results from the Regional Greenhouse Gas Initiative.* ACEEE. Washington, D.C

[11] Hibbard, et al., op. cit.

[12] Weber, S. (Massachusetts DEP). 2013. "Interagency Cooperation & Quantifying EE Air Quality Benefits." The Energy Foundation: Energy Efficiency—Today and Tomorrow, Chicago, IL, October 23, 2013. The Global Warming Solutions Act of 2008 provides the 2020 interim goal and a 2050 80% reduction goal.

[13] Shenot, J. (Regulatory Assistance Project). 2013. "Energy Efficiency as a Means of Promoting Air Quality." The Energy Foundation: Energy Efficiency—Today and Tomorrow, Chicago, IL, October 23, 2013.



The Regulatory Assistance Project (RAP) examined a number of state and regional programs and EM&V resources to illustrate (in the following figure) how several simple efficiency measures can achieve avoidance of CO_2, nitrogen oxides (NO_x), and sulfur dioxide (SO_2).[14]

[14] Colburn, K. (Regulatory Assistance Project). "Regulating CO_2 in the Power Sector and the Role for Energy Efficiency Under Section 111d." The Energy Foundation: Energy Efficiency—Today and Tomorrow, Chicago, IL, October 23, 2013. In practice, the determination of electricity savings would be performed for a given program and state in accordance with state-approved EM&V procedures. Translation of savings into avoided emissions could be performed using marginal emissions or dispatch modeling techniques as was noted in Footnote 2 and will be discussed further below. But the table is illustrative of how discrete energy efficiency measures can be linked to emissions reductions.

"Scale-It-Up": Look-Up Tables for EE/AQ Data

Units Needed to Avoid 1 Ton-per-Year Emissions			
Measure	**NOx**	**SO2**	**CO2**
LED Light – New Construction	3,734	2,555	5.4
Mobile Home Duct Sealing	712	475	1.0
SEER 16 Air Conditioner with Electronically Commutated Motor	5,216	3,130	8.6
EnergyStar Clothes Washer with electrically heated water	29,333	11,000	22

Sources: Northwest Regional Technical Forum; Wisconsin Focus on Energy NEEP Regional Energy Efficiency Database, etc.

Questions for further discussion

- What actions are states, utilities, and power plants taking today that reduce CO_2 emissions from the electric power system? How might these be relevant under section 111(d)?

See answer above.

- What systems do states and power plants have in place to measure and verify CO_2 emissions and reductions?

While there is currently no single binding national standard for energy efficiency program EM&V, most states have developed EM&V approaches, and some regions have adopted common approaches across multiple states; this is especially true for ratepayer-funded programs. In the more than half of U.S. states that have EERS in place, program administrators and their evaluators are measuring their energy savings impacts and related indicators using comparable if not uniform methods.

In recent years a variety of national and regional efforts have promoted increased uniformity across states. The State and Local Energy Efficiency (SEE) Action Network and DOE's Uniform Methods Project, as well as important regional (Northeast Energy Efficiency Partnerships EM&V Forum and the Regional Technical Forum in the Pacific Northwest region) and state (e.g., California) activities, are aimed at increasing consistency in EM&V. Credible EM&V also is required as energy efficiency becomes more widely integrated into resource planning, such as the ISO-New England and PJM EM&V protocols that are applied to demand-side resources that are bid into their forward capacity markets.

Given the value of flexibility under 111(d), the importance of maintaining acceptable levels of robustness and consistency across states, and the need to ensure that compliance activities are valued with some degree of equivalence, the Alliance and ACEEE recommend that EPA issue some guidance on minimum standards for EM&V. Guidelines should require that states document their proposed approaches to EM&V and include a transparent public process engaging all key stakeholders, including regulators, utilities, customers, efficiency advocates, and ratepayer advocates.

After quantifying electricity savings, states should be allowed to employ marginal generation and emissions calculators or dispatch models to quantify emissions avoidance. Currently the EPA-developed Power Plant Emissions Calculator (PPEC) is publically available, while the AVERT tool (using a time-matched marginal methodology) is being developed. These public domain, easy-to-use tools can provide adequate calculations of avoided emissions, while dispatch models are often proprietary and complex. EPA should consider allowing states to use AVERT or similar tools as acceptable methods while also allowing states to use more precise models such as NE-MARKAL, IPM, and proprietary tools used by utilities and regional transmission organizations. EPA's role should be to set clear and flexible guidelines for the use of modeling and calculator tools, while reserving the right to reject the use of tools that do not meet the guidelines.

Further, EPA should consider that smaller, dispersed energy efficiency measures ought to be treated in a manner analogous to the way transportation measures are treated in National Ambient Air Quality Standards (NAAQS) SIPs and transportation conformity. EPA allows and provides guidance for the use of various transportation control measures such as land use policies, public transit, intelligent transportation and congestion pricing programs, and vehicle retrofit and accelerated scrappage programs in SIPs and transportation conformity.[15] Unlike stationary source permit conditions or technical requirements at area sources (e.g., VOC limits, paint booth standards, and reporting requirements for auto body shops), these measures are not subject to strict interpretation of additionality and enforceability. For instance, transit improvements or high-occupancy vehicle lanes do not obligate drivers to undertake certain behavior nor do they create permit-type NOx and VOC emissions limits, but their impacts nonetheless can be credibly modeled. Model results can be compared with selective sampling and monitoring to verify progress in air quality.

EPA guidelines could also require states to track modeling projections to confirm emission reductions and try to address any discrepancies. Since all EGUs have continuous emissions monitors (CEMs) as well as records of fuel consumption, state officials and EPA will have definitive EGU emissions data that could potentially be compared with electricity savings and emissions avoidance estimated using EM&V and emissions quantification tools. This may assist calibration and improvement of such tools, methods, and protocols; allow improvement in SIPs; and assist compliance and enforcement actions as may be warranted.

- How do state programs and measures affect electricity generation and emissions at a regional level? How are interstate effects accounted for when measuring the progress of a state program? For example, are the multi-state effects of state renewable portfolio

[15] U.S. EPA. Transportation-Related Documents. http://www.epa.gov/oms/stateresources/policy/pag_transp.htm

standards, end-use energy efficiency resource standards, emissions performance standards, and emissions budget trading programs currently accounted for by the state, and if so, how?

ACEEE and the Alliance believe that states should be allowed to enter into voluntary agreements to average or trade credits or allowances or otherwise jointly meet targeted emissions reductions. If there are credits for avoided emissions, they should be subject to robust, consistent EM&V practice (as discussed above).[16] Existing (PPEC) and impending (AVERT) marginal generation methodologies as well as dispatch models allow apportionment of electricity savings and avoided emissions to particular EGUs within regional power pools.

The ability of states to average or trade emission credits across state lines could allow more efficient and cost-effective compliance through end-use efficiency, generation and T&D system efficiency, and adjustment of unit dispatch. It could encourage interstate investment in energy efficiency as well as other options, particularly where utility territories, regional transmission organizations, and power pools cross state lines. Because of the nature of CO_2 as a global rather than local pollutant, there are no NAAQS non-attainment or local exposure concerns (as with hazardous air pollutants) that require local or regional concentration monitoring and modeling or "airshed" impact considerations.

2. How should EPA set the performance standard for state plans?

The flexibility allowed under Section 111(d) implies that emission reductions from the power sector as a whole can be considered when setting and determining compliance with the performance standard. This approach would allow for the inclusion of activities that reduce emissions from the sector as a whole—such as end-use energy efficiency. In addition to including large low-cost emissions reduction opportunities, this approach also makes more sense from an environmental standpoint as greenhouse gases don't have localized impacts, but rather the environmental and health harms that this rule is intended to address are global in nature. Therefore, linking the emission reductions to a geographic location may add an administrative burden with little or no benefit.

Under a system-based compliance approach reductions from end-use energy efficiency could be counted and would not necessarily need to be tied to a particular power plant. This would potentially allow for greater flexibility and (at state discretion) averaging or trading of emissions reductions, allowing the lowest-cost emission reductions to be used for compliance.[17] Consequently, this approach should be followed unless EPA and the courts determine that tracking emissions reductions from end-use efficiency to individual plants is needed to comport with the law.

A system-based performance standard would provide the flexibility necessary for state specific plans to be effective, by allowing states to adjust for significant differences in their economic structures, generation blends, power sector regulatory structures, and past energy and

[16] Even if there are not credits under the standard, EM&V is valuable for attributing savings to programs, projects, and measures and also for determining and improving programs effectiveness.
[17] Lashof, D. et al. 2013. *Closing the Power Plant Carbon Pollution Loophole: Smart Ways the Clean Air Act Can Clean Up America's Biggest Climate Polluters.* Natural Resources Defense Council. Washington, D.C.

environmental management experiences. A system-based standard, which can be met by system-wide reductions in electricity consumption, accomplished through end-use energy efficiency, would provide this flexibility.

Questions for further discussion

- Which approaches to reducing CO_2 emissions from power plants should be included in the evaluation of the "best system of emission reduction" that is used to determine the performance level(s) that state plans must achieve? Should the reduction requirement be source- or system-based?

There are clear policy advantages to including end-use efficiency and other options when setting the achievable emission reductions of the BSER. A Natural Resource Defense Council (NRDC) analysis looked at potential scenarios under 111(d) and found that when end-use efficiency is included as a compliance option, there is so much available and at such a low cost that it becomes the primary mechanism by which emission reductions are achieved.[18] The Commonwealth of Kentucky, which one may expect to have a different perspective on carbon regulation than NRDC, also favors a broad, system-based approach that allows a wide range of compliance options.[19] Further, it is noteworthy that the only net negative cost compliance strategy in Kentucky's analysis is demand-side efficiency.[20]

In addition to its substantial potential for emission reductions, end-use energy efficiency can significantly reduce the cost to the power sector of achieving greenhouse gas reduction goals. End-use energy efficiency is not just less expensive than other emissions control technologies, but \often pays for itself by avoiding energy costs. This is because on a levelized-cost basis, the cost of meeting electricity demand through generation resources is significantly higher than meeting customer needs with energy efficiency.

If EPA takes a limited view of the flexibility it is allowed in defining the best "system," it may conclude that the system must be based only on emission reductions that can be achieved through changes in the way the regulated sources operate. This could in principle include installation of a control technology, but since cost is a consideration under 111(d), this approach may result in an approach based solely on efficiency upgrades that can be achieved at existing plants. The potential for these improvements is very limited and by some estimates might be an improvement of only about 5%[21] sector-wide. If EPA does take this limited approach, the emissions reductions achieved from the rule would also be limited. Re-dispatching or fuel switching at existing plants (e.g., switching generation fuels from coal to natural gas or perhaps biomass co-firing) is another method that could result in significant emissions reductions, though it is not clear whether a requirement that existing coal plants switch to burning another fuel would be permissible under 111(d), and this approach would undoubtedly be controversial. Even if not included as part of the BSER, end-use energy efficiency could still potentially be included

[18] Ibid.
[19] Commonwealth of Kentucky, Energy and Environment Cabinet. 2013. *Greenhouse Gas Policy Implications for Kentucky under Section 111(d) of the Clean Air Act*.
[20] Ibid. Table 2.
[21] This is a very rough estimate in the middle of a range of possible supply-side upgrades that could be made to existing power plants. For a more detailed discussion of specific improvements and associated costs, see Sargent & Lundy. 2009. *Coal-Fired Power Plant Heat Rate Reductions.* SL-009597. Sargent & Lundy LLC. Chicago, IL.

by states as a compliance mechanism to reduce the cost of compliance, but the emission reduction goals of the rule would be only a small fraction of what could be cost-effectively achieved.

Alternatively, if EPA identifies a BSER that could be achieved by the power sector as a whole (as opposed to a plant-by-plant, supply-side approach limited to regulated sources), the required emission reductions could be based on what can be achieved through the use of end-use energy efficiency, T&D efficiency, and lower- or no-carbon generation. A system-based approach would provide the flexibility states need to reach any limit on greenhouse gas emissions, while also taking advantage of the rapidly-deployable, low-cost resource that is end-use energy efficiency.

We add that there is some precedent in Section 111 and in 111(d) rules for a system approach that transcends regulated facility "fence lines." Emissions averaging and trading among regulated sources is acceptable under 111(d) in the case of municipal waste combustors,[22] which suggests that emission reductions need not occur within the facility boundaries at each regulated source. This rule has been in place for nearly two decades without court challenge, and as a precedent suggests that a source could pay for reductions to occur at a different location and take credit for those reductions in order to comply with the rule. Because these actions have been deemed creditable, there should be no barriers to state implementation of similar measures in the case of greenhouse gases. States should be allowed the flexibility to claim credit for a wide array of measures which may be performed by many different actors, including businesses, consumers, regulated sources, and the state itself.

Other "beyond the fence line" precedents include provisions for "waste management plans" in several 111(d) combustor emissions guidelines, including model rule provisions for Commercial and Industrial Solid Waste Incineration Units (40 CFR Part 60 Subpart DDDD) and Other Solid Waste Incineration Units (Subpart FFFF), that call for plans that:

> …must include consideration of the reduction or separation of waste-stream elements such as paper, cardboard, plastics, glass, batteries, or metals; or the use of recyclable materials. The plan must identify any additional waste management measures and implement those measures the source considers practical and feasible, considering the effectiveness of waste management measures already in place, the costs of additional measures, the emissions reductions expected to be achieved, and any other environmental or energy impacts they might have.[23]

These waste management plan provisions include consideration of waste reduction (before waste is created), use of recyclable materials, and other aspects that are generally beyond the waste combustion facility. We believe that *beyond-the-fence-line waste reduction and recycling is analogous to electricity efficiency beyond the EGU*. Considerations of effectiveness, cost,

[22] See "Emission Guidelines for Municipal Waste Combustor Metals, Acid Gases, Organics, and Nitrogen Oxides," 40 C.F.R. §60.33b (d). See also "Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam-Generating Units (Clean Air Mercury Rule)," 70 *Fed. Reg*. 28606 (July 18, 2005). Trading was permitted but challenged by petitioners; however, the D.C. Circuit Court overturned the rule on other grounds and did not address the question of emissions trading under Section 111(d) in this context.

[23] 40 CFR 60.230 and 40 CFR 60.3012 are identical. There are analogous provisions in several solid waste combustor New Source Performance Standards too.

existing measures in place, etc. are also analogous to considering existing EERS, RPSs, and other energy policies and programs in the electric system context.

A related question is: even if the law allows EPA to look "beyond the fence line," do these emissions reductions need to be traced to specific regulated plants? We believe such a link is not needed, but if EPA concludes that a link is needed legally, a recent ACEEE paper[24] discusses how emissions reductions could be assigned to particular plants and the dispatch of such designated plants modified.

- How does the amount of flexibility that states are given to include different types of programs in their state plans relate to the "best system of emissions reduction" that is used to set the performance bar for state plans? For example, if state standards to improve end-use energy efficiency were included in state plans, should EPA consider potential improvements in end-use energy efficiency in setting the performance target for states?

A "best system of emissions reduction" should permit the use of a wide array of emission reduction measures in order to take into account the ways in which states differ in their economic structures, strengths, and past experience. Providing for this kind of flexibility in what programs and measures can be included in a state's portfolio will allow states to identify lower-cost greenhouse gas reductions and employ new technologies as they become available.

As discussed previously, numerous states already implement end-use electricity efficiency policies and programs that achieve CO_2 emission reductions even in cases where such emission reduction is not a primary or explicit objective. And they do so while meeting strong cost-benefit criteria. So, whether or not emission benefits are an intended goal of states' efficiency policies and programs, those programs meet the criteria for being part of BSER now.

- What should be the form and specificity of the performance level(s) in EPA guidelines? (Rate-based or mass-based? Separate levels for each subcategory of sources, or one level for the covered sources in the state? A uniform national level, or different levels by state/region based on an established evaluation process?)

As indicated above, states should have the ability to use a mass-based system. Otherwise the Alliance and ACEEE have not yet investigated these issues in detail and therefore decline to comment on this question at this time.

- When can emission reductions from existing power plants be achieved, considering different reduction strategies?

Emissions reductions from the implementation of energy efficiency programs and policies can begin within the first year of implementation. These reductions have the potential to accumulate over time, ramping up as implementation progresses and previous years' measures continue to operate. A forthcoming ACEEE analysis will calculate reasonable ramp-up rates on a state-by-

[24] Hayes, S. & G. Herndon. 2013. *Trailblazing Without the Smog: Incorporating Energy Efficiency into Greenhouse Gas Limits for Existing Power Plants.* American Council for an Energy-Efficient Economy. Washington, D.C.

state level, considering the energy savings opportunities available in each state and how long it would take for each state to ramp up their present programs and policies to best-practice levels.

- How should a state, in applying a standard of performance to any particular source, consider a facility's "remaining useful life" and other factors?

The Alliance and ACEEE have not yet investigated these issues in detail and therefore decline to comment on this question at this time.

3. What requirements should state plans meet, and what flexibility should be provided to states in developing their plans?

A certain degree of flexibility will be necessary in outlining the requirements states must meet. Flexibility in what programs and measures can be included in a state's portfolio will allow states to identify the lower-cost greenhouse gas reductions and employ new technologies as they become available.

States have varying levels of experience and resources available to respond to EPA-promulgated 111(d) emissions guidelines. The timeframe in the President's memorandum to EPA on this issue is aggressive: (111(d) proposal by June 1, 2014; finalization by June 1, 2015; and state plans due by June 30, 2016). It is especially aggressive when considering such factors as: limited state resources; newness of the topic to many states; limited collaboration experience in many states among air quality regulators, utility regulators, and state energy offices; and administrative and legislative procedures that must be met in cases where state regulation and legislation is needed.

Given such factors, EPA should consider allowing states to phase their SIPs under the proposed rule. The first phase could be broad, include initial measures, and include studies and plans that will lead to a subsequent SIP, which would provide more detailed plans for implementation and compliance and would allow time for implementation of complementary energy efficiency regulations and other policies.

We believe that some states will desire detailed guidance on approaches that will earn EPA SIP approval, whereas other states will want the flexibility to customize their approaches and to be recognized for their existing or emerging policies and programs. To address this potentially wide range of needs, EPA should consider providing detailed guidance and one or more model rules (perhaps a "menu" of options). These could appear in 40 CFR Part 60 as "emission guidance" or they could be issued as guidance documents outside of the formal regulation. States could adopt one of these model rules, or they could opt for another approach that can be shown to achieve at least equivalent results.

If EPA opts for rate-based performance standards or criteria, it should offer guidance for translating rate-based standards into mass-based systems, such as applied in the RGGI states and preferred by certain states (see Kentucky comments previously cited), so they can readily demonstrate compliance.

The text of Section 111(d) calls for a process "similar to" that employed for NAAQS SIPs under Section 110. EPA should be cognizant of both the similarities and differences of CO_2 regulation under 111(d) to criteria air pollutants under 110. For instance, there is no NAAQS non-attainment or acute exposure concern in the CO_2 context; thus there is no need to model and monitor upwind states' contribution to downwind state CO_2 concentrations.

End-use energy efficiency and renewable energy (EE/RE) are eligible measures for NAAQS SIP inclusion. Although they were the subject of a 2004 EPA guidance document, there was limited application of EE/RE in NOx SIPs (and in associated NOx trading programs), due in part to a cumbersome process for meeting traditional NAAQS SIP criteria of emissions reductions having to be quantifiable, surplus, enforceable, and permanent. This imposed substantial documentation costs, and because individual energy efficiency projects achieve small amounts of avoided NOx, this made the costs of documentation too large relative to any value of NOx allowances that could be earned. This experience suggests two future changes in approach: (1) streamlining the processes and associated costs of documentation for individual projects, and (2) focusing on documentation methods for larger-scale programs and policies as a whole so that such costs become a more manageable fraction of total costs. While there is certainly a need for rigor in establishing that real emissions savings have occurred, the costs of documentation also need to be manageable, and we believe these two complementary approaches will serve that need. Toward that end, the 2012 EPA EE/RE in SIPs "roadmap" and associated quantification tools (previously cited PPEC and AVERT) are an attempt to revive the opportunity for EE/RE inclusion in NAAQS SIPs.[25]

Although developed for NAAQS SIP purposes, EPA could state that pathways and approaches described in the 2012 "roadmap" would be viewed favorably for 111(d) SIPs and their compliance regimes. Further, as discussed in some detail previously, small, dispersed end-use efficiency measures are analogous to transportation controls. Modeling and sampling rather than permit-like enforceability are sufficient for recognition of transportation controls in NAAQS SIPs. This should be so for small, dispersed energy efficiency measures for 111(d) (and NAAQS) SIPs.

Questions for further discussion

- What level of flexibility should be provided to states in meeting the required level of performance for affected EGUs contained in the emission guidelines?

In part, addressed above. We reiterate support for a system-based approach that allows the use of end-use energy efficiency as well as other approaches (generation and T&D efficiency, dispatch strategies, low and no-carbon generation, and CCS). We also reiterate that EPA can offer model rules or guidance but should allow states the option to offer other approaches that at least meet the emissions impacts that federal guidelines would achieve. We assume that the law constrains eligible compliance measures to those that affect the electrical sector and EGUs.

[25] This new roadmap approach is being "test driven" by Maryland, Massachusetts, and New York. Short of use in formal SIPs, it is also being considered by a number of states for use in the Ozone Advance and PM Advance programs.

- Can a state plan include requirements that apply to entities other than the affected EGUs? For example, must states place all of the responsibility to meet the emission performance requirements on the owners or operators of affected EGUs, or do states have flexibility to take on some (or all) of the responsibility to achieve the required level of emissions performance themselves or assign it to others (e.g., to require an increase in the use of renewable energy or require end-use energy efficiency improvements, which will result in emissions reductions from affected EGUs)?

States should have the flexibility to achieve emissions reductions for compliance so long as avoided or reduced emissions are realized in the regulated sector and its emissions sources. States have developed different approaches towards EERS and RPS based on their different contexts. Some states with vertically-integrated utilities place EERS compliance responsibility on the utility, which administers programs for achieving targeted savings. Others (e.g., Vermont, District of Columbia) have created energy efficiency or sustainable energy "utilities" separate from incumbent power supply utilities that administer efficiency programs. States that rely on competitive wholesale markets for generation and regulated utilities for distribution may use other approaches. For instance, Connecticut's RPS has an energy efficiency credit obligation (Class III Renewable Energy Certificates) which generators must purchase to meet requirements. Most of the Connecticut Class III RECs have been generated through ratepayer programs associated with a quasi-state entity funded by ratepayer funds via utility distribution companies, although third parties can also generate and sell Class III RECs as well. The point is that varying state systems should be accommodated.

Non-utility/non-EGU entities can contribute emissions-avoiding energy savings in other ways. For example, enhancing building energy codes by enacting and enforcing stricter efficiency measures can achieve electricity sector savings and emissions avoidance. Texas, for example, included statewide implementation of the International Energy Conservation Code (IECC) in its NOx SIP. Typically, building energy codes are developed by voluntary national bodies, adopted and administered by states, and enforced by localities.

- What components should a state plan have, and what should be the criteria for approvability?

The Alliance and ACEEE have not yet investigated these issues in detail and therefore decline to comment on this question at this time.

- Can a state plan include programs that rely on a different mix of emission reduction methods than assumed in EPA's analysis of the "best system of emission reduction" that is used to set the performance standard for state plans?

We believe that EPA's analysis of a BSER should serve as a model states can reference to formulate plans that meet the performance standard formed from this analysis. States should be allowed the flexibility to rely on policies and programs not explicitly included in EPA's BSER, as long as they are quantifiable and enforceable. Ensuring that policies and programs are meeting emission reduction targets relies on strong EM&V protocols and resources. If a state's EM&V efforts demonstrate that meaningful emission reductions are being achieved and targets are being met by a particular policy or program, then it should be creditable regardless of its specific typology (efficiency, renewable generation etc.). By granting this flexibility, EPA will give states the flexibility to formulate plans that reference EPA's analysis of a BSER while fitting the economic, experience, and resource constraints specific to the state.

- What should be the process for demonstrating that a state plan will achieve a level of emissions performance comparable to the level of performance in the EPA emission guidelines?

The Alliance and ACEEE have not yet investigated these issues in detail and therefore decline to comment on this question at this time beyond the EM&V discussion above.

- What enforceability, measurement, and verification issues might arise, depending on the types of state measures and programs that states include in their plans? For example, what issues are raised by actions that have indirect effects on EGU emissions, such as end-use energy efficiency resource standards, renewable portfolio standards, financial assistance programs to encourage end-use energy efficiency, building energy codes, etc.)?

Issues of EM&V and quantification of emissions reductions were addressed previously.

- Do different CO_2 reduction methods under different state plan approaches necessitate different timelines for the achievement of emission reductions?

Section 111(d) allows states to consider the "remaining useful life" of facilities and perhaps other components of, in this case, the electric power system, among other factors in developing implementation plans. This suggests that different states could offer differing timelines for emissions reductions. Timelines must also be realistic in terms of the resource deployment cycles associated with a given policy type, in relation to the level of emissions reductions required and the specific characteristics of a state or regional electricity system. For example, to meet a specified emission-reduction target via an EERS, time would be required to penetrate end-use markets sufficiently to achieve the associated levels of energy savings. The fuel mix, dispatch order, and other characteristics of a given electricity system can also affect the time needed to achieve emission reduction targets. For example, because energy efficiency policies remove load from the "top" of the system load curve, the marginal emission rates of EGUs in the system's dispatch order can affect emission reductions over a given time period. States should be allowed to include such considerations in their SIPs.

Also, as described above a two-phased SIP process could also be considered.

- What issues arise from the fact that operation and planning of the electricity system is often regional, but CAA section 111(d) calls for state plans? How should interstate issues be addressed, where actions in one state may affect EGU emissions in another state? For example, where actions have interstate impacts, which state would receive credit for the emission reductions in its state plan? Could EPA provide for coordinated submittal of state plans that demonstrate performance on a regional basis?

The issue of interstate impacts was discussed previously. We reiterate our support for allowing states the option of entering into voluntary agreements to allow them to share, average, and trade emission credits.

In the NAAQS SIP process there is precedent for regionally coordinated SIPs. For instance, the Metropolitan Washington Council of Governments (MWCOG) has played a strong role in regional air quality planning and coordinating the SIP process for the District of Columbia, Maryland, and Virginia. This included, at least in the case of Maryland, provisions for recognizing upwind NOx reductions attributed to energy efficiency measures and REC purchases.

EPA has worked with states to enhance interstate cooperation and coordination on air quality through such mechanisms as the Ozone Transport Commission and the Regional Planning Organizations addressing regional haze/visibility issues.

An example from somewhat wider afield is EPA's acceptance under the Clean Water Act of a multistate Total Maximum Daily Load (TMDL) for mercury (mostly air deposited) from New York and the New England states. There are other multistate TMDLs, including for nutrients for the Chesapeake Bay watershed. We are not experts in the Clean Water Act but do note some analogy to the CAA (Watershed Implementation Plans, WIPs requiring reasonable assurance of progress, and a federal backstop if the WIP is insufficient).

4. What can EPA do to facilitate state plan development and implementation?

EPA should consider allowing a two-staged SIP process as noted earlier. States are concerned that time is short to meet the June 30, 2016 SIP deadline, particularly for states that would need to pass legislation as well as promulgate regulations. Therefore, EPA should signal as soon as practicable whether it will propose a system-based approach that could allow inclusion of end-use energy efficiency and other strategies (low/no-carbon generation, dispatch strategy, etc.) so states can have more time to prepare for SIPs and to implement pertinent rules.

Also as previously noted, EPA should offer one or more model rules and detailed guidance (whether formally in the CFR as "emissions guidelines" or as separate guidance) that states could adopt as a "default" EPA-approvable option. But it also should allow states wide discretion to offer alternative approaches that meet at least what federal guidance would achieve.

EPA should signal to what extent the 2012 EE/RE roadmap and related quantification tools developed by EPA could be applied for 111(d) purposes. Further, EPA should issue minimum acceptable EM&V criteria. In developing such criteria it should consult with its own experts, those at DOE and the National Laboratories, and existing state and regional, EM&V practitioner resources. SEE Action Network, DOE Uniform Methods Project, and NEEP have already been mentioned as focal points for such resources.

EPA and its regional offices should continue their outreach with states, including state energy offices and utility regulators as well as air quality regulators, directly as well as through national

(NACAA, NARUC, NASEO) and regional organizations. Technical assistance through documents, web tools, in-person meetings, and webinars should be provided. EPA should also consult with DOE on the potential for providing states grant funding and technical assistance for SIP-related analysis and related efforts, through the State Energy Program and other DOE resources.

<u>Questions for further discussion</u>

- What types and amount of guidance and implementation support should be provided to states?

This has been addressed previously.

- Are there benefits for coordination among neighboring states in the development and submittal of state plans? Should EPA facilitate the coordination of multi-state plan submittals?

This has been addressed previously.

- Would certain types of measures that might be included in state plans increase the need for coordination among states?

ACEEE and the Alliance have not yet investigated these issues in detail and therefore decline to answer this question at this time.

- Are there model rules that EPA could develop that would assist states, and what would those rules cover?

This has been addressed previously.