Air Resources Board

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November 24, 2014

Ms. Janet McCabe
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U.S. Environmental Protection Agency
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Washington, D.C. 20460

RE: Docket Number EPA-HQ-OAR-2013-0602 (Standards of Performance for Greenhouse Gas Emissions from Existing Stationary Sources: Electric Utility Generating Units)

Dear Acting Assistant Administrator McCabe:

The most recent report from the Intergovernmental Panel on Climate Change shows that global emissions of greenhouse gases (GHGs) continue to rise despite a growing number of policies to address climate change. Strong carbon pollution standards are urgently needed to prevent the worst impacts of climate change. As the President's Climate Action Plan recognizes, electric utility generating units (EGUs) are the largest stationary source of GHG emissions in the country, and so require swift regulatory attention. We applaud your efforts to establish programs for both new and existing EGUs. The emission reductions obtained through the proposals will build on the progress made to date at the state and national levels, to minimize the worst impacts of climate change.

California is in strong support of the proposed "Standards of Performance for Greenhouse Gas Emissions from Existing Stationary Sources: Electric Generating Units" (proposed rule) and we appreciate that in designing it, the U.S. Environmental Protection Agency (U.S. EPA) considered that the electrical grid operates as a system and set its emission guidelines accordingly. This holistic approach will provide much needed flexibility and still ensure emission reductions are achieved. We also appreciate the flexibility provided in the proposed rule for states to show compliance.

This approach will drive continuing pollution reductions from the varying energy resources in the states and support the operational needs of electricity grids across the nation.

California advocates a rigorous and equitable approach that will achieve very significant reductions while using flexibilities inherent in the power grid to support cost-effective compliance with the proposed rule. Specifically, California supports U.S. EPA setting emission targets for each state using the proposed Best System of Emission Reductions (BSER), and we commend U.S. EPA's determination that BSER for existing EGUs recognizes the complex interactions of generation, renewable energy, and demand side reductions in the power grid. Because of this complexity, innovative approaches such as those in the proposed Clean Power Plan are needed in order to reduce GHG emissions while ensuring the reliability of the electric grid is maintained. We commend U.S. EPA for providing states multiple options in designing their compliance plans that can be tailored to ensure this reliability, as well as encouraging a multi-state approach for regional cooperation.

To help further strengthen the proposed rule and at the same time help guide U.S. EPA as to where resources to assist states in complying with the proposed rule could best be spent, we provide the following comments.

The California Air Resources Board (ARB) worked closely with the California Energy Commission, the California Public Utilities Commission, and the California Independent System Operator to develop these suggested revisions to the proposed rule informed by California's experience with the electricity sector, and our own long-term climate goals.

1. Notice of Data Availability and Target Setting Refinement

States throughout the country have succeeded at reducing the emissions of existing EGUs through the use of the strategies that U.S. EPA identifies in the "building blocks" supporting its emission guidelines. California's own experience demonstrates that states can prosper *while* they are reducing emissions and building a cleaner power sector, driving research and development, creating jobs, and protecting public health. We commend U.S. EPA for setting strong targets and would oppose any effort to weaken those targets. U.S. EPA should continue to carefully review the proposal for opportunities to maintain and enhance reductions.

California supports U.S. EPA efforts to set renewable energy goals based on a methodology that is rigorous and uniformly applied to all states. Both U.S. EPA's proposed renewable energy approach and the alternative renewable energy approach are valid methodologies that are adequately supported technically and legally.

However, given the rapid changes in the renewable energy industry, including dramatically declining technology costs at rates that have often exceeded policy-makers' forecasts, California supports U.S. EPA's continuing efforts to incorporate the technical and economic potential of renewable energy in each state in the methodology for target-setting in Building Block #3.

U.S. EPA's recent "Notice of Data Availability" (NODA) offers an opportunity to fine-tune the proposed rule while maintaining emissions reductions and potentially improving implementation. We understand that U.S. EPA has received comments stating that the interim targets may create implementation challenges early in the life of the program where sharp emission cuts are necessary by 2020.

California commends U.S. EPA's willingness to work with states on rule implementation, and supports its efforts to this end. However, California continues to advocate for fair and equitable interim and final targets that will maintain or enhance the overall stringency of the proposed rule. The proposed rule should provide clear glide-paths to ensure that states are on track towards their 2030 emission targets, and the rule should continue to require states to deliver those reductions as quickly as possible.

2. Flexibility allowed in complying with the proposed rule needs to be balanced with fair and equitable enforcement mechanisms

California appreciates that U.S. EPA has offered states a wide range of program design options for state plans – this comprehensive strategy aligns well with our existing AB 32 programs as described in our most recent update to our Scoping Plan to reduce GHGs. The Scoping Plan is California's path forward to reducing GHG emissions from all sectors, including electrification of transportation, which may have significant effects on how our grid operates. It is therefore critical that the final rule provide state planners with the discretion they need to put successful programs in place to capture cost-effective reductions across the grid and continue to efficiently implement existing programs that can deliver reductions into the future. In recognition of the challenges inherent in designing these programs, ensuring state programs harmonize with the new federal system, and incorporating the effects of energy initiatives into Clean Air Act planning, we strongly encourage U.S. EPA to allow states to choose among several compliance options, including a rigorous alternative version of the state commitment approach on which it requests comment.

Although U.S. EPA sets state goals for pollution reduction based on BSER, states should be allowed to meet these goals using the same flexible strategies they have long used to control criteria pollutants under section 110 of the Clean Air Act. Under the proposed rule, states may choose to comply with the emission targets by either placing

full responsibility for emission reductions on covered EGUs (such as through an allowance system) or through a "portfolio" approach. Under the portfolio approach, states may structure "portfolio" plans which spread enforcement across several different entities, including renewable energy programs, energy efficiency programs, and facility-level requirements, at their discretion.

While California has made no decisions on the elements of its compliance plan, in our view it is essential that state plan designs should accomplish three goals: (1) Deliver the emissions reductions which U.S. EPA requires, (2) Minimize disruption to existing successful state programs (including, in California, the state's Cap-and-Trade Program, renewable portfolio standard, and energy efficiency programs), and (3) Avoid creating cumbersome administrative hurdles for states that wish to create or extend programs that help decarbonize their power sectors.

To achieve these goals, and fully unlock the potential for innovation that is provided by Section 111(d), there are two points we ask U.S. EPA to consider as it moves forward in finalizing the proposed rule (these measures are discussed in more detail in Appendix A to this letter):

First, it is important that U.S. EPA provide appropriate flexibility on how existing or new state allowance programs may be integrated into Section 111(d) compliance plans, if a state chooses to do so as its primary compliance strategy. For instance, although California has made no decisions as to whether or how its Cap-and-Trade Program would be integrated into a Section 111(d) compliance plan, it is clear that uncritically adding federally enforceable obligations for covered entities, and requiring U.S. EPA review for all program amendments, would have significant implications for California's Section 111(d) compliance strategy and its Cap-and-Trade Program. These implications include potentially limiting ARB's ability to efficiently amend the underlying regulations without potentially lengthy U.S. EPA approval processes and extending Clean Air Act citizen suit and permitting challenges for program participants. The fact that the California system covers multiple sectors, rather than just covered EGUs, adds to complexity and program integration challenges. ARB firmly believes that our Cap-and-Trade Program can play an integral role in our compliance strategy, and may be the nucleus that furthers a market-based emissions trading program in the West within the context of the proposed rule. We also believe that not every aspect of our Cap-and-Trade Program need be federally enforceable in order to show compliance with the targets proposed in the rule.

As an example of how this issue could eventually materialize, assume California is able to demonstrate that existing EGUs participating in the Cap-and-Trade Program can collectively more than meet the U.S. EPA targets, and so will be economically and

logistically unable to secure sufficient compliance instruments as to emit above those targets given market constraints and energy system realities. As such, a simple federally-enforceable requirement that covered EGUs participate in the California market program would ensure Section 111(d) compliance. This approach would avoid the significant logistical challenges associated with incorporating the fine details of the market program into directly federally enforceable components of a California state plan. We ask U.S. EPA to confirm that such an approach, with sufficient analytic support, can be acceptable.

Second, we strongly encourage U.S. EPA to explore a third compliance system design option: the state commitment approach. In our view, not all states will opt for allowance systems. Similarly, the portfolio approach may see limited use because, as U.S. EPA notes, some states may be concerned about including state energy programs in their federally enforceable compliance plans.

Therefore, while we believe some states may want to use a market-based or portfolio approach, we believe a "state commitment" structure is better suited for other states where the former options present implementation challenges, and has ample precedent as an enforceable and verifiable compliance approach. We elaborate further on this approach in Appendix A, but we summarize the most important points below.

Under a state commitment approach, states pledge federally-enforceable emission reduction commitments to reach their pollution goals. To support these commitments, states provide regular demonstrations to show that their selected programs are resulting in emissions reductions towards the target level. However, the underlying state programs themselves do not become federally enforceable. Regular reporting and contingency planning that may include additional renewable resource commitments, additional energy efficiency programs, or as a last-resort, backstop obligations on covered sources as a final measure helps keep states on course and provides the data required to demonstrate that the plan is working. We understand that U.S. EPA may believe more specific requirements for covered EGUs may also be necessary under this type of compliance strategy. If so, we ask that U.S. EPA commit to continue to work with us and our stakeholders to explore these requirements, and to consider what EGU-specific measures could be enacted that would ensure continuing electrical reliability and not impair the efficient functioning of the market. The final rule should continue to be structured to ensure that states are allowed to design plan elements to provide proportional amounts of energy or emissions savings, based upon what is technically and economically feasible. Accordingly, U.S. EPA should therefore ensure that a wide range of backstop designs are also approvable in state compliance plans to ensure that any compliance shortfalls from non-EGU specific programs are minimized, as these

programs have the greatest potential to provide the most effective emissions and energy savings.
This commitment approach could well be useful to California, and could be preferable to an approach that relies on the carbon market more directly, especially if U.S. EPA decides it needs wholesale federal enforcement of allowance systems. A commitment approach would aid the state in integrating its programs with the proposed rule with minimal disruption. Because Cap-and-Trade and energy sector programs are complex and regularly adjusted through state rulemakings, adding an additional layer of federal oversight potentially will be difficult to manage. ARB believes it can make a rigorous demonstration that these programs will guarantee covered source emissions will remain below the 111(d) target for the state under a wide range of scenarios. As such, we believe the suite of California programs can support a commitment-based compliance demonstration.

This system could also benefit other states which are considering enhanced energy sector programs. State energy regulators are also more likely to support a commitment approach's balance between accountability and policy discretion. Energy regulators in many states have decades of experience and well-established policies in place to provide the accountability required in a 111(d) compliance plan. We emphasize that U.S. EPA should accept these programs only if they are supported by rigorous analysis. These issues, and how they fit into a commitment approach-based compliance plan, are more fully discussed in Appendix A attached to this letter.

Finally, we believe there is legal precedent for using the state commitment process. In the past, U.S. EPA has reviewed and approved several state implementation plans (SIPs) under Section 110 of the Act that are structured using this commitment approach, not only in California, but also in Texas and New York. These SIPs contain target-level emission reduction commitments; an accounting mechanism to provide for state air quality program equivalency demonstrations; and robust evaluation, monitoring and verification (EM&V) strategies.

In sum, U.S. EPA and the states should continue to work together to provide a broad menu of options for state planning. Making clear that allowance systems can be used for compliance planning, while maintaining significant state discretion to ensure they function smoothly is critical. Rigorously designed commitment approaches provide another important path that many states may want to explore. We appreciate U.S. EPA's efforts to provide a broad menu for state planners, while ensuring emission reductions occur as required.

3. Regional planning modularity is critical to multi-state implementation and enforceability

While the proposed rule allows states to work together in complying with their emission targets, it is a significant technical and political challenge to write a single compliance plan that would cover all states involved and be fairly enforceable against them as a single entity. Given the inherent challenges of multi-state rulemaking, U.S. EPA should expect plan development to take time, and consider the possibility that states may not be able to overcome these inherent difficulties. California therefore strongly supports allowing regional plans to be implemented in a modular fashion, under which states might agree to common plan elements.

For example, states may begin with a single-state plan, and develop over time regional plans covering certain aspects of renewable energy and energy efficiency accounting as they learn more about how these programs operate in neighboring states. A viable regional plan might consist of a common accounting system, with each state's plan then focused on state-specific measures. Similarly, states might participate in agreements concerning specific generating facilities or renewable resources. We ask that U.S. EPA consider allowing plans which might include regional elements of this kind, as part of discrete state plans.

U.S. EPA support for common accounting and measurement systems between states as outlined above will help support regional planning. Additionally, clear guidance on best practices for monitoring and verifying emissions reductions linked to energy efficiency and renewable energy programs will be helpful. California has provided more detailed comments on accounting and evaluation, monitoring, and verification of energy efficiency programs specifically in Appendix B to this letter. California is also interested in U.S. EPA's support as it considers how its existing Cap-and-Trade Program, which includes compliance obligations for imported electricity, might be adjusted to account for regional compliance planning.

4. Proper crediting of renewable energy and energy efficiency programs that cross state lines is important for state compliance

U.S. EPA proposes that renewable energy measures consistent with state renewable portfolio standard (RPS) programs could take into account all of the CO_2 emissions reductions implemented by the state, whether they occur within its borders or in other states. One way to ensure proper accounting for renewable generation within a state is to allow regional modular plans (see above) that could account for this electricity. Allowing multi-state flexibility in a modular way could address individual renewable energy needs, would incentivize additional renewable energy investments, and ensure

imported renewable energy dependent markets like California's to continue on its path towards compliance with the goal while supporting state energy policies. However, the proposed rule is silent on the issue of disagreements between states that may wish to claim the same renewable resources. This leads to confusion and possible double counting. Therefore, we suggest U.S. EPA recognize multi-state tracking systems such as the Western Renewable Energy Generation Information System (WREGIS) and codify that renewable energy tracked using renewable energy credits (RECs) under an RPS program is credited to the state receiving the RECs unless a multi-state modular agreement is in place.

A similar dynamic applies to energy efficiency. As proposed, states can take credit only for the effects of energy efficiency programs associated with electricity generated within their borders. This means that while energy efficiency in an *importing* state can benefit an exporting state by reducing the need for generation at higher carbon facilities serving the importer, the proposed rule does not explicitly state whether the exporting state may claim credit for the energy efficiency gains in their compliance plans. If it cannot, it appears that this credit may be lost. Additionally, this dynamic means the importer may have reduced incentive to invest further in these programs. Once again, U.S. EPA support of modular multi-state plans that allow states to fairly claim credit for these lower cost compliance options may also incentivize new energy efficiency measures.

These import/export relationships are particularly marked in the western United States, with many long distance power transfers. California is therefore especially interested in cooperating with our regional partners to explore joint compliance options. For example, under our Cap-and-Trade Program, first deliverers of imported power must hold sufficient compliance instruments for the emissions associated with these imports. Including importing states in a regional market program could reduce or eliminate the need for this requirement for first deliverers, and it could ensure that emissions are properly credited to states and ratepayers responsible for emissions improvements, and help avoid any double counting in a regional program. We provide additional discussion on this topic in Appendix A and ask for U.S. EPA assurance that plans reallocating compliance credit are approvable.

5. Using new power plants subject to 111(b) as a compliance mechanism for 111(d) and New Source Review

New power plants will be subject to U.S. EPA's separate proposed rule under Section 111(b), and are not covered by the proposal under 111(d). However, because these newer plants may displace older plants that are covered by 111(d), U.S. EPA has stated it will allow states to use new plant construction as a compliance strategy for the

proposed rule. This provision may incentivize states to replace existing power plants at an increased rate over what would have been realized in absence of the proposed rule.

Regardless of federal or state regulation, existing plants will be replaced by new plants over time, and at some point in the future it may be possible that U.S. EPA's proposed 111(b) rule will be the sole mechanism through which there are uniform federal standards for GHG emissions from power plants. Likewise, existing plants that modify or are reconstructed would fall under the associated 111(b) requirements. In the context of this future reality, U.S. EPA should ensure that the Section 111(b) rules are as rigorous as possible in the context of the evolving power sector. In particular, California has previously urged U.S. EPA to set distinct standards for natural gas-fired power plants based on their operational profiles to ensure low emissions from peaker, flexible, and baseload plants while maintaining sufficient flexibility to integrate zero-emission renewable generation. In addition, supporting a wide range of potential measures could allow states like California, which recently implemented the region's first energy imbalance market as an option available to other balancing authorities in the West, to track carbon reduction stemming from more efficient utilization of the electric grid. We urge U.S. EPA to continue considering our comments, and to pursue this approach in its final 111(b) rule.

Relatedly, California understands that several states and stakeholders have asked U.S. EPA to include provisions in the final rule for owners and operators of existing EGUs to provide relief from New Source Review (NSR) requirements when these units are being modified in order to comply with the rule. We would object to such an exemption. NSR is a hallmark feature of the Clean Air Act and is one of the primary mechanisms through which public health is protected from the adverse effects of air pollution. California recognizes that modifications to existing EGUs may be necessary in order to, for example, increase operational efficiency. However, U.S. EPA should ensure that EGUs undergoing these modifications meet the requirement of Best Available Control Technology for all pollutants, not just for GHGs. Many areas of the country, including California, continue to experience the worst effects of ozone pollution, and ensuring the existing fleet of EGUs operate as cleanly as possible will help states with their attainment of air quality standards, and ensure air quality is not further degraded.

6. Rate versus Mass Conversions

California thanks U.S. EPA for providing examples of how rate to mass conversion calculations could be performed. We encourage U.S. EPA to continue to assist states in determining the best calculation methodology when converting between these two metrics, and take into account each state's unique circumstances. U.S. EPA should

ensure that the resulting demonstration is fair and equitable, regardless of whether a state chooses to comply with the rule using a rate-based or mass-based metric. We believe that regardless of the metric used to demonstrate compliance, the rule's rigor should be maintained, and ask U.S. EPA to ensure that any approvable calculation methodology account for this rigor.

7. U.S. EPA should provide appropriate flexibility for reporting requirements

The proposed rule includes a requirement that the annual report under Section 60.5815 be submitted by July 1 each year. Because of the timing of current data collection, and the need to leave time to organize and submit the reports, allowing only six months after the close of the year may be a difficult task. Therefore, we ask that U.S. EPA allow states the opportunity to propose an alternative annual reporting submittal date within state plans. This flexibility in designing reporting periods will be needed to address inherent temporal differences in data availability for various state programs, and it is especially needed when multi-state compliance plans are developed.

Conclusion

California strongly supports U.S. EPA's proposal to regulate GHG emissions from existing power plants, and appreciates the flexibility provided. We are encouraged to see that national action is being taken to directly address climate change. We have already seen programs such as our 33 percent Renewable Portfolio Standard and Cap-and-Trade Program requirements increase renewable resource and energy efficiency investments in our state, resulting in much needed emissions reductions to slow the effects of climate change. We applaud U.S. EPA's efforts in this proposed rule, and believe it will accelerate additional clean energy investments, not only in California, but throughout the western region, resulting in real, meaningful reductions in emissions while protecting our recovering economy.

We also appreciate U.S. EPA's efforts to date to collaborate with other members of the federal family to ensure that all agencies are working together to implement the President's clean energy agenda. These efforts should include support for analysis and modeling, a close look at complementary energy programs (such as support for improved appliance energy efficiency standards), and support for siting and development of renewable power facilities. We expect that further work with the Department of Energy, Federal Energy Regulatory Commission, and federal land managers, among others; will help enable western states to smoothly integrate growing amounts of clean energy into a more modern western power system.

Thank you again for the opportunity to provide input on the proposed regulation. We look forward to continued partnership and progress in reducing greenhouse gas emissions. If you have any questions, please contact me at (916) 322-5840, or Mr. Richard W. Corey, Executive Officer, at (916) 322-7077.

Sincerely,

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Chairman

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Mr. Richard W. Corey
Executive Officer

Ms. Janet McCabe
November 24, 2014

APPENDIX A

Legal Support Discussion for State Plan Design Options, Including the State Commitment Approach

Ms. Janet McCabe
November 24, 2014

California Air Resources Board

Legal Memorandum: Implementing and Enforcing Section 111(d) Plans

This California Air Resources Board (ARB) legal memorandum addresses, in part, the United States Environmental Protection Agency (U.S. EPA) request for comment on which types of state plans may be used to comply with its proposed emissions guidelines for certain electric generating units (EGUs). *See* 79 Fed. Reg. 34,830, 34,900-05 (June 18, 2014). This memo reflects prior comments from ARB and other interested state entities.[1]

ARB staff strongly believes that state 111(d) plans for EGUs must be carefully designed and readily enforceable by states, citizens, and U.S. EPA. We believe that a final rule laying out several workable enforceability options will greatly aid states in developing their plans and U.S. EPA as it ultimately reviews them. Some states, especially those with a limited number of covered sources, may be able to comply through direct emission reductions at those sources. Others may find it more effective to use allowance systems and the well-established "state commitment" approach (with backstop compliance requirements for covered sources) on which U.S. EPA requests comment, *see* 79 Fed. Reg. at 34,902. ARB is still considering its options and has made no decisions at this early moment. However, providing a range of appropriate options will aid in California's compliance decisions, as it will for other states.

Our key recommendations are that (1) U.S. EPA favor allowance systems as a compliance mechanism, while appropriately limiting the components of existing or proposed state carbon markets that it requires to be federally enforceable in order, if these markets are used for compliance, to provide continued flexibility to state regulators operating these markets; and (2) U.S. EPA provide a rigorous state commitment approach, in which states take responsibility for a portion of the compliance obligation with ultimate responsibility falling on covered EGUs, as an option for compliance.

I. Statutory and Regulatory Discretion Available to U.S. EPA and the States Allow for Multiple Enforceable Designs for Compliance Plans for Electric Generating Units

As we discuss below, ARB believes that providing a wide range of approvable, rigorous state plan design options in the final rule will help speed compliance. Both the statute

[1] *See attached* comments of 15 States, Filed by the Georgetown Climate Center (Dec. 26, 2013); Comments of the California Air Resources Board (Dec. 27, 2013); Comments of the Attorneys General of 12 States and the District of Columbia (Dec. 16, 2013); California Air Resources Board White Paper on Implementing and Enforcing System-Level Section 111(d) Compliance Plans (April 18, 2014).

and its implementing regulations strongly indicate that U.S. EPA and the states have room to work together to design plans that will work in each state's particular circumstances.

Statutory Direction

The Clean Air Act as a whole is based on cooperative federalism, emphasizing the "primary responsibility" of the states to control air pollution, consistent with governing federal standards. *See* 42 U.S.C. § 7401(a). Section 111(d) markedly relies on this model. Unlike new sources of emissions in covered sectors, which are regulated by uniform federal standards of performance, *see id.* § 7411(b), designing appropriate plans for existing sources, which may be less amenable to uniform retrofit requirements, often requires more creativity. State planners are better able to respond to this complexity with plans designed for the particular existing source populations in their states. Recognizing this reality, Congress gave the states primary responsibility to implement and enforce standards of performance for these sources, subject to U.S. EPA oversight. The contrast between section 111(b)'s federal mandates and section 111(d)'s broad delegation to state planning authorities underlines Congress's cooperative federalism approach in this context.

Although U.S. EPA is to evaluate state plans to determine whether they are "satisfactory," in the sense that they reduce emissions to the required "best system of emissions reduction" (BSER) level and comply with other requirements, the standards of performance contained within these plans are to be "establishe[d]" by the states. *See id.* § 7411(d)(1). A state plan will not be "satisfactory" if it does not "establish" standards that "reflect the degree of emission limitation achievable through the best system of emission reduction," *id.* § 7411(a)(1) & (d)(1). But there are many potential plan designs that could deliver this required level of performance.

The Act leaves that design question to the states, subject to U.S. EPA approval. The Act provides that state plans must "provide for the implementation and enforcement" of standards "for any existing source" consistent with BSER reduction levels. *Id.* § 7411(d)(1). The statute does not say what constitutes a plan "for" any existing source, nor does it specify particular mechanisms for state implementation and enforcement. Thus, ARB staff agrees with U.S. EPA that the requirement that state standards be "for" sources affords U.S. EPA discretion to approve a range of plans that satisfactorily address existing source emissions. *See* 79 Fed. Reg. at 34,903. Although a plan would not be "satisfactory" if its implementation and enforcement design failed to guarantee that BSER emissions levels were achieved and maintained, the form of the plan and its standards is otherwise primarily up to the state.

The statute does not provide much further substantial direct guidance on the content of the state plans.[2] Although the "procedure" under which they are submitted is to be "similar to that provided by section 7410" (section 110) for criteria pollutant plans, *id.* § 7411(d)(1), it is not required to be identical, and no particular requirements are provided by statute. State planners under section 110 are already vested with substantial discretion, so section 111(d)'s cross-reference to that section further demonstrates Congress's intent. *See, e.g., Union Electric Co. v. U.S. EPA*, 427 U.S. 246, 267 (1976) ("[the] state has virtually absolute power in allocating emission limitations so long as the national standards are met"); *Texas v. U.S. EPA*, 690 F.3d 670, 684 (5th Cir. 2012) (the Clean Air Act "supplies the goals and basic requirements of state implementation plans, but the states have broad authority to determine the methods and particular control strategies they will use to achieve the statutory requirements"); *Luminant Generation Co., LLC v. U.S. EPA*, 714 F.3d 841, 845-46 (5th Cir. 2013) (affirming this principle).

Indeed, the design flexibility for section 111 plans is likely greater than that afforded to section 110 plans. This is because the statute sets out a long list of requirements for section 110 planning, *see* 42 U.S.C. § 7411(a)(2)(A)-(M), but does not provide a similarly directive list under section 111, noting only that procedures for those plans should be "similar" to section 110. *Id.* § 711(d)(1).

It is especially reasonable for U.S. EPA to consider creative state plan designs for greenhouse gas emissions from EGUs because of the nature of the best system of emission reduction for these sources. As U.S. EPA discusses at length in the proposal, the most effective systems for controlling power plant emissions include actions that modify the functioning of the electrical grid that links together these sources, and regulates which sources are used at which times. Grid-level actions that displace the need for higher emitting sources can enable very substantial reductions at the sources themselves. [3]

To capture these reductions – that is, to be "satisfactory" – states' plans thus must operate in the larger world of the electric system, and so relate in a complementary way to the many regulators and regulations, state and federal, that also govern the grid. Of course, this is not at all a new challenge: State and federal energy regulators have long adapted their planning processes to accommodate Clean Air Act mandates.[4] The

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[2] With the caveat that: states are to be permitted to take into account the "remaining useful life" of existing sources, among other factors, in their plans. 42 U.S.C. § 7411(d)(1).

[3] We do not further discuss this point here, but refer EPA to the earlier comments cited in footnote 1, which extensively discuss the BSER requirement.

[4] Recent experience implementing the Mercury and Air Toxics Standard (MATS) provides a particularly good example of state and federal cooperation between air and energy regulators. FERC's Order 1000 has helped support that response by directing grid operators to recognize Clean Air Act mandates (among other enacted policies) in their planning processes. The successful response to MATS, and

section 111(d) state plans will benefit from this experience. But the challenge is still real: States should be allowed to design these plans in ways that achieve Congress's mandate to employ the "best system of emission reduction" to address these Clean Air Act requirements while working within the structure of electric system regulation set out by state and federal laws, including the Federal Power Act. *See, e.g., Morton v. Mancari*, 417 U.S. 535, 551 (1974) (statutes are to be interpreted harmoniously).

Clearly U.S. EPA has the discretion to consider for approval a broad range of state plan types given: the principles of cooperative federalism at the foundation of the Clean Air Act; the marked contrast between the national, one-size-fits-all standards for new sources under section 111(b) versus the state plan approach in section 111(d) which provides even greater latitude in some respects to states than in the section 110 context; the statute's reliance on the best *system* of emission reduction, a term that on its face extends beyond the bounds of any particular source; and, in the particular context of this rule, the interconnected nature and diversity of EGUs and the need to harmonize emission reductions with other statutory directives. There is, in other words, every indication that state plans may use a wide array of approaches provided that they guarantee enforceable emission reductions.

Regulatory Direction

U.S. EPA's general section 111(d) implementing regulations reinforce the range of approvable plan designs that U.S. EPA and the states may jointly develop.

The general regulations track the statute's language, directing that state plans are to "establish[ ] emission standards *for* designated pollutants from designated facilities and provide[ ] for the implementation and enforcement of such emission standards." 40 C.F.R. § 60.21(c) (emphasis added). Although the standards "shall apply to all designated facilities within the State," the precise way in which the standards are applied is to be defined in the state plans themselves. *See id.* at § 60.24(b)(3). Though careful monitoring and reporting are required to ensure that facility emissions decline as required, *see id.*at § 60.25, states may chart a range of paths towards the BSER emission levels. U.S. EPA maintains authority over the timing of this process via a requirement that plans include compliance schedules with "legally enforceable increments of progress" for "each designated facility or category of facilities."[5] *Id.* at §

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ongoing implementation of Order 1000, will further smooth the way for implementing section 111(d) carbon rules.

[5] The definition of "increments of progress" provides examples applicable to facility-level equipment modifications, as have been used in some 111(d) plans in the past, but makes clear that this example list is not exclusive. *See* 40 C.F.R. § 60.21(h). Other increments will be appropriate for plans which apply to categories or systems of sources, as will likely be used for EGUs.

60.24(e)(1). Thus, the regulations, appropriately, allow for state creativity while maintaining close U.S. EPA oversight to ensure that states stay on track.

Accordingly, the general regulations provide only limited constraints on just how emission standards themselves are to be designed. They do set broad terms, providing that "[e]mission standards shall either be based on an allowance system or prescribe allowance rates of emissions except when it is clearly impracticable" – if so, other methods are presumably allowed. *See id.* at § 60.24(b)(1).[6] Mass-based trading programs qualify as allowance systems, and these are plainly allowed (and if they were not now permitted, U.S. EPA would still be free to specifically allow them, or other mass-based programs, in this instance, via notice-and-comment rulemaking, as it proposes to do). In sum, just as the statute does, the regulations leave a wide array of emission-standards designs open to the states.[7]

Summation

Both the statute and its implementing regulations make clear that states retain considerable discretion to specify how section 111(d)-covered sources are to reduce their emissions. The general section 111(d) planning rules thus focus on ensuring that U.S. EPA can monitor state progress towards emission reduction targets, rather than prescribing particular state plan designs. The BSER requirement, as applied to EGUs, necessitates particularly strong deference to state planning discretion, because the operations of the electric system are so complex.

U.S. EPA has largely captured this discretion in its proposed EGU state planning rule, but more work remains to be done to recognize the full range of state planning options. These options, which the final rule should support, are discussed below.

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[6] This requirement was originally promulgated as part of the now-vacated Clean Air Mercury Rule. It was repromulgated, however, as part of the MATS rule, and remains good law. *See* 77 Fed. Reg. 9304, 9447 (Feb. 16, 2012). Even if it did not, EPA remains free to adjust its regulations through notice-and-comment rulemaking in accordance with the statute.

[7] It is worth noting that the federal Title V operating permit statute and implementing regulations are consistent with this flexibility. Title V requires that operating permits contain enforceable emission limitations "necessary to assure compliance with applicable requirements" of the Clean Air Act. 42 U.S.C. § 7661c(a). Thus, any terms which are "necessary" to assure compliance with "applicable" requirements must appear in individual source permits. If a given permit condition is not necessary, or a particular requirement does not apply to a given source, then the operating permit need not address those issues. The Title V regulations similarly require permit terms to reflect all section 111 requirements "as they apply to emissions units in a part 70 source" 40 C.F.R. § 70.2, but leaves it to the state to determine which requirements "apply."

II. Allowance Systems

ARB staff expects that many states will strongly consider using or developing trade-able allowance systems to support their compliance efforts, consistent with the strong presumption in favor of these programs in the general 111(d) regulations.[8] Because allowance systems automatically account for emissions reductions achieved by other programs – such as energy efficiency's demand reduction effects – and directly apply statewide emissions limits to individual covered sources, they can efficiently ensure compliance and are among the best and most cost-effective mechanisms to do so.[9] Indeed, the general 111(d) regulations maintain that state standards "shall" be based on allowance systems or prescribed emission rates except "when it is clearly impracticable." *See* 40 C.F.R. § 60.24(b)(1). Recognizing the benefits of these systems, we encourage U.S. EPA to maintain that presumption, and appreciate that U.S. EPA explicitly recognizes these systems as compliance options in the general 111(d) rules.[10]

The final rule needs several clarifications to best provide for allowance systems, and to avoid creating unnecessary challenges for existing state carbon markets.

First, it is important for U.S. EPA to continue to be clear that mass-based allowance programs may be used to comply with its rate-based targets. The section 111(d) general regulations require that state emission standards "shall be no less stringent" than federal emission guidelines; provided a state's system yields an equivalent degree of stringency, a wide range of design choices should therefore be permitted. *See* 40 C.F.R. § 60.24(c). In particular, state systems that reduce mass emissions may well yield a stringency equivalent to the rate standard by reducing the total mass of emissions per MWh, thereby also reducing a state's emission rate. We understand that U.S. EPA will likely issue further guidance on these conversion and equivalency issues, and appreciate that work.

Second, relatedly, U.S. EPA should be clear that states (including California) that operate or may choose to operate an allowance system that extends beyond covered EGUs may still use that system as part of their compliance plans, provided that they can

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[8] Again, as noted above, though California has an economy-wide allowance system, this may, or may not, form part of California's 111(d) compliance plan. EPA should, however, be careful to keep options for allowance systems available.

[9] To be sure, allowance systems are not the only way of achieving 111(d) compliance through direct source regulation. In some states, especially those with a small number of covered sources, direct operating hour reductions at those sources may be sufficient to bring the state into compliance, for instance.

[10] We expect allowance systems could also be appropriate for federal section 111(d) plans, if these become necessary to impose. Such systems are well suited for federal use, having been used in past federal implementation plans under section 110.

demonstrate that the system, operating in tandem with any other relevant state programs, will assure that the federal targets are met. In essence, section 111(d) sector-specific compliance ought not to disrupt the functioning of more complete economy-wide carbon control systems, provided those systems also demonstrate that section 111(d) targets for the covered sector will be satisfied as part of their operations.

Third, very importantly, U.S. EPA should carefully consider which elements of an allowance system must be federally enforceable in order to satisfy its regulations, while maintaining operating space for state regulators to flexibly address more granular market function issues. Designing allowance systems is a complex task, requiring a significant state regulatory effort to define how the allowance market will function. In California's experience, these market rules have required careful elaboration and ongoing market monitoring, along with several sets of regulatory amendments over the past few years. ARB staff does not believe that the full suite of regulatory efforts supporting state allowance systems necessarily need be subject to federal enforcement if the systems are used as all or a portion of 111(d) compliance plan– i.e., not every market rule need be subject to federal plan approval, or open entities to the possibility of federal citizen suit. Such rigidity would make it difficult to adjust these rules as needed, and could impose undue compliance liabilities for market participants. It is very important to ARB to ensure that 111(d) requirements do not cause disruptions to the existing economy-wide carbon market, or to continued regulatory efforts to improve it, so U.S. EPA's confirmation that not all market structures need be federally enforceable is especially important.

Instead, U.S. EPA should confirm that it will evaluate state plans with allowance system designs in accordance with the broad plan design and enforcement latitude that section 111 indicates is appropriate. Although ARB expects to continue to explore options with U.S. EPA and stakeholders, we initially suggest that appropriately bounded enforceability designs might include a commitment to continue operating the system itself and (an obligation for covered EGUs to participate in the system as a federally enforceable obligation – but not federal enforcement of more detailed state-level allowance system rules.[11] Such an approach could be appropriate if a state demonstrated to a reasonable certainty that market competition between entities and market design generally, in concert with complimentary measures reducing EGU emissions, demonstrate that covered EGUs would not acquire sufficient allowances as to collectively exceed the 111(d) levels under a wide range of plausible market conditions. Upon such a demonstration, the underlying market rules would not be

[11] We, of course, expect that EPA would carefully scrutinize any submitted allowance plan to ensure that it would produce the required reductions (in combination with other programs or on its own). Allowance program designs need to be carefully reviewed to ensure, for instance, that they are not over-allocated and that they will function effectively as markets and pollution reduction tools.

included in the plan, but a requirement that entities participate in the plan would be, along with a requirement that the state continue to operate the system as a whole.

As a result, U.S. EPA and citizens would have the authority to enforce the obligation to operate the market as against state agency officials (including via imposing a federal plan, if necessary), *see* 42 U.S.C. § 7411(d)(2)(A), and the requirement to participate in allowance programs against covered entities, *see* 42 U.S.C. §§ 7411(d)(2) (B) & 7413 (U.S. EPA may enforce state plan requirements against covered entities). But U.S. EPA would not enforce compliance with particular program rules; these rules would also not require direct U.S. EPA approval before amendment (unless rule changes significantly changed the compliance demonstration).

Other designs may also be appropriate. We are aware, for instance, that U.S. EPA may determine that additional EGU-specific market design features are necessary in economy-wide carbon markets. If so, U.S. EPA should work very closely with state officials to ensure that any such features do not disrupt the market as a whole, nor unwittingly cause reliability issues within the electrical grid. The large emission reductions which efficient economy-wide carbon markets provide should not inadvertently be compromised by sector-specific section 111 programs.

The goal, in considering the interactions between state allowance systems and the federal rules, should be to ensure that plans are "satisfactory" for federal compliance purposes without potentially significantly disrupting the continuing management and operation of state allowance systems.[12]

III. State Commitments and the Portfolio Approach

Although the section 111(d) regulations establish a presumption favoring allowance systems (or allowable rate requirements), states may demonstrate to U.S. EPA that other options are appropriate in their plans. For a variety of reasons, not all states will opt for allowance approaches, so providing for alternative plan designs where states overcome that presumption is important to achieving BSER-level emissions reductions.

The Portfolio Approach

For some states – especially those with a limited number of covered sources – this task may be very straightforward. Direct emission limitations at those sources (as well,

[12] In a sense, higher level federal enforceability of allowance systems is a variant of the "enforceable commitment" approach discussed below. States would be making a federally enforceable commitment to run an allowance system, with a particular emissions cap, but underlying program details would not themselves be federally enforceable (though a more general requirement for EGUs to participate in the system might be).

perhaps, with enforceable retirements of economically nonviable facilities) may suffice to demonstrate compliance. But for others, a more engaged approach to energy sector change may be necessary, leveraging other demand reduction programs to reduce emissions at covered facilities.

Yet, for these more complex efforts, U.S. EPA's second proposed option for compliance, the portfolio approach (*see* 79 Fed. Reg. at 34,901), may pose problems for states that could limit its use. To provide improved additional compliance options, we urge U.S. EPA to clarify certain aspects of the portfolio approach and also to finalize an option for a state commitment approach (including clear backstop and contingency measures which will apply if commitments do not produce the required reductions), as it suggests may be appropriate. *See id.* at 34,902.

Under U.S. EPA's current portfolio approach proposal, states would develop federally enforceable measures against entities other than covered EGUs, which could include, for instance, utilities regulated by state renewable energy and energy efficiency programs. *Id.* at 34,901. States are at liberty to define which "affected entities" are to be included in the plans. *See id.* at 34,917, Proposed 40 C.F.R. § 60.5820.

We are concerned that this option may not practically be open for many states. As U.S. EPA recognizes, in the view of some critics, "a plan that assigns responsibility to affected entities other than affected EGUs may be more challenging to implement and enforce than a plan with requirements assigned only to affected EGUs." 79 Fed. Reg. at 34,917; *see also id.* at 34,909-10. This is primarily because they assert, as U.S. EPA notes, "including RE and demand-side EE measures in state plans would render those measures federally enforceable," extending federal oversight to areas that have been the "preserve of the state and, in particular, state public utility commissions and the electric utility companies they regulate." *Id.* at 34,902.

Such concerns, whether apt or not, (including citizen suit liability associated with these programs under the portfolio plan design) could deter many states from opting for the portfolio approach. It would be unfortunate if these perceived plan design challenges slowed needed emissions reductions. U.S. EPA could make the approach more attractive by recognizing that the obligations on affected entities in these programs may be imposed at a high level (e.g., a federally-enforceable obligation to participate in a state energy program, rather than federal enforcement of each individual program element). While these changes would be helpful, ARB staff believes that another attractive plan design option – the state commitment approach -- is warranted in the final rule.

The State Commitment Approach

We strongly encourage U.S. EPA also to finalize a version of the state commitment approach it seeks comment upon as an alternative. As U.S. EPA explains, this approach "differs from the proposed portfolio approach" because "the state requirements for entities other than affected EGUs ... would not be federally enforceable. Instead, the state plan would include an enforceable commitment by the state itself to implement state-enforceable (but not federally enforceable) measures that would achieve a specified portion of the required emissions reductions." *Id.* at 34,902. As U.S. EPA notes, this approach could be implemented through direct state commitments for emission reductions that the state expects its programs to achieve, as well as through a variation of the approach under which EGUs would remain responsible for all required reductions, but states would credit EGUs with emissions reductions consistent with those achieved by state-enforceable programs which they commit to operate. *See id.* In either case, ARB would expect clear "backstops" to be built into the state plans which – though perhaps not used as the initial contingency measure – ultimately require covered entities ultimately to make up the difference in emissions if the state falls short.

These approaches maintain federal enforceability. States making such commitments would be subject to federal citizen suit if they failed to meet them, and U.S. EPA would retain its authority to enforce commitments against state agency officials as well. *See id.; see also, e.g., Citizens for a Better Environment v. Deukmejian*, 731 F. Supp. 1448, 1457 (N.D. Cal. 1990) (explaining that citizen suits under 42 U.S.C. § 7604 are available to secure injunctive relief against state agency officials that fail to uphold enforceable commitments in a section 110 plan).[13]

Both of U.S. EPA's proposed variations of the commitment approach have the marked advantage of avoiding any integration challenges, real or perceived, between U.S. EPA's and the state's *emissions* enforcement responsibilities under the Clean Air Act, and the enforcement of state *energy* programs – the issue which U.S. EPA indicated raised challenges, in the view of some critics, for the portfolio approach. *See* 79 Fed. Reg. at 34,902. Under the commitment approach, though those programs would support emission reduction commitments, U.S. EPA and state air agencies would focus on their emissions consequences, rather than on the individual elements of those programs themselves. This separation would help harmonize these two regulatory

[13] We note that section 111(d) also preserves EPA enforcement authority under 42 U.S.C. §§ 7413 & 7414 where a state fails to "enforce the provisions" of its section 111(d) plan. 42 U.S.C. § 7411(d)(2)(B). We do not doubt that EPA has authority to secure appropriate injunctive relief with regard to commitments made in state plans, as do citizens, and to step in with federal enforcement plans if need be. *See BCCA Appeal Group v. U.S. EPA*, 355 F.3d 817, 837, n.25 (5th Cir.2003) (collecting cases on state commitment enforcement).

spheres, while encouraging states to continue to develop innovative state-law energy policies that will support compliance with federal emissions targets. As noted above, commitment approaches could also be used to avoid any undue federal enforceability of the fine details of state allowance systems as well, by rendering the emissions reductions achieved by those systems federally enforceable, but not the system regulations themselves.[14]

State commitment approaches are well established. The Clean Air Act explicitly recognizes their use in contingency planning for areas with extreme local criteria pollutant pollution problems, strongly suggesting that they are also appropriate in plans that address public health challenges across a broader geographic scope. *See* 42 U.S.C. § 7511a(e)(5). Indeed, both section 110 (for attainment plans) and section 172 (for nonattainment plans) endorse the use of a wide array of enforceable measures that clearly can include such commitments. *See* 42 U.S.C. § 7410(a)(2)(A); *id.* § 7502(c)(6). Thus, it is not at all surprising that U.S. EPA and the states have long used such commitments for other criteria pollutant plans. *See, e.g.*, 79 Fed. Reg. 52,526, 52,534 (Sept. 3, 2014) (endorsing enforceable commitments for nonattainment planning generally, per 42 U.S.C. § 7502(c)(6), as part of South Coast air district plan); 77 Fed. Reg. 12,562, 12,653-655 (Mar. 1, 2012) (enforceable commitment approval for San Joaquin air district); 76 Fed. Reg. 69,928, 69,941-45 (Nov. 9, 2011) (same for South Coast air district).

The federal courts have repeatedly upheld plans with enforceable commitments. *See, e.g.*, *Environmental Defense v. U.S. U.S. EPA*, 369 F.3d 193, 208-10 (2nd Cir. 2004) (approving New York plan and holding that "[g]iven the breadth of the statutory language, U.S. EPA's decision to treat an enforceable commitment as a means or technique [of ensuring compliance] is reasonable and therefore should be upheld"); *BCCA Appeal Group v. U.S. U.S. EPA*, 355 F.3d 817, 841 (5th Cir.2003) (approving Texas plan, holding that "U.S. EPA reasonably concluded that an enforceable commitment to adopt additional control measures on a fixed schedule was an 'appropriate' means, technique, or schedule or timetable for compliance under the statute" and noting that U.S. EPA had maintained this interpretation "[f]or over 20 years"); *Bayview Hunters Point Community Advocates v. Metro. Transp. Comm'n*, 366 F.3d 692, 701-03 (9th Cir. 2004) (discussing whether a plan element was an enforceable commitment); *Coalition Against Columbus Center v. City of New York*, 967 F.2d 764 (2nd Cir. 1992) (considering implementation of such a commitment); *Citizens for a Better Environment v. Deukmejian*, 731 F. Supp. at 1457 (analyzing enforceable commitments and holding that "the basic commitment to adopt and implement additional measures, should the identified conditions occur, constitutes a specific strategy, fully enforceable in a citizens action, although the exact contours of those measures are not spelled out.").

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[14] *See* supra n. 10.

Generally, courts and U.S. EPA have found commitments most appropriate when the state demonstrates that it is capable of fulfilling the commitment, the commitment covers a reasonable period of time, and the commitment "addresses a limited portion" of the plan, at least in the case where the state is committing to enact new programs. *BCCA*, 355 F.3d at 840. The key is that the state submits a "comprehensive and detailed plan" for its commitments, allowing U.S. EPA to "deem the proposals sufficient to make the necessary emission reductions." *Environmental Defense*, 369 F.3d at 210.

Section 111(d) plans are particularly amenable to these sorts of commitments, perhaps with some modifications. As discussed above, these plans are significantly less constrained in some regards than the criteria pollutant plans that U.S. EPA has thus far considered. Congress expected a particularly high degree of state flexibility in this context, meaning that a broader approach to state commitments, including allowing commitments to cover a potentially larger portion of state plans, is likely to be appropriate.

In particular, most prior enforceable commitment cases have entailed commitments to enact *new*, relatively untested, programs, which explains why plans did not rely on these programs for large emissions reductions. But under the proposed section 111(d) rule, states may primarily be committing to implement established programs that are already securing substantial emission reductions in those states or other states, meaning that more data, and experience, are available to support projected emission reductions. As a result, where supported by careful analysis, larger commitments can properly be approved. Indeed, even leaving aside this distinction, larger commitments are likely appropriate in this context given Congress's endorsement of substantial state flexibility in section 111(d) planning. Moreover, in the EGU context, where state and federal electric grid regulations warrant particularly careful harmonization efforts with Clean Air Act mandates (*see Morton*, *supra*), commitment approaches avoid direct federal enforcement of state energy programs, helping to place the task of harmonizing energy and environmental policy mandates at the state level as Congress envisioned for the section 111(d) process. *See* 79 Fed. Reg. at 34,902. For all these reasons, state enforceable commitments are an especially useful compliance planning tool for section 111(d) EGU plans, and should be offered as an option for the states.

This does not mean that U.S. EPA can, or should, accept vague promises in lieu of real emissions reductions. Again, U.S. EPA's own regulations favor allowance systems and similar approaches, meaning that U.S. EPA can insist on significant rigor in any alternative approaches. Further, the case law, the agency's practice, and the statute all indicate that commitments must be matched with "comprehensive and detailed plan[s]" to support them, *Environmental Defense*, 369 F.3d at 210, along with careful monitoring and reporting. As commitments cover larger tranches of emissions, they should be reviewed and monitored with greater care, and be accompanied with careful

contingency plans that will be triggered if the anticipated reductions do not fully materialize.

Fortunately, U.S. EPA's proposal already delivers much of this reporting, by providing for regular CEMS monitoring of covered EGUs (*see* Proposed 40 C.F.R. § 60.5805), and for regular state reports on emissions levels statewide. *See id.* § 60.5815. This information is of the sort that would support commitment-based systems by ensuring that additional contingencies can readily be triggered if further reductions are needed.

Further, we would expect (and encourage) U.S. EPA to require state plan with commitments to be very clear about what sorts of contingency measures are triggered in these circumstances. By "contingency" we generally mean the sort of "corrective measures" which U.S. EPA's proposal already would require of state plans which do not impose reduction requirements solely on covered EGUs; measures described in the initial plan which will bring emissions of affected entities back into compliance with the plan.[15] For commitment approaches, these corrective approaches could include additional measures the state will put into force if emissions are not conforming to the expected trajectory, but it is particularly important that at least one of the corrective measures be a source-level "backstop" – that is, a requirement for covered EGUs to make up for any shortfall in the state measure over a reasonable period of time.

This backstop could take many forms so long as it requires actions which will ultimately attain the state targets and those obligations are automatically triggered by circumstances set out in the approved state plan. Triggering circumstances for such a backstop should be transparent – based on tonnage reports from CEMS compared to the commitment trajectory, for instance, or on similarly objective evidence. And the triggered actions should be similarly automatic and set out in advance by the state, at the time of plan approval. The source-level ultimate backstop is particularly important for states and U.S. EPA to settle upon at the time of initial plan approval. Depending on the plan design, covered EGUs might, for instance, be required to retire additional carbon allowances, acquire RECs to offset their emissions, or take similar actions[16] if the state commitment does not deliver in full by a date certain. Note that ARB does not necessarily endorse any particular backstop design on this illustrative list. We would work closely with U.S. EPA and our stakeholders to develop backstops that meet federal requirements while minimizing any market disruptions. Such backstop measures should be automatically enforceable, by citizen suit and by U.S. EPA under section 113, against covered EGUs when the identified triggering circumstances are

[15] *See*79 Fed. Reg. at 34,952.

[16] Again, EPA has also suggested an alternate version of the state commitment approach, under which the state generates compliance credits from RE and EE measures which EGUs can acquire to offset their emissions and meet permitted rates. This system could be another backstop measures.

reached. As such, both covered sources and states would have strong incentives to meet the commitments.

The general 111(d) regulations' preference for allowance systems over other approaches, including commitments should aid U.S. EPA in requiring such rigorous plan designs if states depart from the presumptively favored course. *See* 40 C.F.R § 60.24(b)(1).

In sum, enforceable commitments, long in use elsewhere in the Clean Air Act, are particularly well suited for section 111(d) and, especially, regulation of EGUs under that section, because EGU emission reductions are often best secured and supported by state energy policies that should not need to be federally enforceable themselves and indeed have been demonstrated to be successful without federal enforcement. A commitment-based approach would encourage states to continue to develop and implement these energy programs to support their emissions reductions effort, thereby furthering U.S. EPA's statutory mandate while maintaining room for the state planning innovation that Congress expected from the section 111(d) program. ARB staff urges U.S. EPA to add the commitment approach in the final rule.

IV. Baseline Approaches and Complementary Measures

U.S. EPA's ability to recognize certain energy programs as "complementary" measures will also aid states in plan design, and should be retained in the final rule. *See* 79 Fed. Reg. at 34,902. In essence, this approach recognizes that when multiple measures produce emissions reductions, not all of the measures need be federally enforceable. For instance, a statewide emission cap on EGUs may be supported by various energy efficiency and renewable energy policies, but the cap itself may be the only measure that must be federally enforceable, since it accounts for the effects of the other programs. This sort of analysis will help states design appropriate federal compliance strategies, while maintaining room for continued state-level program development to support their required emissions reductions.

In this vein, we also encourage U.S. EPA to recognize that some existing state programs may not need to be federally enforceable because they are already in force and reflect the status quo. U.S. EPA has already recognized as much in the "baseline pathway" of its "Roadmap" for integrating renewable energy and energy efficiency into criteria pollutant plans, and should do the same here. *See* U.S. EPA, RE/EE Roadmap, Appendix E. Of course, if these programs are discontinued, or altered in ways that substantially affect emissions, plans may need to be revised (and states should have clear obligations to report changed circumstances to U.S. EPA), but the programs should otherwise form part of the baseline analysis, rather than be treated as new enforceable measures.

V. Implications for California and for Regional Planning

Compliance mechanisms like the ones we have outlined here would aid ARB in integrating California's extensive existing greenhouse gas reduction systems with U.S. EPA's section 111(d) rule with minimum disruption. Although ARB continues to explore its options, and will only determine its compliance plan strategy after an extensive public process, ARB staff anticipates that commitment-based systems, accounting for the progress made by California's energy policy and allowance system, may be particularly important for its compliance plan design process. It will be important to maintain federal accountability for California's emissions reductions, while ensuring that the state retains discretion to continue improving and expanding its carbon reduction system without seeking federal approval of many program changes (including, especially, changes that do not directly affect emissions reduction levels).

Allowing plan designs of this sort is also likely to aid regional coordination and compliance. We believe that many states will seek "modular" approaches to regional planning; that is, they will not use regional state plans that bind all states within the region to a common target and compliance mechanism, but instead allow for trading and reallocation between states operating under their own plans. Both allowance and commitment systems can be used for this purpose.

Allowance systems likely provide the most straightforward regional compliance design. State plans that can accept allowances from carbon markets in other states can readily account for reductions across state borders, without requiring shared targets between the states. As long as both states meet their individual targets, U.S. EPA should be indifferent as to the source of the allowances used to comply, since total emissions from the covered EGUs will decline in accordance with the federal rule.

Commitment systems may work similarly, though their design will be somewhat more complex. In essence, states that make individual commitments to emissions reductions may design state plans that rely in part on particular actions in other states for which both states have agreed credit is to be reallocated. For instance, state A may commit to reductions which are achieved, in part, by the operation of a renewable energy source in state B. Provided that the total reductions are underwritten by a federally enforceable commitment in both states, that appropriate contingency measures and backstops are included, and the reallocation is approved as part of those plans, states should have flexibility to structure their programs in workable ways. Though the analysis to support such plans is likely more complex than that required for allowance systems, they should prove a viable option.

VI. Conclusion

Allowance systems are likely among the best means of complying with section 111(d), and many states will consider adopting them consistent with the regulatory presumption favoring them – especially so if U.S. EPA strikes an appropriate balance between federal accountability and state discretion to manage program details. But other state plan options are important to provide, and enforceable commitments, with meaningful backstops and contingencies underwriting them, are likely to be an important federal compliance mechanism for many states, including states that use allowance systems as a matter of state law. U.S. EPA should permit their use, if sufficient reporting and monitoring is included to ensure that commitments are met. We trust the U.S. EPA will use the full range of discretion available to it under the statute to support existing reduction programs and help enable continued emissions reductions in California and throughout the country.

Ms. Janet McCabe
November 24, 2014

APPENDIX B

Energy Efficiency EM&V Discussion

1. **U.S. EPA does not need to establish national EMV protocol(s). Industry standard protocols for evaluation, measurement and verification are available.**

The energy efficiency evaluation measurement and verification industry has multiple well developed protocols and industry standard practices around evaluation, measurement and verification of demand-side energy efficiency measures. A new national protocol is not necessary and would serve little benefit to the industry as a whole; the protocols and resources cited in U.S. EPA's proposed rule provide sufficient reference. It is not necessary to adopt a specific standard or protocol among these choices as they all illustrate industry best practice. Guidelines on program or measure-level evaluation guidance available via the California Protocols and Framework as well as the DOE Uniform Methods project all support consistent methods and documentation of industry standard practice.

2. **U.S. EPA should ensure that savings in state energy efficiency plans are measured against a consistent baseline and are held to a high standard. U.S. EPA can ensure this outcome by providing guidance to states about the minimum information states should include in plans when accounting for and reporting claimed energy efficiency savings. These guidelines should include common accounting, reporting, and data collection expectations for energy efficiency improvements, which will enable effective verification.**

U.S. EPA should require all states to account for energy efficiency savings according to a common and clearly defined baseline, which will ensure that states are reporting energy efficiency savings on a fair and level playing field. For example, this baseline should reflect whether U.S. EPA expects states to claim energy efficiency savings relative to actions that exceed minimum building codes, existing appliance standards and current market conditions.

To ensure that energy efficiency savings are real, additional and verifiable, U.S. EPA should require state plans to include a substantive explanation of how states will account for energy efficiency savings, including details about how states will report and collect data, and with what frequency. Effective evaluation, measurement and verification are predicated upon clear and consistent accounting and data reporting procedures defined at the outset, and state plans should reflect detailed consideration of these issues.

The U.S. EPA should provide guidelines to states about what they should include in their plans to demonstrate that they will conduct sufficient accounting, reporting and minimum levels of data collection to ensure that they meet a normalized and consistent national definition of savings. These guidelines should ensure that state energy efficiency plans use consistent methods to account for claimed energy efficiency

savings so that both U.S. EPA and states can evaluate these savings and they are comparable. To help develop its expectations for how states account for claimed energy efficiency savings in their state plans, as well as for how states evaluate, monitor, and verify those savings, we strongly urge U.S. EPA to consult with the U.S. DOE, which is experienced in both projecting and evaluating energy efficiency savings, and has develop numerous reports on evaluation of energy efficiency programs for the International Energy Program Evaluation Conference (http://www.iepec.org/?page_id=36).

Thus, in consultation with U.S. DOE, U.S. EPA should outline expectations for, and require that state plans explain, at a minimum, the following points:

- The baseline against which states claim energy efficiency savings;
- How states are factoring the effects of their program influence on energy efficiency savings (e.g. how the state represents net versus gross savings and takes into account market trends on claimed and evaluated savings);
- How frequently the state will project and report savings (e.g. annually, bi-annually, and with or without true-ups). States should be required to conduct reporting according to a consistent timeline;
- An evaluation plan that reflects one of the industry best-practice EMV protocols referenced in U.S. EPA's draft regulations (or a different U.S. EPA-certified protocol of comparable robustness), including a framework for how the state will prioritize what type of evaluation is most useful and relevant for the types of programs the state includes in its plan;
- Data collection expectations (e.g. location, measure savings, customer type) during implementation to enable basic evaluation after execution;
- How states model and justify claimed energy efficiency savings, including the granularity at which the state is evaluating savings (e.g. program-level savings; activity-level savings, or measure-level savings).

Deemed savings estimates, based on sound logic for savings estimates, will be the foundation for reporting of most projects and programs until evaluation, measurement and verification can be completed. A reporting mechanism to 'true up' existing estimates or improve estimates going forward should be put in place to ensure the evaluation, measurement and verification efforts inform a meaningful feedback loop and do not result in significant delays in understanding the impacts of energy efficiency efforts. U.S. EPA should expect that state plans will include a meaningful feedback and update strategy. For example, a state plan may demonstrate that the state has rules that annually require covered utilities or efficiency program service providers to report using a state approved database, a technical resource manual or require a third party evaluation of their energy efficiency programs. The state will determine which type of source data for claims and evaluation is appropriate for each utility or energy efficiency

service provider. Evaluation, measurement and verification are means of testing assumptions and validating field performance. State EMV plans should reflect a clearly defined scope, and they should identify analytical limitations. Evaluation will be most valuable when targeted at reducing incremental uncertainties to improve estimates going forward, which will need to be balanced against a pure verification function for EMV activities.

3. **U.S. EPA should clarify what baseline demand forecast states should include in their plans so that states can consistently and accurately report committed and incremental energy efficiency savings.**

Currently, U.S. EPA has not specified which baseline demand forecast states should use in their compliance plans, although it has clarified that nothing in the rule prohibits states from using their own demand forecasts. One concern is that the baseline demand forecast used in the draft rule for target setting is from the EIA's Annual Energy Outlook, which does not include all of California's energy efficiency programs. We therefore ask that U.S. EPA expressly allow states to include in their compliance plan a demand forecast that reflects the most current economic and demographic information available, as well as state data on committed energy savings. We also encourage U.S. EPA to ensure that these baseline forecasts include the same basic load categories to allow comparable emission reductions between states.

4. **All installed and operating energy efficiency measures should be eligible to be included in state plans.**

Many states like California have made significant historical investments in energy efficiency measures that are still installed and operating. U.S. EPA should recognize these investments and allow states to include the savings from these measures in state plans for as long as they continue to result in energy efficiency savings in 2020, even if the measures were installed or action was taken before 2014.

5. **State codes and standards should be allowed to be part of a state's compliance plan, and states should be accountable for documenting how the energy efficiency impacts from these standards will be counted.**

In states with energy standards for buildings and appliances that are more stringent than the federal standards, the agencies adopting these standards are responsible for accounting for the resulting impacts. Protocols exist to help calculate these impacts such as the ones cited in the GHG Abatement Measures Technical Support Document (e.g. Building Energy Codes Program: National Benefits Assessment: 1992-2040 by PNNL) and are a reliable source for direction.

6. U.S. EPA should not limit programs and measures to "well-established" interventions, but should enable new approaches and methods to be demonstrated in state plans.

States should be permitted to pursue a wide range of potential measures to improve energy efficiency, including codes and standards and behavior-changing measures like demand response, time-of-use pricing, and energy-use benchmarking. However, states should be held responsible for demonstrating in their plans how they will measure and evaluate these interventions.

7. U.S. EPA should require state or regional plans to only count toward compliance those energy efficiency savings that are additional and incremental to savings that would have occurred without state energy efficiency programs. However, the U.S. EPA should require states to report both gross and net energy efficiency savings, each of which provides different but equally valuable information that can help U.S. EPA compare the achievements and effectiveness of various state efforts.

If U.S. EPA allows states to count energy efficiency savings as a means of reducing supply-side carbon reductions (as U.S. EPA has proposed in the rate-based goals), U.S. EPA should allow states only to count energy efficiency savings that are additional and incremental to energy savings that would have occurred without state energy efficiency programs. This means that U.S. EPA should not allow states to count the effects of "free-riders" as additional energy efficiency savings that offset EGU emissions. As U.S. EPA explains in its technical support documents, the behavior of free-riders results in "energy savings that [are] likely to have occurred in the absence of program incentives."[17]

To avoid double counting the effects of free-riders and other impacts that are not directly attributable to state energy efficiency activities, and yet to capture the benefits of spillover effects, which represent positive transformational impacts that result directly from state energy efficiency program activities, U.S. EPA should only allow states to count net energy efficiency savings, not gross savings, as valid emission-reducing elements in state plans. This approach parallels U.S. EPA's Building Block #4 energy efficiency goal, which is based on underlying EIA Form 861 data that aims to capture net energy efficiency savings – that is, it intentionally excludes energy and load effects that are not attributable to demand-side energy efficiency program activities.[18] Since U.S. EPA allows states to treat energy efficiency savings as if it were additional carbon-free generation, it is essential that valid energy efficiency savings are truly additional

[17] U.S. EPA Technical Support Document, Projecting EGU CO_2 Emission Performance in State Plans, p. 21.
[18] See Form EIA-861 Instructions, Schedule 6: Demand-Side Management Information.

and they reflect the emission reductions from energy efficiency interventions that would not have occurred otherwise. Similar to our recommendation that U.S. EPA should allow states to choose among the various best-practice EMV protocols available, methods to account for net energy efficiency savings are well-established, and industry best-practice protocols exist to guide how states should perform such accounting. States should have flexibility to account for net energy efficiency according to one of these best-practice protocols.

Regardless whether U.S. EPA chooses to allow states to count either gross or net energy savings in their plans, U.S. EPA should require that state projections of EGU emissions and state accounting of energy efficiency savings both reflect the same accounting method. In other words, if states can only count the benefits of net energy efficiency savings in their implementation plans, state projections of electricity demand and EGU emissions should also reflect the anticipated amount of net energy efficiency savings. Despite whether U.S. EPA allows states to count gross or net savings when evaluating state compliance, U.S. EPA should hold all states to the same accounting approach – net or gross – which should be defined on a common basis across jurisdictions.

States can and should report to U.S. EPA both gross and net energy efficiency savings. Gross savings provides insight into the total energy efficiency savings and corresponding emission reductions that are occurring over time, including savings that may have occurred absent a state energy efficiency program. However, net savings provides insight into how effective each state program dollar or measure was at achieving incremental additional energy efficiency savings that result directly from state actions. Both metrics are valuable from a reporting and monitoring standpoint. Each metric provides different information to the system that may be necessary to assess performance.

Attachments

December 16, 2013

Gina McCarthy
Administrator
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

Dear Administrator McCarthy,

We are a group of state environmental agency leaders, energy agency leaders, and public utility commissioners from 15 states that have taken action to promote clean energy and address climate change. Please accept our enclosed joint comments on forthcoming carbon pollution standards for existing power plants. The development of these comments was facilitated by the Georgetown Climate Center.

At the outset, we applaud the commitment by President Barack Obama and the United States Environmental Protection Agency (EPA) to tackle head-on the challenge of climate change, and to focus in part upon reducing carbon emissions from existing power plants, which account for 33 percent of total greenhouse gas emissions nationwide.[1]

The President, in his June 2013 Presidential Memorandum, called on EPA to build on the leadership that many states, cities, and companies have already shown in reducing carbon pollution from the power sector as it develops its own standards under section 111(d) of the Clean Air Act.[2] EPA subsequently asked for states to provide feedback on specific issues, including state experiences with carbon pollution reduction programs.[3]

We are happy to share our experiences with you. Our states are already achieving significant carbon pollution reductions from the power sector, and are demonstrating a variety of ways in which such reductions can be achieved. Through market-based programs, renewable portfolio standards, energy efficiency resource standards and funding commitments, utility planning, and other efforts, our states have reduced carbon pollution from the electricity sector by 20 percent from 2005 to 2011, and similarly improved our net carbon emission rate 19 percent over the same time period. Many individual states have achieved even greater reductions in carbon pollution—in the range of 30 to 46 percent—in that time period. Our state programs are

[1] U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011 (2013), http://www.epa.gov/climatechange/ghgemissions/usinventoryreport.html.
[2] Presidential Memorandum from Barack Obama to the EPA, June 25, 2013, http://www.whitehouse.gov/the-press-office/2013/06/25/presidential-memorandum-power-sector-carbon-pollution-standards.
[3] U.S. EPA, Considerations in the Design of a Program to Reduce Carbon Pollution from Existing Power Plants (2013), http://www2.epa.gov/sites/production/files/2013-09/documents/20130923stateguestions.pdf.

delivering major economic and health benefits by reducing carbon pollution and traditional pollutants while driving investments in energy efficiency and renewable energy.

We encourage EPA to develop a stringent but flexible framework that equitably achieves meaningful reductions in carbon pollution from the electricity sector while recognizing that states may employ a variety of strategies, including successful state programs already in force, to achieve these goals.

As we detail in our enclosed comments, we urge EPA to:

- Establish the performance level of the standard based on a "best system of emission reduction" that reflects the full range of approaches that states have successfully demonstrated can cost-effectively reduce carbon pollution from the electricity system as a whole;
- Establish the form of the emission guideline in a way that equitably recognizes the different starting points and circumstances of different states, including the pollution reductions achieved by states through climate and clean energy programs; and
- Allow for a variety of rigorous state compliance options, including options for compliance through participation in regional emission budget trading programs and state portfolio programs.

We are grateful to EPA for considering these comments. We are confident that by drawing on the lessons of state experience, EPA can develop emission guidelines that secure the benefits that our states have experienced from carbon pollution reduction for the nation as a whole.

Sincerely,

Mary D. Nichols
Chair
California Air Resources Board

Robert B. Weisenmiller
Chair
California Energy Commission

Michael R. Peevey
Chair
California Public Utilities Commission

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Colorado Department of Public Health and Environment

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Douglas P. Scott
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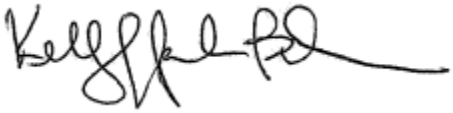
Robert M. Summers
Secretary
Maryland Department of the Environment



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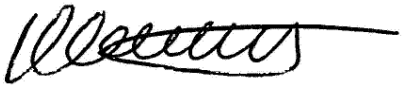

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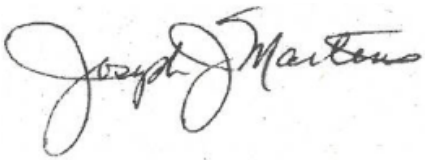

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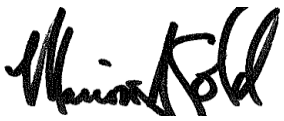

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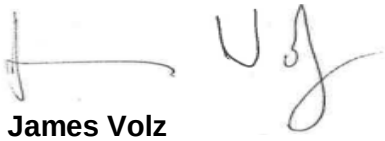

James Volz
Chairman
Vermont Public Service
Board

Maia Bellon
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Department of Ecology

States' §111(d) Implementation Group Input to EPA
on Carbon Pollution Standards for Existing Power Plants

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I. Overarching Principles

Our states support EPA in developing a program that:

- **Achieves significant emission reductions from the power sector in line with the reductions needed to protect public health and welfare.** State greenhouse gas emission reduction goals and the President's commitment to achieve economy-wide carbon pollution reductions of 17 percent below 2005 levels by 2020 reflect the national consensus that these pollution reductions are essential. The electricity sector provides some of the most substantial cost-effective opportunities for reductions relative to other sectors, as evidenced by the reductions in excess of 17 percent already being achieved by state programs, changes in energy markets, and advances in clean energy technologies. As several states have recognized in their plans to achieve economy-wide greenhouse gas reduction goals, the power sector will have to reduce its emissions more than the overall 17 percent goal because reductions from other sectors (e.g., transportation) will be more difficult to achieve.
- **Allows for a variety of flexible compliance options for states by setting rigorous targets while giving states the authority to innovate to reach them.** This approach recognizes that different pathways may be appropriate for different states, that flexibility allows states to cost-effectively achieve reductions by identifying opportunities created by the complex and interconnected nature of the electricity system, and that flexibility also facilitates efficient integration with other environmental obligations and reliability needs.
- **Encourages states that have current effective carbon pollution reduction and clean energy programs to use those programs as compliance mechanisms to meet federal targets.** These include California's AB 32 and related programs, the Regional Greenhouse Gas Initiative's (RGGI) state programs, and other programs such as renewable energy standards and energy efficiency resource standards.
- **Recognizes the carbon pollution reductions already achieved by such state programs, while still achieving significant additional national carbon pollution reductions and creating an equitable national system.**
- **Recognizes the various states' different starting points, but places all states on a trajectory to achieve final targets of comparable rigor.**
- **Minimizes compliance costs and burdens, maintains electricity reliability, and maximizes economic and environmental benefits.**

II. States have Demonstrated Various Programs that are Achieving Meaningful CO_2 Emission Reductions in the Power Sector along with Other Significant Benefits

Our states—along with others—have developed a variety of state programs that achieve substantial, cost-effective carbon emission reductions and improvements in net carbon emission rates. Through market-based programs, renewable portfolio standards, energy efficiency resource standards and funding commitments, utility planning, and other efforts, our states have reduced carbon pollution from the electricity sector by 20 percent from 2005 to 2011, and similarly improved our net carbon emission rate 19 percent over the same time period, from 941 to 759 pounds CO_2 per megawatt hour of electricity produced (lbs CO_2/MWh).[4] These programs are also delivering numerous additional benefits, including reductions of conventional pollutants and the significant public health benefits that accompany those reductions.

Our state programs have been developed through substantial democratic processes, and reflect the different on-the-ground experience of our states, including differences in the structure of energy markets and market participants.

Taken together, these approaches are driving improvements and innovation throughout the electricity system, leading to a cleaner and more efficient system overall.

[4] Calculated from U.S. Energy Information Administration data. CO_2 emissions based on Total Electric Power Industry category, U.S. Energy Information Administration, U.S. Electric Power Industry Estimated Emissions by State, http://www.eia.gov/electricity/data/state/emission_annual.xls [hereinafter EIA State Electric Power Emissions]. Electricity generation data represents the total electricity generated from all electricity generation sources in the state, not just fossil fuel-fired sources. U.S. Energy Information Administration, U.S. Energy Information Administration, 1990-2012 Net Generation by State by Type of Producer by Energy Source (EIA-906, EIA-920, and EIA-923), http://www.eia.gov/electricity/data/state/annual_generation_state.xls [hereinafter EIA State Generation]. Generation includes generation from sources that do not emit carbon pollution, including renewable and nuclear sources.

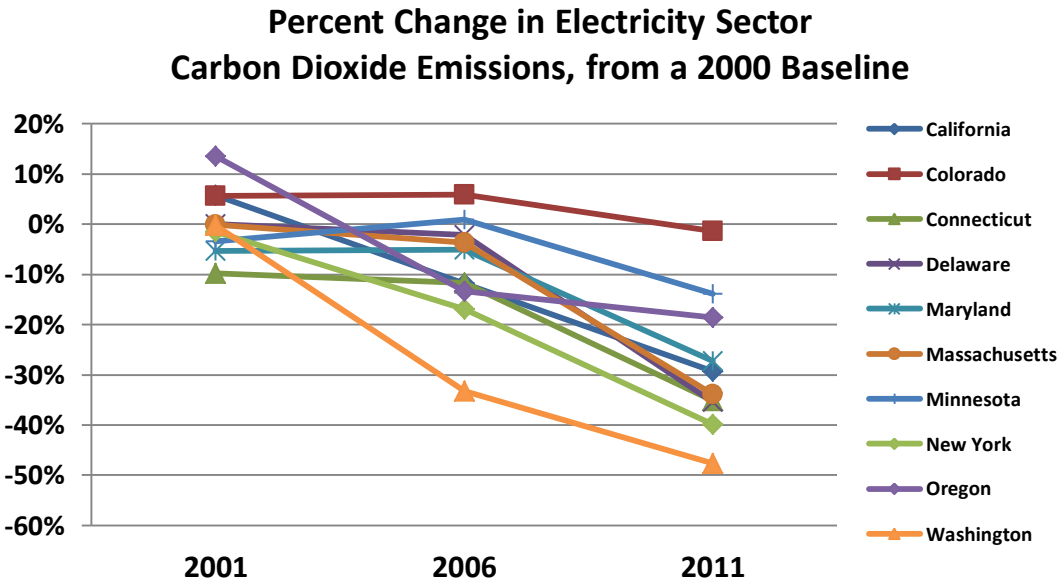

Figure 1: Many of our states have experienced very significant reductions in CO_2 emissions in the electricity sector over the past decade, demonstrating the levels of emission reductions that are achievable. Source: EIA, Total Electric Power Industry CO_2 Emissions.

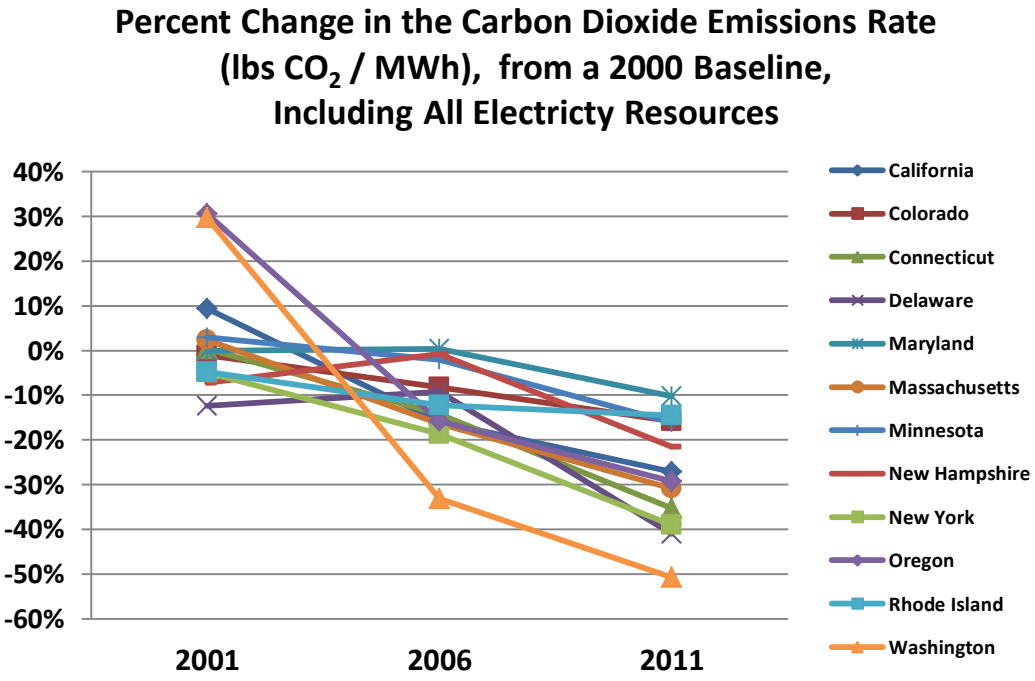

Figure 2: Similarly, many of our states have achieved very significant improvements in net carbon pollution emission rates (comparing total carbon pollution from the electricity sector to total electricity generation, i.e., lbs CO_2 / MWh). Source: EIA, Total Electric Power Industry CO_2 Emissions and Power Generation by State.

Approaches used by our states include the following:

Market-based programs: States that have market-based emission trading programs have demonstrated that these programs are an efficient, cost-effective way to achieve emission reductions and efficiently move the electric grid toward a cleaner system. These programs can operate as stand-alone programs or as "umbrella" policies that accumulate and account for emission reductions from complementary programs, such as renewable portfolio standards, energy efficiency programs, and emission reduction programs directed at other pollutants, as well as fuel switching and energy efficiency at power plants. Market-based programs can take different forms while yielding similar benefits.

For example, the nine states[5] participating in the Regional Greenhouse Gas Initiative have together reduced carbon pollution in the region by over 40 percent from 2005 to 2012.[6] The new RGGI cap[7] of approximately 78 million tons in 2020 is more than 50 percent below 2005 levels. Participating states are investing revenue from allowance auctions into energy efficiency and clean energy programs that benefit consumers and contribute to carbon pollution reductions.[8] These investments in energy efficiency have helped six of the nine RGGI states rank in the top ten most energy efficient states, according to the American Council for an Energy Efficient Economy. Massachusetts, which invests approximately 90 percent of its RGGI proceeds in energy efficiency, has been ranked the number one energy-efficient state for the last three years.[9] An independent study found that the RGGI states have realized a $1.6 billion net benefit from the first three years of the program's operation, in large part due to the energy efficiency investments that have reduced consumer electricity spending and increased economic activity.[10] The same study also found that the region would see a net increase of 16,000 jobs due to these energy efficiency investments and other auction revenue spending from the first three years of the program.[11]

Participating states have found that RGGI captures the benefits of complementary state policies and has resulted in significant changes across the electricity system to reduce emissions. These

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[5] Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont.

[6] Regional Greenhouse Gas Initiative, Report on Emission Reduction Efforts of the States Participating in the Regional Greenhouse Gas Initiative and Recommendations for Guidelines under Section 111(d) of the Clean Air Act 1 (2013).

[7] RGGI establishes an overall emissions cap on the power sector. In 2013, the participating RGGI states agreed to reduce the emissions cap by 45 percent in 2014. Program Review, Regional Greenhouse Gas Initiative website, http://www.rggi.org/design/program_review.

[8] RGGI Benefits, http://www.rggi.org/market/CO2-auctions/results; RGGI, Regional Investment of RGGI CO_2 Allowance Proceeds (2012), http://www.rggi.org/docs/Documents/2011-Investment-Report.pdf.

[9] ACEEE, State Energy Efficiency Scorecard, http://aceee.org/state-policy/scorecard.

[10] The Analysis Group, The Economic Impacts of the Regional Greenhouse Gas Initiative 33 (2011), http://www.analysisgroup.com/uploadedFiles/Publishing/Articles/Economic_Impact_RGGI_Report.pdf. The study looked at years 2009-2011.

[11] Jobs are "job years", or one job sustained for one year. *Id.*

include investments by power companies to make existing units more efficient, shifts across the electricity system to greater use of cleaner fossil-fuel generation sources, reduction of electricity load growth through demand-side energy efficiency strategies, and replacement of fossil-fuel generation with increased renewable energy.

Similarly, the state of California has mounted a comprehensive effort to reduce greenhouse gas emissions, reflecting its commitments to cut carbon pollution to 1990 levels by 2020,[12] and by 80 percent below those levels by 2050, while setting ambitious mid-term targets to keep emissions trending downwards.[13] In order to achieve these goals, California has implemented a comprehensive portfolio of policies, many under the authority of AB 32, California's Global Warming Solutions Act. This includes setting an economy-wide greenhouse gas (GHG) emissions cap that declines to 2020 along with a trading mechanism.[14] Four successful allowance auctions have been held, and the cap is projected to reduce emissions by 25 percent from 2006 to 2020.[15]

As a result of these many efforts, California's utility sector greenhouse gas emissions have continued to decline. Based on initial estimates from the California Air Resources Board, emissions from in-state and imported power fell by 16 million metric tons, or 16 percent, from 2005 to the 2010-12 averaging period (from 108 million metric tons CO_2e to 91 million tons CO_2e).[16] By 2025, California expects to cut utility sector emissions to below 80 million metric tons CO_2e, a roughly 25 percent reduction from 2005 levels in that sector, with already low emissions compared to other states.[17]

Renewable Portfolio Standards: At least 30 states have renewable portfolio standards (RPS) or alternative energy portfolio standards, which can increase renewable generation and displace carbon-intensive fossil fuel generation. The experience of our states, confirmed by independent analyses,[18] finds that sufficiently ambitious renewable energy policies can achieve significant carbon pollution reductions from fossil-fuel fired sources. In addition, these policies can spur

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[12] Cal. Public Health and Safety Code § 38550.
[13] Cal. Exec. Order S-3-05 (June 1, 2005).
[14] *See generally* Cal. Public Health and Safety Code §§ 38550 *et seq.*
[15] Center for Climate and Energy Solutions, California Global Warming Solutions Act (AB 32), http://www.c2es.org/us-states-regions/action/california/ab32 (last visited Oct. 22, 2013).
[16] Cal. Air Resources Board analysis, based in part on Cal. Air Resources Board, 2008 to 2012 Emissions for Mandatory Greenhouse Gas Emissions Reporting Summary (2013), http://www.arb.ca.gov/cc/reporting/ghg-rep/reported-data/2008-2012-ghg-emissions-summary.pdf. This analysis is preliminary, but reflects California's long-term successes and program performance. Emissions in 2012 were relatively higher than in recent years because of relatively low hydroelectric generation and the unexpected shutdown of the San Onofre Nuclear Generating Station, but the state remains on course to meet emissions targets.
[17] Cal. Air Resources Board analysis.
[18] *See e.g.*, Bryan K. Mignone et al., *Cost-effectiveness and Economic Incidence of a Clean Energy Standard*, Economics of Energy and Environmental Policy, Volume 1, Number 3 (2012); Elizabeth Doris and Rachel Gelman, National Renewable Energy Laboratory, State of the States 2010: The Role of Policy in Clean Energy Market Transformation (2011); Sanya Carley, *State Renewable Energy Electricity Policies: An Empirical Evaluation of Effectiveness*, 37 Energy Policy 3071–3081 (2009).

renewable energy innovation and deployment and promote long-term change toward a cleaner electricity system.

For example, The New York State Energy Research and Development Authority (NYSERDA) estimates that the state's RPS, which requires 30 percent of electricity used by consumers to come from renewables by 2015, avoided 4.1 million tons of CO_2 from 2006 to 2012, along with 4,028 tons of nitrogen oxides (NO_x) and 8,853 tons of sulfur dioxide (SO_2).[19] NYSERDA expects that renewable projects already initiated will inject $2.7 billion into the state's economy over their operating lives.[20]

Similarly, Minnesota's Renewable Energy Standard (RES) requires utilities to provide 25 percent of their power from renewables by 2025.[21] As a result of these policies and market conditions, Minnesota has seen a dramatic increase in wind resources, experiencing a 900 percent growth in wind generation from 2000 to 2010.[22] In 2011, wind had grown to provide 12.7 percent of Minnesota's total electricity generation.[23] All Minnesota utilities have met their 2012 RES goals and most ratepayers are benefitting from lower costs.[24]

Likewise, California has implemented a very aggressive RPS, requiring that 33 percent of state power come from renewable sources by 2020.[25] With more than 20 percent of its power already coming from renewable sources, the state is well on its way to meeting that target, and is considering ways to further develop renewable power.

The success of renewable portfolio standards is being demonstrated in many other states across the country as well.[26]

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[19] N.Y. State Energy Research & Development Authority, The New York State Renewable Portfolio Standard Performance Report 19 (2012), http://www.nyserda.ny.gov/Publications/Program-Planning-Status-and-Evaluation-Reports/Renewable-Portfolio-Standard-Reports.aspx.

[20] N.Y. State Energy Research & Development Authority, NYSERDA Renewable Portfolio Standard Main Tier 2013 Program Review Final Report September 5 (2013), http://www.nyserda.ny.gov/Publications/Program-Planning-Status-and-Evaluation-Reports.Renewable-Portfolio-Standard-Reports.aspx

[21] Minn. Stat. 216B.1691 (2013); *see also Minnesota*, DSIRE: Database for State Incentives for Renewable and Efficiency, http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=MN14R. Xcel Energy, the state's largest utility, must achieve 30 percent from renewables by 2020, one quarter of which must be met with wind.

[22] Provided by Minn. Department of Commerce.

[23] Calculated from EIA State Generation, *supra* note 4 (Wind generation as percentage of Total Electricity Power Industry generation).

[24] Minn. Dep't. of Commerce, Progress on Compliance by Electric Utilities with the Minnesota Renewable Energy Objective and the Renewable Energy Standard 3, 9 (2013), http://mn.gov/commerce/energy/images/2013RESLegReport.pdf.

[25] *See generally RPS Program Overview*, Cal. Public Utility Commission, http://www.cpuc.ca.gov/PUC/energy/Renewables/overview.htm.

[26] *See, e.g.,* World Resources Institute report series, Power Sector Opportunities for Reducing Carbon Dioxide Emissions, which identifies significant projected carbon pollution reductions from renewable strategies in specific states, including Pennsylvania, Michigan, North Carolina, and Ohio. Michael Obeiter et al., World Resources Institute, Power Sector Opportunities for Reducing Carbon Dioxide Emissions, http://www.wri.org/our-work/project/us-climate-action/publications.

Energy Efficiency Standards and Programs: State energy efficiency programs and dedicated investments provide some of the most cost-effective opportunities to reduce carbon pollution, reduce electricity costs to rate-payers, increase local economic activity, and create jobs. At least 25 states have energy efficiency resource standards or dedicated funding for energy efficiency established in law. Independent analysis has shown that—when applied across the country—such energy efficiency programs can achieve incremental annual electricity savings in the range of 0.5 to 1 percent annually.[27]

Experience in some of our states demonstrates that even greater annual savings are achievable. Vermont recorded annual savings of 1.8 percent last year through its Efficiency Vermont program,[28] and ISO New England forecasts that New England states' combined programs will effectively flatten projected demand growth through 2022.[29] These reductions in electricity use translate into very significant reductions in carbon pollution. For example, Massachusetts projects that its investment in energy efficiency from 2005 through 2015 will reduce Massachusetts' electricity demand by 17.1 percent, resulting in a total annual reduction of 3 million tons of CO_2 in 2015.[30]

In reducing electricity use, these programs also reduce rate-payer costs. For example, Vermont will see lifetime benefits of $136.1 million after spending $57.1 million on energy efficiency through its Efficiency Vermont program.In Colorado Xcel Energy, Colorado's largest utility, anticipates $227 million in net lifetime economic benefits for its customers as a result of its 2010 demand-side management programs.[31] California's energy efficiency standards have saved consumers over $74 billion on their electric bills over their decades of operation.[32]

In addition to saving rate-payers on electricity costs, demand-side efficiency programs also represent investment in the local economy and the creation of jobs, by creating positions for those who perform energy efficiency audits or install energy efficiency controls in commercial buildings. Investments in energy efficiency by states participating in RGGI were a large driver

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[27] Galen L. Barbose et al., Lawrence Berkeley National Laboratory, The Shifting Landscape of Ratepayer-Funded Energy Efficiency in the U.S. (2009), http://energy.gov/sites/prod/files/oeprod/DocumentsandMedia/LBNL_Shifting_Landscape_of_Ratepayer_Energy_Efficiency_REPORT.pdf (finding savings of 0.4 to 0.9 percent achievable under low to high scenarios).

[28] *2012 Annual Highlights*, Efficiency Vermont, http://www.efficiencyvermont.com/about_us/information_reports/annual-highlights-2012.aspx.

[29] Presentation, ISO New England, Final 2013 Energy-Efficiency Forecast 2016-2022 at slide 37, http://www.iso-ne.com/committees/comm_wkgrps/othr/enrgy_effncy_frcst/2013frcst/iso_ne_final_ee_forecast_2016_2022.pdf.

[30] Provided by Mass. Department of Environmental Protection.

[31] American Council for an Energy-Efficient Economy, Energy Efficiency Resource Standards: A Progress Report on State Experience 12 (June 2011), http://aceee.org/research-report/u112. Vermont's $57.1 million energy efficiency spending includes both Efficiency Vermont and participant spending.

[32] Cal. Energy Commission, Draft 2013 Integrated Energy Policy Report 23 (2013), http://www.energy.ca.gov/2013publications/CEC-100-2013-001/CEC-100-2013-001-LCD.pdf.

for the finding that the RGGI program overall created 16,000 jobs as a result of the first three years of its operation.[33]

These tremendous cost savings to rate-payers and economic benefits help make energy efficiency programs among the most cost-effective measures for reducing carbon pollution.

State and Utility Planning Efforts and Programs: State and utility planning efforts and programs, including planned early retirements of inefficient generation resources, are another approach that can significantly drive reductions in carbon pollution.

A prime example is Colorado's Clean Air – Clean Jobs Act, which required the state's regulated utilities to develop plans for reducing air pollutant emissions from coal-fired power plants equaling either 900 MW capacity or 50 percent of their coal fleet. As a result, the state's public utilities commission (PUC) has now approved plans from regulated utilities that will significantly reduce GHG emissions from coal plants, largely through plant retirements.[34] Colorado's largest utility, Xcel Energy, anticipates reducing its CO_2 emissions by 28 percent by 2020 under the state's Clean Air – Clean Jobs Act.[35]

Minnesota's Emission Reductions Rider statute similarly encourages utilities to file plans containing actions that would reduce emissions and that were not already required by federal regulations; the statute then allowed utilities to recover costs for those actions.[36] For example, the Minnesota Metro Emissions Reduction Project, completed by Xcel Energy from 2007 to 2009, reduced carbon emissions from three Twin Cities area power projects by 21 percent through the replacement of two coal facilities with highly efficient combined cycle units and the rehabilitation of an existing coal unit.[37]

Carbon Capture and Sequestration Programs and Policies: State projects and policies to support carbon capture and sequestration for coal plants can play an important role in achieving reductions from the existing fossil fleet. For example, Illinois has supported the development of clean coal projects through the FutureGen project in conjunction with the U.S. Department of Energy.[38] Illinois also passed the Clean Coal Portfolio Standard Law, which requires new coal-

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[33] Jobs are "job years," or one job sustained for one year. The Analysis Group, The Economic Impacts of the Regional Greenhouse Gas Initiative 47 (2011), http://www.analysisgroup.com/uploadedFiles/Publishing/Articles/Economic_Impact_RGGI_Report.pdf.

[34] *See* Press Release, Gov. Ritter, Bipartisan Lawmakers & Coalition Introduce Colorado Clean Air-Clean Jobs Legislation (Mar. 16, 2010), http://www.colorado.gov/cs/Satellite%3Fc%3DPage%26childpagename%3DGovRitter%252FGOVRLayout%26cid%3D1251573201310%26pagename%3DGOVRWrapper.

[35] Xcel Energy, Colorado Clean Air – Clean Jobs Plan, http://www.xcelenergy.com/Environment/Doing_Our_Part/Clean_Air_Projects/Colorado_Clean_Air_-_Clean_Jobs_Plan (reductions presumed from a 2010 baseline).

[36] Minn. Stat. § 216B.1692 (2013).

[37] Minn. Public Utility Commission, Report to the Legislature on Emission Reduction Projects Under Minnesota Statutes 216B.1692 (2008), http://www.puc.state.mn.us/portal/groups/public/documents/pdf_files/000661.pdf; *Minnesota Metro Emissions Reduction Project*, Xcel Energy, http://www.xcelenergy.com/Environment/Doing_Our_Part/Clean_Air_Projects/MN_MERP.

[38] *See* FutureGen Alliance, http://www.futuregenalliance.org.

fired power plants to capture and store more than half of the carbon emissions that the facility would otherwise emit.[39]

Combined Heat and Power Incentives: Combined heat and power (CHP)—also known as cogeneration—is an efficient, clean, and reliable way to generate electricity and heat from a single fuel source. Commercial and industrial facilities installing CHP systems can reduce load, peak demand, and associated carbon dioxide emissions from the grid by cost effectively generating their own electricity with low-emitting technologies such as fuel cells, natural gas microturbines, and gas turbines with waste heat recovery boilers. Installing CHP systems can significantly increase operational efficiency while lowering energy costs and reducing overall emissions from the electricity sector.

States can play an important role in promoting CHP. For example, Connecticut has implemented a variety of programs to promote CHP including construction grants, standardization of interconnection protocols, low interest loans, and the establishment of a CHP portfolio standard. As a result, Connecticut industry has added more than 91 MW of CHP capacity between 2005 and 2011[40]

State New Source Performance Standards: California, New York, Oregon, and Washington all have state emission performance standards for new power plants that have required new facilities to be highly efficient.[41]

The nation as a whole has also made important reductions in carbon pollution emissions, especially in very recent years, due to a variety of factors, including programs to reduce emissions of other pollutants from the power sector (e.g., mercury, nitrogen oxides, and sulfur dioxide), the increased availability and lower cost of natural gas, and growing efforts to secure the benefits of energy efficiency and renewable power. Overall carbon pollution from the electric power sector fell by 10.1 percent from 2005 to 2011, and the net emission rate for the power sector as a whole improved 11.1 percent from 1390 to 1236 lbs CO_2/MWh.[42] Separate data available for most recent years show that these improvements have accelerated; in the last three years alone, from 2010 to 2012, emissions from the power sector in the United States fell by 10.3 percent.[43]

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[39] 20 Ill. Comp. Stat. 3855/1-10 (2013).

[40] Conn. Department of Energy and Environmental Protection, 2013 Conn. Comprehensive Energy Strategy (2013), http://www.ct.gov/deep/lib/deep/energy/cep/2013_ces_final.pdf

[41] Cal. Pub. Util. Code §§ 8340-41 (2013), SB 1368 Perata (2006); Or. SB 101 (2000); N.Y. Comp. Codes R. & Regs. tit. 6 Part 251 (2013); Wash. Rev. Code ch. 80.80 (2013), Wash. SB 6001 (2007).

[42] Calculated from U.S. Energy Information Administration data. CO_2 emissions based on Total Electric Power Industry category. EIA State Electric Power Emissions, *supra* note 4. Electricity generation data represents the total electricity generated from all electricity generation sources in the state, not just fossil fuel-fired sources EIA State Generation, *supra* note 4.

[43] *Power Plants*, Greenhouse Gas Reporting Program 2012, U.S. Environmental Protection Agency, http://www.epa.gov/ghgreporting/ghgdata/reported/powerplants.html.

III. EPA Should Draw on the Experiences of States in Identifying the Best System of Emission Reduction and in Setting the Performance Level Through a System-Wide Approach

As we discuss above, states are achieving very significant carbon pollution reductions through a variety of state programs, including emission budget and trading programs, renewable portfolio standards, energy efficiency programs, state statutes that require or promote planned electricity resource changes, and others. Implementation of these programs across our states is driving changes to the electricity system as a whole, promoting efficiency improvements at individual sources, using a cleaner mix of our existing fossil fuel-fired sources to meet our electricity needs, adding additional renewable power and other zero-carbon energy capacity, and reducing our overall demand for energy through efficiency.

As EPA designs its Section 111(d) carbon pollution emission guideline for states on the basis of the "best system of emission reduction,"[44] it should take into account all of these types of demonstrated successes and the carbon pollution reductions achievable by them. Only by considering reductions from all of these types of approaches will EPA be able to establish a standard that achieves the most meaningful, cost-effective reductions.

The state programs can be grouped into three categories of approaches (as identified by EPA in its questions), each of which can secure a distinct pool of emission reductions:

1. **Changes at individual covered sources to reduce carbon emission intensity.** These include improving plant efficiency or heat rate, as well as switching to or co-firing with lower carbon fuels. Market-based programs can help drive these types of improvements. Programs and incentives for combined heat and power generation that is more carbon efficient than grid power can also increase the overall efficiency of energy generation. Carbon capture and sequestration can also reduce emissions at individual sources. Other potential on-site improvements that can be used to reduce emissions include: using renewable energy to provide supplemental steam heating; using waste heat to remove moisture from coal; implementing advanced systems for combustion and dispatch optimization, or oxy-combustion systems, and others.[45]

2. **Shifts in generation from covered sources that have higher carbon-pollution emission rates to others that have lower carbon-pollution emission rates.** This includes increasing generation at highly efficient natural gas plants and replacing existing sources with such efficient sources. Market-based state programs are demonstrating the effectiveness of these types of shifts across the electricity system, because sources that have lower carbon emission rates can provide electricity at a lower

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[44] *See* 42 U.S.C. § 7411(a)(1).

[45] *See* Megan Ceronsky and Tomas Carbonell, Environmental Defense Fund, Section 111(d) of the Clean Air Act, The Legal Foundation for Strong, Flexible & Cost-Effective Carbon Pollution Standards for Existing Power Plants 11 (2013), http://blogs.edf.org/climate411/files/2013/10/Section-111d-of-the-Clean-Air-Act-The-Legal-Foundation-for-Strong-Flexible-Cost-Effective-Carbon-Pollution-Standards-for-Existing-Power-Plants-O.pdf.

compliance cost. State new source performance standards have also driven such improvements, as they have required replacement generation to meet emission standards.

3. **Reduction of emissions from covered sources through displacement by zero-carbon generation or reduction in electricity demand.** This category covers two different approaches, both of which have the effect of displacing generation from covered fossil-fuel fired power plants thereby reducing carbon pollution from those sources. Developing additional zero-carbon electricity generation capacity, for example by adding wind and solar energy resources as well as nuclear power,[46] can reduce the use of carbon-emitting electricity resources.

   Another approach is to reduce the overall need for electricity through demand-side energy efficiency measures, such as through more efficient lights and appliances, and better residential and commercial building efficiency. Market-based programs, renewable energy standards, and state demand-side energy efficiency standards and programs are all demonstrating the types of emission reductions that can be achieved from covered sources through this category of reductions.

Our experience has demonstrated that meaningful, cost-effective emission reductions are best achieved through a system-wide approach that draws from all three of these strategies.

In particular, state experience has demonstrated that the most cost-effective strategies resulting in meaningful reductions are those that promote shifts away from high-emission fossil sources, displace emissions with zero-carbon generation, or reduce electricity use through demand-side efficiency programs.

In contrast, more limited emission reductions are available from plant-level efficiency improvements, as demonstrated by the extensive technical analysis in EPA's proposed new source standards for the sector.[47] Meaningful reductions could be achieved at a reasonable cost if the full range of available on-site systems, including efficiency upgrades and other improvements, were applied to each source,[48] except those nearing the end of their remaining useful life. However, we believe that such an approach is less cost-effective, and less effective in promoting long-term improvements in the electricity system, than a system-wide approach as described above and as demonstrated in our states.

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[46] Nuclear energy capacity can be increased through facility upgrades or construction of generation stations.

[47] U.S. Environmental Protection Agency, Standards of Performance for Greenhouse Gas Emissions from New Stationary Sources: Electric Utility Generating Units, EPA-HQ-OAR-2013-0495, at 27 (Sept. 20, 2013), http://www2.epa.gov/sites/production/files/2013-09/documents/20130920proposal.pdf. We do note, however, that source-level programs which directly and significantly reduce the capacity factor (and hence emissions) of inefficient or aging fossil plants, or use similar approaches to limit such plants' continued operations, may achieve substantial reductions.

[48] Such improvement could include the full range of options described under the "Changes at individual covered sources to reduce carbon emission intensity" category above, but opportunities for application of some of the individual strategies may vary by source. See discussion *supra* note 45.

The best emission reduction systems focus on shifting the grid as a whole away from high-carbon sources because individual generating units do not operate independently. Instead, they are part of a system of highly interdependent sources whose aggregate emissions are dependent on system management.[49] As state experience has shown, reducing demand for fossil generation or providing alternative, cleaner, sources of supply achieves emissions reductions far beyond the level that can be achieved by improving the operations of individual fossil plants.

Grid-level programs of this sort have delivered major economic benefits along with environmental improvements. In California, for instance, expanding energy efficiency alone has saved ratepayers billions of dollars while reducing the need for new power plants. The RGGI states are adding thousands of jobs as a result of these efforts, while cutting emissions. Similarly, state efforts to add renewable power across the country have improved the fuel diversity and system performance of the grid, while supporting a national boom in clean energy jobs. These opportunities are not available from strategies which focus only on source-level reductions, which are necessarily more limited and so provide fewer opportunities to save energy and create jobs.

Indeed, one of the Clean Air Act's most notable successes—the Acid Rain Program—achieved tremendous pollution reductions through a grid-level approach, promoting trading between generation sources to reduce emissions from the fleet as a whole, rather than focusing narrowly on individual sources.[50] That effort cut acid gases from power plants in the program by more than 70 percent in an extremely cost-effective way, leading EPA to conclude that "market-based trading systems can cost-effectively reduce pollution and address environmental damage."[51] Related programs have further cut pollution by providing incentives to move the grid, as a whole, toward cleaner energy.[52] We agree with EPA that these system-level approaches,[53] including efforts to integrate renewable energy and energy efficiency into the grid, "represent … a real opportunity" to reduce air pollution.[54]

EPA needs to seize that opportunity because Section 111(d) standards are to be based on the "best system of emission reduction,"[55] and the best systems available include all three carbon reduction strategies the states have demonstrated. The courts are clear that EPA must "weigh cost, energy, and environmental impacts in the broadest sense at the national and regional

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[49] *See* U.S. Environmental Protection Agency, Roadmap for Incorporating Energy Efficiency/Renewable Energy Policies and Programs into State and Tribal Implementation Plans at Appendix B, B-6 (2012) [hereinafter EPA EE/RE Roadmap].

[50] *See generally* 42 U.S.C. §§ 7651 *et seq*.;

[51] U.S. Environmental Protection Agency, Acid Rain and Related Programs 2009 Highlights: 15 Years of Results (2009), http://www.epa.gov/airmarkets/progress/ARP09_4.html.

[52] *See, e.g.*,NO_X SIP Call, 63 Fed. Reg. 57,356 (Oct. 27, 1998); Clean Air Interstate Rule, 70 Fed. Reg. 25,162 (May 12, 2005).

[53] *See also* Clean Air Mercury Rule, 69 Fed. Reg. 4,652, 4,698-4,705 (proposed Jan. 30, 2004) (discussing benefits of allowance system for pollution reduction from the electric power sector while proposing Section 111(d) guidelines for the sector).

[54] EPA EE/RE Roadmap, *supra* note 49, at 12.

[55] 42 U.S.C. §§ 7411(a)(1) & (d)(1) (emphasis added); *see also* 40 C.F.R. §§ 60.21(e), 60.22(b)(5).

levels and over time as opposed to simply at the plant level in the immediate present" as it seeks the best ways to reduce emissions.[56] We are confident that a broad approach is the best path forward here.

Indeed, EPA has recently developed a "Roadmap" that outlines system-level approaches for states seeking to reduce fossil fleet emissions in order to maintain compliance with air quality standards for pollutants like ozone and soot.[57] The Roadmap discusses all three of our strategies, including energy efficiency programs, emissions trading systems, and renewable portfolio standards which can help reduce grid-level emissions. Those same strategies work to reduce greenhouse gas pollution as well.

EPA must therefore look broadly to ensure that it fully accounts for emission reduction opportunities across the electric system, from individual generation stations to the grid as a whole. Simply put, achieving meaningful, cost-effective emission reductions across the power grid requires taking a grid-level perspective, as states' experience demonstrates. That experience shows carbon pollution reductions in the range of 17 to 46 percent over a seven year period (2005-2011) have been achieved by many leading states,[58] along with related improvements in emission rates from 18 to 39 percent in the same time frame, demonstrating that such broad policies can successfully and cost-effectively achieve real progress.[59]

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[56] *Sierra Club v. Costle*, 657 F.2d 298, 330 (D.C. Cir. 1981).

[57] *See generally* EPA EE/RE Roadmap, *supra* note 49.

[58] Represents range of reductions achieved by Connecticut, Delaware, Maine, Maryland, Massachusetts, Minnesota, New Hampshire, New York, Oregon, Vermont, and Washington. Calculated from U.S. Energy Information Administration data. CO_2 emissions based on Total Electric Power Industry category. EIA State Electric Power Emissions, *supra* note 4.

[59] Represents range of reductions achieved by Connecticut, Delaware, Maine, Massachusetts, New Hampshire, New York, and Oregon. Calculated from U.S. Energy Information Administration data. CO_2 emissions based on Total Electric Power Industry category. EIA State Electric Power Emissions, *supra* note 4. Electricity generation data represents the total electricity generated from all electricity generation sources in the state, not just fossil fuel-fired sources EIA State Generation, *supra* note 4.

IV. The Form of EPA's Emission Guidelines Should Recognize Different State Starting Points and Support the Use of State Programs for Compliance

IV.A. The Emission Guideline Should Equitably Recognize States' Different Starting Points and Circumstances

States all across the country can take advantage of the strategies we discuss above to reduce their carbon pollution to a significantly lower level, but will begin with widely differing power fleets and existing regulatory initiatives. EPA should balance these differences with the need to reduce greenhouse gas emissions across the country by placing all states on a trajectory to achieve a uniformly rigorous target, while allowing varying compliance times (recognizing that this period of time may extend beyond an initial phase covered by the rulemaking).

One approach that EPA should consider is setting a single emission intensity target that would apply to each state, individually or as part of a region, representing net improvements to the carbon intensity of a state's electricity system that could be achieved through the system-wide approaches described above. (This target could be expressed as an aggregate emission rate of pounds per megawatt-hour or potentially as a rate of emissions per gross domestic product). States that would have further to go to meet the target could have longer compliance times to meet the common goal. This approach would require all states to reduce emissions while being equitable to states that have already made progress toward meeting the emission intensity target. The same goal would be achieved by establishing a mass-based emission budget for each state that reflects a level of aggregate emissions from covered sources commensurate with full use of the best system of emission reductions. (We discuss ways to convert between mass and rate standards below.)

Approaches like these would automatically recognize the substantial emission reductions achieved by first-mover states while providing other states the time they need to pursue these opportunities. States that have already taken significant action to reduce carbon pollution or already have mostly low-carbon energy resources would be on track to meet such common standards quickly, with fewer opportunities for immediate further improvements beyond those already contemplated in their programs. States that have a high-carbon energy portfolio may have greater opportunities to achieve significant reductions in the near term through actions that other states may have already taken, but may require more time to reach the same level of overall emission performance as states that have already taken significant action.

Reviewing state programs within this framework, EPA would ensure that each state has designed its program to put regulated sources on an achievable glide path to reach its target as soon as practicable,[60] thereby maintaining a clear regulatory incentive to reduce carbon dioxide emissions over the compliance period.

EPA has taken these approaches in the past: other Clean Air Act programs allow states time to comply, with the time period depending on the degree of pollution reduction required and a

[60] States would need to support through analysis that the "glidepath" demonstrates reasonable progress toward the target.

showing of "reasonable progress" towards final standards.[61] EPA's Section 111(d) general regulations likewise support this approach, as they anticipate that state plans will set compliance schedules that include regular progress reports.[62]

We believe this approach, which focuses on moving states toward a shared endpoint, is substantially better than one based on requiring percentage reductions (either in tons or rates) from a particular baseline year. Setting an equitable baseline across the states, which have varying economic and emissions histories, would be difficult and time-consuming. And because states have very different emissions levels now, requiring all states to reduce emissions by the same percentage across the board, regardless of starting circumstances, would not treat the states equitably, or be the most cost-effective way of achieving reductions.[63]

We recognize that other equity issues will arise as EPA considers how to move the states towards a common target. These include the fact that states may be net importers or exporters of power, and so their emissions may be affected by actions in other states that they cannot directly control. On a related point, some states may have relatively smaller in-state power systems, and so may have limited opportunity for system-wide improvements within the state. We believe that encouraging regional 111(d) planning, as we discuss later in these comments, may help address these issues.

IV.B. EPA Should Provide a Durable Regulatory Signal for Further Emissions Reductions

The 111(d) guidelines should send a durable regulatory signal that greenhouse gas pollution from the power sector must be significantly reduced, and that further reductions will be required as systems of emission reduction further improve. Sending that signal requires setting meaningful endpoints for states to reach during the initial compliance period, and committing to regularly review (and, in all likelihood tighten) the guidelines over time.

Although we recognize that states may reach these endpoints at different times, it is important the standards be clear that the endpoints, once reached, are ceilings. Emissions levels (whether set as mass ceilings or maximum emissions rates) cannot be allowed to rise above the target after the end of the initial compliance period.

EPA should further ensure that it is clear to the regulated industry that further reductions are likely in the future. The reduction opportunities available with current adequately demonstrated systems will expand down the road as further deployment of existing clean technologies takes place. EPA should be clear that it will be regularly revisiting its guidelines to assess new pollution control opportunities.

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[61] *See, e.g.*, 42 U.S.C. § 7410 (state plans for criteria pollutants); 42 U.S.C. § 7491(b) (plans need to make "reasonable progress" toward visibility improvements).

[62] *See* 40 C.F.R. §§ 60.24(a) & 60.25(e).

[63] If EPA nonetheless chooses to pursue the approach of requiring all states to achieve a percentage reduction from a baseline year, it should provide states with the option of utilizing an earlier baseline that would recognize the progress that they have already achieved. It would also be important for EPA to recognize the relationship between the baseline year and current reductions already achieved for the purpose of setting the performance level. For example, if EPA were to select 2005 as a baseline year, it should recognize that 2011 emissions nationwide are already 11 percent below 2005 emissions, and the average power sector emissions rate in 2011 is 11 percent below the emission rate in 2005. *See* discussion *supra* at notes 42, 43.

In particular, Section 111 and its implementing regulations already specify that EPA will review, and if appropriate, revise its *new* source regulations every eight years,[64] and that it will publish draft and final existing source guidelines "[c]oncurrently upon or after" proposing new source standards.[65] Although the rules thus anticipate revisions, EPA should further clarify this review obligation. It should do so by providing, by rule, that it will review and, if appropriate, revise, its existing source standards by a date certain, on the same eight-year timeline as applies to its new source standards – a sensible provision that will allow EPA to evaluate the power fleet as a whole in each review.

Such regulatory deadlines are not unusual. In the greenhouse gas context, for instance, EPA included enforceable deadlines in its "tailoring" rule for major source permitting, requiring the agency to regularly revisit its rulemaking over time, as greenhouse gas regulation experience is gained.[66] A similar course is appropriate here. A review commitment will make clear to all parties that the emissions glide paths will continue to decline long after the first compliance period has passed.

IV.C. Emission Guideline Should Provide a Mass-Based Performance Level Option

Many current state greenhouse gas reduction programs, including the programs of states participating in RGGI and the California system, are based on limiting emissions to an overall quantity expressed as a mass (e.g., tons of CO_2). To ensure that these programs can continue to operate smoothly to support compliance with the Section 111(d) rules, EPA should provide for a mass-based emission budget compliance option, either by articulating the standard as a mass-based emission budget, or providing a mechanism for translating from a rate-based standard to a mass-based emission budget.

Such a methodology could apply an emission rate to the projected or historic generation from covered power plants in a state. For example, under a projected generation approach, modeling would be used to project how a state's generation from covered sources would change over a period of time, and then the EPA emission rate would be applied to that projected quantity of electricity generated.[67] Using such an approach would take into account changes in demand, and would therefore be more comparable to using a rate-based standard, where the emissions are proportionate to demand. EPA could require states to reduce or offset the projected demand growth with readily available energy efficiency improvements (e.g., one percent annually). This approach could potentially involve a "true-up" as well—a review of whether actual changes in

[64] 42 U.S.C. § 7411(b)(1)(B).
[65] 40 C.F.R § 60.22(a).
[66] *See* 40 C.F.R. § 50.22.
[67] Under such an approach, it would be appropriate to require new sources to be subject to the new source standard as part of their New Source Performance Standard compliance obligation, as using projected generation to compute a state's emission budget would inherently reflect any new generation required to meet changes in load. Such an approach was proposed by EPA in the Clean Air Mercury Rule. 70 Fed. Reg. 28622 (May 18, 2005).

demand and related factors are consistent with projected changes, and a potential adjustment to the budget to reflect those changes.[68]

If a historic generation approach is used, a state's emission budget would be based on the amount of emissions that would have occurred in a baseline year if the state's power plants had generated the same amount of electricity as they did during the baseline year, but had emitted at a target emission rate.[69]

Note that under these approaches, the emission budget would represent an aggregate budget for all covered sources in a state. States choosing to use the emission budget would be required to meet the standard in the aggregate, could use all cost-effective measures—such as efficiency, renewables, end-use controls, carbon capture and sequestration—to obtain the necessary reductions, and could allow averaging of emissions or trading of emissions allowances. Or a state could join a regional market-based program, and could demonstrate compliance if the group of states collectively met the states' aggregate mass-based standard.

If EPA articulates the standard as a rate-based standard, and if EPA's methodology for translating from a rate-based standard to a mass-based standard involves accounting for projected changes in generation from covered sources, the methodology should be transparent and consistent. The methodology should start with reliable, existing federal data sources, including the Clean Air Markets Division emissions database and the EIA Annual Energy Outlook. EPA should also allow states to seek to use their own data, but EPA should require states to rigorously substantiate any changes to projections based on other, non-federal data sources.[70]

IV.D. Emission Guideline Should Recognize that Averaging or Trading Elements Necessarily Take into Account Remaining Useful Life

Section 111(d) requires EPA to allow a state, in applying a standard of performance to any particular source, to take into consideration the remaining useful life of the existing source to which the standard applies.[71]

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[68] A system-wide approach to reducing emissions includes reducing electricity demand through energy efficiency or displacing demand for fossil fuel-fired generation through additional zero-carbon energy. Therefore any projection of demand change or "true-up" should reflect those anticipated electricity savings or displacement.

[69] For a simplified example, assume that the standard is 1100 lbs/MWh (the proposed rate for new coal plants), and that state "X" has one gas plant and one coal plant, each of 500 MW. In the hypothetical base year of 2013, the gas and coal plant together generate 7 million MWh of electricity and emit 5.2 million tons of CO2, at an average 2013 rate of 1500 lbs/MWh. The state's cap in 2025 would assume the same generation--7 million MWh—and multiply that by the 2025 rate-based standard-- 1100 lbs/MWh. This yields a cap of 3.8 million tons per year, 27 percent less than actual emissions in 2013. Note that this method could be adapted to accommodate different rates for different fuels or plant types, such as those proposed in the new plant standard.

[70] EPA should consider providing guidance for how a state can provide a rigorous demonstration of changes from specific factors, for example if a state is projecting significant increases in electricity demand due to increased electric vehicle deployment as a result of state policies that are not reflected in federal projections.

[71] 42 U.S.C. § 7411(d)(1).

Programs that include averaging and trading inherently take into account remaining useful life, as they allow market participants to make decisions about operations based on market prices. The owners of an older, inefficient facility nearing retirement need not choose between significant modifications to continue operating for only a few years or immediate retirement; instead the owners of such a facility could choose to continue to operate for several years and comply through the purchase of allowances or through averaging emissions with more efficient facilities. In this way, regulated entities may continue to operate facilities that would not be economically feasible to operate if emission reductions were required from each facility, but are economically feasible to operate under a market-based program. In a market-based or averaging program, EPA should consider that allowing states to elect such mechanisms is one way to allow states to take into consideration remaining useful life.

EPA should also consider an option for states without such averaging or trading systems to treat specific facilities separately, for example, if those facilities enter into a legally enforceable agreement to retire by a certain date. If a facility commits to retire during the compliance period, a state might not require it to take all the regulatory steps that would be necessary to reduce its emissions to the level required at the end of that period, because the source will no longer be operating.

For states that use a mass-based approach on a system-wide basis, consideration of useful life could support a declining cap on emissions. For example, a system-wide cap could, over time, decline to a level that corresponds to the emission level of new fossil-fired plants, as higher-emitting existing sources are assumed to retire at the end of their useful lives. Of course, the market signals would determine whether those aging systems actually retire or whether the required emission reductions would be achieved from other plants reducing their generation.

V. EPA Should Allow for a Variety of Rigorous State Compliance Options

V.A. EPA Emission Guidelines Should Allow States to Use Effective Current Programs

As we have discussed above, the states have developed a wide array of emissions reductions programs that are now operating. EPA should incorporate into its "Best System of Emission Reduction" determination all of the approaches that states are already demonstrating achieve cost-effective, meaningful reductions from covered sources, including reductions from onsite improvements, shifts in generation among covered sources, and displacement from zero-carbon generation increases or demand-side efficiency. Even if EPA does not explicitly base the "best system of reduction" on the variety of state programs described above, EPA should allow states with any effective existing programs the option of using these programs as the basis of compliance as long as states can demonstrate through a rigorous, consistent methodology identified by EPA that those programs will achieve the required reductions.

States managing greenhouse gas reduction, energy efficiency, and renewable energy programs have built these programs through their own democratic and stakeholder processes, and with a deep understanding of conditions within their power grids. To the extent that those programs are delivering a substantial portion of the reductions needed to comply with Section 111(d) guidelines, EPA should ensure that its federal framework provides states with the option of incorporating their current programs with minimal change or burden as long as they achieve equivalent reductions. As its governing regulations require, EPA has regularly invited the states to propose a range of approaches to meet federal standards, in whole or in part, and we expect it to follow the same course here.[72]

[72] *See, e.g.*, Emission Guidelines for Municipal Waste Combustors, 60 Fed. Reg. 65,837, 65,402 (Dec. 19, 1995) (111(d) rules for municipal waste combustors, inviting states to submit trading plans to meet federal standards); Clean Air Mercury Rule, 70 Fed. Reg. 28,606, 28,619 (May 18, 2005) (allowing states to develop their own plans to comply with power plant Section 111(d) standards); Clean Air Mercury Rule, 69 Fed. Reg. 12,398, 12,406 (supplemental proposed Mar. 16, 2004) (allowing states to develop their own plans to comply with power plant Section 111(d) standards).

V.B. EPA Should Allow and Promote Interstate Cooperation and Regional Programs

Many existing programs already have a regional component, and others may well incorporate one. EPA should encourage interstate coordination and collaboration, recognizing that the electricity system is a complex, interstate system, and that allowing interstate coordination and collaboration can reduce costs and help avoid challenges that arise when limiting systems to a specific state. Interstate cooperation can also lower the administrative burden on states and compliance entities, and helps to resolve equity issues that might otherwise arise between power-exporting and power-importing states.

Interstate programs have already been successful in a variety of contexts. On a national basis, as we have noted above, EPA has promoted multi-state trading systems through its Acid Rain Program and Cross-State Air Pollution Rule, as well as efforts to decrease regional haze and to address ozone transport issues between and among the states.[73] These programs are frequently identified as being highly cost-effective.[74]

RGGI is a prime example of how an interstate program helps to ensure that the most cost-effective emission reductions occur across the region. Since the program began, coal-fired plants closed within the RGGI region and the capacity of those plants was replaced by increased generation from cleaner and more efficient renewable and natural gas powered sources elsewhere in the region. Indeed, emissions in at least one state actually increased, because that state is the location of some of the more efficient natural gas-fired power plants in the region that had excess capacity.

As RGGI demonstrates, a program that corresponds with or is more closely aligned with the borders of an electricity grid (for example, among states in the same NERC interconnections or regional transmission organizations) is potentially more efficient than programs that are constrained by state borders.

A regional program can also avoid market distortions that would result in less than optimal policy decisions due to some of the interstate issues raised by EPA in its questions. For example, if one state's energy efficiency investments reduce emissions in a neighboring state, a regional program that encompasses both states would be able to reap the emission reduction benefits of that energy efficiency under a regional emissions cap.

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[73] Acid Rain Program, Clean Air Act Title IV, 42 U.S.C. §§ 7651-7651o; 40 C.F.R. Parts 72-28 (Acid Rain Program implementing regulations, establishing interstate trading program); Cross State Air Pollution Rule, 76 Fed. Reg. 48208, 48210 (Aug. 8, 2011) (establishing state trading programs that allow interstate trading); Regional Haze Regulations, 64 Fed. Reg. 35,714, 35,715 (July 1, 1999) (allowing multi-state approaches to controlling regional haze); *Overview of the Ozone Transport Commission NO_x Budget Program*, U.S. Environmental Protection Agency, http://www.epa.gov/AIRMARKET/progsregs/nox/otc-overview.html (describing Northeastern states implementation of NO_x budget trading program); NOx SIP Call, 63 Fed. Reg. 57,359 (Oct. 27, 1998) (establishing recommended multi-state budget trading program to control ozone precursor NO_x).

[74] *See, e.g.,* William F. Pederson, *Should EPA Use Emissions Averaging or Cap and Trade to Implement §111(d) of the Clean Air Act?*, 34 Env. L Rptr. 10731 (2013).

V.C. EPA Should Provide Guidance on How to Address Interstate Issues such as Double-Counting.

Regional collaboration on state Section 111(d) plans can directly address double-counting, either through coordination of compliance systems or through agreements on how to address any double-counting problems. In order to promote such regional cooperation, EPA and DOE should make available information about regional electricity flows and interstate impacts of state programs and policies. EPA should consider providing guidance on how states can collaborate regionally on implementation plans. For example, EPA should allow states using mass-based emission budgets to "pool" emission budgets, and to demonstrate how their state plans will jointly achieve an aggregated emission budget.

But not all states may opt to join regional plans, and clear accounting will be important between and among different regions.

EPA should also provide guidance on how it will address complications that may arise due to the use of different types of state programs. Such complications include situations where one state proposes a program that would achieve reductions through the displacement of fossil fuel generation due to the state's renewable portfolio standards, long-term power purchase agreements, energy efficiency resource standards, or similar state policies, but where the actual reduction of emissions from fossil generation takes place in another state. If EPA provides a state with credit from emission reductions occurring outside its borders, EPA must establish a process for ensuring that states that see their emissions reduced as a result exclude the resulting emissions reductions from their compliance demonstration. A similar situation would arise when a state seeks compliance through planned shut-downs of fossil fuel generation, but then would see that generation replaced by increased carbon generation in another state.

V.D. EPA Should Work with States to Develop Compliance Pathways and Model Rules

To help states develop state-level and regional plans, EPA should work with states to develop compliance pathways for existing programs, for example by developing model State Plans in collaboration with states or making clear that model State Plans developed by states are approvable. (See section VII below for proposed RGGI and State Portfolio compliance pathways).

As part of this work, EPA should develop a procedure for allowing states to demonstrate equivalency with the emission guideline, even if EPA does not explicitly contemplate a state's program type in a model rule. Such a procedure should ensure that equivalent reductions will be achieved through the use of consistent evaluation and quantification methods, as discussed below.

In order to meet the timetable in the Presidential Memorandum requiring states to submit plans by June 30, 2016, EPA should provide a clear indication that it expects certain compliance pathways to be approvable prior to its publication of the final rule by July 1, 2015.

V.E. EPA Should Ensure Consistent Evaluation and Quantification of State Plans

Accommodating a range of state and regional program designs will require EPA to provide program evaluation metrics along with the draft guidelines. Those metrics should offer a transparent, nationally consistent, and readily usable way for states to evaluate their existing programs to determine whether they suffice to comply with the guideline's emissions level, or if additional reductions will be required. By setting out these goal posts early, EPA will make it

easier for states to quickly advance strong programs through the Section 111(d) process, and to identify ways to improve weaker ones.

EPA should build on current program evaluation guidance such as the "Roadmap for Incorporating Energy Efficiency/Renewable Energy Policies and Programs into State and Tribal Implementation Plans"[75] or the State and Local Energy Efficiency Action Network's "Energy Efficiency Program Impact Evaluation Guide."[76] These guides describe the terminology, structures, and approaches used for evaluating energy and demand savings as well as methods for calculating avoided emissions and other non-energy benefits resulting from energy efficiency programs that are implemented by local governments, states, utilities, private companies, and nonprofits. They provide context, planning guidance, and discussion of issues that help illustrate appropriate evaluation objectives and approaches for different efficiency portfolios. By promoting the use of standard evaluation terminology and structures and approaches, evaluations can support the adoption, continuation, and expansion of effective efficiency actions for consistent inclusion in State Plans. EPA and DOE should continue to work with state and local energy and environmental agencies to ensure that renewable energy and energy efficiency programs are evaluated transparently and consistently so that appropriate credit is provided for these programs.

Energy efficiency evaluation methodologies are particularly important for programs ranging from LED lighting replacement to combined heat and power projects. Consistent quantification methodologies are needed for projecting reductions in energy use as part of a baseline energy use forecast and for calculating reductions documented after-the-fact as part of a compliance effort.

[75] EPA EE/RE Roadmap, *supra* note 49.

[76] State and Local Energy Efficiency Action Network, Energy Efficiency Program Impact Evaluation Guide (2012), www1.eere.energy.gov/seeaction/impactguide.

V.F. EPA Should Coordinate Efforts with Other Relevant Federal and State Agencies

Implementing the guidelines will be a collaborative effort between and among numerous federal and regional entities, as well as with the states. We trust that EPA will work particularly closely with federal and state energy regulators, including the Federal Energy Regulatory Commission (FERC), the Department of Energy (DOE), and through the National Association of Regulatory Utility Commissioners (NARUC), state utility regulators, as well as regional grid operators and reliability coordinators. This work will be critical to developing durable system-level standards and accessing state plans employing a variety of policies that may affect the grid. Strong collaboration between EPA and the energy regulators will also be important to make sure that these entities provide maximum support to states investing in emissions controls, by ensuring that energy markets are designed and operated in a way that ensures that clean energy investments are fully valued and able to participate.

Initially, we urge EPA to work particularly closely with DOE in order to develop clear evaluation metrics and modeling tools that EPA and the states can use to assess their various grid-level programs against the level of the emission guidelines, and to assess compliance pathways. As these programs move forward, EPA should also work with FERC and regional grid entities to ensure that reliability-related issues are addressed early in the process, without delaying Section 111(d)'s implementation, just as EPA has done during other Clean Air Act rulemakings. FERC's recent Order 1000, which is helping to integrate public policy mandates into grid planning, should help with this process by enabling measures that complement and support states' emission reduction strategies. EPA should work with FERC, the grid operators, and the states to ensure that the effects of Section 111(d) plans are accounted for in planning early and that any necessary costs are allocated equitably to the affected parties. It will be important for the regional and inter-regional grid plans to be able to account for changes driven by Section 111, and to properly allocate any resulting costs.

FERC should also support transmission upgrades that facilitate increased reliance on renewable generation.

States will also need help from federal energy regulators to properly deploy their plans. We trust the energy regulators will help states assess the effects of their policy proposals, and to design effective grid-related programs, and ask that EPA help to coordinate efforts in this direction. Likewise, it is vitally important that federal programs not present unnecessary impediments to state efforts. All members of the federal family should support ambitious carbon pollution reduction efforts. We remain concerned, for instance, that the Federal Housing Finance Agency continues to complicate financing for the Property Assessed Clean Energy (PACE) program, which should be providing a ready funding stream to help further clean energy improvements. EPA, working with the White House Council on Environmental Quality and other federal coordinating bodies, should ensure that the states do not face conflicting federal messages as they work to reduce carbon pollution.

VI. Specific Compliance Models that EPA Should Work with States to Develop

VI.A. Regional Budget Trading Programs as a Compliance Pathway

EPA's guidelines should recognize the regional nature of electrical grids by allowing participating states to demonstrate compliance with Section 111(d) guidelines on a regional basis.

In a regional budget trading program, overall emissions are capped and sources comply by holding emission allowances equal to their emissions. Individual states participating in a regional program may also reduce emissions through a variety of state-specific energy programs like renewable portfolio standards and energy efficiency programs. The regional emission cap can operate as an umbrella, encompassing and accounting for the emission reductions from these complementary programs. Because overall emissions are limited by the emissions cap, the complementary programs would not need to be federally enforceable. The complementary programs also serve to reduce the cost of complying with the regional emissions cap. RGGI offers one example of this approach.

Under Section 111(d), the states in the regional budget trading program could be given the option of demonstrating in each of their individual state plans that the overall regional emissions cap—which is made up of each individual state's emission budget—collectively meets EPA's standard for the region as a whole. As long as the overall regional emissions cap complies with the guidelines, it should be immaterial to EPA how the participating states elect to apportion the regional emissions cap among the states. Likewise, although a particular state's actual emissions could theoretically exceed its individual state emission budget in a particular year, this should not affect EPA's ability to accept a regional program as a pathway for compliance. As long as the regional program demonstrates that emissions from sources within the region will collectively meet EPA's emission guideline, it can serve as the basis for individual state plans.

As long as EPA provides a mechanism that enables states to have an annual mass-based emissions budget under Section 111(d), then determining whether a regional budget trading program is equivalent to EPA's emission guideline will be a simple matter. In particular, the participating states will have to demonstrate that the annual regional emission cap under the regional program achieves emission reductions equal to or greater than those required by EPA's guidelines.

Although determining equivalency for a regional program like RGGI will generally be straightforward, EPA should develop a mechanism to address any differences in the scope of sources covered by the Section 111(d) guidelines and the scope of sources subject to the requirements of the emission budget trading program. For example, depending on the final shape of EPA's guidelines, it is possible that RGGI could include certain smaller sources that may not be covered by EPA's Section 111(d) guidelines. If the regional budget meets EPA's guidelines even with those additional sources, it clearly suffices. If the additional sources cause the regional budget to be higher than the guidelines, the participating states would demonstrate, using a rigorous and equitable methodology prescribed by EPA, that emissions from the sources covered by Section 111(d) would comply with EPA's guidelines.

Regional budget trading programs may have design elements intended to limit sharp cost escalations. For example, RGGI allows sources to use offsets for a small portion (three percent) of their compliance obligations, and the program revisions that will take effect in 2014 include a Cost Containment Reserve (CCR), which allows the distribution of a limited amount of additional allowances if prices exceed specified levels. These elements are intended to respond to unforeseen market conditions, such as greater-than-anticipated demand growth, but they may

lessen emission reductions. In their implementation plans, the participating states could either demonstrate that these design elements will not allow emissions in excess of those allowed by EPA's emission guideline, or include supplemental measures to ensure consistency with EPA's guideline.

Under a budget trading program like RGGI, enforceability, measurement, and verification are already incorporated into the program in a straightforward matter. In terms of enforceability, sources subject to a budget trading program like RGGI are required to obtain and hold a sufficient amount of allowances by the relevant compliance deadline to cover emissions over the relevant compliance period. Under the existing terms of RGGI states' respective implementing regulations, this is a regulatory requirement that is generally incorporated as a condition of each source's operating permit.

Thus, under a regional budget trading program, an emission cap is enforceable directly against individual sources in a state where the sources are located, and the failure of a source to hold sufficient allowances would violate the state's program and the source's permit. Under an approved Section 111(d) plan, this obligation of each individual source to comply with the budget trading program would become a federally enforceable condition of an individual source's Title V permit. At the end of the compliance period, the "true-up" process, in which states deduct allowances to cover sources' emissions, provides verification that the emission reductions included as part of the participating states' 111(d) plans are actually achieved.

VI.B. Portfolio of State Programs as a Compliance Pathway

As we discuss above, because Section 111(d)-covered fossil plants are embedded in larger power grids, states can reduce emissions through a wide array of programs that improve the performance of the grid as a whole, as well as addressing the plants themselves. Such "portfolio" approaches would integrate an array of programs to reduce emissions from Section 111(d) sources. Because the breadth of such approaches provides an effective platform for emission reductions, EPA should ensure that its proposed Section 111(d) guidelines can accommodate them. EPA's Roadmap for Incorporating Energy Efficiency and Renewable Energy in State Implementation Plans provides a sound foundation for that effort.

In essence, a state putting forward a portfolio plan would demonstrate to EPA that its collection of programs can collectively achieve the emissions reductions required by EPA's Section 111(d) guidelines. These programs might include, for example, energy efficiency standards that reduce demand now being satisfied by fossil plants, renewable energy standards that increase the amount of emission-free power on the grid, and dispatch rules that favor lower-carbon sources of energy over higher-carbon sources. Thus, by chipping away at demand for fossil power, introducing new supplies, and lowering the emissions from any fossil generation that is required, states would implement durable grid-level reforms to comply with Section 111(d).

Many states have programs that could help support such an approach. At least thirty states have enforceable renewable portfolio standards, and at least another seven have policy goals to increase renewable power in their states.[77] Similarly, although state energy efficiency efforts

[77] *Most states have renewable portfolio standards,* U.S. Energy Information Administration, http://www.eia.gov/todayinenergy/detail.cfm?id=4850.

vary widely in stringency, almost all states have implemented at least some such programs, some very aggressively.[78]

Some states have taken particularly comprehensive approaches. These include California, whose AB 32 programs and related energy sector work include a 33 percent renewable portfolio standard requirement by 2020,[79] extensive energy efficiency standards, and an economy-wide cap-and-trade program, among other efforts.

We expect states to present these programs to EPA in one of two general ways, both outlined in the Roadmap:

Some states may choose to present many of their programs as federally-enforceable "control strategies" within their Section 111(d) plans.[80] Under that approach, EPA and the state would share enforcement authority over the state's portfolio of programs, and EPA could either call for plan revisions or enforce directly against a regulated party if required emissions reductions were not forthcoming.[81]

We anticipate, however, that most states will prefer to instead use EPA's "[b]aseline emissions projection pathway."[82] Under that pathway, states first canvass existing energy efficiency and renewable energy programs (among other programs that may affect emissions of Section 111(d) programs) and project the emissions of covered Section 111(d) sources as those programs operate over the course of the compliance period.[83] If the portfolio operates as intended, those projections will likely show that the portfolio programs substantially limit section Section 111(d) source emissions.

Because the portfolio of programs constraining section Section 111(d) emissions forms the background for future emissions projections, the programs themselves are not part of the state's federally-enforceable section Section 111(d) plan, as long as other compliance obligations limit emissions.[84] For example, in California, emissions are limited by the multi-sector emissions cap, and California would demonstrate that the energy efficiency and renewable energy programs, coupled with sources' obligation to hold allowances, limit emissions from the power sector sources to below the state's Section 111(d) budget.

The acceptability of this demonstration turns upon the rigor of the modeling used to test various baseline assumptions. We therefore anticipate working with EPA to develop a modeling "toolkit" that would outline program evaluation methods and acceptable modeling protocols and assumptions for use in such analyses. Such evaluation tools would be used to demonstrate, at

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[78] *See generally State Energy Efficiency Scorecard*, American Council for an Energy Efficient Economy (2012), http://aceee.org/state-policy/scorecard.

[79] *See, e.g.,* Cal. Public Utilities Commission, Renewable Portfolio Standard: Quarterly Report, 1st Quarter 2013 (2013), http://www.cpuc.ca.gov/NR/rdonlyres/384E3432-6EAB-4492-BF88-992874A7B978/0/2013_Q1RPSReportFINAL.pdf.

[80] EPA EE/RE Roadmap, *supra* note 49, Appendix F: Control Strategy Pathway.

[81] We note, in this regard, that EPA' Section 111(d) regulations do allow state agencies other than the state air pollution agency – such as a utility commission which may have primary responsibility over renewable portfolio requirements -- to enforce portions of Section 111(d) plans. *See* 40 C.F.R. § 60.26(d).

[82] *See* EPA EE/RE Roadmap, *supra* note 49, at 33.

[83] *Id.* at Appendix E: Baseline Emissions Projection Pathway (explaining this process).

[84] *Id.* at E-6.

a minimum, that, under a reasonable range of starting assumptions, Section 111(d) source emissions will fall below guideline levels by the time compliance is due, and will not then rise above those levels at any time thereafter.

While many of the grid-level programs themselves are not federally-enforceable under this approach, sources remain accountable for their emissions and could be subject to federal enforcement if necessary. In states with cap-and-trade programs, for instance, sources could be required to hold sufficient allowances to cover their emissions as a federally-enforceable program condition, just as in the RGGI example above. To show that this condition suffices to guarantee compliance, a state could demonstrate that its Section 111(d) source emissions will follow an acceptable trajectory as a result of the state portfolio of programs, and that the cap-and-trade system's allowance allocation likewise follows this trajectory under all reasonably probable trading outcomes. If that demonstration is made, requiring covered sources to hold allowances to cover their emissions would guarantee compliance because those sources would not be able to acquire sufficient allowances to exceed the aggregate emission level required by the Section 111(d) guidelines.[85]

States that don't have existing cap-and-trade programs could propose such programs as a backstop obligation for covered sources. Alternatively, a similar result could be achieved by modeling how many hours covered sources may run without exceeding the guidelines (while taking reliability needs into account). Programs to reduce fossil demand will reduce the need for fossil sources, and so reduce their operating hours. States could then incorporate commensurate operating hour restrictions into the operating permits for covered sources.

We believe that this portfolio approach would apply to groups of states submitting joint plans. In that circumstance, states would undertake the modeling exercises together, thereby accounting for the total impact of all programs on sources within their boundaries.

In sum, the portfolio approach is a natural extension of the baseline modeling states routinely do when developing state implementation plans for air quality programs. Such existing programs form an important foundation for these new planning efforts and can even potentially contribute substantively to achieving required emission reductions if they are sufficiently stringent. As long as states develop clear mechanisms to hold sources to the modeled emission trajectories, and commit to regular program evaluations and necessary revisions, this portfolio approach provides an important way of recognizing state efforts to reduce emissions across the grid.

[85] If there were a serious question as to whether the portfolio (including the allowance market) would function as expected, states could also consider developing an additional, automatic, backstop mechanism which might require sources to retire additional allowances if emissions trajectories deviated sharply from what modeling had predicted.

VII. Appendix: State Experiences with Reducing Carbon Pollution

Individual descriptions of state experiences with reducing carbon pollution in the electricity sector are provided in this appendix.

VII.A. California

California has implemented a suite of programs to meet its goals of reducing greenhouse gas emissions to 1990 levels by 2020 and 80 percent below 1990 levels by 2050.[86] These policies include groundbreaking energy efficiency programs, the most ambitious renewable energy programs in the country, and a multi-sector cap-and trade program.

California's energy efficiency standards are the bedrock upon which its climate policies are built.[87] Energy efficiency is the first resource procured under California's loading order.[88] Because California has decoupled utility profits from sales and offered utilities the opportunity to profit from efficiency, its utilities have strong incentives to pursue these savings.[89] Savings are projected at nearly 70 million megawatt hours (MWh) in 2013 alone.[90] California's efficiency efforts are an economic driver; the state produces twice as much economic output per kilowatt-hour than the national average.[91] The California Energy Commission estimates that efficiency standards have generated $74 billion in savings for Californians.[92] According to independent analysts, California's average monthly residential energy bills are 25 percent below the national average.[93] Analysts have concluded that hundreds of thousands of jobs can be created by the program.[94]

California strives to fill any remaining energy needs with renewable energy. California's Renewable Portfolio Standard (RPS) requires that 33 percent of electricity come from renewable sources by 2020.[95] Companies have responded with large-scale renewable projects and citizens have installed small-scale renewable energy. California has 15,000 megawatts

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[86] *See* Cal. Air Res. Bd., Climate Change Scoping Plan 31-32, 41-46 (2008), *available at* http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf.
[87] *See generally* Cal. Energy Commission, Tracking Progress: Energy Efficiency (2013), http://www.energy.ca.gov/renewables/tracking_progress/documents/energy_efficiency.pdf.
[88] Cal. Energy Commission, Implementing California's Loading Order for Electricity Resources (2004), http://www.energy.ca.gov/2005publications/CEC-400-2005-043/CEC-400-2005-043.PDF.
[89] *See State Energy Efficiency Database: California,* American Council for an Energy-Efficient Economy, http://aceee.org/sector/state-policy/california.
[90] *Id.*
[91] *Id.*
[92] *See Id.*
[93] Devra Wang, Natural Resources Defense Council, California's Energy Efficiency Success Story (2013), http://www.nrdc.org/energy/files/ca-success-story-FS.pdf.
[94] David Roland-Holst, Energy Efficiency, Innovation, and Job Creation in California 35 (2008), http://are.berkeley.edu/~dwrh/CERES_Web/Docs/UCB%20Energy%20Innovation%20and%20Job%20Creation%2010-20-08.pdf.
[95] *See California's Renewables Portfolio Standard (RPS)*, Cal. Public Utility Commission, http://www.cpuc.ca.gov/PUC/energy/Renewables/index.htm.

(MW) of installed renewable capacity, more than doubling its installed capacity since 2002.[96] In 2012, California served about 22 percent of retail energy sales with renewable energy.[97] Proponents of the RPS believe the measure could generate $60 billion and create up to 235,000 jobs.[98] The RPS avoided 3.5 million metric tons of CO_2e in 2011 alone.[99]

California is also a leader in deploying small renewable energy systems. In 2007, the state launched the California Solar Initiative, a first-of-its kind effort to deploy 3,000 MW of rooftop solar photovoltaic (PV) systems and create a self-sustaining market for the technology. It is on track to meet its goal two years early, creating thousands of local jobs and spurring technological innovation.[100]

Importantly, California's cap-and-trade program includes power plants. By placing a price on the carbon content of electricity, the program encourages use of cleaner electricity.[101]

The state is also promoting energy storage efforts which will help further integrate renewable power into the grid,[102] investing in development of other low-emission technologies,[103] implementing a GHG permitting program for new major sources of carbon pollution, and maintaining a GHG emission reporting system.[104]

These efforts support one of the lowest-emitting electricity systems in the country. California's in-state fossil generation is almost entirely natural gas-fired,[105] and the state is rapidly phasing out imported power from higher-emitting coal-fired power plants. These coal imports represent only about 10 percent of California's energy portfolio, and are expected to decline by nearly two-thirds by 2020.[106]

As a result of these efforts, California's utility sector's GHG emissions have continued to decline. Based upon the Air Resources Board's initial analysis, emissions from in-state and imported power fell by 16 million metric tons, or 16 percent, from 2005 to the 2010-12

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[96] Cal. Energy Commission, Tracking Progress: Renewable Energy (2013), http://www.energy.ca.gov/renewables/tracking_progress/documents/renewable.pdf.
[97] *Id.*
[98] Office of Senate Floor Analyses, Bill Analysis for 2011 Senate Bill 2X1 at 10 (2011), http://www.leginfo.ca.gov/pub/11-12/bill/sen/sb_0001-0050/sbx1_2_cfa_20110223_155225_sen_floor.html.
[99] Cal. Environmental Protection Agency, State Agency Greenhouse Gas Reduction Report Card 10, 16 (2013), http://www.climatechange.ca.gov/climate_action_team/reports/2013_CalEPA_Report_Card.pdf.From 2008-2011.
[100] *Cal. Solar Initiative 2013 Annual Program Assessment*, Cal. Public Utilities Commission, http://www.cpuc.ca.gov/PUC/energy/Solar/2013_Annual_Program_Assessment.htm
[101] *See generally* Cal. Air Resources Board, Proposed Regulation to Implement the California Cap and Trade Program, Initial Statement of Reasons (2010), http://www.arb.ca.gov/regact/2010/capandtrade10/capisor.pdf.
[102] *Electric Energy Storage,* Cal. Public Utility Commission, (2013), http://www.cpuc.ca.gov/PUC/energy/electric/storage.htm.
[103] *Electric Program Investment Charge,* Cal. Energy Commission, http://www.energy.ca.gov/research/epic/.
[104] *Mandatory Greenhouse Gas Reporting,* Cal. Air Resources Board, (2013), http://www.arb.ca.gov/cc/reporting/ghg-rep/ghg-rep.htm.
[105] Cal. Energy Commission, Tracking Progress: Installed Capacity (2013), http://www.energy.ca.gov/renewables/tracking_progress/documents/installed_capacity.pdf.
[106] Cal. Energy Commission, Tracking Progress: Current and Expected Energy from Coal in California (2013), http://www.energy.ca.gov/renewables/tracking_progress/documents/current_expected_energy_from_coal.pdf.

averaging period (from 108 million metric tons CO_2e to 91 million tons CO_2e).[107] By 2025, California expects to cut utility sector emissions to below 80 million metric tons CO_2e, a roughly 25 percent reduction from 2005 levels.[108] Carbon emissions from all generation are expected to decline over the 2005-2025 period, with emissions from in-state generation projected to drop by 9 million metric tons and from imported power by 20 million metric tons. California's carbon emissions rates have also fallen, from approximately 1,245 lbs CO_2e/MWh for fossil generation (considering both in-state and imported power) and 875 lbs CO_2e/MWh for all power in 2005 to an average of approximately 1,090 lbs CO_2e/MWh and 775 lbs CO_2e/MWh in the three years before 2012. Those rates are expected to decline to an estimated rate in the range of 830 lbs CO_2e/MWh for fossil sources and of about 581 lbs CO_2e/MWh for all generation by 2025.

[107] Cal. Air Resources Board analysis, based in part on CARB, *2008 to 2012 Emissions for Mandatory Greenhouse Gas Emissions Reporting Summary*, http://www.arb.ca.gov/cc/reporting/ghg-rep/reported-data/2008-2012-ghg-emissions-summary.pdf (last visited Nov. 13, 2013). Analysis is preliminary, but representative. Emissions in 2012 were relatively higher than in recent years because of relatively low hydroelectric generation and the unexpected shutdown of the San Onofre Nuclear Generating Station, but the state remains on course to meet emissions targets.

[108] Cal. Air Resources Board analysis.

VII.B. Colorado

Colorado is on track to achieve a 29 percent reduction in carbon dioxide emissions by 2018[109] and has experienced significant growth in renewable power in recent years.[110] Policies to promote energy efficiency, support renewable energy, and reduce carbon pollution play an important role in Colorado's energy outlook, including Colorado's Clean Air – Clean Jobs Act. Colorado's efforts to reduce carbon pollution will also result in reductions in other air pollutants and promote cleaner energy sources to meet electricity needs while promoting economic development.

To support greater energy efficiency—and reduce energy costs—Colorado law requires a 5 percent reduction from 2006 electricity sales by 2018 and 5 percent reduction from 2006 peak demand by 2018.[111] In 2012, the electricity demand-side management plans of the Public Service Company of Colorado and Black Hills Energy resulted in net economic benefits of $103.7 million.[112] Energy efficiency goals set for Xcel Energy and Black Hills Energy under the law reduced CO_2 emissions by 1 million tons from 2009 to 2011.[113]

In 2010, Colorado increased its Renewable Energy Standard (RES) from 20 percent to 30 percent by 2020 for investor-owned utilities.[114] Under legislation passed in 2013, larger rural electric co-ops must meet a 20 percent renewable target by 2020, while smaller co-ops and most municipal utilities have a 10 percent target.[115] Caps on retail cost increases address concerns about price spikes for consumers.[116] The RES is projected to create more than 33,000 jobs during construction and $4.3 billion in lifetime economic output.[117] These benefits are in addition to some 30 million tons of avoided CO_2.[118]

The Clean Air – Clean Jobs Act enacted in 2010 will significantly reduce air pollution, including GHG emissions, while improving public health, supporting in-state energy production, and spurring job creation. The law, which was supported by a diverse group of stakeholders,

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[109] Per Colo. Department of Public Health and Environment.
[110] EIA State Generation, *supra* note 4.
[111] Colo. Rev. Stat. § 40-3.2-104 (2013).
[112] Colo. Public Utility Commission, 2013 Report to the Colorado General Assembly on Demand Side Management 6 (2013), http://cdn.colorado.gov/cs/Satellite/DORA-PUC/CBON/DORA/1251638492924.
[113] Southwest Energy Efficiency Project, House Bill 07-1037: A Success Story for Homes and Businesses in Colorado Serviced by Xcel Energy and Black Hills Energy (2011), http://www.swenergy.org/news/news/documents/file/CO%20House%20Bill%201037%20fact%20sheet.pdf.
[114] Colo. House Bill 10-1001 (2010); *see* Colo. Governor's Energy Office, Colorado's 30% Renewable Energy Standard: Policy Design and New Markets 3 (2010), http://cnee.colostate.edu/graphics/uploads/HB10-1001-Colorados-30-percent-Renewable-Energy-Standard.pdf.
[115] Colo. Senate Bill 13-252 (2013).
[116] *See* Press Release, Gov. Hickenlooper Signs Executive Order, Issues Signing Statement Related to SB13-252 (June 5, 2013), http://www.colorado.gov/cs/Satellite?c=Page&cid=1251643166067&p=1251643166067&pagename=GovHickenlooper%2FCBONLayout.
[117] Colo. Governor's Energy Office, Colorado's 30% Renewable Energy Standard: Policy Design and New Markets 10 (2010), http://cnee.colostate.edu/graphics/uploads/HB10-1001-Colorados-30-percent-Renewable-Energy-Standard.pdf.
[118] *Id.*

including utilities, environmental groups, the natural gas industry, and state officials, requires utilities to develop plans to reduce air pollution emissions from dirtier plants.[119] Xcel Energy, Colorado's largest utility, anticipates reducing its emissions of CO_2 in Colorado by 28 percent, NO_X by 86 percent, SO_2 by 83 percent, and mercury by 82 percent by 2020 under the law (Xcel Energy was also a participant in this dialogue).[120] Xcel's plan is predicted to have a positive economic impact of $590 million on the state from 2010 to 2026, and to create about 1,500 jobs during peak construction.[121]

Colorado's electricity generation mix is made up of 10 percent renewables, 62 percent coal, and 27 percent natural gas.[122] From 2005-2011, power generation from wind jumped 570 percent providing 4.4 million MWh—a significant increase that in part reflects the effectiveness of the state's RES.[123] During this time, Colorado's CO_2 emissions declined by 1.9 million tons and its CO_2 emissions rate dropped 7.9 percent while power generation increased 3.7 percent.[124]

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[119] *See* Press Release, Gov. Ritter, Bipartisan Lawmakers & Coalition Introduce Colorado Clean Air-Clean Jobs Legislation (Mar. 16, 2010), http://www.colorado.gov/cs/Satellite%3Fc%3DPage%26childpagename%3DGovRitter%252FGOVRLayout%26cid%3D1251573201310%26pagename%3DGOVRWrapper.

[120] *Colorado Clean Air – Clean Jobs Act*, Xcel Energy, http://www.xcelenergy.com/Environment/Doing_Our_Part/Clean_Air_Projects/Colorado_Clean_Air_-_Clean_Jobs_Plan.

[121] *Id.*

[122] *Generation*, Colo. Energy Office, http://www.colorado.gov/cs/Satellite/GovEnergyOffice/CBON/1251599939003.

[123] EIA State Generation, *supra* note 25.

[124] *Id.*

VII.C. Connecticut

Connecticut's early leadership to mitigate the effects of climate change produced its 2005 Climate Change Action Plan, which included increasing investments in energy efficiency, supporting the expansion of Connecticut's Renewable Portfolio Standard (RPS), and participation in the Regional Greenhouse Gas Initiatives (RGGI) among its top ten strategies for reducing the state's greenhouse gases emissions.[125] The strategies embodied in that plan set Connecticut on a firm trajectory toward meeting the emissions reductions requirements of the state's 2008 Global Warming Solutions Act: a 10 percent reduction from 1990 emissions by 2020 and an 80 percent reduction from 2001 emissions by 2050.[126]

From 2005 to 2011, Connecticut expanded climate mitigation efforts to include initiatives on: clean cars, green building standards, smart growth, appliance standards and an expansion of energy efficiency to include oil heat customers.[127] As a result of these actions statewide GHG emissions decreased by nearly 5 percent from 1990 levels; bringing Connecticut almost halfway to its 2020 goal under its Global Warming Solutions Act. At the same time, Gross State Product has increased by 64 percent.[128]

Between 2005 and 2011, Connecticut reduced annual emissions of carbon dioxide from its power sector by nearly 30 percent (from 11.7 to 8.2 million metric tons) and reduced the carbon intensity of its generating fleet by 30 percent (from 766 lbs/MWh to 535 lbs/MWh)[129] due to reductions in energy consumption and a shift to cleaner generation sources, catalyzed by successful state air quality regulations, including the Regional Greenhouse Gas Initiative (RGGI); improved economics and supply of natural gas as a fuel for power generation; investments in energy efficiency; and increased deployment of renewable energy sources through the RPS and other market-based tools.

Connecticut is saving energy and reducing emissions every year through investments in energy efficiency as the state pursues its statutory goal of "all cost effective energy efficiency" through its utility-administered, conservation and load management programs. Each $1 invested in these programs provides direct energy savings for participating residents and businesses, and results in more than $2 of system-wide benefits. Since 2006, the State's energy efficiency programs have resulted in average annual electricity savings of more than 300 million kilowatt/hrs per year,[130] which is enough electricity to power more than 30,000 homes for a year. Connecticut's efficiency programs have helped reduce electricity consumption by 10 percent

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[125] Conn. Climate Change Action Plan (2005), http://www.ct.gov/deep/lib/deep/climatechange/ct_climate_change_action_plan_2005.pdf.

[126] An Act Concerning Connecticut Global Warming Solutions, Public Act No. 08-98, http://www.cga.ct.gov/2008/ACT/PA/2008PA-00098-R00HB-05600-PA.htm.

[127] *Climate Actions,* Conn. Department of Energy & Environmental Protection, http://www.ct.gov/deep/cwp/view.asp?a=4423&q=530720&DEEPNAV_GID=2121.

[128] Calculated based on Federal Reserve Economic Data, http://research.stlouisfed.org/fred2.

[129] Calculated from EIA data. EIA State Generation, *supra* note 4.

[130] Conn. Statewide Energy Efficiency Dashboard, http://www.ctenergydashboard.com/Public/PublicHome.aspx

from 2005 levels,[131] resulting in avoiding the emission of more than 2 million tons of carbon dioxide.

Connecticut's renewable portfolio standard (RPS) requires all retail electricity suppliers to obtain at least 27 percent of their supply from renewable sources by 2020.[132] In recent years, Connecticut has launched new initiatives that harness market forces to boost the supply of low-cost, in-state renewables. Small-scale (up to 1-2 MW) renewable distributed generation projects can compete for long-term power purchase agreements that Connecticut's electric distribution companies are required to offer through reverse auctions.[133] These projects support local economic development and also reduce local electricity consumption. Additionally, through various innovative financing mechanisms from the Clean Energy Finance and Investment Authority (CEFIA), Connecticut's groundbreaking "green bank," installed solar capacity within the state continues to grow.[134] CEFIA has also employed its model of leveraging state funding to attract private capital and investment in clean energy to ramp up the deployment of fuel cells throughout Connecticut. As a result of these programs, the state has increased its deployment of in-state renewables more than ten-fold since 2010, and will deploy more than 55 MW in 2013.[135] At the regional level, in 2013, Connecticut's electric companies have signed long-term power purchase agreements that will bring more grid-scale solar and wind to the regional wholesale power market, while staying on track to meet its RPS goals and displace fossil fuel generating units.

Connecticut participates in RGGI, the nation's first market-based, regulatory program to cap and reduce greenhouse gas emissions from large fossil fueled power plants. Connecticut has received more than $87 million in proceeds from the auction of emission allowances. The state reinvests nearly 70 percent of those proceeds in energy efficiency programs that benefit individuals, businesses, and state and local governments. Connecticut also invested 23 percent of its RGGI proceeds in the deployment of more than 6 MW of clean energy systems, including residential and commercial solar photovoltaic power systems and commercial fuel cell power systems.[136] Studies indicate that each dollar of Connecticut investment of RGGI proceeds will yield more than $394 million in net economic value to Connecticut and produce 2,036 job years of employment over 10 years.[137]

Connecticut has also promoted the use of combined heat and power to achieve additional emission reductions. Through a variety of programs—including construction grants,

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[131] Calculated from EIA data, Retail Sales of Electricity by State by Sector by Provider, http://www.eia.gov/electricity/data/state/.

[132] *Conn. Renewable Portfolio Standards Overview*, Conn. Department of Energy & Environmental Protection, Public Utilities Regulatory Authority, http://www.ct.gov/pura/cwp/view.asp?a=3354&q=415186.

[133] *Low and Zero Emissions Renewable Energy Credit Program*, Conn. Department of Energy & Environmental Protection http://www.ct.gov/deep/cwp/view.asp?a=4120&Q=503720.

[134] Clean Energy Finance and Investment Authority, http://www.ctcleanenergy.com/Default.aspx.

[135] Conn. Department of Energy & Environmental Protection, Restructuring Connecticut's Renewable Portfolio Standard ii (2013), http://www.ct.gov/deep/lib/deep/energy/rps/rps_final.pdf.

[136] *Conn. Program Investments*, Regional Greenhouse Gas Initiative, http://www.rggi.org/rggi_benefits/program_investments/connecticut.

[137] Environment Northeast, Economic Benefits of RGGI in CT (June 2013), http://www.env-ne.org/public/resources/ENE_RGGI_Economic_Benefits_CT_20130627.pdf.

standardization of interconnection protocols, low interest loans, and the establishment of a CHP portfolio standard—Connecticut industry added more than 91 MW of CHP capacity, which is more than any state in the region between 2005 and 2011.[138]

[138] Conn. Department of Energy and Environmental Protection, 2013 Conn. Comprehensive Energy Strategy (2013), http://www.ct.gov/deep/lib/deep/energy/cep/2013_ces_final.pdf.

VII.D. Delaware

Delaware's efforts to transform its electric generation fleet have resulted in drastic reduction in CO_2 emissions. Compared to 2005, all sources of electric power generation in Delaware have lowered their CO_2 emissions by 43 percent and CO_2 emissions from coal fired units have been reduced by nearly 70 percent.[139] This is a result of a coordinated effort involving adoption of regulations that required installation of controls on coal and oil fired generating units,[140] participation in the Regional Greenhouse Gas Initiative, adoption of Renewable Portfolio Standards, [141] and aggressive implementation of energy efficiency and combined heat and power.

Nine out of ten uncontrolled coal units that existed in 2005 have either retired, converted to natural gas or repowered to more efficient natural gas fired CHP. The remaining unit is equipped with activated carbon for mercury control, state of the art scrubber to reduce acid gases, and selective catalytic reduction (SCR) to control NOx. New state-of-the-art natural gas units are replacing any lost capacity.

In addition, solar deployment has increased 25-fold, from two MW to more than 50 MW of installed capacity, and Delaware hosts some of the largest fuel cell farms in the nation. In addition, the state has invested more than $120 million in efficiency in the past three years, including more than $72 million in public facilities through the innovative green bonds of the Delaware Sustainable Energy Utility. [142]

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[139] 2005-2011. EIA State Emissions, *supra* note 4.

[140] Electric Generating Unit (EGU) Multi-Pollutant Regulation, 7-1100 Del. Admin. Code § 1146 (2013), *available at* http://regulations.delaware.gov/AdminCode/title7/1000/1100/1146.shtml#TopOfPage

[141] *Delaware's Renewable Portfolio Standard*, Delaware Public Service Commission, http://depsc.delaware.gov/electric/delrps.shtml.

[142] Gayathri Vaidyanathan, *Del. Creates Utility Fund for Public Building Retrofits*, Greenwire (Oct. 20, 2011), *available at* http://www.seu-de.org/Press/2011_media_E&E_News_Greenwire_SEU_Bond_Story_10Oct%2020.pdf.

VII.E. Illinois

Illinois encourages efforts to reduce carbon pollution and increase clean energy through its energy efficiency and renewable energy standards. In addition, the state plays a leading role in advancing carbon capture and storage (CCS) technologies through the FutureGen project in conjunction with the U.S. Department of Energy.[143]

Energy efficiency policies require electric utilities to save two percent of electricity annually by 2015 and have reduced rate-payer spending on electricity.[144] For example, in the first year (2008-2009) of the Illinois Public Utilities Act, Ameren Illinois Utilities (AIU) customers saved almost 90,000 MWh, far exceeding AIU's goal for that year.[145] In Plan Year 3 (June 2010-May 2011), another major utility, Commonwealth Edison Company (ComEd), achieved about 662,000 MWh net energy savings through its energy-efficiency and demand-response programs.[146]

Under its RPS, Illinois requires that 25 percent of its electricity come from renewables by 2025.[147] The state has experienced significant growth in wind power development as a result—electricity generation from wind increased by more than six million MWh from 2005-2011.[148] Growth in wind energy from 2003 to 2010 alone created almost 10,000 new local jobs during construction and a lifetime economic benefit of $3.2 billion, according to one analysis.[149] In 2011, Illinois avoided about five million tons of CO_2 emissions from renewable resource integration, along with four million tons of NO_X.[150]

In addition to its CCS work on FutureGen, Illinois aims to significantly reduce carbon pollution from any new coal plants through emission standards. From 2009-2015, any new coal-fueled power plant must capture and store 50 percent of the carbon emissions that the facility would otherwise emit.[151] This target increases to 70 percent from 2016-2017 and to 90

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[143] *See* FutureGen Alliance, http://www.futuregenalliance.org/.
[144] 220 Ill. Comp. Stat. 5/8-103(b) (2013).
[145] *See* Ameren Ill. Utilities, ActOnEnergy Energy Efficiency and Demand-Response Program Results 9 (2010), *available at* http://library.cee1.org/sites/default/files/library/8579/CEE_Eval_AIUEnergyEfficiencyPofolioReport2008_2009_1Jan2010.pdf.
[146] Navigant Consulting, Inc., Evaluation Report: Summary Report Final 1 (2012), *available at* http://ilsagfiles.org/SAG_files/Evaluation_Documents/ComEd/ComEd%20EPY3%20Evaluation%20Reports/ComEd_Summary_PY3_Evaluation_Report_Final.pdf.
[147] Ill. Pub. Act 095-0481 (2007).
[148] EIA State Generation, *supra* note 4.
[149] Ctr. for Renewable Energy, Illinois State University, Economic Impact: Wind Energy Development in Illinois 6, 25 (2010), http://web.extension.illinois.edu/lgien/pdf/events/2012_04-19_economic.pdf.
[150] Ill. Power Agency, Annual Report: The Costs and Benefits of Renewable Resource Procurement in Illinois Under the Illinois Power Agency and Illinois Public Utilities Acts 35 (2013), http://www2.illinois.gov/ipa/Documents/201304-IPA-Renewables-Report.pdf.
[151] Ill. Clean Coal Portfolio Standard, Public Act 095-1027 (2009).

percent after 2017.[152] These policies are especially notable as coal provides 45 percent of the state's electricity.[153]

[152] *Id.*

[153] 2011 data. EIA State Generation, *supra* note 4.

VII.F. Maryland

Maryland has achieved significant electricity sector GHG emission reductions since 2006—a decline of 9.7 million metric tons, or 30 percent—due in significant part to its participation in the Regional Greenhouse Gas Initiative (RGGI), a requirement to reduce energy use, its RPS, and regional fuel switching.[154]

In July 2013, a plan released by Governor Martin O'Malley outlined more aggressive measures the state can take to meet its economy-wide goal to reduce GHG pollution 25 percent from 2006 levels by 2020.[155] Continuing to reduce carbon pollution from the electricity sector through participation in RGGI, energy efficiency programs, and renewable energy programs are key components of the plan. An independent study found the overall collection of climate and energy proposals would generate $1.6 billion for Maryland's economy and support 37,000 jobs.[156]

Through recently announced programmatic changes to RGGI, including a reduction in the regional emissions cap of more than 50 percent from 2005 levels by 2020, Maryland expects to further reduce the state's 2020 CO_2 emissions from the electricity sector by an additional 3.6 million metric tons.[157]

The state's EmPOWER Maryland initiative mandates a 15 percent reduction in peak demand and per-capita electricity consumption and demand by 2015 from 2007 levels. Ten percent of the overall reduction must come from measures implemented by the state's utilities and five percent from other energy efficiency programs.[158] To date, Maryland has achieved a 10.8 percent reduction in peak electricity demand, equivalent to avoiding one coal power plant.[159] The state is on track to exceed its peak demand target with a current projected 17.7 percent reduction in peak demand by 2015. The EmPOWER Maryland program has funded measures that will reduce ratepayer electricity use by more than 2 million MWh per year and save $250 million annually.[160] These savings will continue for years, with currently existing measures saving ratepayers $3.7 billion over their useful life.[161] Total annual GHG emission reductions attributable to aggressive implementation of EmPOWER Maryland could reach 10.52 million metric tons of CO_2e in 2020.[162]

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[154] Reduction based on emissions from in-state electricity generation. Per Md. Department of the Environment.

[155] Md. Department of the Environment, Maryland's Greenhouse Gas Reduction Plan (2013) http://www.climatechangemaryland.org/site/assets/files/1184/mde_ggrp_execsummary_2013.pdf [hereinafter Md. 2013 GHG Reduction Plan]. Maryland's Greenhouse Gas Reduction Act requires Maryland to achieve a 25 percent reduction in state-wide greenhouse gases from 2006 levels by 2020 and establishes a long-term goal to reduce emissions 90 percent by 2050. Md. Code Ann., Envir. §§ 2-1201 to 1211.

[156] Md. 2013 GHG Reduction Plan, *supra* note 155, at 192-93.

[157] Press Release, Md. Energy Administration, RGGI States Propose Lowering Regional CO2 Emissions Cap 40%, http://www.mde.state.md.us/programs/PressRoom/Pages/0207RGGIAnnouncement.aspx.

[158] Per Md. Energy Administration.

[159] *Id*. Similarly, since 2007, the state's per capita energy consumption has declined by nearly 10 percent.

[160] *EmPOWER Maryland Planning*, Md. Energy Administration, http://energy.maryland.gov/empower3/.

[161] *Id.*

[162] Md. 2013 GHG Reduction Plan, *supra* note 155, at 84.

Maryland's RPS requires 20 percent of electricity consumed in the state to be generated by renewable energy sources in 2022. A proposal to increase the RPS to 25 percent by 2020 is under consideration. [163] Maryland's RPS includes a solar "carve out" requiring 2 percent of all electricity delivered in Maryland to come from in-state solar generation (photovoltaic or thermal) by 2020.[164] The Maryland Offshore Wind Energy Act of 2013 establishes revenue certainty for 20 years for a 200 MW offshore wind project, and is a key component of the state's renewable energy expansion.[165]

Coal is the single largest source of electricity in Maryland's generation portfolio. However, during the period from 2005 to 2012, the percentage of electricity generated from coal dropped from 56 to 43 percent. Maryland's CO_2 emission rate per MWh hour declined by 12 percent during 2005-2011.[166] The state's Calvert Cliffs nuclear plant provides 35 percent of the state's electricity, and renewables, including hydroelectric plants, wind farms, and solar cells now contribute nearly seven percent.[167]

[163] *Id.* at 84-85; Md. Code Ann., Pub. Util. Cos. § 7-701 et seq.
[164] Md. Code Ann., Pub. Util. Cos. § 7-701.
[165] Per Md. Energy Administration June 27 presentation or comments; *see also* Md. Offshore Wind Energy Act of 2013, House Bill 226 (2013).
[166] Emission rate calculated using all electricity generation. EIA State Generation, *supra* note 4; EIA State Emissions, *supra* note 4.
[167] 2011 data. U.S. Energy Information Administration, Maryland State Profile, http://www.eia.gov/state/?sid=MD#tabs-4.

VII.G. Massachusetts

The Global Warming Solutions Act (GWSA), signed by Governor Patrick in August of 2008, created a framework for reducing heat-trapping emissions to levels that scientists believe give us a decent chance of avoiding the worst effects of global warming. It requires reductions from all sectors of the economy to reach a 25 percent reduction of greenhouse gas emissions (GHGs) below 1990 levels by 2020 and an 80 percent reduction by 2050, the path toward which is laid out in the Massachusetts Clean Energy and Climate Plan for 2020.[168]

- Massachusetts is showing the way to a clean energy economy—and it is reaping some of the direct benefits in economic growth—through the development of smart, targeted policies that reduce emissions by promoting greater energy efficiency, developing renewable energy, and encouraging other alternatives to the combustion of fossil fuels. Elements of this success include:
- From 1990 to 2011, the New England electric grid operator indicates total Massachusetts electric consumption increased by 22 percent; however, associated emissions dropped 37 percent because higher carbon fuels like coal and oil are being replaced with cleaner fuels like natural gas and renewable sources. This shift can be attributed to successes of the renewable energy requirements, the regional CO2 cap-and-trade system, air quality regulations and the recent natural gas boom in the United States. In recent years the growth rate in electric demand has flattened due in large part to investment in end-use energy efficiency. [169]
- Massachusetts is one of the states participating in the Regional Greenhouse Gas Initiative (RGGI), the nation's first market-based regulatory program to cap and reduce greenhouse gas emissions from large fossil-fueled power plants. Massachusetts has directed the vast majority of its RGGI proceeds into clean energy programs and initiatives. Since 2008, Massachusetts has received more than $233 million in RGGI auction proceeds, which it has used to implement energy programs that improve building efficiency, comfort, durability, health, and affordability for individuals, businesses, and state and local governments.
- Massachusetts is saving energy every year through with new energy efficiency investments and programs as the state continues to embrace efficiency as its “First Fuel.” These diverse programs have saved enough electricity to power almost 110,000 homes for a year and enough natural gas to heat 15,000 homes for a year. Energy

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[168] Massachusetts Clean Energy and Climate Plan for 2020 (2010), http://www.mass.gov/eea/docs/eea/energy/2020-clean-energy-plan.pdf. For more information, see the Global Warming Solutions Act Dashboard: http://www.mass.gov/eea/air-water-climate-change/climate-change/massachusetts-global-warming-solutions-act/global-warming-solutions-act-dashboard.html. Except for where otherwise noted, all data in this document is drawn from the Dashboard, updated by MassDEP October 2013.

[169] *Regional Greenhouse Gas Initiative Auction Proceeds,* Massachusetts Executive Office of Energy and Environmental Affairs, http://www.mass.gov/eea/grants-and-tech-assistance/guidance-technical-assistance/agencies-and-divisions/doer/rggi-auction-proceeds.html.

efficiency has reduced greenhouse gas emissions by more than 431,000 metric tons—the equivalent of taking about 85,000 cars off Massachusetts' roads for a whole year. For every one dollar invested in efficiency, the average benefit was $4.17 for homeowners and $5.10 for businesses. Massachusetts' bold energy efficiency initiatives have made it the most energy efficient state in the country for the last three years, according to the American Council on an Energy Efficient Economy.[170]

- Massachusetts is dramatically boosting renewable energy generation. Due to financial incentives such as renewable energy credits, net metering, and long-term contracts, solar energy capacity has grown from 1.64 MW in 2007 to 327 MW in 2013, reaching Governor Patrick's goal of 250 MW 4 years early;[171] wind energy has grown from 1.64 MW to 103 MW in these same years.[172] And Massachusetts is vigorously pursuing other clean energy solutions, such as combined heat and power, and energy from the anaerobic digestion of food waste.
- Green building standards have created new markets for energy efficient building design, retrofit, and operations. Almost 200 new LEED-certified buildings were constructed in Massachusetts from 2001-2011.
- The Commonwealth's clean energy industry is growing rapidly, despite a tough economic environment nationally. Surveys by the Clean Energy Center show that there was an increase in clean energy jobs of 11.8 percent in 2013 and now almost 80,000 employees are working in clean energy throughout the Commonwealth. Since 2011, this growth has outpaced the growth in the Massachusetts economy by more than eight times. Clean energy continues to maintain its place as one of the Commonwealth's marquee industries with 1.9 percent of the total Massachusetts work force.

Thanks to a combination of these measures, since 1990 statewide GHG emissions have fallen 10%, while over the same period Gross State Product has increased 68 percent. These results clearly disprove the myth that environmental protection hinders economic progress. In the past decades—against a backdrop of tightening federal and state emission limits on many sectors, from factories and power plants to automobiles—Massachusetts' population and total energy use have grown modestly as the state's economy has increased dramatically. Over the same period, emissions of greenhouse gases and other air pollutants have dropped. Massachusetts looks forward to continuing this trend of emissions reductions coupled with economic growth as it works toward the limits set by the Global Warming Solutions Act and federal stationary source GHG regulations.

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[170] ACEEE, The State Energy Efficiency Scorecard, http://aceee.org/state-policy/scorecard.
[171] Mass. Department of Energy Resources, Installed Solar Capacity (2013), http://www.mass.gov/eea/docs/doer/renewables/installed-solar.pdf.
[172] Mass. Department of Energy Resources, Installed Wind Capacity (2013), http://www.mass.gov/eea/docs/doer/renewables/installed-wind.pdf.

VII.H. Minnesota

From 2005-2011, Minnesota experienced a 17.5 percent reduction in carbon dioxide pollution.[173] Policies to reduce carbon dioxide emissions, reduce emissions of mercury and other air pollutants, increase renewable energy use, and improve energy efficiency have helped drive these reductions. To build on this progress, the state has established goals to reduce greenhouse gas emissions by 15 percent from 2005 levels by 2015, by 30 percent by 2025, and by 80 percent by 2050.[174]

Minnesota has a target of reducing energy use by 1.5 percent per year through energy efficiency measures.[175] Minnesota's Conservation Improvement Program (CIP) requires utilities to spend a minimum of 1.5 percent of annual operating revenues on incentives like rebates on high-efficiency appliances and efficient lighting programs.[176] CO_2 emissions reductions from the CIP have been increasing in recent years, reaching more than 800,000 tons in 2010.[177]

Minnesota's Renewable Energy Standard (RES) requires utilities to generate 25 percent of their power from renewables by 2025.[178] Xcel Energy, the state's largest utility, must achieve 30 percent from renewables by 2020, one quarter of which must be met with wind. All utilities have met their 2012 RES goals and most ratepayers are experiencing cost benefits.[179] New legislation creates an additional solar energy standard that will require investor-owned utilities to obtain 1.5 percent of their power from solar energy by 2020.[180] Between 2000 and 2010, wind power generation in Minnesota increased 900 percent and natural gas generation increased 250 percent.[181] Most of the growth in natural gas use occurred after its price dropped from historic highs in 2008.[182] Also between 2000 and 2010, the use of biomass for power generation increased 60 percent, while the use of coal for power generation decreased about 17 percent and use of petroleum for power generation decreased 94 percent.[183] The chart below shows the current electricity generating mix in Minnesota today.[184]

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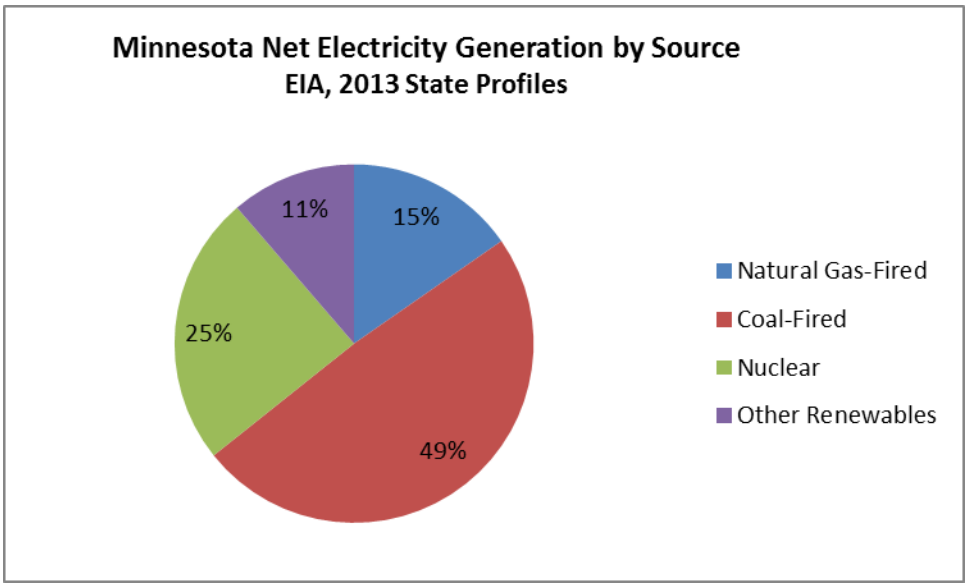
[173] Reduction in in-state electricity generation. EIA State Emissions, supra note 4.
[174] Minn. Stat. § 216H.02.
[175] Minn. Stat. § 216B.2401. Amended 2013 to "at least" 1.5%.
[176] *How CIP Works*, Minn. Department of Commerce, http://mn.gov/commerce/energy/topics/conservation/How-CIP-Works.jsp; Minn. Stat. 216B.241.
[177] Minn. Department of Commerce, Minnesota Conservation Improvement Program Energy and Carbon Dioxide Savings Report for 2009-2010 at 3 (2012), http://mn.gov/commerce/energy/images/CIPCO2Rpt2012.pdf.
[178] *Renewable Energy*, Minn., http://mn.gov/portal/natural-resources/renewable-energy/; Minn. Stat. § 216B.1691.
[179] Minn. Department of Commerce, Progress on Compliance by Electric Utilities with the Minnesota Renewable Energy Objective and the Renewable Energy Standard 3, 9 (2013), http://mn.gov/commerce/energy/images/2013RESLegReport.pdf.
[180] *Governor OKs Solar Energy Bill,* Greenwire (May 24, 2013); Minn. Stat. § 216B.1691 (Subd. 2f.).
[181] Provided by Minn. Department of Commerce.
[182] *Id.*
[183] *Id.*
[184] *Id.*



Under the 2007 Next Generation Energy Act, Minnesota prohibits new coal-fired power plants that produce a net increase in carbon emissions.[185] Utilities cannot import electricity from large fossil fuel-fired power plants in another state that were not operating by January 1, 2007.[186] Minnesota also has a longstanding moratorium on new nuclear power plants, although two existing plants operate.[187]

From 2005-2011, Minnesota reduced its CO_2 emissions by 6.9 million tons, lowering its CO_2 emissions rate by 17.5 percent, even while power generation slightly increased.[188] Minnesota experienced economic growth as emissions have dropped and electricity rates remain competitive.[189] Minnesota is committed to continuing its transformation of the nature of the generation of electric power used in Minnesota and look to this federal rulemaking to help meet our commitments.

[185] Minn. Stat. § 216H.03.
[186] *Id.*
[187] Per Minn. Department of Pollution Control Agency.
[188] In-state electricity generation. EIA State Emissions, *supra* note 4.
[189] Per Ellen Anderson, Energy Adviser to Minnesota Gov. Mark Dayton.

VII.I. New Hampshire

New Hampshire demonstrated early leadership to mitigate the effects of climate change by enacting its Clean Power Act in 2002. It also produced its revised March 2009 Climate Change Action Plan, which included recommendations for maximizing energy efficiency, increasing renewable energy required by its Renewable Portfolio Standard (RPS), and participation in the Regional Greenhouse Gas Initiatives (RGGI) among its top strategies for reducing the state's greenhouse gases emissions.[190] The strategies embodied in that plan set New Hampshire on a firm trajectory toward meeting the emissions reductions goals: a 20 percent reduction from 1990 emissions by 2025 and an 80 percent reduction by 2050.

New Hampshire has achieved a 38 percent reduction in carbon pollution from the power sector in the past seven years due to policies that have capped carbon emissions, required more renewable energy generation, invested in energy efficiency, and experienced fuel-switching from coal to natural gas.[191] New Hampshire's policies have resulted in significant new clean generation sources, including increased operation of new, efficient natural gas plants, increased operation of a nuclear plant, and increased renewable power generation. New Hampshire's participation in RGGI is a major factor in the state's efforts to curb carbon pollution while generating more than $57 million in proceeds from the auction of emission allowances.[192]

New Hampshire is one of nine states that form RGGI, the first emissions budget and allowance trading program in the United States to reduce GHG emissions from the power sector. A study by The Analysis Group found the first three years of RGGI produced $1.6 billion in economic growth while lowering consumer energy bills.[193] New Hampshire uses a portion of the proceeds from RGGI allowance auctions to invest in energy efficiency in communities and support green jobs. As of June 2012, New Hampshire's cumulative energy savings due to projects that received RGGI funds ($21.8 million spent) are expected to be $107.8 million through 2030 based on current energy prices. For every dollar spent as of June 2012, the expected return is $4.95 in energy savings.[194]

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[190] NH Climate Change Action Plan (2009), http://des.nh.gov/organization/divisions/air/tsb/tps/climate/action_plan/nh_climate_action_plan.htm.

[191] 2005-2011. EIA State Emissions, *supra* note 4.

[192] 2013 RGGI Annual Report to Legislative Committees (2013), http://puc.nh.gov/Sustainable%20Energy/GHGERF/RGGI%20Annual%20Reports/2013%20RGGI%20Annual%20Report%20to%20NH%20Legislature.pdf.

[193] Analysis Group, The Regional Greenhouse Gas Initiative: Economic Impacts of the First Three Years (2011), http://www.analysisgroup.com/uploadedFiles/Publishing/Articles/Economic_Impact_RGGI_Fact_Sheet.pdf.

[194] Carbon Solutions New England, New Hampshire Greenhouse Gas Emissions Reduction Fund (GHGERF): Year 3 (July 2011 – June 2012) Evaluation (2012), http://puc.nh.gov/Sustainable%20Energy/GHGERF/Evaulations/GHGERF_Year%203_annual_report_2011-12_FINAL.pdf
(Greenhouse Gas Emissions Reduction Fund administered by the NH Public Utilities Commission (PUC)).

New Hampshire's RPS calls for 24.8 percent of the state's electricity to come from renewable sources by 2025.[195] This policy boosted the use of biomass and hydroelectric resources and jumpstarted wind power development. The New Hampshire Public Utilities Commission (PUC) administers the Renewable Energy Fund, (REF) under which it has established five grant and rebate programs that have seen substantial demand and growth since their creation following the REF's establishment in 2009. The REF has awarded 1,614 rebates for renewable energy systems, and provided New Hampshire homeowners, businesses, schools, towns, non-profit organizations and other eligible entities with $7,455,536 in funding toward these systems. In addition, the PUC's competitive grant program has provided close to $2 million in funding for renewable projects featuring technologies from biomass heating systems to hydroelectricity upgrades to photovoltaic, solar hot air, and landfill-gas-to-energy, among others. In 2013, it is expected that an additional $4 million will be awarded through additional grants for renewable energy projects. These rebate and grant funds have leveraged $38.4 million in private investment, providing a boost to the state's economy and creating jobs for electricians, plumbers, and alternative energy businesses.[196]

These new policies and the low price of natural gas have delivered a cleaner power sector in New Hampshire and resulted in lower wholesale electricity prices. Fourteen percent of New Hampshire's 2011 net electricity generation came from renewable energy.[197] Natural gas accounted for 33 percent of New Hampshire's net electricity generation in 2011, up from 24 percent in 2010. [198] The Seabrook nuclear power reactor, the largest in New England, provided 42 percent of New Hampshire's 2011 net electricity generation.[199]

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[195] *Electric Renewable Portfolio Standard*, New Hampshire Public Utilities Commission, http://puc.nh.gov/Sustainable%20Energy/Renewable_Portfolio_Standard_Program.htm

[196] New Hampshire Public Utilities Commission, 2013 REF Annual Report to Legislative Committees (2013), http://puc.nh.gov/Sustainable%20Energy/Renewable%20Energy%20Fund/2013%20REF%20Report%20to%20Legislature%2010-1-13.pdf .

[197] 2011 data. U.S. Energy Information Administration, New Hampshire State Profile, http://www.eia.gov/state/?sid=NH .

[198] *Id.*

[199] *Id.*

VII.J. New York

New York has achieved a 39 percent reduction in carbon pollution from the power sector in the past seven years due to policies that have capped carbon emissions, required more renewable energy generation, and invested in energy efficiency, as well as a switch in generation sources from coal to natural gas due in part to low natural gas prices.[200] New York's policies have resulted in significant additions of clean generation sources, including new efficient natural gas plants and renewables. New York's participation in RGGI is a major factor in the state's efforts to curb carbon pollution while generating nearly $600 million to date for a broad spectrum of clean energy programs.[201]

New York is one of nine states that form RGGI, the first emissions budget and allowance trading program in the United States to reduce GHG emissions from the power sector. An independent study by the Analysis Group found the first three years of RGGI produced $1.6 billion in economic growth while lowering consumer energy bills.[202] New York uses proceeds from RGGI allowance auctions, which are projected at approximately $65 million annually, to invest in comprehensive strategies that help achieve the RGGI CO_2 emission reduction goals to reduce GHG pollution through energy efficiency, renewable energy, and carbon abatement technology.[203] RGGI revenues support green jobs, including the training of 1,000 workers to implement building retrofits.[204] The revenues also fund solar power installation efforts.[205] Overall, RGGI-funded projects have benefited more than 55,000 households and 600 businesses in New York.[206]

New York implemented an energy efficiency goal reducing energy consumption 15 percent by 2015.[207] As a result of this Energy Efficiency Portfolio Standard, the 2009 New York State Energy Plan projected emissions reductions of more than 9 million tons of CO_2 in 2015, as well as 6,544 tons of NO_X and 9,040 tons of SO_2.[208] While more savings are achievable, third party

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[200] 2005-2011. EIA State Emissions, *supra* note 4.

[201] $583.4 million in cumulative proceeds from auction of New York allowances, as of Dec. 6, 2013. *Cumulative Allowances and Proceeds by State*, Regional Greenhouse Gas Initiative, http://www.rggi.org/market/co2_auctions/results#state_proceeds.

[202] Analysis Group, The Regional Greenhouse Gas Initiative: Economic Impacts of the First Three Years (2011) http://www.analysisgroup.com/uploadedFiles/Publishing/Articles/Economic_Impact_RGGI_Fact_Sheet.pdf.

[203] N.Y. State Department of Environmental Conservation. *See also* N.Y. State Energy Research & Development Authority, Regional Greenhouse Gas Initiative Investment Plan (2013), http://www.nyserda.ny.gov/Energy-and-the-Environment/Regional-Greenhouse-Gas-Initiative/Auction-Proceeds.aspx.

[204] N.Y. State Department of Environmental Conservation.

[205] *Id.*

[206] *Id.*; *Regional Greenhouse Gas Initiative*, N.Y. State Department of Environmental Conservation, http://www.dec.ny.gov/energy/rggi.html#Rulemaking.

[207] N.Y. State Public Service Commission, Order Establishing Energy Efficiency Portfolio Standard and Approving Programs, Case 07-M-0548 (June 18, 2008), *available at* http://www3.dps.ny.gov/W/PSCWeb.nsf/0/06F2FEE55575BD8A852576E4006F9AF7?OpenDocument.

[208] State Energy Planning Bd., Energy Efficiency Assessment, New York State Energy Plan 2009 at 29 (2009), http://www.nysenergyplan.com/Prior-State-Energy-Plans/2009stateenergyplan.aspx.

analysis shows by the end of 2011 the program had avoided $3.2 billion in wasted energy costs and created about 10,000 jobs.[209]

New York's RPS calls for 30 percent of the state's electricity to come from renewable sources by 2015.[210] This policy has boosted wind power development and jumpstarted solar resource development in the Empire State. The New York State Energy Research and Development Authority (NYSERDA) estimates that the RPS avoided 4.1 million tons of CO_2 from 2006 to 2012, along with 4,028 tons of NO_x and 8,853 tons of SO_2.[211] NYSERDA expects that projects initiated to meet the standard will inject $1.1 billion into the state's economy over their operating lives.[212]

These new policies and the low price of natural gas have delivered a cleaner power sector in New York and resulted in lower wholesale electricity prices.[213] New York currently gets 22 percent of its energy from renewable sources, 18 percent of which comes from hydroelectric power.[214] Prior to implementing an RPS, New York generated only a nominal amount of wind power.[215] It now has more than 1,600 MW of installed wind energy capacity, accounting for two percent of the state's power.[216] Natural gas power plants generate 44 percent of New York's electricity.[217] Nuclear power plants produce 30 percent of the generation mix.[218] From 2005-2011, New York reduced 24 million tons of CO_2 emissions from the power sector and its CO_2 emission rate declined 35 percent.[219]

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[209] Pace Energy & Climate Center, Energy Efficiency in New York: Midcourse Status Report of '15 by 15' at 6 (2012), http://energy.pace.edu/sites/default/files/publications/Energy%20Efficiency%20in%20New%20York%2015x15_0.pdf.

[210] Per N.Y. State Department of Environmental Conservation June 27 presentation, comments; N.Y. State Public Service Commission, Order Establishing New RPS Goal and Resolving Main Tier Issues, Case 03-E-0188 (Jan. 8, 2010), *available at* http://www3.dps.ny.gov/W/PSCWeb.nsf/0/1008ED2F934294AE85257687006F38BD?OpenDocument.

[211] N.Y. State Energy Research & Development Authority, The New York State Renewable Portfolio Standard Performance Report 19 (2012), http://www.nyserda.ny.gov/Publications/Program-Planning-Status-and-Evaluation-Reports/Renewable-Portfolio-Standard-Reports.aspx.

[212] *Id.*

[213] Per N.Y. State Department of Environmental Conservation.

[214] 2012 data. EIA State Generation, *supra* note 4.

[215] N.Y. State Energy Research & Development Authority, RPS Performance Report (2013), http://www.nyserda.ny.gov/Energy-Data-and-Prices-Planning-and-Policy/Program-Planning/Renewable-Portfolio-Standard/Main-Tier/Documents.aspx.

[216] 2011 data, U.S. Energy Information Administration, Existing Nameplate and Net Summer Capacity by Energy Source, Producer Type and State (EIA-860), http://www.eia.gov/electricity/data/state/existcapacity_annual.xls.

[217] 2012 data. EIA State Generation, *supra* note 4.

[218] *Id.*

[219] *Id.;* EIA State Electric Power Emissions, *supra* note 4.

VII.K. Oregon

In 2007, Oregon established ambitious goals for reducing statewide emissions to 75 percent below 1990 levels by 2050.[220] While significant progress is required to meet this goal, the state recently announced that the first interim goal—arresting growth and beginning to reduce emissions by 2010—has been met.[221] A significant part of this progress has been achieved through a variety of programs that have improved energy efficiency across the state and increased investment in renewable energy. Following are brief descriptions of several programs Oregon has implemented that have reduced emissions from the power sector.

- The Energy Facility Siting Council Carbon Dioxide Standard sets carbon dioxide emissions standards for new energy facilities (currently 0.675 lbs/KWh for baseload gas plants). An applicant has three alternatives for meeting the standard: 1) on-site cogeneration, 2) implementing offset projects directly or through a third party; or, 3) to pay the Climate Trust $1.27 per ton to offset emissions for the applicant.[222]
- The Emissions Performance Standard requires that all long-term commitments for power meet an emissions standard of 1,100 lbs/MWh, regardless of the geographic location of the generation.[223]
- The Renewable Portfolio Standard requires that all utilities serving Oregon load must include in their portfolio a percentage of electricity generated from qualifying renewable energy sources. The percentage of qualifying electricity that must be included varies by utility, with Oregon's three largest utilities required to reach 5 percent in 2011, 15 percent in 2015, 20 percent in 2020, and 25 percent in 2025.[224]
- The Oregon PUC's integrated resource planning approach requires electric utilities to update 20-year plans every two years that identify the resources to meet expected demand that provide the best mix of cost and risk. Costs of potential future greenhouse gas regulation are required to be explicitly evaluated for major capital investments and environmental compliance investments in existing resources.
- Oregon's public purpose charge takes 3 percent of the total revenues collected by the utilities to provide roughly $60 million per year to support energy efficiency, renewable energy, and low-income programs in Oregon. Furthermore, utilities are required to assess the achievable cost effective conservation potential in their service territories. If there is a gap between the potential and what can be achieved through funding provided by the public purpose charge funding, the utilities can ask for rate recovery in order to

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[220] Global Warming Actions, 2007 Or. Laws 907, http://www.oregonlegislature.gov/bills_laws/lawsstatutes/2007orLaw0907.html.
[221] Or. Global Warming Commission Report to Legislature (2013), http://www.keeporegoncool.org/sites/default/files/ogwc-standard-documents/OGWC_2013_Rpt_Leg.pdf
[222] Or. Department of Energy, Oregon's Carbon Dioxide Standards For New Energy Facilities (2010), http://www.oregon.gov/energy/Siting/docs/Reports/CO2Standard.pdf.
[223] Or. Department of Energy, Greenhouse Gas Emissions Standard, http://www.oregon.gov/energy/GBLWRM/docs/GHG_Rules.pdf.
[224] *Renewable Portfolio Standard*, Or. Department of Energy, http://www.oregon.gov/energy/RENEW/RPS/Pages/index.aspx.

pursue the additional conservation. Recently, this has provided approximately $125 million per year for cost-effective energy efficiency.[225]

- Oregon's Residential Energy Tax Credit program has provided a wide variety of tax credits for efficient appliances, cars and energy systems.[226] Similarly, tax credits aimed at business and commercial customers provided a wide range of credits for energy efficiency and renewable energy. Currently this program provides credits for high efficiency heating and air conditioning systems, as well as energy generation and alternative fuel systems.

Overall, Oregon has made considerable reductions in greenhouse gas emissions associated with the generation of electricity supplied in the state. Between 2005 and 2010, emissions associated with electricity used by Oregon households and businesses declined 10 percent.[227] This reduction—spurred by the policies described above—has helped the state meet its first greenhouse gas reduction goal; meeting the ambitious goals for the future will require the state to build on these policies and the introduction of new approaches.

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[225] *Public Purpose Charges for PGE*, PacifiCorp, Or. Department of Energy, http://www.oregon.gov/energy/cons/pages/sb1149/business/ppcinvest.aspx.

[226] *About Oregon's Residential Energy Tax Credit Program,* Or. Department of Energy, http://www.oregon.gov/ENERGY/RESIDENTIAL/Pages/residential_energy_tax_credits.aspx.

[227] Or. Department of Environmental Quality, Oregon's Greenhouse Gas Emissions Through 2010: In-Boundary, Consumption-Based and Expanded Transportation Sector Inventories (2013), http://www.oregon.gov/DEQ/AQ/Pages/Greenhouse-Gas-Inventory-Report.aspx.

VII.L. Washington

Washington produces very low carbon emissions from its electricity sector due to its expansive hydroelectric resources. The state is taking steps to further reduce its carbon emissions through energy conservation and renewable energy programs, as well as by requiring the early closure of its only coal plant. Washington achieved a 46 percent carbon emissions reduction from 2005 to 2011, and reduced its carbon emissions rate by 52 percent over the same period, from 328 to 158 lbs CO_2/MWh of electricity generated.[228]

Washington has achieved significant savings from its energy conversation programs. In 2012, the State of Washington achieved 980,643 MWh of incremental conservation savings, out of retail sales of 92,675,126 MWh.

Washington voters approved ballot initiative 937 in November 2006 which set new renewable energy resource and conservation requirements for electric utilities to meet.[229] Codified in Chapter 19.285 RCW, the energy conservation section requires each qualifying utility to "pursue all available conservation that is cost-effective, reliable and feasible." Seventeen utilities, representing about 84 percent of Washington's load, currently meet the definition of qualifying utility.

The law requires utilities to use the Northwest Power and Conservation Council's methodology to determine their achievable cost-effective conservation potential every two years for the subsequent ten-year period. Utilities also must establish and update a biennial conservation acquisition every two years. If a utility does not meet its conservation goals, it must pay an administrative fine for each MWh of shortfall, starting at $50 and adjusting annually for inflation beginning in 2007.[230]

The Northwest Power and Conservation Council approved its Sixth Power Plan, in 2010. The Power Plan is a regional energy blueprint that guides the region's electric utilities. Covering the 20 year period from 2010-2020, the Power Plan called for 6,000 – 7,000 average megawatts of conservation savings to meet 85 percent of the region's load growth.[231] The Pacific Northwest is on track to meet this goal, and expects to continue investing heavily in efficiency. Under federal law, the Council revises the 20-year plan every five years.

Washington's private and public utilities also have long records of offering customer energy efficiency and conservation programs supported by regional organizations including the Northwest Energy Efficiency Alliance. The Northwest Energy Efficiency Alliance seeks to

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[228] Calculated from U.S. Energy Information Administration data. CO_2 emissions based on Total Electric Power Industry category. EIA State Electric Power Emissions, *supra* note 4. Electricity generation data represents the total electricity generated from all electricity generation sources in the state, not just fossil fuel-fired sources EIA State Generation, *supra* note 4.

[229] Energy Independence Act, Washington Initiative Measure No. 937, http://www.secstate.wa.gov/elections/initiatives/text/i937.pdf.

[230] ACEEE, State Energy Efficiency Policy Database: Washington, http://aceee.org/sector/state-policy/washington#Energy Efficiency Resource Standards (last updated Aug. 12, 2013).

[231] Northwest Power and Conservation Council, Power Planning, http://www.nwcouncil.org/energy/powerplan/.

transform markets for energy efficient products. Its market transformation program impacts consumer goods, as well as building codes, design, construction and operations.[232]

Washington has also taken significant steps to increase renewable resources. In addition to conservation requirements, ballot initiative 937 set new renewable energy resource requirements for electric utilities. Codified in Chapter 19.285 RCW, the law requires qualifying utilities to meet 15 percent of their electric load with new renewable energy by 2020.

According to the Utilities and Transportation Commission, in 2012 Washington's investor-owned electric utilities, which combined serve about half the state of Washington's residents, generated or acquired 2.35 million megawatt hours of new clean electricity.[233] This only includes energy generated from new renewable projects, and not energy generated from the region's considerable fleet of older hydroelectric dams. According to the Washington State Energy Office, in 2012 state of Washington produced about 73 percent of its electricity from carbon-free sources.[234]

And this new renewable energy is not as expensive as many claimed it would be when the law was passed by Washington's voters. The investor owned utilities' filings show that complying with the RPS only cost their customers an additional $35 million in 2012 — an increase to the average household bill of 1.2 percent, or a little over $1 a month.[235]

Finally, Washington will achieve significant further reductions through the early closure of its only coal-fired power plant. In 2011 the Washington State Legislature passed, and the Governor signed into law, legislation requiring the closure of the only coal powered electricity plant located in Washington. The Centralia plant was the largest single source greenhouse gas emission in the state, and through the deal closes one coal boiler in 2020 and the other by 2025. Additionally, the plant will meet a schedule of emissions reductions along the way.[236]

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[232] Northwest Energy Efficiency Alliance, Market Transformation, http://neea.org/about-neea/market-transformation.

[233] Washington Utilities and Transportation Commission, Renewable Energy, http://www.utc.wa.gov/regulatedIndustries/utilities/energy/Pages/renewalEnergy.aspx.

[234] Washington Dept. of Commerce State Energy Office, Fuel Mix Disclosure, http://www.commerce.wa.gov/Programs/Energy/Office/Utilities/Pages/FuelMix.aspx.

[235] Washington Utilities and Transportation Commission, Company Annual Reports, http://www.utc.wa.gov/regulatedIndustries/utilities/energy/Pages/CompanyAnnualReports.aspx.

[236] Coal-Fired Electric Generation Facilities, ch. 180, 2011 Wash. Laws 1330, http://www.leg.wa.gov/CodeReviser/documents/sessionlaw/2011pam2.pdf.

Air Resources Board

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December 27, 2013

Ms. Gina McCarthy, Administrator
U.S. Environmental Protection Agency
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Washington, D.C. 20460

Dear Administrator McCarthy:

The California Air Resources Board (ARB or Board) extends our thanks to the U.S. Environmental Protection Agency (U.S. EPA or EPA) for meeting with us and representatives from California's energy agencies and local air districts last month to discuss our experience reducing carbon pollution in the electric power sector. We appreciate U.S. EPA's efforts to solicit state leadership perspectives on the most effective framework to achieve reductions under section 111(d) of the Clean Air Act (Act). We support U.S. EPA's efforts to reduce carbon emissions from power plants with a strong standard and we applaud your willingness to explore a range of mechanisms to set and enforce compliance with the standard. We offer these comments, developed in consultation with the California Energy Commission (CEC), California Public Utility Commission (CPUC), and California Independent System Operator (CAISO), as an initial response to U.S. EPA's questions to the states, and look forward to further conversations. We are also coordinating our efforts with California's many air districts, which have the primary responsibility for stationary source permitting in our state. ARB and other California agencies have also provided comments in several multi-state letters, including comments coordinated by the Georgetown Climate Center. This letter builds upon those efforts by providing more detailed recommendations and additional information on California's programs.

ARB advocates a rigorous and equitable approach that will achieve very significant reductions while using flexibilities inherent in the power grid to support cost-effective compliance with the section 111(d) standard. The standard should recognize the significant progress made by many states, including California, while supporting the additional reductions ultimately needed to achieve the 80 percent reduction in greenhouse gas (GHG) emissions below 1990 levels by 2050, which may be necessary to stabilize the climate. We are interested in helping U.S. EPA develop program

elements that would be attractive to other states and that will result in a dramatically cleaner national power sector. To reach this target, the standards will have to drive emission control policies both at individual sources and across the power grid.

In the context of our successes to date and desire to continue to use our suite of programs and policies to reduce GHGs, we are providing overarching comments on the design of the 111(d) guidelines for U.S. EPA's consideration. These comments are based on the following core principles:

1) The standards, while acknowledging the diversity of the many states' power fleets and energy policies, should recognize that *every* state can prosper with a low carbon economy, and provide tools for states to move in that direction. U.S. EPA should recognize that the best systems of emission reduction now demonstrated can be broadly applied to help move all states toward lower emitting power sectors as long as sufficient time is provided to them.

2) The standards should recognize that electricity system-level programs, such as energy efficiency measures, can cost-effectively curtail emissions from covered 111(d) sources. Emissions reductions associated with such programs accordingly must inform both the level of the standards and compliance pathways available to reach that level.

3) EPA should, to the greatest extent possible, build upon working programs in the states, supporting the continued operation and extension of these programs as tools to achieve and demonstrate compliance with the standards in substantial part. While solidifying existing progress, the standards should also provide direction and incentives for states to learn from successful programs operating outside their borders.

4) The standards should balance state policy-making autonomy with the need for accountability by providing clear tools for states to use in assessing programmatic and source level compliance using robust monitoring, verification, and reporting systems.

5) While maintaining accountability for both sources and states, the standards should be designed to maintain state control over energy programs and other system-level policies, while providing for federal oversight where necessary.

6) The standards must be carefully structured to avoid causing criteria pollutant and toxic pollutant increases in areas that cannot support such increases.

It is our desire to work with U.S. EPA staff to further explore and refine specific programmatic elements and to provide U.S. EPA with the data it needs to support the framework described in this letter.

I. Setting the Level of the Standard and Translating the Best Systems of Emission Reduction Into Enforceable State Plans

EPA should take a systems-level approach to the standard, recognize progress already made by early-mover states, and set a mass-based emissions performance target (perhaps with a rate-based compliance option) commensurate with state demonstrated performance. Recognizing that a flexible systems-level approach can achieve large reductions, U.S. EPA should set a very stringent standard.

States should be permitted to use a variety of enforcement approaches to demonstrate compliance with the federal standard; a rigorous monitoring, verification, and reporting system should be included as an essential element for demonstrating compliance with this flexible, system-based approach; and program-level compliance will be facilitated by a high degree of air and energy agency coordination.

A. EPA Must Consider System-Level Programs and Policies in Setting the Level of the Standard in Concert With Mechanisms That Directly Reduce Emissions Within the Fenceline

The section 111(d) standards must require existing fossil plants to substantially curtail their greenhouse gas emissions, consistent with the "degree of emission limitation achievable through the application of the best system of emission reduction" (BSER).[1] Systems which can best reduce emissions from power plants do not operate exclusively within the fencelines of those plants. Rather, the integrated nature of the power grid means that policies which displace the need for fossil generation can often cut emissions from covered sources more deeply, and more cost-effectively than can engineering changes at the plants alone, though these source-level control efforts are a vital starting point. Ensuring that individual sources reduce their carbon emissions will improve the overall emissions profile of the system, support needed modernization, and in many cases reduce criteria air pollutants and toxics. U.S. EPA must require emissions reductions consistent with the full application of the best systems of emission reduction operating at both the plant and system levels.

[1] 42 U.S.C. §§ 7411(a)(1) & (d).

Both the President's ambitious Climate Action Plan and the Clean Air Act itself require U.S. EPA to act aggressively to limit carbon pollution. The Act is a "technology-forcing" statute,[2] designed to drive the rapid implementation of innovative systems of emission reduction. Although this technology-forcing mandate has been applied most frequently to new sources of emissions under section 111, the same essential directive applies to existing sources under section 111(d). That provision directs U.S. EPA and the states to extend similarly rigorous "standards of performance" to existing plants in the same source categories in which the new source standards drive innovation. Section 111(d), in other words, ensures that innovation spreads to the *full* source category, not only new facilities. The standards must work to drive emissions cuts throughout the source category consistent with the best systems of emission reduction.

Specifically, the Clean Air Act charges U.S. EPA broadly with identifying the necessary degree of emission reduction which "reflects" that secured by "adequately demonstrated" systems, while taking nonair quality health and environmental impacts, energy requirements, and cost into account.[3] Existing source plans may also consider the remaining useful life of regulated sources.[4] Nothing in this directive limits U.S. EPA to analyzing only systems within the fenceline of covered sources. On the contrary—Emissions reductions at covered sources must *reflect* the operation of adequately demonstrated systems, but the systems themselves are not defined as co-extensive with the sources. Both "reflect" and "system" are sweeping terms that do not have fenceline limits, and the statute imposes none.[5] They indicate that U.S. EPA is to identify and consider all systems which can reasonably be used to reduce source category level emissions, regardless of the mechanism by which such a system operates.

An examination of system-wide emissions reduction opportunities is warranted with regard to existing power plants because these plants are inherently embedded in the national power system. Power plants do not operate independently. They respond to needs across the grid, compete against each other in power markets, and are constrained by common reliability standards. These complex relationships mean that

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[2] *See, e.g.*, *Sierra Club v. Costle*, 657 F.2d 298, 364 (D.C. Cir. 1981); *see also Lignite Energy Council v. U.S. EPA*, 198 F.3d 930, 934 (D.C. Cir. 1999) (Achievability "looks toward what may be fairly projected for the regulated future, rather that the state of the art at present").

[3] 42 U.S.C. § 7411(a)(1).

[4] *Id.* § 7411(d)(1).

[5] *See also, e.g.* Webster's Third New International Dictionary of the English Language Unabridged 2322 (1968) (defining "system" at the time of the creation of section 111(d) as "a complex unity formed of many often diverse parts subject to a common plan or serving a common purpose"); *Engine Manufacturers Ass'n v. South Coast Air Quality Management District*, 541 U.S. 246, 252-53 (2004) (stating that where statute does not separately define term, courts presume that "the ordinary meaning of that language accurately expresses the legislative purpose.") (quotations and citation omitted).

power plants respond to each others' behavior, ramping up or ramping down as plants come on- and off-line, and as market needs change. As a result, emissions from these sources are particularly amenable to control by grid-level changes, such as energy efficiency programs, environmentally-focused dispatch rules and procurement policies, and renewable power supplies, which can displace dirtier generation.

The effects of these grid-level programs must be included in U.S. EPA's considerations because the BSER inquiry is designed to identify "demonstrated" systems which can produce "achievable" emissions reductions, and these demonstrated policies greatly increase the achievability of large reductions.[6] U.S. EPA must capture all source-level reductions available in its standard-setting as well—and some of these reductions may be substantial—but U.S. EPA may not artificially terminate its standard-setting analysis at the fenceline. *Beginning* at the fenceline, U.S. EPA should evaluate all emissions reductions opportunities.[7] California air districts, which have the primary responsibility for addressing stationary source emissions are well positioned to assist U.S. EPA in that inquiry. But, grid-level strategies are also plainly "adequately demonstrated," and show that a large "degree of emission limitation" is "achievable" if they are applied to reduce emissions from existing sources.[8]

This "achievability" consideration is ultimately central to the statute's purpose because it links the grid-level policies and programs which states have demonstrated with the "degree of emission reduction," which existing sources must ultimately achieve as a reflection of the operation of those systems of emission reduction. In essence, greater reductions are "achievable" if a greater range of policies are available to support them. Sources can curtail their emissions more sharply, over shorter time periods, if the grid can more fully compensate for reduced capacity factors at high-carbon generators. Because grid-level programs reduce the cost of reductions while shortening the time needed to achieve large reductions, U.S. EPA can, and must, conclude on its review of these programs that large reductions can be required of the population of existing sources.

The statute further enables this approach by directing that the state plan development process under section 111(d) "shall" be procedurally "similar to that provided by [section

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[6] *See* 42 U.S.C. § 7411(a)(1).

[7] U.S. EPA should investigate the degree of reductions possible from a full suite of source-level engineering and fuel-switching programs, including plant upgrades like turbine blade replacements, and co-firing or modifying facilities to use lower-carbon fuel, as well as considering standards which may facilitate the retirement or repowering of the oldest, most inefficient plants which have reached the end of their remaining useful life. Such measures at these older plants will likely be more achievable if other system-level policies facilitate these changes by reducing demand for these plants.

[8] *See* 42 U.S.C. § 7411(d)(1).

110 of the Act],"[9] under which states develop State Implementation Plans (SIP) to attain compliance with the national ambient air quality standards (NAAQS) for criteria pollutants.[10] The SIP process has long afforded states a great deal of flexibility to seek required pollution reductions from a wide array of programs. Similar flexibilities are important when addressing existing sources under section 111 because some portion of the emission reductions available from these sources may often be most achievably and cost-effectively secured through system-level efforts.

EPA has repeatedly confirmed that grid-level programs fall within the Clean Air Act, most recently in an expansive "Roadmap for Incorporating Energy Efficiency/Renewable Energy [(EE/RE)] Policies and Programs into State and Tribal Implementation Plans" under section 110 of the Act.[11] Section 111(d)'s direct cross-reference to section 110, and the acknowledged efficacy of these programs at controlling air pollutants, including the pollutants which section 111(d) is designed to address, indicates the appropriateness of including these measures in the BSER determination. In the Roadmap, U.S. EPA itself concludes that "EE/RE policies and programs offer the potential to achieve emission reductions at a cost that can be lower than traditional control measures," and, critically, may therefore "be a cost-effective strategy that state... agencies can use … to help attain and maintain compliance with NAAQS, as well as achieving other regulatory or non-regulatory objectives such as … *limiting greenhouse gases*."[12] We agree.

States' successes in reducing emissions help to indicate the performance level U.S. EPA must require.[13] Our own experience, and that of many other states, confirms that a very large degree of reduction is possible with policies which reduce the need for fossil power, as well as requiring maximum pollution controls at plants themselves. California's comprehensive approach to GHG reduction has secured very cost-effective carbon pollution reductions through energy efficiency programs, renewable power and storage procurement processes, and economy wide Cap-and-Trade Programs, among other efforts. While we understand that each state will need to find a plan that works for

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[9] *Id.*
[10] *See id.* § 7410(a).
[11] U.S. EPA, Roadmap for Incorporating Energy Efficiency/Renewable Energy Policies and Programs into State and Tribal Implementation Plans (2012); *see also, e.g.*, U.S. EPA, Guidance on SIP Credits for Emission Reductions from Electric-Sector Energy Efficiency and Renewable Energy Measures (August 5, 2004).
[12] Roadmap at 12 (emphasis added).
[13] The Georgetown Climate Center has recently released a helpful report detailing many of these successes. *See* Georgetown Climate Center, *Reducing Carbon Emissions in the Power Sector: State and Company Successes* (2013), available at: http://www.georgetownclimate.org/sites/default/files/Reducing_Carbon_Emissions_in_the_Power_Sector-Success-Stories.pdf.

its particular circumstances, our experiences underline that successful programs will certainly find substantial emissions reductions from taking a grid-level approach. Our collective experiences show that it is achievable to reduce fossil plant emissions deeply and rapidly; the statute requires that U.S. EPA work with the states to achieve this degree of emission reduction.

We emphasize that the broad analysis required by the statute leads to a policy quite different from that urged by some commentators, who have called for U.S. EPA to require reductions commensurate only with what limited site-level improvements can achieve, perhaps while allowing extremely flexible system-level *compliance* options to achieve those reductions. The Clean Air Act's ambitious mandates do not permit U.S. EPA to allow for maximum flexibility to attain only a minimal target. We agree that states have substantial discretion as to the contents of their plans, subject to U.S. EPA's oversight, and expect that states will explore a variety of compliance approaches. But, this compliance flexibility for states and regulated sources is distinct from the initial broad analysis required of U.S. EPA as it sets the emission guideline which state plans are required to achieve. Indeed, to guarantee enforceable emissions reductions, such flexibility is best paired with a rigorous standard.

B. Methods for Setting the Standard

EPA must determine the degree of emission reduction which state section 111(d) plans must achieve. To do so, U.S. EPA will have to determine the achievability of emissions reductions from the collection of covered sources in each state. Existing state programs will be an important guide as U.S. EPA conducts this analysis.

The 111(d) regulations translate the broad statutory mandate into a series of analytic steps under which U.S. EPA first identifies adequately demonstrated systems of emissions reduction, then develops "[i]nformation on the degree of emission reduction which is achievable with each system, together with information on the costs and environmental effects of applying each system to designated facilities," along with the time required, and finally identifies the degree of emission reduction possible with the application of the best of these of these systems.[14] One way to view these requirements is that U.S. EPA is functionally filling in the data points needed to draw an abatement curve showing the amount of reductions possible for a given cost over a given period as different systems of reduction are brought to bear, and then selecting a required "degree of emission reduction" off that curve.

As U.S. EPA works to identify the full range of emission reduction systems, it would both need to identify plant-level engineering changes (likely grouped into strategies

[14] *See generally* 40 C.F.R. § 60.22(b).

applicable to categories of similar plants) or fuel shifts that could reduce emissions, and also to consider which grid-level approaches to source emissions reduction are sufficiently demonstrated and available as to be used to set the BSER-based emission limitation for all states.

State policy successes demonstrate that certain "low-hanging fruit" system-level reductions are likely to be broadly available. For instance, though not all states may immediately be able to reach the energy-efficiency savings rates of the best-performing states, all states can certainly develop programs that capture a substantial portion of these savings. Similarly, though not all states may be able to immediately implement wide-ranging renewable portfolio standards, all states can certainly integrate some degree of zero emissions generation into their grids. Recognizing that varying conditions may argue for a somewhat conservative approach to emissions reduction forecasting from demonstrated system-level programs, U.S. EPA could work to identify the emissions profiles of these "good enough" programs—the reductions which should be achievable in many conditions—and associated cost profiles. In essence, U.S. EPA would develop information on a range of emission reduction options and associated costs per ton of reduction, layering upward from the facility level while using relatively conservative estimation protocols for grid-level policies and programs.

EPA could then apply several different methods to translate this information into BSER emissions levels for each state. For instance, published research suggests requiring states to maximize reductions at a given marginal abatement cost of carbon may produce substantial reductions by leveraging all available control strategies below that cost.[15] Other proposals, based on setting final targets or emissions rates, are similarly ultimately based on determining the maximum degree of reduction possible at reasonable cost (though they translate that analysis through a different process).[16] The common thread these approaches share, consistent with the 111(d) regulations, is that they identify a range of emissions reductions and costs, and then set emission reduction requirements by requiring states to achieve reductions consistent with the best system of emission reduction, developed by considering the effects of the full application of all cost-effective programs.

One possibility would be to use energy system modeling to determine for each state the maximum degree of emission reduction possible with the application of all cost-effective systems of emission reduction, which U.S. EPA has identified, thereby setting the BSER

[15] *See, e.g.*, Dallas Burtraw & Matt Woermann, Resources for the Future, *Technology Flexibility and Stringency for Greenhouse Gas Regulation* (2013).
[16] *See, e.g.*, Natural Resources Defense Council, *Closing the Power Plant Pollution Loophole* (2013).

level for the existing sources in that state.[17] U.S. EPA would first determine a carbon reduction cost it deemed reasonable, in light of the statute's urgent pollution reduction purpose,[18] and determine the degree of reductions possible from existing sources if a state employs all emissions reduction systems with a cost equal to, or below, the cost threshold. By populating the model with the full range of demonstrated emission reduction systems, including grid-level programs, U.S. EPA would likely determine that substantial reductions are possible in many states. The states would then submit 111(d) plans for U.S. EPA approval which were designed to meet these reduction levels, with the particular policy design of each plan left to each state, within the statute's constraints.

This approach has the advantage of equitably requiring similar levels of emission reduction effort and marginal cost in all states, while focusing program implementation initially on states with more cost-effective reduction opportunities.

Focusing on an end goal of remaining emissions (whether generated through the process we suggest or another), rather than a reduction from a particular baseline, affords states the most flexibility, recognizes historical actions to improve energy efficiency and reduce GHG emissions from the electricity sector, and, as we discuss below, may remove the need to federalize some state programs because the emissions goal itself can be made federally enforceable. If a baseline approach is, nonetheless, used, the baseline should be set as near to the present as possible to gain real reductions.

In implementing this, or any section 111(d) requirement, U.S. EPA could set either a mass-based or a rate-based "degree of emission reduction" but U.S. EPA should ensure that states can demonstrate compliance based on either metric. We prefer mass-based targets because they have the significant advantage of automatically accounting for reductions in the total mass of covered emissions as a result of displacing covered sources with energy efficiency or renewables. However, several groups have proposed ways of accounting for such strategies in a rate-based framework and these approaches may be workable. U.S. EPA, should, in any event, provide clear conversion protocols if it selects either a mass-based or rate-based metric.

[17] We expect that compliance with any BSER level would be assessed with some degree of averaging in order to account in part for variation in emissions which unexpected changes in the power system (such as low hydroelectric years or unexpected plant closures) may cause in emissions levels in any given period.

[18] We note, in this regard, that the courts have repeatedly held that Congress has already determined that substantial costs are worth bearing in order to secure the great benefits of air pollution control. *See, e.g.*, *Portland Cement Ass'n v. Train*, 513 F.2d 506, 508 (D.C. Cir. 1978) (reasonable to impose substantial costs unless there is a "gross disproportion" between costs and benefits).

We note that in light of the substantial analytic task before it, we would support U.S. EPA using the upcoming proposal to offer its initial conclusions as to costs of reduction and the resulting state targets, and using the comment period as a chance to engage states and other stakeholders to enhance the data available to the agency in the final standard setting and plan-writing process moving forward.

C. Implementation Timing

EPA must determine a time frame in which states would apply these reduction measures; the time frame will also affect implementation costs, and, hence required reductions. Over a longer time frame, more reductions are possible; shorter time frames will likely raise the cost of deeper cuts.

One approach to setting the compliance schedule for the standard that recognizes the different states' starting points would link the time-scale with the magnitude of reductions required to meet the standard. The area classifications used for setting attainment deadlines for meeting the ambient air quality standards provides an analogy for U.S. EPA's consideration in setting the schedule. For example, U.S. EPA could use state carbon emission baselines and final standard targets to classify states as moderate, serious, severe, and extreme, in accordance with the magnitude of reductions needed. Factoring in cost, the amount of time needed to achieve the level of reductions could be estimated, with states designated as the equivalent of severe and extreme having more time to reach their carbon standard than states designated as serious or moderate.

Compliance timeframes will vary depending on the level of reductions needed to meet a state's end goal. Long-term goals will help guide states in doing the long-term planning for investment needed for sustainable and continuing emission reductions from the power sector. However, if the compliance year is too distant from the starting point, then a credible policy regime for ongoing emission reductions is compromised. U.S. EPA should include regular evaluations of state progress in meeting a state's long-term goal.[19] An enforceable midterm target (or regular intervals) at which a state's program is evaluated should be established to ensure it remains on a trajectory consistent with meeting the end goal performance standard. If the state is not on track, then the section 111(d) plan should be revised to include additional emission reduction measures or to otherwise strengthen the plan. The regular eight-year review cycle for the section 111 program provides a natural point to set mid-term targets and supply program evaluations. At that time, recognizing ongoing progress in emission control

[19] We note that the 111(d) regulations provide for progress reports and increments of progress. *See, e.g.,* 40 C.F.R. § 60.25.

systems that the program will, in part, have driven, U.S. EPA must evaluate whether to further tighten targets or otherwise improve the program.

D. Enforceability and the Content of State Plans

Section 111(d) and its enforcing regulations create two distinct sets of accountability obligations—on the states to develop and enforce state plans, and on facilities regulated by those plans. Ultimately, both sets of obligations work to ensure that "standards of performance [apply] to any existing source" of the regulated air pollutants.[20]

Sources must immediately take action to reduce emissions from processes in their direct control; thus, there should be no enforceability difficulty in requiring sources to achieve reductions consistent with various heat-rate and fuel-based improvements. California air districts, which are already implementing greenhouse gas best available control technology permitting under other provisions of the Clean Air Act, have demonstrated that many of these methods can produce substantial reductions; U.S. EPA should require reductions consistent with their full use. Some substantial degree of additional reductions will be more readily achieved if states also implement grid-level policies to reduce demand on covered sources, allowing them to more readily curtail their emissions and operations. To enable these reductions, U.S. EPA should explore a range of approaches to enforceability that will encourage both states and covered sources to implement the full range of reductions.

We expect that many states will want to use allowance systems to guarantee enforceability. These systems automatically link source-based reductions with system-level programs by setting system-wide limits while requiring facilities to take responsibility for their emissions. In such a system, facilities are required to hold sufficient allowances to cover their emissions; available allowances are keyed to the total level of reduction required by covered sources. In that context, a requirement that sources hold sufficient allowances to cover all emissions can serve as an enforceable requirement to guarantee sources meet their emission budget, provided that sources cannot or will not acquire more sufficient allowances to exceed the budget. System-level programs reduce allowance prices and other compliance costs and support a lower total number of allowances by reducing demand for fossil power sources. Both California and the Regional Greenhouse Gas Initiative states have implemented such systems and other states may find them to be an economically efficient way of allocating compliance responsibilities among sources. We urge U.S. EPA to give states a clear path to seek approval of such programs.

[20] *See* 42 U.S.C. § 7411(d)(1). *See also*40 C.F.R. §§ 60.24(b)(3) ("[E]mission standards shall apply to all designated facilities within the state").

Not all states may implement such systems. For these states it will be important to find ways to ensure that reductions from both source- and grid-level emissions reduction systems are federally enforceable. Section 111(d) ultimately requires that all covered sources reduce their emissions consistent with a state's plan, which is to be developed using procedures similar to the section 110 criteria pollutant planning process. Section 111(d) thus has something of a hybrid nature. It fuses section 111's general source-level focus with section 110's flexible state planning approach. The state planning requirement, which is designed to be similar to section 110 criteria pollutant plans, suggests that states and U.S. EPA have some discretion to utilize different approaches for guaranteeing enforceability, as they do in the section 110 context. This discretion will be important because not all system-level reduction opportunities are under the direct control of individual sources, but all reductions must be enforceable.

The appropriate enforceability program design may vary with the circumstances of each individual state. We suggest that U.S. EPA explore structures under sources that may be held directly accountable (for instance, in Title V permits), at least for the degree of emission reduction attainable from source-level actions under their direct control (via efficiency measures, fuel-switching, and so on), while states are held responsible for a second tranche of emission reductions attributable to grid-level policies, which also reduce source emissions.[21] EPA should ensure that regulated sources have strong incentives to support the success of grid-level programs, perhaps by directing that plans require additional source reductions if state programs do not fully deliver reductions for which the state is responsible. We further suggest that the federally-enforceable requirement for this grid-level portion of the plan be the state's emissions target, rather than any particular state programs, in order to avoid unnecessarily federalizing state energy programs. We expect states would propose such hybrid approaches to U.S. EPA in their implementation plans, but suggest that U.S. EPA explicitly invite such innovative approaches in its proposal.

EPA has taken a similar approach in the section 110 context while approving some of California's ozone state implementation plans. Under those plans, the state commits to an emissions target, with the state's overall emission reduction requirement serving as the primary federally enforceable requirement, leaving the state to develop programs to meet that federal requirement with programs that ultimately reduce source emissions but without federal enforceability for the individual programs.[22] This structure could

[21] We are aware there may be modeling approaches of sufficient rigor as to translate the effects of these programs directly into source-level requirements, and look forward to also exploring those approaches with U.S. EPA as the 111(d) process continues.

[22] *See, e.g.*¸77 Fed. Reg. 12,652 (Mar. 1, 2012) (approving San Joaquin Valley ozone State Implementation Plan which set enforceable emission reductions to reduce ozone pollution, including an obligation to implement or design all emission reduction programs necessary to achieve these reductions).

have the advantage of setting federally-enforceable reductions while leaving room for states to develop a range of innovative programs which might not themselves have to be federally enforceable. If state programs failed to achieve these additional reductions, the section 111(d) plans could automatically require program redesigns or additional source-level limits.

As U.S. EPA has suggested in its Roadmap, states which incorporate existing energy efficiency or renewable energy programs into their baseline load growth and emissions projections need not make those programs separately federally enforceable. Instead, such programs merely set the business as usual emissions trajectory because they would be in force with or without a section 111(d) plan. See, e.g., 40 C.F.R. §§ 60.25(b)(1) (providing for monitoring of regulated sources); 60.26 (requiring states to demonstrate legal authority to enforce emissions standards against regulated facilities). Although U.S. EPA will certainly need to verify these projections carefully, such an approach could provide further flexibility to states wishing to rely on grid-level programs to help meet emissions targets.

Other solutions are available. U.S. EPA and the states will need to explore a range of options which ensure reductions from covered sources while leaving states room to develop innovative emission reduction approaches without adding an undue layer of federal enforcement to state energy program efforts.

We strongly believe that nothing in the Act requires sources now participating in California's AB 32 Cap-and-Trade system to face redundant compliance requirements under the section 111(d) program. California's own program limits source emissions sharply and helps guarantee declining power sector emissions. We intend to work with U.S. EPA to demonstrate that sources participating in our allowance programs will also satisfy section 111(d) requirements and to take any necessary measures to ensure that all federal enforceability issues have been addressed.

II. The California Experience

***California has successfully driven large reductions in its carbon emissions through a variety of source- and system-level approaches which should inform U.S. EPA's evaluation of possible emissions nationally*.**

California has made remarkable progress in developing and implementing new policies and strategies to reduce GHG emissions within the State's electricity sector. Consistent

with the State's loading order,[23] CEC, CPUC, and ARB have adopted a suite of programs and regulations that are substantially reducing electricity-sector GHG emissions. California's comprehensive approach to GHG reduction has combined energy efficiency programs, renewable power and storage procurement processes, and economy wide Cap-and-Trade Programs, among other efforts. While we understand that each state will need to find a plan that works for its particular circumstances, our experiences underline that successful programs will find substantial emissions reductions from taking a grid-level approach. Section 111(d) and its implementing regulations require U.S. EPA to account for these successful state experiences.

Presently, about 40 percent of the California's total GHG emissions are associated with the electricity sector and efforts to reduce electricity-related emissions are a key component of our efforts under the AB 32 Scoping Plan. The Scoping Plan was built on the principle that a balanced mix of strategies is the best way to cut emissions and grow the economy in a clean and sustainable direction. California is on track to meet the goals of AB 32 (1990 levels by 2020, or 431 $MMTCO_2e$[24] from all sectors) and has implemented a comprehensive suite of measures across sectors that are moving the State toward a lower carbon future utilizing cleaner and more efficient energy, cleaner transportation, and a comprehensive Cap-and-Trade Program. The Cap-and-Trade Program will play a key role in ensuring that California remains on track to meet its 2020 reduction target and will play an important role in achieving cost-effective reductions beyond 2020. U.S. EPA should recognize California's program portfolio as an effective system to obtain reductions from existing electrical generating units as it evaluates BSER.

Our estimates show that the result of our many efforts has caused utility sector emissions to decline. Emissions from in-state and imported power fell by 16 percent (16 million metric tons) from 2005 to the 2010-12 averaging period. Emissions from both portions of the sector will continue to fall as a result of California's programs. By 2025, we expect to cut our electricity sector emissions to below 80 million metric tons CO_2e, a roughly 25 percent reduction from 2005 levels in that sector alone. California's carbon emissions rates (both of fossil generation alone and for all power used in the state) have also fallen, from 1,245 $lbCO_2e/MWh$ for fossil generation and 875 $lbCO_2e/MWh$ for all power in 2005 to 1,090 $lbCO_2e/MWh$ and 775 $lbCO_2e/MWh$ in

[23] The "loading order" is California's preferred sequence for meeting electricity demands: energy efficiency and demand response first; renewable resources second; and efficient natural gas-fired power plants third.

[24] ARB is proposing to update the 2020 goal via the Scoping Plan Update, weighting the 1990 emissions with 100-year GWPs from the IPCC's Fourth Assessment Report. The new target would be 431 MMTCO2e, approximately a one percent increase from the 427 MMTCO2e target adopted by the Board in 2007.

2012, and are expected to decline to approximately 830 lbCO_2e/MWh and 580 lbCO_2e/MWh by 2025.

The majority of GHG emission reductions for the California electricity sector are being driven by four key programs: (1) supply-side emission reductions; (2) energy efficiency programs, including utility-level programs and building and appliance energy efficiency standards; (3) renewables programs, including the 33 percent Renewable Portfolio Standard (RPS) and the Million Solar Roofs/California Solar Initiative program;[25] and (4) the Cap-and-Trade Regulation. The electricity sector is expected to achieve 25 MMT of greenhouse gas reductions by 2020, with almost half of the reductions from energy efficiency programs. Below we provide a description of these programs and the emission reductions achieved to date, and also describe the mechanism of verification for each program.

Beyond the 40 percent of GHG emissions from the electricity sector emissions, the largest category of emissions is from the transportation sector. To support the reduction of these emissions, California Governor Edmund G. Brown Jr. issued an executive order setting a goal of 1.5 million zero-emission vehicles on California roads by 2025.[26] CPUC, ARB, CEC, and other state agencies are coordinating actions under the direction of the Governor's Zero Emission Vehicle Action Plan to eliminate regulatory barriers that impede consumer adoption of these vehicles.[27] While this effort will result in an increase in California's electricity consumption, it will also result in large GHG emissions reductions. Although overall statewide GHG emissions will be reduced in the long run from vehicle electrification, there is the potential to shift additional emissions to the power sector if that sector is not also carefully controlled. As a result, carbon reductions from electrical generating units are important to the State to ensure that growing electricity demand from zero-emission vehicles does not offset carbon emission reductions secured by that program in the transportation sector, further demonstrating why a strong standard is needed.

A. Supply-Side Energy Efficiency Improvement Opportunities

In California, power generation is largely from natural gas, and due to air quality considerations is generally very efficient. To further enhance efficiency, ARB approved a regulation in 2010 that requires the largest industrial facilities in California to conduct a

[25] This program encompasses three components: (1) the California Solar Initiative (CSI) that the CPUC administers within IOU service areas; (2) the New Solar Homes Partnership (NSHP) that the CEC administers within IOU service areas; and (3) various POU programs that are self-administered. All three components received funding from the State to provide subsidies for solar PV under SB 1.
[26] California Executive Order B-16-2012, issued on March 23, 2012, http://gov.ca.gov/news.php?id=17463.
[27] http://opr.ca.gov/docs/Governor%27s_Office_ZEV_Action_Plan_%2802-13%29.pdf

one-time energy efficiency assessment of sources of GHGs to determine potential emission reduction opportunities, including those for criteria pollutants and toxic air contaminants. The industrial facilities subject to the regulation include all facilities with 2009 GHG emissions of 0.5 $MMTCO_2e$ or greater, as well as cement plants and transportation fuel refineries that emitted at least 0.25 $MMTCO_2e$. Combined cycle electricity generating facilities built after 1995 are exempt. Fourteen electrical generation facilities were required to provide information under the regulation, which includes cost data. The reporting generating facilities include natural gas-fired boilers and turbines, as well as a small number of coal-fired boilers. Three coal-fired boiler facilities are included in the report, with a total generating capacity of 212 MW. Only one of the three facilities is still operating with coal as a fuel. The efficiency improvement methods identified fall into the following categories: change in operation of equipment, change in maintenance practices, change in management systems, process control, same but more efficient technologies, and investment in new technologies. A report summarizing the data collected for the electrical generation sector is expected to be publicly available in early 2014.

B. Energy Efficiency Programs

A variety of utility demand-side energy programs, along with appliance, building, and electronic energy efficiency programs support California's top priority to reduce the need for new energy resources to meet increasing demand. CPUC has developed an innovative series of utility-run efficiency programs which require investor-owned utilities to take advantage of all cost-effective energy efficiency; publicly owned utilities (POU) are also implementing efficiency programs. CEC continues to provide a leadership role in developing and adopting new appliance and building efficiency standards. Building efficiency standards were updated this year and now require 25 percent more efficiency from residential construction and 30 percent more efficiency from non-residential construction than the prior standards.[28] CEC also adopted aggressive energy efficiency standards for televisions in 2009, and first-in-the-nation energy efficiency standards for battery chargers in 2012.[29]

California's experience demonstrates that demand-side energy efficiency is a particularly successful emission reduction system.

[28] Computed from *California Energy Demand, 2012–2022 Final Forecast*, June 2012, Form 2.2 on Committed Energy Impacts.
[29] CEC. 2013. California Energy Commission 2012 Accomplishments. http://www.energy.ca.gov/releases/2013_releases/2012_Accomplishments.pdf.

Utility Programs

California requires its investor-owned utilities to first meet any resource needs "through all available energy efficiency and demand reduction resources that are cost effective, reliable, and feasible."[30] CPUC ensures that these companies meet this goal by working with CEC to "identify all potentially achievable cost-effective electricity efficiency savings" and then translating these potential savings into "efficiency targets," which the investor-owned utilities must achieve in their resource procurement plans.[31] CPUC policy rules regarding energy efficiency programs for the investor-owned utilities have strict cost-effectiveness requirements, which specify that their energy efficiency portfolios as a whole must have higher benefits than costs. We invite U.S. EPA to review program details, including verification strategies, as set forth in the CPUC's *Energy Efficiency Policy Manual*.[32]

California investor-owned utility programs regulated by the CPUC save about 3,000 GWh per year, enough savings to power about 600,000 households. The programs are estimated to have cut CO_2 emissions by 3.8 million tons during 2010-11, the equivalent of removing over 700,000 cars from California's roads. Compared to the cost of other climate policies, energy efficiency provides substantial emissions reductions and should be an essential element of the BSER CO_2 reduction target required by U.S. EPA of all state plan designs. Though not all states may immediately be able to reach the energy-efficiency savings rates of the best-performing states, all states can certainly develop programs that capture a substantial portion of these savings.

CPUC and CEC have pursued utility-driven efficiency programs of this sort for decades and the target-setting mechanism itself has now been in place for almost a decade, with great success. While California has picked much of the "low hanging fruit" with respect to energy efficiency measures, it is significant to note that we are still finding cost effective energy efficiency programs after 20 years of implementation. A recent energy efficiency potential study, for instance, has identified tens of thousands of GWh in potential savings available over the next decade, indicating that efficiency continues to be a durable resource for reductions. Data from 2010-2012 also shows investor owned utility average benefits exceed costs in California by approximately 1.5 to 2.5 times for efficiency programs, based on metrics that assess total benefits and costs for all customers versus for the utility only, respectively; similar ratios for other states may be even more favorable. In addition, the current metrics do not include the potential

[30] Cal. Pub. Utility Code § 454.5(a)(9)(C).
[31] *Id.* § 454.55.
[32] *Available at:* http://www.cpuc.ca.gov/NR/rdonlyres/7E3A4773-6D35-4D21-A7A2-9895C1E04A01/0/EEPolicyManualV5forPDF.pdf.

beneficial environmental aspects of these programs in the benefit-cost tests. CPUC continues to move forward, developing ambitious next generation targets for covered utilities.

Publicly-owned utilities are also taking substantial energy efficiency measures. These entities vary a great deal in size, which impacts the range of energy efficiency programs that are offered. At the larger end of the spectrum are the Los Angeles Department of Water and Power (LADWP), Sacramento Municipal Utility District (SMUD), and Imperial Irrigation District. On the other end are dozens of POUs serving much smaller communities, including but not limited to the cities of Needles, Gridley, and Biggs. LADWP and SMUD together represent over half of the total retail electricity sales from public power (55.7 percent). As large as LADWP and SMUD are compared to other POUs, combined they are roughly one-fifth the size of the two largest investor-owned utilities (IOU), Pacific Gas & Electric, and Southern California Edison.

Public power commitments to energy efficiency programs are extensive and comprehensive. Residential programs focus on energy audits, Energy Star® appliance rebates and replacements, lighting improvements, attic insulation, as well as incentives to install highly-efficient heating, ventilation and air conditioning (HVAC). Commercial and industrial programs target lighting, HVAC, and manufacturing/food processing equipment. POUs also partner with schools and public institutions to educate residents and implement a variety of beneficial programs. POUs across the state are currently evaluating and developing more advanced programs in the areas of commercial/industrial demand response, thermal energy storage, on-bill financing, customer behavior change, and “whole building” retrofits.

The above programs have resulted in a realization of the following partial list of benefits:[33]

- Public power programs reduced peak demand by more than 82.5 MW. Since 2006, POUs have reduced peak demand by over 563 MW.

- The net annual kilowatt-hours savings totaled over 439,700 MWh. Since 2006, POUs achieved nearly 2.89 million MWh in savings through energy efficiency programs.

- Applying the Total Resource Cost (TRC) societal test, the principal measure used in the industry to determine whether programs are cost-effective, the aggregated TRCs for public power equals 2.66 in FY11/12, meaning public

[33] California Municipal Utilities Association, *Energy Efficiency in California’s Public Power Sector – 2013 Status Report*

power energy efficiency programs produce over two-and-a-half dollars in societal benefits for every dollar spent.

Appliance Standards

Building on its past appliance standards, CEC is currently in the pre-rulemaking phase to consider additional appliance types for coverage by Title 20 appliance standards. Appliances being considered include consumer electronics, lighting, water appliances, and several additional appliance types. Future California Title 20 updates and corollary collaborative work with the U.S. Department of Energy on appliance standards should focus both on realizing cost-effective energy savings and on incorporation of features that can assist in grid resilience and responsiveness.

Proposition 39

Funding from the California Clean Energy Jobs Act (Proposition 39), approved by California voters in November 2012 and subsequently refined through Senate Bill 73 (Skinner, Chapter 29, Statutes of 2013), will provide a significant source of new revenue (an estimated $2.75 billion over five years) to support energy efficiency and clean energy projects in California's public schools (K–12) and community colleges.

Local Governments

At the local government level, several communities have created property-assessed clean energy financing districts (PACE programs) that allow residential and commercial property owners to finance renewable on-site generation and energy efficiency improvements through voluntary property tax assessments.

State Buildings

Governor Brown took specific action in 2012 to improve the energy efficiency of state owned buildings through Executive Order B-18-12, which directs State agencies to reduce their grid-based energy purchases by at least 20 percent by 2018. This Executive Order also directs State agencies to reduce the GHG emissions associated with the operating functions of their buildings by 10 percent by 2015, and 20 percent by 2020.[34]

Existing Buildings

Assembly Bill 758 (Skinner, Chapter 470, Statutes of 2009), requires CEC to develop and implement a comprehensive energy efficiency program for all of California's existing buildings. CEC is currently drafting an Action Plan for 758, which will propose solutions for energy efficiency issues in California's existing buildings.

[34] Executive Order B-18-12, issued on April 25, 2012. See http://gov.ca.gov/news.php?id=17508.

Zero Net Energy (ZNE)

In 2008, CPUC set forth ZNE goals in its long-term Energy Efficiency Strategic Plan and implementation roadmap for several Big Bold Energy Efficiency Strategies. CPUC's Big Bold Energy Efficiency Strategies, later updated in 2011, state that all new residential buildings shall be ZNE by 2020, new commercial buildings shall be ZNE by 2030, and half of existing commercial buildings shall be retrofitted to ZNE by 2030. It is expected that the major contributors to achieving this goal are building and appliance standards regulations. This effort is complemented by utility energy efficiency programs that motivate change in consumer behavior in areas outside of regulatory reach.

CEC has made progress toward achieving the state's ZNE goals for new residential and new commercial buildings through periodically increasing stringency of the building and appliance standards, and broadening their reach. Working with CPUC, CEC is currently developing a definition for ZNE Code compliant buildings that it will publish in the 2013 Integrated Energy Policy Report. ARB is in the process of updating the Scoping Plan, California's plan for reducing greenhouse gas emissions, and is committed to building upon the recent policies and goals adopted by CPUC and CEC and supporting the development of a statewide program requiring all new residential and commercial construction to operate with zero net energy use.

C. Renewable Energy Programs

Established in 2002 under Senate Bill 1078, accelerated in 2006 under Senate Bill 107 and expanded in 2011 under Senate Bill 2, California's Renewables Portfolio Standard (RPS) is one of the most ambitious renewable energy standards in the country. The RPS program requires all California retail electric providers to increase procurement from eligible renewable energy resources to 33 percent of total procurement by 2020. The State has also established a separate but related renewable energy policy to complement the 33 percent RPS. As part of his Clean Energy Jobs Plan, Governor Brown set an aggressive target of adding 8,000 MW of centralized, large-scale renewable facilities and 12,000 MW of distributed renewable generation by 2020. Of the 12,000 MW distributed renewable generation goal, 4,000 MW has already come online.

California has made substantial progress in developing new renewable generating resources to support the RPS and the Governor's goals. Approximately 2,000 MW of new renewable capacity came online in 2012,[35]–1,600 MW of which is wind generation; another 2,000 MW of renewable generation is scheduled to come online before the end of 2013. California is now the nation's second largest producer of wind power.[36]

[35] California Public Utilities Commission, *Renewables Portfolio Standard Quarterly Report*, 3rd and 4th Quarter 2012, http://www.cpuc.ca.gov.

[36] Wiser, Ryan, and Mark Bolinger. 2012. 2011 Wind Technologies Market Report. Lawrence Berkeley National Laboratories. U.S. Department of Energy. DOE/GO-102012-3472. August.

California leads the nation in solar photovoltaic capacity.[37] In 2012, California became the first state to install more than 1,000 MW of new solar capacity in a single year, from a combination of utility-scale projects and customer installations.[38] The State's Million Solar Roofs/California Solar Initiative program enacted in 2006 (Senate Bill 1, Murray, Chapter 132) is driving much of this effort. The incentive-based program set a target for 3,000 MW of self-generative solar, including solar water heating, by 2017. To date, over 1,400 MW of self-generating solar capacity has been installed under the incentives provided by this program.

D. Cap-and-Trade Program

On January 1, 2012, ARB launched the second-largest greenhouse gas Cap-and-Trade Program in the world. The Cap-and-Trade Regulation ensures progress toward the emissions target included in AB 32 and provides businesses flexibility to reduce emissions at the lowest possible cost. The Cap-and-Trade Regulation establishes a hard and declining cap on approximately 85 percent of total statewide GHG emissions. Under the Cap-and-Trade Regulation, ARB issues allowances equal to the total amount of allowable emissions and distributes them to regulated entities. One allowance equals one metric ton of GHGs. Each regulated entity must hold allowances equal to its emissions.

The Cap-and-Trade Regulation gives companies the flexibility to trade allowances with others or take steps to cost-effectively reduce emissions at their own facilities. As the cap declines, aggregate emissions are reduced. Under the Cap-and-Trade Regulation, a portion of the allowances required for compliance are auctioned by the State. The State's portion of the proceeds from these auctions is to be used to fund projects to reduce GHG emissions. The Cap-and-Trade Regulation provides assurance that California's 2020 target will be met because the regulation sets a firm limit on 85 percent of California's GHG emissions.

Because the Cap-and-Trade Program applies only to California entities, ARB designed the regulation to minimize emissions leakage by requiring first jurisdictional deliverers of electricity to hold a compliance obligation—that is, the first entity to put electricity onto the California grid is responsible for these emissions—whether they are a power plant or an importer.

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[37] Dutzik, Tony, and Rob Sargent. 2013. *Lighting the Way: What We Can Learn From America's Top 12 Solar States.* Environment America Research and Policy Center. July. www.environmentamericacenter.org/sites/environment/files/reports/Lighting_the_way_EnvAM_scrn.pdf.

[38] Marshall, J. 2013. California Still Tops in Renewable Energy Rankings. http://www.pgecurrents.com/2013/08/22/california-still-tops-in-renewable-energy-rankings/. Accessed August 23, 2013.

ARB has implemented mechanisms to keep allowance prices within an acceptable range by allowing a limited amount of future allowances to be used for compliance should prices get too high. The continuation of the Cap-and-Trade Program post-2020 will enhance the effectiveness of the new cost containment mechanism proposal.

On January 1, 2014, California is scheduled to link its program with the Canadian Province of Québec. California and Québec have worked together to harmonize their regulations and coordinate on a joint auction platform and tracking system.

The Cap-and-Trade Program limits the future emissions of GHGs by establishing an overall limit on emissions from most of the California economy—the "capped sectors." Within the capped sectors, some of the reductions are being accomplished through direct regulations, such as improved building and appliance efficiency standards, the low carbon fuel standard, and the 33 percent Renewables Portfolio Standard. Whatever additional reductions are needed to bring emissions within the cap is accomplished through price incentives posed by emissions allowance prices. Together, direct regulation and price incentives assure that emissions are brought down cost-effectively to the level of the overall cap. Reductions in the remainder of the economy—the "uncapped sector"—are being accomplished through specific measures, such as those for high-GWP gases and fugitive emissions from industrial sources.

E. Program Monitoring, Verification, and Reporting

If states opt to incorporate system-level plans into their section 111(d) compliance strategies, the robustness of monitoring and reporting components for these programs become critical to ensure reductions are realized. We outline some of the evaluation programs used in California, which may help inform U.S. EPA's evaluation of proposed state approaches.

CPUC has built robust evaluation into all of its renewable energy, demand response and energy efficiency programs. The critical components are different depending on the type of program.

For Energy Efficiency Programs, CPUC has employed a variety of incentives and penalties over the years to ensure compliance, refining its approach on a regular basis to improve program functionality. In recent years, CPUC has focused on "deep" retrofits, financing, and codes and standards. Utilities are rewarded on a wide range of metrics to ensure utilities focus on long-lived programs, including total program savings, effective program administration, and advocacy for improved standards. Measurement and evaluation is the key to this effort, and CPUC employs a staff of technical experts who work with outside consultants to measure program effectiveness and constantly

improve understanding of energy savings through efficiency. To this end, CPUC has created a database of all energy efficiency measures that tracks the energy consumption and savings of each measure. The database is constantly refined and updated as new empirical data becomes available about each measure in the database. Information on evaluation, measurement, and verification for energy efficiency programs can be found here: http://www.cpuc.ca.gov/PUC/energy/Energy+Efficiency/

For the RPS, CEC and CPUC work collaboratively to implement the program. The original RPS legislation assigned CEC with the responsibilities of certifying renewable facilities as eligible for the RPS, and designing and implementing a tracking and verification system to ensure that renewable energy output is counted only once for the purpose of the RPS and for verifying retail product claims in California or other states. Senate Bill X1-2 increased CEC's role with respect to POUs. As a result, CEC adopted regulations specifying procedures for enforcement of the RPS for POUs, and certifies and verifies eligible renewable energy resources procured by POUs and monitors their compliance with the RPS. CEC continues to certify and verify RPS procurements by retail sellers. CEC refers POU non-compliance issues to ARB, which may impose penalties. CPUC's responsibilities over IOUs, electric service providers, and community choice aggregators include determining annual procurement targets and enforcing compliance; reviewing and approving each IOU's renewable energy procurement plan; reviewing IOU contracts for RPS-eligible energy; and establishing the standard terms and conditions used by IOUs in their contracts for eligible renewable energy. CPUC issues program progress reports on a quarterly basis, and it makes an annual compliance report to the Legislature, which is required under State law. Utilities that do not meet their RPS goals are subject to a fine of $0.05 per kWh, up to $25 million per year. Those reports can be found here:
http://www.cpuc.ca.gov/PUC/energy/Renewables/

For the California Solar Initiative, CPUC relies on robust measurement and evaluation to ensure that the program is on track to meet its goals. The program performs regular evaluations in a variety of performance metrics, including 1) Process evaluations, which evaluate how well the utilities are administering the program; 2) Impact evaluations, which measure capacity of systems installed, performance of systems, degradation, and other metrics; 3) Cost-effectiveness evaluations, which measure the benefits of the program compared with the costs; 4) Market transformation reports, which assess how well the program has transformed the market for distributed solar PV systems; 5) Distributed Generation Impact Reports, which assess the technical impact of distributed solar PV systems on the functioning of the electric grid; and 6) External financial audits, which seek to ensure that the program administrators are properly tracking and reporting program expenses.

For the Cap-and-Trade Regulation administered by ARB, requirements to surrender allowances ensure emission reductions and provide compliance certainty using a state-level program that points to source-level controls. A requirement that sources surrender allowances on an annual basis can serve as an enforceable requirement to guarantee sources are on track to meet their emission budget, provided that sources cannot or will not acquire more sufficient allowances to exceed the budget. California's program limits source emissions, and helps guarantee declining power sector emissions. The current program has partial requirements at annual intervals, which includes a demonstration that the source is on a glide path to full compliance at the end of each compliance period. This flexibility is important to the design of the program and gives subject entities options to fulfill their obligations.

California's Cap-and-Trade system is supported by extensive enforcement, monitoring, and verification systems. These include a comprehensive GHG reporting rule,[39] which requires a wide array of sources to report their greenhouse gases annually, subject to rigorous independent verification requirements.[40] These reporting requirements ensure that sources fully comply with the Cap-and-Trade Regulation itself, which covers the vast bulk of greenhouse gas sources in the California economy (including the electric power sector, both electric power importers and exporters and individual generators).[41] Both the reporting and Cap-and-Trade rules impose civil and criminal liability for violators, and ARB has developed an extensive enforcement program. In the electric power sector context, ARB also works closely with other energy regulators, including CPUC, CEC, CAISO, Federal Energy Regulatory Commission, and the Commodity Futures Trading Commission to detect and correct noncompliance. With this support, the Cap-and-Trade Program guarantees consistent, substantial, quantifiable, and enforceable reductions from all covered sources, including power plants.

F. Intrastate Agency Program Coordination

Section 111(d) planning for the energy sector requires careful collaboration between energy and environmental agencies. Under the Clean Air Act, state governors are free to designate the agencies responsible for compliance with the Act, and section 111(d) may well provide a case for directing multiple agencies to work together on the planning process, whether as formal designees for federal compliance purposes or simply as a matter of effective state coordination.

California provides a good example of the positive results of such collaborative efforts. For a number of years, California regulators have been working to transition from the

[39] Cal. Code Regs. Titl. 17 §§ 95100 *et seq*.
[40] *See, e.g.*, *id.* §§ 95101 (applicability); 95130-95133 (verification).
[41] *See generally* Cal. Code Regs. Title 17, §§ 95800 *et seq.*

"silo," single-purpose approach to regulations and make a concerted effort to collaborate not only across multi-media environmental programs but also across various overlapping jurisdictions under the topics of air and energy. California's push to meet a substantial portion of air quality and climate change goals in heavily polluted regions through electrification and alternative energy projects has necessitated close collaboration between the State's air and energy agencies, which includes all levels of management and staff. Presently, many issue-focused groups exist to handle the multiple levels of coordination and subject areas that cross air and energy programs.

One of the key groups that may be used as a model for other states to follow is convened by the Governor's Office. The Energy Principals report and advise on the highest policy-level and most sensitive energy issues. The Principals group includes the State's leadership at ARB, CEC, CPUC, CAISO, and the State Water Board. These meetings provide an opportunity to discuss energy issues, set State priorities, resolve conflicts, and plan for the future. This group has addressed climate change planning, the retirement of the San Onofre Nuclear Generating Station, and the retirement of once-through cooling power plants to mitigate impacts to aquatic organisms, among other issues. Program success requires the cooperation of all involved agencies, and as a result of these concerted efforts, California air and energy agencies are coordinating more effectively than ever before and improving mutual understanding of each organization's concerns.

California also coordinates state and regional air pollution control programs. ARB has an oversight role, with direct regulatory responsibilities in some areas (including California's climate programs), but California's air districts are on the front lines of many emission control efforts, especially with regard to stationary sources. California's air agencies work closely together, and with the state's energy regulators to reduce emissions while protecting ratepayers.

III. Cross-State Issues

The interstate nature of the power grid raises complex questions. We look forward to working with U.S. EPA and our partner states to resolve these questions. Our initial efforts are focusing on tools that encourage states to collaborate and to account properly for reductions driven by these efforts.

EPA should include incentives for inter-state and regional collaboration.

Because the U.S. electricity system crosses state lines, U.S. EPA guidelines should encourage regional cooperation. Connecting the markets for buying and selling electricity beyond state boundaries can increase local utilities' flexibility and reliability

and provide consumer savings by enabling use of a wide variety of energy sources. Integrating our electricity markets expands user access to renewable energy sources. Recognizing and encouraging regional collaboration to reduce greenhouse gas emissions from the power plants that provide electricity to interstate markets is a possibility in a flexible, system-based approach. U.S. EPA should provide incentives to encourage states to work together in developing their section 111(d) plans to ensure that electricity imports and exports are properly accounted for, and opportunities to reduce emissions based on the efforts of partner states are recognized.

The *Pacific Coast Action Plan on Climate and Energy*, signed by the leaders of British Columbia, California, Oregon, and Washington, could be used as a model for states that have import/export implications. The Action Plan represents a commitment to a comprehensive and far-reaching strategic alignment to combat climate change and promote clean energy by harmonizing GHG reduction targets, expanding use of zero-emission vehicles, adopting low carbon fuel standards, leading the way to zero-net energy buildings, and supporting strong federal policy on GHG emissions, among other goals. Through the Action Plan, the leaders agreed that all four jurisdictions will account for the costs of carbon pollution and, where appropriate and feasible, link programs to create consistency and predictability across the region.

EPA's guidelines should address treatment of imported and exported electricity by allowing states that implement demand-side programs to take credit for those programs.

We look forward to working with U.S. EPA to ensure that energy crossing state lines is properly accounted for. California State law requires it to take responsibility for carbon emissions from the electricity it uses regardless of the point of origin and accounts for emissions from both in-state generation and imported electricity. U.S. EPA should consider adopting a similar approach. Each state could be responsible for emissions associated with both in-state and imported power and would receive credit for reducing emissions through demand-side programs from both in-state and imported power.

In the Cap-and-Trade Regulation, California implements this approach by requiring first deliverers of electricity to hold a compliance obligation. For imported electricity, the electricity importer is the first deliverer. The electricity importer is identified in two ways: (1) as the Purchasing-Selling Entity on the for the North American Electric Reliability Corporation (NERC) E-Tag when electricity is delivered between balancing authority areas, and (2) as the facility operator or scheduling coordinator when electricity does not cross balancing authorities. The criteria that led ARB to use this regulatory approach and identification of the first deliverer was that the first deliverer must be identifiable, ARB must rely on verifiable data, ARB must have jurisdiction over the first

deliverer, and the approach must be able to be duplicated and integrated with a linked program in a regional or comprehensive GHG program. The regulation and resulting compliance obligation must facilitate an appropriate and timely price signal, minimize unintended market signals that would inhibit or interfere with market structure or operation, treat all first deliverers equally, whether they are in-state generators or electricity importers.

Use of the first deliverer meets the necessary criteria because the electricity importer is clearly identified as the facility operator or scheduling coordinator or identified through the NERC E-tag, and it uses reliable data through the Mandatory Reporting Regulation, U.S. EPA, and the U.S. Energy Information Administration. This also treats in-state and out-of-state deliverers equally. The resulting carbon price is applied based on the actual emissions in State and out-of-state for specified sources or default emissions factor for unspecified sources. California's first-deliverer approach to treatment of electricity imports and exports is a model U.S. EPA could use as a national model.

Future Collaboration

California imports a significant proportion of its energy. In the future, the State may also export significant amounts of energy from renewable power sources at certain periods. These links tie us closely to our neighboring states and to the many states of the Western Energy Coordinating Council region. Due to the interconnectedness of the power grid, emission reductions occurring in one state may be the direct result of grid-level programs implemented in a neighboring state. In order to ensure that the state funding the program reducing emissions receives credit for the emission reductions resulting from them, importing states should be able to collaborate with exporting states to develop joint plans recognizing these relationships. This type of approach will necessitate states working closely together via both their air and energy agencies. We look forward to exploring carbon reduction opportunities throughout the regional grid with all these potential partners. The section 111(d) standards will help to support that cooperative effort.

IV. Relationship with the 111(b) Standard

While U.S. EPA is considering the 111(d) proposal, the agency is also currently setting performance standards for new sources of carbon pollution in the power sector under section 111(b) of the Clean Air Act. We will provide comments, if any, on the 111(b) standard at an appropriate time. For now, we emphasize that U.S. EPA should not view its technology analysis in the 111(b) context as constraining the emissions reductions it can secure from existing sources under the system-based approach, which the statute

invites for existing sources under 111(d). It is entirely possible that the 111(d) standard could have a stronger limit than the 111(b) standard for new sources due to the systems-based approach we have advocated.

V. Conclusions

We are committed to work closely with U.S. EPA to ensure that the section 111(d) power plant standards achieve significant national reductions, and to ensure that the actions that California facilities have taken and will be taking under AB 32 will be recognized and credited toward their 111(d) obligations.

We look forward to incorporating section 111(d) compliance into our efforts. California is coordinating its energy policy more effectively than ever before and our climate goals have steered us to look at the electricity system in an integrated fashion. As such, we advocate for a flexible, system-wide approach built on being more efficient and more innovative to motivate cost-effective and meaningful carbon reductions from the electric power sector.

Ultimately, air agencies will need to translate federal regulatory text into section 111(d) state plans within 12 months of U.S. EPA's finalization of the guidelines. We suggest that U.S. EPA share draft preamble and regulatory text with state and local air agencies prior to publication of the June 2014 proposal so potential issues and solutions can be developed prior to publication. We also suggest that U.S. EPA use the June 2014 proposal to solicit information from states needed to help finalize the guidelines by June 2015, to help states get a running start on developing state plans by June 2016.

We look forward to continued partnership and progress reducing GHG emissions as U.S. EPA formulates the 111(d) guidelines. Upon request we will provide additional details regarding the concepts and programs outlined herein. If you have any questions, please contact Mr. Richard W. Corey, Executive Officer, at (916) 445-4383.

Sincerely,

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COMMENTS OF THE ATTORNEYS GENERAL OF NEW YORK, CALIFORNIA, MASSACHUSETTS, CONNECTICUT, DELAWARE, MAINE, MARYLAND, NEW MEXICO, OREGON, RHODE ISLAND, VERMONT, WASHINGTON, AND THE DISTRICT OF COLUMBIA ON THE DESIGN OF A PROGRAM TO REDUCE CARBON POLLUTION FROM EXISTING POWER PLANTS

Executive Summary

The Environmental Protection Agency is soliciting input from stakeholders in developing a proposed rule under section 111(d) of the Clean Air Act (Act) to address greenhouse gas emissions from existing power plants: the largest source of greenhouse gas emissions in the nation. The Act requires EPA to ensure that States achieve emission reductions from existing power plants necessary to protect human health and welfare from the harms of carbon pollution. As part of its outreach effort in advance of proposing a rule in June 2014, EPA has requested the view of States on several aspects of regulation under section 111(d), including determining the best system of emission reduction and designing criteria by which to evaluate the adequacy of state programs.

The Attorneys General of New York, California, Massachusetts, Connecticut, Delaware, Maine, Maryland, New Mexico, Oregon, Rhode Island, Vermont, Washington, and the District of Columbia submit these comments in response to that request and on related issues concerning EPA's vital obligation to limit greenhouse gas emissions from existing power plants. Although each of the undersigned States has already taken significant steps to reduce greenhouse gas pollution emitted by the power sector, substantial work remains.

Section I of these comments provides background on the importance of EPA's rulemaking to address carbon pollution from existing power plants. First, we discuss the serious and well-recognized harms caused by carbon pollution and associated with climate change. Against this backdrop, we summarize how EPA finally reached the point of regulating greenhouse gas emissions from power plants. We then explain the various programs that, in the absence of EPA action until now, States have implemented to reduce greenhouse gas emissions from the power industry cost-effectively. These approaches include renewable portfolio standards, market-based cap-and-trade systems, planned retirements of coal-fired power plants, demand management and energy efficiency programs.

Section II discusses EPA's legal authority to regulate greenhouse gas emissions from existing power plants under section 111(d), including the text and legislative history supporting such regulation. Because EPA is regulating greenhouse gas emissions from new power plants under section 111(b) and greenhouse gases are not regulated as criteria pollutants or as hazardous air pollutants, EPA must regulate those emissions from existing power plants under

section 111(d). The obligation to act is further supported by EPA's longstanding interpretation of the scope of its authority to regulate under section 111(d), which was not altered by Congress's amendment of the statute in 1990.

Section III concerns the substantive aspects of regulation under section 111(d), including its cooperative federalism framework and EPA's role within this structure. Although some State Attorneys General have sought to relegate EPA to a perfunctory procedural role, EPA's role is far more central. EPA is first tasked with issuing emission guidelines that include minimum substantive emission limitations. In doing so, the Act authorizes EPA to determine the degree of emission limitation achievable when the best *system* of emission reduction, as determined by EPA to have been adequately demonstrated, is applied. To make this determination, EPA must consider a range of systems, including source-based and system-based[1] approaches of emission reduction. Then, EPA prescribes how to measure the achievable emission limitation, for example, with a pounds per megawatt hour emission rate, or a tons per year mass emission limit. Many existing programs that States have employed to begin the urgent task of reducing greenhouse gas emissions from the power sector should inform EPA's determination of the reductions achievable.

Finally, in Section IV, we look at the States' critical responsibilities under section 111(d). EPA sets the required degree of emission reduction, but each State must actually determine how to regulate its existing sources through its own state plan. Because section 111(d) puts the States in the driver's seat to implement and enforce the required emission reductions, EPA must give the States options to demonstrate compliance with its emission guidelines and tell the States how to show that their plans are equivalent to such guidelines. Such alternative mechanisms may include trading and other existing state programs, use of multi-year compliance periods, regional cooperation, and phased reductions if, among other things, the proposed standards are enforceable and the reductions are measurable and timely achieved. In short, the statute gives EPA and the States sufficient flexibility to achieve meaningful reductions of greenhouse gas emissions quickly and in a cost-effective way.

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[1] In its request for input in advance of EPA's proposed section 111(d) rule, EPA referred to two options for addressing carbon pollution from existing power plants, a "source-based approach" and a "system-based approach." CONSIDERATIONS IN THE DESIGN OF A PROGRAM TO REDUCE CARBON POLLUTION FROM EXISTING POWER PLANTS (Sept. 23, 2013), *available at* http://www2.epa.gov/sites/production/files/2013-09/documents/20130923stateguestions.pdf. EPA explained that "[a] system-based approach evaluates a broader portfolio of measures including those that could be taken beyond the affected sources but still reduce emissions at the source." *Id.* at 1-2. These comments accordingly use the terms "system-based approach" or a "system-wide approach" to mean industry-wide or power sector-wide systems of emission reduction.

I. The Urgency of Aggressively Addressing the Largest Sources of Carbon Pollution

In *Massachusetts v. EPA*, 549 U.S. 497, 521 (2007), the Supreme Court noted that "[t]he harms associated with climate change are serious and well recognized." As the recent draft U.S. Climate Action Report prepared by the Department of State succinctly states: "The scientific consensus . . . is that anthropogenic emissions of greenhouse gases are causing changes in the climate that include rising average national and global temperatures, warming oceans, rising average sea levels, more extreme heat waves and storms, extinctions of species, and loss of biodiversity." Climate Action Report 2014, U.S. Biennial Report – Highlights at 2.[2] The release of atmospheric carbon dioxide from human activities is also the primary cause of ocean acidification, which causes changes to ecosystems and marine biodiversity, potentially impacting food security and the economy.[3] A recent report confirmed that "[t]he ocean continues to acidify at an unprecedented rate in Earth's history," with a projected increase of 170 percent in ocean acidity by 2100 compared with preindustrial levels if carbon dioxide emissions are not reduced.[4] Significant reductions in greenhouse gas emissions must occur to prevent increases in the frequency, magnitude and scale of the adverse impacts of climate change pollution, which include:

- more heat-related deaths and illnesses;
- higher smog levels, increasing the rate of asthma, pneumonia and bronchitis;
- extreme weather, including storms, floods and droughts;
- loss of water supplies due to increased salinity and saltwater intrusion;
- coastal land loss due to inundation, erosion, submergence and habitat loss from a rising sea level;
- increased risk of wildfire;
- loss of snowpack in California's Sierra Nevada and the Cascade mountains in Oregon and Washington;
- ocean acidification;
- threats to ecosystems from the Adirondacks in New York to the Sierra Nevada in California;
- disappearance of plant and animal species and a rise of insect-borne illnesses, destructive fungi and pests;
- displacement of cold water fish species such as native brook trout in New York;

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[2] *Available at* http://www.state.gov/e/oes/climate/ccreport2014/index.htm.

[3] Ocean Acidification Summary for Policymakers, Third Symposium on the Ocean in a High-CO2 World, *available at* http://www.igbp.net/publications/summariesforpolicymakers/summariesforpolicymakers/oceanacidificationsummaryforpolicymakers2013.5.30566fc6142425d6c9111f4.html.

[4] *Id.*

- warmer stream temperatures and reduced stream flow, threatening Chinook salmon, coho salmon and steelhead trout species in California, Oregon and Washington;
- reduced hydroelectric production from snowmelt-driven shifts in stream flow;
- threats to our food production, agriculture and forest productivity;
- threats to our energy, transportation and water resource infrastructure; and
- increased environmental pressures on certain communities in low-lying areas, particularly in Alaskan indigenous communities.

The Supreme Court's decision not to disturb a federal court of appeals' ruling upholding EPA's determination that greenhouse gas emissions endanger public health and welfare ends the legal debate on climate science, *Coalition for Responsible Regulation v. EPA*, 684 F.3d 102 (D.C. Cir. 2012), *cert. denied*, 82 U.S.L.W. 3214 (U.S. Oct. 15, 2013) (No. 12-1272), switching the focus squarely to what the federal government and the States can do to address these emissions.

A. The history of federal regulation of power plant greenhouse gas emissions

In 2006, after EPA revised its new source performance standards (NSPS) for power plants and failed to include standards for greenhouse gas emissions, the States of New York, Connecticut, California, Delaware, Maine, New Mexico, Oregon, Rhode Island, Vermont, Washington, the Commonwealth of Massachusetts, the District of Columbia and the City of New York filed a petition seeking judicial review of that failure. *New York v. EPA* (D.C. Cir. No. 06-1322). The matter was ultimately remanded to the agency after the Supreme Court's decision in *Massachusetts v. EPA*, and in 2010, the parties entered into a settlement agreement setting a schedule for EPA to propose and promulgate NSPS for greenhouse gas emissions from new and existing power plants.

Although EPA failed to meet that rulemaking schedule, on June 25, 2013, President Obama issued a memorandum to the Administrator of the EPA, in which he directed the Administrator to fulfill her statutory duty under sections 111(b) and 111(d) of the Act "to issue standards, regulations, or guidelines, as appropriate, that address carbon pollution from modified, reconstructed, and existing power plants and build on State efforts to move toward a cleaner power sector." The President established new dates for the Administrator to issue a new proposal for NSPS for greenhouse gas emissions, for the Administrator to propose and finalize emission guidelines for existing power plants, and for the States to submit their implementation plans pursuant to those guidelines.

"The unique characteristics of carbon pollution and the interconnected nature of the electric power sector call for a broad and flexible approach to designing the program for existing power plants."

EPA Overview Presentation of Clean Air Act Section 111 (minute 27:49), *available at* http://www2.epa.gov/carbon-pollution-standards/what-epa-doing#overview.

EPA proposed NSPS for greenhouse gas emissions from new power plants on September 20, 2013.[5] As discussed below, the proposal triggered EPA's obligation to proceed with rulemaking under section 111(d), which governs regulation of air pollutants for existing sources that if new, would be subject to the NSPS. EPA's authority to act under section 111 is supported by the Supreme Court's decision in *American Electric Power v. Connecticut*, 131 S. Ct. 2527, 2537 (2011) (*AEP*), where the Court specifically pointed to section 111 in finding that the Act "speaks directly" to carbon dioxide emissions from power plants and that therefore, the Act "and the EPA actions it authorizes" displace any federal common law right of action to abate carbon dioxide emissions from fossil fuel-fired power plants.[6]

B. State efforts to curb power plant greenhouse gas emissions

Rather than simply wait for federal action, many States moved forward independently to implement programs to reduce greenhouse gas emissions from fossil fuel-fired power plants. Twenty States and the District of Columbia have set greenhouse gas emissions targets, reduced levels of emissions that each State has committed to achieve by a specified time.[7] States have employed different strategies to curb emissions, some of which are highlighted below.

Renewable portfolio standards

Most States now have renewable portfolio standards that require electricity providers to obtain a given amount of their electricity from sources such as wind or solar energy. These standards create demand for new renewable power generation, which can displace generation from existing fossil fuel-fired sources.

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[5] EPA had previously proposed an NSPS for greenhouse gas emissions from new power plants on April 13, 2012. 77 Fed. Reg. 22,392 (April 13, 2012). After receiving and reviewing more than a million public comments on the proposal, EPA decided to issue a new proposal. *See* http://www2.epa.gov/sites/production/files/2013-09/documents/20130920proposal.pdf.

[6] Because *AEP* concerned existing power plants, not new ones, the Court's reference to EPA's authority under the NSPS provisions of the Act to abate carbon dioxide emissions from fossil fuel-fired power plants must be to regulation under section 111(d).

[7] *See* http://www.c2es.org/us-states-regions/policy-maps/emissions-targets.

Under these programs, state renewable energy targets range from 1.5 percent (Iowa) to 40 percent (Hawaii), with compliance due over a range of time periods. Emission reductions attributable to these standards depend on the level and design of the standards and other state-specific factors, like the carbon intensity of existing sources and changes in demand. New York's effort to meet its renewable target of 30 percent by 2015 has already eliminated millions of tons of carbon dioxide, in addition to other pollutants. The World Resources Institute has projected that even States with relatively modest standards of between 8 and 12.5 percent can achieve reductions in emissions from existing power plants.[8]

Market-based systems

A number of Northeastern and mid-Atlantic States have joined together to reduce greenhouse gas emissions from existing power plants in their States through a regional cap-and-trade system known as the Regional Greenhouse Gas Initiative (RGGI).[9] Pursuant to each RGGI State's own regulations, regulated power plants must acquire, either at auction or on a secondary market, one emission allowance for each ton of carbon dioxide emitted. RGGI has succeeded in reducing carbon dioxide emissions from the power sector by more than 40 percent below 2005 levels, with further reductions projected. At the same time, these States have used the proceeds from allowance auctions to fund investments in energy efficiency, further reducing demand and generating large net economic benefits (hence the coining of the term a "cap-and-invest" program). For example, a recent analysis of RGGI's costs and benefits in the participating States found that the program produces a net benefit of $1.6 billion in the region (net present value), based on the first three-year compliance period.[10]

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[8] *See* Michael Obeiter et al., World Resources Institute, Power Sector Opportunities for Reducing Carbon Dioxide Emissions: Ohio 2 (2013), *available at* http://www.wri.org/sites/default/files/power_sector_opportunities_for_reducing_carbon_dioxide_emissions_ohio_summary.pdf; Michael Obeiter et al., World Resources Institute, Power Sector Opportunities for Reducing Carbon Dioxide Emissions: North Carolina 2 (2013), *available at* http://www.wri.org/sites/default/files/power_sector_opportunities_for_reducing_carbon_dioxide_emissions_north_carolina_summary.pdf; Michael Obeiter et al., World Resources Institute, Power Sector Opportunities for Reducing Carbon Dioxide Emissions: Michigan 2 (2013), *available at* http://www.wri.org/sites/default/files/power_sector_opportunities_for_reducing_carbon_dioxide_emissions_michigan_summary.pdf; Michael Obeiter et al., World Resources Institute, Power Sector Opportunities for Reducing Carbon Dioxide Emissions: Pennsylvania 2 (2013), *available at* *http://www.wri.org/sites/default/files/power_sector_opportunities_for_reducing_carbon_dioxide_emissions_pennsylvania_summary.pdf*.

[9] The States that currently participate in RGGI are Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont.

[10] *See* Analysis Group, The Economic Impacts of the Regional Greenhouse Gas Initiative on Ten Northeast and Mid-Atlantic States (2011), *available at* http://www.analysisgroup.com/uploadedFiles/Publishing/Articles/Economic_Impact_RGGI_Report.pdf.

California's economy-wide cap-and-trade program likewise requires power plants to obtain allowances or credits sufficient to match their emissions. The program is a key element of the State's efforts to reduce emissions to 1990 levels by 2020, as required by the California Global Warming Solutions Act. *See* CAL. HEALTH & SAFETY CODE §§ 38550, 38562(a). California projects the combination of cap and trade, a renewable portfolio standard, energy efficiency standards for consumer and industrial products, and other programs will reduce power sector emissions by at least 25 percent from 2005 levels by 2025. The state board has set a declining cap on emissions at a level deemed necessary to achieve the statute's emissions reductions goals, and thus can use the cap as a backstop in the event other programs in California's portfolio fall short of achieving their projected reductions.

Demand management

States have achieved significant cost-effective emission reductions and saved ratepayers money through efforts to reduce demand for electricity generation. More than half of the States require utilities to adopt Energy Efficiency Resource Standards, reducing demand by a specified amount each year.[11]

Retirement planning and plant refurbishment

Some States have enacted laws to encourage the retirement of old, inefficient power plants. Colorado's Clean Air Clean Jobs Act, HB-1365, required utilities to develop plans to reduce carbon dioxide and other emissions from their coal-fired power plants. The law encouraged utilities drafting those plans to consider retiring those plants and investing in energy efficiency programs, and allowed utilities to recover the costs of such changes. The State's largest utility, Xcel Energy, developed a plan to replace coal-fired power plants with natural gas-fired plants. Xcel projects its plan will reduce its carbon dioxide emission by 28 percent by 2020 and its emissions of other pollutants like sulfur and nitrogen oxides and mercury by more than 80 percent each. A similar law in Minnesota led Xcel to replace two existing coal-fired power plants and refurbish another, leading to a 21 percent reduction in greenhouse gas emissions.

Energy efficiency programs

Other state efforts include energy efficiency standards for consumer products and commercial and industrial equipment, residential and commercial building codes, and incentives for consumers to adopt more efficient technologies, and

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[11] *See* American Council for an Energy-Efficient Economy, *The 2013 State Energy Efficiency Scorecard* 19-20 (2013), *available at* http://aceee.org/research-report/e13k.

investment in energy efficiency projects. Massachusetts' energy efficiency programs have been so successful that the Independent System Operator New England (ISO-NE), New England's regional transmission organization which operates the bulk electric power generation and transmission system for New England and administers wholesale electricity markets, has begun to take the programs into account for purposes of its long term load forecasting. For the period 2016 through 2022, ISO-NE is projecting that, with state energy efficiency investments fully included, load growth will remain flat at about 132,000 GWh.[12] Such flat load growth means that customers reduce energy costs by 1) avoiding the cost of energy that would have been used absent energy efficiency; 2) reducing overall energy prices since lower demand results in lower prices for everyone; and 3) avoiding generation, transmission, and distribution infrastructure costs system-wide. By contrast, without including state energy efficiency programs in the projection, load growth is forecasted to increase from 144,000 to 152,000 GWh during that same period.[13] These data show that consumers can dramatically reduce the demand curve if state programs offer the right incentives.

The Massachusetts energy efficiency programs reduced retail sales of electricity in the Commonwealth by 2 percent in 2012; that number is expected to reach 2.5 percent in 2015, resulting in a cumulative annual carbon dioxide emission reduction of three million metric tons in 2015 from electric energy efficiency programs implemented from 2005 through 2015.[14] Because energy efficiency is less expensive than fossil fuel-fired power, the flattening of demand attributable to the Massachusetts efficiency programs represents both substantial savings to consumers and highly cost-effective reductions in carbon dioxide emissions.

Oregon's public purpose charge – 3 percent of the total revenues collected by the state's utilities – provides roughly $60 million per year to support energy efficiency, renewable energy, and low-income programs in Oregon. This funding supports the Energy Trust of Oregon's electric programs, including a goal of saving over 2,000 GWh of electricity between 2010 and 2014, equivalent to 1 percent of electricity sales in 2013 and 2014.

California has likewise focused on energy efficiency as a means to protect its consumers and reduce air pollution. For decades, California has enforced an expanding network of efficiency standards which help minimize the energy needed

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[12] ISO-NE Final 2013 Energy Efficiency Forecast 2016-2022 (Feb. 22, 2013), Slide 37, *available at* http://www.iso-ne.com/committees/comm_wkgrps/othr/enrgy_effncy_frcst/2013frcst/iso_ne_final_ee_forecast_2016_2022.pdf.

[13] *Id.*

[14] Massachusetts Department of Environmental Protection (November 21, 2013).

to power appliances and buildings.[15] Energy savings are projected at nearly 70,000 GWh in 2013 alone.[16] The California Energy Commission estimates that these efficiency standards have generated $74 billion in savings for California consumers over the last several decades.[17] Energy efficiency is the first resource California looks to as it considers its energy needs, and is the first resource considered in procurement proceedings under California's loading order.[18] Because California has decoupled utility profits from energy sales, its investor-owned utilities have strong incentives to pursue these savings.[19] Academic analysts have concluded that hundreds of thousands of jobs can be created by California's expanding energy efficiency programs.[20]

States' innovative programs provide valuable data and experience for EPA to consider and upon which it should draw in determining the best system of emission reduction from existing power plants.

II. EPA's Legal Authority to Regulate Greenhouse Gas Emissions from Existing Power Plants

EPA historically has interpreted section 111(d) to mandate regulation of existing sources' emissions of pollutants that are not regulated as criteria pollutants (under sections 108 and 110, 42 U.S.C. §§ 7408, 7410) or as hazardous air pollutants (under section 112, *id.* § 7412) once EPA regulates emissions of those pollutants from new sources under section 111(b). This construction is consistent with the idea that section 111(d) provides a "backstop" to regulation of pollutants under the national ambient air quality standards (NAAQS) or hazardous air pollutant programs. Thus, here power plants emitting greenhouse gases are subject to mandatory regulation under section 111(d) because greenhouse gases are not regulated as criteria pollutants or as hazardous air pollutants and because EPA has

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[15] *See generally* California Energy Commission, *Tracking Progress: Energy Efficiency* (2013), *available at* http://www.energy.ca.gov/renewables/tracking_progress/documents/energy_efficiency.pdf.

[16] *Id.*

[17] *See id.*

[18] *See generally* California Energy Commission, *Implementing California's Loading Order for Electricity Resources* (2004), *available at* http://www.energy.ca.gov/2005publications/CEC-400-2005-043/CEC-400-2005-043.PDF.

[19] *See* American Council for an Energy-Efficient Economy, *State Energy Efficiency Database: California* (2013), *available at* http://aceee.org/sector/state-policy/california.

[20] David Roland-Holst, Energy Efficiency, Innovation, and Job Creation in California 35 (2008), *available at* http://are.berkeley.edu/~dwrh/CERES_Web/Docs/UCB%20Energy%20Innovation%20and%20Job%20Creation%2010-20-08.pdf.

moved forward with regulating greenhouse gas emissions from power plants under section 111(b).

Two recent commentators have sought to use a legislative oddity – the enactment in 1990 of two differently worded amendments to section 111(d) – to argue that EPA is powerless to regulate greenhouse gas emissions from existing power plants.[21] As explained below, however, Congress's enactment of these two amendments did not change the backstop nature of EPA's authority to regulate under section 111(d). Instead, Congress revised section 111(d) to correct a cross-reference to section 112 as a result of substantive changes to section 112, not to effectuate sweeping change in the coverage of pollutants regulated under section 111(d).

A. The language, structure and history of section 111(d) show that greenhouse gas emissions from existing power plants are subject to regulation under this section.

Under the familiar two-pronged test of *Chevron, U.S.A., Inc. v. NRDC*, courts and agencies "must give effect to the unambiguously expressed intent of Congress." 467 U.S. 837, 842 (1984) (*Chevron*). If the statute is silent or ambiguous with respect to the specific issue, the question for the court is whether the agency's answer is based on a permissible construction of the statute. *Id.* at 842.

At step one of *Chevron*, "traditional tools of statutory construction," including legislative history and statutory text and structure, are employed to discern legislative intent. *Id*. at 843 n.9. *See*, *e.g.*, *Zuni Public School Dist. No. 89 v. Dep't of Educ.*, 550 U.S. 81, 89-100 (2007) (considering legislative history and purpose of statute first at step one, then again at step two). The text and structure of section 111(d) and the circumstances surrounding the amendment of section 111(d) make clear that power plant greenhouse gas emissions are subject to section 111(d) regulation.

Before its amendment in 1990, section 111(d) authorized regulation of "any air pollutant which is not included on a list published under section 7408(a) or 7412(b)(1)(A) of this title." *See* 42 U.S.C. § 7411(d) (West 1977). At that time, section 112(b)(1)(A) required EPA to list hazardous air pollutants meriting regulation under section 112. *See id*. § 7412(b)(1)(A). Congress amended the Act extensively in 1990 after its approach to regulating hazardous air pollutants "proved to be disappointing" due to EPA's delay in listing those pollutants under

[21] William J. Haun, *The Clean Air Act as an Obstacle to the Environmental Protection Agency's Anticipated Attempt to Regulate Greenhouse Gas Emissions from Existing Power Plants*, THE FEDERALIST SOCIETY (March 2013); Brian H. Potts, *The President's Climate Plan for Power Plants Won't Significantly Lower Emissions*, 31 YALE J. REG. ONLINE 1, 9 (Aug. 22, 2013).

section 112.[22] The 1990 amendments overhauled section 112 to identify 188 specific hazardous air pollutants and to regulate their emissions. 42 U.S.C. § 7412 (2012). To conform the language of section 111(d) to the changes made to section 112, Congress also revised section 111(d).

However, in an unusual turn of events, different language in the House and Senate bills amending section 111(d) was enacted into law without being reconciled in conference. In such circumstances, the Statutes at Large, rather than the U.S. Code, are controlling.[23] The Statutes at Large contain both the House and Senate amendments to section 111(d). The Senate amendment, set forth at Pub. L. No. 101-549, § 302(a), 104 Stat. 2399, 2574 (1990), simply substituted the reference to the amended section of the Act[24] and provides:

> Section 111(d)(1) of the Clean Air Act is amended by striking '112(b)(1)(A)' and inserting in lieu thereof '112(b).'

The House amendment, set forth at Pub. L. No. 101-549, § 108(g), 104 Stat. 2399, 2467 (1990), took a different approach and replaced the simple reference with an explanation:

> Section 111(d)(1)(A)(i) of the Clean Air Act [42 U.S.C. 7411(d)(1)(A)(i)] is amended by striking 'or 112(b)(1)(A)' and inserting 'or emitted from a source category which is regulated under section 112.'

Both amendments appear in the House Conference Report, which was enacted by both the House and the Senate, H.R. Conf. Rep. 101-952, at 50, 123 (1990), and the bill signed by President Bush contained both amendments surrounded by brackets with a footnote describing the amendments as "duplicative." According to the codifier, the provisions did nothing more than merely "in different language, change the reference to section 112." The Clean Air Act, as Amended, *reprinted in* 1 ENVIRONMENT AND NATURAL RES. POLICY DIV., LIBRARY OF CONGRESS, A LEGISLATIVE HISTORY OF THE CLEAN AIR ACT AMENDMENTS OF 1990, at 46 (1998).

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[22] *See Sierra Club v. EPA*, 353 F.3d 976, 979-80 (D.C. Cir. 2004) (describing history of hazardous air pollutant provisions between 1970 and 1990).

[23] 1 U.S.C. § 112 (2012). *See United States Nat'l Bank of Oregon v. Indep. Ins. Agents of Am.*, 508 U.S. 439, 448 (1993) ("Though the appearance of a provision in the current edition of the United States Code is 'prima facie' evidence that the provision has the force of law, 1 U.S.C. § 204(a), it is the Statutes at Large that provides the 'legal evidence of laws,' [1 U.S.C.] § 112, and despite its omission from the Code [a provision] remains on the books if the Statutes at Large so dictates").

[24] *See* 42 U.S.C.A. § 7411(d) (West 1977).

The bill signed by President George H.W. Bush contained both amendments surrounded by brackets with a footnote stating: "The amendments . . . appear to be duplicative; both, in different language, change the reference to section 112."

The Clean Air Act, as Amended, *reprinted in* 1 ENVIRONMENT AND NATURAL RES. POLICY DIV., LIBRARY OF CONGRESS, A LEGISLATIVE HISTORY OF THE CLEAN AIR ACT AMENDMENTS OF 1990, at 46 (1998).

Consistent with congressional intent and the codifier's understanding, the revisions to section 111(d) must be read, as a *Chevron* step one matter, as differently worded provisions that simply conformed the reference in section 111(d) to preclude the simultaneous regulation of air pollutants under sections 111(d) and 112. Indeed, the House and Senate amendments are found under the headings "Miscellaneous Provisions" and "Conforming Amendments," respectively. Pub. L. No. 101-549, §§ 108, 302(a), 104 Stat. 2399, 2467, 2574 (1990).

Despite the statutory language and structure and the legislative history, two recent commentators have argued that the House amendment precludes EPA regulation of greenhouse gas emissions from power plants under section 111(d), because greenhouse gas emissions would fall under the category of *any* pollutant that happens to be emitted from a source category that is being regulated under section 112. Nothing in the legislative history or structure of section 111(d) suggests that Congress intended the amendment to effect a sweeping, substantive change in the scope of regulation under section 111(d).

First, "[s]uch a reading would be inconsistent with the general thrust of the 1990 amendments, which, on balance, reflects Congress' desire to require EPA to regulate more substances, not eliminate EPA's ability to regulate large categories of pollutants like non-[hazardous air pollutants]." 70 Fed. Reg. 15,994, 16,032 (March 29, 2005). And where the 1990 amendments provided regulatory relief for specific categories of sources, they did so explicitly, *see*, *e.g.*, 42 U.S.C. §§ 7412(e)(1), 7412(n)(1), and after much discussion.[25] As the Supreme Court said in another Clean Air Act case, Congress "does not, one might say, hide elephants in mouseholes." *Whitman v. Am. Trucking Ass'ns.*, 531 U.S. 457, 468 (2001).

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[25] *See*, *e.g.*, S. Rep. No. 101-228, at 147 (1989), *reprinted in* 5 ENVIRONMENT AND NATURAL RES. POLICY DIV., LIBRARY OF CONGRESS, A LEGISLATIVE HISTORY OF THE CLEAN AIR ACT AMENDMENTS OF 1990, at 8514-15 (1998) (describing section 112(e) exceptions to general rules for scheduling standard-setting for sources under section 112(d)); Senate Debate on S. 1630 (April 3, 1990), *reprinted in* 4 ENVIRONMENT AND NATURAL RES. POLICY DIV., LIBRARY OF CONGRESS, A LEGISLATIVE HISTORY OF THE CLEAN AIR ACT AMENDMENTS OF 1990, at 7139-40 (1998) (discussing Senate Amendment adding section 112(n) requirement of study of mercury emissions from power plants prior to setting standards under section 112).

Second, as the former head of EPA's enforcement office recently wrote, such an interpretation would make section 111(d) a "dead letter" because it is "difficult—perhaps impossible—to think of an air pollutant that is (a) emitted by stationary sources within the ambit of section 111 but (b) not also emitted by some sources (stationary or otherwise) that *also* emit[] hazardous air pollutants." Adam Kushner and Judith Coleman, "*Lessons from Mercury: Ensuring Legal Certainty for New GHG Performance Standards from Existing Fossil Fuel Plants*," EE News 6 (Oct. 24, 2013) (emphasis original).[26] This huge gap in regulation would render section 111(d) ineffective in fulfilling its structural and historical role as a backstop provision and "impute to Congress a purpose to paralyze with one hand what it sought to promote with the other." *Clark v. Uebersee Finanz-Korporation, A.G.*, 332 U.S. 480, 488-89 (1947). A "cardinal principal of statutory construction" requires courts to reject interpretations like this that would render statutory provisions superfluous. *New York v. EPA*, 443 F.3d 880, 887 (D.C. Cir. 2006) (quoting *TRW, Inc. v. Andrews*, 534 U.S. 19, 31 (2001)).

The Federalist Society's interpretation "would make section 111(d) a 'dead letter' because it is "difficult—perhaps impossible—to think of an air pollutant that is (a) emitted by stationary sources within the ambit of section 111 but (b) not also emitted by some sources (stationary or otherwise) that also emits hazardous air pollutants."

Adam Kushner and Judith Coleman, "Lessons from Mercury: Ensuring Legal Certainty for New GHG Performance Standards from Existing Fossil Fuel Plants," (Oct. 24, 2013) at 6.

B. EPA has reasonably interpreted section 111(d) to resolve any ambiguity.

At a minimum, EPA's interpretation that gives effect to both the Senate and House amendments by limiting (not eliminating) its section 111(d) authority when it is regulating a source category under section 112 should be upheld because it is a permissible construction of the statute. *Chevron*, 467 U.S. at 843; *City of Arlington v. FCC*, 133 S. Ct. 1863 (2013) (reiterating that *Chevron* framework applies when agency interprets jurisdictional provision of statute it administers). Under EPA's

[26] *Available at* http://www.eenews.net/assets/2013/10/24/document_gw_01.pdf. Indeed, the commentators do not admit this potential breadth insofar as they suggest that the House Amendment precludes regulation of air pollutants emitted by a source category only where the source category to be regulated under section 111(d) is also regulated under section 112. Moreover, the fortuity that pollutant X shares a source with other more stringently regulated pollutants logically should have no bearing on the stringency, or existence of, regulation of pollutant X. *See Desert Citizens Against Pollution v. EPA*, 699 F.3d 524, 527-28 (D.C. Cir. 2012) (rejecting argument that certain consequences flowed simply because sources listed under one section for their emissions of seven particular hazardous air pollutants also emitted other pollutants).

interpretation, if EPA is regulating source category X under section 112, section 111(d) could not be used to regulate any hazardous air pollutant emissions from that particular source category. 70 Fed. Reg. at 16,031; s*ee also* 73 Fed. Reg. 44,354, 44,417-18, 44,487, 44,493 (July 30, 2008); 69 Fed. Reg. 4,652, 4,685 (Jan. 30, 2004).

In *Citizens to Save Spencer County v. EPA*, 600 F.2d 844, 872 (D.C. Cir. 1979), the court upheld EPA's approach of seeking to reconcile seemingly inconsistent amendments by giving some effect to both, explaining that:

> [where Congress] drew upon two bills originating in different Houses and containing provisions that, when combined, were inconsistent in respects never reconciled in conference . . . it was the greater wisdom for the agency to devise a middle course between inconsistent statutes so as to give maximum possible effect to both.

Similarly here, EPA's interpretation gives effect to each amendment, maintaining the focus of the previous version of the Act on specific pollutants, as preserved by the Senate amendment, and incorporating the House amendment's reference to specific sources to ensure that section 112 regulated source categories will not be subject to duplicative regulation of hazardous air pollutants under both section 112 and section 111(d). As a *Chevron* step two matter, EPA's interpretation giving effect to both amendments is a reasonable one. *Chevron*, 467 U.S. at 843; *Smiley v. Citibank, N.A.*, 517 U.S. 735, 744-745 (1996).[27]

Thus, because greenhouse gases are not regulated as hazardous air pollutants or criteria pollutants, and because EPA has moved forward with regulation of power plant greenhouse gas emissions under section 111(b), power plant greenhouse gas emissions must be regulated under section 111(d).

III. The Cooperative Federalism Framework of Section 111(d)

Section 111(d) establishes a framework that gives EPA and the States distinct but complementary roles to regulate air pollutants from existing sources that, if new, would be subject to NSPS. Section 111(d) requires EPA to prescribe regulations that establish a section 110-like procedure under which each State shall submit to EPA a plan establishing, implementing and enforcing standards of performance for such sources. "Standard of performance" is defined as a standard for emissions of air pollutants that reflects the degree of emission limitation

[27] *See also Am. Water Works Ass'n v. EPA*, 40 F.3d 1266, 1271 (D.C. Cir. 1994) (quoting *Chem. Mfrs. Ass'n v. NRDC*, 470 U.S. 116, 126 (1985); *Desert Citizens Against Pollution*, 699 F.3d at 527-28 (agreeing with EPA's interpretation that section 112(c)(6)'s cross-reference to sections 112(d)(2) and (d)(4) only meant that seven pollutants specified in section 112(c)(6) were subject to standards required in latter sections, not that all hazardous air pollutants emitted by sources that also emitted seven pollutants were subject to these standards).

achievable through the application of the best system of emission reduction that, considering the cost of achieving the reduction and any nonair quality health and environmental impact and energy requirements, EPA determines has been adequately demonstrated. 42 U.S.C. § 7411(a)(1).

As discussed below, the definition of "standard of performance" calls for EPA to determine the adequately demonstrated best system of emission reduction and the corresponding achievable degree of emission limitation.[28] Once EPA sets the floor in its emission guidelines, each State must submit a plan establishing standards of performance for existing sources and implementing and enforcing such standards. 42 U.S.C. § 7411(d)(1).

Thus, like the section 110 state implementation plan (SIP) framework and procedure, section 111(d) directs EPA to work hand-in-hand with the States to ensure that each State – through its plan – achieves the reductions that EPA has determined are achievable through the application of the best system of emission reduction that has been adequately demonstrated. This cooperative federalism allows EPA to establish the minimum reductions required, while giving the States flexibility to determine how to achieve those reductions (or more).

A. Section 111(d) requires EPA to establish emission guidelines, including substantive limitations, for existing sources.

Under section 111(d), EPA issues emission guidelines and, "in compliance with those guidelines and subject to federal oversight, the States then issue performance standards for stationary sources within their jurisdiction." *AEP*, 131 S. Ct. at 2537 (citing 42 U.S.C. § 7411(d)). The statutory framework thus requires EPA to "establish guidelines as to what the best system for each such category of existing sources is" and the States to apply those guidelines. H.R. Rep. No. 95-294, at 195, *as reprinted in* 1977 U.S.C.C.A.N. 1077, 1274.

To fulfill its statutory responsibilities, EPA must establish substantive emission limitations for existing sources. Pursuant to section 111(a), EPA must determine the emission reduction achievable through application of the best system of emission reduction it determines is adequately demonstrated, considering costs and other factors. 42 U.S.C. § 7411(a). Based on this determination, EPA uses its expertise to establish standards for new and modified sources under section 111(b) and emission guidelines for the States to follow under section 111(d). For EPA to evaluate the adequacy of state plans under section 111(d)(2), as the statute requires it to do, EPA must first establish a benchmark. That way it can, if necessary, step

[28] "Emission limitation" is defined in section 302 to mean requirements which limit the quantity, rate or concentration of emissions of air pollutants on a continuous basis, including any requirement relating to the operation or maintenance of a source to assure continuous emission reduction, and any design, equipment, work practice or operational standard promulgated under this chapter. 42 U.S.C. § 7602.

in where a State either submits an unsatisfactory plan or fails to enforce provisions of an approved plan. 42 U.S.C. § 7411(d)(2).

Another group of State Attorneys General has pointed to the language in section 111(d) that requires EPA to establish a procedure similar to that under section 110 for submission of state plans as limiting the agency's role to a perfunctory one.[29] EPA correctly dismissed that interpretation at the beginning of the section 111(d) program. That interpretation cannot be squared with the statute's directive that EPA evaluate the content of state plans under section 111(d) and "prescribe a plan for a State in cases where the State fails to submit a satisfactory plan." 42 U.S.C. § 7411(d)(2). And if the States alone could determine the standards to be applied, it would not have been necessary for Congress to expressly require EPA to allow the States to consider the "remaining useful life of a source" when applying those standards. Indeed, the very language upon which these commentators rely, requiring EPA to establish a "procedure similar to that provided by section 7410," does not support their interpretation because EPA uses its scientific expertise to establish substantive standards under section 110 (national ambient air quality standards), which the States then develop plans to implement. Thus, section 111(d) plainly requires EPA to establish minimum emission limitations to guide the States in devising their plans and to provide an objective measure against which EPA may judge the equivalency of the performance standard(s) included in each state plan.

EPA's regulations call for guideline documents to include:

- a description of adequately demonstrated systems of emission reduction,
- the degree of emission reduction achievable with each system,
- the costs and environmental effects of each system,
- an emission guideline reflecting the application of the best system of emission reduction adequately demonstrated for existing sources, and
- the time within which compliance with equivalent emission standards can be achieved.

40 C.F.R. § 60.22(b).

EPA's longstanding interpretation of its authority further affirms that it is, at a minimum, *allowed* to establish substantive guidelines. *See Chevron*, 467 U.S. at 842 (agency's interpretation will be upheld if based on permissible statutory construction). In its rulemaking proposal to establish general procedures under section 111(d), EPA explained that it would publish guideline documents setting minimum emission limitations that reflect the best available demonstrated systems of emission control. 39 Fed. Reg. 36,102 (Oct. 7, 1974).

EPA reiterated in the preamble to its final rule that the agency has the statutory

[29] *Perspective of 18 States on Greenhouse Gas Emission Performance Standards for Existing Sources under § 111(d) of the Clean Air Act*, submitted to EPA under cover letter dated September 11, 2013 by the State of Nebraska Office of the Attorney General ("*Nebraska*").

authority to set minimum emission guidelines for state emission standards included in state plans. 40 Fed. Reg. 53,340, 53,342 (Nov. 17, 1975). Responding to industry comments questioning EPA's authority to prescribe more than procedural requirements for state plan adoption and submittal, EPA correctly reasoned that its interpretation was necessary to implement section 111(d) effectively. If EPA had no authority to set minimum substantive guidelines, the States would be able to set "extremely lenient standards" for air pollutants subject to regulation only under Section 111(d) – which would leave "a gaping loophole in a statutory scheme otherwise designed to force meaningful action." *Id.* at 53,343.

Thus, if the Administrator determines that a designated pollutant may cause or contribute to endangerment of public health or welfare, emission standards shall be no less stringent than EPA's emission guidelines.[30] 40 CFR § 60.24(a)(d). EPA has followed this approach in each of the emission guidelines it has promulgated pursuant to section 111(d), repeatedly establishing minimum emission limitations in its final emission guidelines for each State to include in its respective plan.[31] A contrary interpretation would undermine the intent of section 111(d) to provide a backstop for emissions of harmful unregulated air pollutants from existing sources and also effectively would nullify section 111(d)'s provisions concerning EPA's role in determining the best system of emission reduction and in approving state plans.[32]

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[30] EPA's guidelines to the States are not enforceable against a source, but may be used to judge the adequacy of state plans. 40 Fed. Reg. at 53,343.

[31] *See, e.g.*, 40 C.F.R. § 60.31d (establishing emission guideline for sulfuric acid production units at 0.25 grams sulfuric acid mist per kilogram of sulfuric acid produced); 40 C.F.R. § 60.33b (establishing emission guidelines for pollutants emitted by municipal waste combustors); 40 C.F.R. § 60.33e (establishing specified emission limits for pollutants emitted by hospital, medical, infectious waste incinerators); 40 C.F.R. § 1515 (establishing specified emission limits for pollutants emitted by small municipal waste combustion units); 40 C.F.R. § 60.2515 (establishing specified emission limits for pollutants emitted by commercial and industrial solid waste incineration units); 40 C.F.R. § 60.2983 (establishing specified emission limits for pollutants emitted by other solid waste incineration units); 40 C.F.R. § 60.5015 (establishing specified emission limits for pollutants emitted by sewage sludge incineration units).

[32] *Cf. Big Rivers Elec. Corp. v. EPA*, 523 F.2d 16, 22 (6th Cir. 1975) (EPA acted within its authority in rejecting alternate control strategies in lieu of emission limitations that Kentucky sought to include in its state implementation plan and explaining that under section 110's "dual scheme, the freedom of the States to choose the manner of achieving this goal [of reducing air pollution] was made subject to the absolute requirement that every state plan include emission limitations as an ingredient").

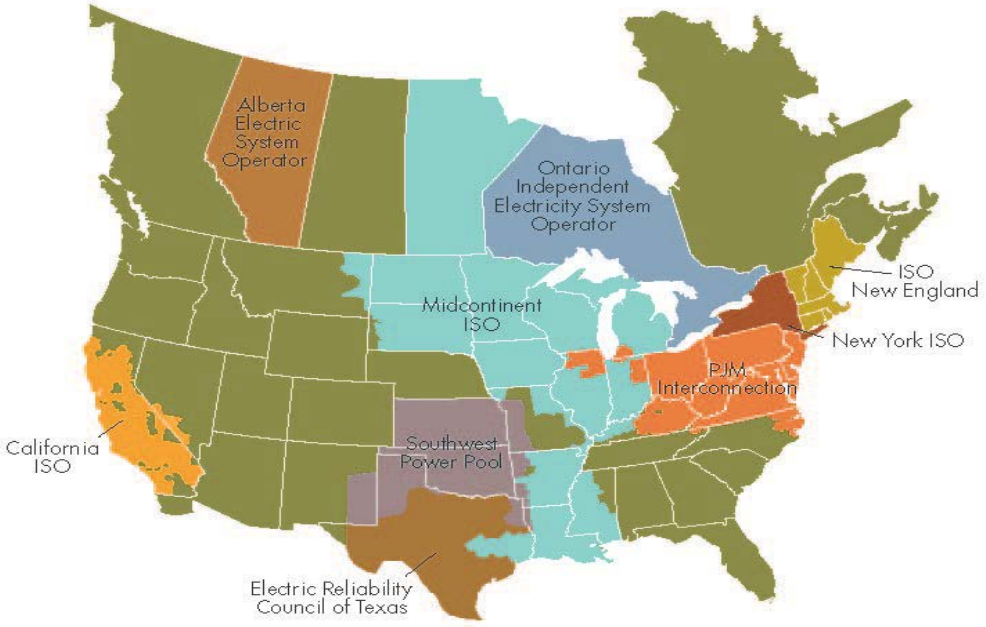
B. EPA must evaluate the full range of available systems in determining the achievable emission reductions from existing power plants.

EPA must require emission reductions at a level that is achievable when applying the best system of emission reduction that EPA determines is adequately demonstrated, considering the cost of achieving the reduction and any nonair quality health and environmental impact and energy requirements. 42 U.S.C. § 7411(a); *AEP*, 121 S. Ct. at 2549. Because section 111(d) applies only to existing sources, Congress recognized from the outset a need for flexibility in determining appropriate control measures. *See* "Clean Air Act Amendments of 1977," *Committee on Interstate and Foreign Commerce,* H.R. Rep. No. 95–294 at 195, *reprinted in* 4 "A Legislative History of the Clean Air Act Amendments of 1977," *Congressional Research Service,* 2662. Therefore, to achieve the greatest level of reductions from existing power plants cost effectively, EPA must evaluate diverse types of systems when considering the best demonstrated system of emission reduction, in keeping with the highly interconnected nature of the existing sources at issue here.

1. EPA must consider system-based approaches as well as source-based approaches to determine the best system of emission reduction adequately demonstrated and the corresponding emission limitation.

EPA must consider existing systems of emissions reductions in determining the "best system of emission reduction" for greenhouse gases emitted by power plants. Because the statute does not separately define "system," the assumption is that "the ordinary meaning of that language accurately expresses the legislative purpose." *Engine Mfrs. Ass'n v. S. Coast Air Quality Mgmt. Dist.*, 541 U.S. 246, 252-53 (2004) (quotations and citations omitted). At the time that Congress created the NSPS program in 1970, system was defined as "a complex unity formed of many often diverse parts subject to a common plan or serving a common purpose." Webster's Third New International Dictionary of the English Language Unabridged 2322 (1968). This broad definition includes not just source-specific systems or approaches to reducing emissions, but also system-wide approaches that have been adequately demonstrated. Source-specific changes that reduce carbon emissions include plant efficiency improvements, heat rate improvements, switching to or co-firing with lower carbon fuels, combined heat and power programs, and carbon capture and sequestration. System-wide approaches would include those programs that shift generation from less efficient to more efficient plants and to renewable energy and programs that reduce the need for generation and could drive or otherwise implicate the source-specific approaches noted above. Such systems would include emissions from all power plants or from multiple power plants within a regional, state or regulatory system to which each power plant must adhere.

Because existing power plants are components of a complex and interconnected electricity grid, or network, EPA must consider system-wide programs that reduce carbon emissions from this sector. Approaches for reducing emissions from existing power plants will be most effective if they reflect the fact that power plants operate not in isolation, but as parts of large, dynamic grid-connected systems.



http://www.isorto.org/site/c.jhKQIZPBImE/b.2604471/k.B14E/Map.htm

For example, ISO-NE, New England's regional transmission organization, includes 300 generating plants and 8,000 miles of transmission lines. ISO-NE serves 6.5 million households and businesses, and its 400 market participants complete wholesale electricity transactions valued annually at ten billion dollars.[33] The interconnected nature of the electricity system is taken into account for purposes of system management; for example, decisions concerning plant retirements and dispatch are made on the basis of system-wide considerations. *See, e.g.*, ISO-NE Non-Price Retirement Determination Letters and Resource Responses.[34]

EPA has previously recognized the interconnected relationship between regional multi-state power pool dispatch decisions and resulting emissions impacts in the participating States. In EPA's SIP call for nitrogen oxides (NOx SIP call), EPA approved a redistribution of the NOx SIP call budgets for Connecticut, Massachusetts and Rhode Island based on a Memorandum of Understanding

[33] See ISO-NE history, *available at* http://www.iso-ne.com/aboutiso/co_profile/history/index.html.

[34] *Available at* http://www.iso-ne.com/genrtion_resrcs/reports/non_prc_retremnt_lttrs/2011/salem_retirement_election.pdf.

(MOU) entered into by the three States and EPA. 64 Fed. Reg. 49,987, 49,989 (Sept. 15, 1999). EPA noted that the States belonged to the same power pool and that, because "dispatch is determined on the power pool level rather than the State level, dispatch itself may result in redistribution of generation and resulting emissions among the States in the power pool." *Id.* Therefore, EPA concluded "a redistribution, based on the MOU, of budgets within that power pool is appropriate if the same overall budget results." *Id.*

"[S]tandards adopted for existing sources under section 111(d) of the Act are to be based on available means of emission control (not necessarily technological)." H.R. Rep. No. 95-294, at 11, *as reprinted in* 1977 U.S.C.C.A.N. 1077, 1088. Thus, in analyzing the best system to reduce greenhouse gas emissions from power plants that is adequately demonstrated, EPA must consider electric power system-based approaches and existing state and regional programs, including those described above, that have successfully reduced carbon dioxide emissions from the power sector as a whole. *See Essex Chem. Corp. v. Ruckelshaus*, 486 F.2d 427, 433-34 (D.C. Cir. 1973) (explaining that "[it] is the system which must be adequately demonstrated and the standard which must be achievable"). Such reductions, which have resulted in part from system-based approaches that provide incentives for sources to increase efficiency and find reductions elsewhere in the power sector, must be considered by EPA in determining the best system of emission reduction. In addition to recognizing the true nature of electricity generation and supply, such an approach offers the greatest potential for achieving significant greenhouse gas reductions from existing power plants.

2. EPA may determine that the emission limitation is best measured by mass and best achieved in phases.

EPA's emission guideline must reflect the application of the best system of emission reduction as determined by EPA. *See* 40 C.F.R. § 60.22(b). In establishing the emission guideline, EPA may determine that the best metric is a mass-based limit and that existing power plants may achieve increasingly stringent limitations in phases.

Although EPA has typically defined an emission limitation by an emission rate, for example, pounds per megawatt hour (lbs/MWh), EPA is not constrained to do so. The Act defines "emission limitation" as a limit on "the quantity, rate or concentration of emissions of air pollutants on a continuous basis." 42 U.S.C. § 7602(k). Thus, EPA may find that the best metric for the achievable emission limitation is a mass-based limit or cap on the quantity of emissions, for example, tons/year, as long as the source is continuously subject to the emission limitation or standard. *See* 42 U.S.C. § 7602(k) (defining "emission limitation"). In *Sierra Club v. EPA*, 551 F.3d 1019, 1027 (D.C. Cir. 2008), the court rejected EPA's attempt to exempt major sources from normal emission standards under section 112 during startups, shutdowns and malfunctions and explained that "[w]hen *sections 112 and*

302(k) are read together, . . . Congress has required that there must be continuous *section 112-compliant* standards." Thus, when sections 111(d) and 302(k) are read together, the source must be continuously subject to section 111(d)-compliant standards.[35]

To ensure that sources are subject to continuous emission limitations, section 111(d) standards, whether in emission rate or mass-based form, must be reliable and enforceable. *See Kennecott Copper Corp. v. Train*, 526 F.2d 1149, 1155 (9th Cir. 1975) (finding that intermittent control systems are not reliable or enforceable and therefore violate statute's requirement that NAAQS be met by continuous emission limitations to maximum extent possible). Thus, although EPA may broadly define a "system" for purposes of determining what level of emission reductions are achievable, state plans must ensure that emission limits can be enforced against covered facilities, as is done through the RGGI program for example.

EPA also may determine that the best demonstrated system of emission reduction can achieve specified limitations in phases. For example, certain renewable energy programs may require investment and time to realize lower emissions, or certain retirement planning and clean energy incentives may mean that greater emission reductions will be achieved later in time. In such circumstances, a phased approach may best reflect the achievable emission limitations. *See* 42 U.S.C. § 7411(d)(1). EPA has discretion under section 111(d) to so determine and to allow States to give affected sources more time to meet more stringent reduction requirements, based on when the reductions may be achieved, provided that the critical goal of achieving significant emission reductions from this industry sector expeditiously is maintained. *Id.*; *see* 70 Fed. Reg. at 28,620.

IV. Evaluating Equivalency of State Programs Under Section 111(d)

Once EPA sets the floor in its emission guidelines, each State must submit a plan establishing standards of performance for existing sources and implementing and enforcing such standards. 42 U.S.C. § 7411(d)(1). As under section 110, it is up to the States to make the choices.[36] So long as the States demonstrate that the steps and strategies proposed in their plans meet EPA's guidelines, the States

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[35] In this way, the definition of "standard of performance" in section 302, which means "a requirement of continuous emission reduction," is also satisfied. 42 U.S.C. § 7602(l).

[36] In the section 110 context, which provides insight because of section 111(d)'s reference thereto, courts have rejected attempts by EPA to dictate to the States the choices they employ in their SIPs. *See Train v. NRDC*, 421 U.S. 60, 79 (1975) (explaining that although EPA is "plainly charged" with setting NAAQS, EPA has "no authority to question the wisdom of a State's choices of emission limitations if they are part of a plan which satisfies the standards of § 110(a)(2)"); *Union Electric Co. v. EPA*, 427 U.S. 246, 268-69 (1976) (rejecting claims of technological or economic infeasibility as basis for EPA to deny SIP, because "Congress plainly left with the States … the power to determine which sources would be burdened by regulation and to what extent" and that Congress considered risks associated with technology forcing and "decided that the dangers posed by uncontrolled air pollution made them worth taking").

retain the authority to determine *how* to achieve the overall emission limitations. *See, e.g.*, *Virginia v. EPA*, 108 F.3d 1397, 1410 (D.C. Cir. 1997) (finding that EPA has no authority under section 110, as amended in 1990, to force a State to adopt particular control measures). At the same time, EPA must ensure that state plans achieve real, quantifiable and enforceable reductions.

Because the States must demonstrate that their plans comport with EPA's guidelines, EPA should provide sufficient guidance regarding the minimum requirements and how the States can show that their strategies will achieve the necessary reductions. Equivalency determinations should be guided by the general principles discussed above: that Congress gave EPA the authority to require the States to achieve specified reductions, that Congress gave the States the authority to set performance standards for existing sources, and that Congress recognized the need for flexibility, including the appropriateness of considering remaining useful life and other factors for particular sources.

A. The States must be given flexibility in their plans provided that their proposed programs are enforceable.

Given the daunting challenge of addressing climate change, EPA should fully embrace the flexibility built into the statutory design by accepting a variety of state programs under section 111(d) so long as those programs achieve the emission limitation EPA sets and are enforceable.[37] As discussed above, many States have already implemented a variety of programs that have achieved significant reductions of carbon dioxide emissions from the power sector. These programs include 1) both interstate and intrastate market-based programs that cap carbon dioxide emissions at reduced levels, 2) retirement and refurbishment planning as well as renewable portfolio standards that encourage a shift away from more carbon-intensive electricity production, and 3) demand side management and energy efficiency programs that reduce the amount of electricity needed and thereby cause a decrease in carbon dioxide pollution. Because these types of programs have succeeded in reducing carbon pollution from the power sector, the States should be permitted to rely on these programs in their plans, subject to EPA review, to demonstrate equivalency consistent with section 111(d)'s requirements.

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[37] The National Association of Regulatory Utility Commissioners (NARUC), whose members' fundamental role is to assure that utilities provide reliable electricity at a fair cost, recently recognized the need to address greenhouse gas emissions with flexibility and from a regional perspective, resolving that, among other things, " the guidelines should provide sufficiently flexible compliance pathways or mechanisms that recognize State and regional variations to achieve the most cost-effective emissions reductions in each State;…" *Resolution on Increased Flexibility with Regard to the EPA's Regulation of Greenhouse Gas Emissions from Existing Power Plants*, *available at* http://www.naruc.org/Resolutions/Resolution%20on%20Increased%20Flexibility%20with%20Regard%20to%20the%20EPAs%20Regulation%20of%20Greenhouse%20Gas%20Emissions%20from%20Existing%20Power%20Plants.pdf.

Similarly, if EPA elects to issue a rate-based emission guideline, EPA should provide guidance to the States, for the purpose of demonstrating equivalency of state programs. For example, if EPA issues a pounds-per-megawatt hour carbon dioxide limit on power plant emissions, it should provide guidance on how to translate that rate-based emission guideline into a mass-based standard, for example, tons of carbon dioxide emitted annually from power plants, individually and/or combined in a state or regional system (see below).

EPA should also provide adequate guidelines on appropriate implementation and enforcement mechanisms, such as monitoring and reporting requirements. These guidelines are necessary to ensure that each State meets its obligations and that no "double counting" occurs. One option EPA could consider that would allow for flexibility yet ensure enforceability would be to allow the States to utilize a multi-year compliance period. Under this approach, each source is required to demonstrate full compliance on a multi-year, instead of an annual, basis.

B. States should be allowed to use trading programs to meet their section 111(d) obligations.

Cap-and-trade programs are well-suited to address greenhouse gas emissions from existing power plants in light of the ability of such programs to ensure source compliance with emission limitations and the difference in "hot spot" effects caused by greenhouse gas emissions and criteria pollutants. If a cap-and-trade program sets the cap appropriately below current emissions and mandates that all emissions from sources in the category are covered by sufficient allowances, such a program should qualify as a system that requires continuous emission reduction. *See* 42 U.S.C. §§ 7411(a); 7602(l).[38] As discussed below and in the next section, EPA should therefore allow the States to use intrastate and interstate cap-and-trade programs in meeting their section 111(d) obligations.

EPA has previously allowed the States to implement trading programs to satisfy their section 111(d) obligations. For example, in its municipal waste combustor rule, EPA allowed the States to establish a program to enable municipal waste combustor plants to engage in trading of nitrogen oxides emission credits, so long as EPA approved the trading program before implementation. 60 Fed. Reg. 65,387, 65,402 (Dec. 19, 1995); 40 CFR § 60.33b.

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[38] EPA may consider scenarios in which emissions reductions attributable to renewables generation and increased end use energy efficiency would be credited on the basis of carbon dioxide emissions avoided, and such credits used by covered facilities to achieve compliance with the emission guidelines. *See, e.g.*, Natural Resources Defense Council, Closing the Power Plant Carbon Pollution Loophole: Smart Ways the Clean Air Act Can Clean Up America's Biggest Climate Polluters (March 2013). In considering these scenarios, EPA should evaluate and articulate any methodology to be used to determine credit eligibility sufficient to satisfy section 111(d)'s existing source emission limitation requirement.

Similarly, in the Clean Air Mercury Rule (CAMR), EPA authorized the States to participate in a cap-and-trade program to meet their section 111(d) obligations. 70 Fed. Reg. at 28,616-17. Although that rule was vacated by the D.C. Circuit on other grounds,[39] there are several aspects of that rulemaking that could inform EPA's thinking here, especially given that greenhouse gas emissions do not pose the type of "hot spot" concerns as pollutants such as mercury.

First, in determining that a cap-and-trade program could be considered the best system of emission reduction, EPA concluded that it was the best system "in the relevant timeframe." 70 Fed. Reg. at 28,617. That is instructive here where in light of the potential options for existing power plants, supply side energy efficiency, fuel switching, and co-firing with cleaner fuels, shifting dispatch to lower emitting facilities, and demand side energy efficiency are some of the emission reduction strategies available "in the relevant timeframe."

Second, EPA allowed each State to choose whether to fulfill its section 111(d) obligations by participating in a cap-and-trade program or selecting some other means to stay within its statewide emissions budget. A similar approach could work here for greenhouse gas emissions. Third, EPA required new units to be subject to the cap-and-trade program and to hold sufficient allowances to cover their emissions. *See* 70 Fed. Reg. at 28,632. EPA let each State choose an allocation method and choose whether to set aside allowances to account for new units. *See id.* at 28,632; 69 Fed. Reg. at 12,406-409. Similarly, the States should have the option of including all power plants, including those that may come on-line after a state plan is approved, within a trading plan for greenhouse gas emissions. A state plan could specify its allocation method and specify how new units will be accommodated.

A source category cap-and-trade program, whether standing alone or as an element of a larger state cap-and-trade program, will drive reductions both at and outside the source category because cap-and-trade is designed to provide an economic incentive for sources to increase efficiency and deploy other means of reducing emissions and for end users to innovate, as well. All reductions attributable to such a market-based approach should be considered for purposes of EPA's best system of emissions reduction determination. Nevertheless, while cap-and-trade drives reductions outside the source, it is not necessary to quantify and account for those reductions for compliance purposes. For all the reasons discussed

[39] The D.C. Circuit vacated the section 112 delisting rule that EPA relied upon to promulgate CAMR under section 111(d). *New Jersey v. EPA*, 517 F.3d 574 (D.C. Cir. 2008). References to the CAMR in this paper do not reflect any support or endorsement of EPA's attempt through CAMR to regulate hazardous air pollutants under section 111 rather than section 112. As discussed above, a cap-and-trade program involving greenhouse gas emissions does not raise the type of local air pollution concerns that were present with respect to CAMR.

above, EPA should allow the States to use a cap-and-trade system under section 111(d).

C. The States should be allowed to work together to meet their obligations.

The States should be allowed to cooperate with each other to achieve the overall reductions and to demonstrate regional compliance, consistent with the Act's general encouragement of cooperative activities by the States and local government for the prevention and control of air pollution. 42 U.S.C. § 7402. Moreover, as a matter of state sovereignty, the States should be given the choice of working in coordination with their sister States to meet their section 111(d) obligations, so long as each individual state plan is enforceable against covered facilities and ensures against both States claiming "credit" for the same emission reductions.

Regional efforts can reduce emissions at least as effectively as individual state efforts, and more cost-efficiently. Regional efforts may be especially appropriate because, as discussed above, existing power plants are components of a complex and interconnected electricity grid, or network, that supplies the nation's energy. Allowing regional cooperation among States that share an electricity grid would also decrease the likelihood of emissions leakage by maintaining an even playing field among those sources within the same regional transmission organization.

EPA in the section 110 context has already recognized that redistribution of NOx emissions among three States within a power pool is appropriate if the overall budget remains the same. 64 Fed. Reg. at 49,989.[40] The same rationale applies here to allow the States to cooperate together to achieve overall regional reductions under section 111(d), provided that those reductions are enforceable.

D. EPA should evaluate allowing the States to implement their state plan reduction requirements in phases.

EPA should evaluate allowing the States to implement their state plan reduction requirements in phases and require sources to meet specified emission reductions by certain target dates, according to when the reductions are achievable. A phased approach would allow the States to account for planned retirements, or the remaining useful life of sources, and call for more modest reductions sooner and greater reductions later when an old, less efficient source will be replaced, or at least have its electricity production replaced, by a cleaner more efficient source or demand reduction measures. *See* 42 U.S.C. § 7411(d)(1); H.R. Rep. No. 95-294, at 195, *as reprinted in* 1977 U.S.C.C.A.N. 1077, 1274 (explaining that EPA's "guidelines must take into account the remaining useful life of existing sources").

[40] *See* discussion *infra* pp. 19-20.

However, any phasing must be scrutinized to account for the critical need to reduce greenhouse gas emissions from power plants as expeditiously as possible.

V. Conclusion

Section 111(d) gives EPA and the States the necessary authority to make meaningful reductions of harmful greenhouse gas emissions from existing power plants. Existing state programs adequately demonstrate that significant emission reductions from the power sector are achievable. EPA accordingly should apply the best system of emission reduction as reflected by these state programs and require the States to achieve the corresponding emission limitation as expeditiously as possible. By working together, as mandated by section 111(d), EPA and the States can reduce carbon pollution as necessary to protect human health and welfare.

Respectfully submitted,

Dated: December 16, 2013

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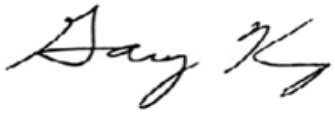

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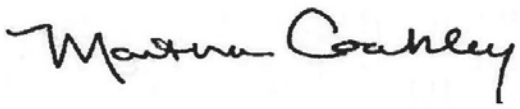

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California Air Resources Board
CLEAN POWER PLAN PROPOSED RULE (111(d))
DISCUSSION PAPER
September 2014

Introduction

At the 2009 United Nations Climate Change Conference in Copenhagen, President Obama pledged to reduce the United States' greenhouse gas (GHG) emissions to 17 percent below 2005 levels by 2020. In 2013, the president introduced his Climate Action Plan (Plan), which is the Nation's roadmap for attaining the 2020 goal. As a part of the Plan, the President directed the United States Environmental Protection Agency (U.S. EPA) to develop regulations for electric generating units (EGU). EGUs are the largest single source of GHG emissions in the United States, accounting for about one-third of all domestic GHG emissions.

On June 2, 2014, U.S. EPA proposed the Clean Power Plan (proposed regulation) under section 111(d) of the Federal Clean Air Act. The proposed regulation can be found at: http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule. Under U.S. EPA's proposed regulation, carbon emissions from existing EGUs are expected to be cut by 30 percent below 2005 levels by 2030.

U.S. EPA is soliciting comments on the proposed regulation. The Air Resources Board (ARB), in collaboration with the California Energy Commission (CEC) and California Public Utilities Commission (CPUC), and in consultation with the California Independent System Operator (CAISO) have been working together to identify potential issues/concerns and will be providing written comments to U.S. EPA by the October 16, 2014 deadline. In addition, because of the interconnectedness of the western power grid, the proposed rule allows states the option to work together in developing compliance plans. ARB and state energy agency staff are currently exploring these opportunities for coordination with other western states that participate in the Western Electricity Coordinating Council (WECC) and/or Pacific Coast Collaborative. ARB and state energy staff are also having discussions with a broader coalition of states to promote support for U.S. EPA's effort and find common ground on issues that will support a rigorous federal target for emissions reductions while giving states flexibility to innovate as they improve existing programs and develop new ones.

The proposed rule under section 111(d) only applies to existing EGUs. New EGUs are subject to a separate rulemaking by U.S. EPA under section 111(b) of the Federal Clean Air Act. Many of these new, more efficient EGUs may, over time, displace existing dirtier plants regulated under 111(d). This may create an incentive in many states to increase the replacement rate as a result of the 111(d) rulemaking.

As a result, we are strongly encouraging U.S. EPA to ensure that 111(b) rules are as rigorous as possible to continue driving down emissions in the power sector. In particular, California has previously urged U.S. EPA to set distinct standards for subcategories based on a natural gas-fired power plant's operational profile (for example, baseload, conventional load-following, fast-start/ramping, and peaking) to ensure the lowest achievable emissions. California is encouraging U.S. EPA to pursue this approach in its final 111(b) rule. A copy of our comment letter can be viewed at: http://www.arb.ca.gov/cc/powerplants/111b_comment_letter.pdf.

Background

The proposed 111(d) rule, which would be codified under 40 CFR Part 60, Subpart UUUU, sets state-specific carbon dioxide (CO_2) emission limits for the energy sector as a whole. The limits were established by comparing CO_2 emissions from all subject EGUs to total electricity generation which includes zero or near-zero carbon renewables, avoided generation due to energy efficiency, and some nuclear power. The requirements are applicable to the following types of EGU units constructed on or before 1/8/2014: steam generating and integrated gasification combined cycle (IGCC) units with a base load rating greater than 73 MW (250 MMBtu/hr) and constructed for supplying one-third or more of its potential output and producing more than 219,000 MWh net on an annual basis; and stationary combustion turbines rated at greater than 73 MW that are supplying greater than one-third of their potential electric output, produces more than 219,000 MWh on a three year rolling average, and combusts more than 10 percent fossil fuel and more than 90 percent natural gas on a heat input basis on a three year rolling average.

The rate calculation includes fossil sector emissions in the numerator and total state energy production (including energy production from zero carbon and energy efficiency resources) in the denominator. The calculation is based on CO_2 emissions from affected units in pounds divided by state electricity generation from fossil-fuel fired power plants and specified low or zero emissions units such as nuclear and renewables, as well as energy savings from energy efficiency programs.

Under Section 111 of the Federal Clean Air Act, U.S. EPA sets emission targets for covered sources in each state based upon the degree of reduction achievable through the Best System of Emissions Reductions (BSER). U.S. EPA's analysis concluded that BSER for existing power plants was best represented by the effect of four sets of measures, called "building blocks." The four building blocks used were:

1) Increased energy efficiency at coal-fired plants: U.S. EPA assumed coal plants could increase efficiency and obtain a 6 percent heat rate improvement.

2) More effective use of existing natural gas-fired plants: U.S. EPA assumed that natural gas-fired combined cycle plants could operate up to 70 percent of capacity.

3) Increased renewable generation and retention of “at risk” nuclear generation: U.S. EPA assumed that renewable generation could be increased. For California, U.S. EPA used a WECC wide renewable energy average of 21 percent and a growth rate of approximately 6 percent per year. In addition, U.S. EPA assumed that six percent of a States’ nuclear capacity, operating as of May 2014, could be factored into the state performance goal.

4) Expand energy efficiency programs: U.S. EPA assumed that energy efficiency could ramp up to a 1.5 percent annual savings rate.

Although the emission targets set as a result of these calculations must be met by each state, the particular strategies which inform the building block calculations are not required elements of a state’s compliance strategy. The building blocks are only used to set a state’s target. States are free to use different approaches in creating their own plans as long as the interim and final 2030 emissions targets are achieved.

U.S. EPA set California’s interim goal (the average of years 2020-2029) at 556 lbs CO_2/MWh and the final goal at 537 lbs CO_2/MWh by 2030. This goal is rate-based: while the numerator counts emissions from covered facilities, the denominator also includes avoided generation resulting from energy efficiency and zero-carbon electricity.

CEC, in consultation with ARB and CPUC, performed a preliminary analysis to estimate the expected CO_2 rates in 2020, 2024 and 2030. Based on this analysis, we believe that using the current mix of energy and environmental programs being implemented within the State will bring us into compliance with the U.S. EPA proposed targets for California. In addition, U.S. EPA’s rule, as proposed, will further support existing state policies on energy and air quality.

States have the option to use either the rate-based goal or to convert the rate-based goal to a mass-based goal. If a state chooses to use a mass-based goal, the plan must be developed to identify what the mass-based goals will be and describe the analytical process used to determine the goal. U.S. EPA has proposed that a state can use a simple conversion based on the established state goals and the projected generation or use model runs to determine the mass-based goal. U.S. EPA is taking comment on how to calculate a mass-based goal. California is currently reviewing both rate and mass options and is taking input on which option to use.

The proposed regulation requires each state to submit a SIP-like plan by June 30, 2016. The proposed regulation allows for a single state plan or states can work together and submit a multi-state plan. The state plan can include existing state programs such as the Cap and Trade Regulation (under AB 32), and demand side reductions (energy efficiency (EE) and renewable energy (RE)).

States are required to include in their plan a list of measures and describe how these measures will result in compliance with the interim and final performance goals. States

are to include a “glideslope” that will show for every 2-rolling calendar years from 2020 to 2029 and for 2030 what the expected emissions will be to meet the interim and final goals. A state must include corrective measures in the plan as a backstop and implement these measures if the actual reported emissions are off by more than 10 percent from what was projected in the plan.

Plans must include the following: (1) A list of affected entities and their emissions; (2) A description of the plan approach and the geographic scope of the plan; (3) Identification of the emission performance level to be achieved from 2020-29 and 2030; (4) A demonstration that compliance will be achieved; (5) Emission standards for the affected entities; (6) A demonstration that each standard is “quantifiable, non-duplicative, permanent, verifiable, and enforceable with respect to an affected entity”; (7) Milestones and corrective measures, as necessary; (8) Identification of applicable monitoring, recordkeeping, and reporting requirements for affected entities; (9) Description of the process and schedule for state reporting to U.S. EPA; and (10) Certification that the plan was developed with through a public process.

Discussion

Overall, ARB and our state energy agency partners are supportive of the proposed regulation. Implementing the proposed regulation will reduce emissions of GHGs, criteria, and toxic pollutants providing both public health and climate benefits. In addition, the U.S. EPA has developed a balanced and flexible proposal that will allow states to build on existing programs and develop strategies that reflect individual state needs and goals.

There are a number of key considerations that are critical to ensuring a national program supports individual states progress in establishing and carrying out their own climate programs. These include:

1) Ensuring that compliance with the federal program complements compliance efforts now required for California State program. Entities participating in state programs that meet federal requirements should be able to comply with federal programs with minimal additional procedural hurdles, focusing energy on emissions reductions rather than process. In particular, federal enforcement requirements should ensure states and covered entities stay on track, while leaving room for state policy innovation going forward;

2) Supporting regional planning, ranging from region-wide agreements to targeted agreements on particular issues, to support integrated carbon reductions across grid regions. The final rule should recognize energy import and export relationships between states as they work together to ensure proper crediting of emissions reductions, encourage increased use of renewable energy and energy efficiency, and lay the groundwork for multi-state partnerships;

3) Balancing state policy-making autonomy with the need for accountability by providing clear tools for states to use in assessing programmatic level compliance using existing monitoring, verification, and reporting system requirements when possible;

4) Allowing sufficient time for states to transition to a cleaner utility sector with the ultimate goal of decreasing the average emission rate, and total emissions, of the fossil generating fleet on a national basis and bringing higher carbon states in line with more proactive states, such as California.

In developing the proposal, U.S. EPA had to find a balance between many different state policies, programs, and goals to come up with a program that would deliver GHG reductions, provide accountability and enforceability for state plans, allow states the flexibility to choose the mix of technologies and policies that work best for them, and provide the option for regional planning recognizing the interconnectedness of multi-state grids.

ARB will work with U.S. EPA towards the goal to ensure that the final regulation supports flexible state programs to encourage innovation, provides common accounting and measurement systems to support regional planning, and allows states to implement programs with appropriate federal oversight requirements.

ARB is seeking stakeholder input on several areas of particular interest on 111(d) as described below.

1. Balancing federal approval requirements with state flexibility

Under the Clean Air Act, states must be able to demonstrate that the plans submitted under section 111(d) are federally enforceable as a practical matter. However, under the statute, states are given a wide-latitude as to how they demonstrate compliance with the performance goals set by U.S. EPA. Recognizing this fact, it is important that U.S. EPA remain flexible, but also requires states to provide a plan that ensures reductions are achieved with appropriate reporting, and contingency measures if states fall short of projected goals.

Several different federal enforceability structures may be appropriate in section 111 plans and U.S. EPA proposed options in their proposal. ARB seeks stakeholder comment on these options.

(1) Baseline and complementary measures.

U.S. EPA's proposal, and prior guidance on state criteria pollutant planning under section 110 of the Federal Clean Air Act, suggest that certain state measures which are already in force under the status quo, or whose effects complement the effects of other federally-enforceable measures, may not themselves need to be federally enforceable (though discontinuing these policies may trigger plan revisions). ARB is considering

what state policies might appropriately be described as baseline or complementary measures.

(2) Using existing Cap-and-Trade regulations as the basis for meeting section 111(d) emissions limits.

California's economy-wide Cap-and-Trade program limits existing power plant emissions, because all these sources must hold and surrender Cap-and-Trade allowances consistent with their emission compliance obligation. Thus the program accounts for the effects of other policies, including energy efficiency and renewables. ARB is considering whether aspects of the Cap-and-Trade program could help ensure enforceability of section 111(d) limits and, if so, what sorts of analytic demonstration would be required to assure compliance.

(3) State commitment approaches.

U.S. EPA is exploring whether states can make enforceable state commitments to achieve emissions reductions from their programs without making the program themselves federally enforceable. For instance, California might commit, subject to federal law, to achieving certain reductions through the operation of its energy efficiency programs without making provisions of those programs themselves federally enforceable. Similar constructs have been used for plans under section 110, from at least California, Texas, and New York, and have been upheld by the courts. Compliance is monitored through regular reporting and contingency planning is used to ensure states don't get off track. This approach ensures continuous progress towards meeting federal targets, while giving states flexibility to innovate and improve programs. ARB is interested in whether this approach is appropriate here.

<u>Questions for discussion:</u>

Without limiting other topics, ARB solicits stakeholder feedback on the following:

1) Which enforceability mechanisms might be most appropriate for a California section 111 plan?

2) If ARB designates some programs as complementary or baseline programs, which state programs should these be, and which should be put forward as federally enforceable components of the plan?

3) What sorts of demonstrations can ARB use to show that its Cap-and-Trade program, combined with other state programs, will reliably produce compliance with the federal target under a range of best- and worst-case scenarios?

4) What components, if any, of the Cap-and-Trade program might be appropriate or inappropriate for federal enforcement? What are the benefits and costs of those arrangements?

5) If ARB uses state commitments to support any aspects of its plan, what sort of commitments (in terms of rigor of reduction, time, and program operation) are appropriate, and what data should ARB use to support these commitments?

6) What sorts of reporting, from both the state and covered entities, would be appropriate to ensure emissions reductions are met?

7) What sort of contingency and backstop measures should ARB consider building into the plan to ensure that it can respond to unexpected events?

2. Accounting for Renewable Energy and Energy Efficiency in Regional Planning

Under U.S. EPA's proposed rule, there are default rules for counting energy efficiency and renewable energy in state plans, though these rules may be adjustable through regional agreements. Under the default rules, states can claim credit only for renewable energy they consume and that is accounted for under their renewable policies; as a result, states exporting renewable energy may not receive credit for these exports without further agreements with importing states. A similar dynamic applies to energy efficiency. States can only take credit for the effects of demand reduction resulting from their state policies at EGUs within their borders. This means that states which import a portion of their power may not receive full credit for emission reductions resulting from their energy efficiency policies that reduce the need for imported power. At the same time, energy exporting states may not be able to claim credit for these emission reductions either. As a result, both of these default rules may not capture all incentives for energy efficiency and renewable energy development in areas, like the West, with many large export and import relationships.

These import/export relationships are particularly important in the West because there are numerous long distance power transfers in the region. California is particularly interested in working with our regional partners to explore joint compliance options and ensure that renewable energy and energy efficiency are accounted for across state lines to strongly encourage further investments. We will continue to work with U.S. EPA to ensure this type of regional planning will be approvable.

Questions for discussion:

1) How can regional agreements best incentivize low carbon power in exporting states?

2) How can accounting rules for renewables and energy efficiency support regional planning?

3) Can multi-state agreements expand opportunities for more cost-effective emission reductions?

4) Are there existing programs, such as renewable energy credits, that should be used to account for reductions across state lines?

3. Regional Planning Mechanics

Recognizing that energy regulation may differ significantly between states, California is exploring various approaches to regional planning, including large-scale regional plans and a more focused modular approach that would allow implementing specific elements in a modular fashion. Under this modular approach, states would develop a state-specific plan that could also include common plan elements between states. Such common elements might include, for instance, a common accounting system, which allocates compliance credit among the states, with the bulk of each state's plan then focused on state-specific measures. For instance, states might want to develop regional plans accounting for renewable energy and/or energy efficiency credits. The "module" would contain enforceable commitments and tracking provisions, and be submitted by each state as a common plan element between two or more larger plans, which would ensure no double counting of carbon reductions.

In order to enable states to carry out this type of regional planning, U.S. EPA will need to develop clear guidance on legal responsibilities, as well as common accounting and measurement systems between states. California will continue to work with U.S. EPA and our regional partners to further explore this option.

Questions for discussion:

1) What are some of the pros and cons of large scale regional plans versus a modular approach?

2) What types of elements (e.g. accountability, enforceability) should be included in any regional plan?

3) What sorts of specific issues must accounting and measurement systems address in order to support regional planning?

4) What if a state under a regional plan fails to deliver emissions reductions, how should the shortfall be addressed and by whom?

5) Plans typically are revisited over time. What should this process look like under a regional plan?

6) What legal designs might be available and approvable for a regional plan? Would, for instance, it be appropriate for states to separately adopt

complementary plan language, or would a single, more uniform, document be needed?

7) Under a regional plan scenario, should states be required to use the same compliance metric? If they do not, what mechanisms could be used to address any "seam" issues between states using different compliance systems?

4. Rate versus Mass Calculation Metrics

The proposed targets for each state are expressed as a rate (lbs CO_2/MWh). U.S. EPA is allowing states the option to show compliance using a mass-based approach.

ARB and energy agency staffs are currently exploring the pros and cons of using a rate versus mass target. Rate targets may have some advantages: California is unique in that policies are being implemented to greatly increase the deployment of electric vehicles and the infrastructure necessary to support them. In addition, some local air districts are looking at greater electrification of residential, commercial, and industrial sectors to minimize fuel combustion and its associated emissions. These policies are likely to result in the need for more generation capacity. Although some of this capacity will likely be served by new facilities not subject to section 111(d), some may come from existing facilities. A rate-based metric addresses this situation by providing some flexibility, allowing for growth in output while limiting carbon intensity.

On the other hand, the mass-based option would limit overall carbon emissions, consistent with California's larger climate goals, and would likely be easier to monitor and enforce given many of our existing climate programs are mass-based. Mass-based systems may also help better support regional planning, since ton-based accounting is a relatively straightforward way of addressing effects on emissions from power transfers across state lines. Mass-based accounting may also, as a result, help reduce the need for standardized monitoring and verification systems in regional planning. A careful analysis will be needed to determine the best approach for California.

U.S. EPA provided some guidance on converting rate-based targets to mass-based. However, the language, as proposed, leaves room for multiple interpretations. ARB staff has requested U.S. EPA to provide some specific examples of how they would perform this conversion. ARB is continuing to work with U.S. EPA on acceptable calculation methodologies to ensure that the resulting demonstration is fair and equitable, regardless of the form of the standard.

Questions for discussion:

1) The proposed regulation allows states the option of choosing a compliance metric. What are the pros and cons of each metric for California?

2) What approaches for converting between rate and mass systems are most appropriate for California?

3) Under a mass-based goal should states be allowed to grow the mass-based goal in future years to account for growth?

5. Stringency of Targets

As described above, in establishing each state's target, U.S. EPA used four building blocks. These building blocks included a number of general assumptions, projected growth of electricity demand, states' varying energy mixes, and cost-effective additionality of renewable energy and energy efficiency resources. Some of these assumptions and projections are based on a national or regional basis, instead of an individual state-by-state analysis.

For example, additional renewable energy resources identified in building block 3 of the proposal are based on a regional analysis of existing renewable portfolio standards (RPS). For the west, this means that California's existing state-mandated 33 percent RPS is undervalued in U.S. EPA's 2030 target for California, as many other western states do not have comparably aggressive RPS goals. Using U.S. EPA's current methodology, California is credited with a 20 percent RPS goal by 2030 to meet the proposed target of 537 lbs CO_2/MW-hr.

Questions for discussion:

1) Are there ways in which the proposed methodology could be revised to improve the accuracy, and rigor, of the state targets? What would, for instance, be the impacts of a state-by-state analysis of energy mix, anticipated load growth, and resource availability on the targets? Which revisions would produce the most beneficial results?

2) In the context of a California-only compliance plan, what are the pros and cons to increasing the stringency of California's target? What about a multi-state compliance approach?