December 1, 2014

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

RE: Joint State Comments in Response to EPA's Proposed Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, Docket ID No. EPA–HQ–OAR–2013–0602

Dear Administrator McCarthy,

We are a group of state environmental agency leaders, energy agency leaders, and public utility commissioners from 14 states.[1] Please accept our joint comments submitted here in response to EPA's proposed Clean Power Plan, which establishes carbon pollution emission guidelines for existing electric utility generating units. The development of these comments was facilitated by the Georgetown Climate Center.

We applaud EPA for proposing a rule that will place the United States on a path to achieving meaningful reductions in carbon pollution, although we recognize that greater overall reductions will be necessary to meet the challenge of climate change. Our states are already demonstrating that significant, cost-effective reductions can be achieved from the power sector through the "system" EPA identifies as the basis for its proposed emission guideline. We therefore support EPA's general approach to setting the emission guideline. We also applaud EPA for providing states flexibility to design their state plans in ways most appropriate to their unique individual and regional circumstances and to use existing climate and energy programs for compliance.

The need to reduce greenhouse gas emissions to address climate change is clear. Our states are already experiencing the harms of climate change, including increased wildfires, more severe droughts and heatwaves, rising seas, and increased frequency and intensity of severe weather events such as hurricanes. Rising temperatures and other impacts of climate change also contribute to increased air pollution, such as particulate matter, ozone, and smog. These impacts are directly harming the health and

[1] Signees are state officials from the following states: California, Connecticut, Delaware, Illinois, Maine, Maryland, Massachusetts, Minnesota, New Hampshire, New York, Oregon, Rhode Island, Vermont, and Washington.

welfare of residents in our states and causing significant economic damage; we provide more details on these climate impacts and their costs in the attached document.

In order to address the challenge of climate change, we need to significantly reduce carbon pollution and other greenhouse gas emissions, as informed by the best science. Recognition of the need for deep reductions is reflected in the greenhouse gas reduction goals that have been established in many of our states, including commitments to reduce emissions by 75 to 80 percent by 2050.[2]

Power plants are the largest source of emissions of greenhouse gases in the United States, and therefore it is appropriate for EPA to use its authority under the Clean Air Act to promulgate regulations that will achieve significant emission reductions from these sources as expeditiously as possible.

The costs of inaction are high. The harms from climate change will only continue to grow in the future, and the most vulnerable in our society are at greatest risk. We have an obligation to our children and future generations to take action now to reduce carbon pollution and prevent the worst harms of climate change.

The good news is that our states and others have already demonstrated that it is quite feasible to cost-effectively reduce carbon pollution from the power sector and transition to a cleaner, more efficient electric power system that improves public health and strengthens our economies.

In the absence of comprehensive Congressional action to address climate change, we commend EPA for proposing these regulations under its Clean Air Act authority to regulate greenhouse gases as an air pollutant, as affirmed by the Supreme Court.[3] We are particularly appreciative of EPA's unprecedented outreach effort to states and other stakeholders to solicit input in developing this proposal.

The benefits of the proposed rule to families in states across the nation are clear. In addition to reducing carbon emissions, the Clean Power Plan results in a decrease in other pollutants; EPA projects that in 2030 reducing particulate matter and ozone

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[2] *See infra* Section I.C.

[3] The Supreme Court held in 2007 that the Clean Air Act requires EPA to regulate greenhouse gas pollution unless the agency determines that such pollution would not endanger public health and welfare. *Massachusetts v. EPA*, 549 U.S. 497 (2007). This general regulatory authority was affirmed this year when the Court partially upheld EPA permitting requirements for greenhouse gas emissions from newly constructed or modified major sources under the Prevention of Significant Deterioration program. *Utility Air Regulatory Group v. EPA*, 134 S. Ct. 2427 (2014). The Court has also previously held that EPA's implementation of Section 111 of the Clean Air Act to regulate greenhouse gases displaces the federal common law right to seek abatement of greenhouse gas emissions from power plants. *American Electric Power Co. v. Connecticut*, 131 S. Ct. 2527 (2011).

pollution will have the effect of avoiding up to 150,000 asthma attacks, 3,300 heart attacks, 6,600 premature deaths, and 490,000 days of missed school for children or missed work for adults.[4] The proposal would also reduce the emissions of hazardous air pollution, including hydrochloric acid and heavy metals such as mercury, which will improve the health of our rivers and streams, forests, crops and wildlife.[5]

As mentioned above, we support EPA's general approach to identifying a Best System of Emission Reduction (BSER) that recognizes the system-wide strategies that are already being used to achieve carbon pollution reductions from fossil fuel-fired power plants and drive technology improvements in the electricity system. The experience of our states confirms that the best system for reducing carbon pollution includes a combination of improving power plant efficiency, shifting to less carbon-intensive generation among affected sources, and reducing pollution at affected sources through shifts to renewable energy and implementation of demand-side energy efficiency. This combined system represents the best system to reduce carbon pollution from existing power plants when taking into consideration cost, impacts on energy, and other health and environmental impacts, as required by the Clean Air Act.

We note that the overall level of projected power sector carbon pollution reduction—30 percent below 2005 levels by 2030—would represent a significant step toward achieving the emission reductions needed in the United States. This level of reduction alone, however, is insufficient to meet the challenge of climate change, and additional reductions will be required throughout the global economy. The experience of many of our states shows that even greater levels of cost-effective carbon pollution reductions from the power sector are achievable in this timeframe using the system described by EPA.

We also applaud the flexibility that EPA has provided to states, reflecting the federalist framework of the Clean Air Act and Section 111(d) in particular. This will allow states and power companies to use strategies and programs that are already working and to design plans appropriate for their individual and regional circumstances. We particularly commend EPA for including the following important flexibilities:

- the option for state plans to include existing or new renewable portfolio standards, energy efficiency resource standards, and market-based programs to reduce carbon pollution;

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[4] U.S. EPA, Regulatory Impact Analysis for the Proposed Carbon Pollution Guidelines for Existing Power Plants and Emission Standards for Modified and Reconstructed Power Plants, Table 4-18 at 4-36 (June 2014), http://www2.epa.gov/sites/production/files/2014-06/documents/20140602ria-clean-power-plan.pdf.
[5] *Id*. at 7-11.

- the option for states to select a mass-based compliance framework;
- the use of multi-year compliance periods; and
- the option for states to implement multi-state plans.

In response to EPA's request for comment, we also suggest a number of ways in which the proposed rule can be clarified and refined. We provide details in the attached document. In summary:

- EPA should maintain the general two-part structure of an interim goal with a 10-year averaging period and a final goal, and allow states to develop their own "glide paths" by which they meet the goals. We encourage EPA to provide states additional flexibility to meet the interim goal through allowing states the options to credit certain reductions achieved prior to 2020 and to begin the interim compliance period before 2020.
- EPA should reflect in the Best System of Emission Reduction the potential for all states to achieve some improvement in emission performance by shifting from existing fossil steam generation to natural gas generation or co-firing or repowering with natural gas, as articulated in the "minimum floor" proposal identified by EPA in the Notice of Data Availability.
- EPA should allow states a range of federally enforceable plan design options. This should include the option of using tradable allowance systems, along with support for integrating existing state carbon markets and other state programs into the federal Clean Power Plan framework while maintaining significant state discretion to operate and improve state programs. EPA should also provide the option of using a "state commitment" approach for "portfolio" state plans, where those commitments are carefully defined, subject to regular reporting, and include a federally enforceable backstop measure on EGUs to secure any reductions that state plan commitments do not deliver.
- EPA should provide guidance on demand-side energy efficiency evaluation, measurement, and verification that encourages full and transparent use of this strategy and ensures that real reductions will be achieved.
- EPA should provide guidance to Regional Administrators to ensure consistent evaluation of state plans across regions.
- EPA should clarify and refine elements of the proposal relating to multi-state collaboration to provide additional support and incentives for these approaches, including flexibility for states to collaborate through submission of both joint and individual plans.

- EPA should clarify that state plans will not be allowed to "double count" reductions, but also allow states to take credit for emission reductions achieved out of state due to in-state energy efficiency or renewable measures as long as the reductions are not double-counted.

Finally, we also attach here earlier comments submitted by many members of this group to EPA in advance of the development of the proposed rule. These earlier comments are consistent with our comments and recommendations here and we request that they be included in the rulemaking record.[6]

We commend EPA on taking this crucial first step in what must be an incremental, long-term plan to reduce emissions from all sectors.

This proposed rule represents the most significant component of our national effort to reduce carbon emissions throughout our economy. It provides an opportunity to harness American ingenuity to be global leaders in the clean energy economy of the future.

Given the scale of needed reductions and the enormous costs of expected climate change impacts, we believe all states have an obligation to implement reasonable measures to reduce carbon emissions. Our states already have extensive experience developing and implementing successful state and regional clean energy and climate programs. We are excited to work with other states to share information and lessons learned from our programs, and to in turn learn from other states, as all states prepare to develop plans for compliance with the Clean Power Plan.

We look forward to continuing to work with EPA to finalize this rule and implement it successfully.

Sincerely,

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[6] States' Roadmap on Reducing Carbon Pollution (Dec. 16, 2013), http://www.georgetownclimate.org/sites/www.georgetownclimate.org/files/EPA_Submission_from_States-FinalCompl.pdf. *See also* Docket ID EPA-HQ-OAR-2013-0602-0198, Supporting & Related Material, State Environmental Agency leaders from CA, CO, DE, IL, ME, MD, MA, MN, NH, NY, OR, RI, VT, WA, Open Letter to the EPA Administrator Gina McCarthy on Emission Standards Under Clean Air Act Section 111(d) (Dec. 16, 2013), http://www.regulations.gov/contentStreamer?objectId=090000648173e7e0&disposition=attachment&contentType=pdf.

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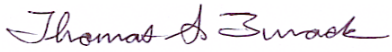

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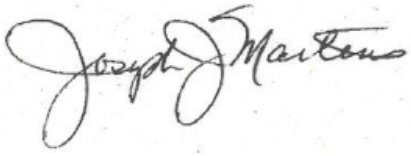

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States' Clean Power Plan Implementation Group Comments to EPA on Carbon Pollution Standards for Existing Power Plants

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I. Impacts of Greenhouse Gas Pollution on Our States and the Need for Action

I.A. Our States Are Already Experiencing Climate Impacts, with Significant Economic Cost

The United States is already experiencing the impacts of a changing global climate. The National Climate Assessment indicates that the average U.S. temperature has increased by 1.3 to 1.9 degrees Fahrenheit since 1895, and the period from 2001 to 2012 was the warmest decade on record.[7] This temperature increase is causing observable changes, including reduced ice and snowpack extent and duration, changes in precipitation, and sea-level rise. Our individual states[8] are already experiencing these impacts, and incurring substantial economic costs responding to climate-related disasters. For example:

Wildfires and forest impacts: Higher temperatures and lower moisture during summers—a projected result of climate change in the U.S.—contribute to increased wildfire severity and extent.[9] The state of Oregon expects the area burned to increase by 900 square miles per year by the 2040s, 2.5 times the 1980-2006 average.[10] Washington State experienced the largest wildfire in state history in 2014, covering about 400 square miles and destroying an estimated 300 homes.[11] Warmer temperatures and a lengthening of the frost-free season are also contributing to increases in insect outbreaks and tree disease outbreaks, which further fuels flammability.[12]

Drought: Higher temperatures and precipitation changes are expected to increase evaporation rates and decrease the extent and duration of snowpack necessary to recharge water supplies, all of which contribute to drought conditions. More intense summer droughts are projected nearly everywhere in the continental U.S., due to longer periods of dry weather and more extreme heat associated with climate change.[13] California is currently facing an unprecedented drought, expected to cause the loss of

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[7] U.S. Global Change Research Program, Climate Change Impacts in the United States: The Third National Climate Assessment 28 (2014), nca2014.globalchange.gov/report [hereinafter U.S. GCRP 2014].

[8] Signees to this letter include representatives from the state of Vermont. Although Vermont does not possess any sources affected by the proposed Clean Power Plan, the state of Vermont will be directly affected by the regulations: Vermont is already experiencing the harms of climate change and is seeking actively to mitigate greenhouse gas emissions; Vermont participates in a regional effort to reduce emissions from the power sector in the Regional Greenhouse Gas Initiative; and implementation of state plans to comply with the Clean Power Plan in other states will affect Vermont's electricity system.

[9] U.S. GCRP 2014, *supra* note 7, at 178.

[10] Oregon Department of Environmental Quality, Oregon's success investing in energy efficiency and renewable energy (May 2014), http://www.georgetownclimate.org/sites/www.georgetownclimate.org/files/Oregon_StateAchievementFactSheet.pdf.

[11] Wayne Havrelly, Longer, hotter Northwest fire seasons are 'new normal,' USA Today (Jul. 28, 2014), http://www.usatoday.com/story/news/nation-now/2014/07/28/northwest-fire-season-longer-hotter/13260757/.

[12] Climate Impacts Group, University of Washington, Climate Change Impacts and Adaptation in Washington State: Technical Summaries for Decision Makers (Dec. 2013), http://cses.washington.edu/db/pdf/snoveretalsok816.pdf.

[13] U.S. GCRP 2014, *supra* note 7, at 75.

17,000 jobs and over $2 billion in economic costs to the state's agriculture sector.[14] This year large areas in Oregon and Washington, as well as much of the southwest, have been designated as drought disaster areas by the U.S. Department of Agriculture.[15]

Extreme weather events: Heavy rains, flooding, and hurricane activity have increased in recent years, and the intensity and frequency of these events are expected to continue to increase because of climate change.[16] For example, in Vermont, average annual precipitation has increased 5.9 inches since 1960, and almost half of this increase has occurred since 1990. In 2011, heavy rain and wind from Tropical Storm Irene caused devastating flooding in Vermont, causing approximately $250 million of damage to roads, bridges, and rail lines.[17] Tropical Storm Irene also left 800,000 Connecticut customers without power for up to nine days. This record outage was surpassed only six weeks later when an October snowstorm took out power for 880,000 customers.[18]

A year later, Hurricane Sandy hit many of the areas still recovering from Irene. This "superstorm" caused widespread devastation, including 60 deaths in New York, 22 deaths in New Jersey, and 4 deaths in Connecticut.[19] The storm caused catastrophic flooding of communities, knocking out power for more than two million people in New York and 625,000 in Connecticut, damaging major transportation systems, destroying or damaging more than 300,000 homes, and leaving countless families homeless.

Damage from Hurricane Sandy to New York City alone was estimated at $19 billion, and statewide Sandy cost New York $32.8 billion in repair and restoration costs and $9.1 billion in mitigation and prevention costs.[20] The estimated cost to Connecticut for the 2011-2012 storms exceeded $750 million dollars. That figure does not include uninsured losses which could push the losses over $1 billion dollars.[21]

Extreme rainfall events, storms, and flooding are expected to become more common, threatening states' infrastructure and water quality. Rising sea levels increase the prospect that coastal states will be more vulnerable to these types of storms in the years ahead.

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[14] Jim Carlton, California Drought Will Cost $2.2 Billion in Agriculture Losses This Year, The Wall Street Journal (Jul. 15, 2014), http://online.wsj.com/articles/drought-will-cost-california-2-2-billion-in-losses-costs-this-year-1405452120.
[15] U.S. Department of Agriculture, Disaster and Drought Information, (Sept. 17. 2014), http://www.usda.gov/wps/portal/usda/usdahome?navid=DISASTER_ASSISTANCE.
[16] U.S. GCRP 2014, *supra* note 7, at 36-37, 41-42.
[17] Vermont Agency of Natural Resources, Tropical Storm Irene By the Numbers, http://www.anr.state.vt.us/anr/climatechange/irenebythenumbers.html.
[18] Connecticut Department of Energy and Environmental Protection, 2013 Comprehensive Energy Strategy for Connecticut (Feb. 19, 2013), http://www.ct.gov/deep/lib/deep/energy/cep/2013_ces_final.pdf.
[19] Miguel Llanos, Sandy death toll in US rises to 109; 'there could be more,' Bloomberg warns, NBC News (Nov. 2, 2012), http://usnews.nbcnews.com/_news/2012/11/02/14884300-sandy-death-toll-in-us-rises-to-109-there-could-be-more-bloomberg-warns?lite.
[20] Per New York State Department of Environmental Conservation staff.
[21] CT DEEP, *supra* note 18.

Sea-level rise: Coastal states are already confronting the threat of sea-level rise. Global sea levels are projected to rise an additional one to four feet or more by 2100 due to thermal ocean expansion and melting glaciers and ice sheets. An estimated 5 million people in the U.S. live within the area that would be inundated with four feet of sea level rise; that affected area could experience further increased flooding due to climate-related storm surges and land subsidence.[22] For example, Massachusetts faces the loss of fourteen acres of land per mile of coast line by 2100 and exacerbated flood damages, as a "10-year flood will have the magnitude of the present 100-year flood."[23] California is also highly vulnerable to damages from sea-level rise. Based on projections of "medium to medium-high" emissions levels to 2100 resulting in a 1.4 meter sea-level rise, California would be at risk of $100 billion in property damages and 480,000 people at risk from a 100-year flood event.[24] In Maryland, five feet of sea-level rise over the next century could flood 550 square miles of land at high tide, including 60,000 homes and 66 miles of state roads.[25]

Increased air pollution: Higher air temperatures and increased wildfire smoke are expected to increase particulate matter and ozone, threatening public health. Increased heat, an expected impact of climate change, will increase formation of ground-level ozone, which diminishes lung function and exacerbates asthma. Particulate matter concentrations increase with increased wildfire frequency and severity; inhalation of particulate matter can cause lung and cardiovascular damage.[26] A study found that California could experience as many as six to thirty more days per year with ozone concentrations that exceed federal clean-air standards, depending on the extent of increased temperatures. In the southern California region, projected changes in ozone concentrations due to climate change in the year 2050 could increase by 9 to 18 parts per billion. These studies reflect the increased efficiency of ozone production in a warmer climate and the potential for increased biogenic volatile organic compound emissions driven by higher temperatures, problems exacerbated by the emission of other greenhouse gases.[27]

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[22] U.S. GCRP 2014, *supra* note 7, at 44-45.
[23] *Massachusetts v. EPA*, 549 U.S. 497 n.20 (2007) (citing Kirshen Decl. ¶ 10, at 198).
[24] Matthew Heberger et al., California Climate Change Center, The Impacts Of Sea-Level Rise On The California Coast 2-3 (May 2009), http://pacinst.org/wp-content/uploads/sites/21/2014/04/sea-level-rise.pdf (cited by U.S. EPA, 74 Fed. Reg. at 32764 (July 8, 2009).
[25] Maryland Department of the Environment, Maryland's Greenhouse Gas Reduction Plan, 37 (Oct. 2013), http://climatechange.maryland.gov/site/assets/files/1392/mde_ggrp_report.pdf.
[26] U.S. GCRP 2014, *supra* note 7, at 220-23.
[27] Michael J. Kleeman et al., Climate Change Impact on Air Quality in California: Report to the California Air Resources Board (June 2010), www.arb.ca.gov/research/apr/past/04-349.pdf.

I.B. In Contrast, Our States Have Found that Taking Action to Reduce Carbon Pollution Can Provide Economic Benefits

Failure to act to reduce greenhouse gas emissions will be costly. In contrast, action to reduce carbon emissions generates economic benefits, as has been shown in each of our states. For example:

- California's Renewable Portfolio Standard (RPS) is projected to generate $60 billion in the California economy and create up to 235,000 jobs.
- By 2015, Illinois' RPS is projected to bring nearly $6 billion in new investment and create over 5,000 jobs, while its Energy Portfolio Standard is projected to save the average household close to $100 a year, to stimulate nearly $5 billion in economic activity, and to create over 16,000 new jobs.
- An independent study found that Maryland's portfolio of climate and energy programs would generate $1.6 billion for the state's economy and support 37,000 jobs.[28]
- Investments in energy savings and renewable energy generation from Oregon's public purpose charge have produced the equivalent of 2,200 full-time jobs and added $2.7 billion to the local economy, while also saving utility customers $1.3 billion on their energy bills through reduced energy demand.
- In Massachusetts, surveys by the Clean Energy Center show an 11.8 percent increase in clean energy jobs in 2013; clean energy employment has grown between 6 and 12 percent annually for the last five years. Nearly 80,000 employees are working in clean energy throughout the Commonwealth.[29]
- Through 2012, New York achieved more than $5.8 billion in cumulative energy bill savings through NYSERDA's System Benefits Charge and Energy Efficiency Portfolio Standard efficiency programs.[30]
- Washington voters established targets for new renewable energy generation in 2006, helping drive more than $7 billion in investment in Washington's clean energy economy.

As these examples show, our states have found that there are significant economic benefits to reducing carbon pollution from the power sector.

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[28] MDE, *supra* note 25.
[29] Massachusetts Clean Energy Center, 2013 Massachusetts Clean Energy Industry Report, http://images.masscec.com/uploads/attachments/2013/09/MassCEC_2013_IndustryRpt.pdf.
[30] Per New York State Department of Environmental Protection staff.

We also note that many of our states have found that every dollar saved through investments in energy efficiency creates net benefits to the economy, and EPA's economic analysis should fully consider the net benefits of energy efficiency measures that would be implemented to comply with the rule.

I.C. Level of Reduction Needed to Address Climate Change

Scientific studies show that deep reductions in carbon emissions are needed to avoid the most severe impacts of climate change. In the 2009 Copenhagen Accord, the world's governments reaffirmed that in order to "prevent dangerous anthropogenic interference with the climate system,"[31] scientific consensus indicates that "the increase in global temperature should be below 2 degrees Celsius" (3.6 degrees Fahrenheit).[32] The 2007 Intergovernmental Panel on Climate Change Fourth Assessment Report concluded that in order to achieve that goal and stabilize global CO_2 concentrations, 2050 greenhouse gas emissions from industrialized nations must be at least 80 percent lower than in 1990.[33] The recently released Fifth Assessment Report indicates that an emissions level near or below zero will be necessary by 2100.[34]

Many of our states have already made substantial commitments to achieve deep reductions in carbon emissions, from the power sector and economy-wide. The long-term greenhouse gas emissions reduction targets set by states in our clean energy and climate action plans or established by our state legislatures reflect the level of ambition that is achievable. For example, our state greenhouse gas reduction commitments include the following:

- California: 80 percent below 1990 levels by 2050[35]
- Connecticut: 80 percent below 2001 levels by 2050[36]
- Maine: 75-80 percent below 2003 levels long term ("may be required")[37]

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[31] United Nations Framework Convention on Climate Change, Article 2: Objective, http://unfccc.int/essential_background/convention/background/items/1353.php.

[32] United Nations Framework Convention on Climate Change, Report of the Conference of the Parties on its fifteenth session, held in Copenhagen from 7 to 19 December 2009, 4 (2009), http://unfccc.int/documentation/documents/advanced_search/items/6911.php?priref=600005735#beg.

[33] IPCC, Climate Change 2007: Mitigation, Policies, Instruments and Co-operative Agreements, Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, http://www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-chapter13.pdf.

[34] The Fifth IPCC report does not provide a specific target for developed countries for 2050, but says that a 40 to 70 percent reduction in global greenhouse gas emissions will be necessary by 2050 for all countries relative to 2010 emissions. IPCC, Climate Change 2014: Synthesis Report 39 (Nov. 1, 2014), http://www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_LONGERREPORT.pdf.

[35] California Executive Order S-3-05 (June 1, 2005), http://gov.ca.gov/news.php?id=1861.

[36] Connecticut Public Act No. 08-98, An Act Concerning Connecticut Global Warming Solutions (June 2, 2008), http://www.cga.ct.gov/2008/ACT/PA/2008PA-00098-R00HB-05600-PA.htm.

- Massachusetts: 80 percent below 1990 levels by 2050[38]
- Minnesota: 80 percent below 2005 levels by 2050[39]
- New Hampshire: 80 percent below 1990 levels by 2050[40]
- Oregon: 75 percent below 1990 levels by 2050[41]
- Vermont: 75 percent below 1990 levels by 2050 ("if practicable")[42]

The electric power sector is responsible for about one-third of national greenhouse gas emissions and approximately 40 percent of CO_2 emissions, making it the single largest sector for emissions in the United States. Moreover, the fact that these emissions are produced by a small number of sources relative to other sectors (e.g., transportation), and that there are a large number of cost-effective opportunities to reduce emissions, means that it is critical that we achieve significant reductions from the power sector in order to address the challenge of climate change.

I.D. Overall Level of Reduction Not Sufficient to Address Climate Change

Given the pressing challenge of climate change, we applaud EPA for proposing a rule that will place the United States on a path to achieving meaningful reductions in carbon pollution.

EPA's proposal represents the most significant component of our national effort to reduce carbon emissions throughout our economy. The proposal alone, however is insufficient to achieve the level of reductions necessary to avoid the most dangerous impacts of climate change. Although it is a crucial first step, the 30 percent reduction in power sector carbon emissions below 2005 levels by 2030 that the Clean Power Plan is projected to achieve falls short of the progress needed to reach an 80 percent reduction in economy-wide emissions by 2050.

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[37] Public Law of the State of Maine, Me. Rev. Stat. Ann. tit. 38 § 576 (Sept. 13, 2003), http://www.mainelegislature.org/ros/LOM/lom121st/5pub201-250/pub201-250-44.htm.
[38] Massachusetts Climate Protection and Green Economy Act (Aug. 7, 2008), https://malegislature.gov/Laws/SessionLaws/Acts/2008/Chapter298.
[39] Minnesota Next Generation Energy Act of 2007, Minn. Stat. § 216C.05 (2006), https://www.revisor.mn.gov/bin/bldbill.php?bill=S0145.2.html&session=ls85.
[40] New Hampshire Climate Change Policy Task Force, The New Hampshire Climate Action Plan (Mar. 2009), http://des.nh.gov/organization/divisions/air/tsb/tps/climate/action_plan/documents/nhcap_final.pdf.
[41] Oregon House Bill 3543: Global Warming Actions (2007), https://olis.leg.state.or.us/liz/2007R1/Downloads/MeasureDocument/HB3543.
[42] Vermont H.R. 6: House resolution urging action on climate change-related policies (Feb. 3, 2011), http://www.leg.state.vt.us/docs/2012/resolutn/HR0006.pdf; Vermont Executive Order No. 15-12: Governor's Climate Cabinet and State Agency Climate Action Plan (Dec. 28, 2012), http://www.anr.state.vt.us/anr/climatechange/Pubs/ClimateCabinetExecOrder_15-12.pdf.

II. Support for EPA's Approach to Setting the Emission Guideline

II.A. We Support EPA's Identification of the Best System of Emission Reduction

We support EPA's general approach to setting the emission guideline in the proposed rule and to determining the Best System of Emission Reduction (BSER).[43]

As described above, many of our states have already achieved significant reductions in carbon pollution from the power system. Based on our state experience, we agree with EPA that the "best" system for reducing carbon pollution from fossil fuel-fired electricity generating units is a combination of strategies including improving efficiency (i.e., "heat-rate") at affected power plants, shifting to less carbon-intensive generation among affected power plants, and reducing pollution at affected power plants through expanded deployment of low- and zero- carbon generation and demand-side energy efficiency. We agree with EPA that this system reflects the "best" system when taking into account the criteria required by law, including technological feasibility, the amount of emission reductions the system would generate, associated costs, energy impacts, and that Section 111 is designed to promote the development and implementation of technology.[44]

This system reflects the reality of the electric grid, where interconnected energy generation resources (and energy efficiency resources) are managed dynamically to ensure that energy demand is met moment-to-moment. We have long relied on the interconnected nature of the power grid to provide opportunities to reduce air pollution from fossil fuel-fired power plants. When renewable energy resources are added to the grid, they displace existing generation or avoid additional generation from fossil fuel-fired plants; emissions go down or are avoided. When coal plants run less, energy demand is met by increased dispatch of natural gas plants and zero-carbon resources. When we have invested in demand-side energy efficiency, power demand goes down and emissions go down or are avoided as well. This is the system of emission reduction that we have successfully deployed to reduce pollution from power generation, including carbon pollution.

Our state programs and experiences support and affirm the Administrator's determination that such a system and its constituent elements have been adequately demonstrated, are technologically feasible, and work in practice to cost-effectively reduce carbon pollution from power plants while maintaining the reliability of the electric system. On average, our states have reduced carbon pollution from the power

[43] In response to EPA's request for comment on the proposed BSER. 79 Fed. Reg. at 43835. We note that this letter does not address the proposed scoping of these different building blocks and the various levels of implementation that EPA proposed and applied to individual states; many of our states will comment on those separately.
[44] 42 U.S.C. § 7411; 79 Fed. Reg. at 43879.

sector by 23 percent from 2005 to 2012, [45] and achieved a 22 percent improvement in the carbon intensity of their power sector.[46] This reduction reflects the effectiveness of this system and its individual components.

We provide more detail on how our states have demonstrated these constituent elements and the system as a whole here:

Heat Rate Improvements (Building Block 1)

Electricity generators in our states have already demonstrated that it is possible to employ best operating practices and upgrade equipment to improve the efficiency of fossil fuel-fired electric generating units (EGUs) and reduce emissions.

Such improvements have been driven by a number of state policies, including the Regional Greenhouse Gas Initiative (RGGI). Independent analysis has shown that coal-fired EGUs have historically been capable of making improvements in heat rate to respond to increases in operating costs (i.e., increases in the cost of fuel).[47] In RGGI, the requirement for units to hold allowances for each ton of CO_2 emitted creates a similar financial incentive for units subject to the program to improve their efficiency, and some coal-fired power plants in the region have performed such upgrades in recent years. For example, the Public Service Company of New Hampshire upgraded a coal-fired unit at Merrimack Station by installing new energy-efficient turbine; the upgrade is estimated to avoid up to 150,000 tons of CO_2 emissions per year.[48] In another example, Minnesota's Metro Emission Reduction Project encourages utilities to make voluntary emissions reductions at qualifying units. Xcel Energy completed a project under this program from 2007 to 2009 that included reducing carbon emissions from three Twin Cities-area power projects by 21 percent. At one facility, reductions were achieved

[45] Computed from U.S. Energy Information Administration data for total electric power sector emissions in CA, CT, DE, IL, ME, MD, MA, MN, NY, NH, OR, RI, VT, WA. EIA, U.S. Electric Power Industry Estimated Emissions by State (EIA-767, EIA-906, EIA-920, and EIA-923).

[46] Computed from U.S. Energy Information Administration data for total electric power sector generation and emissions in CA, CT, DE, IL, ME, MD, MA, MN, NY, NH, OR, RI, VT, WA. Electricity generation data is from EIA, Net Generation by State by Type of Producer by Energy Source (EIA-906, EIA-920, and EIA-923). Carbon pollution data is from EIA, U.S. Electric Power Industry Estimated Emissions by State, (EIA-767, EIA-906, EIA-920, and EIA-923).

[47] Joshua Linn, Erin Mastrangelo, and Dallas Burtraw, Regulating Greenhouse Gases from Coal Power Plants under the Clean Air Act, 1 J. ASSOC. OF ENVT'L & RESOURCE ECON. 93, 126 (2014) (finding historic data shows improvements in heat rates of U.S. coal-fired EGUs in response to coal-price increases); *see also* Denny Ellerman, Note on the Seemingly Indefinite Extension of Power Plant Lives, A Panel Contribution, 19(2) ENERGY J. 129 (1998) (noting that existing power plants are being improved as they age and therefore not being replaced at what earlier would have been considered the end of their useful lives).

[48] Northeast Utilities, Our Environmental Performance, http://www.nu.com/csrr/pdf/NUCSRR_our_performance.pdf.

through rehabilitation of an existing coal unit with a new turbine, upgraded steam generator, and improved emissions control equipment.[49]

Dispatch Changes Among Affected EGUs (Building Block 2)

Our states have experienced increased utilization of more efficient natural gas combined-cycle (NGCC) units while experiencing decreased generation at the most carbon-intensive fossil-fired EGUs. For our group of states, electricity generation from natural gas-fired EGUs increased 37 percent between 2005 and 2012, while generation from more carbon-intensive coal-fired EGUs has decreased 36 percent over the same period.[50] This shift to less carbon-intensive fossil fuel-fired generation was a major factor in the 23 percent reduction in carbon emissions achieved by our states over the same period of time, as noted above.

EPA proposes that increasing utilization of existing NGCC units is a component of the Best System of Emission Reduction, and this has been demonstrated by our state experience. NGCC units that were operating in our states in 2005 increased their generation 21 percent by 2012.[51] This significant increase in utilization at existing NGCCs is a significant component of the system our states have collectively used to achieve emission reductions and improve emissions intensity.

EPA also takes comment on whether the BSER should also reflect potential reductions in emissions from affected sources because of a shift in dispatch to new NGCCs, as well as opportunities to reduce the carbon-intensity of coal-fired EGUs through co-firing or repowering with natural gas.

A shift in dispatch to new NGCC units has also been a significant component of the system our states have used to achieve emission reductions and emission intensity improvements. Between 2005 and 2012—the same period that our states saw significant decreases in coal-fired electricity generation, decreases in CO_2 emissions, and improvements in emission rates—our states experienced a collective increase of 12,584

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[49] Minnesota 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; Xcel Energy, Minnesota Metro Emissions Reduction Project, http://www.xcelenergy.com/Environment/Doing_Our_Part/Clean_Air_Projects/MN_MERP.

[50] Computed from U.S. Energy Information Administration data for CA, CT, DE, IL, ME, MD, MA, MN, NY, NH, OR, RI, VT, WA. EIA, Net Generation by State by Type of Producer by Energy Source (EIA-906, EIA-920, and EIA-923).

[51] Computed from U.S. Energy Information Administration data for CA, CT, DE, IL, ME, MD, MA, MN, NY, NH, OR, RI, VT, WA for NGCC units that were in operation in 2005 and are listed as "likely covered fossil sources" in EPA's TSD Goal Computation Appendix 7. 2012 nameplate capacity, generation, and capacity factor data come from EIA 860 and EIA 923. 2005 and 2012 generation data comes from EIA 906 and EIA 920.

megawatts of NGCC nameplate capacity. In 2012, NGCC units that began operation after 2005 contributed an additional 50 million megawatt hours of generation.[52]

Similarly, a number of coal-fired EGUs in our states have already reduced their carbon pollution rate by co-firing with natural gas.[53] This demonstrates that in some circumstances, such strategies are cost-effective under current market conditions.

Within the group of states participating in RGGI, the overall shift in generation from carbon-intensive EGUs to more efficient and less carbon-intensive NGCC units is at least partially attributable to the emission budget trading program. Since the program sets a price on carbon emissions through the auction of emission allowances, NGCC units incur lower emission allowance costs relative to coal-fired generation units and therefore are called on to operate more often.

There are other examples of state programs that have promoted a shift to NGCC generation and the resulting reduction in CO_2 emissions:

- In Delaware, energy providers NRG and Calpine have used a state grant program to replace coal-fired generation units with combined cycle natural gas plants; the state now has only one remaining coal-fired generating unit.[54] Delaware reduced carbon pollution from the power sector by over 27 percent from 2005 to 2012, while increasing natural gas generation by over 300 percent and decreasing coal generation by 70 percent.[55]
- California's in-state fossil generation is almost entirely natural gas-fired,[56] and the state is rapidly phasing out imported power from higher-emitting coal-fired power plants through implementation of an Emissions Performance Standard.[57] These coal imports represent only about 7.5 percent of California's energy portfolio, and are expected to continue to decline through 2020.[58]

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[52] Computed from U.S. Energy Information Administration data for CA, CT, DE, IL, ME, MD, MA, MN, NY, NH, OR, RI, VT, WA for NGCC units that were in operation in 2005 and 2012 and are listed as "likely covered fossil sources" in EPA's TSD Goal Computation Appendix 7. 2012 nameplate capacity, generation, and capacity factor data come from EIA 860 and EIA 923. 2005 and 2012 generation data comes from EIA 906 and EIA 920.

[53] Andover Technology Partners, Natural Gas Conversion and Cofiring for Coal-Fired Utility Boilers 19 (2014) (noting conversion of two Laskin Energy Center units underway in Minnesota and two Edge Moor units completed in Delaware).

[54] Doug Rainey, Officials mark conversion of Dover power plant to natural gas, Delaware Business Daily (Aug. 1, 2013), http://delawarebusinessdaily.com/2013/08/officials-mark-conversion-of-dover-power-plant-to-natural-gas/.

[55] U.S. Energy Information Administration, Net Generation by State by Type of Producer by Energy Source: 1990-2012, State Historical Tables EIA-906, EIA-920, and EIA-923, http://www.eia.gov/electricity/data/state/.

[56] California Energy Commission, Tracking Progress: Installed Capacity (2013), http://www.energy.ca.gov/renewables/tracking_progress/documents/installed_capacity.pdf.

[57] Cal. Pub. Util. Code §§ 8340-8341, and implementing regulations.

[58] California Energy Commission, Tracking Progress: Current and Expected Energy from Coal in California (Nov. 6, 2014), http://www.energy.ca.gov/renewables/tracking_progress/documents/current_expected_energy_from_coal.pdf.

Expanding Less Carbon-Intensive Generating Capacity (Building Block 3)

In most of our states, emissions from fossil fuel-fired EGUs have decreased while renewable energy generation has increased, in large part due to our states' renewable energy policies. States across the country are successfully reducing greenhouse gas emissions and driving technological development by integrating renewable sources into the grid. At least 30 states have renewable portfolio standards or alternative energy portfolio standards.[59] The experience of our states, confirmed by independent analyses,[60] indicates that sufficiently ambitious renewable energy policies can achieve significant carbon pollution reductions or avoid pollution increases by replacing generation from fossil fuel-fired sources or avoiding increased generation. In addition, these policies can spur renewable energy innovation and deployment and promote long-term change toward a cleaner electricity system.

Examples of how our states have cost-effectively reduced emissions from fossil-fuel fired EGUs through increases in renewable generation include the following:

- California has an aggressive RPS, requiring that 33 percent of state power procurement come from renewable sources by 2020.[61] The measure avoided emissions of 3.5 million metric tons of CO_2 equivalent in 2011 alone.[62] With more than 20 percent of the state's power already coming from renewable sources, California is well on its way to meeting that target, and is considering ways to further develop renewable power. California has 20,500 megawatts of installed renewable capacity, more than doubling its installed capacity since 2002.[63] In 2012, California served about 22 percent of retail energy sales with renewable energy.[64] California has demonstrated that replacing carbon-intensive generation

[59] Center for Climate and Energy Solutions, Renewable and Alternative Energy Portfolio Standards, http://www.c2es.org/node/9340.
[60] *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).
[61] *See generally* California Public Utility Commission, RPS Program Overview, http://www.cpuc.ca.gov/PUC/energy/Renewables/overview.htm.
[62] California 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.
[63] California Energy Commission, Tracking Progress: Renewable Energy (Aug. 19, 2014), http://www.energy.ca.gov/renewables/tracking_progress/documents/renewable.pdf.
[64] *Id*.

with renewable fuels is economically beneficial and highly effective at reducing greenhouse gas emissions—the RPS is projected to generate $60 billion and create up to 235,000 jobs.[65]

Nuclear generation has also been an important component in some of our states' strategies to reduce carbon emissions by continuing to meet a substantial portion of electricity demand with carbon-free generation. For example, in 2012 nuclear-powered generation comprised 48 percent of generation in Illinois, 47 percent in Connecticut, 36 percent in Maryland, and 30 percent in New York.[66] We note that if some amount of at-risk nuclear generation is discontinued, as projected by the U.S. Energy Information Administration,[67] then emissions or emission rates would be likely to increase unless the lost generation capacity was replaced entirely with non-emitting resources or avoided through demand-side energy efficiency.

Demand Side Energy Efficiency (Building Block 4)

Our states have a record of successfully reducing emissions through the use of demand-side energy efficiency measures. State energy efficiency programs cost-effectively reduce carbon pollution emissions or avoid pollution increases by reducing demand for generation, while also lowering energy costs for consumers.

Examples of these programs include the following:

- Maryland has achieved a 14.6 percent reduction in peak electricity demand from a 2007 baseline—equivalent to avoiding one coal power plant—and has established a goal of reaching a 15 percent reduction in per capita energy consumption by 2015.[68] Implementation of EmPOWER Maryland has offset 1.3 million metric tons of CO_2 emissions.[69] The program has funded measures that will reduce ratepayer electricity use by more than 2 million MWh per year and save $250 million annually.[70] Savings are projected to continue for years, with currently existing measures saving ratepayers $3.7 billion over their useful life.[71]

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[65] California 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.
[66] U.S. EIA, Net Generation by State by Type of Producer by Energy Source (EIA-906, EIA-920, and EIA-923).
[67] U.S. EIA, Annual Energy Outlook 2014, Implications of Accelerated Power Plant Retirements, http://www.eia.gov/forecasts/aeo/power_plant.cfm (noting that AEO 2014 analysis projects 6 GW of generic nuclear plant retirements due to economic challenges 2012-2019, not including six nuclear plant closures already announced).
[68] Per Maryland Energy Administration staff.
[69] MDE, *supra* note 25.
[70] Maryland Energy Administration, EmPOWER Maryland Planning, http://energy.maryland.gov/empower3/.
[71] *Id*.

- Massachusetts projects that its investment in energy efficiency from 2005 through 2015 will reduce the state's electricity demand by 17.1 percent, resulting in a total annual reduction of 3 million tons of CO_2 in 2015.[72]

Our states have also successfully tailored these efficiency programs to reach rural consumers, residents of low-income housing, and other under-served constituencies; examples of such programs include:

- The Massachusetts statewide energy efficiency program covers low-income residents that live in both single and multi-family homes, as well as new construction of low-income housing. In 2013, the low-income program reported over $33 million in electric benefits and over $92 million in benefits from all energy sources.[73] In addition, the Efficiency Neighborhoods+ initiative, which began in 2013, will provide significant energy-saving benefits to low- and moderate-income residents in designated urban neighborhoods, often with older housing stock.[74]
- Minnesota's Conservation Improvement Program (CIP), which set energy efficiency goals for utilities, includes a requirement that utilities spend a minimum of 1.5 to 2 percent of annual gross operating revenues on efficiency programs; at least 0.2 percent must be spent on programs to serve low-income customers.[75]
- Vermont's Manufactured Housing Innovation Project is a pilot project to develop new, energy-efficient manufactured homes to respond to the loss of homes during Tropical Storm Irene and to increase the supply of quality affordable housing. Using advanced energy efficiency technology, these homes are projected to use only 29 percent as much energy as a typical mobile home, minimizing monthly energy costs and making the homes more affordable overall.[76]

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[72] NESCAUM, States' Perspectives on EPA's Roadmap to Incorporate Energy Efficiency/Renewable Energy in NAAQS State Implementation Plans: Three Case Studies 28 (May 22, 2014), http://www.nescaum.org/documents/nescaum-final-rept-to-epa-ee-in-naaqs-sip-roadmap-case-studies-20140522.pdf.

[73] Massachusetts Energy Efficiency Advisory Council, Statewide Electric 2013 Plan Year Report Data Tables, http://ma-eeac.org/wordpress/wp-content/uploads/Statewide-Electric-2013-Plan-Year-Report-Data-Tables.xlsx.

[74] 2012 Report of the Massachusetts Energy Efficiency Advisory Council 21 (Nov. 13), http://www.mass.gov/eea/docs/doer/energy-efficiency/ma-advisory-council-2012-report.pdf.

[75] Minnesota Department of Commerce, How CIP Works, http://mn.gov/commerce/energy/topics/conservation/How-CIP-Works.jsp.

[76] Vermont Housing & Conservation Board, Manufactured Housing Innovation Project, http://www.vhcb.org/mhip/; see also Vermont Housing & Conservation Board, Manufactured Housing Innovation Project Report (Mar. 2013), http://www.vhcb.org/mhip/pdfs/manufactured_housing_innovation_project-sm.pdf.

At least six[77] of our states had achieved incremental annual savings of greater than 1.0 percent of retail sales in 2012 (ME, VT, CA, CT, MN, and OR), and two had achieved savings rates of at least 1.5 percent (ME and VT). Seven of our states have policies in place that require incremental savings of 1.5 percent of retail sales on or before 2020 (IL, MA, MN, NY, RI, VT, and WA).[78]

A Combined Approach Yields the Best System of Emission Reduction

As our states have demonstrated, significant carbon pollution reductions can be achieved cost-effectively while maintaining electric reliability—and while providing economic, public health, and jobs benefits—using the system that combines the approaches detailed above and that EPA has identified as the BSER.

Examples of how our states have achieved significant carbon pollution reductions using this system include:

- The nine states participating in RGGI have together reduced carbon pollution from power plants in the region by over 40 percent from 2005 to 2012.[79] The new RGGI cap[80] of approximately 78 million tons of CO_2 emissions in 2020 is more than 50 percent below 2005 levels. This reduction has resulted largely from the implementation of the combined elements of the proposed BSER, and has been achieved at a low cost and with significant benefits. An independent study found that the RGGI states realized $1.6 billion in net benefits 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.[81] 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.[82] The RGGI program has led to investments by power companies to make existing units more efficient, shifts across the electricity system to greater use of cleaner fossil-fuel generation

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[77] We note that EPA's reliance on EIA Form 861 may result in undercounting of historical energy efficiency savings for some states.

[78] U.S. EPA, Technical Support Document: GHG Abatement Measures 5-33 (June 2014), http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule-ghg-abatement-measures.

[79] 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), http://www.rggi.org/docs/RGGI_States_111d_Letter_Comments.pdf.

[80] 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. Regional Greenhouse Gas Initiative, Program Review, http://www.rggi.org/design/overview/cap.

[81] 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.

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

sources, replacement of fossil-fuel generation with increased renewable energy, and reduction of electricity load growth through demand-side energy efficiency strategies.

- Minnesota's clean energy and emissions reduction programs, which employ the strategies of all four BSER building blocks, have helped the state reduce power sector emissions by 28 percent from 2005 to 2012.[83]As mentioned previously, 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 rehabilitation of an existing coal unit and the replacement of two coal facilities with highly efficient NGCC units.[84] The 2007 Next Generation Initiative set statewide greenhouse gas reduction goals and established the state's Renewable Energy Standard (RES) and Conservation Improvement Program (CIP) for energy efficiency.[85] Minnesota's RES requires utilities to provide 25 percent of their power from renewables by 2025.[86] Minnesota has seen a dramatic increase in renewable resources, growing from 5.8 percent of the state's electricity generation in 2000 to 20 percent in 2014.[87] All Minnesota utilities have met their 2012 RES goals and most ratepayers are benefitting from lower costs.[88] The CIP set a 1.5 percent energy savings goal for utilities that operate in Minnesota; the statutes also include requirements for how utilities reinvest their CIP funds, including renewable and distributed generation projects and programs serving low income customers.[89] The 2013 Minnesota Solar Energy Standard establishes for certain utilities a standard to obtain 1.5 percent of retail electric sales from solar energy by 2020, and it creates

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[83] U.S. Energy Information Administration, U.S. Electric Power Industry Estimated Emissions by State: 1990-2012, State Historical Tables EIA-767, EIA-906, EIA-920, and EIA-923 (May 2014), http://www.eia.gov/electricity/data/state/ (accessed via the Georgetown Climate Center State Energy Analysis Tool, http://www.georgetownclimate.org/SEAtool).

[84] Minnesota 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

[85] Minnesota Department of Commerce, Minnesota's Next Generation Energy Initiative, http://mn.gov/commerce/energy/images/SummaryNext%20Generation%20Energy%20Initiative.pdf.

[86] Minn. Stat. 216B.1691 (2013); *see also* DSIRE: Database for State Incentives for Renewable and Efficiency, Minnesota, 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.

[87] Minnesota Office of the Governor Blog, "Minnesota: Gaining Jobs" (July 14, 2014) Available http://mn.gov/governor/blog/the-office-of-the-governor-blog-entry-detail.jsp?id=102-136769

[88] Minnesota 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.

[89] Minnesota Department of Commerce, How CIP Works, http://mn.gov/commerce/energy/topics/conservation/How-CIP-Works.jsp.

a goal of obtaining 10 percent of the entire state's retail electricity sales from solar power by 2030.

- California has mounted a comprehensive effort to reduce greenhouse gas emissions, reflecting its commitments to cut carbon pollution to 1990 levels by 2020[90] and by 80 percent below those levels by 2050.[91] To achieve these goals, California has implemented an economy-wide portfolio of policies, many under the authority of AB 32, California's Global Warming Solutions Act.[92] By 2025, California expects to cut power sector emissions by 25 percent from 2005 levels, and the state is employing the BSER building blocks in achieving those targets.[93] As mentioned previously, California has shifted in-state fossil generation almost entirely to natural gas, and is rapidly phasing out imported power from coal-fired power plants.[94] Also discussed above, California has an ambitious RPS of 33 percent that is projected to generate $60 billion and create up to 235,000 jobs.[95] In addition, California is a leader in energy efficiency, which is the first resource procured under California's loading order.[96] California has decoupled investor-owned utility profits from sales and offered investor-owned utilities the opportunity to profit from efficiency, creating strong incentives to pursue these savings.[97]

The BSER as determined by EPA reflects that individual generating units do not operate independently, but are instead part of a system of highly interdependent sources whose aggregate emissions are dependent on system management. States, electricity system operators, and power companies are achieving carbon pollution reductions from fossil fuel-fired power plants by shifting the grid as a whole away from high-carbon power sources. Our on-the-ground experiences demonstrate that a combined approach using all of the strategies reflected in EPA's four building blocks is the most cost-effective way to achieve reductions from the energy sector.

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[90] Cal. Public Health and Safety Code § 38550.
[91] Cal. Exec. Order S-3-05 (June 1, 2005).
[92] *See generally* Cal. Public Health and Safety Code §§ 38550 *et seq.*
[93] California Air Resources Board analysis.
[94] California Energy Commission, Tracking Progress: Installed Capacity (2013), http://www.energy.ca.gov/renewables/tracking_progress/documents/installed_capacity.pdf; Cal. Energy Commission, Tracking Progress: Current and Expected Energy from Coal in California (Nov. 6, 2014), http://www.energy.ca.gov/renewables/tracking_progress/documents/current_expected_energy_from_coal.pdf.
[95] California 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.
[96] California 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.
[97] *See* State Energy Efficiency Database: California, American Council for an Energy-Efficient Economy, http://aceee.org/sector/state-policy/california.

II.B. A More Limited System of Emission Reduction Would Not be the Best System

In its proposal, EPA invites comment on a BSER composed only of heat-rate improvements to coal-fired EGUs (building block 1) and dispatch to existing combined-cycle natural gas EGUs (building block 2).[98] A system composed only of these two building blocks would provide less overall opportunity for carbon pollution reduction at a higher cost. 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 and shifting to natural gas. Reductions from demand-side energy efficiency and renewable energy are also among the most cost-effective reductions. A more limited system would not promote the most cost-effective carbon reducing improvements to the power sector, and therefore cannot be considered the best system of emission reduction.

Furthermore, in determining the best system of emission reduction, EPA is directed to consider that Section 111 is designed to promote the development and implementation of technology. Including in the BSER the opportunities available throughout the electricity system to reduce emissions from affected sources will promote technological advancements throughout the sector that will drive further carbon reductions. A system limited to only building blocks 1 and 2 would exclusively promote improvements of fossil fuel-fired technologies, but would not promote technological improvements or increases in deployment of zero-carbon generation or advanced technologies to reduce energy demand. It is these latter elements of the system that will be most critical to achieving the long-term carbon pollution reductions in the power system necessary to address the challenge of climate change.

Our state experience demonstrates that the combination of heat rate improvements in fossil-fired EGUs, shifts in dispatch to less carbon-intensive generation sources, and reductions in fossil-fuel fired generation from increased zero-carbon and low-carbon generation and increased demand-side efficiency—as reflected in building blocks 1 through 4—achieve a high degree of cost effective carbon emissions reductions. The emissions reductions we have achieved are significantly greater and more cost effective than could be achieved by heat rate improvements and redispatch alone. Consequently, the BSER should be composed of the entire system reflected in all four building blocks.

[98] 79 Fed. Reg. at 34878.

II.C. State Experience Confirms that this Overall Level of Implementation is Achievable

Our state experience also confirms that the overall, national level of reduction expected from EPA's proposed emission guideline is achievable, as many of our states have cost-effectively achieved even greater reductions on a shorter timeframe.

EPA projects that the proposed emission guideline will achieve a 22 percent reduction over a 19-year period (2012-2030).[99] As described above, many of our states have already achieved reductions of this magnitude in a shorter time frame. On average, our states have reduced carbon pollution from the power sector by 23 percent in the eight-year period between 2005 and 2012.[100] The nine states[101] participating in the Regional Greenhouse Gas Initiative have together reduced carbon pollution in the region by over 40 percent from 2005 to 2012.[102]

In short, the collective experience of our states demonstrates that the system identified by EPA is already being successfully implemented to achieve emission reductions of a similar magnitude, in a shorter timeframe, than the overall reductions proposed by EPA, and a number of are states have achieved significantly greater reductions.

II.D. Translating Rate-Based Goals to Mass-Based Emission Budgets

We strongly support EPA's proposal to allow states the option of complying with a mass-based emission budget equivalent to the rate-based state goal identified in the emission guideline. Mass-based approaches have many advantages, including harnessing the market's ability to find the most cost-effective reduction opportunities and ease of administration and compliance. Our group of states does not take a consensus position regarding the specific translation methodologies presented in the Technical Support Documents that accompany the proposed rule.[103]

We note that a number of our states have programs that promote clean vehicles, and that will result in reductions of carbon pollution and other air pollutants. Most importantly, this includes the Zero Emission Vehicle (ZEV) regulations—which require that zero-emission vehicles constitute a percentage of vehicle sales—and a supporting

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[99] Computed based on 2012 CO_2 emissions data for U.S. power sector and EPA RIA projections from all power sector sources under state scenario in 2030

[100] *Supra* note 45.

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

[102] RGGI, *supra* note 79, at 1.

[103] U.S. EPA, Technical Support Document: Projecting EGU CO_2 Emission Performance in State Plans, (June 2014), http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule-projecting-egu-co2-emission-performance; U.S. EPA, Technical Support Document: Translation of the State-Specific Rate-Based CO_2 Goals to Mass-Based Equivalents (Nov. 2014), http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule-translation-state-specific-rate-based-co2.

memorandum of understanding (MOU) that have been adopted by eight of our states.[104] The MOU establishes a collective target of placing 3.3 million zero emission vehicles on the road by 2025; the majority of the vehicles will be plug-in electric vehicles. Shifting to these electric vehicles from conventional petroleum-fueled vehicles will significantly reduce overall carbon pollution in our states, but it will also affect electricity demand. We urge EPA to work with the MOU states to identify a rigorous load-growth projection or methodology that takes into account any projected load changes from these regulatory ZEV programs for the purposes of translating from a rate-based state goal to a mass-based emission budget.[105]

II.E. Support for Interim Targets and Compliance Flexibility

Our states generally support EPA's proposed two-part goal structure that requires states to meet a ten-year average interim goal 2020 to 2029 and a final goal in 2030 in their state plans.

Given that carbon dioxide remains in the atmosphere for a century or more, strong interim targets are important to the proposed rule's environmental protectiveness. As we noted earlier, our states are already experiencing the harms of climate change, and therefore cost-effective steps to reduce carbon pollution should be taken as soon as possible.

Interim targets are also important in that they enable timely, comprehensive planning to reduce a broad range of air pollutant emissions in an integrated and cost-effective way. The inclusion of interim targets beginning in 2020 combined with a ten-year averaging period provides states with both a clear signal of the significant CO_2 reductions required in the near term and the flexibility to meet those reductions while taking into account obligations to reduce other pollutants. This allows states to holistically address not only CO_2 emissions under the Clean Power Plan but also mercury and air toxics emissions under the Mercury and Air Toxics Standards, cross-border air pollution under the Cross-State Air Pollution Rule, ozone precursors contributing to nonattainment areas under the upcoming revision to the ambient air quality standard for ozone, and haze-creating pollutants under the Regional Haze Program. Comprehensive planning is more cost-effective, ensuring that investments made in pollution controls are not stranded if high-emitting power plants become less economical to run under the broader framework of clean air standards. Providing interim targets combined with a flexible 10-year averaging period leading to a final 2030 goal will provide states and power companies with the regulatory certainty to make these cost-effective investment decisions.

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[104] State Zero-Emission Vehicle Programs Memorandum of Understanding (Oct. 24, 2013), http://www.arb.ca.gov/newsrel/2013/8s_zev_mou.pdf.

[105] This is not a recommendation that EPA should credit offsetting reductions in carbon pollution in the electricity sector.

We appreciate the flexibility that EPA has already provided in allowing the interim goal to be met through a ten-year rolling average during the period from 2020 to 2029. This is an effective way to allow states to develop their own "glide path" to meet the level of emission performance required by the final goal in 2030.

EPA recognizes in the Notice of Data Availability (NODA) that some stakeholders have indicated that the flexibility provided by the ten-year averaging period for interim goals is constrained by the stringency of some states' interim goals. As noted above, we strongly support the inclusion of interim targets, but also encourage EPA to provide states additional flexibility for meeting these interim targets. For example, we encourage EPA to allow states to credit certain reductions achieved between the proposal of the rule and 2020; we also encourage EPA to allow states the option to begin the interim compliance period before 2020 and therefore have a longer averaging period. EPA took comment on both of these mechanisms in the proposal and the NODA. We strongly encourage EPA to allow states to set forth their own interim milestones and glide path while meeting the enforceable interim target (on a 10-year average, as proposed) and the 2030 emission target.

In the event that EPA chooses to provide states with greater interim flexibility in a way that reduces the emissions reductions that would have otherwise been achieved in the interim period, we encourage EPA to consider other changes identified in this letter that would reflect additional cost effective opportunities for reductions, including implementing a reasonable minimum floor for a shift to natural gas.

II.F. Considerations for Potential Changes to Building Blocks

Many of our individual states will submit separate comments that may include suggested refinements to the building block and goal computation calculations. In response to EPA's requests for comment in its Notice of Data Availability, we provide the following input on selected potential changes to the building block methodology:

Building Block 2 – Minimum Level of Generation Shift to Natural Gas

In the NODA, EPA requests comment on whether building block 2 should include an assumption about a minimum level of generation shift from higher-emitting fossil steam generation to lower-emitting natural gas generation. This proposal reflects stakeholder comments that there is a significant opportunity to reduce emissions not only by shifting generation to existing NGCC units with additional capacity, but also by shifting generation to new NGCC units or by co-firing or repowering with natural gas at existing coal-fired EGUs. Under this proposal, all states would be assumed to have some potential for reducing emissions through a shift to natural gas generation under one of these pathways.

In our experience, there is significant opportunity to reduce emissions from affected sources by shifting to natural gas generation in all three ways. Our states have collectively achieved significant improvements in emission performance through

increases in utilization of existing NGCC units, as originally proposed in EPA's building block 2. In addition, however, our states have also experienced significant improvements in emission performance due to shifts in generation to *new* NGCC units as well as through co-firing or repowering with natural gas at existing coal-fired EGUs.

Incorporating into the BSER the potential to improve emission performance from all three of these methods of shifting to natural gas generation is in keeping with EPA's overall approach and would better reflect the actual system that our states have used to achieve emission reductions.

EPA's original proposal considered the potential to shift generation from coal-fired power plants to existing, underutilized NGCC plants. The proposal rightly recognized that due to the interconnected nature of the power grid and interoperability of different generation resources, reduced use of high carbon-intensity EGUs would result in increased utilization of other generation resources, such as efficient NGCC plants.

As demonstrated by our state experience, however, focusing only on shifts to existing NGCC units does not capture the other ways in which changes in the electricity sector are leading to emission reductions at existing fossil-fired EGUs.

A diverse array of coal plants across the country have been or are being converted to burn natural gas, reducing carbon pollution from these plants. Co-firing and converting to gas at coal boilers provides significant reductions not only in carbon pollution but also in harmful co-pollutants emitted by coal plants, and facilitates attainment of other clean air standards.[106]

New natural gas plants are currently being constructed, and market trends indicate that more will be constructed in the future.[107] In many states, power companies have already identified their intent to replace generation from older, inefficient coal-fired EGUs with new, efficient NGCC units.

We therefore support EPA's proposal to establish a reasonable minimum value as a floor for the amount of generation shift to natural gas for purposes of building block 2, which could include re-dispatch to existing NGCC units, re-dispatch to new NGCC units, or co-firing with natural gas in existing coal-fired boilers. This methodology would better reflect the system that our states have already demonstrated has been effective at reducing CO_2 emissions from affected sources.

Building Block 2 – Phase-In

EPA requests comment in the NODA on the potential for gradually phasing in building

[106] Andover Technology Partners, Natural Gas Conversion and Cofiring for Coal-Fired Utility Boilers (2014).
[107] U.S. Energy Information Administration, Annual Energy Outlook (2014).

block 2 to address concerns about interim goal stringency. This group does not take a position on whether EPA should phase in building block 2, and our states may have different positions on this issue. However, if EPA does choose to develop a phase-in schedule for building block 2, we encourage the Agency to base any rate of transition from existing coal to existing underutilized NGCC capacity on technical considerations relevant to such a transition. We recommend that EPA carefully consider historic changes in the relative utilization of coal and NGCC plants in response to price considerations, as well as natural gas supply capacity, as an important source of information about the potential for and pace of shifts in utilization between coal- and gas-fired power plants.

III. State Plan Issues

III.A. Support for EPA's Flexible Approach to State Compliance

Our states generally support EPA's proposed approach to state compliance, which allows states to use and build upon existing programs and successes, employ the most cost-effective strategies available under either rate-based or mass-based compliance frameworks, adapt approaches to their unique situations, and consider multi-state strategies.

Below, we offer support for specific elements of EPA's proposal, as well as suggestions for refinements that could help ease state implementation of the rule. In particular, we support EPA's efforts to address the enforceability of measures included in state plans; as EPA continues to hone available compliance methods, we urge the Agency to offer states strategies that appropriately balance accountability for significant emissions reductions with the ability to innovate to secure these reductions.

We support EPA's effort to allow states to extend the deadline to submit plans, but also ensure that they make progress toward a complete plan. Additionally, our states appreciate EPA's efforts to provide the flexibility to build upon our existing, proven state programs for compliance. Finally, we are pleased that EPA recognizes the importance of evaluation, measurement, and verification (EM&V) for renewable energy and energy efficiency, and we provide input on EPA's proposal to develop EM&V methodology guidance based on our states' extensive experience operating these programs and accounting for their electricity savings and emissions reductions.

III.B. Portfolio Approach, Enforceability, and Corrective Measures

We appreciate the flexible approach taken by EPA with regard to state compliance options. As many of our states noted in a December 2013 letter, it is important for states with established and proven clean energy and efficiency programs to be able to build on those programs for compliance. The enforceability mechanisms that EPA requires in state plans should support these existing programs, as well as new programs

in other states, by minimizing program changes required purely to conform with federal requirements, while still providing enough additional program review and accounting to ensure that required reductions are achieved.

To that end, we provide the following recommendations related to enforceability and state plan development:

Diversity in Emission Allowance Programs: Tradable allowance systems incorporating covered EGUs are likely among the most efficient ways of ensuring enforceability, and are a favored state design option under the general Section 111(d) regulations.[108] However, existing and future allowance program designs will vary, and the final rule should accommodate this diversity. For example, while the RGGI program covers only EGUs, the California carbon market includes other sectors. As regional carbon markets expand over time and EPA fulfills its obligations to regulate carbon pollution from other industries, both sectoral and economy-wide allowance programs may be used. EPA should recognize either sort of allowance program as sufficient for compliance with the rule, provided that an appropriate demonstration is made that the program (combined, if necessary, with other measures) will ensure that covered emissions from regulated sources will conform to federal requirements.

State Flexibility to Adjust Program Details: Likewise, EPA should consider which specific elements of state-based allowance systems must be made federally enforceable, and which may remain as state-enforceable infrastructure for these programs. Provided that states implementing these programs rigorously demonstrate to EPA that their systems will achieve required reductions, EPA should ensure that these states retain flexibility to adjust program details and amend market regulations as appropriate. For example, EPA might consider whether key program components—such as the total allowances in the system and the requirement that sources hold allowances to cover their emissions—should be federally approvable, while implementation details remain state law matters.

Support for Portfolio and State Commitment Approaches: We support allowing states the option to use a "portfolio" approach to design programs that place some but not all compliance obligations on affected EGUs, as long as state plans ensure that the emissions of the covered sources decline on the required glide path. We also urge EPA to allow states the option of employing a "state commitment" version of this portfolio approach, as long as a source-level, federally enforceable backstop is required.[109]

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[108] 40 C.F.R. § 60.24(b)(1) ("Emission standards shall either be based on an allowance system or prescribe allowable rates of emissions except when it is clearly impracticable.").

[109] In response to EPA's requests for comment on the portfolio approach proposed and option for "state commitment approach." 79 Fed. Reg. at 34901-02.

Under the portfolio approach as proposed, states could designate different "affected entities" that would be responsible for complying with portions of state plans. It is important that EPA afford states considerable discretion as to which entities would be included in such an approach and how accountability would be structured. Section 111(d) gives states broad flexibility to achieve the required emissions reductions. States, subject to EPA approval, may determine how those reductions are most effectively implemented, including direct emissions reductions from covered EGUs and complementary state energy planning actions that reduce demand on affected EGUs; however, many of the underlying regulatory details of these state actions may not need to be federally enforceable, depending on the overall design of a given state plan.

Instead, it would be appropriate under some circumstances for EPA to accept an "enforceable commitment from the state itself to implement state-enforceable measures" which will achieve a portion of the required emissions reductions, at least in the first instance. Under this "state commitment" approach, variations of which have already been used in the Section 110 context, state energy program measures, for instance, would not be directly federally enforceable (and so not subject to federal and citizen enforcement under the Clean Air Act), but the commitment to achieve the reductions that they support *would* be enforceable against the state planning entity. The result is to curtail emissions from affected EGUs consistent with system-level reductions, while maintaining state control over the regulatory details of the state energy planning measures that support those reductions. Furthermore, under this approach, the states themselves would determine the appropriate role of different state agencies in implementing and overseeing such programs.

In order to guarantee the reductions the final rule will require, state planners would need to support these commitments with clear initial demonstrations that the required reductions will be achieved, regular reporting during the compliance period, and clear contingency and federally enforceable backstop measures if the expected reductions are not achieved. In particular, we strongly recommend that EPA require that state plans using a state commitment approach include a backstop that automatically places a federally enforceable limit on covered EGUs, to secure any reductions that state plan commitments do not deliver. The state would choose the mechanism for the federally enforceable limit; for instance, the backstop could take the form of a mass-based allowance system or a rate-based averaging system.

For example, a state choosing to pursue a state commitment approach would develop a plan that includes a limit on affected EGUs that itself is not sufficient to achieve the state's overall emission performance requirement. In the plan, the state would also commit to implementing other measures, such as renewable energy and energy efficiency programs, to make up the difference; that commitment by the state would be federally enforceable against the state itself, although the underlying programs would not be federally enforceable. A well-designed plan would include clear and rigorously

defined interim contingencies that would be automatically triggered if the state commitments do not deliver the expected reductions in emissions. Interim contingencies could include expansions of state program commitments, such as committing more of the underlying resource savings from an existing energy efficiency resource standard, or scaling up the state programs themselves if all underlying resources have been committed.

In addition, the state plan should be required to include as a final backstop a federally enforceable limitation on affected EGUs sufficient to guarantee that the state goal will be met should the initial state commitment measures and any interim contingencies fail to achieve the required level of emission reduction. This backstop would be triggered automatically at a specific milestone—for example, after a state's emissions from affected EGUs significantly exceed its projected emission performance glide path for more than one year even after any interim contingency measures have been put into effect. The federally enforceable backstop could be implemented as either a rate-based or mass-based limitation on EGUs sufficient to secure any reductions that state plan commitments do not deliver.[110] For example, the backstop could be implemented as an allowance trading system under a mass-based approach. Alternatively, the state could choose a backstop to be implemented as a federally enforceable rate-based averaging mechanism that includes adjustments or credits based on energy efficiency or renewable energy so long as the state plan includes a rigorous methodology for crediting real and meaningful reductions.

An appropriately designed commitment system in the Section 111 context would create incentives for state planners and covered entities to work together to secure reductions from the electric system as a whole. EPA Regional Administrators, evaluating state plans pursuant to the final rule and the general Section 111(d) regulations, should only approve plans that create these incentives and maintain appropriate rigor.

Enforceability of Complementary and Baseline Measures: Finally, we approve of EPA's recognition that some complementary emission reduction measures may not need to be federally enforceable because other measures capture their effects (such as, for example, a cap-and-trade system that is supported by a separate renewable portfolio standard). States and EPA regional offices should decide together which particular measures must be reflected in enforceable plans, and which may not.

Similarly, consistent with EPA's earlier "Roadmap" for including certain energy policies in Section 110 plans, EPA should recognize that some measures now in force likely represent baseline measures that need not themselves be federally enforceable

[110] Although the enforceable obligation would be on EGUs, this does not mean that the EGUs would be required to achieve reductions through on-site interventions only, as described below.

because they have already been incorporated into state policy. Of course, plan revisions may be warranted if states do not continue implementing these measures.

In sum, we believe that EPA and the states can develop enforceable state plans that will maintain state progress toward federal goals, while preserving significant flexibility for states to continue developing and improving reduction approaches. This flexibility, which is appropriate and necessary given Section 111(d)'s system-level mandate, can best be provided by balancing support for state policy development with rigorous reporting, analysis, and enforcement. We encourage EPA to finalize a rigorous state commitment-based approach as an option for state planning, which will enhance states' ability to deliver the reductions required.

III.C. Plan Development Timeline and Process

We applaud EPA's effort to structure the state plan submittal timeline to allow states additional time if needed to develop state plans, while still ensuring progress toward a complete plan. Specifically, we support EPA's proposal to provide a one-year extension to June 30, 2017, for states to submit a complete individual state plan if the state documents the need for additional time, and a two-year extension to June 30, 2018, if the state plan includes a multi-state approach.

We also support EPA's proposal of an initial plan due by all states on June 30, 2016, to meet the timeline established in President Obama's June 2013 Presidential Memorandum on Power Sector Carbon Pollution Standards. These initial plans appropriately require states to demonstrate commitment to creating an individual state program or participation in a multi-state planning process, as well as progress toward the development of a complete state plan or multi-state plan.[111] Initial plans also appropriately require initial quantification of the level of emission performance that will be achieved in the plan; our states support this requirement but note that this quantification ought not require complex methodology or modeling.

We note that some states may need more time beyond the provided extensions to develop state plans, due to time-intensive stakeholder processes, regulatory requirements, and the need in many states for legislative approval or other action. We suggest that EPA consider allowing states an additional one-year extension for the final plan under certain circumstances. Such a request should be granted only upon a showing of good cause—for example, where a state plan requires legislative approval and a state legislature meets only every other year.[112]

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[111] In response to EPA's request for comment on initial plan elements and whether the guidelines should require a state to have taken significant, concrete steps toward adopting a complete plan for the initial plan to be approvable. 79 Fed. Reg. at 34916.

[112] In response to EPA's request for comment on the approach for extensions. 79 Fed. Reg. at 34915.

We also note that development of state plans will require significant staffing and resources, and we urge the federal government to provide additional funds to support state plan development.

In addition, we note that our states have extensive experience developing state and regional clean energy and carbon emission reduction programs. We are willing to work with other states to share information, analysis, and lessons learned from our programs as all states begin to consider compliance options and develop state plans.

III.D. Clarity on Recognition of State Programs for Compliance

Our states appreciate EPA's efforts to provide the flexibility to build upon existing programs for compliance. As stated previously, states that already operate successful clean energy, efficiency, and other climate programs should be able to use those programs to comply with EPA's final rule. To clarify precisely how emissions reductions from state programs will be credited, we request that EPA provide more detailed guidance on the recognition and crediting of state programs toward compliance.

In particular, clarity is needed regarding the mechanisms that would be used to recognize emissions reductions achieved by existing state programs in the time between the proposal of the rule and the beginning of the interim compliance period.[113] Greater clarity is also needed regarding the way in which renewable energy generation and avoided generation from energy efficiency are credited toward meeting a rate-based state goal.

III.E. Measuring and Verifying Energy Efficiency and Renewable Energy

Our states appreciate that EPA recognizes the importance of quantifying, monitoring, and verifying the electricity generation or electricity savings effects of renewable energy and demand-side energy efficiency measures. We have extensive experience operating energy efficiency and renewable energy programs and measuring the electricity savings and emissions reductions they achieve.

We support EPA's proposal to require state plans that include enforceable renewable and efficiency measures to include an EM&V plan, as well as EPA's proposal to develop guidance on acceptable EM&V methods to be incorporated into such a plan. We encourage EPA to provide draft EM&V methodology guidance before the final rule is issued, and to work with states, DOE, and other stakeholders to develop the guidance; in particular, EPA should solicit EM&V methodology input from states with well-established programs.[114] The development and use of consistent and robust EM&V methodologies for well-established and emerging energy efficiency programs will help

[113] In response to EPA's request for comment on approaches for recognizing existing programs. 79 Fed. Reg. at 34918.

[114] In response to EPA's request for comment on approaches for EM&V. 79 Fed. Reg. at 34921.

to establish equivalence across the country. As EPA moves forward with creating its final rule, it should endeavor to provide consistency in state target setting and compliance, while allowing for traditional resource acquisition programs and innovative market development and financing programs in a manner that recognizes the contribution of state efforts.

We also urge EPA to continue communicating and coordinating with Public Utility Commissions and other entities charged with oversight of demand reduction programs, and encourage additional cooperation between EPA and DOE.

Energy Efficiency Measures

Our states support a "middle ground" approach to establishing standards for EM&V protocols to measure savings from energy efficiency measures in state plans, to allow for flexibility while supporting consistent verification of energy savings across all states. As presented by EPA,[115] this approach balances certainty and flexibility by providing specific EM&V criteria for the most common and high-achieving energy efficiency strategies, while providing generalized guidance for new or emerging approaches. We also suggest that EPA include a state certification option for energy efficiency programs or measures, under which the state may propose a methodology for EPA, with involvement from DOE, to approve.

We agree with EPA that there is a range of established EM&V procedures and protocols across energy efficiency measures, and we recognize that flexibility in crediting these measures will support new innovative approaches. EPA should credit well-established standardized programs with uniform, accessible, and transparent methodologies. In developing EM&V guidance for the well-established energy efficiency approaches, we suggest EPA consider the approaches developed by the DOE Uniform Methods Project, Pacific Northwest Regional Technical Forum (RTF), Northeast Energy Efficiency Partnerships (NEEP) EM&V Forum, and ISO-NE, among others. We encourage EPA to clarify what the Agency considers "adequate documentation" for innovative energy efficiency measures, given the wide range of practices across public utility commissions (PUCs). For example, approaches to evaluate measure life and persistence of energy savings vary among PUCs, as noted by EPA.[116]

Renewable Energy Measures

Our states agree with EPA that many existing state and utility requirements for quantification, monitoring, and verification of renewable energy programs provide a

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[115] U.S. EPA, Technical Support Document: State Plan Considerations 56 (June 2014), http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule-state-plan-considerations.
[116] *Id*. at 50.

good basis for EPA to establish EM&V guidance for renewable energy measures included in state plans. We support EPA's development of guidance on acceptable EM&V methods and encourage EPA to work with DOE, states and stakeholders in developing that guidance, as discussed above.

III.F. Consistency and Rigor in Plan Evaluation and Approval

Just as consistency and rigor are key criteria for EM&V methodology, consistent evaluation and approval of individual state plans will help ensure a well-functioning national program and equitable treatment among states. This consistency will be especially important given the flexibility provided to states to develop unique state plans to suit individual state situations. Our states generally support the required plan components and evaluation criteria as proposed;[117] however, we request that EPA provide sufficient guidance to Regional Administrators to ensure that all state plans are evaluated and approved consistently across different regions.

In response to EPA's request for comment on the option of partial or conditional approval,[118] our states encourage EPA to finalize a rule that allows for partial or conditional approval of state plans, provided EPA develops a specified procedure for the state to cure the deficiencies identified in a partially or conditionally approved plan before EPA imposes a federal plan.

Additionally, we support EPA's proposal to allow states to modify approved state plans so long as the state demonstrates that the revision will not reduce the plan's emission performance.[119]

IV. Interstate Compliance, Accounting, and Effects

Our states applaud EPA's provision of flexibility to states to work together for compliance. Multi-state coordination provides substantial benefits, and can also resolve accounting issues and unwanted interstate effects that may arise between adjacent state programs of varying designs, as many of our states noted in a previous submission to EPA. As EPA recognizes in its proposal, the electricity grid is a complex interstate system, and coordination of state planning can help ensure a well-functioning national system. Multi-state planning processes and dialogues allow states to share information and analyses as they consider compliance options, and increase understanding of the ways state programs may interact. Coordination of compliance approaches will encourage more

[117] In response to EPA's request for comment on all aspects of general approvability criteria and the twelve specific plan components. 79 Fed. Reg. at 34909.
[118] 79 Fed. Reg. at 34916.
[119] 79 Fed. Reg. at 34917.

efficient outcomes that are more closely aligned with the current electricity system, and provide more cost-effective compliance options and reduce administrative costs.

Multi-state approaches to reducing pollution have proven successful in many contexts, such as regional haze regulations and several iterations of programs to reduce transport of ozone and particulate matter. In the greenhouse gas emissions context, RGGI provides an example of a highly successful regional budget trading program that has achieved substantial reductions cost-effectively. We commend EPA for recognizing these benefits and allowing states the flexibility to design programs that allow for multi-state collaboration, and support EPA's proposed extended timeline for multi-state engagement and the requirement of a rigorous but attainable demonstration of progress toward a potential multi-state approach.

Below, we provide suggestions for refinements to the proposal that could help make it easier for states to pursue a range of collaboration options. For example, this range could include standardized mechanisms to trade renewable and energy efficiency credits, or agreements on how to allocate avoided emissions from renewable energy and energy efficiency. Clarification of the variety of collaborative options available to states may encourage participation in the regional coordination and planning processes that are beginning to take place around the country.

We also urge EPA to provide effective guidance to ensure harmonious interaction among state plans, including prohibiting double counting but also promoting full use of energy efficiency and renewable energy.

IV.A. Clarifying EPA's Support for Multi-State Collaboration and Coordination

Encouraging "No Regrets" Participation in Regional Processes

In addition to the potential benefits of multi-state approaches to compliance, as discussed above, there are also substantial benefits to "no regrets" participation in multi-state coordination and planning processes. Such regional processes are taking place around the country, allowing participating states to share information and analysis while considering their compliance options. We urge EPA to recognize the importance of these multi-state dialogues, and provide states flexibility to participate in these multi-state processes while considering their individual compliance options.

In response to EPA's request for comment on the required elements of an initial plan,[120] we suggest a clarification to the proposed element requiring a Memorandum of Understanding or similar agreement with other states if a multi-state approach is being pursued, in order to encourage states to participate in multi-state dialogues. We suggest

[120] 79 Fed. Reg. at 34916.

that such an agreement should demonstrate meaningful commitment to a multi-state planning process and a timeline for concluding the process, but should not be a burdensome requirement that necessitates legislation.

Allowing Additional Time to Design Multi-State Approaches

Our states applaud EPA's effort to allow more time for multi-state engagement by giving states pursuing multi-state approaches an additional year to submit their plans, while also ensuring progress toward development of a multi-state program through the initial plan requirements.[121]

Providing Flexibility to Join or Leave Multi-State Programs

Multi-state approaches will need a process to address a state joining or leaving a collaborative process or arrangement. We request that EPA work with states to identify approvable "on-ramps" and "off-ramps" in state plans with collaborative efforts. We also ask that EPA provide guidance on how states could use a plan revision or other mechanisms to join or form a multi-state collaboration in the future.

Additionally, we suggest that for this purpose, calculating a multi-state, mass-based goal by aggregating individual state mass-based goals would be simpler than requiring a methodology that includes modeling projected emissions from the entire region. This would allow the multi-state goal to be adjusted more easily if a state joins or leaves the program. EPA proposes that a multi-state mass-based goal be based on translation of an aggregation of the state-specific rate-based CO_2 emission performance goals, and seeks comment on options for calculating a weighted average rate-based emission performance goal for multiple states.[122] We encourage EPA to provide states the additional option to calculate a multi-state mass-based goal by aggregating individual mass-based state goals.

Clarifying Potential Collaboration Options

We believe states should have maximum flexibility to determine what kinds of collaborations might work for them. These could include submission of joint plans, standardized approaches to trading renewable or energy efficiency credits, or negotiated agreements on how to allocate avoided emissions or generation from renewable energy and energy efficiency among states.

In response to EPA's request for comment, we request that EPA provide states the broadest number of options for how to incorporate such collaborations into state plans.

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[121] In response to EPA's request for comment on potential mechanisms for fostering multi-state collaboration. 79 Fed. Reg. at 34921.
[122] 79 Fed. Reg. at 34911.

Specifically, we request that in addition to allowing states to submit a single multi-state plan, EPA also allow states the options of: 1) submitting individual plans for state-specific elements and including a common submittal that addresses common plan elements, and 2) separate individual submittals that are materially consistent for all common plan elements that apply to all participating states.[123] These two options would provide the necessary flexibility for states to develop interstate agreements while keeping autonomy over state-specific plan elements, and may encourage more states to participate in multi-state collaborations. We therefore urge EPA to finalize both additional multi-state plan submittal options on which the Agency takes comment.

We also encourage EPA to help facilitate such interstate agreements or multi-state collaborations by working with states to either identify or provide a platform or framework that states may elect to use for the tracking and trading of avoided generation or emissions credits due to interstate efficiency or renewable energy. EPA has previously administered emissions trading programs under the Clean Air Act, such as the Acid Rain Program and the NOx Budget Program. EPA could provide such a platform, support a third party to provide such a platform, or work with states to build on existing platforms; such options would alleviate the potential administrative burden of developing a trading program and allow states to pursue the option of interstate trading agreements at less cost.

IV.B. Accounting for Interstate or Interregional Effects of Plan Measures

We appreciate that EPA's proposal recognizes the complexity of accounting for interstate effects of state plan measures, and makes efforts to take into account the emissions reductions resulting from renewable and efficiency measures while also minimizing double counting.

Our states recommend that EPA address accounting for interstate renewable energy and energy efficiency by explicitly prohibiting double counting but also promoting full use of the emission reductions that occur as a result of energy efficiency and renewable energy. Specifically, in response to EPA's request for comment on interstate effects,[124] a state should be able to take credit for emission reductions achieved out of state due to in-state energy efficiency or renewable measures as long as the reductions will not be double-counted.[125]

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[123] *Id*.

[124] 79 Fed. Reg. at 34922.

[125] These comments do not take a position on which state should bear the burden of demonstrating that reductions achieved through renewable energy or energy efficiency are not double-counted, as there was no consensus on this issue. For this reason, it should not be inferred that these comments suggest either that a state making investments in or implementing policies that result in renewable energy or energy efficiency should bear the burden of proving there is no double counting of reductions resulting from those policies or investments, or

EPA requests comment on what a demonstration that interstate accounting for renewable energy or energy efficiency will not result in double counting would entail. We recommend that EPA provide guidance on EM&V methodologies that would be acceptable for states to demonstrate and take credit for emissions reductions achieved by their renewables and efficiency programs. We provide more detailed suggestions for EM&V methodology in Section III.

Accounting of the emissions reductions achieved through interstate renewable energy and energy efficiency without double-counting could be accomplished, for example, through standardized credit trading or an agreement to distribute avoided emissions from renewable energy and energy efficiency, as discussed above. Likewise, as we suggest above, a consistent trading platform could streamline this accounting and ensure that interstate renewable energy and efficiency are fully accounted for using standardized currency while alleviating the administrative burden on states. Finally, we urge EPA to minimize potentially harmful interstate effects, by working to minimize the perverse market incentives or disincentives that could result from a patchwork of state programs with different compliance frameworks.

V. Conclusion

In conclusion, we appreciate EPA's unprecedented outreach before the rule issuance, and for developing a proposal that incorporated and addressed many of the comments raised by our states and other states and stakeholders. We support EPA's framework for the proposed rule, especially the approach to the best system of emission reduction and the flexibilities provided to states. In response to EPA's requests for comment, we have offered suggestions on how to clarify and refine the rule.

We commend EPA on taking this crucial first step in what must be an incremental, long-term plan to reduce emissions from all sectors in all states. This proposed rule represents the most significant component of our national effort to reduce carbon emissions throughout our economy. We look forward to continuing to work with EPA to finalize this rule, inform associated guidance, and work towards successful implementation.

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that a state achieving reductions under a mass-based system should bear the burden of proving that there is no double counting because of the effects of out-of-state renewable energy or energy efficiency policies on in-state generation. Individual states may take positions on these issues in their own comments.

Attachment:

States' Roadmap on Reducing Carbon Pollution
Submitted to U.S. EPA December 16, 2013

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
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California Air Resources Board

Robert B. Weisenmiller
Chair
California Energy Commission

Michael R. Peevey
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California Public Utilities Commission

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Collin O'Mara
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Chair
Illinois Commerce Commission

David Littell
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Maine Public Utilities Commission

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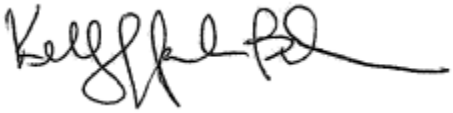
Maryland Department of the Environment



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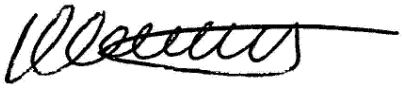
Maryland Public Service Commission



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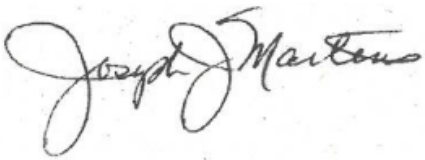

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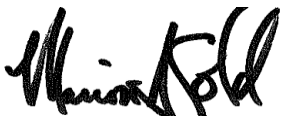

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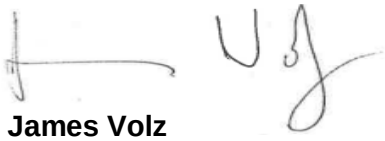

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Department of Ecology

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.

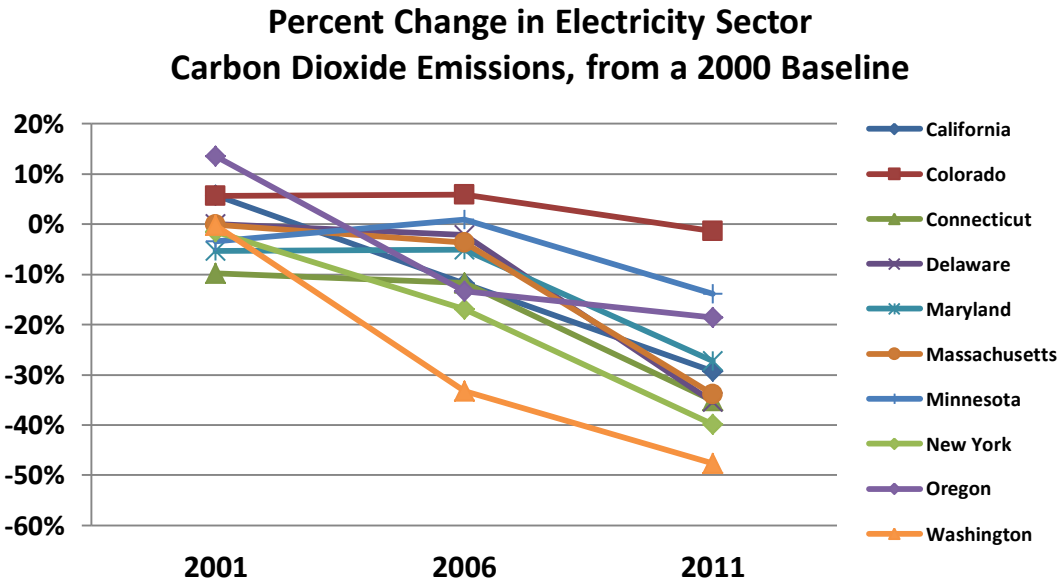

Figure 1: Many of our states have experienced very significant reductions in CO_2 emissions in the electricity sector over the past decade, demonstrating the levels of emission reductions that are achievable. Source: EIA, Total Electric Power Industry CO_2 Emissions.

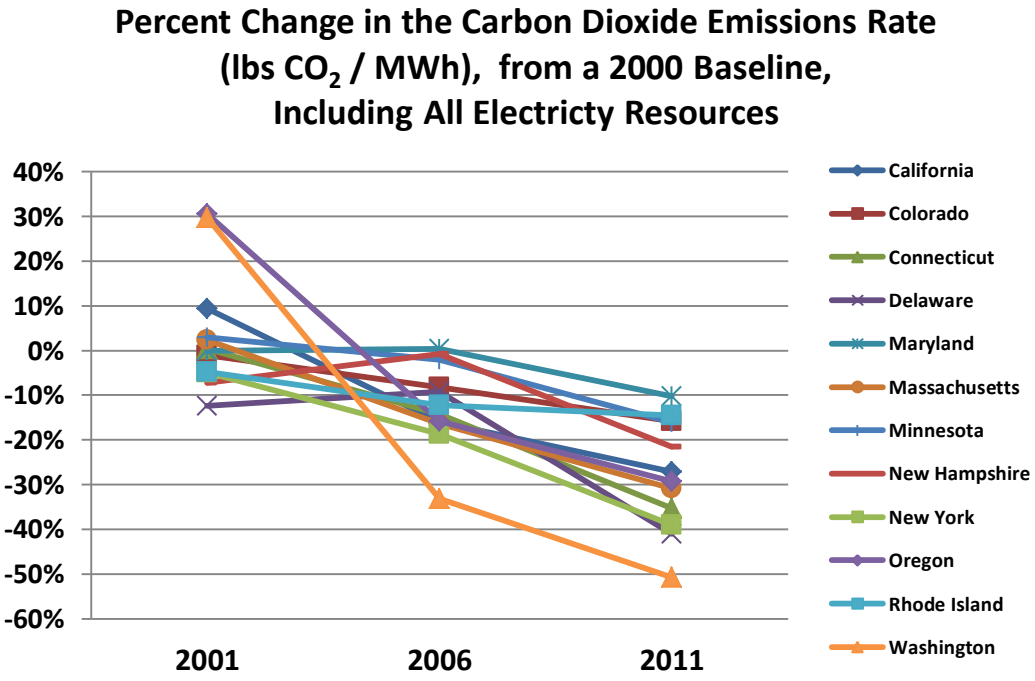

Figure 2: Similarly, many of our states have achieved very significant improvements in net carbon pollution emission rates (comparing total carbon pollution from the electricity sector to total electricity generation, i.e., lbs CO_2 / MWh). Source: EIA, Total Electric Power Industry CO_2 Emissions and 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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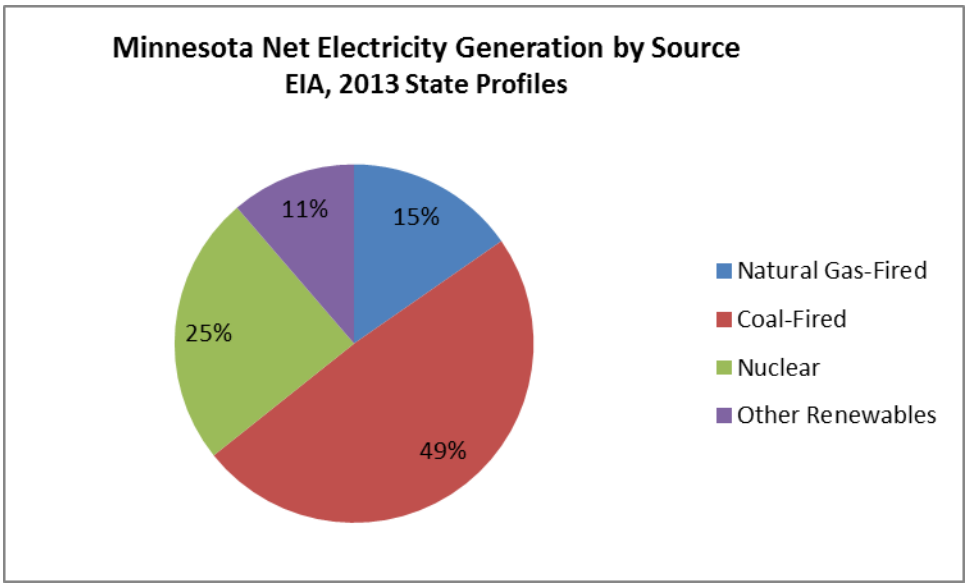
[173] Reduction in in-state electricity generation. EIA State Emissions, supra note 4.
[174] Minn. Stat. § 216H.02.
[175] Minn. Stat. § 216B.2401. Amended 2013 to "at least" 1.5%.
[176] *How CIP Works*, Minn. Department of Commerce, http://mn.gov/commerce/energy/topics/conservation/How-CIP-Works.jsp; 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.