Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

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November 28, 2014

Gina McCarthy, Administrator
U.S. Environmental Protection Agency
Air and Radiation Docket and Information Center
Mail Code: 2822T
1200 Pennsylvania Ave., NW
Washington, DC, 20460
Attn: Docket ID No. EPA-HQ-OAR-2013-0602

Re: Proposed Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units (79 Fed. Reg. 34830, June 18, 2014)

Dear Administrator McCarthy:
The State of Connecticut ("Connecticut"), through its Department of Energy and Environmental Protection, is pleased to offer the following general and attached detailed comments in support of the U.S. Environmental Protection Agency's ("EPA") proposed emissions guidelines for states to follow in developing plans to address greenhouse gas ("GHG") emissions from existing fossil fuel-fired electric generating units ("EGUs") (79 Fed. Reg. 34830, June 18, 2014 ("Clean Power Plan" or "CPP").

The need to reduce GHG emissions in order to avert the most severe economic, environmental and human harm from climate change is clear. Connecticut is already experiencing the impacts of climate change. These impacts are directly harming the health and welfare of Connecticut residents and causing significant economic damage. Heavy rainfall events, flooding, and hurricane activity have increased in frequency and intensity in recent years and are expected to continue to increase. In August 2011, Tropical Storm Irene 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. And in October 2012, Superstorm Sandy hit many of the areas still recovering from Irene and knocked out power for much of a week to more than 625,000 customers. Sandy was termed a superstorm because of the confluence of several severe weather systems, but also due to a warming climate. Rising sea levels increase the prospect that states will be more vulnerable to these types of storms in the years ahead. The estimated cost to Connecticut for the 2011 storms will exceed $750 million dollars. That figure does not include uninsured losses which could push the losses over $1 billion dollars. The impact from these storms is not limited to Connecticut.[1]
In Connecticut, we have proven that states can achieve significant, cost-effective GHG reductions while creating jobs and growing a clean energy economy. Between 2005 and 2012, we reduced the carbon intensity of our state's economy by 34%, while increasing our gross domestic product by 16%.

[1] http://www.ct.gov/deep/lib/deep/energy/cep/2013_ces_final.pdf

Connecticut is one of a handful of leadership states that have taken early action to achieve substantial economy-wide reductions in emissions of carbon dioxide and other greenhouse gases. Through Connecticut's participation in the path-breaking Regional Greenhouse Gas Initiative ("RGGI"), the nation's first interstate, carbon dioxide cap-and-trade program, we have reduced emissions from our state's electricity generating sector while funding investments of more than $104 million in complementary energy efficiency, renewable energy, and other carbon emissions mitigation measures.

I am proud of the progress we have made in Connecticut. Our successes clearly prove that EPA's approach to the Best System of Emission Reduction ("BSER") of the Clean Power Plan is feasible and cost-effective. Between 2005 and 2012, we reduced gross CO_2 emissions from the power sector by 23%, and per capita emissions by 25%. We achieved these reductions by displacing coal and oil generation with high efficiency, low emitting natural gas combined cycle generating technology, safely maintaining and operating significant nuclear generation capacity, and ramping up investments to deploy renewable energy and energy efficiency. Other highlights of our clean energy transition include:

- Our emissions of harmful criteria pollutants have dropped precipitously: emissions of nitrogen oxides (NOx) and sulfur oxides (SOx) decreased by 80% and 91% between 2005 and 2011.[2]
- Thanks to our investments in energy efficiency, Connecticut families and businesses are using less electricity. Between 2005 and 2012, electricity consumption in Connecticut decreased by 11% on a per capita basis and 13% on a gross basis.[3] Connecticut has ranked among the top 10 states on the American Council for an Energy-Efficient Economy Energy Efficiency Score Card for eight consecutive years.[4]
- By reinvesting RGGI proceeds and other funds in clean energy, between 2010 and 2013, we achieved a tenfold increase the amount of renewable energy generation deployed in our state, including solar photovoltaics and fuel cells.

This progress has occurred concurrent with a 6.4% increase in electricity generation from Connecticut's generating units, as dispatch of Connecticut's extremely low carbon generation fleet increases to meet regional electricity demand.[5]

Under the leadership of Governor Dannel P. Malloy, proactive energy and environmental policies are keeping Connecticut on track to further reduce GHG emissions by pursuing a cheaper, cleaner, more reliable energy future. In 2011, Connecticut established the nation's first Green Bank, to attract private investment in the deployment of clean energy in Connecticut. Over the past two years, each $1 of public funds invested via the Green Bank, attracted

[2] 2011 National Emissions Inventory, http://www.epa.gov/ttn/chief/net/2011inventory.html

[3] Gross and per-capita electricity consumption derived from EIA Retail Sales of Electricity by State by Sector by Provider http://www.eia.gov/electricity/data/state/ and U. S. Census 2005 & 2012 American Community Survey (ACS) http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF

[4] ACEEE 2006-2013 State Energy Efficiency Scorecards, http://www.aceee.org/state-policy/scorecard

[5] EIA Net Generation by State by Type of Producer by Energy, http://www.eia.gov/electricity/data/state/

approximately $5-$10 of investment from private sources.[6] Connecticut's continuing efforts are laying a foundation to achieve the dramatic reductions in carbon emissions necessary by mid-century to fight climate change while creating jobs and generating savings and revenue that flow back into our local economy. In 2013, we issued a Comprehensive Energy Strategy that identified further opportunities to achieve cuts in carbon emissions by ramping up investment in energy efficiency and renewable energy.[7] We expect to meet the 2020 emissions mandates of our state's Global Warming Solutions Act well in advance of 2020.[8]

In 2011, Connecticut consolidated its public utilities regulation, energy planning, and environmental protection agencies into a unified Department of Energy and Environmental Protection. Our experience has been that environmental protection and energy policy goals are more effective when integrated, and we strongly encourage EPA to coordinate and collaborate with the Department of Energy, the Federal Energy Regulatory Commission, and state public utility regulators as well as state environmental agencies in the refinement and implementation of the Clean Power Plan. Close, thoughtful coordination and cooperation among federal agencies with environmental and energy regulatory authority is imperative to achieving the carbon reductions, affordable, reliable energy, and prosperous economic future envisioned in the Clean Power Plan.

Our nation needs a comprehensive framework for addressing climate change, to ensure that all states—not just a proactive few—do their part to make cost-effective reductions in carbon pollution. The Connecticut experience demonstrates the fact that states can dramatically reduce carbon emissions, improve air quality, and protect public health while stimulating economic growth and prosperity. We believe that EPA's proposed approach to BSER replicates what Connecticut and a handful of other states found to be a successful and universally applicable framework for emissions reductions across the country.

While working within the legal framework of Clean Air Act (CAA) Section 111, EPA has leveraged system-wide strategies that are already being used to achieve carbon pollution reductions from fossil-fuel fired EGUs and drive technological improvements in the electricity system. By including energy efficiency and renewable energy strategies in the approach to BSER, EPA recognizes that states have the flexibility of basing their plans on proven strategies that already are providing cost-effective CO_2 emissions reductions. Connecticut is pleased that the Clean Power Plan recognizes that states may choose to work cooperatively to comply with the emissions guidelines by developing multistate plans. Connecticut also acknowledges the desirable environmental multi-pollutant benefits that could assist ongoing efforts to attain and maintain several national ambient air quality standards and help address the air quality related public health concerns arising from such traditional pollutants as ground level ozone.

In the attachment to this letter, we offer a number of detailed comments on the Clean Power Plan intended to capitalize on the positive points of the proposal while avoiding certain less desirable outcomes. Our attached comments are focused on preserving and, where feasible, improving the

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[6] *Connecticut's Green Bank: Energizing Clean Energy Finance*, http://www.ctcleanenergy.com/annualreport/

[7] http://www.ct.gov/deep/lib/deep/energy/cep/2013_ces_final.pdf

[8] http://www.cga.ct.gov/current/pub/chap_446c.htm#sec_22a-200a

national stringency of the proposal; balancing flexibility and accountability in state plan requirements; and ensuring that the responsibility of achieving reductions is equitably distributed among the states.

Connecticut applauds EPA's unprecedented outreach efforts in the development of the proposal and EPA's thoughtful consideration of the feedback it received prior to releasing the proposal. We strongly encourage EPA to maintain this level of interaction with states in finalizing the rule and providing guidance on implementation. Connecticut staff's expertise in air quality and energy planning are at your service should we be able to assist you as you finalize Clean Power Plan on the aggressive schedule established by the President's Climate Change Action Plan.

Sincerely,

Robert J. Klee
Commissioner

Comments from the State of Connecticut on
Proposed Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units (79 Fed. Reg. 34830, June 18, 2014)

Connecticut supports the comments on the proposed Clean Power Plan ("CPP") prepared by the Regional Greenhouse Gas Initiative (RGGI), the Northeast States for Coordinated Air Use Management (NESCAUM), the Georgetown Climate Center, the Connecticut Green Bank, and the Northeast Energy Efficiency Partnerships (NEEP)[9]. Specifically, Connecticut supports the general building block framework as the Best System of Emission Reduction ("BSER") and EPA's proposal to begin program implementation in 2020 with emissions declining through 2030. Connecticut provides additional comments and recommendations below.

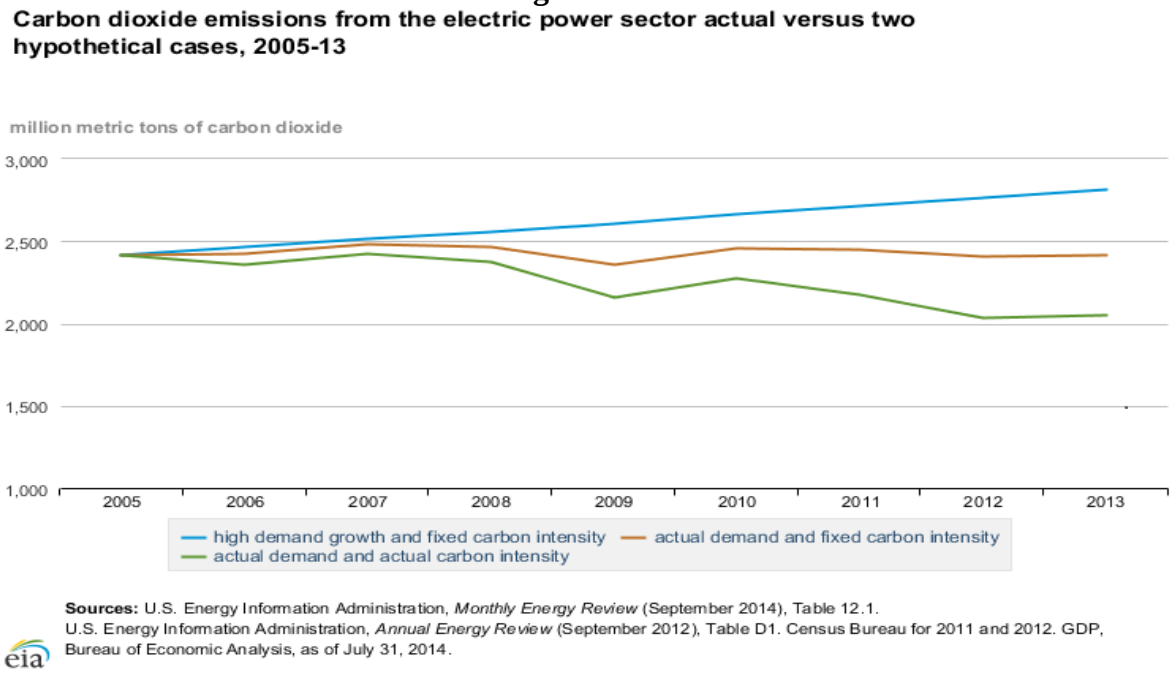
1) Maintain 2012 Baseline Year for Goal Setting

In its original proposal and the subsequent Notice of Data Availability ("NODA"), EPA request comment on whether or not to premise the building blocks on emissions from just one calendar year, 2012. EPA notes that some stakeholders contend that 2012 may not have been representative of normal operations and that it may be more reasonable to use 2010, 2011, or some average of multiple years between 2010 and 2011.

Connecticut strongly supports the use of 2012 as the base year for the Clean Power Plan building block methodology. Figure 1 shows actual emissions of CO_2 from the nation's electric power system from 2005 through 2013. Emissions of CO_2 were lower in 2012 than in any year after 2005. Use of any other calendar year or average of multiple years for the baseline would weaken the national stringency of the Clean Power Plan proposal, all else remaining equal. If the nation is to meet the goals for carbon pollution articulated in President Obama's 2013 Climate Action Plan, and the level of reduction that science indicates is necessary to stabilize global surface temperatures, then we have a moral and ethical obligation to use our best year to date as the baseline for additional action.

[9] NEEP comment signatories: Acadia Center, Alliance to Save Energy, American Council for an Energy Efficient Economy, Connecticut Department of Energy and Environmental Protection, Conservation Services Group, Home Performance Coalition, Massachusetts Executive Office of Environmental Affairs, Natural Resources Defense Council, Northeast Energy Efficiency Partnerships, Northwest Regional Technical Forum, Rhode Island Office of Energy Resources, Southeast Energy Efficiency Alliance, South-central Partnership for Energy Efficiency as a Resource, Southern Alliance for Clean Energy, Vermont Energy Investment Corporation,

Figure 1[10]



2) Building Block Implementation

Connecticut supports the methodology for applying EPA's building blocks as described in the original proposal. In Connecticut, energy efficiency ("EE") and renewable energy ("RE") measures play a key role in reducing the rate of demand growth, supporting sustained economic dispatch of clean sources of generation before oil and coal, and minimizing the impacts of seasonal peak demand and constraints on New England's natural gas transmission system. These complementary effects of EE and RE have helped Connecticut to significantly reduce annual emissions of carbon pollution, NOx, and SOx from its electricity generating system since 2005, while the amount of electricity generated actually increased resulting in a net decrease in emissions intensity.

In the NODA, EPA discusses some stakeholders' desire to have EPA set state goals by requiring 100 % of the EE and RE building blocks to replace existing fossil generation. In the NODA, EPA acknowledges that this methodology will be significantly more stringent and less cost effective than the original proposal.[11]

Connecticut's experience does not demonstrate that 100% of EE and RE measures are displacing existing fossil generation. Significantly, Connecticut is a net exporter of electricity in a deregulated regional power market. Accordingly, market forces and energy demand *outside* of Connecticut determine the amount of generation—including fossil generation—that operates in Connecticut. In 2012, approximately 17% of Connecticut's generation served load outside the

[10] http://www.eia.gov/environment/emissions/carbon/

[11] 79 FR 64553

state's borders.[12] Conceivably, Connecticut could reduce its in-state demand to zero but its generation fleet could still run to serve load in other states.

Requiring 100% of EE and RE to displace existing generation would necessarily require states like Connecticut to deploy greater amounts of EE and RE than contemplated in the rule. The two methods proposed to establish RE targets are based upon state potential and regional RPS requirements. Proposed EE goals were developed based on the level of efficiency achieved by leading states. Requiring all states to implement RE and EE to 100% offset existing fossil generation would necessarily require states to go beyond what has been adequately demonstrated. This is particularly true for leading states such as Connecticut. For these reasons, Connecticut believes that the presumption that 100% of EE and RE directly replace existing fossil generation has not been adequately demonstrated and should not be the basis for state goal setting as discussed in the NODA.[13] To the extent that EPA includes a requirement that EE and RE displace existing fossil generation, EPA must work with the states to accurately reflect the extent such replacement actually occurs in that state and consider factors such as growth in energy demand and net imports and exports.

In the original proposal, EPA requests comment on whether or not state goals should be revisited post 2030. If the legal authority and resources exist to revisit state goals post 2030, Connecticut recommends that EPA evaluate the nationwide deployment of RE and EE, and then determine the appropriateness of state goal setting methodologies based on RE and EE measures displacing existing fossil generation.

3) Support for Currently Proposed Interim Compliance Period

EPA's original proposal and the NODA seek comment on the interim compliance period from 2020-2029. Some stakeholders assert that in 2020 the sudden onset of the heat rate improvements from Building Block 1 and the re-dispatch to natural gas requirements from Building Block 2 create a "cliff" and the ten-year averaging period in the proposal may not be sufficient for states to achieve compliance with interim goals. In the NODA, EPA expresses two potential ways to address this: (1) phase in the requirements of Building Blocks 1 and 2 over the ten year period; and/or (2) devise a scheme for issuance of early reduction credit for actions taken prior to 2020 that can be used to facilitate compliance with interim goals.

Connecticut opposes phasing in the requirements over the ten year period, because it will reduce the national stringency of the proposal. Additionally, Connecticut notes that 2020 is still six years away. As discussed below with respect to Building Block 2, in the six-year time period between 1999 and 2005, Connecticut added significant quantities of new natural gas fired, combined cycle and simple cycle generation to its generation fleet. In that time period, natural

[12] Comparison of Retail Sales of Electricity by State by Sector by Provider vs. Net Generation by State by Type of Producer by Energy 2005-2012, EIA, http://www.eia.gov/electricity/data/state/http://www.eia.gov/electricity/data/state/

[13] Connecticut also objects to this assumption being included in the rate to mass conversion as it was in the technical support document released on November 6, 2014.

gas fired generation rose from 27% to 55% of Connecticut's fossil generation.[14] By 2010, natural gas accounted for approximately 96% of fossil generation in Connecticut. Based on this experience, Connecticut has demonstrated that the redispatch envisioned in the CPP is reasonable and can be achieved in the allowed time frame.[15] Additionally, the Clean Power Plan proposal is not prescriptive. It offers flexibility for states to use additional EE and RE to compensate for the inability to fully satisfy the heat rate improvements and redispatch to natural gas required in Building Blocks 1 and 2. Therefore states have options to avoid the perceived "cliff" discussed in the NODA.

Additionally, Connecticut opposes any glide path that allows a state plan to backload its reductions in the end of the compliance period. Connecticut has serious concerns that in such a circumstance, if the state is not achieving the emission reductions expected in the state plan, EPA would not be able to enforce a sufficient change to the state compliance plan to achieve the shortfall in emission reductions without compromising grid reliability.

Connecticut does not oppose EPA's suggestion to devise a scheme of early reduction credit for states that take early action. Early reduction credits could provide an incentive for states to begin more concerted efforts to reduce carbon pollution sooner rather than later. Early reduction credit could also eliminate the apparent disparities between the emissions goals set for early acting states and the goals set for states that have been less proactive. Connecticut believes that any early reduction credit scheme adopted by EPA should abide by the following principles:

- Use of early reduction credit should be limited to the state that created the credit;
- Early reduction credit should expire at the close of the Interim Compliance period to preserve national stringency post 2030;
- Credit for RE should promote renewable sources with minimal criteria and hazardous air pollutant emissions; and
- Credit for early and surplus redispatch to natural gas should only be based on measures that are federally enforceable and permanent and replace high carbon fuels with natural gas (e.g., burner replacement memorialized in a federally enforceable operating permit, unit retirement and/or replacement with new natural gas fired unit subject to a federally enforceable operating permit, federally enforceable operating permit requirements to co-fire gas up to a specified percentage of load at all times that a unit is operating; or a federally enforceable annual capacity factor limit on amount of coal and/or oil that can be burned in a unit that converts to interchangeably fire natural gas).

Finally, EPA offers the opportunity for states to adopt mass based plans and multi-state plans as compliance vehicles. Single and multi-state mass based plans, like RGGI, can provide a means to mitigate the impacts of the perceived "cliff" in the Interim Compliance Period. Connecticut

[14] Comparison of Net Generation by State by Type of Producer by Energy 2005-2012, EIA, http://www.eia.gov/electricity/data/state/

[15] To the extent that the phase in is off-set by other measures that increase the stringency of the CPP, Connecticut does not object. However, Connecticut does object to state plans that delay implementation to late in the compliance period because, at that point, if states are lagging behind their goals, the emission reductions will likely be unable to be achieved without significant risk to system reliability.

suggests that EPA develop guidance and provide assistance to states seeking to create mass based plans with a particular focus on preserving the stringency of Interim Targets and ensuring compliance with them. Should the Clean Power Plan become subject to protracted legal challenges that delay implementation, EPA should apply enforcement discretion with respect to compliance with Interim Targets.

4) Rate to Mass Conversion

Connecticut appreciates EPA's recent Rate to Mass Technical Support Document released on November 6, 2014, on converting the rate based targets to annual mass equivalents. Connecticut encourages EPA to be receptive to alternative methods — as EPA has indicated in the guidance that it would be – provided that such methods provide adequate justification and support for the data and assumptions used to develop states' mass based targets. Additionally, Connecticut requests that guidance be provided to the regional EPA offices to ensure that approved mass based targets are adequately protective, equitable, reflect the realities of an integrated electric power grid,[16] and achieve at least an equivalent reduction from 2005 emissions from affected sources as modeling indicates would be achieved by the proposed rates.[17]

As discussed previously in section 2, *supra*, Connecticut objects to the assumption found in the Rate to Mass Technical Support Document, that100% of incremental RE and EE will supplant existing fossil fuel generation. Connecticut does not believe that this has been adequately demonstrated and notes that such a requirement does not recognize the substantial reductions of CO_2 emissions Connecticut has achieved since 2005.

5) Building Block-Specific Technical Comments

a) Building Block 1: Coal Unit Heat Rate Improvements:

Following an economic and technical feasibility assessment, EPA found that heat rate improvement ("HRI") is an available low-cost approach to CO_2 reduction for existing coal-fired EGUs and subsequently proposed a 6 percent heat rate improvement in each state's coal fleet.[18] Connecticut supports the 6 percent coal fleet heat rate improvement assumption and recommends that it be maintained.

Many stakeholders have and will continue to comment on the achievability of a 6 percent HRI, especially in the context of whether it is appropriate to apply such an assumption uniformly given HRIs accomplished by some coal-fired EGUs prior to the 2012 baseline and given the

[16] Whatever method for converting rate to mass EPA approves must be able to account for reductions of emissions in one state may drive emissions up in another state within the same RTO. For example, if a coal plant in one state is retired, an existing natural gas EGU may replace that generation. This effect is encouraged by Building Block Two of the CPP, but if the states are not in a multi-state plan such a result would be discouraged by the state in which the existing natural gas generation facility resides.

[17] Connecticut recommends that whatever changes EPA makes in the final rule does not reduce the national stringency of the rule below the 30% reduction from 2005 in carbon emissions achieved by the proposed rule.

[18] *Technical Support Document: GHG Abatement Measures*, U.S. Environmental Protection Agency Office of Air and Radiation (June 10, 2014), at 2-40.

remaining useful life of such plants. Specifically, in a November 2013 resolution with regard to this proposal, the National Association of Regulatory Utility Commissioners ("NARUC") noted that Section 111(d)(1)(B) requires the Administrator to permit a state, in applying such standards of performance, "to take into consideration, among other factors, the remaining useful life of the existing source to which such standard applies."[19]

In regard to the remaining useful life of existing coal-fired sources, according to a recent Southwest Power Pool market study, the national average retirement age of coal-fired generation is 48 years.[20] According to the same market study, these coal generation units could be retrofitted with emission controls, including efficiency investments that "could significantly extend the economic useful life of the plants well beyond the normal retirement point."[21]

Independent experts have concluded that EPA's goal is technically feasible.[22] Additionally, the proposal does not mandate that every state or every coal-fired EGU engage the 6 percent HRI as a compliance strategy. Indeed, the flexibility afforded by the proposal allows the states to forgo this building block altogether; should a state elect HRI as a compliance strategy, the proposal expressly anticipates fleet-wide averaging, thereby facilitating greater opportunities at a lower cost compared to the treatment of plants on an individual basis.[23]

Therefore, to the extent that the 6 percent HRI assumption is perceived as presenting a near-term challenge with respect to the achievability of individual state goals, Connecticut reiterates the suggestions of the RGGI states with respect to several important factors that show that this perception is incorrect. First, the range of relative in-service dates of the nation's coal fleet indicates that many of these units may face potential retirement in the coming decade due to age alone, thereby resulting in significant emission reductions during the 111(d) compliance timeframe. Second, should these aging coal units elect to invest in HRI efficiency measures as part of a larger strategy for emission reductions in a state, such investments will also serve to increase the lifespan of these units. Third, the flexibility afforded to states by the CPP provides an opportunity for a state to demonstrate compliance through any number of pathways, which may not even include an HRI investment strategy. Therefore, the 6 percent HRI assumption should be retained in the final CPP.

b) Building Block 2: Redispatch to Natural Gas

Building Block 2 focuses on opportunities to reduce emissions intensity by increasing the utilization of existing natural gas combined cycle ("NGCC") units. EPA invites comment on

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[19] *Resolution on Increased Flexibility with Regard to the EPA's Regulation of Greenhouse Gas Emissions from Existing Power Plants*, NARUC (Nov. 20, 2013).

[20] *2012 State of the Market*, Southwest Power Pool (May 17, 2013) at 19, a*vailable at:* http://spp.org/publications/2012-State-of-the-Market-Report.pdf.

[21] *2012 State of the Market*, Southwest Power Pool (May 17, 2013) at 19, *available at:* http://spp.org/publications/2012-State-of-the-Market-Report.pdf.

[22] Dallas Burtraw, *How can coal power plants reduce emissions and be made more efficient—and at what cost (building block #1)?*, Resources for the Future (Oct. 7, 2014), http://www.rff.org/centers/climate_and_electricity_policy/Pages/6-Increasing-Efficiency-at-Coal-Plants.aspx#A1.

[23] *Id.*

whether it should consider options for a target utilization rate for existing NGCC units greater than the proposed 70 percent target utilization rate.[24] EPA also seeks comment on the inclusion of new NGCC and co-firing natural gas at existing fossil steam generating units as a means of reducing carbon intensity.[25] Connecticut reiterates the comments of the RGGI States in recommending a broader strategy to deploy natural gas fired generation to reduce the carbon intensity of the nation's generating fleet. Specifically, Connecticut suggests a goal setting strategy that represents the BSER should include: redispatch to new NGCC; consideration of the ability to co-fire or interchangeably burn natural gas at existing steam generating units; and redispatch of remaining coal and oil generation to existing NGCC, up to a 75 percent capacity factor, based on average annual capacity.

This package of recommendations: (1) optimizes the emissions reduction potential of this building block while limiting the potential for unintended outcomes; (2) capitalizes on the increase in new NGCC capacity nationwide that will occur through market forces irrespective of the proposed rule; (3) respects the thermodynamic limitations of NGCC units and (4) highlights the opportunity of make greater use of natural gas in existing steam generating units. It is important that these suggestions be implemented together so as to preserve the overall stringency of this building block. The combination of the recommendations results in a demonstrated level of achievable emission reductions, accountability, and flexibility consistent with states' requests and Congress's intent in section 111(d) of the Clean Air Act.

Incidentally, according to EIA data, the top 5 natural gas producing states in 2012 consumed less 55% of the gas they produced and marketed, yet all have CPP state goals that are significantly less stringent than Connecticut's.[26] Furthermore, Connecticut does not produce any natural gas. These facts clearly demonstrate that there are additional, cost-effective opportunities to redispatch to and/or co-fire natural gas in greater amounts.

EPA's NODA requests comment on the benefits of co-firing and redispatch to new NGCC. As noted above, in the 6-year timespan between 1999 and 2005, Connecticut installed more than 1000 MWs of new NGCC capacity. Immediately prior to that-period, several CPP subject steam generating units in Connecticut were retrofitted to co-fire and/or interchangeably fire natural gas with other fossil fuels. The retrofits provided the benefit of significantly reducing NOx and SOx emissions. For example, an EGU known as "Middletown Unit 3" added natural gas firing capability in 1997. Using 1997 as a baseline for emissions, the unit operated for 9 out of 16 years with NOx, SOx and CO_2 emission rates below those of 1997. In fact, in 2012, the unit's emissions rates for NOx, SOx, and CO_2 were 41%, 91%, and 14% lower than 1997 levels.[27]

Greater utilization of natural gas has the co-benefit of significantly reducing emissions of NOx and SOx from the power sector, reduces the frequency of maintenance operations like soot blowing and boiler tube cleaning, can reduce the amount of ash that must be disposed of, supports national efforts to reduce the transport of air pollutants, and facilitates compliance with

[24] 79 FR 34866

[25] 79 FR 34875-34877

[26] http://www.eia.gov/tools/faqs/faq.cfm?id=46&t=8

[27] See EPA's Clean Air Market Division database

the Cross State Air Pollution Control Rule and possibly the forthcoming Transport Rule and Regional Haze State Implementation Plan development. The Connecticut experience demonstrates that BSER should go beyond redispatch to existing NGCC and include redispatch to new NGCC and co-firing/interchangeably firing natural gas in existing steam generating units.

c) Building Block 3: Renewable Energy and Nuclear

Building Block 3 focuses on the use of no/low emission RE sources and nuclear energy as part of the BSER for reducing emissions of CO_2 from affected units.

i) Remove the "At-Risk" nuclear generation from the goal setting methodology

The overall experience of Connecticut (and the other RGGI states) demonstrates that a mass-based approach to emission reductions can incentivize economic otherwise viable nuclear resources to remain online by increasing the competitiveness of legacy nuclear resources with fossil fuel-fired EGUs (which should increasingly reflect a carbon price in their offerings). However, experience in the RGGI region also suggests that financial and other issues need to be taken into consideration when evaluating or forecasting the contribution of nuclear resources, particularly in light of the transformation of the natural gas market in recent years. In the rate-based goal-setting methodology at issue here, EPA's proposal attempts to incentivize states to retain existing nuclear generation through the inclusion of an at-risk assumption in the goal computation methodology.

While additional incentives may be necessary (especially at the federal level) EPA should remove the at-risk assumption from the goal computation methodology since its design neglects to account for the full range of possible circumstances—including safety (e.g. safety upgrades such as those required in response to the Fukoshima flooding and reactor meltdown) and environmental concerns (e.g. effluent limits and cooling water intake structure requirements under Clean Water Act Sections 316(a) and 316(b), respectively)—in which a nuclear resource may be pressed into retirement. If EPA, however, opts to retain its proposed approach, then EPA should consider providing an "off-ramp" by which the nuclear generation component would be removed from a state's goal computation upon expiration of an existing license or following an accident that translates into cost-prohibitive repairs.

Although a significant portion of Connecticut's generation comes from nuclear generation, Connecticut objects to crediting existing or under-construction nuclear generation as an off-set to exiting fossil generation. Such a proposal would significantly reduce the stringency of the CPP and is unnecessary.

ii) Connecticut supports the inclusion of RE in the BSER and offers recommendations to improve the equity and effectiveness of Building Block 3

Connecticut strongly urges EPA to define and utilize consistent renewable energy technologies for both the goal computation process and for state compliance purposes. The current proposal creates ambiguity and implies that certain types of generation that were included in goal setting

as zero carbon will be discounted or disqualified from use in demonstrating compliance. Successful implementation of the CPP will rely on clear and consistent definitions.

Subject to the limitations described below in Crediting of EE and RE for Compliance with the Rule, EPA must allow for the crediting of RE generation located in one state but financially supported by ratepayers residing in another state. Such credit should follow the renewable funding source (e.g., energy certificates (RECs) obtained from those resources and/or power purchase instruments that directly led to the development or continued operation of those resources.)

For a variety of reasons discussed in greater detail below, rather than using a Renewable Portfolio Standard based methodology, Connecticut recommends that EPA should establish in-state renewable generation targets based on the technical and economic potential for the siting of renewable generation within the boundaries of the individual state. In fact, Connecticut strongly urges EPA to adopt as its Building Block 3 methodology the alternative approach to the quantification of renewable energy generation as described in the proposal and accompanying technical support documents[28] with some modifications. Specifically, Connecticut observes that the application of the "top 16 state benchmark" is unduly limiting with respect to the technical potential of renewable technologies in each state—particularly in regard to the development of utility-scale solar. Rather than averaging the development rates of the top 16 states, EPA should rely on an average of the top 5 states for each technology. As described in EPA's alternative approach, adding a development cost ceiling in terms of $/MWH to this suggested modification to the benchmark development rate would ensure that only the cost-effective renewable generation in each state is targeted.

iii) Concerns with the use of RPS requirements to establish RE targets[29]

Connecticut believes the use of RPS requirements to establish RE targets is inappropriate for several reasons. At the time Connecticut's RPS was enacted, in 1998, it was not intended to address climate change. Rather, it was designed to achieve several objectives: diversify the state's energy resource mix to promote reliability, provide a hedge against volatile fossil fuel prices, improve environmental conditions by reducing air emissions, create clean energy jobs, and enhance the quality of life in the state.[30] Accordingly, while many RPS-eligible RE technologies can improve environmental conditions by reducing air emissions and creating clean energy jobs, ultimately technical and economic feasibility dictate which RE technologies are brought to market to satisfy RPS targets. These technical and economic circumstances are not necessarily aligned with the CPP goal of reducing CO_2 emissions.

Second, many RPS targets are predicated on a state's efforts to deploy RE across a group of states within a particular region. Through a regional RPS market structure, renewable resources

[28] Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 79 Fed. Reg. 34829, 34869 (proposed June 2, 2014) (to be codified at 40 C.F.R. pt. 60); *Alternative RE Approach Technical Support Document*, U.S. Environmental Protection Agency Office of Air and Radiation (June 10, 2014).

[29] For a detailed look at Connecticut's RE experience, see Appendix A.

[30] Restructuring Connecticut's Renewable Portfolio Standard (April 26, 2013), available at http://www.ct.gov/deep/lib/deep/energy/rps/rps_final.pdf at p. 1.

are built at the most economically and technically feasible location within the borders of the defined RPS market—borders that generally correspond to the regional grid in which the state operates (or often neighboring regions with sufficient transmission ties) rather than aligning with individual state boundaries.[31] In establishing aggressive RPS policies, Connecticut, as did other New England states[32], considered the potential for the market to fulfill the demand created by the state policy, and did not anticipate siting all stimulated renewable energy within its borders; to do so would be to ignore the benefits and realities of regional transmission. Accordingly, EPA's proposal to rely on state RPS goals to yield in-state renewable generation targets ignores the regional interdependency implied in a given state's RPS target. Connecticut did not intend, and technically cannot, meet its RPS requirements exclusively through in-state generation.

Third, although the CPP proposal contemplates the possibility of allowing states to credit out-of-state RE that they fund and support, EPA must recognize that a state does not have control over the permitting, siting, and regulation of facilities located outside its borders. State RPSs contain necessary options and flexibility with regard to this fact. Such flexibility, however, may be lost if a state's RPS becomes a part of the federally enforceable CPP.

Fourth, many RPS targets—including Connecticut's—include the possibility of alternative compliance payments, which can be paid in lieu of acquiring RE generation and protect against significant ratepayer impacts if the market cost of RE generation exceeds certain levels.

Fifth, the RPS methodology involves some inherent inconsistencies in how RPS are implemented. Specifically, several states' RPS requirements are particularly ambitious because they include the contributions of existing hydroelectric resources, biomass, waste-to-energy, and fuel cells. The RPS methodology holds these states accountable for achieving levels of RE generation derived from the inclusion of these technologies, but expressly excludes existing hydroelectric generation from use for compliance purposes and implies that biomass, waste-to-energy, and fuel cell contributions could be severely discounted in or disqualified from compliance demonstrations. Furthermore, the methodology does not have a concrete definition of what technologies are considered renewable energy sources for the purposes of the rule.

Should EPA promulgate a final rule that relies on the RPS methodology for Building Block 3, Connecticut suggests the following improvements to resolve inconsistencies inherent in the treatment of hydroelectric power, biomass and waste-to-energy generation, and fuel cells:

With respect to the treatment of hydroelectric power, Connecticut recommends that EPA remove hydroelectric power from the goal computation methodology both from the state baseline of existing renewable generation and the portion of a state's RPS that is expected to be met from existing hydropower.[33] EPA should continue to only credit new or incremental hydroelectric

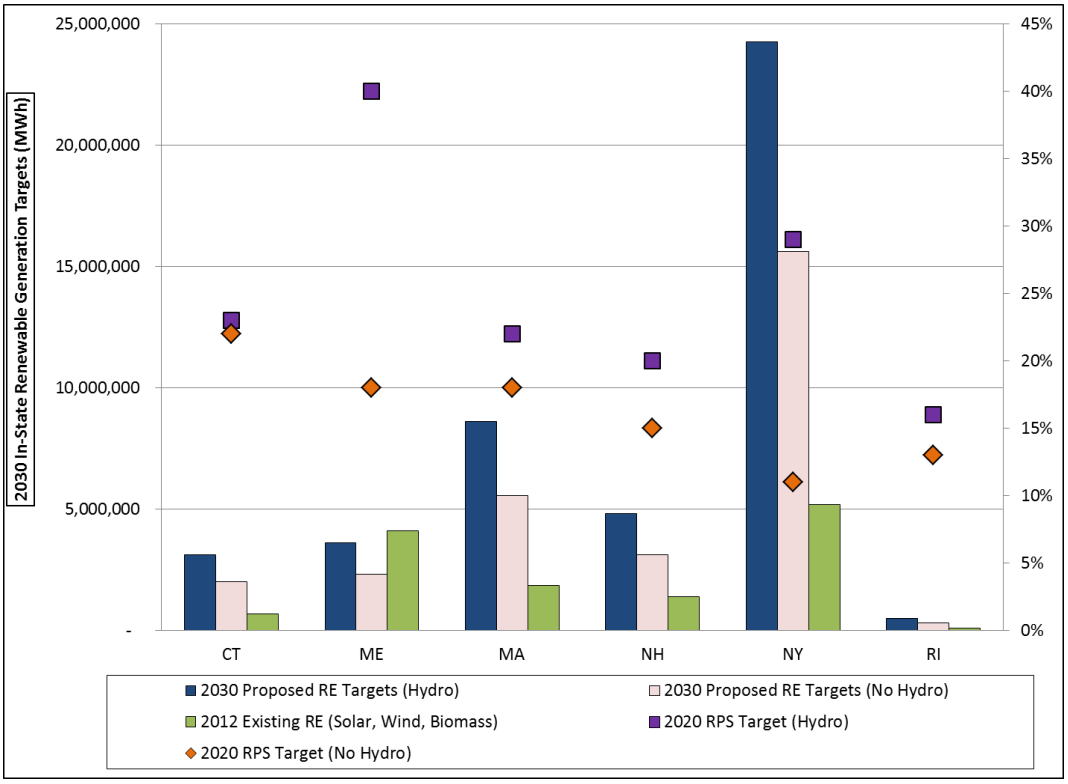
[31] Several ISO-NE states allow RE from New York and Canada be certified as RPS eligible in their states. In Connecticut, as of October 2013, 6 wind and 2 landfill gas facilities from Canada and 6 wind, 1 biomass, 19 landfill gas, and 2 run of river hydro facilities from New York were certified as RPS eligible. In 2010, Six percent and one percent of Connecticut's Class I RPS came from New York and Canada respectfully. *See* Restructuring Connecticut's Renewable Portfolio Standard (April 26, 2013), available at http://www.ct.gov/deep/lib/deep/energy/rps/rps_final.pdf at p. 10.

[32] See Figurer 4, below, to see the regional nature of PPAs in New England.

[33] As proposed, EPA has removed existing hydroelectric generation only from the states' existing RE baselines.

renewable resources for purposes of compliance. Connecticut further recommends that if the EPA is unable to calculate the amount of existing hydro included in individual state RPS, states with RPS requirements that are clearly distorted by inclusion of existing hydro be removed from the northeast average. As Figure 2 indicates, Maine and New York's RPS are heavily influenced by existing hydro.

Figure 2: Impact of Including Hydroelectric Resources in the Renewable Energy Generation Goal Computation for the Northeast Region



Alternatively EPA could adopt a uniform 20% target for the nation. The regional targets bear no relationship to the techno-economic ability of states to meet the regional targets and therefore are arbitrary. A uniform 20% target, however, is consistent with the Best System of Emission Reduction by requiring all regions to meet the standards set by the leading states/regions. The top three regions, northeast[34] (20%), south central (20%), and west (21%), all essentially have the recommended 20% target. The other regions can reasonably be expected to achieve the same target as the leading regions.[35]

With respect to biomass and waste-to-energy generation, Connecticut recommends that existing biomass and waste-to-energy generation should be credited as zero carbon emissions for the purpose of *interim* state goals. In so doing, EPA would facilitate compliance with the interim

[34] The northeast would have a 20% target after Maine and New York's existing hydro distortion is removed.

[35] If the EPA declines to remove Maine and New York from the northeast region's target, the EPA should require a uniform 25% target (the current northeast target) as BSER. If the northeast, with the lowest potential for renewable energy, can achieve a 25% target, the rest of the nation can as well.

state goals, avoiding exacerbating the "cliff" feared by many states, acknowledging the decline in feedstock to waste-to-energy plants,[36] and allowing states the time needed to deploy replacement RE that would have less negative air quality impacts. Additionally, this method avoids disruption to existing state RPS markets that could be caused by discounting or disqualifying these technologies from compliance with the CPP.

With respect to fuel cells, the proposed rule does not indicate how fuel cell generation will be credited. Connecticut recommends that fuel cells be treated as a renewable regardless of fuel source. Accordingly, fuel cells should be creditable in a state plan regardless of when installed. Connecticut has limited capacity to build renewable generation in state. Accordingly, Connecticut has made significant investment in encouraging fuel cell generation as an economically viable option for reducing air pollutant emissions from in-state generation. EPA has indicated that it intends on treating fuel cells powered by natural gas as fossil fueled generation in the final rule.[37] Connecticut believes this is an inappropriate treatment of fuel cell technology and does not properly recognize the potential for this clean technology to reduce CO_2 emissions from existing fossil fuel generation. Excluding natural gas fuel cells from the renewable energy generation definition would exclude existing units from compliance and, therefore, would not properly recognize the contributions of leading states like Connecticut in advancing this technology.

i) Support for the establishment of state RE targets based on in-state techno-economic potential

Connecticut believes that a methodology based on each state's technical and economic potential for RE development, such as the NREL GIS-based analysis discussed in EPA's GHG Abatement TSD, is a more equitable approach to establishing RE targets than an RPS-based methodology. This is because the proposed RPS methodology requires less of states in regions with relatively lower RPS requirements than of those in states in regions with ambitious RPS requirements, irrespective of available technical and economic potential.[38]

Connecticut recognizes that the technical and economic potential of RE development is not evenly distributed among the states. To address that issue, EPA requested comment on ways to address disparities in the technical and economic potential among states. We suggest that there may be ways to build "caps" and "floors" into the assignment of technical and economic potential. Such upper and lower bounds could acknowledge the practical limitations of development in certain high potential states while also preventing other states with lower potential from backsliding to a level of RE generation that is less than what they have achieved in 2012. However, Connecticut is opposed to any modification to the technical and economic potential that would result in a reduction in the national stringency of the rule as proposed.

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[36] The decline in feedstock is the anticipated result from increased diversion, reuse, and recycling. For example, Connecticut has set a goal of doubling its diversion from landfill or waste-to-energy plants from~30% to 60% by 2024. *See Conn. Gen. Stat. Sec. 22a-241a.*

[37] Such intention was conveyed in telephonic conferences on September 25, 2014 and October 14, 2014 during which EPA requested comment on this issue.

[38] For example, the Southeast regional renewable energy generation target corresponds to only 10% as proposed by the EPA since only 1 of the 8 states in the identified region previously adopted a renewable portfolio standard. This is in stark contrast to the 25% regional renewable energy generation target proposed for states in the Northeast.

ii) Concerns with the use of a regionalized approach state RE targets based on techno-economic potential

EPA is seeking comment on an "approach [that] adjusts each state's RE target based on the RE potential available across a multi-state region in which the state is located. Under this approach, a state's goal would be informed by the opportunity to develop out-of-state RE resources as part of its state plan, and thus better align RE targets with the proposal to allow the use of certain out-of-state renewables for compliance . . . ."[39] The NODA suggests that under this approach, each state's renewable energy target would be allocated proportionally to each state in its region "by a chosen criterion, such as each state's share of total electricity sales within that region in 2012." Connecticut does not support this third variant of the Building Block 3 approach.[40]

Although Connecticut currently has an ambitious RPS target with expectations of significant development of renewable generation out-of-state, the Connecticut RPS target is established under state authority, and includes certain ratepayer protections such as the possibility of alternative compliance payments. As discussed above, Connecticut has very limited renewable generation potential within its borders. Connecticut does not have control over the permitting, siting, and regulation of facilities located outside its borders. To the extent that the EPA establishes a federally-enforced RE target for Connecticut, compliance with which requires Connecticut to develop resources in other states, we are concerned about the feasibility of complying with such a mandate. Notwithstanding the inherent ability to overcompensate in some building blocks to make up for deficiencies in others, given state sovereignty issues, a mandated requirement to build out-of-state renewables is not appropriate.

As stated above, we prefer a method that sets in-state RE goals based on in-state technical and economic potential. However, should EPA determine that such a method cannot be implemented, then Connecticut strongly prefers an approach based on regionalized technical and economic potential over the proposed RPS approach.

d) Building Block 4: Energy Efficiency (EE)[41]

Building Block 4 focuses on energy efficiency as a means of meeting electricity demand and reducing emissions from CPP affected sources. Connecticut has significant experience in administering EE programs to the benefit of rate payers and the environment. Connecticut fully supports the inclusion of EE in the BSER for reducing CO_2 emissions from existing power plants. Connecticut's wealth of experience implementing EE programs demonstrates that other states — especially those that have not yet seized the opportunity to invest in such programs — possess largely untapped and substantial potential to achieve energy savings through energy efficiency measures. Furthermore, these states should embrace this opportunity to invest in energy efficiency programs that empower their ratepayers with tools that will lower their

[39] *Notice of Data Availability*, U.S. Environmental Protection Agency Office of Air and Radiation (October 2014).

[40] Connecticut strongly objects to any allocation of RE based upon electric generation as outside of a state's control in a deregulated market and not reflective of CO2 emissions. Connecticut is a net exporter of electricity but also has a relatively clean generation fleet with significant generation from nuclear and natural gas facilities.

[41] For a detailed look at Connecticut's EE experience, see Appendix B

monthly bills by reducing energy consumption. With respect to promoting and strengthening the use of EE in the context of the CPP, Connecticut reiterates the comments of the RGGI states.

One mechanism to maximize the potential emission reductions contemplated by Building Block 4 would be to assign an increased ramp-up rate to those states which by year-end 2012 had not met or exceeded either the average U.S. total incremental savings as a percentage of retail sales (2012) or the average U.S. total cumulative savings as a percentage of retail sales (2012).[42] Specifically, the goal computation for these states should reflect a targeted 0.38 percent rate of improvement of incremental annual savings per year, as opposed to the 0.20 percent per year ramp-up schedule identified by the EPA in the current proposed goal computation. This heightened ramp-up rate of 0.38 percent per year is supported by data and analysis included in the EPA's technical support documents,[43] and is consistent with the demonstrated concept that "lower-hanging fruit" is ripe for the picking.

Certain energy efficiency measures can be undertaken quickly, cost effectively, and as part of a wider range of reduction strategies. This is supported by energy efficiency supply curves, such as the McKinsey Curve, which depict a number of efficiency measures by category and sector according to the average cost of the efficiency measure and the value of direct energy savings that the measure is expected to provide over its lifetime.[44] States that are just starting to implement energy efficiency measures likely have a wide variety of inexpensive strategies to choose from, while states that are already undertaking aggressive efforts to achieve their economic energy efficiency potential may be targeting measures further up the supply curve, which requires a greater investment of resources and effort. These circumstances affecting states that are already exceeding the national average for incremental or cumulative savings (calculated as a percentage of 2012 retail sales) should be recognized by maintaining the 0.20 percent ramp-up rate as proposed by the EPA.

Additionally, EPA should recognize savings accruing in the compliance period regardless of when implemented so long as the state plan can demonstrate sufficient EM&V was in place. EPA set Building Block 4 goals by requiring states to ramp-up current efficiency programs. This structure requires states that have already take action to do more than states that have been less aggressive or have not taken any actions. Additionally, the underlying assumption in EPA's goal calculation is that state programs in 2012 were robust enough to receive credit in compliance demonstrations. The proposed rule, however, only allows energy efficiency savings installed starting in June of 2014 to be credited in state compliance plans.[45] Connecticut recommends that the rule provide credit for any efficiency measure that is achieving energy savings within the compliance period so long as the state plan can demonstrate that the savings are real and quantifiable. A state can make this demonstration if it can show that sufficient EM&V was in place at the time the efficiency measures were implemented. Connecticut is <u>not</u> recommending a

[42] This methodology would increase the stringency of this building block for 24 of the states using data included in Table 5-4 of the GHG Abatement Measures TSD.

[43] *Id.* at 5-35 and Appendix 5-3.

[44] Hannah Choi Granade et al., *Unlocking Energy Efficiency in the U.S. Economy*, McKinsey & Company (July 2009), at 15.

[45] Connecticut recognizes that energy efficiency measures taken in 2014 will only receive credit in compliance demonstrations to the extent that savings are being achieved in within the compliance period of 2020 through 2030.

banking of energy efficiency measures.[46] Rather, the recommendation is a modest recognition of the fact that states have already taken aggressive steps to implement energy efficiency programs and invested in a robust EM&V program to ensure that real savings are achieved. This recommendation, like the previous recommendation, recognizes that leading states, like Connecticut, have already picked the low-hanging fruit and that efforts to achieve further energy efficiency will be further up the supply curve, requiring a greater investment of resources and effort.

6) EE Evaluation, Measurement and Verification ("EM&V")

In its Technical Support Document, EPA requests comments regarding the adoption of existing and new EM&V protocols.[47] Connecticut notes, that to the extent a state intends to comply by establishing a mass based target, the state's EE program, including its EM&V protocols should not be subject to approval in a state plan or federally enforceable. That being said, as a general principle, Connecticut supports EPA's adoption of EM&V that provide states transparency and clarity. EPA's rules should allow states flexibility and provide for equitable treatment of EE savings for states, which have varied levels of experience with EE. EM&V rules should provide explicit definitions. Connecticut recommends that EPA provide for transparent and comparable definitions and documentation of EE impacts and supporting practices across states. Consistent with these principles, Connecticut offers the following specific recommendations on EPA's requirements and guidance.

EPA should adopt EM&V practices that have been successfully in use for well over a decade in Connecticut. Connecticut makes use of rigorous and well-established protocols and methodologies used to measure savings in EE programs.[48] Connecticut compiles and documents methodologies for measuring EE savings in a Technical Reference Manual (TRM),[49] which is reviewed and approved by Connecticut's Department of Energy and Environmental Protection. Connecticut EE programs undergo rigorous evaluation studies conducted by independent third party evaluators and overseen by an independent evaluation contractor. The results of these studies are presented publicly. Connecticut and other stakeholders review and provide input to evaluation study work plans and draft evaluation studies. In addition to Connecticut's practices, ISO-NE has established rigorous EM&V protocols to measure and verify reductions in electric demand from state EE programs. Since ISO-NE allows EE and demand-side resources to count toward meeting regional capacity needs, ISO-NE requires a rigorous protocol to ensure grid reliability.

EPA should promote standardized EE data collection, reporting, and EM&V practices. We recommend the use of the glossary that has already been developed by DOE/EPA State and

[46] Connecticut could support a banking of EE credits if such credits are implemented or off-set by other measures so as to not reduce the stringency of the CPP.

[47] Technical Support Document for Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, State Plan Considerations, pp. 56-59.

[48] E.g., International Performance Measurement and Verification Protocol (IPMVP), used to determine measured savings. http://www.o-world.org/

[49] In Connecticut, this is document is referred to as the Program Savings Document.

Local Energy Efficiency Action Network in its publication, Energy Efficiency Program Impact Evaluation Guide," Appendix A.[50] This glossary would serve as a useful starting point in EPA's effort to develop a common terminology among states.

The northeast has already undertaken efforts to improve and standardize reporting practices. NEEP's Model EM&V Methods Standardized Reporting Forms provides a template for standardizing EE reporting practices.[51] In addition, northeast states have developed resources on cost-effectiveness measures, data collection protocols, statewide EE reporting guidelines, EM&V methods and savings assumptions, as well as empirical studies on measure lives, load shapes and other measures used in TRMs. These processes and protocols, vetted through multiple states, will be useful for states that are embarking on statewide programs and that need guidance on EM&V procedures. In addition, New England states have had TRMs in use for many years. These documents contain useful data on equipment and installation descriptions, savings methodology, and measure lives and can provide templates for states that are embarking on large scale EE programs.

Connecticut supports NEEP's recommendation that EPA engage DOE to convene states and EM&V professionals in early 2015 to develop protocols. DOE, with the participation of states and industry experts, would identify generally accepted methods and protocols for states to use in EE measurement and reporting. DOE should work with states and experts to develop a list of generally accepted protocols to be completed by publication of EPA's final rule. These protocols would include, but not be limited to, determining baselines, methods of verifying installations, measure persistence, and statistical confidence levels for measuring program savings. The goal would be to establish EM&V standards as states start to prepare their plans. DOE should also identify gaps in protocols and common practices, and develop a schedule for their development. DOE should further be engaged to help develop protocols to include a definition of baseline as "business as usual," or "common practice baseline" consistent with baseline definitions provided in DOE's SEE Action Impact Evaluation Guide.[52] These baselines should include federal standards, naturally occurring efficiency and compliance practices with current building codes (to the extent that building code compliance is demonstrated), and state and federal appliance standards.

Connecticut supports NEEP's recommendation for the EPA to engage DOE to design and develop a rating system (with stakeholder input) that assesses the rigor and precision of EM&V methods used, and that discounts credit for EE savings when less rigorous or less statistically accurate methods are used. Connecticut also supports NEEP's recommendation that the EPA should promote appropriate evaluator training and experience to ensure qualified professionals to conduct EM&V with required minimum levels of training and expertise.

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[50]Glossary of Terms, Version 2.1, A project of the Regional Evaluation, Measurement and Verification Forum, Prepared by Paul Horowitz PAH Associates, Facilitated by Northeast Energy Efficiency Partnerships.
https://www4.eere.energy.gov/seeaction/system/files/documents/emv_ee_program_impact_guide_0.pdf

[51] http://23.99.21.98/fmi/webd#NEEP_EMV_REPORTS&lay=CoverPage&viewstyle=form&record=1&mode=browse

[52]The State and Local Energy Efficiency Action Network, Evaluation, Measurement, and Verification Working Group. Energy Efficiency Program Impact Evaluation Guide, December 2012
https://www4.eere.energy.gov/seeaction/sites/default/files/pdfs/emv_ee_program_impact_guide_1.pdf

Connecticut concurs with NEEP's recommendation that EPA develop an EM&V Plan template with specific plan components to guide states on what needs to be in plans. EPA should designate DOE to be the lead agency in developing reporting templates. Connecticut believes that the following components should be included in state plans:

1) Name of organization that will prepare evaluated energy savings reports
2) Relationship of organization preparing the report to the subject EE program(s) and program administrator(s)
3) Schedule of when the reports will be prepared and time period they will cover
4) Name of the state or regional entity that will review and certify the evaluated savings
5) Manner in which evaluated energy savings reports will be made publicly available
6) Multi-year evaluation plan, with timing of evaluation efforts and processes including planning, implementation, reporting, and updating

In addition, EPA should provide guidance on reporting, such as including interim reporting, and should offer to review state EM&V plans prior to submission and provide interim comments to give states greater assurance that their plans will be accepted by EPA.

EPA solicits comment on whether to account for avoided T&D losses and how to do so in a consistent manner across states.[53] Connecticut supports allowing states to include T&D loss factors. Since emissions reductions are measured from the location of electric generating plants, energy savings from EE should not only include end-use savings but also avoided T&D losses. Specifically, states should be allowed to use their own T&D loss factors where state-specific data are available. Where state-specific data are not available, states should use a regional T&D loss factor such as RTO data, or EIA data.

EPA is considering whether to adopt time differentiated data on energy savings from energy efficiency programs for use in states' implementation plans.[54] Connecticut believes that states should not be required to submit time differentiated savings from their EE programs. However, the impact of EE programs on CO_2 emissions can vary greatly according to the time of day and by season. Connecticut recommends that states that can demonstrate that they have high quality load shape data be given the option to include time differentiated energy savings in their implementation plans. EPA is considering whether to use gross or net savings as a measure of energy reductions from states' EE programs.[55] This question has been discussed among New England states. Connecticut agrees with NEEP's position that energy efficiency savings estimates should be based on "adjusted gross savings" rather than net or gross savings. Adjusted gross savings measures EE savings beyond "business as usual" and is updated to include the most recent impact evaluations. Adjusted gross savings are EE savings resulting from actions taken by participants in an EE program, but not adjusted for spillover and free ridership effects.

[53] Technical Support Document for Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, State Plan Considerations, pp. 50-51. Docket ID No. EPA-HQ-OAR-2103-0602.

[54] Technical Support Document for Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, State Plan Considerations, pp. 52-53. Docket ID No. EPA-HQ-OAR-2103-0602.

[55] *Id.*

Adjustments are made for data errors, installation and persistence rates, and hours of use.[56] EPA seeks to measure EE savings related to the actions of EE program participants, but not necessarily directly attributable to the efforts of Program Administrators. Therefore, it is not necessary to conduct detailed estimates of spillover and free ridership. Moreover, methodologies can differ in the estimation of spillover and free ridership effects; inclusion of these adjustments will not necessarily result in more accurate EE savings estimates. Connecticut notes that ISO-NE uses adjusted gross savings in measuring and crediting EE resources in regional Forward Capacity Market. Care should be taken in the use of adjusted gross savings that no double counting of EE savings across at state's different types of program activities, i.e., municipal versus EDC ratepayer funded programs.

EPA has indicated that it supports a broad range of EE programs, provided that their savings are measured and verified by rigorous protocols, and the EE program evaluations are complete and consistent with EPA requirements. EPA has identified general education programs as having less well established EM&V protocols.[57] Connecticut supports implementation of general education programs as an effective tool in raising awareness in the general public and in building related professions. However, we recognize that the impact of education programs on reducing a state's energy cannot be measured directly. As part of its EM&V protocol, EPA should identify the major components of an effective general education plan. For general education programs to be credited for energy reductions, states should be required to include a description of the major components of their general education program in their plan. Connecticut cautions against excessive credit for general education programs. A state should be able to credit energy savings from its general education program, up to a maximum level, e.g., 5 percent of total savings from its EE programs.

EPA has also identified targeted consumer behavior programs as EE programs with less established EM&V protocols.[58] Customer behavior programs generally rely on econometric analysis to estimate the differences between large numbers of participants versus non-participant customers. Connecticut cautions EPA to accept savings only from customer behavior programs with EM&V protocols in which the data selection and econometric analysis performed are demonstrated to have been completely independent of the vendor or program administrator that implements the behavioral program.

7) Crediting of EE and RE for Compliance with the Rule

Connecticut recommends that, for purposes of rate-based compliance plans, EPA require that "avoided emissions" that result from EE and RE be "credited" by adding the total avoided generation to the denominator of the BSER emission rate equation. This method ensures consistency between EPA's goal setting and goal compliance as well as equity between states. If

[56] NEEP Glossary of Terms, Version 2.1, 2011, p. 7.
http://www.neep.org/sites/default/files/products/EMV_Glossary_Version_2.1.pdf

[57] Technical Support Document for Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, State Plan Considerations, pp. 48-49. Docket ID No. EPA-HQ-OAR-2103-0602

[58] Technical Support Document for Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, State Plan Considerations, pp. 49. Docket ID No. EPA-HQ-OAR-2103-0602

EPA does not adopt Connecticut's primary recommendation, EPA should credit the "avoided emissions" using the appropriate RTO marginal emission rate.[59] The marginal rate is appropriate because incremental EE and RE have historically avoided generation from the marginal EGU. The average RTO emission rate is inappropriate because incremental RE and EE often reduce the rate of demand growth rather than displacing generation from the average unit. The generation that would be required to meet demand growth is typically supplied by the marginal unit. Connecticut and the other states in ISO-NE have significantly reduced CO_2 emissions by displacing coal and oil with cleaner sources to serve base load. Figure 3 depicts the installed generating capacity within New England by fuel type and the proportion of generation actually supplied by fuel type. More than 85% of generation in 2013 came from no/low carbon emission sources, resulting in a lower average CO_2 emission rate than the marginal unit. Accordingly, crediting based on the average RTO emission rate would significantly undervalue the CO_2 emissions avoided by incremental EE and RE measures. Further, use of the average emission rate would cause a diminishing value of incremental EE as the nation's generation fleet becomes cleaner over the compliance period. Thus, the incentive to implement EE measures diminishes at the same time that greater investment of resources are required to achieve savings as the lowest hanging fruit gets picked.

Figure 3: New England Regional Electric Generating Capacity and Energy Production by Fuel Type

New England Generation by Fuel Type	% Total Capacity 2013	% of Electric Energy 2013
Natural Gas	43%	46%
Oil	22%	<1%
Coal	7%	6%
Hydro	4%	6%
Nuclear	15%	33%
Pumped Storage	5%	1%
Other Renewables	3%	8%

8) Avoiding Double Counting and Interstate Effects

EPA notes the complexity of accounting for interstate effects associated with measures in a state plan, to allow states to take into account CO_2 emission reductions resulting from programs while minimizing the possibility of double counting. EPA seeks comment on how to avoid double counting emission reductions using EPA's proposed approach.[60] This complexity overshadows a simpler matter, namely ensuring that there is a one-to-one relationship between RE and EE credits and credit users.

[59] ISO-NE has been calculating the marginal emission rate for its generation fleet since 1994 for the specific purpose of understanding the effect of demand side management and renewable generation on EGU emission for NOx, SO2, and CO_2 within the RTO. *See 2012 ISO New England Electric Generator Air Emissions Report*, available at, http://www.iso-ne.com/genrtion_resrcs/reports/emission/2012_emissions_report_final_v2.pdf

[60] 79 FR 34921-34922

Connecticut suggests that, as a starting point, EPA should look to its January 2001 Improving Air Quality Through Economic Incentive Programs ("EIP") draft guidance to provide clarity for states adopting rate-based plans to memorialize the creation of and transactions involving EE and RE credits. The EIP has been relied upon for describing how market-based discretionary economic incentive programs can meet EPA state implementation plan approvability requirements.

There are four elements to ensure the integrity of EIPs: (1) surplus, (2) quantifiable, (3) enforceable, and (4) permanent. These four elements have been the cornerstones of state emissions credit trading programs, including Connecticut's emission credit trading program for nitrogen oxides (NOx) emissions from stationary sources. Connecticut's NOx emissions trading program resulted in significant decreases in NOx emissions at a lower societal cost than would have been achieved by traditional command and control regulations. As EIPs are approved into a State Implementation Plan, an EIP necessarily includes adequate monitoring, record keeping and reporting procedures to provide for compliance determinations and enforcement.

Along with the four integrity elements, the EIP recommends tracking mechanisms for the emissions credits such as unique serial numbers and a state registry. Such provisions will work to preserve the integrity of EE/RE credits and prevent simple double counting (i.e., the use of the same EE/RE credit by more than one compliance entity). However, with regard to the use of EE and RE measures for compliance with the state goals, the EIP principles should be amended or clarified, particularly the principles of surplus and permanent. For example, renewable generation used by a state to satisfy its RPS should not be disqualified from use to satisfy CPP requirements just because it was used for RPS compliance. Similarly the concept of permanence may need to be customized to recognize that EE and RE measures have a finite life, and thus create a discrete stream of energy savings or clean generation over that finite time period.

EPA also solicits comment on a more complex double counting issue associated with the interstate effects of EE and RE.[61] Generally speaking, EE and RE investments made in one state may impact the emissions profile of another state and raise concerns about who gets credit for the reductions. Attributing credit to both the affecting and affected states would necessarily weaken the stringency of the rule and result in double counting. Connecticut anticipates utilizing RGGI, a mass-based approach, for compliance, thereby reducing the potential for double-counting of RE/RE measures amongst the states involved. However, Connecticut recognizes that some states may elect to use rate-based targets; in order to ensure transparency and equity, EPA should include additional clarity in the final rule to avoid potential double-counting of RE/EE measures in compliance demonstrations.

Connecticut notes that a double-counting issue could arise at the seams of states not participating in joint compliance plans. Although the proposal suggests that this issue could be resolved by a cooperative accounting agreement among states,[62] the approach articulated in the proposal may not produce the desired resolution. The proposal suggests that a mass-based state could adjust

[61] 79 FR 34921

[62] *Technical Support Document: State Plan Considerations*, U.S. Environmental Protection Agency Office of Air and Radiation (June 2014), at 94.

the overall CO_2 emissions from the affected fleet to account for the "export" of avoided CO_2 emission credits. However, RE and EE benefits are automatically accounted for under a mass-based program, as the existence of RE generation and EE measures, or "negawatts," displaces the state's or region's reliance on fossil fuel-fired generation. Due to the nature of the electricity system and the economic dispatch model of our shared grids, it is difficult to unravel the location and type of fossil fuel-fired generation the specific unit of RE or EE has displaced. Any adjustment to the overall CO_2 emissions from the mass-based state's affected fleet would therefore be derived from assumptions — i.e., estimates of the magnitude by which to offset the emissions of the mass-based state's affected fleet. Should an adjacent state that relies on a rate-based approach attempt to claim credit for renewable generation produced in a mass-based state, Connecticut believes that this would result in unavoidable double-counting of the RE and/or EE measures.

To address this concern, Connecticut recommends that the EPA prohibit rate-based states from taking credit for RE and EE that is already accounted for under the cap of a mass-based state. Such a prohibition is necessary in order to ensure the integrity and stringency of the CPP targets. A categorical prohibition would not unduly restrict compliance options for states electing a rate-based approach, as these states still could comply using renewable energy generated in other rate-based states or through mechanisms designed to stimulate in-state renewable generation, such as feed-in tariffs or grant programs.

Connecticut recognizes that states utilizing a mass-based approach may not account for development of RE and/or EE measures in neighboring states (or countries) that are not subject to the same CO_2 cap. This event, however, does not create a problem unless the mass-based state's net energy imports relative to its demand significantly increases. Accordingly, Connecticut recommends that for states utilizing a mass-based approach, EPA should require the state to monitor its net energy imports over the compliance period of the proposed rule. If a state realizes a significant increase in net imports relative to its consumption, then the EPA should require an analysis of the cause of the imports to ensure that the state is not implicitly crediting RE and/or EE measures adopted by another state. This recommendation avoids the difficulty of tracking the location and type of the specific fossil fuel-fired generation that the specific unit of RE or EE has displaced, unless a problem becomes apparent.

9) State Plan Content, Development, Submission, Schedule

EPA seeks comment on all aspects of the elements of state plan content and the criteria for approval. The twelve state plan components are familiar to states that have been required to prepare state plans for incineration sources under CAA sections 129 and 111(d). All of those twelve components are sensible and easy to comprehend in the context of requiring particular sources to meet emissions limitations for identified pollutants. The conceptual function of each of those measures is applicable to state plan preparation for the CPP, although the unique approach to BSER in the CPP-- the application to a pollutant that is neither a criteria pollutant nor a hazardous air pollutant, and the interplay of air quality regulation and electric sector considerations -- requires EPA to allow some flexibility in how a state satisfies each of the twelve components. EPA has experience exercising appropriate flexibility and case-specific evaluation to make determinations that balance flexibility and achievement of the desired

environmental result in the desired timeframe. Connecticut views certain rule flexibilities in the final CPP as positive, understanding that EPA has the experience to apply flexibility appropriately, in a manner constrained by equity and achievement of the 30% reduction in power sector CO_2 emissions.

EPA's issuance of state plan templates can be a useful means of facilitating timely state plan submission and assist states that have had less experience with state plan submissions or state implementation plan submissions under CAA Section 110. Additionally, templates may also facilitate consistency across the various EPA regions. However, EPA should not mandate the use of the templates.

State plan templates can also serve the purpose of specifying the minimum level of information necessary to secure an extension. EPA must recognize that there will be factors outside the control of state environmental agencies (e.g., the schedule of convening state legislative bodies) that may require accommodation. Similarly, as EPA has recognized, additional time may be necessary to develop multi-state plans.

With regard to states that may be adopt a multi-state approach to CPP compliance, Connecticut notes that for multistate nonattainment areas for criteria pollutants, each state is required to submit an individual attainment plan, although the states must coordinate actions during the planning process and may rely on common inventories and modeling to satisfy the individual state plan requirement. Connecticut has participated in such multistate ozone and particulate matter attainment planning and knows that the process will work to achieve the desired result. EPA should consider whether this same approach might be well-suited to multistate areas under the CPP and whether states and EPA could benefit from the familiarity of that approach. EPA should vary from that approach only if EPA believes that administrative and cost efficiency would be achieved by an alternative approach.

EPA seeks comment on whether the EPA should develop guidance that describes acceptable projection approaches, tools, and methods for use in an approvable plan, as well as whether the EPA should provide technical resources for conducting projections.[63] Page 43 of the *Projecting EGU CO_2 Emission Performance in State Plans* TSD states that such guidance could include default modeling assumptions or data sources for key assumptions and that state modeling projections included in a state plan could include assumptions that deviate from EPA's recommended default assumptions, but a state plan would justify the reason for using alternative assumptions. Connecticut recommends that EPA develop guidance that describes acceptable projection approaches, tools, and methods for use in an approvable plan and also recommends that EPA accept collective state CO_2 projection tools such as Eastern Regional Technical Advisory Committee (ERTAC) EGU.

With regard to state plans assigning legal responsibility for compliance to affected sources and other entities, Connecticut notes that some states adopted such an approach for Municipal Solid Waste Combustors, another category of sources subject to regulation under Section 111(d) of the Clean Air Act. Specifically, Connecticut state regulations impose specific emissions limits,

[63] 79 FR 34923

monitoring, record keeping and reporting on owners and operators of affected sources. EPA has acknowledged that RGGI would be an acceptable compliance mechanism to meet the best system of emissions reductions. Under RGGI, the nine participating states each promulgated state rules that apply directly to affected sources, requiring them to satisfy individual requirements that in aggregate ensure compliance with state and regional mass based targets. Provided individual requirements are made federally enforceable and contained in the operating permits applicable to the affected units, Connecticut believes it would be appropriate to assign legal responsibility for meeting state plan commitments to the owners and operators of affected sources.

Alternatively, Connecticut is not opposed to state "commitment" or portfolio based plans that assign some or all of the CPP compliance obligation to the state, provided that such plans contain measures the achieve real reductions. EPA should provide guidance to regional offices for the review of such plans to ensure consistency across the regions. Where state plans allow for assignment of some of the compliance obligation to the state, such plans should include contingency measures or indicate a schedule for development and implementation of contingency measures if periodic reporting indicates that the plan is not achieving the projected rate of emissions reductions.

In its preamble, EPA seeks comment regarding corrective action in state plans where emission limits applicable to affected EGUs alone would not assure full achievement of the required level of performance, if any of the other portfolio of measures in the plan are not fully implemented or fail to achieve the required level of emission performance.[64] Additionally, the proposed CPP anticipates that state plans would include a process and schedule for implementing corrective measures if reporting shows that the plan is not achieving the projected level of emission performance. EPA seeks comment on: (1) whether corrective action should include the adoption of new plan measures and subsequent resubmission of the plan to the EPA for review and approval; (2) should the process specify the implementation of measures that are already included in the approved plan in the event that the projected level of performance is not being achieved; and (3) at what point should such a process and schedule be triggered. For state plans that are not self-correcting, EPA should leverage its experience with contingency measures in state attainment plans under CAA Section 110 to develop and administer the corrective measures of the CPP. Contingency measures in attainment planning serve the same purpose as corrective measures in the CPP in that they provide a means for the state to reach compliance if implemented required measures fail to achieve attainment or make reasonably further progress towards attainment by the applicable date. EPA has approved a number of different approaches to contingency depending on the specific circumstances of a state. EPA should allow for such flexibility in the final CPP corrective measures provisions, to the extent that flexibility does not interfere with timely goal achievement. Corrective measure requirements should not be so loose as to allow a state that fails to meet its goal to continue business as usual for the affected sources. EPA's policies and practices for reasonable further progress and attainment demonstrations under subpart 2 of part D of Title I of the CAA (as they relate to ozone nonattainment areas) provide a practical approach to state compliance with the CPP goals.

[64] 79 FR 34952

10) Technical Corrections

a) Baseline Generation from CPP Subject Units - Algonquin Windsor Locks:

Connecticut notes that there appears to be an inconsistency in the way that the Sum of Carbon Dioxide (tons), Sum of Electric Generation (MWh) and Sum of Net Energy Output (MWh) in the Natural Gas Combined Cycle (NGCC) data for Algonquin Windsor Locks in the 2012 Plant level data for likely covered fossil sources (Goal Computation TSD Data File - Appendix 7) spreadsheet was calculated, as compared with the data for Capitol District Energy Center. On the Unit-Level Inventory (Goal Computation TSD Data File - Appendix 7) spreadsheet, the Carbon Dioxide (tons), Electric Generation (MWh) and Net Energy Output (MWh) data for the STG was not added to the Carbon Dioxide (tons), Electric Generation (MWh) and Net Energy Output (MWh) data for the GTG for Algonquin Windsor Locks. However, the GTG and STG Carbon Dioxide (tons), Electric Generation (MWh) and Net Energy Output (MWh) data for Capitol District Energy Center were added together. Both facilities have combined cycle units that are used for cogeneration purposes. Connecticut recommends that the Carbon Dioxide (tons), Electric Generation (MWh) and Net Energy Output (MWh) data be calculated on a consistent basis for Algonquin Windsor Locks and Capitol District Energy Center. Connecticut realizes that if a data correction is warranted, it will likely not impact Connecticut's final state goal.

b) Baseline "Sales" data used in setting EE target under Building Block 4:

Building Block Four goals were set by using 2012 utility sales.[65] EPA calculated the total sales of "bundled" and "delivered" from "regulated" and "unregulated" utilities. Included in the sales was a "utility" named "Adjustment 2012" which reported 40,368 MWh. These sales, however, are a summation of the total sales from "unregulated" utilities already reported and used in the baseline determination. The data attributed to "Adjustment 2012" does not represent actual sales of electricity. Accordingly, "Adjustment 2012" represents a double counting and should be removed from Connecticut's 2012 baseline utility sales. Connecticut realizes that this data correction will likely not impact Connecticut's final state goal significantly.

[65] *See* Clean Power Plan Proposed Rule Technical Documents, Data File: GHG Abatement

Appendix A: Connecticut's Renewable Energy Experience

RPS requirements are a mechanism by which to drive investment in renewable energy through the participation of a state in a larger regional market. Through an RPS approach, renewable resources are incentivized to build at the most economically and technically feasible location within the borders of the defined RPS market—borders that generally correspond to the regional grid in which the state operates (or often neighboring regions) rather than aligning with individual state boundaries.[66] In establishing aggressive RPS policies, Connecticut considered the potential for the market to fulfill the demand created by the state policy, and did not anticipate the siting of all stimulated renewable energy to occur within its borders; to do so would be to ignore the benefits and realities of regional transmission. Accordingly, the EPA's proposed methodology that relies on state RPS goals to yield in-state renewable generation targets ignores the realities of the RPS mechanism as a beyond the state borders tool.

Connecticut is particularly dependent upon RE generation from out of state to meet its RPS requirements. For example, in 2010, only 11% of the electricity used to meet Connecticut's Class I standard came from in-state projects.[67] A total of 76% of ratepayer costs for Class I resources supports biomass plants, located primarily out-of-state. Another 13% of Connecticut's Class I requirement is supplied by landfill gas projects, also mostly located out-of-state.[68] Thus, although Connecticut had only about 5% of New England's installed renewable capacity as of 2011, it accounted for more than one-third of the Class I RPS demand in the region.[69] While in-state facilities will help Connecticut meet its RPS requirements, the resources most available in Connecticut can be more expensive than Class I resources available regionally. As a result, by 2020 in-state resources are expected to produce approximately 23% of the Class I RPS requirement, but will account for 32% to 45% of the total cost of complying with the Class I requirements.[70] Accordingly, a requirement that more in-state renewable generation be developed in Connecticut is economically prohibitive.

Because of the regional nature of the RPS market, Connecticut and its sister New England states have executed purchase power agreements with RE developers for projects throughout the region irrespective of the location of the project. Indeed, as the following figure[71] depicting recent PPAs for RE generation demonstrates, there is only a modest correlation between a RE generator's location and the state with which the facility has entered into a PPA:

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[66] Several ISO-NE states allow RE from New York and Canada be certified as RPS eligible in their states. In Connecticut, as of October 2013, 6 wind and 2 landfill gas facilities from Canada and 6 wind, 1 biomass, 19 landfill gas, and 2 run of river hydro facilities from New York were certified as RPS eligible. In 2010, Six percent and one percent of Connecticut's Class I RPS came from New York and Canada respectfully. *See* Restructuring Connecticut's RPS (April 26, 2013). Available at http://www.ct.gov/deep/lib/deep/energy/rps/rps_final.pdf at p. 10.

[67] *Id.*

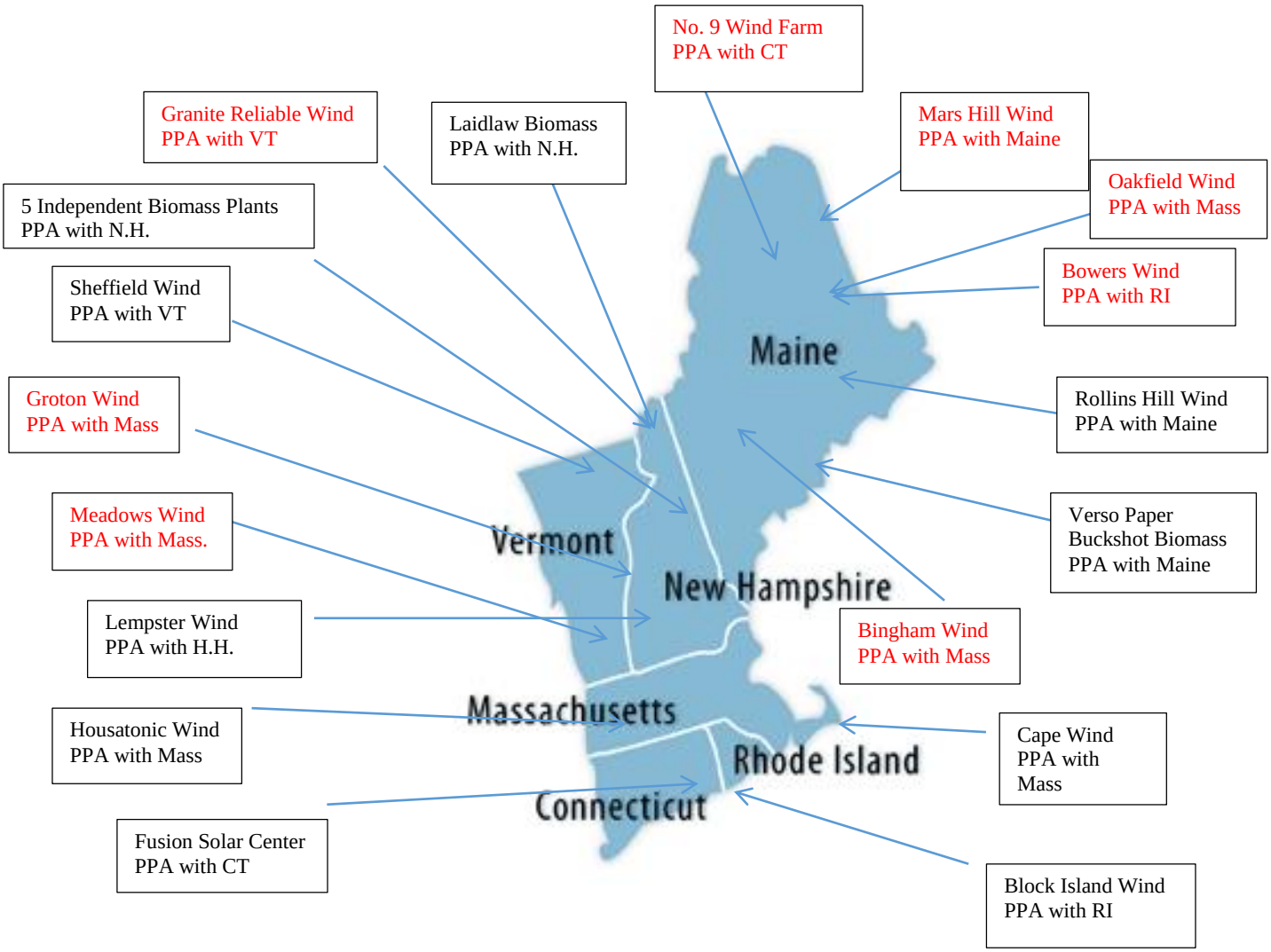
[68] *Id.* at p. 9

[69] *Id.* at p. 5

[70] *Id.* at p. 15

[71] Figure courtesy of ISO-NE

Figure 4: New England State PPAs for Renewable Energy



Appendix B: Connecticut's Energy Efficiency Experience

Energy efficiency is widely regarded as the least-cost energy resource option available today. A recent American Council for an Energy-Efficient Economy study concluded that electric utility energy efficiency programs, at an average cost of $.28/kWh ("kWh"), provide resource options ranging from 1/2 to 1/3 the cost of alternative options such as building new power plants.[72] Connecticut has been a leader in investing in energy efficiency programs. In 1998, the Connecticut General Assembly showed great leadership by establishing an energy efficiency fund, supported by a $.003/kWh assessment on all retail electric customers. These actions nearly tripled the investment in electric efficiency from approximately $30 million annually in the early 1990s to nearly $90 million in 2000. Beginning in 2005, ratepayer contributions to the Connecticut Energy Efficiency Fund were supplemented by new revenue sources, including revenues from the ISO-NE Forward Capacity Market, sales of Class III Renewable Energy Credits, and proceeds from CO_2 allowances through RGGI. In 2011, annual investment in electric efficiency reached $124 million.

These investments delivered real and significant savings to Connecticut consumers. From 2007 to 2011, Connecticut efficiency programs helped reduce the State's electricity consumption by more than 5%.[73] Between 2000 and 2011 more than 285,000 (or about 20%) Connecticut homes received home energy evaluations and associated measures such as efficient lighting, weatherization, and air sealing through residential energy efficiency programs. In addition, over 34,000 Connecticut businesses participated in the energy efficiency programs during this same period.[74] Since 2000, investments in electric energy efficiency measures have saved over 650 megawatts (MW) in peak demand and reduced consumption by about 13%.[75] For every dollar invested in energy efficiency, Connecticut receives electric, gas, fuel oil, and propane system benefits valued at nearly $2.40.[76]

Building upon its success, in 2014, Connecticut nearly doubled its annual investment in energy efficiency to nearly $200 million.[77] This substantial increase was part of Governor Malloy's multi-pronged effort to mitigate a projected increase in electricity rates.[78] Further, over the next ten years, this expanded efficiency investment is expected to nearly eliminate growth in the state's annual electricity consumption (projected to rise an average of only 0.05% per year), and

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[72] Maggie Molina, *The Best Value for America's Energy Dollar: A National Review of the Cost of Utility Energy Efficiency Programs*, ACEEE Report Number U1402 (March 2014), at iii.

[73] Northeast Energy Efficiency Partnerships, "A Regional Roundup of Energy Efficiency in the Northeast and Mid-Atlantic States." Available at http://www.neep.org/uploads/policy/2011 Regional Roundup_FINAL.pdf.

[74] The Connecticut Light and Power Company, et al., 2012 Electric and Natural Gas Conservation and Load Management Plan. Available at http://www.energizect.com/sites/default/files/2012%20CLM%20Electric%20and%20Gas%20Plan%20FINAL.pdf.

[75] *Id.*

[76] Energy Efficiency Board 2013 Program and Operations Report. Available at http://www.energizect.com/sites/default/files/Final%202013%20ALR%20as%20Released%20for%20Print.WEB_.2.25.14_0.pdf.

[77] Connecticut Public Act, 13-298.

[78] 2013 Comprehensive Energy Strategy for Connecticut (February 19, 2013). Available at http://www.ct.gov/deep/lib/deep/energy/cep/2013_ces_final.pdf at p.4

reduce electricity consumption during peak demand periods to 0.5% per year. Not only will the increased investment reduce electric bills, the program will create support 5,500 in-state jobs by 2022 and grow the State's economy.[79]

Further, as Connecticut ramps up its investment in energy efficiency, innovative financing sources will be required. Accordingly, Connecticut established the first-in-the nation "Green Bank," whose mission is to use limited state or ratepayer funds to attract private investment in clean energy. Over the past two years, each $1 of public funds invested via the Green Bank attracted approximately $5-$10 of investment from private sources.[80] Connecticut has also developed standardized energy savings performance contracts for State and municipalities to engage energy service companies, and launched a statewide Property Assessment Clean Energy finance program that will enable commercial entities to pay back energy efficiency and clean energy investments over time on their property tax bills. Connecticut has also launched a statewide Energize Connecticut campaign design to make Connecticut residents and businesses aware of the cheaper, cleaner energy choices available to them, as well as the expanded opportunities for financing these energy efficiency investments and clean energy alternatives. These investments will not only increase Connecticut's investment in energy efficiency, but will decrease the reliance on electric ratepayers.

[79] 2013 Comprehensive Energy Strategy for Connecticut (February 19, 2013). Available at http://www.ct.gov/deep/lib/deep/energy/cep/2013_ces_final.pdf at p.4

[80] *Connecticut's Green Bank: Energizing Clean Energy Finance*, http://www.ctcleanenergy.com/annualreport/