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December 1, 2014

The Honorable Gina McCarthy
Environmental Protection Agency
EPA Docket Center (EPA/DC), Mail code 28221T
Attn: Docket ID No. EPA-HQ-OAR-2013-0602
1200 Pennsylvania Ave. NW
Washington, DC 20460
A-and-R-Docket@epa.gov

Re: Docket ID No. EPA-HQ-OAR-2013-0602 – *Comments of the Maine Public Utilities Commission on Proposed Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 79 FR 343830 (June 18, 2014)*

Dear Administrator McCarthy:

The Maine Public Utilities Commission ("the Commission") respectfully submits the following comments on the U.S. Environmental Protection Agency's ("EPA's") proposed Clean Power Plan ("CPP"), which would establish carbon dioxide ("CO_2") emission guidelines for existing electric generating units ("EGU's") under Section 111(d) of the Clean Air Act ("CAA").[i] We also comment on certain aspects of EPA's Notice of Data Availability ("NODA"), released on October 28, 2014 to accompany the CPP.

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[i] On November 5, 2014 Maine and the eight other states participating in the Regional Greenhouse Gas Initiative ("RGGI") submitted extensive comments on the CPP. In those comments Maine and the other states reserved the right to submit additional comments on issues of interest to any separate state(s).

Thank you for this opportunity to comment on the CPP.

Sincerely,

The Maine Public Utilities Commission

Thomas Welch Chairman	David Littell Commissioner	Mark Vannoy Commissioner

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Standards of Performance for	)	
Greenhouse Gas Emissions from	)	Docket No. EPA-HQ-OAR-2013-0602
Existing Sources: Electric Utility	)	
Generating Units; Proposed Rule	)	

COMMENTS OF THE

MAINE PUBLIC UTILITIES COMMISSION

ON THE PROPOSED CLEAN POWER PLAN

Via regulations.gov and email

December 1, 2014

The Commission comments cover six subjects: (1a) a formulation error that results in inconsistent treatment of existing hydroelectricity in the proposed building block three approach that should be corrected; (1b) the alternative approach for establishing a renewable energy standard in the CPP goal setting methodology lacks the specificity to identify intrastate transmission costs to integrate wind into the New England grid, resulting in overestimation of the economic potential for new renewable generation capacity for Maine; (1c) both existing and new renewables should receive regionalized treatment in any goal setting methodology; (2) the CPP fails to credit early-actor states for the full amount of reductions achieved in recent years; (3) potential unintended consequences from the disparate treatment of natural gas combined cycle generation that in fact provides electricity transmitted across state boundaries; (4) the need to apply rigorous evaluation, measurement and verification ("EM&V") criteria for efficiency measures included in any state's compliance plan; (5) the shortcomings of the proposal set forth in the NODA to change the treatment of renewable energy and energy efficiency in the goal setting formula; and (6) failure of the November rate-to-mass translation to account for the complexity of regional electricity resource changes.

1. Deficiencies in the Formulation of Renewable Energy Goals in Building Block Three

a) There is an Inconsistent Treatment of Existing Hydroelectricity in the Proposed Approach to Set Maine's State Renewable Energy Goals and then Disallow for the Very Same Hydroelectricity for Compliance with the Goal

Building block 3 of the CPP standard-setting methodology includes a formula whereby state renewable energy generation is a significant factor for setting the target rate of emissions for each state. In determining this building block 3 goal, state renewable energy is measured against a state-specific renewable percentage that is derived from existing state Renewable Portfolio Standard ("RPS") requirements for that state and its neighbors, arranged in regions as determined by the EPA to reflect similar levels of potential renewable energy. To some degree, the EPA chose state RPS programs as the standard out of deference to those states' analyses of their respective potential to increase renewable production in the future. That deference to state determinations of state specific renewable potential is entirely appropriate for those states that have undertaken to set an RPS or other renewable development standard. Under the CPP, the average of the state RPS requirements within the region becomes the standard applicable to each state within the region.

When it established the renewable generation goals for each state EPA considered all forms of renewable energy addressed by any state RPS. For Maine, the EPA attributes the total RPS standard of 40 percent, which includes existing hydro generation as well as wind, biomass, and all other renewables as defined in Maine statute. EPA has not, however, carried the same inclusive approach through to compliance with the target emissions rate as calculated. Specifically, although existing biomass and hydropower resources are included in establishing the regional RPS average against which each state will be measured,[1] the states may not count the MWh generated from existing hydropower in the compliance determination nor all biomass.[2] This disparate treatment of existing hydropower and biomass plainly results in a mismatch between the state goal-setting methodology and what is allowed for compliance. States such as Maine with an RPS based on investments in significant biomass and hydropower resources should be allowed to use all State RPS-compliant resources to avoid this mismatch.

The EPA should correct this error by including existing hydropower and biomass in countable state compliance generation, or by eliminating existing hydropower (and non-qualifying biomass) from states' RPS standards when establishing the regional average

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1 Maine relies on hydropower for over one-quarter (25.9%) of the state's total generation. Wood-derived biomass fuels an additional 20.4% of Maine's generation. The EPA is separately considering sustainable biomass fuel guidelines, to be developed in conjunction with the states.

2 EPA appears to be allowing a portion of biomass used to generate electricity to qualify, consistent of electricity derived from waste biomass and sustainably harvested biomass. *See* U.S. EPA, Framework for Assessing Biogenic CO_2 Emissions from Stationary Sources (Revised Nov. 19, 2014). Nonetheless, Maine allows electricity generated from non-waste and other biomass to qualify and thus this presents another mismatch to a lesser degree than hydro generated electricity. The only Maine biomass generated electricity that appears to qualify is that generated from waste biomass or sustainably harvested biomass whereas Maine's full RPS-compliant biomass generation is used to set Maine's building block three goal creating a similar though less exacerbated inconsistency for biomass.

under building block 3.[3] With either correction, the RPS-based approach to standard-setting would provide a more accurate indicator of the ability of states to develop renewable energy as a means of reducing carbon dioxide emissions during the compliance period. Maine recommends this RPS-regional average approach be corrected as described in this Section as the preferable technical methodology for setting a representative renewable goal for building block 3 purposes because it recognizes the regional nature of the electricity grid serving New England and New York.

In the alternative, as described in the next section, Maine supports the NODA approach to regionalizing the NREL renewable potential calculations. It is essential that EPA regionalize the renewable goals in building block 3 in order to maintain the technical legitimacy of the building block 3 renewable component. Electricity is generated, consumed and transmitted on a regional basis – not within state borders. Moreover, the renewable energy credit markets are regional markets within the Northeast (New England and New York). Both the RPS approach and the NODA regionalization approach recognize this fundamental attribute of electricity generation that usage and transmission within regions satisfies various state RPS laws.

b) The Failure of the Alternative Approach for Renewable Energy Goal-Setting to Incorporate Regional Costs of Alleviating Intrastate Transmission Constraints to Accommodate Additional Renewable Energy Generation is Arbitrary as to Maine; the NODA Suggestion to Regionalize the NREL Alternative Approach Renewable Energy Goals Corrects this Deficiency in the Alternative Approach in the June Proposal

[3] Eliminating existing hydropower from Maine's RPS standard would reduce Maine's RPS percentage from 40% to approximately 18%. Likewise eliminating biomass from Maine's RPS would reduce Maine's RPS percentage from 40% to approximately 29%. And eliminating both biomass and hydropower as was used to comply with Maine's RPS in 2012 would reduce Maine's RPS goal from 40% to approximately 7%. Since Maine's RPS is one of the highest in the U.S. and plainly pulls up the Northeastern RPS average calculated by EPA (along with NY's RPS which also uses a majority of hydropower), the entire regional average estimate for renewables is set too high to allow for compliance without existing hydropower and biomass resources recognized in the Maine RPS.

Although EPA sets forth the above RPS-based approach as the preferred means of incorporating renewables into the CPP, which Maine agrees with if corrected as described above, thus giving deference to State RPS development processes that are focused on weighing the local and regional costs and benefits of new renewable generation, EPA also seeks comment on an alternative based on technical analysis of the potential for renewable energy *within a state*. The technical potential calculation rests on two sources of information. First, the EPA draws on an assessment by the Department of Energy's National Renewable Energy Laboratory ("NREL"). Second, econometric modeling using the Integrated Planning Model ("IPM") is used to project the ability of states to deploy cost-effective renewable generating capacity. The EPA's "technical potential" alternative to the RPS standard-setting methodology ascribes to each state an amount of incremental renewable generation equal to the lesser of these two projections.

This "technical potential" approach is problematic if not regionalized, and we urge EPA not to depart from the RPS-based approach (corrected as set forth above) precisely because it is regionalized. The technical potential for development of renewable energy is determined in large measure by an analysis of the physical characteristics and resources of a region within which electricity is used and transmitted. The actual likelihood of developing renewable generation is heavily constrained by the ability to transmit that power to "load centers" where it is consumed. Load centers are typically areas of high population, commercial and industrial concentration such as Boston, portions of Connecticut and the greater New York City area. Transmission constraints are often dispositive in the decision to invest in new renewable capacity, and this factor has not been adequately considered in the alternative "technical potential" approach. By not adequately considering the transmission constraints to move renewable power, specifically from Maine, to load centers in southern New England and New York, this alternative "technical potential" approach fails to reflect the regional nature of the electricity grid within ISO-NE and ISO-NY.

In the case of Maine, the IPM econometric analysis does not explicitly model intrastate transmission constraints that today prevent additional new renewable energy capacity from receiving revenues in the ISO-NE Forward Capacity Auction ("FCA").[4] Failure to account for these constraints overlooks what may be substantial intrastate system grid upgrades required to transfer additional new renewable energy generation from the resource areas to load. The Commission has reviewed numerous transmission cost studies prepared by ISO-NE and transmission engineers such as RLC Engineering over the last four years. Based on our review of these studies, the Commission is concerned that the cost to upgrade the regional transmission grid as well as Maine's transmission system to accommodate the level of new wind generation estimated by the IPM analysis may cost in excess of $2.5 billion.[5] Indeed, the cost of integrating a greater amount of wind, 2,000 megawatts, into the New England grid alone (excluding New York) was estimated at $4.7 to $7.9 billion by ISO-NE or $8.0 to $17.9 billion for 4,000 megawatts (half of these MWs are offshore and half onshore with the bulk of the transmission system upgrade costs to accommodate onshore rather than offshore).[6]

The goal-setting methodology should not force a renewable energy rich state such as Maine to bear the costs of developing new capacity that, although technically achievable, may be economically infeasible for a single state due to the expense of overcoming transmission constraints and the costs of system integration and tying into grid infrastructure at great distances from load centers.[7] The separate criterion derived from estimates of the potential build-out of renewables based on modeling projections does not adequately address this concern based on more specific studies undertaken by ISO-NE and

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4 One significant intrastate transmission constraint exists at the Orrington South interface. See ISO New England Inc., Docket No. ER15 – Informational Filing for Qualification in the Forward Capacity Market, November 4, 2014, p. 15. Online at http://www.iso-ne.com/static-assets/documents/2014/11/er15-___-000_11-6-14_2018-2019_icr_filing.pdf

5 This estimate is based upon the proposed cost of the Northeast Energy Link HVDC line to transmit additional electricity generation from Eastern and Northern Maine and the estimated cost to upgrade the AC transmission system to transmit additional generation from Western Maine.

6 ISO-NE, 2030 New England Power System Study, pp. 16 & 21, http://www.iso-ne.com/committees/comm_wkgrps/prtcpnts_comm/pac/reports/2010/economicstudyreportfinal_022610.pdf

7 See New England Wind Integration Study, (Dec. 5, 2010) (Prepared for ISO New England by GE Energy Applications and System Engineering) http://www.iso-ne.com/committees/comm_wkgrps/prtcpnts_comm/pac/reports/2010/newis_report.pdf; see also 2030 New England 2030 Power System Study (Feb. 2010) (ISO New England), http://www.iso-ne.com/committees/comm_wkgrps/prtcpnts_comm/pac/reports/2010/economicstudyreportfinal_022610.pdf

RLC Engineering for the New England States Committee on Electricity. We therefore believe that the RPS-based standard, corrected to include consistent treatment of hydropower and biomass, is the best available indicator of achievable renewable generation and in the alternative regionalizing the NREL numbers is necessary to produce a technically defensible renewable potential estimate.

EPA's Notice of Data Availability ("NODA") issued on October 28, 2014 describes a third approach, which is essentially a modification of the alternative technical potential approach described above to regionalize those NREL numbers as is preferable. Under the NODA approach, technical potential within a state is assessed based on NREL data and IPM modeling as described above, then aggregated with the technical potential of other states across a region. This regional total technical potential is then re-allocated to the states in proportion to each state's load (or some other criterion), reflecting the regional nature of the electric grid. This regional approach partially addresses the concerns relating to transmission constraints and system integration costs to the extent that those constraints correspond with interstate transfers.

In general, Maine supports regional approaches as the most cost-effective way for states to reduce power sector CO_2 emissions, creating possibilities for least cost reductions. Regional approaches reflect the regional nature of the grid. RECs are freely traded within the Northeast (New England and New York) and this market – like the RGGI market – is already successfully regionalized.

The opportunities for developing renewable energy are regional in nature. Where states are joined by a regional grid and participate in a regional REC market as among New England and New York, whether a technically feasible renewable generation unit is developed does not depend on state borders.

Maine offers the following comments in support of the NODA's approach to setting state renewable targets, based on the Alternate technical potential analysis used in the CPP reallocated on a regional level:

- In a regional REC market, a state's opportunity to develop RE generation is far greater than the opportunities within the state. The technical potential for development of renewable resources is not equally distributed among states and is enhanced when states with low potential have an incentive to support interstate renewable projects.

- Because out-of-state renewables are allowed for compliance, it is logical that the ability to access renewables available regionally beyond a state's border should be a factor in a state's target under the CPP.

- A resource-intensive state should not bear the entire burden for developing those resources including hundreds of millions to billions of dollars of transmission interconnection costs and system-wide transmission upgrades where the power will be utilized regionally and the emissions reductions will be experienced regionally as renewable generation offsetting emissions located in other states with greater fossil generation but less renewable generation than Maine.

- In some instances the technical potential of a renewable resource greatly exceeds what the host state can develop on its own due to costs of upgrading intrastate and interstate transmission systems. Regionalization provides a pathway for addressing some states' concerns with the original RPS proposal, while also eliminating the technical flaws in the Alternate approach. Among those technical flaws is forcing more renewables into resource rich wind states than those states can integrate into the electrical system on their own.

- To avoid double-counting, any regionalized approach must include clear guidance about how to credit renewables that are accounted across state borders.

If EPA elects to redistribute renewable energy development potential on a regional basis, Maine supports reallocation on a mass-based allocation similar to the manner in which RGGI allocates emission credits, or by peak-load allocation as done in ISO-NE for pooled-transmission facility costs. Because most fossil-fuel electrical generation units are in operation more so under regular peak conditions than low-load conditions, the peak-load allocation is most representative of times when the most units to be regulated by EPA's 111(d) proposal would be in operation. For this reason, the peak-load allocation already in use in New England is a technically appropriate allocation method. Nonetheless, the EPA should allow flexibility for states to choose a mass-based reallocation method, peak-load allocation or other method and recognize other state allocation methods where they are supported by the states involved in a regional program.

To the extent EPA adopts a regional estimate that reflects both the regional nature of the electricity grid and the regional nature of the renewable energy markets that exist between states in the northeast, the approach described above removes the technical flaw with the alternative approach as described in the June proposal of ascribing the entire technical and economic burden of developing regional renewable energy resources to the state containing those resources within its borders without considering the electrical load and regional markets served by those renewable resources. The third method for calculating the building block 3 renewable goals in the NODA is therefore preferable to the alternate method described in EPA's June proposal.

c) Both Existing and New Renewables Should Receive Regionalized Treatment in any Goal Setting Methodology

As stated, Maine electricity generation exists in a regional marketplace. This existing regionalized market extends beyond electrical energy to include the renewable attributes of that energy. Over two-thirds of the wind power projects in Maine under construction or in permitting are under direct contract with out-of-state entities and more will serve regional load. Further, all of the existing wind generation in Maine is qualified and receives revenues from the sale of RECs into other New England state RPS programs. A list of states in which Maine's renewable projects qualified to sell renewable energy credits is attached as Appendix 1.

Renewable electricity generation, and specifically existing and new wind facilities, is often under long-term power purchase agreements with utilities in other states in New England. Over 900 MW of approximately 1300 MW of current, under construction and Maine wind generators in permitting are under contract with utilities or entities outside of Maine. *See* Appendix 2. While load for merchant and other projects ends up serving regional load dispatch, even accounting for just those projects under contract with utilities and entities outside Maine, it is evident that from the list of current, under construction and wind power projects in permitting that over two-thirds of wind power projects in Maine are under direct contract to serve load and renewable markets outside Maine. The overwhelming majority of wind projects in Maine serve load in southern New England, including utilities in Massachusetts and Connecticut. *See* Appendix 2. For this reason it is unfair to allocate responsibility for new or existing renewables in building block 3 entirely to Maine because the wind resource exists within Maine but serves out of state load.

Hydroelectric and biomass facilities located in Maine also sell energy and RECs out of state. Whatever final specific methodology is adopted by EPA, the goal setting methodology should reflect the reality of the existing regionalized renewable energy contracts, transfers and markets that exist in New England and New York that result in new and existing renewable projects including wind, hydroelectric and biomass serving regional load and regional customers outside of Maine.

2. <u>Inequitable Treatment of Early Actor States</u>

By investing in renewable energy and significant energy efficiency measures over the past decades, Maine has already achieved significant reductions in fossil fired emissions and its emissions rate. In most cases, the investments needed to achieve these results exceed those of other states. The emissions reductions achieved in Maine already exceed the national goals of 30 percent reduction set by the CPP by a substantial degree when examined in the context of reductions since 2002. The investments made in Maine – increased renewable generation, extensive cost-effective efficiency programs for residential, commercial and industrial sectors, and transitioning to use of less-carbon intensive fuels for generation – mirror the elements of the emission reduction building blocks.

The application of the CPP should reward and encourage early acting states such as Maine for the results achieved to date by giving equitable treatment to recent emissions reductions. Early acting states have developed policy tools and program, such as RGGI and other efficiency and renewable programs that exemplify effective emission-reducing strategies.

Whether or not the CPP equitably treats early actor states depends partly on the baseline year underlying the development of the standards set forth in the building blocks. For most purposes, EPA considers 2012 the baseline year against which future reductions are measured in the CPP. By 2012 Maine had already spent a decade implementing one of the strongest RPS requirements in the U.S., and had also invested substantial funds (RGGI auction proceeds, ratepayer assessments and other funding streams) in efficiency. In the last 10 to 15 years, both Maine's renewable energy and energy efficiency programs have become among the most highly developed in the nation. These investments contributed to emissions reductions for Maine prior to 2012 that in fact exceed those EPA is requiring on average nationally. During the period 2002 to 2012, Maine's power sector emissions declined by 58%.[8]

It would therefore be arbitrary to ascribe to Maine additional reductions beyond those applicable in states where no effort has been made and no expense incurred. Maine's RPS is already among the highest in the U.S. As a percentage of load, Maine generates more electricity from renewable resources than any other state east of the Mississippi. Maine is a

[8] Maine's emissions from 2002 to 2004 averaged 5.04 million tons annually. Average emissions from 2010 to 2012 were 2.12 million tons annually. EPA Emissions from Fossil Fuel Combustion, http://epa.gov/statelocalclimate/documents/pdf/CO2FFC_2012.pdf

net exporter of electricity, renewable energy, and renewable energy credits to the northeast regional grid and markets. As a result, Maine has already achieved many of the goals of EPA's proposed rules. Because of its actions and investments, Maine as an early actor state has fewer untapped opportunities than late-starting states. The cost of achieving additional emissions reductions in states such as Maine may be higher than achieving the same amount of initial reductions in a state that has not yet acted.

Several aspects of the CPP create this risk of inequitable treatment. First, the baseline year against which future emissions will be compared is 2012. Programs developed by Maine achieved some of those reductions, including electricity restructuring, which allowed competitive generation investments, and air emission control requirements under state laws. Market forces also contributed to develop natural gas generation capacity in Maine and other Northeastern states. Some other states and regions did little to encourage renewables, NGCC, and/or invest in efficiency. Some states increased their emissions during the period leading up to the baseline year.[9] An equitable approach would set baseline years[10] prior to their emissions reductions efforts, whether they began in 2002 or 2012.[11] Maine believes a baseline average of years 2002 through 2005 should be utilized to best capture early state efforts. A baseline of 2005 is consistent with President Obama's Copenhagen Accord commitment and in fact consistent with the emissions reductions publicized by the Obama Administration, and U.S. EPA in publicizing this 111(d) rule proposal in June of 2014.

3. <u>The Risk of Unintended Consequences Resulting from the CPP's Treatment of New Natural Gas Combined Cycle Generating Units</u>

[9] Texas' emissions from 2002 to 2004 averaged 222.4 million tons annually. Texas' average emissions from 2010 to 2012 were 226.7 million tons. Id.

[10] The NODA seeks comment on whether to give some states baseline years other than 2012.

[11] This approach would not ignore more recent emission reduction information, but would simply set the baseline for future reductions at a point that is most equitable to reflect the very emission reduction methods EPA recognizes this proposed rule. Therefore it is consistent with the EPA's statutory requirement to base new rules on the most recent available information to recognize when those states that have earlier reduced emissions consistent with EPA's rule.

EPA has also solicited comment on the treatment of NGCC units in the CPP. We identify how the CPP's treatment of NGCC units is anomalous and may lead to interstate inequities and unintended consequences.

Differential treatment of existing (under Section 111(d)) and newly constructed NGCC units (under Section 111(b)) under EPA's proposed rules places a potentially inequitable economic burden upon early acting states such as Maine that have already begun their transition to an NGCC fleet. Resource modelling for all regions by ISO/RTOs and private modelers show substantial NGCC build-outs in the future, with or without EPA regulation of carbon emissions. General economic and technological trends, such as advances in shale gas extraction, have made natural gas generation economically competitive against coal generation across much of the USA.

States that have already built out NGCC fleets in response to the low cost of natural gas in the 1990s and for environmental concerns are now faced with a more constrained treatment (and concomitant costs) of their NGCC fleets under Section 111(d) relative to those states who will now begin transitioning to natural gas for similar economic and environmental reasons, constructing an NGCC fleet relatively unconstrained in emissions under Section 111(b).

The specific concern related to the above involves building block two and the CPP's objective of encouraging re-dispatch from higher-emitting generating units to lower-emitting generating units. Under the CPP 111(d) proposal the amount of re-dispatch expected of states is limited by the makeup of the existing generating fleet. Although it would be feasible to construct new NGCC plants for commissioning on or near the start of the compliance period, building block two only considers re-dispatch to NGCC plants already in operation. Early acting states such as Maine that have already made substantial progress in phasing out its oil and coal generation are faced with the potential economic burden of re-dispatching its existing NGCC fleet investments, while states that have yet to make these investments may utilize the unconstrained dispatch to newly constructed NGCC units that are economic to build without any regulation. To address this inequity, where the re-dispatch is limited only by the lack of in-state NGCC capacity, a minimum floor of re-dispatch should be attributed to the states to recognize likely cross state transfers of NGCC generated electricity. That will even out the compliance burden between states and regions such as New England, which have already transitioned to a NGCC fleet, and other areas where there are few or none of these units yet, but certainly will be in the near future. This adjustment would more accurately and equitably set the goals as among regions and states.

4. The Importance of Rigorous EM&V in Energy Efficiency Goal-Setting and Compliance Determinations

Building block four asks each state to deploy increasing levels of energy efficiency programing and other measures that can reduce demand for fossil fired generation. The MWh of efficiency savings is based on an assessment of the best performing state efficiency programs across the country. Each state is given a ramp-up period before the MWh of efficiency savings is attributed to that state.

Quantifying the results of state efficiency programs is therefore crucial not only in assessing state compliance efforts, but in determining whether the formula upon which state expectations are based is appropriately incorporated into in the Best System of Emissions Reductions ("BSER") formula. The MWh of savings from efficiency programs are not subjected to metering as are the other generation-related factors incorporated into the BSER. Therefore the system whereby the savings are quantified must be rigorous at a high level of confidence.

In the goal-setting context, rigorous EM&V will ensure that any standard derived from the results of existing state programs is credible. If the goal-setting methodology relies on efficiency programs with weak EM&V protocols, there is a risk that the formula will project efficiency savings that will be difficult to achieve when stronger EM&V protocols are applied during compliance. As with all the other building blocks, the stringency of the standards used in goal-setting must match the stringency of the compliance expectations, or distortions will result. The EPA must establish robust EM&V guidelines against which the results of state efficiency programs should be measured in order for their efficiency-derived MWh to be counted for compliance.

5. The NODA's Proposal to Change the Way Energy Efficiency and Renewable Energy are Incorporated into the Goal Setting Formula Establishes Dramatically Different State Goals than the Original CPP

The CPP goal setting formula consists of an equation with a numerator equal to mass of CO_2 emissions and a denominator equal to MWh of electricity generated. In the CPP as originally proposed, renewable energy and energy efficiency are included in the denominator as MWh of energy generated (or the equivalent in the case of efficiency). Since there are no emissions directly associated with renewable generation or efficiency, the CPP as originally proposed did not factor these elements into the numerator.

The NODA, however, would make a very significant change in this formula. For each state, the mass of emissions set forth in the numerator would be reduced by an amount corresponding to the emissions from fossil fuel generation that would theoretically be displaced by the renewables and efficiency included in the denominator. This "displacement" proposal would make each state's emissions rate more stringent. For states with a high ratio of renewables to fossil fuel fired generation, the increased stringency is very significant to the point of being infeasible.

The NODA's late release has not allowed for a full assessment of this alternative at this date, but preliminary analysis suggests that re-configuring the goal-setting equation as proposed could reduce (i.e. tighten) the CPP's goal for Maine by nearly 90% below the original goal of 378 lbs/MWh. The combination of the EPA's technical potential methodology (described above) and the "displacement" assumption could reduce Maine's 2030 emission rate to as low as 44 lbs/MWh – a technically and economically infeasible level.[12] In 2012

[12] The NODA does not provide sufficient detail to precisely calculate the impact of these proposals. It is clear, however, that the "displacement" approach would decrease the lbs. of emissions in the numerator of the rate calculation equation, while the "technical potential" approach would increase the MWh of generation in the

Maine's wind power fleet had an average capacity factor of 25%, with specific wind farms ranging from 19-36%. The rate of 44 lbs/MWh is too low to ensure that Maine's three to five natural gas combined cycle electrical generation units would be able to provide reliable electricity to balance intermittent renewable resources such as wind without significant regional investments. A regional approach might help alleviate this concern somewhat but not so much as to allow Maine's rate anywhere near the level of 44 lbs/MWh.

The NODA's proposal seems to assume that each MWh of efficiency or renewable energy will replace one MWh of re-dispatched in-state NGCC generation (Maine will have no oil- or coal-fired generation). In fact, renewables and efficiency may offset the need to develop new capacity to meet load growth, rather than existing fossil fired generation. For this reason, we do not believe that the NODA's new formulation better captures potential emissions reductions than the original formula.

Maine recommends a modification to the NODA displacement assumption so that the final targets reflect what is reasonably achievable by the states. Specifically, while the displacement concept is contemplated by both the NODA and by the rate-to-mass translation TSD, Maine strongly recommends that EPA adopt the displacement methodology in only one context so as to prevent a duplicative counting of fossil fuel displacement. In order to maintain consistency across rate-based and mass-based approaches, EPA should provide states opting to pursue a mass-based approach with the opportunity to justify the appropriate amount of fossil generation that should be displaced (rather than apply an assumption that all incremental EE and RE will displace existing fossil fuel-fired generation). Such an approach is appropriate given that modeling used to convert a rate-based target into a mass-based emissions cap will provide fuel mix projections,

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denominator. Each of these changes would lower the resulting rate, increasing the stringency of the rule for states with significant renewable resources. For example, depending on how applied, the "displacement" proposal may decrease the emissions in Maine's numerator from 3.4 million lbs. to 0.6 million lbs., while the "technical potential" approach may increase the generation in the denominator from 9.2 GWh to 13.8 GWh. Taken together, Maine's resulting rate goal would be 44 lbs/MWh – an infeasible rate for the reasons above.

thereby alleviating the need to include a calculation-based displacement assumption as part of those states' respective targets.[13]

6. EPA's Illustrative Rate-to-Mass Translation in its November 2014 TSD Fails to Account for the Complexity of Regional Electricity Resource Changes Expected Between 2012 and 2030

We have reviewed EPA's illustrative example of a Rate-to-Mass translation (*Projecting EGU CO_2 Emission Performance in State Plans*), the November 2014 released computational methodology in the RTM TSD, and considered the RGGI states' own experience in developing and updating a mass-based emissions cap. The experience of the RGGI states demonstrates that a correctly determined mass-based target is a cost-effective, efficient, and transparent means of achieving the desired emission reductions.

In conducting the translation between the rate-based targets and a mass-based emissions cap, there may be some apparent value of providing a simple calculation-based methodology, such as the approach illustrated by the recently released RTM TSD.

However, Maine respectfully observes that the approach outlined by the proposed CPP, which seeks to effectuate emission reductions on a system-wide basis, is not especially conducive to a simplified calculation-based translation methodology. Of specific concern is the complexity of this nation's interdependent electricity grids as well as the dynamic nature of our energy markets, which both contribute to the resulting inability of historically-based generation and capacity data to provide reliable analyses of projected fuel mixes for individual states that participate in larger market structures. Electricity system modeling offers crucial insights pertaining to how that system will respond to changes in policy or market forces, especially related to the type and location of generation shifts. Electricity system modeling is standard planning procedure in ISO/RTO and state planning. Such modelled outputs are essential for determining the equivalent

[13] To implement this approach, EPA could publish a final rate target for all states, which is inclusive of the displacement assumption. A second set of rates, non-inclusive of the displacement assumption, could be published as approved inputs for use by states in converting to a mass-based emissions cap.

mass-based emissions targets for each state, and irreplaceable for scenarios in which not all states in an ISO/RTO elect to participate in a regional, mass-based approach to compliance.

For example, consider a situation derived from a historical example, in which a state's existing capacity profile is comprised of primarily under-utilized NGCC EGUs accompanied by the state's economic and technical potential to develop a significant amount of incremental RE generation. This hypothetical State A has been assigned a fairly stringent rate under the CPP, and coupled with the negligible growth rate derived for its region, receives a low mass-based cap using the calculation-based rate-to-mass conversion methodology. However, its neighbor, State B, whose existing capacity profile consists of coal-fired EGUs and only modest economic or technical potential to develop incremental RE resources, receives a comparably high mass-based cap relying on the calculation-based rate-to-mass translation. Following implementation of the CPP, market forces or state action could contribute to the closure of one or more of the coal-fired EGUs in State B, causing an increased utilization of the NGCC units in State A in order to satisfy the regional load. In this historically-derived example, State A would be unable to comply with its CPP mass-based target absent a pre-existing regional cooperative agreement, and State B may have undertaken little to no action (independent of basic market forces) to effectuate its CPP compliance.

The likelihood of an outcome such as the hypothetical described above would be drastically reduced if traditionally and standard electricity system modeling is employed to accomplish the rate-to-mass translation. Essentially, such modeling is necessary to project the system-wide impact of the CPP and to ensure that a meaningful equivalency of stringency between the approaches is maintained. While modeling is sometimes criticized for its complexity, as well as retroactively judged for its accuracy, neither characterization justifies reliance on an over-simplified calculation-based rate-to-mass conversion given the system-wide goal-calculations and compliance options of the CPP. With respect to the concerns of complexity, the RGGI states note that at least two grid operators conducted system-wide modeling of the proposed state targets during the comment period, and could reasonably be expected to assist with any future modeling efforts given the grid operators' independent concerns about system reliability and resource adequacy. Furthermore, states electing to pursue a mass-based compliance approach would very likely need to conduct interim modeling to develop and demonstrate projected compliance. The EPA could also consider providing states with additional resources to support this modeling effort.

In regard to the accuracy of modeling results, just as with any methodology used to conduct the rate-to-mass translation, the output is only as reliable as the underlying assumptions. For this reason, we recommend that EPA prescribe rebuttable presumptions for input source data, such as reliance on the ISO/RTO load forecasts and interconnection queues to determine firm retirements and firm builds, as well as Annual Energy Outlook projections for fuel prices.[14]

Furthermore, EPA should specifically clarify that, for purposes of the rate-to-mass translation, underlying RE and EE state policies should not be included in the baseline. To require state RE and EE policies to be modelled in the baselines essentially takes away the benefits of those programs during the compliance period for states that implement these very programs which EPA hopes to encourage states to undertake. Any impact on regional dispatch attributable to these complementary policies is not within the appropriate scope of the rate-to-mass translation but would be measured either by a rate-based cap or other compliance measure in a state utilizing a mass-based system.[15]

While a modeling-based approach for the rate-to-mass translation is most appropriate due to the system-wide structure of the CPP, a calculation-based methodology for the rate-to-mass translation *could* be appropriate if EPA corrects for the apparent double-counting of fossil fuel displacement. Fossil fuel displacement may be already accounted for in the calculation of a state's rate and then EPA would potentially count that displacement again in the rate-to-mass translation. That results in any overly stringent compliance system for those states utilizing mass

[14] These presumed inputs should be rebuttable in the event that the state can provide credible evidence to demonstrate that the load growth assumption should be adjusted due to another state policy designed to reduce greenhouse gases from other sectors through electrification, which could increase electricity use. Examples include utility heat pump initiatives which reduce greenhouse gas emissions in other contexts.

[15] Depending on the ISO/RTO to which the state belongs, this may require an adjustment to the load forecast.

based systems. Fossil fuel displacement should not be counted twice, first in the rate calculation and then again in the rate-to-mass calculation.

Conclusion

We recognize the magnitude of EPA's proposal and respectfully submit these comments for consideration. These comments on the proposed CPP provide the perspective of the Maine Public Utilities Commission.

Appendix 1
2014 Eligibility of Maine Renewable Generating Facilities in Other State RPS Programs

Plant - Unit	Fuel Type	CT Class I	CT Class II	MA Class I	MA Class II	RI New	RI Existing	NH Class I	NH Class IV
BUCKSPRT - VERSO BUCKSPORT G5	Biomass					Yes			
DEBLOIS - DOWNEAST POWER	Biomass			Yes					
GUILFORD - GALLOP POWER GREENVILLE	Biomass			Yes					
BIGELOW - REENERGY STRATTON	Biomass		Yes						
LVER-AEI - REENERGY LIVERMORE FALLS	Biomass		Yes						
WASHNGTN - COVANTA JONESBORO	Biomass		Yes	Yes					
ENFLD_ME - COVANTA WEST ENFIELD	Biomass		Yes	Yes		Yes	Yes		
UNDER5MW - EXETER AGRI ENERGY	Digester gas					Yes			
Lewiston-Auburn WPCA Anaerobic Digestor - Lewiston-Auburn WPCA Anaerobic Digestor Unit #1	Digester gas			Yes					
UNDER5MW - HOWLAND	Hydroelectric/Hydropower								Yes
UNDER5MW - DAMARISCOTTA HYDRO	Hydroelectric/Hydropower								Yes
UNDER5MW - PUMPKIN HILL	Hydroelectric/Hydropower								Yes
MOSHERS - HYDRO KENNEBEC	Hydroelectric/Hydropower						Yes		
RUMFORD - AZISCOHOS HYDRO	Hydroelectric/Hydropower						Yes		
UNDER5MW - BRASSUA HYDRO	Hydroelectric/Hydropower						Yes		
GULFISLD - GULF ISLAND COMPOSITE	Hydroelectric/Hydropower						Yes		
LAKEWOOD - WESTON	Hydroelectric/Hydropower						Yes		
LEWSTN_L - MONTY	Hydroelectric/Hydropower						Yes		
LOUDEN - BAR MILLS	Hydroelectric/Hydropower						Yes		
LOUDEN - CATARACT EAST	Hydroelectric/Hydropower						Yes		
LOUDEN - SKELTON	Hydroelectric/Hydropower						Yes		
TOPSHAM - BRUNSWICK	Hydroelectric/Hydropower						Yes		
W_BUXTON - BONNY EAGLE/W. BUXTON	Hydroelectric/Hydropower						Yes		
W_BUXTON - HIRAM	Hydroelectric/Hydropower						Yes		
WILLIAM - WILLIAMS	Hydroelectric/Hydropower						Yes		
WINSLOW - SHAWMUT	Hydroelectric/Hydropower						Yes		
UNDER5MW - ORONO B HYDRO	Hydroelectric/Hydropower					Yes			
Kennebec Water U5 - Kennebec Water U5	Hydroelectric/Hydropower				Yes				
Jay - Jay No. 1	Hydroelectric/Hydropower				Yes				
Jay - Jay No. 2	Hydroelectric/Hydropower				Yes				
Jay - Jay No. 3	Hydroelectric/Hydropower				Yes				
Jay - Jay No. 4	Hydroelectric/Hydropower				Yes				
Jay - Jay No. 5	Hydroelectric/Hydropower				Yes				
Jay - Jay No. 6	Hydroelectric/Hydropower				Yes				
UNDER5MW - MEDWAY	Hydroelectric/Hydropower				Yes				Yes
UNDER5MW - STILLWATER	Hydroelectric/Hydropower				Yes				Yes
UNDER5MW - STILLWATER B HYDRO	Hydroelectric/Hydropower			Yes					

BOIS_CAS - RUMFORD FALLS	Hydroelectric/Hydropower			Yes					
TOPSHAM - MILLER HYDRO	Hydroelectric/Hydropower			Yes					
Livermore Falls - Livermore No. 1	Hydroelectric/Hydropower			Yes					
Livermore Falls - Livermore No. 2	Hydroelectric/Hydropower			Yes					
Livermore Falls - Livermore No. 3	Hydroelectric/Hydropower			Yes					
Livermore Falls - Livermore No. 4	Hydroelectric/Hydropower			Yes					
Livermore Falls - Livermore No. 5	Hydroelectric/Hydropower			Yes					
Livermore Falls - Livermore No. 6	Hydroelectric/Hydropower			Yes					
Livermore Falls - Livermore No. 7	Hydroelectric/Hydropower			Yes					
Livermore Falls - Livermore No. 8	Hydroelectric/Hydropower			Yes					
Livermore Falls - Livermore No. 9	Hydroelectric/Hydropower			Yes					
GRAHAM - MILFORD HYDRO	Hydroelectric/Hydropower			Yes	Yes			Yes	
UNDER5MW - BARKER LOWER HYDRO	Hydroelectric/Hydropower		Yes						
UNDER5MW - BARKER UPPER HYDRO	Hydroelectric/Hydropower		Yes						
UNDER5MW - GARDINER HYDRO	Hydroelectric/Hydropower		Yes						
UNDER5MW - GREAT WORKS COMPOSITE	Hydroelectric/Hydropower		Yes						
UNDER5MW - GREENVILLE HYDRO	Hydroelectric/Hydropower		Yes						
UNDER5MW - MECHANIC FALLS HYDRO	Hydroelectric/Hydropower		Yes						
UNDER5MW - NORWAY HYDRO	Hydroelectric/Hydropower		Yes						
UNDER5MW - YORK HYDRO	Hydroelectric/Hydropower		Yes						
UNDER5MW - WAVERLY AVENUE HYDRO	Hydroelectric/Hydropower		Yes						
UNDER5MW - LEDGEMERE	Hydroelectric/Hydropower		Yes						
UNDER5MW - LEWISTON U5	Hydroelectric/Hydropower		Yes						
UNDER5MW - SYSKO GARDNER BROOK U5	Hydroelectric/Hydropower		Yes						
UNDER5MW - ROCKY GORGE CORPORATION	Hydroelectric/Hydropower		Yes						
UNDER5MW - SPARHAWK	Hydroelectric/Hydropower		Yes						
UNDER5MW - SYSKO STONY BROOK	Hydroelectric/Hydropower		Yes						
UNDER5MW - SYSKO WIGHT BROOK	Hydroelectric/Hydropower		Yes						
UNDER5MW - BROWNS MILL HYDRO	Hydroelectric/Hydropower		Yes						Yes
UNDER5MW - PITTSFIELD HYDRO	Hydroelectric/Hydropower		Yes						Yes
LOUDEN - NORTH GORHAM	Hydroelectric/Hydropower		Yes				Yes		
UNDER5MW - SALMON FALLS HYDRO	Hydroelectric/Hydropower		Yes				Yes		Yes
UNDER5MW - KEZAR LOWER FALLS	Hydroelectric/Hydropower		Yes		Yes				
UNDER5MW - KEZAR UPPER FALLS	Hydroelectric/Hydropower		Yes		Yes				
UNDER5MW - KENNEBEC WATER U5	Hydroelectric/Hydropower		Yes		Yes				
UNDER5MW - MESSALONSKEE COMPOSITE	Hydroelectric/Hydropower		Yes		Yes				
UNDER5MW - BENTON FALLS HYDRO	Hydroelectric/Hydropower		Yes		Yes		Yes		Yes
Sebec Hydro - Sebec Electric	Hydroelectric/Hydropower	Yes							
UNDER5MW - EUSTIS HYDRO	Hydroelectric/Hydropower	Yes							
UNDER5MW - MARSH POWER	Hydroelectric/Hydropower	Yes							
UNDER5MW - UNION GAS STATION	Hydroelectric/Hydropower	Yes			Yes				

UNDER5MW - ORONO	Hydroelectric/Hydropower	Yes		Yes				Yes
UNDER5MW - PINE TREE LFGTE	Landfill gas	Yes		Yes		Yes		
UNDER5MW - CROSSROADS LANDFILL	Landfill gas	Yes		Yes		Yes		Yes
LOUDEN - MERC	Municipal solid waste		Yes					
UNDER5MW - COBSCOOK BAY TEP TGU 1	Ocean Tidal			Yes				
REC-MaryThron	Solar Photovoltaic			Yes				
Ashland - Ashland PV	Solar Photovoltaic			Yes				
Americas' Wood Company - Amwood Solar	Solar Photovoltaic			Yes				
Damariscotta Hardware - Damariscotta Hardware	Solar Photovoltaic			Yes				
Days Inn - So. Portland - Days Inn - So. Portland	Solar Photovoltaic			Yes				
Loring Solar II - Loring Solar II	Solar Photovoltaic			Yes				
Loring Solar One, LLC - Loring Developement	Solar Photovoltaic			Yes				
Boothbay Solar, LLC - Boothbay Solar, LLC	Solar Photovoltaic			Yes				
BRYMCA Solar, LLC - BRYMCA Solar, LLC	Solar Photovoltaic			Yes				
COA Solar, LLC - COA Solar, LLC	Solar Photovoltaic			Yes				
Eliot Solar, LLC - Eliot Solar, LLC	Solar Photovoltaic			Yes				
Oakhurst Dairy - Oakhurst Dairy	Solar Photovoltaic			Yes				
RTT Solar, LLC - RTT One	Solar Photovoltaic			Yes				
Scarborough Solar, LLC - Scarborough Solar, LLC	Solar Photovoltaic			Yes				
SOPO Solar, LLC - SOPO One	Solar Photovoltaic			Yes				
Thomas Solar LLC - Thomas One	Solar Photovoltaic			Yes				
Unity Solar, LLC - Unity One	Solar Photovoltaic			Yes				
Windham Solar, LLC - Windham Solar, LLC	Solar Photovoltaic			Yes				
Yarmouth Solar, LLC - Yarmouth Solar, LLC	Solar Photovoltaic			Yes				
York Beach Fire Station - York Beach Fire Station	Solar Photovoltaic			Yes				
BEE Co - CT9 - Baily Island PV	Solar Photovoltaic	Yes						
BEE Co: CT ME NH RI - PV	Solar Photovoltaic	Yes						
SPRNG_ST - Eco Maine	Trash-to-energy		Yes					
CHEMICAL - PERC-ORRINGTON 1	Trash-to-energy		Yes					
BULL_HL - BULL HILL WIND	Wind			Yes				
UNDER5MW - FOX ISLAND WIND	Wind			Yes				
UNDER5MW - FOX ISLAND WIND2	Wind			Yes				
UNDER5MW - BEAVER RIDGE WIND	Wind			Yes				Yes
WOODSTCK - SPRUCE MOUNTAIN WIND	Wind	Yes		Yes				
KIBBY - KIBBY WIND POWER	Wind	Yes		Yes				
ROLLINS - ROLLINS WIND PLANT	Wind	Yes		Yes				Yes
STETSON - STETSON WIND FARM	Wind	Yes		Yes		Yes		Yes
ROXBURY - RECORD HILL WIND	Wind	Yes		Yes		Yes		Yes
STETSON - STETSON II WIND FARM	Wind	Yes		Yes		Yes		Yes
BUCKSPRT - VERSO BUCKSPORT G5	Wood					Yes		
UNDER5MW - J & L ELECTRIC - BIOMASS I	Wood	Yes						

Bigelow - Boralex Stratton	Wood	Yes								
BIGELOW - REENERGY STRATTON	Wood	Yes								
LVER-AEI - REENERGY LIVERMORE FALLS	Wood	Yes								

Appendix 2

Recent Maine Renewable Projects – Status and PPA 11/2014			
Facility Name	Nameplate Capacity	Status	PPA
Mars Hill	42MW	In Operation	NB Power through 2015
Stetson I and II	83MW	In Operation	Stetson I – merchant Stetson II – 50% merchant; 50% PPA to Harvard Univ.
Kibby	132MW	In Operation	Transcanada short term PPA; 10 year 30MW with NSTAR
Oakfield	147MW	Under construction	PPA with four MA utilities
Vinalhaven	4.5MW	In Operation	REC multiplier (state of ME)
Beaver Ridge	4.5MW	In Operation	PPA with NH utility
Rollins	60MW	In Operation	PPA with ME utilities (20% Emera; 80% CMP)
Record Hill	50MW	In Operation	Merchant
Spruce Mountain	20MW	In Operation	PPA with MA municipalities & one RI municipality
Bull Hill	34MW	In Operation	PPA with NStar (MA)
Passadumkeag	42MW	Permit denied; denial overturned by BEP; appealed to Law Court ; law court upholds BEP	Had a PPA in MA, but withdrew
Hancock Wind (Bull Hill 2)	54MW	Permit approved; appealed; BEP dismissed appeals; developer seeks amended permit	PPA with VT for 25%; PPA with MA Municipal Wholesale Electric Co. for 75%
Saddleback Wind	34MW	Under construction	PPA with MA utilities and one VT municipality
Number Nine	250MW		PPA with CT utilities (2)
Bingham Wind	186MW	Permit approved; under appeal	PPA with four MA utilities
Bowers		Permit denied; under appeal	PPA with RI utility (Nat'l Grid)
Apex Downeast	90MW		PPA with ME utilities
Jonesport Wind	9.6MW		PPA with ME utilities (Community Pilot)
Pigsah	9MW		PPA with ME utilities (Community Pilot)
Shamrock Partners	10MW		PPA for 4MW (Community Pilot)
ORPC	5MW	In Operation	PPA with ME utilities (Ocean Energy Act)
Sisk Mountain	44MW	Approved	
Canton Mountain	22MW	Permit approved; appealed; BEP upheld permit approval	