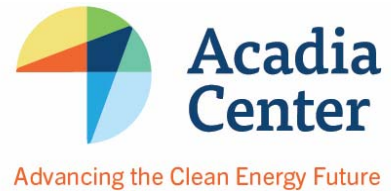


# Initial Comments on Scope of Millstone Study in Response to Executive Order No. 59



## DEEP/PURA Joint Docket 17-07-32

August 15, 2017

### Introduction and Background

Acadia Center thanks the Connecticut Department of Energy and Environmental Protection (“DEEP”) and the Public Utilities Regulatory Authority (“PURA”) for the opportunity to submit written initial comments in the above-referenced joint proceeding in response to the Notice of Request for Written Comments issued jointly by DEEP and PURA on August 9, 2017.

Acadia Center is a non-profit, research and advocacy organization committed to advancing the clean energy future. Acadia Center is at the forefront of efforts to build clean, low carbon and consumer friendly economies. Acadia Center’s approach is characterized by reliable information, comprehensive advocacy and problem solving through innovation and collaboration.

The results of the study outlined by DEEP and PURA could influence Connecticut’s long-term energy strategy, as well as its ability to meet mandatory carbon emissions reductions targets under the Global Warming Solutions Act (“GWSA”). As discussed in more detail below, the scope of the study should develop a robust and transparent modeling approach that includes a base case representative of current trends and procurements, as well as sensitivities to different penetration levels of various demand-side technologies, clean energy resources, and commitments under the Regional Greenhouse Gas Initiative (“RGGI”). The timeframe must adequately cover nuclear unit operating licenses and should consider the state’s mandatory climate goals. All base case assumptions should be based on planned and authorized additions or closures and observed trends, and not on speculative or expected changes. Specifically, the merchant replacement scenario should not be artificially constrained to new gas-fired combined cycle plants and/or gas turbines, as discussed further below. Finally, throughout the study, it is essential to recognize that Millstone participates in the broader New England wholesale power grid managed by ISO-New England (“ISO-NE”). Connecticut residents should not bear the burden of the plant’s costs alone when the power is priced, sold, and consumed through regional processes.

Acadia Center appreciates the opportunity to provide these comments to DEEP and PURA and looks forward to continued collaboration with all parties.

### General Comments

Connecticut’s future is in clean, renewable energy. Building a lower cost, consumer friendly energy system to confront climate change will require replacing coal, oil, and natural gas with zero-emission alternatives. Existing nuclear plants like Millstone Power Station may play a role in that transition, but Connecticut needs a realistic, long-term plan to replace the plant — which will retire eventually — with clean energy. This strategic plan for post-nuclear operation must consider the full range of renewable generation, energy efficiency, demand response, and energy storage technologies. Wind, solar, and other clean energy resources are increasingly competitive with traditional power generation sources. The value of energy efficiency and demand reduction

measures must be addressed and a high level of transparency provided into value inputs. Resource valuation must encompass all possible quantifiable benefits to the state to ensure an accurate and fair comparison of the relative merits of different resources, but especially for demand-side resources, which offer unique benefits that usually make them the superior economic choice to any new supply-side energy resources.

Connecticut is not the first state to address this situation of potential nuclear retirement, and there are lessons to be learned from how other states have addressed these scenarios. California will replace the state's last nuclear reactors with energy efficiency, renewables, and energy storage. In Illinois, nuclear support mechanisms are paired with significant commitments to energy efficiency, wind and solar. New York agreed to support upstate nuclear power plants, but only as part of a broader plan to source 50 percent of electricity supply from renewables by 2030. DEEP and PURA should consider the actions these states have taken when developing a strategy for Connecticut to handle Millstone's eventual retirement.

Due to the detailed and sensitive nature of the proposed study, we request that DEEP and PURA issue a draft methodology and baseline or base case scenario this fall for stakeholder input as an interim step before release of the draft report tentatively scheduled for December. Additionally, the scoping materials and draft report should include a list of resources referenced and complete citations throughout the text to provide transparency to the reviewer.

## Modeling Approach

**Scoping Item 1:** Renewable and/or hydropower penetration in the base case should be based on current requirements under the state's renewable portfolio standard and recent procurements to meet the renewable portfolio standard ("RPS").

**Scoping Item 2:** Yes, other sensitivities should include:

- a. Meeting Connecticut's mandatory greenhouse gas emissions targets. Annual emissions should be evaluated across all scenarios, and it should not be assumed in the base case scenario that the state is on track to meet either the 2020 or the 2050 GWSA targets, as shown by Acadia Center analysis<sup>1</sup> and the modeling by the Governor's Council on Climate Change ("GC3").<sup>2</sup> Compliance with these emissions targets will be difficult to reach based on the state's current levels and trajectory. Adding new natural gas supply infrastructure will increase Connecticut's carbon emissions, making compliance with GWSA targets even more challenging.

Sensitivities for emissions could also include meeting the interim 2030 targets being considered by the GC3, including a 35%, 45%, and 55% reduction from 1990 levels. After 2030, these scenarios should follow the trajectories established by the GC3 to meet the 2050 emissions targets.

- b. Different penetration levels of various demand-side technologies, such as energy efficiency, storage, demand response, and advanced load management. The modeled savings from these programs should be subtracted from ISO-NE's Capacity, Energy Loads, and Transmission ("CELT") forecast, per scoping item 4. Significant electrification of building heating and transportation, as will be required

<sup>1</sup> See Acadia Center, *Updated Greenhouse Gas Emissions Inventory for Connecticut GHG Inventory*, available here: <http://acadiacenter.org/wp-content/uploads/2016/06/CT-GHG-Emissions-Inventory-Report-2.pdf>.

<sup>2</sup> See *Connecticut Governor's Council on Climate Change Exploratory Report*, available here: [http://www.ct.gov/deep/lib/deep/climatechange/gc3/gc3\\_exploratory\\_report\\_2016.pdf](http://www.ct.gov/deep/lib/deep/climatechange/gc3/gc3_exploratory_report_2016.pdf).

to meet GWSA targets, will also impact electric demand. The increased load from these technologies should also be added to the CELT forecast. Since some technologies are not required and/or are in the planning stages (i.e., energy storage and offshore wind), they should be included in the sensitivities analysis.

- c. RGGI carbon emissions cap extension scenarios beyond 2030. Since the study will extend beyond 2030, which will be the end of the new RGGI cap extension, DEEP and PURA will need to evaluate different RGGI cap scenarios for years beyond the 2020-2030 program extension. These different RGGI cap scenarios will have impacts on the prices of different generation options, and it will be important to understand how these sensitivities impact the economic viability of different generation options.

**Scoping Item 3:** No, the 2018-2035 timeframe is not appropriate, and should be extended to cover the end of the operating licenses for both Millstone units, which occurs in 2045 (unit 2 closes in 2035, unit 3 closes in 2045). The modeling should also cover the end of Connecticut’s requirements under the GWSA, or 2050, to ensure that the state meets its mandatory climate goals.

## Modeling Assumptions of the Base Case

### Electric Demand Assumptions

**Scoping Item 4:** In the base case, energy efficiency and demand response should be included at the rate at which they are currently planned. The CELT forecast is an appropriate starting point for modeling demand in the base case, but it should be adjusted to include all planned and approved electric efficiency. The CELT forecast has been improved to incorporate more energy efficiency in recent years, but it still does not capture all savings.<sup>3</sup> The load forecast beyond the 10-year period of the CELT forecast should be projected based on rates provided in the CELT report.

### Resource Additions/Retirements (NE & NY)

**Scoping Item 5:** DEEP and PURA should consider EIA’s 860 survey data in deciding which plants are currently in operation, retired, or planned in the base case. Only plants that have officially announced their closure should be retired in the base case. The closure of “at risk” plants could be evaluated in a sensitivity scenario, and different thresholds could be considered for which units are retained or retired.

**Scoping Item 6:** The base case should only include new generation that has been approved or procured. Justification should be included in the study methodology for all new plants included in the base case.

**Scoping Item 7:** See scoping item 6.

**Scoping Item 8:** No, public policy procurements should not be assumed to be fully realized in the baseline, since the states only have the authority, not the obligation, to complete these procurements. Only procurements that are complete should be considered in the base case. DEEP and PURA should provide justification in the study methodology for new capacity included from any procurements in the base case.

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<sup>3</sup> See Acadia Center, *The Hidden Costs of Energy: Overpaying for an Outdated System*, available here: [http://acadiacenter.org/wp-content/uploads/2016/06/AC\\_transmissionmemo\\_spreads\\_finalforweb.pdf](http://acadiacenter.org/wp-content/uploads/2016/06/AC_transmissionmemo_spreads_finalforweb.pdf).

**Scoping Item 9:** The base case scenario should not include the 30% Class 1 renewables by 2030 recommendation from the draft CES because of the dependence of this change on legislative action. The current RPS calls for 20% Class 1<sup>4</sup> renewables by 2020.<sup>5</sup> This should be the foundation of the base case scenario, which should not assume renewables grow beyond this level.

The 30% by 2030 recommendation from the draft CES should be one of the sensitivity scenarios modeled. If the goal of the scenario is to test this RPS level, after 2030, renewables growth would be assumed to be flat, like the base case scenario.

Additional scenarios that evaluate meeting state emissions targets could consider renewables growth beyond the base case or the RPS adjustment proposed by the CES, and these changes will likely be necessary to meet the emissions requirements.

**Scoping Item 10:** It is reasonable to assume that nuclear plants in the region will operate through their existing licenses or until their announced closure date in the base case scenario. Any closures of these plants before the end of their licenses or before their announced retirements would only be appropriate for sensitivity analysis.

## Fuel Price Assumptions

**Scoping Item 11:** For short-term fuel commodity prices, NYMEX or EIA's Short Term Energy Outlook can be used where applicable. For later years, EIA's Annual Energy Outlook data can be used. Any data sources used in the modeling should be clearly cited and publicly accessible.

**Scoping Item 12:** Only LNG import or export capacity currently approved in the region should be assumed in the base case. Imports should only be considered in the base case to the extent they are cost effective and within the limits of current capacity.

**Scoping Item 13:** Only pipelines that have received approval and are in final planning stages or are under construction should be considered in the base case. It would not be appropriate to include additional capacity in the baseline.

## Replacement Scenarios

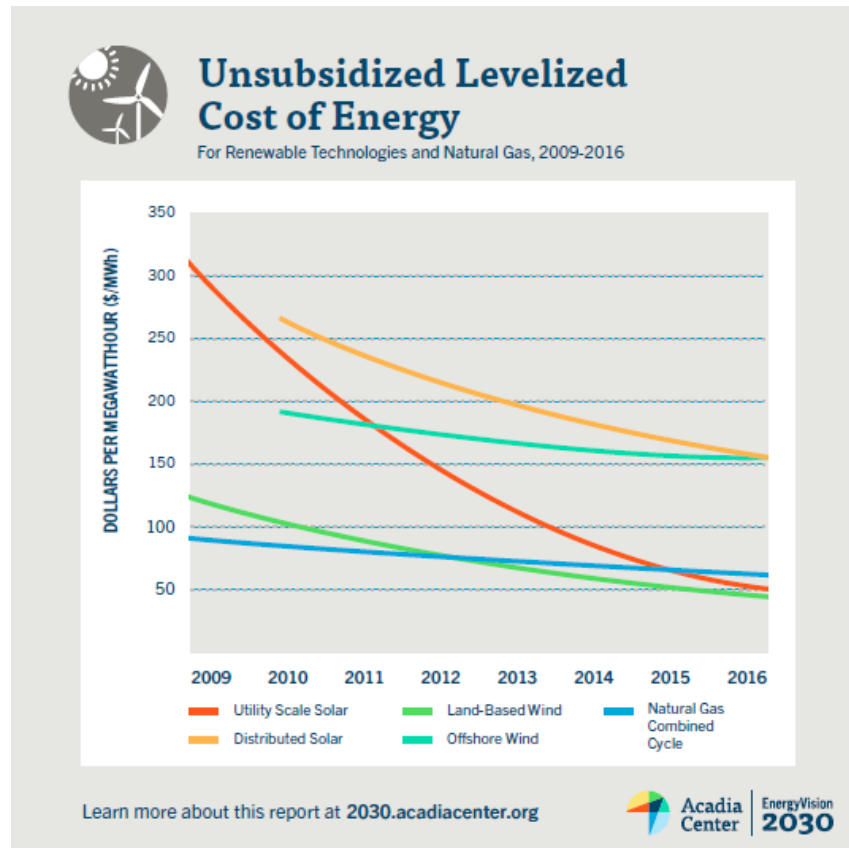
**Scoping Item 14:** We agree that one replacement scenario should assume Millstone retires after the current forward capacity market commitment ends in May 2021. Merchant entry replacement scenarios should not be limited to new gas-fired combined cycle plants and/or gas turbines. Energy efficiency and demand management must be acknowledged as the cheapest resource and included in the analysis to replace lost capacity. The levelized cost of energy ("LCOE") for grid-scale solar PV and land-based wind is lower than the LCOE for natural gas with current natural gas market conditions, before considering tax credits (see Chart below),<sup>6</sup> and should be included in the merchant replacement scenario. Sensitivity analyses that examine implementation of a RGGI cap

<sup>4</sup> See Connecticut General Statutes § 16-1.

<sup>5</sup> See Connecticut General Statutes §§ 16-245a.

<sup>6</sup> All data from Lazard's Levelized Cost of Energy Analysis Reports, Versions 4.0-10.0 (Version 10.0 available here: <https://www.lazard.com/perspective/levelized-cost-of-energy-analysis-100/>). These unsubsidized levelized cost of energy values do not include Federal tax incentives, which would further reduce levelized costs for renewable technologies.

beyond 2030 should evaluate the impact of the cap on the LCOE of different technologies to better understand merchant entry replacement in these scenarios.



The public policy scenarios must include a mix of resources, including demand response, energy storage, and energy efficiency, in addition to emissions-free renewable energy. With its immense technical potential, and continually improving economics, offshore wind must also be included in the analysis and given fair comparative treatment to other resources – in contrast to the brief statements made in the draft Comprehensive Energy Strategy.<sup>7</sup>

**Scoping Item 15:** Behind the meter solar is not explicitly listed as a resource for Public Policy Replacement, but has the potential to reduce demand. EnergyVision 2030<sup>8</sup> shows that 11 GW of distributed solar generation will be needed across the New England states to meet greenhouse gas emissions requirements. Connecticut will host some of this new distributed capacity, and it should be considered in the Public Policy Replacement scenarios.

## Options/Mechanisms

**Scoping Item 16:** Connecticut should not enter into an agreement as an individual state with Millstone as identified in the scope under 3(a)ii. Millstone participates in the broader New England wholesale power grid managed by ISO-NE and should work with the regional authority as appropriate. Connecticut residents should

<sup>7</sup> See *Connecticut Department of Energy and Environmental Protection, Comprehensive Energy Strategy*, July 26, 2017, “Grid-Scale Renewable Siting”, p. 15.

<sup>8</sup> See: [2030.acadiacenter.org](http://2030.acadiacenter.org).

not bear the burden of the plant's costs alone when the power is priced, sold, and consumed through regional processes.

**Scoping Item 17:** For the remaining scoping options, more detail on what would be analyzed, including cost and benefits, and under what circumstances they would be considered is necessary.

**For more information:**

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