

Dominion Energy Services, Inc.
Law Department
120 Tredegar Street, Richmond, VA 23219
DominionEnergy.com



Via Electronic Filing

January 8, 2018

Rob Klee
Commissioner
Department of Energy and Environmental Protection (DEEP)
79 Elm Street
Hartford, CT 06106-5127

Katie Dykes
Chair
Public Utilities Regulatory Authority (PURA)
10 Franklin Sq.
New Britain, CT 06051

Re: **DEEP Proceeding: Governor's Executive Order Number 59: DEEP and PURA Joint Proceeding**

PURA Docket No. 17-07-32: DEEP and PURA Joint Proceeding to Implement the Governor's Executive Order Number 59

Dear Commissioner Klee and Chairwoman Dykes:

Enclosed please find Dominion Energy Nuclear Connecticut, Inc.'s ("Dominion Energy") comments, and the accompanying affidavit of Susan F. Tierney, Ph.D. of the Analysis Group Inc., in response to the Department of Energy and Environmental Protection ("DEEP") and the Public Utilities Regulatory Authority's ("PURA") Notice of Request for Written Comments issued on December 14, 2017 in the above referenced joint proceeding.

Please do not hesitate to contact me if you have any questions or require additional information. Thank you.

Sincerely,

A handwritten signature in blue ink that reads "Lillian M. Cuoco".

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**STATE OF CONNECTICUT
DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION
PUBLIC UTILITIES REGULATORY AUTHORITY**

DEEP AND PURA JOINT PROCEEDING) DOCKET NO. 17-07-32
TO IMPLEMENT THE GOVERNOR’S)
EXECUTIVE ORDER NUMBER 59) January 8, 2018

**COMMENTS OF DOMINION ENERGY NUCLEAR CONNECTICUT, INC.
ON DEEP AND PURA DRAFT REPORT**

Dominion Energy Nuclear Connecticut, Inc. (“Dominion Energy” or the “Company”) hereby submits the following comments, and accompanying affidavit of Susan F. Tierney, Ph.D. of the Analysis Group Inc. (“Tierney Affidavit”),¹ in response to the Department of Energy and Environmental Protection (“DEEP”) and the Public Utilities Regulatory Authority’s (“PURA”) Notice of Request for Written Comments issued on December 14, 2017 in the above referenced docket.

I. Introduction

Dominion Energy commends DEEP and PURA (collectively, the “Agencies”) on the issuance of their Draft Report on December 14, 2017.² Since the initiation of this joint proceeding, the Agencies and their consultant, Levitan and Associates, Inc. (“Levitan”), have made considerable progress toward a comprehensive evaluation of the role of nuclear generating facilities in Connecticut and the New England region, and their important contribution to stabilizing electric rates, reducing greenhouse gas emissions, maintaining reliability, and adding to the regional and local economy. The clear message from the Draft Report is that Millstone Power Station is a foundational piece to Connecticut’s energy, environmental and economic

¹ Affidavit provided as Attachment A.

² *Resource Assessment of Millstone Pursuant to Executive Order No. 59 and Public Act 17-3*, Connecticut Department of Energy and Environmental Protection and Connecticut Public Utilities Regulatory Authority, Docket No. 17-07-32 (December 14, 2017)(“Draft Report”).

goals, now and in the future. We are appreciative of the significant time and leadership attention that the Agencies have given to this effort.

We do have important context to offer on the economic analysis and conclusions of the Draft Report, which builds on our past in-person meetings, correspondence and the information we shared on a protected basis. Simply put, while reasonable analyses can disagree on forward looking projections of market revenues for any generator in the region, there are important revisions that should be made to assumptions about Millstone's actual operating costs, notwithstanding the Company's strong and prudent management of the station and its expenses.

We are mindful that the significant time needed to clarify legal requirements and ensure confidential treatment of this information did not optimally align with your consultant's deadlines. Accordingly, we appreciate the significant time and leadership attention that the Agencies have devoted to reviewing the detailed cost information that we provided, including multiple meetings and an in-person review of ten years of data, five years of actual costs, five years of projections, and detailed supporting documentation. In this cooperative spirit, as we have previously stated, we stand ready to continue to provide you with confidential information in order for the Agencies to make an informed and accurate decision.

II. Millstone Economic Analysis in the Levitan Study Significantly Understates Operating Costs and Capital Requirements

The Levitan Report concludes that Millstone will be economically viable during the study period from 2022 to 2035, but the findings are based on assumptions that dramatically understate the station's real costs. Dominion Energy shared actual cost data for the last five years, and projected cost data for the next five years, with leadership of the Agencies on a confidential basis and will explain herein the nature of the incorrect assumptions in the Levitan Report.

First, use of Virginia-based, regulated, stations with identical units as a proxy for Millstone's cost is simply mixing apples and oranges. As the Company explained to the Agencies in its letter on December 7, 2017, the assumption in the Levitan Report that Millstone's two units are similar to Dominion Energy Inc.'s nuclear stations in Virginia is not accurate. In fact, Millstone Unit 2 and Unit 3 are entirely different designs requiring separate control rooms, separate spare parts inventory, distinct operator training and separate teams of licensed operators. The differences in the units also require more service contracts at the station compared to nuclear stations in Virginia because they cannot be shared.

Operating two different unit designs is an important component, but not the only component, contributing to much higher costs at Millstone. In addition, Millstone's larger physical footprint requires a larger security staff and has higher site maintenance costs including utility costs, building maintenance and snow removal.

Moreover, Millstone has higher labor costs, reflecting the difference in prevailing wages between a relatively high cost northeastern state and Dominion Energy Inc.'s regulated nuclear generating stations in Virginia, both of which are located in lower cost, rural areas of the Commonwealth. Salaries are significantly higher for Millstone employees vis a vis the Virginia nuclear generating stations and hourly rates for contractors are also dramatically higher.

These three factors related to costs explain a significant part of the understatement of Millstone's operating costs in the Levitan Report, but there is one other important factor to address which we have come to better understand in our cross walk of the study's assumptions with operating reality: corporate support for the station is understated in the Levitan Report.

As with all Dominion Energy Inc.'s facilities, the Company budgets and accounts for back office support of all types at the holding company level: human resources, information

technology, fiscal and accounting, environmental, and legal costs, etc. These costs are reflected at the holding company level through a subsidiary, Dominion Energy Services, Inc. While this has been a common practice in corporate America for many years, it is a relatively new concept among energy companies, and Dominion Energy's parent company was an early adopter of it within the industry. It is not surprising therefore that the Levitan Report missed a critical component of operating costs. While Dominion Energy carefully manages these costs, and is extremely competitive relative to our peers, they are a notable component, and necessary for a heavily regulated nuclear generating facility where safety, security, environmental stewardship, being a best in-class employer, and operational excellence are paramount.

In summary, with regard to operating costs, Dominion Energy, Inc. takes pride in the efficient and effective manner with which we manage all our assets. However, the Levitan Report significantly understates Millstone's operating costs, most notably in terms of labor and corporate support, as well as in other areas shared with the Agencies on a confidential basis.

Similarly, the Levitan Report understates the upcoming capital requirements of Millstone as critical station components reach their end of life cycle and need to be replaced to maintain the Company's core commitments of safety and operational efficiency. It is important in this regard not to confuse operating cash flow, much of which must be reinvested in the capital needs of the station, with profitability.

Evaluating the profitability of assets in a diverse company like Dominion Energy, Inc., which operates in multiple states throughout the nation, is a complex undertaking. Dominion Energy, Inc.'s leadership and management have a fiduciary responsibility to deploy its capital in the most advantageous settings in consideration of the risks, business climate, and growth opportunities available. As a merchant asset, the risks for Millstone Power Station are

inherently higher than they are for regulated assets. As the Draft Report correctly notes, while we greatly value our role in Connecticut's energy and environmental landscape, economy, and civic life, the continued operation of Millstone is ultimately a management decision.³

The Levitan Report's underestimation of Millstone's actual operating costs and capital requirements significantly impacts the analysis of Millstone's projected economic viability. If the Levitan Report were to adjust its assumptions based on the reality described above, the financial condition of Millstone is much more tenuous than projected. Coupled with the risk profile and the required rate of return for a merchant nuclear plant owner, the Millstone Power Station is not the profitable enterprise portrayed in the Levitan Report. We respectfully submit that the Agencies should adjust their reliance on the Levitan Report accordingly when evaluating a recommendation to move to the competitive solicitation phase under June Special Session Public Act 17-3, *An Act Concerning Zero Carbon Solicitation and Procurement* (the "Act"). The Company stands ready to continue to provide the Agencies any additional information they may require, on a confidential basis, to support these important points.

III. The Company Seeks a "Win-Win" for Millstone and Consumers

The extremely cold temperatures and correspondingly high power prices that greeted the new year are a stark reminder of the value of price certainty in energy supply, whether electric generation, natural gas, or fuel oil, which the state and the region found themselves dependent upon during the past several days. From the beginning of our work leading to this point, we focused on developing a public policy solution in collaboration with the state that provides needed certainty for the long-term operations of Millstone while also providing value for Connecticut's ratepayers.

³ Draft Report at p. 8.

Dominion Energy strongly believes that a competitive solicitation for a long-term contract from nuclear generating facilities is the best policy option for Connecticut. The Draft report suggests other potential policy options, but these options will take considerable time to implement and are not specifically authorized by the Act. The Agencies have valuable and extensive experience conducting RFPs for various energy resources and the existing process can be easily adapted for nuclear generating facilities and other eligible resources.⁴

In fact, the Draft Report establishes a compelling case for the Agencies to recommend moving forward with a competitive solicitation for nuclear power generating facilities under the Act, even before the vivid demonstration provided by the recent cold weather. The environmental, economic, zero carbon, and jobs benefits to Connecticut far outweigh the potential costs of ensuring the continued operation of Millstone. Further, as Dr. Sue Tierney explains, the decision to move to the competitive solicitation phase under the Act presents little, if any, downside to the state.⁵

The Agencies can conduct a RFP soliciting offers from nuclear power generating facilities and other eligible resources and determine whether they are bona-fide competitive offers. If an offer is not competitive or attractive to the state, then the Agencies can reject it. By contrast, failing to move to the competitive solicitation phase carries a great deal of risk. If the analysis of Millstone's economic viability is wrong and Dominion Energy decides to retire the units, "it is likely that there will be negative consequences for Connecticut consumers' electricity bills, for GHG emissions, for macroeconomic impacts in the state, and so forth."⁶ Moving to the solicitation phase gives the Agencies optionality and the ability to assess the market for zero-emission energy. While the Agencies' desire to comprehensively evaluate all potential policy

⁴ Draft Report at p. 29.

⁵ Tierney Affidavit at p. 9.

⁶ Tierney Affidavit at p. 10.

options is understandable, the clear preference of the legislature is to favor the competitive procurement of a long-term contract under the existing statutory framework. This should be the Agencies' primary focus, and as discussed above, the evidence strongly supports a recommendation to move to the solicitation phase.

There are many reasons why a competitive solicitation is the preferred approach for Connecticut. First, Connecticut already has the laws and regulations in place to conduct a RFP for zero carbon resources, and the Agencies have gained valuable experience conducting RFPs and selecting long-term contracts for various energy resources over the past few years. According to the Draft Report, the prior experience with Power Purchase Agreement ("PPA") authority "has demonstrated that these types of PPAs fit within the state, federal, and ISO New England regulatory framework and market rules."⁷ Connecticut's procurement process has withstood several legal challenges and is clearly within the state's rights, with the United States Court of Appeals for the Second Circuit recently affirming that a claim of federal preemption against the process could not withstand a motion to dismiss.⁸ A competitive solicitation allows the Agencies to take action relatively quickly and establish some stability for the future of nuclear generation in the state.

As Dr. Tierney explains, ISO-NE market participants frequently use bilateral contracts and it would be consistent with the structure of the market for the Connecticut EDCs to enter into contracts with resources whose environmental and reliability attributes are considered of value to the state.⁹ Bilateral contracts also provide a great deal of flexibility as the various terms included in the agreement can be negotiated to meet the needs of both parties. Finally, bilateral contracts provide price certainty, not just to the generator, but also to electric customers as they act to

⁷ Draft Report at p. 29.

⁸ *Allco v. Klee*, 861 F.3d 82 at 97 (2nd Cir. 2017).

⁹ Tierney Affidavit at pp. 9-10.

protect consumers against potential price spikes in natural gas and energy prices. The dramatic increase in energy prices this winter makes clear the benefits of protecting a portion of consumer's electricity costs by contracting for electricity not produced by natural gas.

The Draft Report also presents the Zero-Emission Credits ("ZECs") approach as a potential policy option for Connecticut. The Draft Report notes that New York has already implemented a ZEC program and the design of a ZEC program could lend itself to a "multi-state trading system" that would be "more efficient and effective than Connecticut acting alone."¹⁰ The ZEC approach does have some appeal because it provides a mechanism to value certain attributes of zero carbon resources that are currently not adequately valued in the ISO-NE energy markets. However, properly designing and implementing a ZEC program for Connecticut will take a significant amount of time, and the multi-state version envisioned by the Agencies would take considerably more, if it were to prove feasible at all, recognizing the inherent complexity of working at the multi-state level of policy making.

While these time constraints are prohibitive in the near term, it is important to recognize that moving to the competitive solicitation phase allowed under the Act does not preclude the state from evaluating and designing a regional approach in addition to action Connecticut may take, as the parameters of the underlying legislation do not allow for all of the station's output to be contracted through Connecticut's clean energy solicitation process.

Finally, the Draft Report briefly mentions the U.S. Department of Energy's Notice of Proposed Rulemaking ("DOE NOPR") issued in September 2017.¹¹ The proposed rule would allow for "the recovery of costs of fuel-secure generation units frequently relied upon to make

¹⁰ Draft Report at p. 31.

¹¹ *Grid Reliability and Resilience Pricing*, 82 Fed. Reg. 46,940 (October 10, 2017).

our grid reliable and resilient.”¹² While the prospects for any action from FERC are unclear, it is likely that other parties will urge the Agencies not to recommend any path forward for Connecticut and instead wait for the federal government to address viability of nuclear resources. The Agencies should disregard these arguments. Connecticut cannot sit on the sidelines and wait to see *if* the FERC will take action (action it is worth noting that many of these same parties are opposing at the federal level). Connecticut has the means, through the Act, and substantial evidence in support of moving to the competitive solicitation phase. Any FERC action will take years to come to fruition as it must move to the final rule or show cause phase and then allow the RTOs to develop rules through their stakeholder processes. It should also be noted that the potential federal action lacks policy context that is important to Connecticut, most notably a focus on zero carbon resources.

IV. **Conclusion**

Dominion Energy greatly appreciates the Agencies’ work to evaluate the role of nuclear generating facilities in Connecticut and the New England region pursuant to the Governor’s Executive Order No. 59 and the Act. We are appreciative of the rigor of the work by the Agencies, the management time and attention that has been given to this effort, including several in-person meetings, and the detailed review of actual Millstone financial information. The Draft Report presents substantial evidence establishing the benefits of Millstone’s continued operation. Dominion Energy has provided detailed cost information to demonstrate the needed modifications that should be made to the draft reports conclusion’s regarding Millstone’s finances. We stand ready to provide additional information, as needed, on a confidential basis. We also are eager to work to develop a win-win for Millstone’s future and Connecticut’s consumers.

¹² DOE NOPR at 46,945.

**Attachment A:
Affidavit of Susan F. Tierney, Ph.D
Analysis Group Inc.**

STATE OF CONNECTICUT
DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION
PUBLIC UTILITIES REGULATORY AUTHORITY

DEEP AND PURA JOINT PROCEEDING)
TO IMPLEMENT THE GOVERNOR’S)
EXECUTIVE ORDER NUMBER 59) DOCKET NO. 17-07-32

Affidavit of Susan F. Tierney, Ph.D.
Regarding the DEEP and PURA Draft Report on Resource Assessment of Millstone Station

INTRODUCTION AND SUMMARY

- My name is Susan F. Tierney. I am a Senior Advisor at Analysis Group Inc., 1900 16th Street, Suite 1100, Denver, Colorado, 80202, where I provide policy, economic and strategy consulting in the electric industry. .

- I have worked for many decades in areas relevant to the matters being considered by the Department of Energy and Environmental Protection (“DEEP”) and the Public Utilities Regulatory Authority (“PURA”) in this proceeding. Among other things, my work has involved: regulation of public utilities and other entities in the electric industry; wholesale power markets and consumers’ rates; reliability of the electric industry; and the design of environmental policies related to power generation.¹³

¹³ I have been involved in issues related to public utilities, ratemaking and electric industry regulation, and energy and environmental economics and policy for approximately 35 years. During this period, I have worked on electric and gas industry issues as a utility regulator and energy/environmental policy maker, consultant, academic, and expert witness. I have been a consultant and advisor to private and publicly owned energy companies, grid operators, government agencies, large and small energy consumers, environmental organizations, foundations, Indian tribes, and other organizations. Before becoming a consultant, I held several senior governmental policy positions in state and federal government, having been appointed by elected executives from both political parties. I served as the Assistant Secretary for Policy at the U.S. Department of Energy (1993-1995). I held senior positions in the Massachusetts state government as Secretary of Environmental Affairs; Commissioner of the Department of Public Utilities; and Executive Director of the Energy Facilities Siting Council. I have testified at various state regulatory agencies and legislatures (including in Connecticut) and before Congress and state and federal courts. I have written extensively on issues in the electric industry. My Ph.D. in regional planning is from Cornell University. I previously taught at the University of California at Irvine, and at the Massachusetts Institute of Technology (MIT). I am a Visiting Fellow in Policy Practice at the University of Chicago’s Energy Policy Institute (EPIC); and a member of the advisory councils at New York University’s Policy Integrity Institute, Duke University’s Nicholas Institute for Environmental Policy Solutions, and Columbia University’s Center for Global Energy Policy. I currently sit on several non-profit boards and commissions, including as: chair of the Advisory Council of the National Renewable Energy Laboratory; chair of

- I have been asked by Dominion Energy Nuclear Connecticut, Inc. (“Dominion Energy”) to comment on various issues raised in the DEEP/PURA Draft Report on “Resource Assessment of Millstone Pursuant to Executive Order No. 59 and Public Act 17-3,” issued on December 14, 2017 (the “DEEP/PURA Draft Report”). In preparing this affidavit, I have also reviewed the December 7, 2017 report by Levitan & Associates, “Resource Assessment on the Economic Viability of the Millstone Nuclear Generating Facilities” (“Levitan Report”); the Governor’s Executive Order No. 59; Connecticut Public Act 17-3, *An Act Concerning Zero Carbon Solicitation and Procurement* (the “Act”); the draft 2017 Connecticut Comprehensive Energy Strategy (“Connecticut CES”); and other reports (including the December 2016 study (“Tierney Millstone Report”) I conducted on the value Millstone provides to Connecticut’s electricity consumers and toward achievement of the state’s goals for clean energy and reduction of carbon dioxide (CO₂) emissions¹⁴).
- As I explain further below, my four primary points are as follows:
 1. The DEEP/PURA Draft Report recognizes the important role that Millstone plays in the state’s electricity mix. The report identifies the adverse impacts (in terms of more costly power supply, higher retail electricity prices, higher CO₂ emissions, less fuel diversity, and less macroeconomic activity) that would occur in Connecticut and New England region if Millstone were to retire in the near term.¹⁵ As such, the DEEP/PURA Draft Report makes a compelling case that Connecticut officials, residents and businesses should care about whether Millstone remains in operation or not, and the report provides insights that are critical in informing the next steps that Connecticut officials will need to take with respect to Millstone. The DEEP/PURA Draft Report

ClimateWorks Foundation; and a director of World Resources Institute, the Energy Foundation, Resources for the Future, the Keystone Center, and the Alliance to Save Energy. I am a member of the NYISO’s Environmental Advisory Council; and just completed service as the chair of the Department of Energy’s Electricity Advisory Council and as a member of the National Academy of Sciences committee on resiliency of the U.S. electric system. I was co-lead convening author of the Energy Supply and Use chapter of the National Climate Assessment and served on the Secretary of Energy’s Advisory Board.

¹⁴Susan Tierney and Craig Aubuchon, “Millstone Power Station: Providing support for Connecticut’s clean energy goals,” December 2016, http://www.analysisgroup.com/uploadedfiles/content/insights/publishing/analysis_group_millstone_report_final_12-1-2016.pdf.

¹⁵ As I discuss further below, I reached similar conclusions in my Tierney Millstone Report.

provides strong support for DEEP to act upon its authorities under the Act and solicit market-based offers from eligible suppliers.

2. Although the Levitan Report concludes that Millstone's *economics* are net positive,¹⁶ DEEP and PURA officials should not conclude, based on that analysis, that Dominion Energy will similarly find that Millstone is sufficiently profitable from a *financial* point of view so that the company continues to spend its resources to keep the plant in operation through its full operating-license period. The owner of a merchant nuclear plant like Millstone focuses on financial considerations (e.g., the timing of anticipated cash flows, the estimated impacts on quarterly earnings, the risk-adjusted returns, the tolerance of the company's board and shareholders for investments with differing risk profiles, the alternative uses to which the company's capital and managerial resources can be put, the company's actual cost of capital) in determining whether an investment is profitable and worthwhile to pursue. The Levitan Report does not address such issues for the specific owner of a specific merchant nuclear plant. By contrast, the financial disclosures of the Dominion Energy parent company do so, and reflect the company's recent decision to report risks related to potential retirement of the Millstone Station.
3. Assuming that there is at least some (if not considerable) uncertainty about whether the Levitan Report is "right" about Millstone having positive economics and whether Dominion Energy would similarly conclude that Millstone's financial outlook is sufficiently positive, then DEEP and PURA officials still face the important question of how to proceed in the face of such uncertainty. On the one hand, there seems little downside of DEEP taking the step of soliciting offers from eligible resources under the Act's new authority. This market-based approach could reveal whether there are competitive offers from Dominion Energy and other eligible suppliers, and would be consistent with the policy and market context in New England in which counterparties consider and often do enter into bilateral agreements for electricity and

¹⁶ As I discuss further below, I make this comment without even commenting (or needing to) on whether the assumptions used in the Levitan Report are appropriate.

environmental attributes of value to those parties. If an actual offer from Dominion Energy ended up being unattractive, then DEEP and PURA officials need not accept it and the state would be no worse off compared to having never solicited an offer from eligible suppliers. Conversely, if DEEP were to decide not to conduct a competitive solicitation, then the state would run the risk that Millstone's owner disagrees with the findings in the Levitan Report and decides to close the plant, leading to the many adverse impacts identified in the DEEP/PURA Report. In the end, conducting the request for proposals ("RFP") provides optionality in light of uncertainty in the analysis of Millstone's economics and profitability.

4. Finally, from a policy point of view, I offer several other observations, along with my primary recommendation that the state proceed to solicit offers from eligible suppliers under the Act. Although I encourage the state (DEEP/PURA) to explore the possibility of developing a multi-state market for zero-emission credits ("ZECs") (e.g., from suppliers that offer supply-side and demand-side resources without emissions of greenhouse gases ("GHG")), such an approach will take more time than is required to discover whether a bilateral contracting option could help enable the state to retain and compensate suppliers of zero-carbon resources as a transition strategy. The solicitation/contracting approach also has the advantage (in the near term) over a ZEC-related market design in that it is an approach Connecticut could implement in the near term under current law and does not preclude the possibility of developing a multi-state market for ZECs later on.

FURTHER DISCUSSION OF THESE ISSUES

Insights from the DEEP/PURA Draft Report and other related reports

- As I stated previously, the DEEP/PURA Draft Report provides insights that are critically important for those agencies' consideration of the next steps they should take to help ensure reliable, resilient, low-emitting, and affordable power supplies. These insights lead me to encourage DEEP and PURA

officials to pursue an approach that deliberately keeps open Connecticut's energy/power supply options in the near term. In the following paragraphs, I provide support for this position.

- The DEEP/PURA Draft Report recognizes the unique role that Millstone plays in helping to ensure that Connecticut's (and New England's) electricity portfolio produces an efficient and economical supply of power while also helping to control the power sector's CO₂ emissions. Such a goal is consistent with state policies as articulated in the Connecticut CES and the state's Global Warming Solutions Act.
- As noted in the DEEP/PURA Draft Report, Millstone is the largest generating station in New England. In my own report on Millstone, I observed that it "supplies one-seventh of the region's entire electrical demand, just under half of total Connecticut electric generation, and almost 60 percent of Connecticut consumers' total electricity demand."¹⁷ This means that compared "to the other 49 states, Connecticut now has the fifth lowest carbon emissions per person, ties for third place in energy productivity (i.e., the amount of energy used per dollar of economic activity), and is the eighth lowest in terms of the carbon intensity of its energy system. Connecticut's electricity production accounts for only 20 percent of total in-state carbon emissions – a share that is far lower than in most of the other 49 states."¹⁸ This has resulted in large part from the significant amount of carbon-free electricity hosted within the borders of the state, 98 percent of which came from nuclear generation at the Millstone Power Station.
- The DEEP/PURPA Draft Report properly recognizes the importance of Millstone's operations for the ability of the state to achieve its GHG-emission-reduction targets cost effectively. The analyses being conducted by Governor's Council on Climate Change ("GC3") to help it establish an interim target that ensures that Connecticut is on a path to achieve its 2050 GHG-reduction target, assume "the continued operation of both Millstone units through the conclusion of their respective NRC licenses

¹⁷ Tierney Millstone Report, page 1 (footnotes in the original are not included in this quote).

¹⁸ Tierney Millstone Report, page 1 (footnotes in the original are not included in this quote).

in 2035 and 2045.”¹⁹ The DEEP/PURA Draft Report concludes that “achieving the interim GHG goals contemplated by the GC3 would require electricity generation to be 60 to 80 percent zero-carbon by 2030 in order to meet the mid-term targets contemplated by the GC3....Without the carbon-free electricity provided by nuclear facilities, most notably, the Millstone units, any interim emissions reduction target set by the GC3 become increasingly difficult to achieve.”²⁰

- I agree with the DEEP/PURA Draft Report’s finding that “Millstone provides benefits in terms of GHG emissions avoidance, fuel diversity, and fuel security”²¹ and further observe that Millstone’s output also helps to mitigate electricity prices increases. In the analysis I co-authored in 2016, an early retirement of Millstone would have adverse price impacts for Connecticut’s consumers and would also adversely affect fuel diversity in the regional power market and CO₂ emissions in Connecticut.²² My study specifically concluded the following points (with quoted text from pages iii-v of my report):

- “Maintaining Millstone in operation through 2030 provides \$6.2 billion (net present value) in benefits to all New England electricity consumers. This equates to average savings for New England consumers of \$536 million per year”, a significant portion of which would flow to Connecticut consumers. “Avoiding a premature retirement of Millstone station saves the average Connecticut residential electricity customer over \$500 through 2030.”
- “In-state CO₂ emissions from Connecticut’s power plants would increase by 2.2 million metric tons (“MMT”) a year, which would substantially increase the difficulty for Connecticut to meet its goal to reduce GHG emissions by 20 MMT by 2050. It will be hard enough for Connecticut – like other regions – to meet this goal – but maintaining Millstone’s operations will keep Connecticut from backtracking....The CO₂ emissions avoided through Millstone’s operations are roughly equivalent to taking nearly 470,000 passenger cars from the road each year. These would be on top of the 0.5-1.5 million light-duty electric vehicles (“EVs”) that Connecticut already anticipates will be required to help meet its interim 2030 GHG reduction targets.”
- “Losing Millstone’s output would increase nitrogen-oxide (“NOx”) emissions from power plants in Connecticut and elsewhere in New England, thus contributing to worsening air quality and health impacts locally.”

¹⁹ DEEP/PURA Draft Report, page 7.

²⁰ DEEP/PURA Draft Report, page 7.

²¹ DEEP/PURA Draft Report, page 27.

²² Tierney Millstone Report, pages iii-viii.

- “Without Millstone, natural gas-fired electric generation would rise to 58 percent of all regional supply by 2020 and remain above 50 percent through 2030 – even as other [large-scale hydroelectric] imports and renewables come on line as assumed [in the study]. By contrast, with Millstone’s output, natural gas fired electric generation would account for 45 percent of generation by 2020 and only 38 percent by 2030. The premature retirement of Millstone...could increase electric sector reliability challenges, particularly during the winter heating season when New England’s gas demand is greatest. This trend towards greater reliance on natural gas is the opposite of what the region’s grid operator and Connecticut officials have said is needed to address both electric-system cost and reliability issues.”
- “Thus, even if everything goes perfectly in terms of Connecticut and other states meeting their energy-efficiency and clean-energy goals, our analysis finds that Millstone’s operations would provide substantial positive economic and environmental benefits. But if, for any reason, some or all these objectives and assumptions do not end up as planned or hoped for – that is, if benchmark natural gas prices end up being higher than expected, and/or if new renewables and Canadian hydropower supplies come on line more slowly than anticipated, and/or if electricity demand is above forecasted levels (as could occur with faster-than-expected adoption of electric vehicles) – then the premature loss of the Millstone Power Station would make it much more difficult and costly for Connecticut to meet its fundamental energy and environmental goals.”
- “Losing Millstone during the 2017-2030 period would require, in the near term at least, that its generation be replaced by a mix of new and existing gas-fired resources plus imports from neighboring regions – thus worsening local air pollution and putting pressure on in-state GHG emissions and the region’s carbon cap. Alternatively, replacing Millstone’s carbon-free generation would require up to an additional 7,000 megawatts (“MW”) of onshore wind, over and above the total amount (5,800 MW) already assumed to come on line in New England by 2030 in our base case.”

I reaffirm the overall conclusion from our analysis, that “Millstone’s continued operation is key to enabling Connecticut to stay on track in its clean energy, climate and affordable-energy goals. At best, maintaining Millstone will bolster Connecticut and the region’s electric system as it transitions toward more renewable energy. At worst, maintaining Millstone’s operations provides a valuable, effective and efficient insurance policy in helping Connecticut to remain focused on its goals of ‘lowering energy bills and improving the state’s competitiveness.’ It also helps to avoid the addition of new gas-fired generating units that could exacerbate potential stranded cost problems in the years to come, as the region transitions toward much deeper decarbonization of its electric grid. Either way,

Millstone's electric supply provides substantial value to Connecticut's consumers and to the state's economy."²³

Economic Analysis of an Investment Is Not Equivalent to A Financial Analysis of a Specific Company's Investment Opportunities Related to a Particular Project

- The DEEP/PURA Draft Report points out that the Levitan Report found that Millstone's going-forward economics would be net positive, based on public information available to the Levitan analysts. I strongly discourage DEEP and PURA officials from concluding, however, that this finding will assure an outcome in which the plant continues in operation through its full licensing period. Importantly, the Levitan Report presents an *economic* assessment view of the plant, not a *financial* analysis of profitability for a particular owner of a particular merchant nuclear plant at a particular point in time.
- From a technical point of view, there are important differences. For example, the Levitan Report's economic analysis focuses on net present values over a long period of time, using a standard discount rate. By contrast, a financial analysis of Dominion Energy's investment in Millstone would take into consideration such things as: the timing of cash flows to the owner of the plant (e.g., that quarterly returns in the near term matter much more than returns in much-later time periods, with the latter having little visibility and much more uncertainty); the alternative uses of funds (opportunity costs) that the owner might consider in determining whether this particular investment is the right one; the firm's actual cost of capital and its risk tolerance; business model considerations for the owner; and so forth.
- The Levitan Report found that the net cash flows from the plant would be positive, but did not – and in practicality could not – consider whether such returns are those anticipated by the owner or are sufficient in light of the merchant/high-risk quality of this particular investment, or whether the owner finds that there are more reasonable uses of its capital (e.g., in regulated businesses) compared to

²³ Tierney Millstone Report, page v (footnotes in the original are not included in this quote).

continuing to invest in Millstone to keep it in operations. The fact that Dominion Energy has begun to signal in public filings²⁴ that it faces choices about continued operation of this plant should count for a lot in terms of providing signs about whether this particular owner agrees with the apparent conclusion of the Levitan Report that Millstone offers net positive economics for Dominion Energy to continue the capital investment and operating expenditures needed to maintain the plant in operation through 2030. The reality is that publicly traded companies with quarterly financial disclosure filings (and constant need to take into account the near-term market views expressed in stock prices and analyst reports) need to pay attention to near-term conditions, with concerns expressed in capital markets for investments whose positive returns are both risky and far distant in the future.

The Option Value of Conducting a Competitive Solicitation

- At best, there is at least some (if not considerable) uncertainty about whether the Levitan Report’s conclusions are “correct” about Millstone having positive economics and a sufficiently attractive financial outlook for its owner. What, then, should (or might) DEEP and PURA officials do in light of this uncertainty? One approach would be to consider whether there are downsides of conducting a competitive solicitation under the Act, and reviewing the “market intelligence” provided in the responses from Dominion Energy and other eligible suppliers. If there are no real downsides of soliciting *bona-fide* offers, then DEEP should proceed with a solicitation.
 - From the point of view of impacts on the wholesale market: It would not be inconsistent with the structure of New England’s wholesale market for Connecticut companies to enter into bilateral contract(s) with resources whose environmental attributes and electricity products are considered of value to consumers and to the state. Others in the regional power market enter

²⁴ In its most recent quarterly financial disclosure form filed with the Securities and Exchange Commission, Dominion Energy made the following statement (for the first time in such disclosures) regarding continued operations of Millstone: “While management currently has no plans which may affect the carrying value of Millstone, based on potential future economic and other factors, including, but not limited to, market power prices, results of capacity auctions, legislative and regulatory solutions to ensure nuclear plants are fairly compensated for their carbon-free emissions, and the impact of final rules from the EPA and the efforts of states to implement those final rules; there is risk that Millstone may be evaluated for an early retirement date. Should management make any decision on a potential early retirement date, the precise date and the resulting financial statement impacts, which could be material to Dominion Energy, may be affected by a number of factors, including any potential regulatory or legislative solutions, results of any transmission system reliability study assessments, and decommissioning requirements, among other factors.” Form 10-Q Quarterly Report of Dominion Energy, Inc., Virginia Electric and Power Company and Dominion Energy Gas Holdings, Inc., for the quarterly period ended September 30, 2017, pages 93 and 95.

into bilateral contracts (including with parties that own existing resources), even as they also participate in the region's centralized energy, capacity and ancillary services markets. These parties do so in part to lock in price and other terms and conditions of service.

- From the point of view of somehow adversely requiring companies to sign up for contract(s) that are otherwise not attractive: Conducting a competitive procurement to test the market does not compel state officials to accept and/or approve offer at any price. If an offer from Millstone is unattractive, for example, then the state does not need to accept it.
- Conversely, should DEEP and PURA officials conclude that the Levitan analysis is “right” and then decline to conduct a competitive solicitation, then Connecticut runs the risk that Millstone's owner ends up disagreeing with the conclusion that Millstone is profitable and decides to close the plant, leaving Connecticut with the adverse economic and environmental impacts that it has sought to avoid.
- Conducting the competitive solicitation provides optionality to explore the implications of uncertainty in the analysis of Millstone's economics and profitability. If no solicitation occurs but the Levitan Report's analysis turns out to be wrong (in terms of its conclusions that Millstone is economical and profitable for its owner to continue to operate the plant) and Dominion Energy retires both units in the relatively near term, then it is highly likely that there will be negative consequences for Connecticut consumers' electricity bills, for GHG emissions, for macroeconomic impacts in the state, and so forth. If a solicitation occurs (whether or not the Levitan analysis is “correct”), then the RFP process leaves open the possibility that state officials will be able to discover whether there is a competitive offer from Dominion Energy.

Policy Options and Instruments

- From a policy point of view, I offer three further observations. First, as recognized in the DEEP/PURA Draft Report, New England's electric supply portfolio is increasingly dependent upon natural gas, with challenging implications for price volatility, fuel security and GHG emissions. Such dependence has been highlighted during New England's recent extreme cold snap conditions. With

constraints on the availability of natural gas in the region, the region is leaning on dual-fuel generators to make up the difference, and prices are reflecting these circumstances.²⁵ Loss of Millstone would worsen these problems. The resilience of the system depends upon having a diverse portfolio,²⁶ and Millstone's near-term retirement would worsen fuel diversity. This would adversely impact Connecticut's consumers and its economy.

- Second, the DEEP/PURA Draft Report's focus, appropriately, is on impacts in Connecticut. Whether or not the rest of New England benefits from Millstone's continued operation, as long as it is clearly in the public interest of Connecticut's consumers, its economy and its environmental goals for state officials to take steps toward keeping Millstone in operation, then Connecticut should not "hold out" on doing so contingent upon whether the rest of New England's beneficiaries also step up.
- Third, from a 'policy instrument' point of view, the DEEP/PURA Draft Report identified two potential approaches (the competitive solicitation/long-term contracting approach, and the ZEC market approach). Each offers potential benefits, but one (the competitive solicitation/contracting approach) has near-term advantages. Certainly, the ZEC approach has the advantage of providing a mechanism to value and provide compensation for power resources with the environmental attribute of zero-carbon electricity supply. But establishing the market rules for adopting a single-state ZEC market would take time, and even more time would be required to create a regional ZEC market with other states. The solicitation/contracting approach can also provide price visibility and compensation

²⁵ On January 2nd, 2018, "ISO New England spokesperson Marcia Blomberg said the regional power system is operating under normal conditions but the extreme cold weather is increasing demand for natural gas for heating, creating pipeline constraints, driving up natural gas prices and causing dual-fuel generators to switch fuels. As a consequence, oil- and coal-fired power plants are generating much more power than usual and wholesale power prices have soared, said Blomberg. As of 10:30 a.m. on Jan. 2, 34% of New England's electricity was being supplied by oil-fired generation (which over a given year supplies less than 1% of the region's generation), followed by natural gas at 25%, nuclear at 23%, renewables at 9%, coal at 6% and hydro at 4%. Of the renewable generation, 62% of it was supplied by greenhouse gas-emitting wood-, refuse- and landfill gas-fired generation, with wind supplying 38% and solar less than 1%. According to data from SNL Energy, ISO-NE's internal hub clocked a day-ahead power price of \$210/MWh at peak on Jan. 2, up from a Dec. 22 peak of just \$66.25/MWh.... Along with nuclear and coal power plants, dual-fuel units [are] running on oil.... 'Environmental limitations on how much, or whether, some oil-fired power plants will be able to generate electricity could become a concern this week and for the remainder of the winter.'" Andrew Coffman Smith, "New England dual-fuel units burning through oil, emissions limits amid cold snap," SNL Financial, January 02, 2018 5:49 PM ET. Also, on January 4th, SNL Financial further reported: "Next-day power prices in the East on Thursday reached highs not seen since late January 2014 owing to an ongoing winter storm and forecasts of even colder weather in the coming days. At next-day markets, power at the New England Mass hub was exchanged in the mid-\$280s to mid-\$330s, up from a Wednesday index of \$198.50..." Stephen Cedric Jumchai, "Winter storm drives East US power values to near 4-year highs above \$300," SNL Financial, January 04, 2018 4:42 PM ET.

²⁶ Sue Tierney, "About that national conversation on resilience of the electric grid: The urgent need for guidance and action," UtilityDive, December 13, 2017, <https://www.utilitydive.com/news/about-that-national-conversation-on-resilience-of-the-electric-grid-the-ur/512545/>

for attributes (e.g., fuel security, zero-carbon generation) offered by eligible resources, but this approach has the advantage that it is something that Connecticut can undertake on its own under current law and can be accomplished relatively quickly. And taking this step in the near term does not preclude Connecticut from taking actions in the future to develop a ZEC market that can operate more broadly in the region.

CONCLUSION

- This concludes my affidavit.