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## Memorandum

TO: RHODE ISLAND ENERGY FACILITY SITING BOARD  
FROM: ROBERT FAGAN, SYNAPSE ENERGY ECONOMICS, INC.  
DATE: SEPTEMBER 14, 2018  
RE: INVENERGY DUAL-FUEL POWER PLANT - UPDATE ON LACK OF NEED FOR PLANT – RI  
EFSB DOCKET SB-2015-06

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### **New Information Affecting Reliability Need for Invenergy Dual-Fuel Plant – Since February 2018**

This Memorandum describes new information that has become available since February 2018 concerning any purported need for either unit 1 (485 MW) or unit 2 (485 MW) of Invenergy’s proposed Burrillville power plant. These units are sometimes referred to as “Turbine One” and “Turbine Two.”

#### Context for This Memorandum

On June 14, 2016, CLF filed my direct testimony in the Rhode Island PUC Docket 4609 pertaining to Invenergy. My testimony was that there was no short-, medium-, or long-term reliability need for Invenergy’s proposed plant. (PUC Testimony, page 3, lines 21-27.) However, in July 2016, the PUC disagreed with me and issued an Advisory Opinion saying that Invenergy was needed.

On August 7, 2017, CLF filed my direct testimony in this Docket. In that testimony, I provided newly available evidence – evidence that had not been available the previous year at the time of the PUC decision – that confirmed that my June 2016 PUC testimony had, in fact, been correct – that is, that there is no short-, medium-, or long-term reliability need for Invenergy’s proposed plant. In my August 2017 EFSB direct testimony, I incorporated by reference my June 2016 testimony at the PUC in order to show multiple, specific areas in which: (a) the PUC had not credited my earlier testimony; but (b) subsequent evidence, not available to the PUC at the time of its initial ruling, showed that I had been correct. For example:

With Regard To Declining Peak Load – One of the most important factors driving need (or lack of need) for new power plants is the level of peak load.<sup>1</sup> In my August 2017 testimony, I showed how new evidence, not available at the time of the PUC decision, showed declining peak load in

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<sup>1</sup> In this memorandum peak load refers to the “net” peak load seen on the transmission grid after accounting for the effects of energy efficiency and small, behind-the-meter solar PV resources. Net peak load is defined in that manner by ISO NE.

New England. This is a reliable indicator that, all else equal, new power plants are not needed. Specifically, my August 2017 testimony relied heavily on the ISO's 2017 CELT (Capacity, Energy, Loads, and Transmission) Report. (August 2017 testimony page 36, line 16 – p. 37, line 8.) That section, in turn, referred back to my June 2016 PUC testimony at page 12, line 8 through page 27, line 16; including Figure 1 (page 14); Figures 3 and 4 (page 18); Figures 5 and 6 (page 19); Figures 7 and 8 (page 23); Figure 9 (page 25); and Figures 10 and 11 (page 26).

With Regard To New Resources – In July 2016, the PUC concluded that Invenergy's proposed plant was needed because "there is no assurance that any of the [other, proposed] new resources [i.e., power plants] will be built." In my August 2017 EFSB testimony, I showed that this was no longer true. Specifically, I provided evidence that new power plant construction that was not certain at the time of the PUC decision had become certain in the intervening year: (a) the 484 MW Bridgeport Harbor 5 plant (gas combined cycle) was already under construction in Connecticut; (b) the 333 MW Canal 3 plant (gas combustion turbine) had been permitted by Massachusetts EFSB in June 2017; and (c) the 195 MW West Medway plant (gas combustion turbine) had also been approved by the Massachusetts EFSB in November 2016. (See my August 2017 EFSB testimony at page 33, line 15 – page 34, line 10.) This change in circumstances, in the period after the PUC decision in July 2016, was a further strong indicator that Invenergy's proposed plant was not needed.

With Regard To Possible Future Retirements of At-Risk Plants – In July 2016, the PUC concluded that Invenergy was needed because of the possible future retirements of "at-risk plants." The ISO has identified over 5,000 MW of at-risk resources that may retire. In my August 2017 EFSB testimony, I provided new information on the rate of retirements of these "at-risk" plants, information that had not been available at the time of the PUC decision: (a) FCA-11 (held in February 2017 for capacity obligations for 2020/2021) actual results that showed all but 154 MW of at-risk units clearing (August 2017 testimony at page 11, lines 1-7); (b) FCA-12 retirement de-list bids (made public in March 2017) that showed minimal retirements in FCA-12 (held in February 2018) (page 11, line 8 - p. 12, line 1); (c) results of FCA-10 and FCA-11 indicate continued slow rate of retirements. I explained that this showed that those at-risk plants were willing to stay in the New England market despite the decline of auction clearing prices from over \$17/KW-month in FCA-9 to \$7.03/KW-month in FCA-10 and \$5.30/KW-month in FCA-11. (August 2017 testimony, at page 12, lines 2-10).

In February 2018, CLF filed my supplemental testimony in this docket. That document was much briefer than my August 2017 testimony in this docket because I was primarily addressing a relatively narrow issue: the significance of the ISO's decision (taken in September 2017) to disqualify Invenergy's Turbine Two from participation in the ISO's FCA-12 (held in February 2018). My February 2018 testimony was that: (a) without Invenergy participating in FCA-12 or obtaining a CSO for Turbine Two, the ISO was able to obtain all the capacity it needed from "other less expensive sources" (February 2018 Supplemental Testimony, page 3, lines 13-17); and (b) in fact, no new large gas combined cycle plants cleared FCA-12 (February 2018 Supplemental Testimony, page 3, line 18 to page 4, line 6).

At least equally important, in my February 2018 Supplemental Testimony, I discussed at some length the further, additional, new evidence of "surplus capacity conditions in New England."



(February 2018 Supplemental Testimony, page 6, line 19.) Specifically, I made reference to: (a) the ISO's January 8, 2018 transmittal letter to FERC pertaining to the Dynamic De-List Bid Threshold (page 4, line 12 to page 6, line 15; and Exhibit C); and (b) the ISO's preliminary 2018 CELT Report. These documents had not existed at the time CLF had filed my August 2017 testimony. This evidence of "surplus capacity conditions in New England" is important because the existence of surplus capacity now means that new, additional power plants (like Invenergy's proposed project) are not needed in the future.

### The Present Memorandum

In this Memorandum I provide additional facts, data points, and information all of which was not previously available, even at the time of my most recent filing here at the EFSB, in February 2018.

In this Memorandum, I affirm my previously stated opinion that the electricity from Invenergy's Turbine One and Turbine Two are not needed in New England for short- medium-, or long-term reliability or resource adequacy in New England.

The first item below (FERC's recent approval of the newly lowered Dynamic De-List Bid Threshold) further demonstrates that there is a present surplus of capacity in New England, even without Invenergy's proposal.

The second and third items below (pertaining to the final 2018 CELT Report and the summer peak load in 2018) both confirm what I stated in my February 2018 Supplemental Testimony that projections of declining peak load in the future (and newer vintage forecasts indicating lower peak load for any given future year, relative to the prior-year vintage forecast) demonstrate that there is no need for new fossil power plants in the future like Invenergy's proposed plant.

The fourth item below reflects the results of the most recent Annual Reconfiguration Auction, in which Invenergy sold out of its CSO for Turbine One in the 2020/2021 period.

The fifth item below (pertaining to Mystic Units 8 and 9) confirms the accuracy of my prior testimony that the current rate of retirements of so-called "at-risk" or other plants in New England does not show a need for new power plants like Invenergy's.

Finally, Items 6 and 7 below (pertaining to newly announced procurements of renewable energy including Canadian hydroelectric power; offshore wind in Massachusetts, Rhode Island, and Connecticut; and deployment of storage resources) show that new renewables and storage resources, in combination with the patterns of lower peak load can and will serve to ensure a reliable supply of resources in New England if or as older fossil-fuel generators retire. This is a very important point, in part because in July 2016 – when the PUC rendered its decision – none of these large procurements of renewables were known with the level of certainty that now exists.



## Connecting the Dots

All of these separate data points must be viewed together in order to understand the broader picture.

- There is a current surplus of capacity in New England; while
- Peak load, which drives future demand, is declining; while
- The pace of retirements shows no need for new power plants; and
- Large procurements of new renewables are coming into the New England electricity marketplace.

It is important to read my three prior filings pertaining to Invenenergy together with the present Memorandum, because the trend demonstrated is important. Between each pair of filings, there is more evidence available of the present surplus of capacity in New England; of declining peak load; and of additional resources (both limited conventional, and renewable) entering the market.

Taken together, the foregoing facts along with the additional detail contained in my prior testimonies show that there is no short-, medium-, or long-term reliability need for Invenenergy's Turbine One or Turbine Two.

### **1. FERC Approval of ISO NE Filing<sup>2</sup> of Lower Dynamic De-List Bid Threshold (DDBT) (March 2018).**

On March 9, 2018, after my February 2018 Supplemental Testimony was filed, FERC approved ISO NE's application to lower the Dynamic De-list Bid Threshold (DDBT), affecting the next three Forward Capacity Market auctions. As noted in my February 2018 Supplemental Testimony, the lower DDBT is in place because of relative surplus of capacity in New England. On page 5 of my February 2018 Supplemental Testimony I quoted from the ISO's January 8, 2018 Transmittal Letter to FERC (and I attached the full document as Exhibit C to my testimony):

Under these conditions [market condition changes leading to surplus], a reduction in the DDBT is warranted. **First, it is reasonable to assume that a marginal de-list bid from an existing resource will set the clearing price. The cost of new entry is well above the current DDBT of \$5.50/kW-month, making it difficult for a new resource to bid competitively and clear in the auction.** Further, no existing suppliers have submitted (or maintained) de-list bids in recent auctions indicating a capacity cost above the current DDBT. **Moreover, with the year-over-year increases in surplus conditions, it is likely that auction prices will continue to clear lower.** This is reflected in the drop in clearing price from \$7.03/kW-month in FCA 10 to \$5.297/kW-month in FCA 11 for a majority of zones – a price that is already below the current DDBT. With an even greater

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<sup>2</sup> ISO NE January 2018 filing, DDBT. Exhibit RMF-3, February 2018 testimony.

surplus projected for FCA 12 [actual FCA 12 clearing price = \$4.63] **and no current indication that these supply and demand dynamics will change for future auctions**, it is important that the DDBT be lowered to ensure that the mechanisms in place to protect against uncompetitive clearing in the auction function properly.

The bold-faced text above appeared as bold-faced text in my February 2018 Supplemental Testimony (but not in the ISO's January 8, 2018 Transmittal Letter to FERC).

The newly lowered DDBT will be applicable for the FCA-13 through FCA-15 auctions, occurring in February 2019 (for the Capacity Commitment Period June 1, 2022 to May 31, 2023), February 2020 (for the Capacity Commitment Period June 1, 2023 to May 31, 2024), and February 2021 (for the Capacity Commitment Period June 1, 2024 to May 31, 2025).

FERC's decision to accept the ISO's request to lower the DDBT represents confirmation of the ISO's belief that there is an existing surplus of capacity in New England and that that surplus of capacity is expected to continue through mid-2024, and possibly through mid-2025.<sup>3</sup>

As I state above, this presently existing surplus of capacity in New England must be viewed in the context of declining demand between now and 2027 (Items 2 and 3, below) and the entry of new conventional resources (Bridgeport Harbor, Canal 3 and West Medway) and the entry of new renewable resources and anticipated deployment of storage (Items 6 and 7, below).

## **2. ISO NE Release of the 2018 CELT Forecast and Data (May 2018)**

On May 1, 2018, ISO NE released its final CELT (Capacity, Energy, Loads, and Transmission) forecast of loads. I had included a preliminary estimate of the CELT data in my February 2018 Supplemental Testimony (Supplemental Testimony, page 6, line 20 to page 10, line 14, including Figure 1 on page 8 and Table 1 on page 9). My new Table 1 below contains final 2018 CELT data showing the net peak load forecast, and comparisons to (1) the preliminary forecast included in my February 2018 testimony; (2) the 2017 CELT forecast; and (3) the 2015 CELT forecast. The 2015 CELT forecast was used in FCA-10, resulting in the Capacity Supply Obligation award to Turbine One of the proposed Invenenergy plant (i.e., based on a projection (at that time) of future peak load that was significantly too high). The table shows the ongoing trend that ISO NE load forecasts show lower net peak load for any given future year with each successive vintage of forecast.

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<sup>3</sup> ISO NE indicated in its transmittal letter that it will revisit the DDBT prior to FCA 15.

**Table 1. 2018, 2017, and 2015 CELT Forecast – Net Summer Peak Load – MW**

Forecast Year	Prelim. Estimate 2018 CELT Net Peak Load Forecast	Final 2018 CELT Net Peak Load Forecast	2017 CELT Net Peak Load Forecast	2015 CELT Net Peak Load Forecast	2018 Final CELT vs. 2017 CELT	2018 Final CELT vs. 2015 CELT
<b>2018</b>	25,637	25,729	26,458	27,177	-729	-1,448
<b>2019</b>	25,453	25,512	26,409	27,310	-897	-1,798
<b>2020</b>	25,328	25,298	26,298	27,400	-1,000	-2,102
<b>2021</b>	25,120	25,136	26,213	27,487	-1,077	-2,351
<b>2022</b>	25,001	25,021	26,167	27,599	-1,146	-2,578
<b>2023</b>	24,928	24,942	26,155	27,733	-1,213	-2,791
<b>2024</b>	24,769	24,889	26,176	27,876	-1,287	-2,987
<b>2025</b>	24,766	24,864	26,229		-1,365	
<b>2026</b>	24,750	24,874	26,310		-1,436	
<b>2027</b>	24,668	24,912				

Source: Synapse tabulation, based on ISO NE final 2018 CELT data, 2017 CELT data, and 2015 CELT data.

Note: 2015 CELT forecast data was the original forecast relied upon by Invenergy and upon which the CSO for turbine 1 was obtained in 2016.

The data show that based upon final 2018 CELT forecast data, the net peak load in New England is forecast to be more than 1,000 MW lower than projected in 2017 (May 2017 CELT) during the 2021-2023 period, and more than 1,400 MW lower by 2026. When compared to the peak load forecast at the time of Invenergy’s original application (the 2015 CELT forecast), the net peak load in 2021 is projected to be 2,351 MW lower. By 2024, the projected net peak load is more than 2,900 MW lower than first projected at the time of Invenergy’s application. This demonstrates the dramatic reduction in new capacity need due directly to ongoing increases in behind-the-meter solar PV and energy efficiency relative to the forecast of these demand-side resources in earlier years.

These data are important because they show declining future demand for electricity in New England for the period when the proposed Invenergy plant may come on line (the 2021-2023 period) and continuing through until 2027. And, as discussed above, this declining future demand comes in the context of the present surplus of capacity in New England and the simultaneous entry of significant new conventional and renewable resources (without Invenergy’s proposed plant).

### **3. Normalized (50/50) Peak Load Summer 2018 Likely Less Than Forecast in 2018 CELT.**

The 50/50 weather normalized 2018 summer net peak load has not yet been reported by ISO NE. However, the highest net peak load, on August 29, 2018, as reported on the ISO NE “Real Time Maps and Charts” system load graph was 25,763 MW.<sup>4</sup> August 29, 2018 was an exceedingly hot and humid day occurring midweek of a hot and humid series of days, and likely was not a “normal” day, for load forecasting purposes.<sup>5</sup> Its net peak load hour may have been closer to a “90/10” day than a “50/50” day. The 50/50 or “normalized” 2018 CELT net peak load forecast was 25,728 MW and the 90/10 peak load forecast was 28,119 MW (2018 CELT Forecast Data, ISO NE).<sup>6</sup> This information will be reported by ISO NE in September or October, likely in time for the next ISO NE Participants Committee meeting, scheduled for October 4, 2018. A lower actual net peak load (normalized for 50/50 weather) on the peak summer load day indicates the net peak load forecast will likely be revised downward again in the next round of load forecasting (all else being equal), culminating with the 2019 CELT report in May 2019. This is important because peak load drives the demand for future capacity. Lower peak load means lower demand for capacity in the future – at a time when there is already a surplus of capacity, as determined by the ISO and FERC.

### **4. Invenergy No Longer Has CSO for 2020/2021 for Turbine 1 – Result of Annual Reconfiguration Auction**

Invenergy no longer has the CSO originally obtained for Turbine One for the 2020/2021 capacity commitment period. Invenergy traded out of its CSO for that period in the first Annual Reconfiguration Auction (ARA-1) for that 2020/2021 period,<sup>7</sup> seen in the table below. The ISO can (and will) maintain system reliability for the 2020-2021 period without Invenergy.

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<sup>4</sup> Based on a 12-period average of the highest 12 consecutive hourly periods of load. This was essentially between 5 and 6 PM. Load data are reported in 5-minute increments on the ISO NE website.

<sup>5</sup> ISO NE will compute the weighted temperature-humidity index for this day and report where on the distribution (i.e., between 50/50 and 90/10) the actual weather conditions were.

<sup>6</sup> [https://iso-ne.com/static-assets/documents/2018/09/forecast\\_data\\_2018.xlsx](https://iso-ne.com/static-assets/documents/2018/09/forecast_data_2018.xlsx).

<sup>7</sup> ISO NE Annual Reconfiguration Auction results, ARA-1, for CCP-11 (2020/2021).

**Table 2. Results of Annual Reconfiguration Auction 1 for the 2020/2021 Period (CCP-11)**

Results of the First ARA for 2020/21						
	Clearing Price \$/kW-month	Supply Offers (MW)		Demand Bids (MW)		Net Capacity Cleared (MW)
		Submitted	Cleared	Submitted	Cleared	
Rest of Pool	\$3.672	155	102	584	0.7	101
Northern NE	\$3.672	191	33	2,441	58	25
Southeast NE	\$3.672	136	21	1,204	502	481
Cross Sound Cable	\$3.672	0	0	0	0	0
NY AC Ties	\$3.672	1,282	387	0.5	0.5	387
Phase II	\$3.672	0	0	0	0	0
New Brunswick	\$3.672	0	0	31	0	0
Highgate	\$3.672	0	0	0	0	0
Totals		1,764	543	4,261	561	(18)

Notes:

The \$3.672/kW-month ARA clearing price is a lower than the associated FCA-11 clearing price of \$5.30/kW-mo.

Source: ISO NE.

As seen in the table above, the Southeast NE zone cleared 502 MW of “demand bids,” which means that 502 MW of CSO obligations were “bought out” at a price of \$3.672/kW-month, meaning that the holders of CSOs paid \$3.672/kW-month to shed the obligation.

### 5. Mystic Units 8 and 9 and Retirement Considerations for FCA-13

Mystic combined cycle units 8 and 9, which together total 1,413 MW (summer qualified capacity supply obligation, FCA-12; Mystic 8 = 703.3 MW, Mystic 9 = 709.7 MW), were two of the largest units potentially affecting the capacity portfolio available for the Southeast New England zone for FCA-13 and FCA-14 (though they were not originally associated with the portfolio of what the ISO has identified as plants being “at risk” of retirement). While Exelon (the owner of Mystic 8 and 9) had indicated potential retirement of those units prior to FCA-13,<sup>8</sup> in fact we now know that Mystic Units 8 and 9 will remain available to contribute to reliability needs in New England through the 2024/25 period, or for the next three FCM auctions (FCA-13, to be held in February 2019; FCA-14, to be held in February 2020; and FCA-15, to be held in February 2021).<sup>9</sup> The manner in which the ISO elected to retain the Mystic 8 and 9 units was

<sup>8</sup> Exelon letter to ISO NE, April 4, 2018. Available at [https://www.iso-ne.com/static-assets/documents/2018/04/exelon\\_generation\\_response\\_letter\\_mystic\\_station\\_retirement\\_delist\\_bids\\_april\\_4\\_2018.pdf](https://www.iso-ne.com/static-assets/documents/2018/04/exelon_generation_response_letter_mystic_station_retirement_delist_bids_april_4_2018.pdf).

<sup>9</sup> ISO New England Inc. Compliance Filing to Establish a Fuel Security Reliability Standard, Short-Term Cost-of-Service Mechanism, and Related Cost Allocation for Out-of-Market Compensation in Docket No.

controversial among some owners of other power plants in New England, but that controversy is not relevant to the proceedings before this EFSB. What is relevant to the EFSB is that we now know that Mystic 8 and 9 will be retained by the ISO and will be “price takers” in the FCM auctions, with FERC approval already in hand,<sup>10</sup> through and including Capacity Commitment Period 13 (June 1, 2022 to May 31, 2023), Capacity Commitment Period 14 (June 1, 2023 to May 31, 2024) and Capacity Commitment Period 15 (June 1, 2024 to May 31, 2025). The ISO decision to retain these plants, now approved by FERC, substantially undercuts any argument that the possible retirement of plants in New England shows the need for Invenergy between now and at least through the summer of 2024.

By then, much or all of the anticipated Canadian clean energy (1,100 MW capacity) and MA, RI and CT-sponsored offshore wind resources (totaling 1,400 MW nameplate, or 420-518 MW capacity value)<sup>11</sup> are estimated to be in commercial operation.

The 575 MW (summer qualified capacity supply obligation, FCA-12) Mystic Unit 7 is retiring in FCA-13. No other large units are retiring in FCA-13.

## **6. New Supplies of Canadian Hydro Power and Offshore Wind in MA, RI, and CT**

Pursuant to Massachusetts’ 2016 “Energy Diversity Act” (page 37 of my August 2017 Testimony), the New England Clean Energy Connect (NECEC) project approved by the Massachusetts Department Of Energy Resources<sup>12</sup> and currently before the MA Department of Public Utilities (DPU) is estimated to reflect an average levelized price of \$59/MWh for power – that is, highly competitive with fossil resources. It will provide 9,554,940 MWh of annual hydro energy to New England, with 1,090 MW of firm capacity.<sup>13</sup> (Invenergy argues that its proposed

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EL18-182-000, and Docket No. ER18-\_\_\_-000. August 31, 2018. [https://www.iso-ne.com/static-assets/documents/2018/08/fuel\\_security\\_compliance\\_filing.pdf](https://www.iso-ne.com/static-assets/documents/2018/08/fuel_security_compliance_filing.pdf).

<sup>10</sup> FERC, Order Denying Waiver Request, Instituting Section 206, and Extending Deadlines, ISO New England Inc., 164 FERC ¶ 61,003 (2018). <https://www.ferc.gov/CalendarFiles/20180702193957-ER18-1509-000.pdf>.

<sup>11</sup> The next section cites ISO NE’s estimate that offshore wind capacity value could range from 30-37% of nameplate value. 30% x 1400 = 420 MW. 37% x 1400 = 518 MW.

<sup>12</sup> NECEC is a project contracted by Massachusetts that will build a new transmission line in western Maine from the Canadian border to the Lewiston, ME region, and use the rest of the ISO NE grid to deliver an incremental 1,100 MW of capacity to New England. See MA DOER letter filing at <https://macleanenergy.files.wordpress.com/2018/07/doer-83d-filing-letter-dpu-18-64-18-65-18-66july-23-2018.pdf>. MA DPU docket details available at docket 18-64, <https://eeaaonline.eea.state.ma.us/DPU/Fileroom/dockets/bynumber>.

<sup>13</sup>Petition of NSTAR Electric Company d/b/a Eversource Energy for Approval of Proposed D.P.U. 18-64 Long Term Contracts for Clean Energy Projects Pursuant to Section 83D of An Act Relative to Green Communities, St. 2008, c. 169, as amended by St. 2016, c. 188, § 12, DPU 18-64, et al., Application Joint



plant would be better than some renewable generators because its electricity output would also be firm.) Note that 1,090 MW is larger than both of Invenenergy's proposed turbines, and well over double Invenenergy's existing CSO of 485 MW acquired in FCA-10. It is estimated that NECEC will be in commercial operation by December 2022.

Also pursuant to MA's 2016 Energy Diversity Act, the Vineyard Wind offshore wind project in Massachusetts was approved by the MA Department Of Energy Resources, and is now before the MA DPU, at a levelized price of power of \$65/MWh, for 800 MW of nameplate capacity to be installed by January 2023, with the first 400 MW by January 2022.<sup>14</sup> The capacity credit of this project will likely range from 30%-37%, or possibly higher.<sup>15</sup>

Rhode Island announced procurement of 400 MW (nameplate) of offshore wind, Revolution Wind, installed by 2023.<sup>16</sup>

Connecticut announced procurement of 200 MW of offshore wind, incremental to the RI procurement from Revolution Wind, installed by 2023.<sup>17</sup>

As I discussed above, these large new procurements of renewable energy come in the context of the ISO having significant surplus capacity today and projected peak load (and therefore capacity supply procurement needs) declining over the coming decade.

In addition, the new Massachusetts energy law, addressed in the next section, also includes the ability for the Massachusetts Department Of Energy Resources to investigate procurement of up to an additional 1,600 MW of offshore wind power by 2035, an increment above the 2016

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Testimony of Waltman/Brennan/ Furino D.P.U. 18-64/D.P.U. 18-65/ D.P.U. 18-66 July 23, 2018. Page 37 indicates that capacity of the NECEC at its delivery point in Maine is 1,090 MW. Available at <https://eeaonline.eea.state.ma.us/EEA/FileService/FileService.Api/file/FileRoom/9636755>.

<sup>14</sup> See filing letter at <https://macleanenergy.files.wordpress.com/2018/08/doer-83c-filing-letter-dpu-18-76-18-77-18-78august-1-2018.pdf>. MA DPU docket details available at docket 18-76, <https://eeaonline.eea.state.ma.us/DPU/Flerom/dockets/bynumber>.

<sup>15</sup> ISO New England, *2015 Economic Study—Evaluation of Offshore Wind Deployment* (September 2, 2016), [https://www.iso-ne.com/static-assets/documents/2016/09/2015\\_economic\\_study\\_offshore\\_wind\\_development\\_final.docx](https://www.iso-ne.com/static-assets/documents/2016/09/2015_economic_study_offshore_wind_development_final.docx). Page 7. The 30-37% range is associated with peak hours between 2 and 6 PM. As additional solar PV is installed throughout New England, the peak hour is expected to shift to later hours, and the capacity credit associated with offshore wind will be higher, since offshore wind levels increase throughout the afternoon in the summer.

<sup>16</sup> Rhode Island Office of the Governor, Press Release, May 23, 2018, <https://www.ri.gov/press/view/33287>.

<sup>17</sup> Connecticut Governor's office and CT Department of Energy and Environment Protection (DEEP) press release, June 13, 2018, <https://www.ct.gov/deep/cwp/view.asp?A=4965&Q=603300>. Revolution Wind, <http://dwwind.com/project/revolution-wind-ct/>.



Energy Diversity Act's directive for Massachusetts to procure its first 1,600 MW of offshore wind power by 2027 (800 MW of which has now been procured).

## **7. Massachusetts New Energy Law and FERC Approval of ISO NE Storage Resource Construct**

The state of Massachusetts passed energy legislation (H-4857) on July 31, 2018.<sup>18</sup> The new energy law sets a storage target of 1,000 MWh by 2025, and the Massachusetts Department of Energy Resources has latitude to implement a number of policies including procurement methods to achieve the target. FERC issued its Order 841 in February 2018, directing ISOs to remove barriers to participation in wholesale markets by electric storage resources.<sup>19</sup> ISO NE is preparing a compliance filing by the end of this year to finalize improvements in the wholesale market tariff structure to allow storage resources to participate in the New England wholesale markets.<sup>20</sup> Pursuant to FERC's Order, storage resources of 100 kW and above can now participate in the ISO's Forward Capacity Market and annual Forward Capacity Auctions, thereby allowing aggregators to include smaller installations for capacity counting purposes. These steps provide further support to projections that increasing amounts of storage resources will be installed in New England, providing yet additional capacity. The ISO NE Interconnection Queue has 565 MW of battery storage capacity requesting interconnection since March 1, 2018.<sup>21</sup> In total, there is roughly 1,000 MW of battery storage in the Queue seeking interconnection.

The increased entry of storage resources into the ISO NE capacity and energy markets, indicated by (1) ISO NE's planned compliance filing to FERC Order 841; (2) commercial potential seen in the queuing of these resources for interconnection to the ISO NE market; and (3) the new Massachusetts' legislation, is important. Invenenergy says that its fossil-fueled power plant can serve as a backstop to variable output renewable energy resources. While this is true, it is also true that storage will be increasingly able to serve as a capacity resource complementing the energy provision of renewable energy resources.

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<sup>18</sup> Available at <https://malegislature.gov/Bills/190/H4857.pdf>.

<sup>19</sup> <https://www.ferc.gov/whats-new/comm-meet/2018/021518/E-1.pdf>.

<sup>20</sup> ISO NE August 2018 presentation available here [https://www.iso-ne.com/static-assets/documents/2018/08/a7\\_presentation\\_order\\_841\\_compliance.pptx](https://www.iso-ne.com/static-assets/documents/2018/08/a7_presentation_order_841_compliance.pptx).

<sup>21</sup> See ISO NE interconnection queue as of 9/6/2018 at <https://irtt.iso-ne.com/reports/external>.