ISO New England Overview and Regional Update

Vermont System Planning Committee

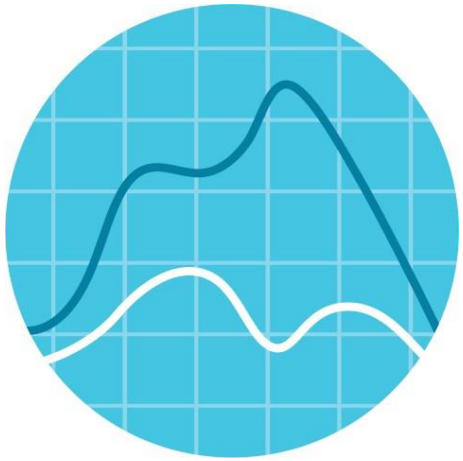
April 2019 Quarterly Meeting

Molly Connors

EXTERNAL AFFAIRS REPRESENTATIVE

ISO REPORTS AND UPCOMING ACTIVITIES

ISO-NE Reports and Activities

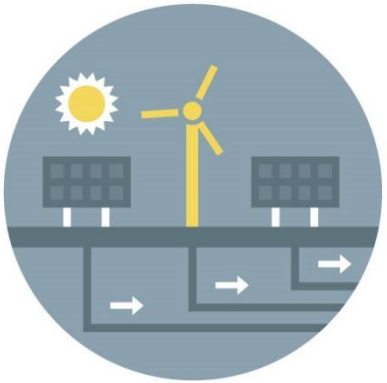


Available Now:

- Draft 2019 ISO-NE Annual Energy and Summer Peak Forecast
- 2019 *Regional Electricity Outlook*
- Continuous Storage Facility Participation Webinar

  Presentation and recording now available

ISO-NE Reports and Activities



Coming Soon:

- **Energy-Efficiency and Solar Photovoltaic (PV) Forecasts**
  - Scheduled for release by May 1, 2019 in the annual CELT report
- **Consumer Liaison Group**
  - June 13, September 5, and December 5
  - Meeting agendas, presentations, and summaries will be posted on the CLG webpage
- **Planning Advisory Committee - Grid Transformation Day**
  - **Thursday, May 23** in Westborough, MA
  - Agenda and registration information are on the PAC website
- **2019 Regional System Plan Public Meeting**
  - Thursday, September 12 in Boston, Mass
  - Agenda and speakers will be posted on the ISO website

ISO-NE Reports and Activities

Of Interest:

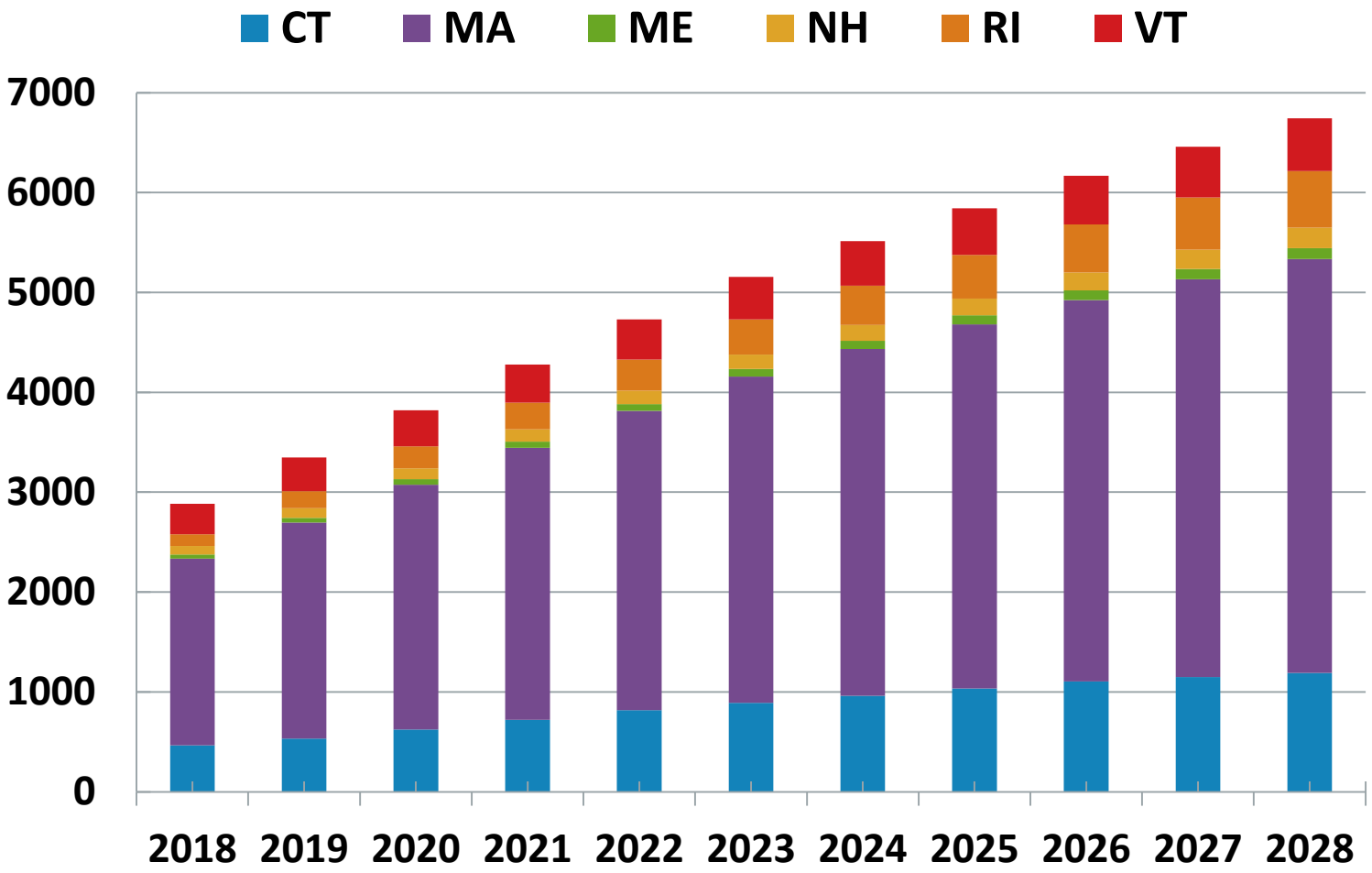
Spotlight: An Integrated Approach to Wind Power

- New England has **enough wind energy** to power **more than a million homes**
- ISO New England has undertaken a **number of initiatives** to integrate wind resources into the power system
- These videos detail the work being done **behind the scenes** at ISO New England **to weave wind** energy into our operations, markets, and system planning procedures

SOLAR PV FORECAST

Final 2019 PV Forecast

Cumulative Nameplate Installed, MW_{ac}

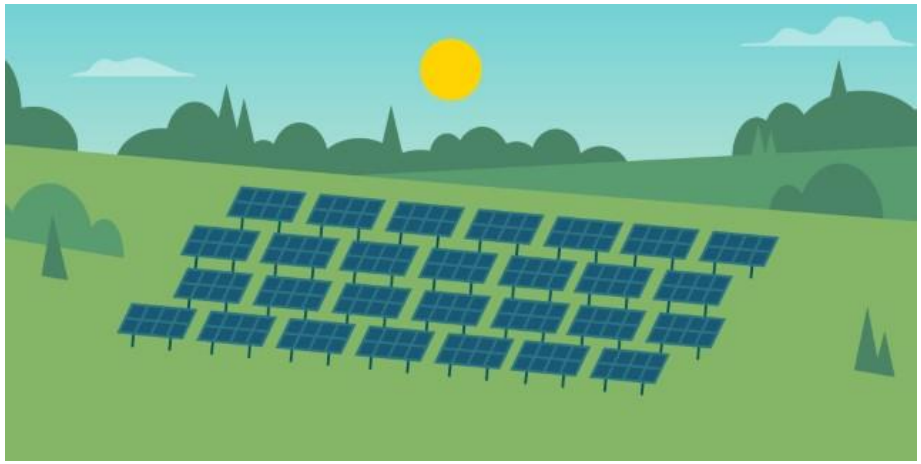


Source: Final 2019 PV Forecast. Available at https://www.iso-ne.com/static-assets/documents/2019/03/3_final-pv-forecast-2019-mar19.pdf.

Distributed Generation Forecast Working Group

Next Steps

- **May 1, 2019**: 2019 CELT report issued
- **October 2, 2019**: Held for discussion of new issues, as appropriate (WebEx)
- **December 5, 2019**: Review state policies and PV survey results

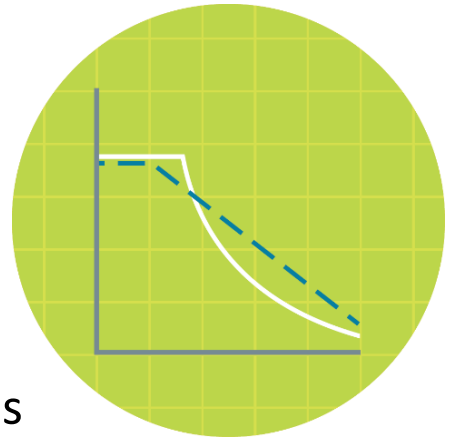


FORWARD CAPACITY AUCTION #13

June 1, 2022 – May 31, 2023 Capacity Commitment Period

ISO New England Administered the Thirteenth Forward Capacity Auction (FCA #13) in February

- FCA #13 was held on February 4-5, 2019 to procure the capacity resources needed to meet demand for electricity, plus reserve requirements, during the **June 1, 2022 to May 31, 2023** capacity commitment period
- The auction concluded with **sufficient resources** to meet the installed capacity target of 33,750 MW, with the lowest clearing price in six years due to surplus capacity
- The **clearing price** in the auction was **$3.80** per kilowatt-month (kW-month) across all of New England, compared to $4.63/kW-month in last year's auction
  - No price separation among the three capacity zones



FCA #13 Attracted and Retained a Variety of Resources to Ensure Resource Adequacy in 2022-2023

- The auction concluded with commitments from **34,839 MW** of capacity to be available in 2022-2023
  - 29,611 MW of **generation**
  - 4,040 MW of **energy-efficiency and demand-reduction measures**
  - 1,188 MW of **imports** from New York, Québec and New Brunswick
- Roughly **145 MW** of resources received obligations under the renewable technology resource (RTR) exemption
  - Including **solar** and **solar+battery** projects
  - More than **300 MW** remain under the RTR exemption
- ISO New England retained two units, **Mystic 8 and 9**, needed for fuel security

FCA #13 Featured the First Substitution Auction for Sponsored Policy Resources

- The first *Competitive Auctions with Sponsored Policy Resources* (CASPR) **substitution auction** was held in conjunction with FCA #13 for state-sponsored resources seeking commitments in the 2022-2023 timeframe
- The CASPR design is intended to:
  - **Accommodate** sponsored policy resources into the Forward Capacity Market over time, and
  - **Preserve** competitively based capacity pricing for other resources

- The substitution auction closed with **Vineyard Wind**, an offshore wind project in development off the coast of Massachusetts, assuming an obligation of **54 MW** from an existing resource that will retire in 2022-2023

ENERGY SECURITY

ISO New England Is Pursuing Short- and Long-Term Solutions to Address Energy-Security Challenges

- **Short-term**: In December 2018, the Federal Energy Regulatory Commission (FERC) accepted ISO New England's proposed tariff changes to **retain** resources seeking retirement on the basis of a **fuel-security reliability need** (in place for FCA #13, 14 and 15)

- The ISO committed to addressing the impacts of retaining resources for fuel security and is, therefore, proposing an **interim compensation mechanism** to provide similar compensation to similarly situated resources

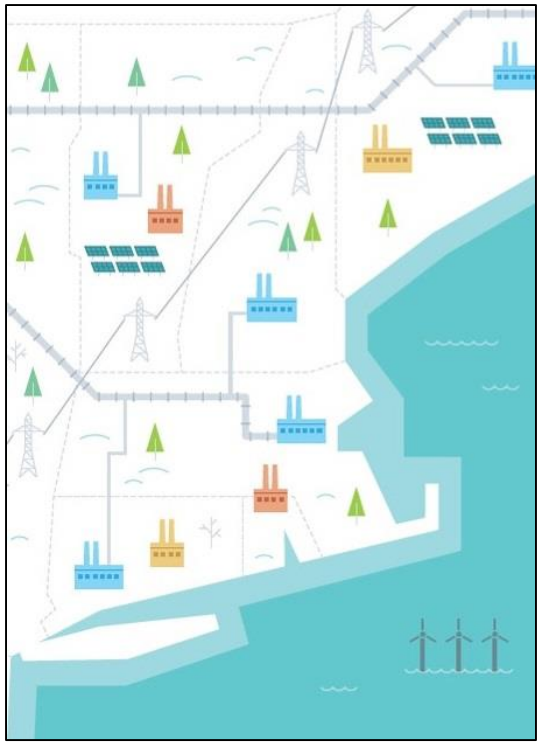
The Interim Compensation Mechanism Will Serve as a Bridge to the Long-Term Solution

- The ISO filed its proposal with FERC on March 25
  - The program aims to provide compensation for generators to maintain greater stores of energy or fuels than they would otherwise keep on hand

- Under the proposal, **eligible resources** include
  - Batteries
  - Biomass/refuse
  - Coal
  - Demand response (if distributed generation with eligible technology)
  - Hydro (if on-site or upstream reservoir/pondage controlled by participant)
  - Natural gas (if supply contract for firm delivery of gas to New England)
  - Nuclear
  - Oil
- ISO New England estimates **direct program costs** in the range of $112 million to $158 million per year

ISO New England Has Proposed A Long-Term, Market-Based Solution to Improve Energy Security

- **On April 1**, the ISO issued a **discussion paper** on the proposed design
- The ISO is working toward making a filing with FERC by **October 15, 2019**
  - Changes to be implemented on **June 1, 2024**
  - Aligns with the capacity commitment period for **FCA #15**
- The ISO is launching a formal **quantitative and qualitative analysis** this summer, with completion expected this fall



The ISO's Long-Term Solution Focuses on Energy Optimization

- **Changes the Current Day-Ahead Energy Market to a Multi-Day-Ahead Market (M-DAM)**
  - Procure resources over a rolling, multi-day-ahead horizon to provide a forward price signal for resources to replenish fuel inventories when prospective supplies are tight and to avoid prematurely depleting limited energy

- **Adjusts Markets to Include Three New Ancillary Services Co-optimized with a Multi-Day-Ahead Market for Energy**
  - **Replacement Energy Reserves** – if a day-ahead cleared resource is unable to perform
  - **Generation Contingency Reserves** – for fast-start/fast-ramping generation contingency response
  - **Energy Imbalance Reserves** – when forecast load exceeds day-ahead cleared physical supply

- **Creates a New (Voluntary) Forward/Seasonal Market Ahead of the Winter Period**

FOR MORE INFORMATION…

Subscribe to the *ISO Newswire*

ISO Newswire is your source for regular news about ISO New England and the wholesale electricity industry within the six-state region

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ISO Express provides real-time data on New England's wholesale electricity markets and power system operations

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ISO to Go is a free mobile application that puts real-time wholesale electricity pricing and power grid information in the palm of your hand

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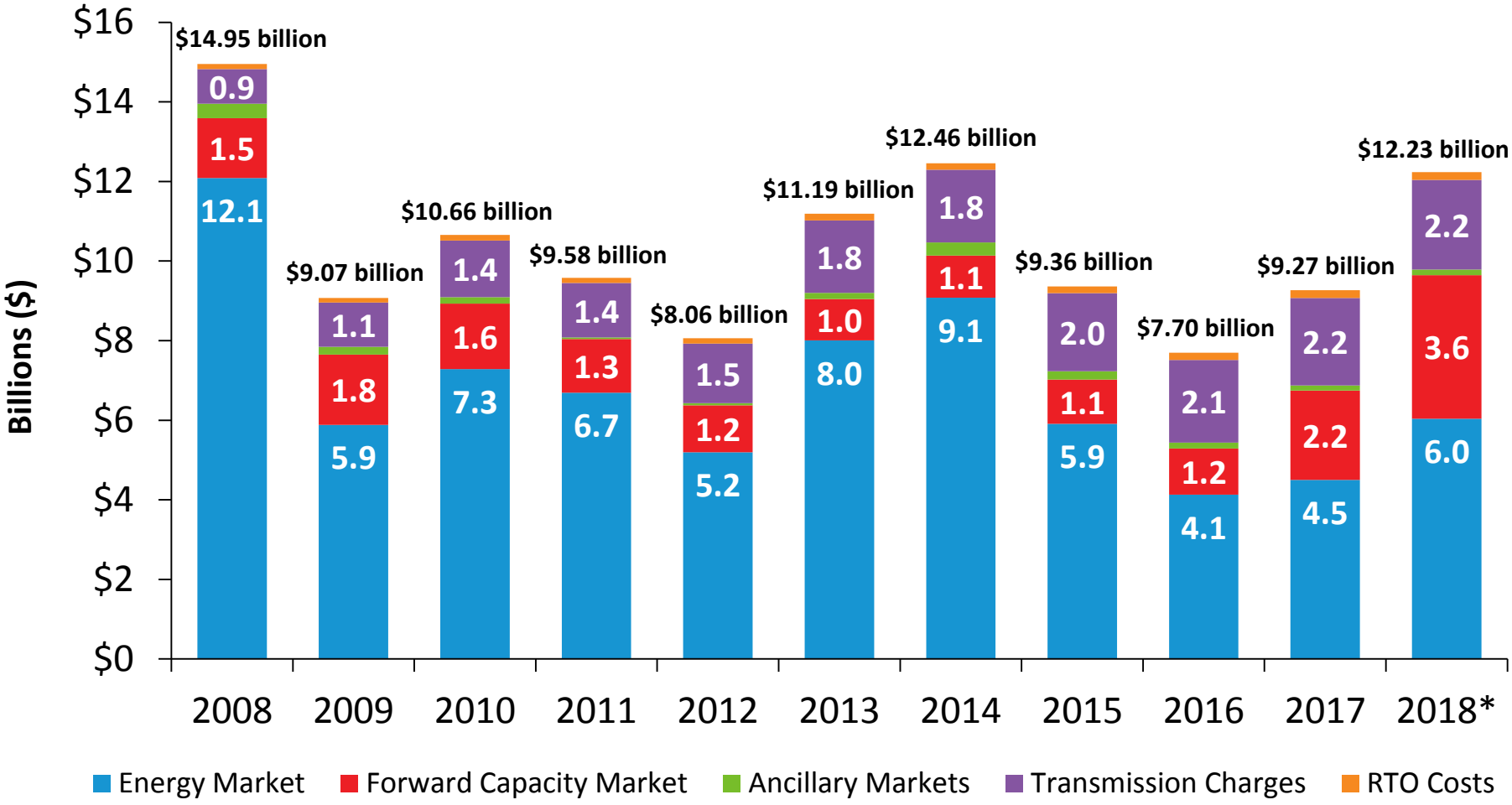
APPENDIX

Wholesale Electricity Costs

New England Wholesale Electricity Costs

Annual wholesale electricity costs have ranged from $7.7 billion to $15 billion



Source: *2018 Report of the Consumer Liaison Group*; * 2018 data is preliminary and subject to resettlement

Note: Forward Capacity Market values shown are based on auctions held roughly three years prior to each calendar year.

New England Wholesale Electricity Costs[a]

	2014		2015		2016		2017		2018	
	$ Mil.	¢/kWh	$ Mil.	¢/kWh	$ Mil.	¢/kWh	$ Mil.	¢/kWh	$ Mil.	¢/kWh
Wholesale Market Costs										
Energy (LMPs)[b]	$9,079	6.9	$5,910	4.5	$4,130	3.2	$4,498	3.5	$6,041	4.7
Ancillaries[c]	$331	0.3	$210	0.2	$146	0.1	$132	0.1	$143	0.1
Capacity[d]	$1,056	0.8	$1,110	0.8	$1,160	0.9	$2,245	1.8	$3,606	2.8
Subtotal	*$10,466*	8.0	*$7,229*	5.5	*$5,437*	*4.2*	*$6,875*	*5.4*	*$9,789*	*7.6*
Transmission charges[e]	$1,828	1.4	$1,964	1.5	$2,081	1.6	$2,199	1.7	$2,249	1.7
RTO costs[f]	$165	0.1	$165	0.1	$180	0.1	$193	0.2	$195	0.2
Total	**$12,459**	**9.5**	**$9,358**	**7.1**	**$7,698**	**5.9**	**$9,267**	**7.3**	**$12,233**	**9.4**

(a) Average annual costs are based on the 12 months beginning January 1 and ending December 31. Costs in millions = the dollar value of the costs to New England wholesale market load servers for ISO-administered services. Cents/kWh = the value derived by dividing the dollar value (indicated above) by the real-time load obligation. These values are presented for illustrative purposes only and do not reflect actual charge methodologies. *** The wholesale values for 2018 are preliminary and subject to resettlement.**

(b) Energy values are derived from wholesale market pricing and represent the results of the Day-Ahead Energy Market plus deviations from the Day-Ahead Energy Market reflected in the Real-Time Energy Market.

(c) Ancillaries include first- and second-contingency Net Commitment-Period Compensation (NCPC), forward reserves, real-time reserves, regulation service, and a reduction for the Marginal Loss Revenue Fund.

(d) Capacity charges are those associated with the Forward Capacity Market (FCM).

(e) Transmission charges reflect the collection of transmission owners' revenue requirements and tariff-based reliability services, including black-start capability, voltage support, and FCM reliability. In 2018, the cost of payments made to these generators for reliability services under the ISO's tariff was $37.0 million. Transmission charge totals for years 2010 forward reflect the refund of Schedule 1 TOUT charges to regional network load.

(f) RTO costs are the costs to run and operate ISO New England and are based on actual collections, as determined under Section IV of the *ISO New England Inc. Transmission, Markets, and Services Tariff*.