ISO New England Update

Consumer Liaison Group Meeting

Anne George

VICE PRESIDENT, EXTERNAL AFFAIRS AND CORPORATE COMMUNICATIONS

TODAY'S UPDATES

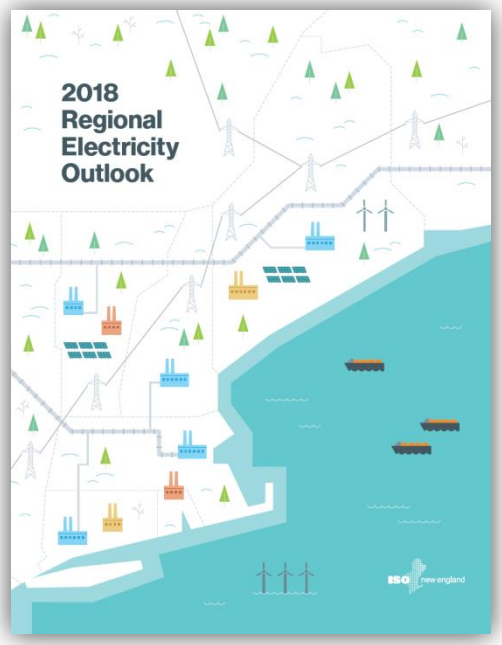
- ISO New England and Consumer Liaison Group Coordinating Committee Issue *2017 Report of the Consumer Liaison Group*
- ISO New England's *Operational Fuel-Security Analysis*
- Results of Forward Capacity Auction #12
- Preliminary Wholesale Electricity Costs for 2017

2017 Report of the Consumer Liaison Group Available, and CLG Meeting Dates Set for 2018

- The 2017 Report of the Consumer Liaison Group summarizes the **activities of the CLG in 2017**
  - The report also provides an update on ISO activities and initiatives, as well as wholesale electricity costs and retail electricity rates in New England
- Meeting dates set for **2018**:
  - March 1, 2018
  - June 14, 2018
  - September 20, 2018
  - December 6, 2018

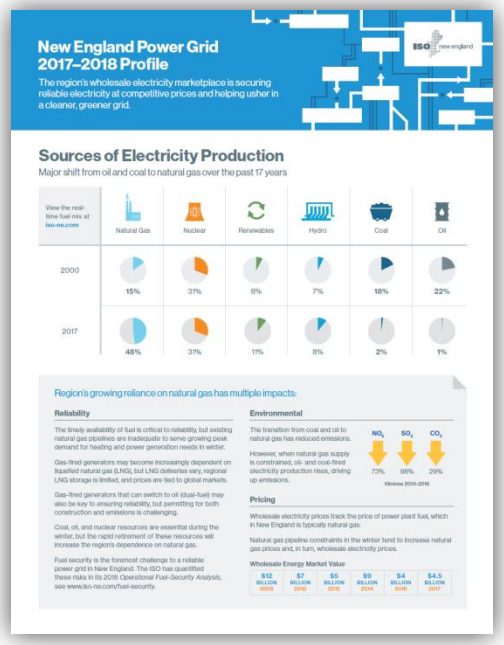
Source: https://www.iso-ne.com/committees/industry-collaborations/consumer-liaison/

ISO New England Releases Several New Publications



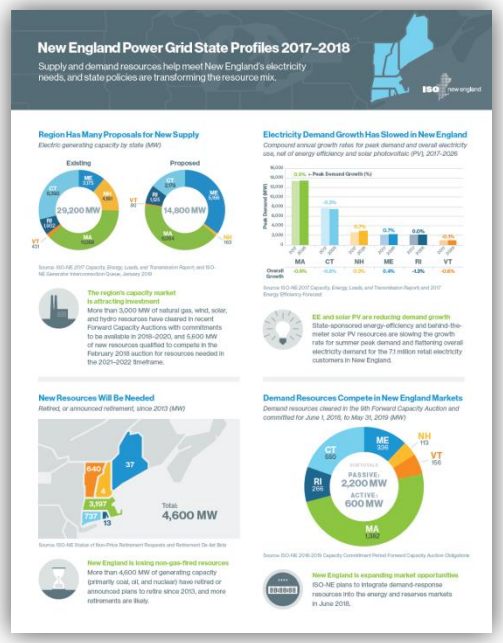
2018 Regional Electricity Outlook

Provides an in-depth look at New England's biggest challenges to power system reliability, the solutions the region is pursuing, and other ISO New England efforts to improve services and performance



New England Power Grid Profile

Provides key grid and market stats on how New England's wholesale electricity markets are securing reliable electricity at competitive prices and helping usher in a cleaner, greener grid



New England State Profiles

Provides state-specific facts and figures relating to supply and demand resources tied into the New England electric grid and state policies transforming the resource mix in the region

ISO NEW ENGLAND'S *OPERATIONAL FUEL-SECURITY ANALYSIS*

Study Seeks to Understand the Future Effects of Trends Already Affecting Power System Operations

- The analysis examines **23** possible fuel-mix combinations during the 2024-2025 winter, and quantifies each case's **fuel-security risk**
  - *i.e.,* the number and duration of **energy shortfalls** that would require implementation of emergency procedures to maintain reliability

- The study assumed **no additional natural gas pipeline capacity** to serve generators would be added during the study timeframe
- The study is **not** a precise prediction of future system conditions; rather, it seeks to illustrate the **range of potential risks** that could confront the power system if fuel and energy were constrained during the winter

Study Modeled a Wide Range of Resource Combinations Considering Five Key Fuel Variables

1. 

Retirements of coal- and oil-fired generators (the study assumes that New England will have no coal-fired power plants in winter 2024/2025)

2. 
Imports of electricity over transmission lines from New York and Canada

3. 
Dual-fuel oil tank inventories (i.e., how often on-site oil tanks at dual-fuel power plants are filled throughout the winter)

4. 

Level of liquefied natural gas (LNG) injections into the region's natural gas delivery and storage infrastructure

5. 
Level of renewable resources on the system

Study Suggests Six Major Conclusions

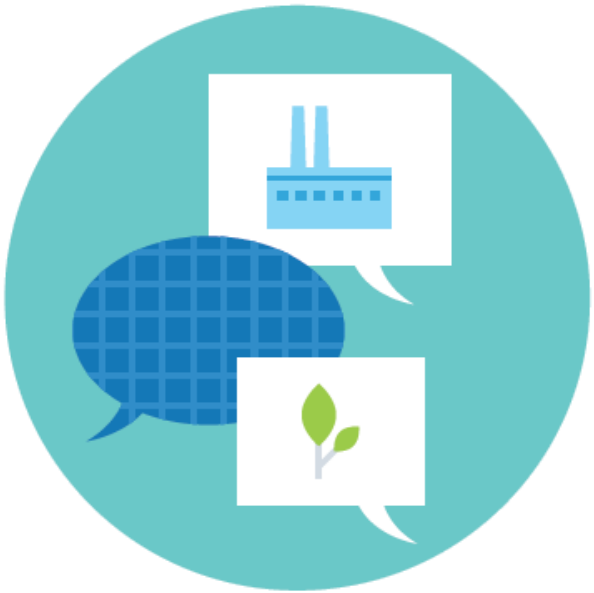
1. **Outages**: The region is vulnerable to the season-long outage of any of several major energy facilities
2. **Key Dependencies**: Reliability is heavily dependent on LNG and electricity imports; more dual-fuel capability is also a key reliability factor
3. **Logistics**: Timely availability of fuel is critical, highlighting the importance of fuel-delivery logistics
4. **Risk**: All but four of 23 scenarios result in load shedding, indicating a trend towards increased fuel-security risk
5. **Renewables**: More renewables can help lessen fuel-security risk, but are likely to drive oil-and coal-fired generator retirements which, in turn, require more LNG
6. **Positive Outcomes**: Higher levels of LNG, imports, and renewables can minimize system stress and maintain reliability; delivery assurances and transmission expansion would be needed

Rollout of *Operational Fuel-Security Analysis* and Request for Stakeholder Input

- ISO New England President and CEO Gordon van Welie testified before **U.S. Senate Energy and Natural Resources Committee** along with DOE, FERC, and PJM on January 23
  - ISO's testimony is available here: https://www.iso-ne.com/static-assets/documents/2018/01/testimony_gordonvanwelie_january232018.pdf
- ISO presented the results of the study to the **NEPOOL Reliability Committee** on January 24
- ISO has provided stakeholders the opportunity to request alternative assumptions and scenarios for analysis

Next Steps: ISO New England Will Continue to Discuss the Results of the Study with Stakeholders

- As the region's grid operator responsible for **reliability**, the ISO must independently assess the level of risk to reliable power system operations
- A **key question** to be addressed will be the level of fuel-security risk that the ISO, the region, policymakers, and regulators are willing to tolerate
- Discussions with **stakeholders** on potential solutions to address the region's fuel-security risks are targeted to begin later in 2018

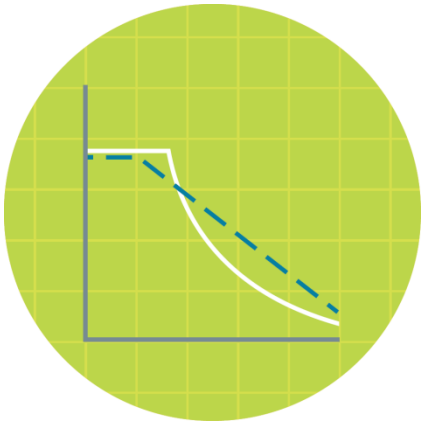


FORWARD CAPACITY AUCTION #12

June 1, 2021 – May 31, 2022 Capacity Commitment Period

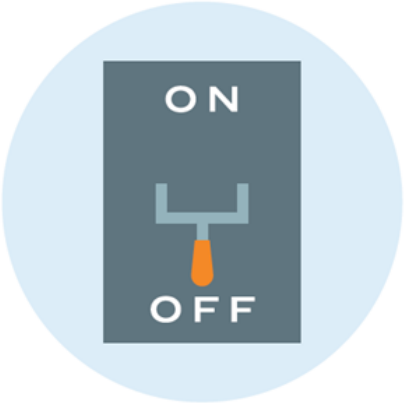
ISO New England Administered the Twelfth Forward Capacity Auction (FCA #12) in February 2018

- FCA #12 was held on February 5-6 to procure the resources needed to meet demand for electricity during the **June 1, 2021 to May 31, 2022** capacity commitment period
- The auction concluded with **sufficient resources** to meet demand in the 2021-2022 timeframe, with the lowest clearing price in five years due to surplus capacity
- The **clearing price** in the auction was $4.63 per kilowatt-month (kW-month) across all of New England, compared to $5.30/kW-month in last year's auction
  - No price separation among the three capacity zones



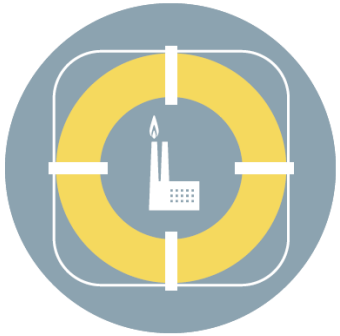
FCA #12 Attracted and Retained a Variety of Resources to Ensure Resource Adequacy in 2021-2022

- The auction concluded with commitments from **34,828 MW** of capacity to be available in 2021-2022
  - 30,011 MW of **generation**, including 174 MW of new generation
  - 3,600 MW of **energy-efficiency and demand-reduction measures**, including 514 MW of new demand-side resources
  - 1,217 MW of total **imports** from New York, Québec and New Brunswick
- No new large-scale generators cleared in the auction
- Roughly 500 MW of capacity submitted **retirement de-list bids** that were accepted in advance of FCA #12



ISO New England Retained Roughly 1,300 MW of Capacity to Ensure Local Reliability

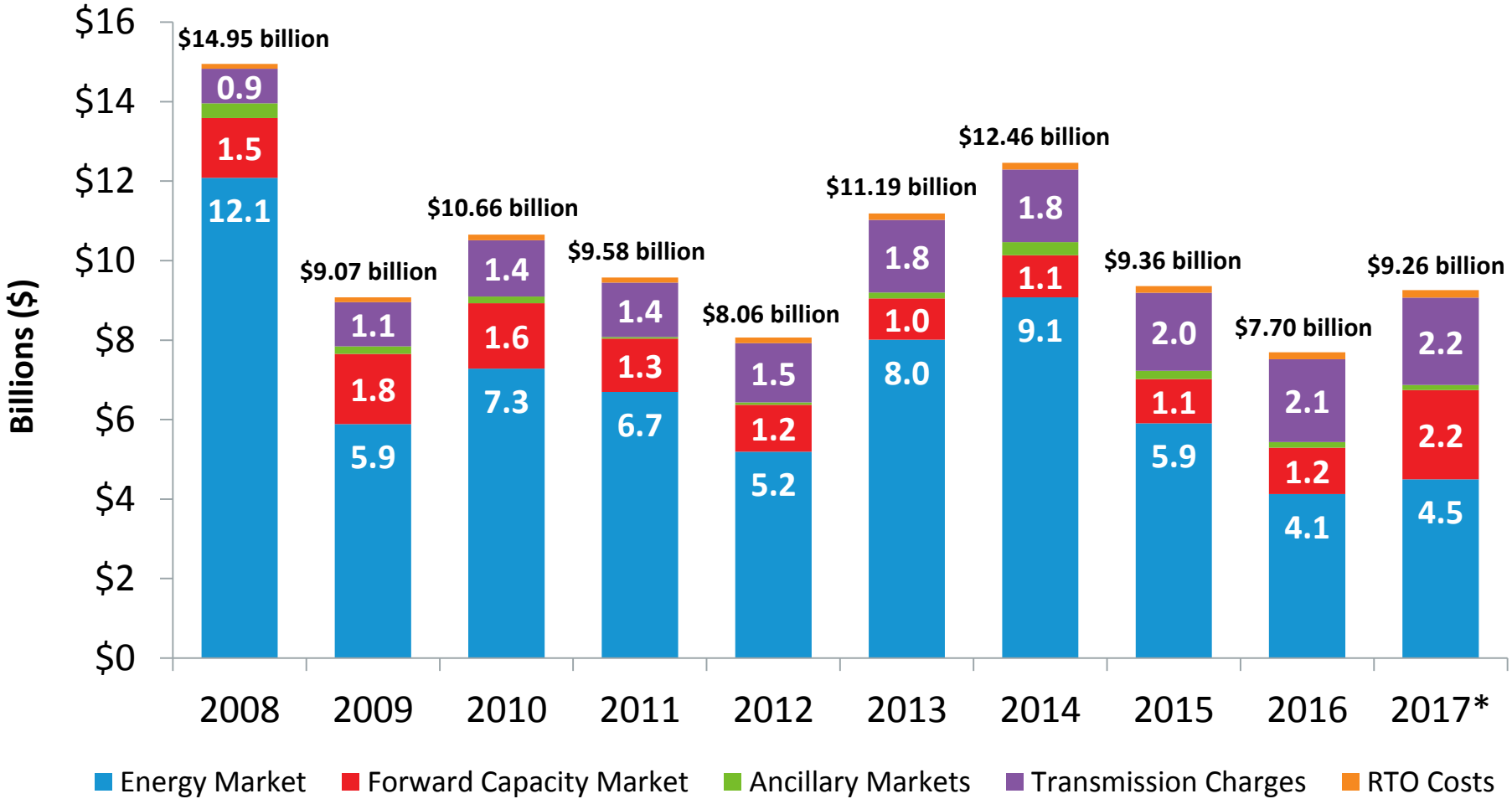
- While the auction secured sufficient capacity to meet demand systemwide for 2021-2022, some existing resources dropped out during the auction by submitting a **dynamic delist bid**
- When a resource seeks to delist, or remove itself, from the capacity market, the ISO conducts a **reliability review** to determine if the power system can maintain system reliability without that resource
  - Reliability reviews were conducted on resources totaling roughly **2,775 MW** that submitted delist bids during the auction to withdraw from the capacity market for one year
- If transmission security could be jeopardized, the ISO can **reject** a one-year delist bid and **retain** a resource
  - ISO retained two units to ensure local reliability



WHOLESALE ELECTRICITY COSTS FOR 2017

New England Wholesale Electricity Costs

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



Source: *2017 Report of the Consumer Liaison Group*; * 2017 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]

	2013		2014		2015		2016		2017*	
	$ Mil.	¢/kWh	$ Mil.	¢/kWh	$ Mil.	¢/kWh	$ Mil.	¢/kWh	$ Mil.	¢/kWh
Wholesale Market Costs										
Energy (LMPs)[b]	$8,009	6.0	$9,079	6.9	$5,910	4.5	$4,130	3.2	$4,498	3.5
Ancillaries[c]	$152	0.1	$331	0.3	$210	0.2	$146	0.1	$127	0.1
Capacity[d]	$1,039	0.8	$1,056	0.8	$1,110	0.8	$1,160	0.9	$2,244	1.8
Subtotal	*$9,200*	*6.9*	*$10,466*	*8.0*	*$7,229*	*5.5*	*$5,437*	*4.2*	*$6,869*	*5.4*
Transmission Charges[e]	$1,822	1.4	$1,828	1.4	$1,964	1.5	$2,081	1.6	$2,199	1.7
RTO Costs[f]	$167	0.1	$165	0.1	$165	0.1	$180	0.1	$193	0.2
Total	**$11,189**	**8.4**	**$12,459**	**9.5**	**$9,358**	**7.1**	**$7,698**	**5.9**	**$9,261**	**7.3**

(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 2017 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 transitional Installed Capacity (ICAP) Market through May 2010 and the Forward Capacity Market (FCM) from June 2010 forward.

(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 2017, the cost of payments made to these generators for reliability services under the ISO's tariff was $35.4 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*.

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
- Log on to **ISO Express**
  - ISO Express provides real-time data on New England's wholesale electricity markets and power system operations
- Follow the ISO on **Twitter**
  - @isonewengland
- Download the **ISO to Go App**
  - 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

Mark Your Calendars!

Consumer Liaison Group Meeting Dates for 2018:

June 14, 2018
September 20, 2018
December 6, 2018

Questions