



ISO New England Overview and Regional Update

*Vermont System Planning Committee
July 2020 Quarterly Meeting*

Molly Connors

EXTERNAL AFFAIRS REPRESENTATIVE



RECENT REPORTS AND ACTIVITIES

Coming Soon, Of Interest

2019 Annual Markets Report

2020 Summer Outlook

Transmission Planning

ISO-NE Reports and Activities

Coming Soon

- [Consumer Liaison Group Quarterly Meetings](#)
 - September 17: Carbon Pricing (via WebEx)
 - December 2 (Details TBD)

Of Interest

- [COVID-19 Update:](#)
 - Details regarding workforce re-entry, observations on electricity demand
- [Wholesale Energy Market Prices in May 2020 Hit Record Low](#)
 - Day-ahead electricity prices lowest in market history, real-time third-lowest
- [For the Second Year in a Row, the ISO Sponsored a Senior Design Capstone Project at the University of Connecticut](#)
 - This year's project, *Generator Model Verification Result Analysis System*, required the students to analyze power plant model performance



Wholesale Electricity Markets Operated Competitively Last Year, According to *2019 Annual Markets Report*

- In May, ISO New England's **Internal Market Monitor (IMM)** issued the *2019 Annual Markets Report (AMR)*
 - The IMM functions **independently** of ISO management and reports directly to the ISO Board of Directors
- The AMR assesses the **state of competition** in the wholesale electricity markets administered by the ISO during the most recent operating year (January to December)
- The AMR also presents the **most important findings, market outcomes, and market design changes** of New England's wholesale electricity markets for 2019



Note: The *2019 Annual Markets Report* is available at <https://www.iso-ne.com/static-assets/documents/2020/05/2019-annual-markets-report.pdf>

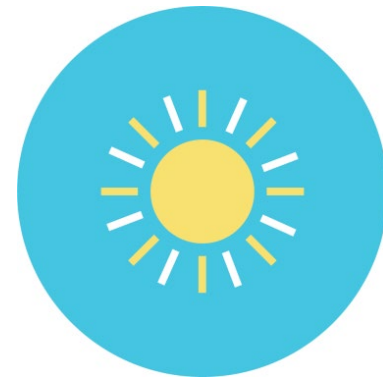
Highlights from the 2019 Annual Markets Report

Markets performed well and exhibited competitive outcomes in 2019

- The **total cost** of wholesale electricity in 2019 was **\$9.8 billion**, representing a 19% (or \$2.8 billion) decrease compared to 2018
 - Largely due to lower natural gas prices and demand for electricity
- Energy market costs totaled **\$4.1 billion** in 2019, representing a 32% (or \$1.9 billion) decrease compared to 2018
 - Due to milder weather during the high-electricity-demand seasons of summer and winter
 - Natural gas prices averaged **\$3.26/MMBtu** in 2019 down by \$1.69/MMBtu on 2018 prices (representing a **34% decrease**)
- Capacity market costs totaled **\$3.4 billion** in 2019, representing a 6% (or \$.2 billion) decrease compared to 2018
 - Driven by clearing prices in the ninth and tenth Forward Capacity Auctions



Summer Outlook Highlights



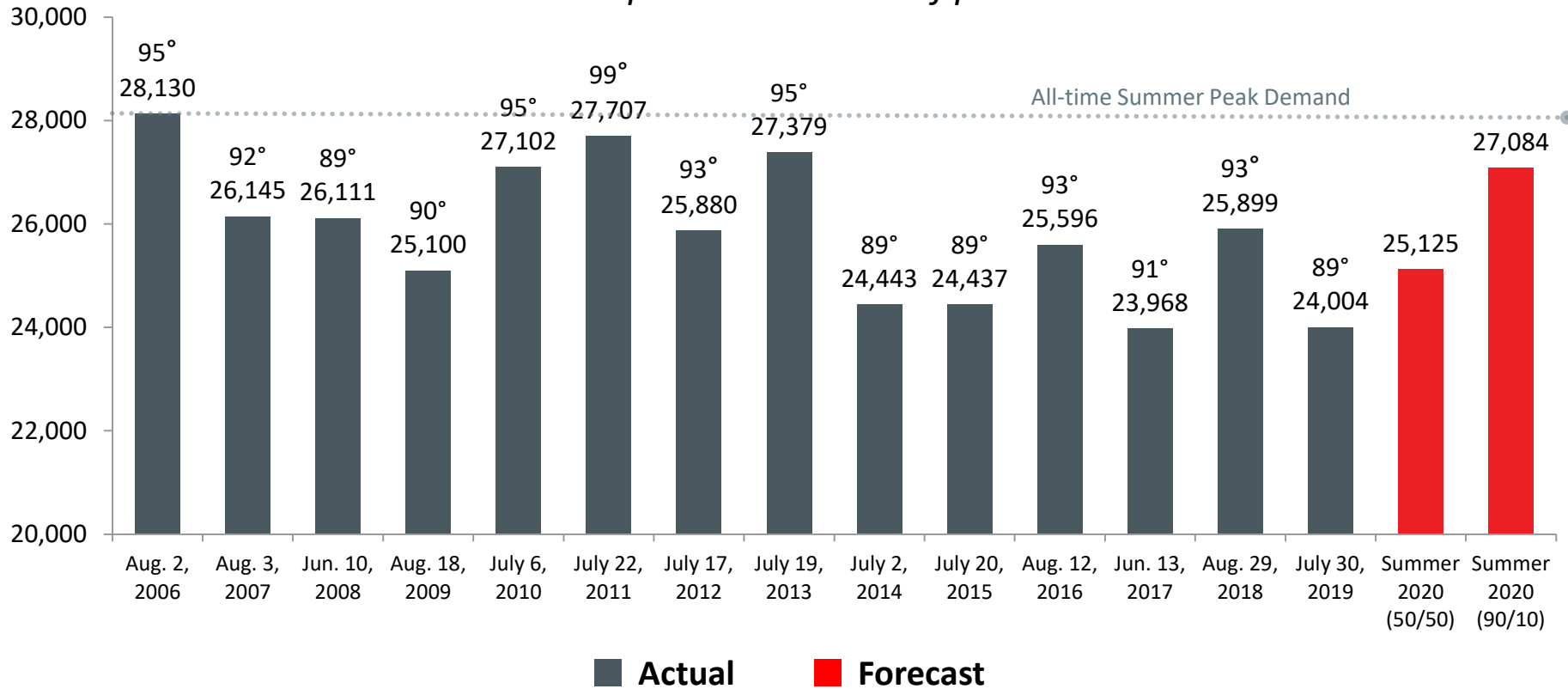
- New England is expected to have the necessary resources to meet peak demand for electricity this summer under both typical and extreme weather conditions
 - Typical summer weather peak demand forecast: **25,125 MW**
 - Extreme summer weather peak demand forecast: **27,084 MW**
- Both forecasts take into account the demand-reducing effects of energy-efficiency measures (more than **3,300 MW**) acquired through the Forward Capacity Market and behind-the-meter solar (nearly **800 MW**)
- New England has more than **33,000 MW** of total capacity available this summer
- ISO issued its Summer Outlook press release on May 21, 2020

Summer Outlook Press Release: <https://www.iso-ne.com/about/news-media/press-releases/>

Weather Drives Summer Peak Demand

Historical and Projected Peak Demand in New England

Annual System Peak (MW) *and temperature at time of peak*



Note: Summer 2019 50/50 and 90/10 forecasted peaks include the demand-reducing effects of energy-efficiency measures acquired through the Forward Capacity Market and behind-the-meter solar.



TRANSITION TO THE FUTURE GRID

A collaborative effort among regional industry stakeholders, the New England states, and ISO New England



Stakeholders Are Exploring Potential Market and Reliability Issues Amid Evolving State Policies

- In April, NEPOOL, the ISO, and the New England States Committee on Electricity (NESCOE) launched the “**Transition to the Future Grid**” project
 - The group will **design** and **conduct** a study to help identify any operational and reliability needs for the region’s power system in the future
 - If needs are identified, a **gap analysis** will be conducted to determine whether there are any market deficits that need to be addressed to assure the continued reliable operation of the system
 - Based on the results from the gap analysis, potential wholesale regional market approaches **would be explored**
- **All materials** related to this project are on the ISO’s [website](#)



PLANNING ADVISORY COMMITTEE UPDATE

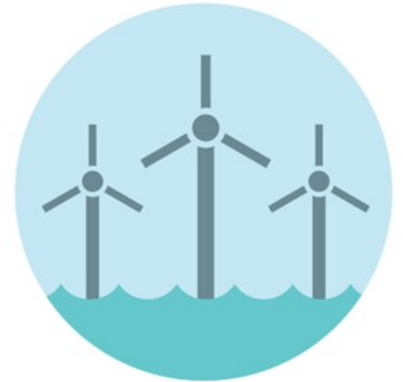
Reliability and Transmission Processes

Offshore-Wind Economic Studies

2020 Capacity, Energy, Loads, and Transmission (CELT) Report

Recent Planning Advisory Committee (PAC) Discussions Have Included Offshore Wind and Reliability Studies

- The [Planning Advisory Committee \(PAC\)](#) is an open stakeholder forum that provides input and feedback to the ISO on regional system planning
- Recent topics at the PAC have included:
 - The **Competitive RFP** for Boston (“Boston 2028 RFP”)
 - Transmission Planning for **Public Policy** (2020 Process)
 - **Two Economic Studies** focused on offshore wind
 - **One study** is in response to the New England States Committee on Electricity (NESCOE) and examines several scenarios for the integration of up to **8,000 MW** of offshore wind energy by **2030** and **2035**
 - **Another study** is in response to a request by Anbaric Development Partners LLC and examines the injection of up to 12,000 MW of offshore wind by 2030



The PAC Will Meet Next on July 22

- The 2019 NESCOE Economic Study is **complete and available** on the ISO's website
- The 2019 Anbaric Economic Study is underway
- A [new section of the ISO-NE website](#) has been developed and dedicated to Economic Studies
 - This section hosts Economic Study reports for the **last ten years** and related supporting documentation



ISO-NE PUBLISHES 2020 CAPACITY, ENERGY, LOADS, AND TRANSMISSION (CELT REPORT)

Includes First-Ever Heating and Transportation Electrification Forecasts

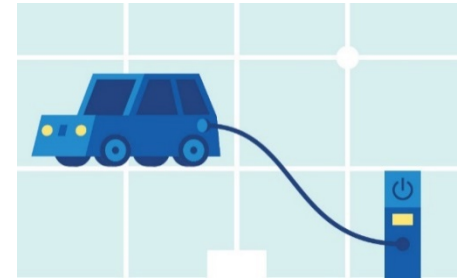
The CELT Report is a Primary Source for Assumptions Used in ISO System Planning and Reliability Studies

- The 2020 CELT Report projects both net energy usage and net peak **demand will increase slightly** over the 10-year period
 - Overall electricity use is expected to **increase by 0.4% annually**
 - This is an increase from the 2019 CELT, which reported an average annual **decrease of -0.4%**
- Peak demand under typical summer peak weather conditions is expected **to fall slightly**, by -0.2% over the 10-year period
 - From 25,125 MW in 2019 to 24,755 MW in 2029
- Winter peak demand is forecasted to increase an average of **about 0.1%** annually, under both normal and extreme conditions.
 - For normal winter weather, net peak demand is expected to increase from 20,166 MW in 2019 to 20,334 MW in 2029
- These forecasts include the demand-reducing impacts of solar PV and energy efficiency



The 2020 CELT Includes 10-Year Forecasts for Heating Electrification and Light-Duty Electric Vehicles

- The ISO seeks to capture the growth in **air source heat pumps** and **light-duty electric vehicles** and quantify the resulting increases in electricity demand
- Regarding heating, the ISO forecasts that **roughly 750,000** air source heat pumps will be installed in New England by 2029
 - Will have an estimated **661 MW** impact on winter peak in 2029
- Regarding **light-duty electric vehicles**, the ISO forecasts the deployment of **more than 515,000** vehicles region-wide
 - Additional load could contribute **282 MW** to summer peak demand in 2029 and **414 MW** to the winter peak in 2029
- The ISO recognizes that heating and transportation electrification are **nascent trends** and views its 2020 forecast methodology as a starting point



FOR MORE INFORMATION...



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Log on to ISO Express

[ISO Express](#) provides real-time data on New England's wholesale electricity markets and power system operations



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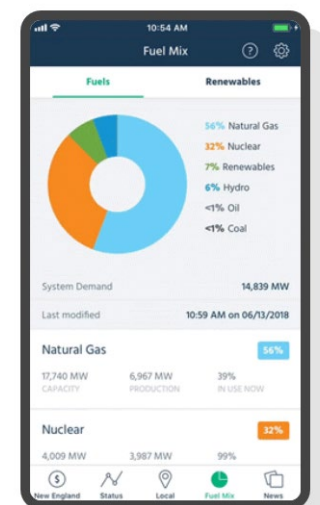
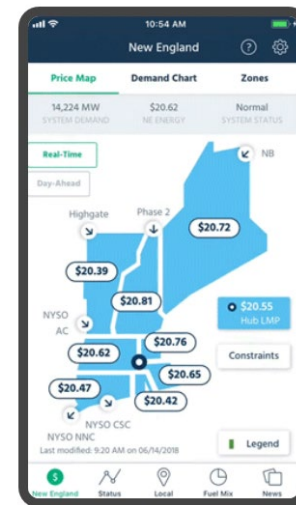


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Download the ISO to Go App

[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



Questions

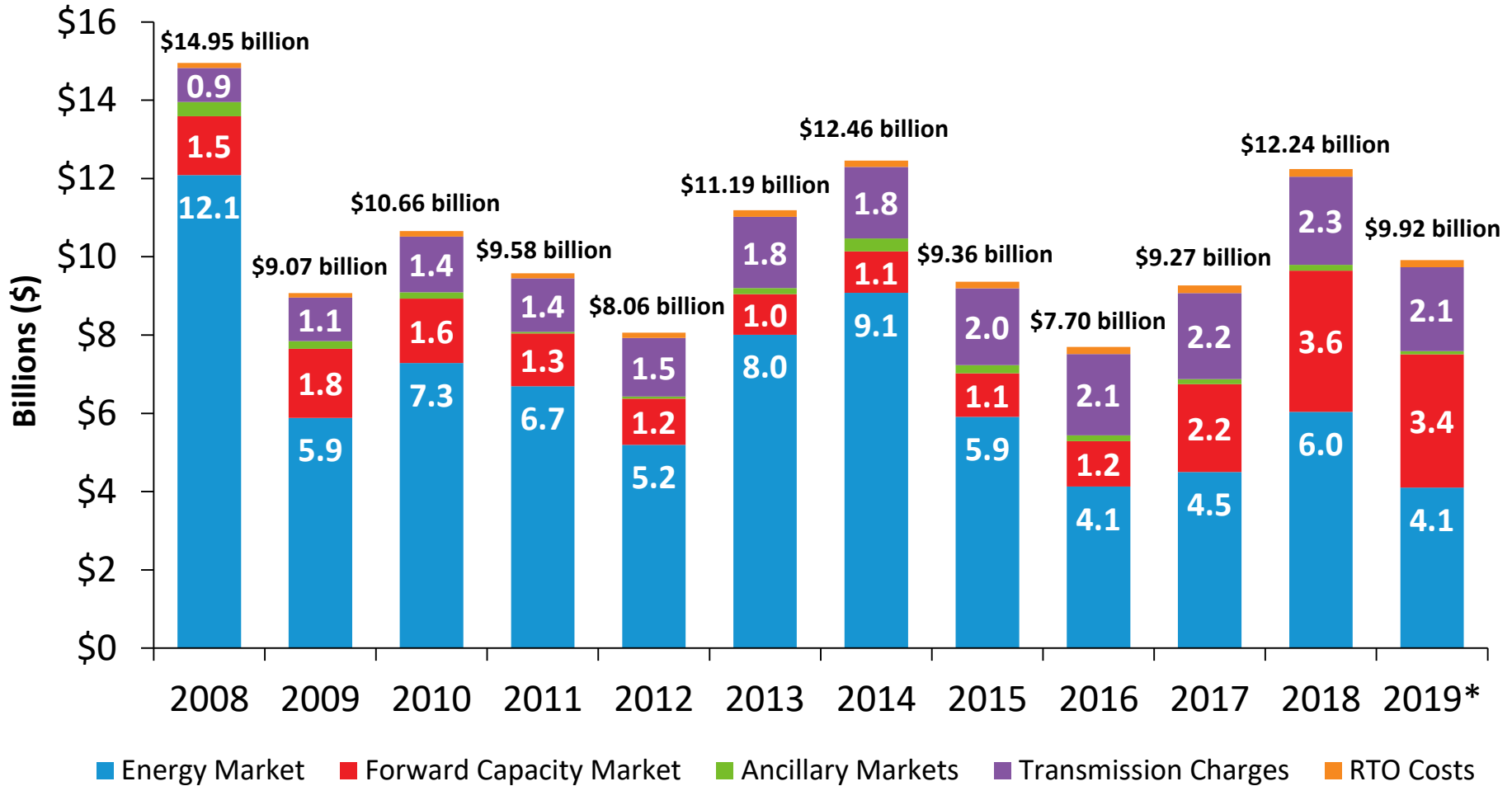


APPENDIX



New England Wholesale Electricity Costs

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



Source: [2019 Report of the Consumer Liaison Group](#); * 2019 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)

	2015		2016		2017		2018		2019*	
	\$ Mil.	¢/kWh	\$ Mil.	¢/kWh	\$ Mil.	¢/kWh	\$ Mil.	¢/kWh	\$ Mil.	¢/kWh
Wholesale Market Costs										
Energy (LMPs) ^(b)	\$5,910	4.5	\$4,130	3.2	\$4,498	3.5	\$6,041	4.7	\$4,105	3.3
Ancillaries ^(c)	\$210	0.2	\$146	0.1	\$132	0.1	\$147	0.1	\$81	0.1
Capacity ^(d)	\$1,110	0.8	\$1,160	0.9	\$2,245	1.8	\$3,606	2.8	\$3,401	2.7
Subtotal	\$7,229	5.5	\$5,437	4.2	\$6,875	5.4	\$9,794	7.6	\$7,586	6.0
Transmission charges^(e)	\$1,964	1.5	\$2,081	1.6	\$2,199	1.7	\$2,250	1.7	\$2,146	1.7
RTO costs^(f)	\$165	0.1	\$180	0.1	\$193	0.2	\$196	0.2	\$184	0.1
Total	\$9,358	7.1	\$7,698	5.9	\$9,267	7.3	\$12,240	9.4	\$9,915	7.9

(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 2019 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 2019, the cost of payments made to these generators for reliability services under the ISO's tariff was \$42.2 million. Transmission charge totals 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*.