

# Putting Markets to Work for New England



The region's wholesale electricity marketplace is securing reliable electricity at competitive prices and helping usher in a cleaner, greener grid.

## Why Markets?

New England restructured its power industry and launched wholesale electricity markets in the late 1990s based on several key principles:

**Competition** among wholesale electricity buyers and sellers yields prices that accurately reflect a resource's operating costs

**Efficiency and transparency** spur innovation and investment in new power resources and technologies to ensure power system reliability

**Investment risk** shifts from consumers to private investors

### Markets Select the Most Cost-Effective Resources to Meet Current and Future Electricity Needs

Close to 500 generators, importers, demand resources, and others compete to sell three types of wholesale electricity products and services through New England's markets. The markets select the lowest-priced offers that can meet real-time demand and ensure system reliability; they are neutral to resource type.

- Electric energy:** The Day-Ahead and Real-Time Energy Markets are forward and spot markets for trading electric energy. The energy price fluctuates throughout the day and at the different locations in New England, reflecting the amount of consumer demand, constraints on the system, and the price of fuel that power plants use to generate electricity.
- Short-term reliability services:** Resources compete in the ancillary markets to provide backup electricity as well as services needed to support the physical operation of the system, such as frequency regulation and voltage support. These services are critical during periods of heavy demand or system emergencies.
- Long-term reliability service:** Power resources compete in the Forward Capacity Market (FCM) to take on a commitment to be available to meet projected demand for electricity three years out. The FCM works in tandem with the energy markets to attract and sustain needed power resources today and into the future.

The prices established for these three products and services together make up the overall price of wholesale electricity. Buyers and sellers may also contract separately to trade wholesale electricity.

To ensure fairness, ISO New England has no financial stake in any companies doing business in the markets.

## Markets Are Transforming the Power Plant Fleet



Roughly 16,000 megawatts (MW) of new generation have come on line since 1999 – most are lower-emitting natural-gas-fired plants – giving the region one of the most efficient generation fleets in the country. Additions also include growing amounts of wind, solar, and other renewable resources – and as of January 2017, grid-scale battery storage.

Coal, oil, and nuclear generators are more expensive to operate than gas-fired resources, and some are retiring; the remaining coal and oil resources face stricter environmental requirements and run infrequently.



Over 2,700 MW of demand resources, such as energy efficiency, are registered in New England. These resources can help minimize the need for new power plants and transmission lines.

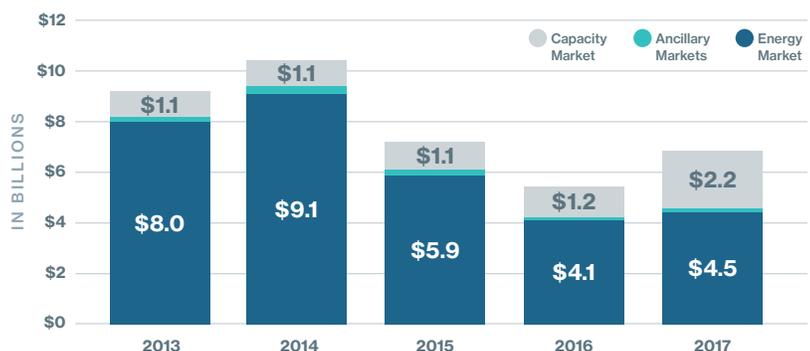
Emissions from regional generators have fallen significantly since 2001 as a result.



See [www.iso-ne.com/air-emissions](http://www.iso-ne.com/air-emissions) for additional statistics.

## Annual Value of Wholesale Electricity Markets in 2017 Among Lowest in a Decade

Despite December price spikes, 2017 had the second-lowest average annual energy market prices since 2003 because of lower prices and demand through most of the year; capacity market prices were higher to replace retiring generation.

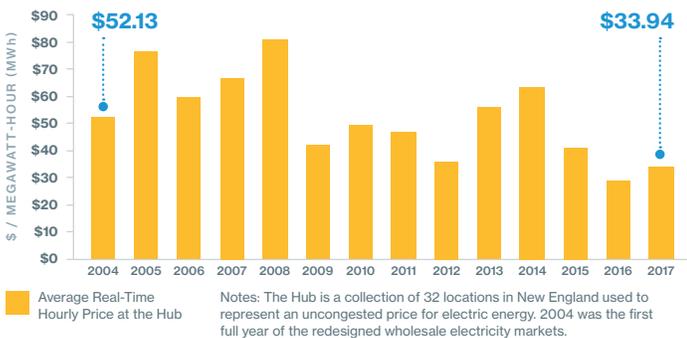


## Wholesale Electricity Prices Are Competitive Nationally When Natural Gas Is Unconstrained

With over 50% of the region's generators able to run on natural gas, the price of this single fuel sets the energy price most of the time. This linkage shows markets are working as designed, producing competitive prices that reflect generators' real-time fuel costs.

When the region's gas-fired generators have unconstrained access to low-cost natural gas from the nearby Marcellus shale (which emerged as a resource in 2008), New England's wholesale electricity prices are competitive nationally. The high efficiency of natural-gas-fired generators, coupled with typically low-priced shale gas, is largely responsible for a 35% decrease in the average price of New England's wholesale electricity between 2004 and 2017. These lower wholesale prices translate into lower power-supply charges for consumers.

### Low Natural Gas Prices Have Helped Drive Down the Average Annual Wholesale Electricity Price



## Working to Accommodate State Clean-Energy Goals and Competitive Markets

Even with low to no fuel costs, most renewable resources are still expensive to build and connect to the grid, so they aren't competitive in the wholesale marketplace. To meet clean-energy goals, New England states are pursuing long-term contracts and other types of incentives to spur the development of these resources.

But by offsetting construction and operating costs, resources that receive public financial backing gain a competitive market advantage over other resources needed to satisfy regional electricity needs, balance intermittent renewable generation, and provide grid stability services. Markets only work well when prices accurately reflect the costs of building and operating power resources. Accurate, transparent, competitive prices are essential to attracting and retaining cost-effective investment in all types of resources needed for reliability.

To help usher in more clean energy while protecting a robust market framework, the ISO is adding a substitution auction to the FCM so that new, sponsored renewable resources can take on the capacity commitment of (i.e. substitute) older, fossil fueled generators that want to retire, without undermining competitive pricing.



### About ISO New England

Created in 1997, ISO New England is the independent, not-for-profit corporation responsible for the reliable operation of New England's electric power generation and transmission system, overseeing and ensuring the fair administration of the region's wholesale electricity markets, and managing comprehensive regional electric power planning.

## Constrained Fuel Affects Price and Reliability

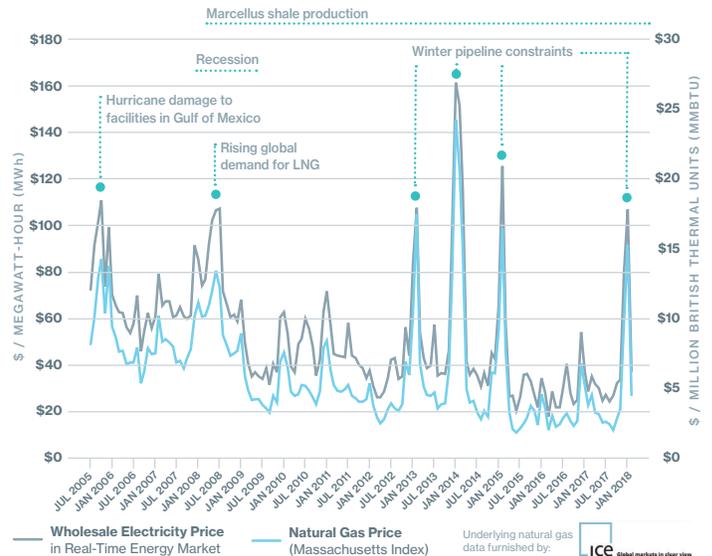


During very cold periods, the region's natural gas delivery infrastructure may not meet the heavy demand from both the electricity and heating sectors. When generators' access to gas supplies is limited, the region may face reliability concerns and price spikes (for example during winters 2013 and 2014 and the recent cold spell in December 2017–January 2018). The use of liquefied natural gas (LNG) can help fill the gap, but regional LNG storage is limited, international deliveries vary, and because it's traded globally, pricing can be expensive. Procurements of LNG and other stored fuels also often require advance arrangements.

These conditions, coupled with the region's ongoing loss of non-gas-fired generation, could threaten electric reliability during future severe cold spells. Oil-fired and nuclear generators, in particular, are still critical when natural gas is constrained or demand soars.

Ongoing regional discussions are focused on the complex question of how best to protect reliability in light of generator retirements and worsening regional fuel constraints. Market rule changes and other ISO interventions may help mitigate some of the reliability risk. However, effective long-term solutions will likely take concerted regional efforts that extend beyond the ISO's jurisdiction.

### Price Volatility Becomes More Acute as Constraints Become More Severe



- ▶ See ISO New England's *2018 Regional Electricity Outlook* ([iso-ne.com/reo](http://iso-ne.com/reo)) for more on the transformation of New England's wholesale electricity industry and the steps the region is taking to address challenges.
- ▶ Learn more about the ISO's role in designing and administering the region's markets at [iso-ne.com/about/what-we-do](http://iso-ne.com/about/what-we-do).
- ▶ Follow the regional discussion around fuel constraints at [iso-ne.com/fuel-security](http://iso-ne.com/fuel-security).