

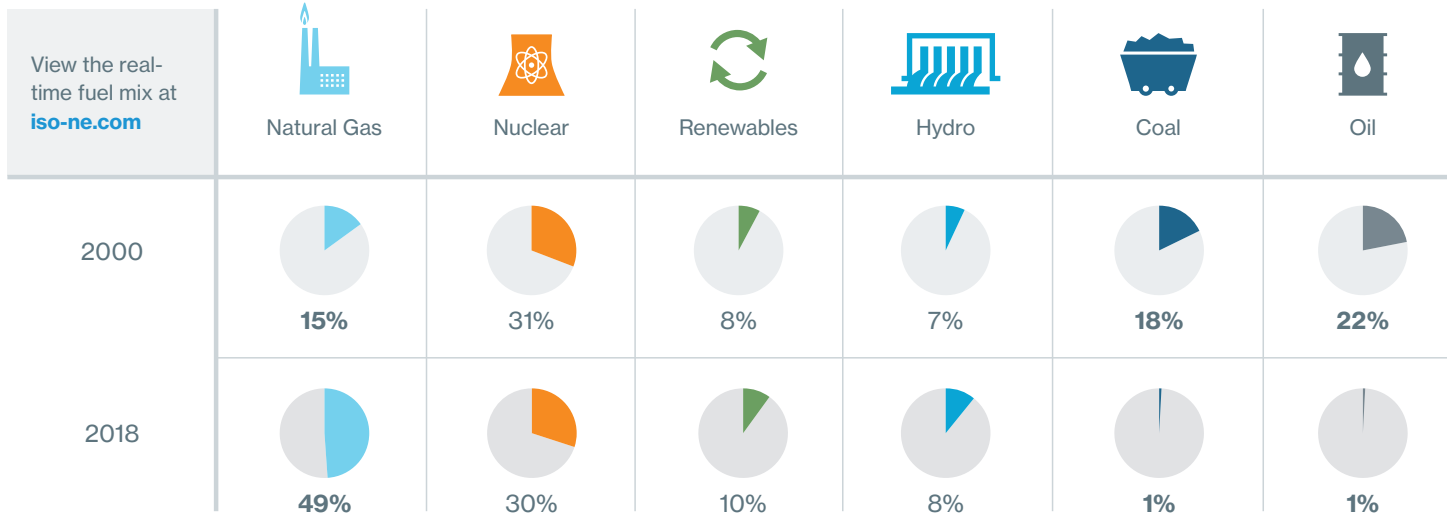
New England Power Grid 2018–2019 Profile

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

ISO new england

Sources of Electricity Production

Major shift from oil and coal to natural gas over the past 18 years



Region's power system is undergoing a rapid transformation. This transition has multiple impacts:

Changing Resource Mix and Emergence of a Hybrid Grid

New England's resource mix is transitioning from coal, oil, and nuclear power to natural gas-fired generation and renewable energy. Natural gas use has grown in New England due to advances in technology and abundant supplies of low-cost gas from nearby shale deposits. Today, it accounts for roughly half of the electricity generated in New England. At the same time, advances in technology and state support for renewable energy have led to significant increases in wind and solar power, and the New England states have plans to add additional supplies of clean energy to the power system in the coming years.

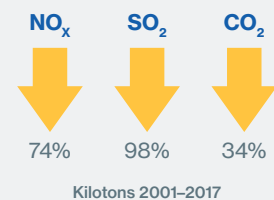
New England's *traditional* power system is rapidly becoming a *hybrid* system where electricity needs will be met by conventional resources and significant amounts of large-scale renewable resources connected to the regional transmission system, in combination with thousands of small resources connected directly to retail customers or local distribution utilities.

Maintaining reliable power system operations becomes more complex with the shift to resources that face constraints on energy production.

Environmental

The transition from coal and oil to natural gas has reduced emissions.

However, when natural gas supply is constrained in winter, oil- and coal-fired electricity production rises, driving up emissions.

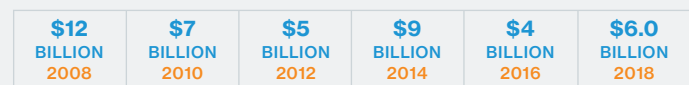


Pricing

Wholesale electricity prices track the price of power plant fuel, which in New England is typically natural gas.

Natural gas pipeline constraints in the winter tend to increase natural gas prices and, in turn, wholesale electricity prices.

Wholesale Energy Market Value



Electricity Demand

Demand for electricity peaks in the summer; a smaller peak occurs in the winter. Records: 28,100 MW in summer and 22,800 MW in winter.

State-sponsored energy-efficiency (EE) and behind-the-meter solar photovoltaic (PV) programs are slowing growth in peak demand, and overall demand growth is flat; states are projected to spend \$10.5 billion on EE between 2019 and 2027.

Forecasted annual growth rates for New England through 2027 →	PEAK DEMAND (90/10 SUMMER PEAK):	0.8%	-0.2%
	OVERALL DEMAND:	0.9%	-0.9%
		Without EE & PV	With EE & PV

Demand Resources

In 2018, energy-efficiency projects provided 2,500 MW, and active demand response (load management, distributed generation) provided 400 MW of the region's total capacity needs.

Effective June 1, 2018, demand resources have further opportunities to participate in the wholesale electricity markets.

New England has approximately 31,000 megawatts (MW) of installed electricity generating capacity

The power generation resource mix is transitioning from coal, oil, and nuclear power to natural gas and renewable energy.

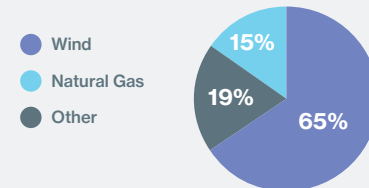
Generation Retirements

Coal- and oil-fired power plants make up roughly 25% of the region's electricity generating capacity but tend to be used only during peak demand periods and are retiring rapidly.

- Since 2013, more than 5,200 MW of primarily coal, oil, and nuclear generating capacity have retired or announced retirement by mid-2020
- Another 5,000 MW of coal- and oil-fired generators are at risk for retirement in coming years

Proposed Generation

Developers have proposed 20,600 MW of new generating resources as of January 2019.



About 9,000 miles of high-voltage transmission lines span the six states. Transmission projects completed and underway are strengthening the grid and enabling its transformation. Since 2002, about 790 projects have been put into service; roughly 80 additional projects are anticipated over the next 10 years that will ensure electricity continues to move reliably and efficiently across the region.

Imported Power

On an annual basis, New England is generally a net importer of electricity via interconnections to neighboring power systems in New York, Quebec, and New Brunswick.

Percentage of net energy from imports

16% 2015	17% 2016	17% 2017	17% 2018
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Merchant transmission companies, electric utilities, and renewable energy developers are proposing several projects to deliver low- or non-carbon-emitting resources into the New England market.

Wind Power

Roughly 1,400 MW of wind power is operational in the region. Developers are proposing nearly 13,500 MW of additional wind power, primarily in northern New England and offshore in southern New England.

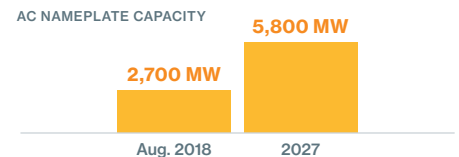
Additional transmission will be needed to integrate these large-scale wind resources.

Adding renewable resources will displace fossil-fueled resources and help achieve state policy objectives, but this will require resources like grid-scale energy storage to help balance the variability of renewables.

Solar Power

State policies are promoting development of behind-the-meter distributed resources, specifically solar PV resources.

ISO-NE 2018 Solar PV Forecast



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.

