

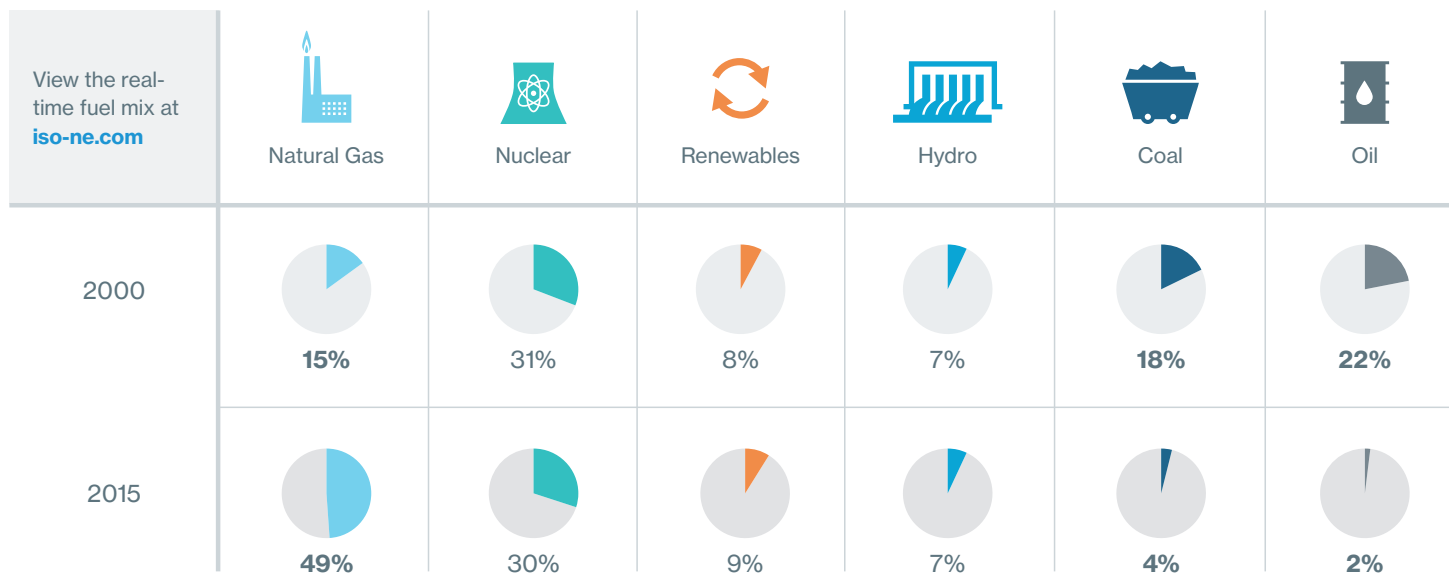
# New England Power Grid 2015–2016 Profile

A rapid transformation of the region's electric power resource mix is underway

ISO new england

## Sources of Electricity Production

Major shift from oil and coal to natural gas over the past 15 years



### Region's growing reliance on natural gas has multiple impacts:

#### Reliability

Existing natural gas pipelines are inadequate to serve growing peak demand for heating and power generation needs in winter.

Gas-fired generators may also use liquefied natural gas (LNG), but LNG deliveries vary, regional LNG storage is limited, and prices are tied to global markets.

Coal and oil resources are essential during winter, but the rapid retirement of these resources will increase the region's dependence on natural gas.

#### Pricing

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

Low natural gas prices in 2015 resulted in low wholesale electricity prices in New England.

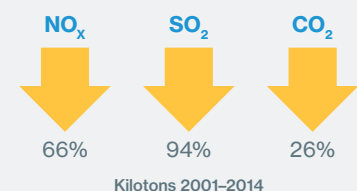
Natural gas pipeline constraints in the winter tend to increase natural gas prices and, in turn, wholesale electricity prices.

#### Wholesale Energy Market Value

\$12 BILLION 2008	\$7 BILLION 2010	\$5 BILLION 2012	\$9 BILLION 2014	\$6 BILLION 2015
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#### Environmental

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



However, when natural gas pipelines are constrained, oil- and coal-fired electricity production rises, driving up emissions.

The New England states, electric utilities, and others are evaluating potential solutions to address natural gas infrastructure constraints in the region.

## 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) programs are slowing growth in peak demand, and overall demand growth is flat; states are projected to spend \$6 billion on EE between 2019 and 2024.

Forecasted annual growth rates for New England through 2024 →	PEAK DEMAND:	1.3%	0.7%
	OVERALL DEMAND:	1.0%	0.1%
		Without EE	With EE

- Increased penetration of plug-in electric vehicles will increase demand for electricity

## Demand Resources

In 2015, energy-efficiency projects provided 1,700 MW, and active demand response (load management, distributed generation) provided 600 MW of the region's total capacity needs.

New England's demand resources have the largest peak demand impact – 10% reduction capability – among all US ISOs and RTOs.

## 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.

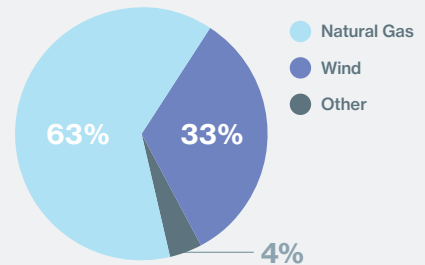
### Generation Retirements

Coal- and oil-fired power plants make up nearly 30% of the region's electricity generating capacity but tend to be used only during peak demand periods and are retiring rapidly.

- More than 4,200 MW of coal, oil, and nuclear generating capacity has retired or will retire by mid-2019
- Another 6,000 MW of coal- and oil-fired generators are at risk for retirement by 2020

### Proposed Generation

Developers have proposed 13,000 MW of new generating resources as of January 2016.



About 8,600 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 650 projects have been put into service; over 200 more 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 that serves New England's annual electricity demand

10% 2012	15% 2013	16% 2014	16% 2015
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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

More than 800 MW of wind power is operational in New England.

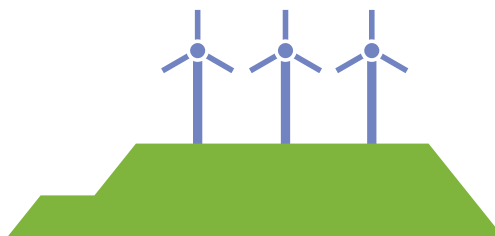
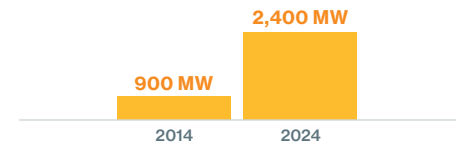
Developers are proposing more than 4,000 MW of additional wind power, primarily in northern New England and offshore in southern New England.

Additional transmission will be needed to successfully integrate large-scale wind resources in New England.

## Solar Power

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

ISO-NE 2015 Solar PV Forecast  
AC NAMEPLATE CAPACITY



## 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.

