New England Power Grid 2019–2020 Profile

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

A Major Energy Transformation Is Underway

New England has shifted away from older coal- and oil-fired generation to cleaner burning natural gas.

Most of today’s electricity comes from lower-emitting energy resources.

The region is transitioning to large-scale clean and renewable energy.

2019 ENERGY RESOURCES

- Nuclear 25%
- Natural Gas 40%
- Renewable 19%
- Net Imports 19%
- Coal 0.4%
- Oil 0.1%

YESTERDAY VS. TODAY

- Coal: 2000 = 15%, 2019 = 13%
- Oil: 2000 = 0.4%, 2019 = 0.1%
- Natural Gas: 2000 = 19%, 2019 = 40%

LOOKING TO THE FUTURE

- Wind power dominates new resource proposals: more than 14,000 MW of wind
- Solar power is growing rapidly: ISO-NE forecasts close to 8,000 MW within a decade
- New transmission proposals would provide access to additional clean or renewable energy in New England or Eastern Canada
- Battery storage technologies are emerging at the customer and grid level

Major Emissions Reductions

Emissions from regional generators have fallen significantly since 2001.

- Carbon Dioxide (CO₂) major driver of climate change
- Nitrogen Oxide (NOₓ) adds to smog
- Sulfur Dioxide (SO₂) with NOₓ, leads to acid rain

<table>
<thead>
<tr>
<th>Year</th>
<th>Coal</th>
<th>Oil</th>
<th>Natural Gas</th>
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<tbody>
<tr>
<td>2000</td>
<td>15%</td>
<td>0.4%</td>
<td>19%</td>
</tr>
<tr>
<td>2019</td>
<td>13%</td>
<td>0.1%</td>
<td>40%</td>
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Very Low Wholesale Prices

After plummeting almost 50% a decade ago, average wholesale energy prices have remained consistently low, reflecting low natural gas prices.

**2019 data are subject to adjustments.**

*The Hub is a collection of 32 locations in New England used to represent an uncongested price for electric energy. Note: Higher prices in 2013 and 2014 were largely due to spikes in natural gas prices during wintertime fuel-delivery constraints.*

Average Annual Price of Wholesale Electricity
(Average Real-Time Hourly Price at the Hub*)

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<tr>
<td>$ / MWh</td>
<td>$80.56</td>
<td>$42.02</td>
<td>$30.67</td>
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Electricity Demand

In New England, 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 $10.6 billion on EE between 2020 and 2028.

<table>
<thead>
<tr>
<th>Forecasted annual growth rates for New England through 2028</th>
<th>PEAK DEMAND (50/50 SUMMER PEAK):</th>
<th>OVERALL DEMAND:</th>
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<tbody>
<tr>
<td>Without EE &amp; PV</td>
<td>0.7%</td>
<td>-0.4%</td>
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<tr>
<td>With EE &amp; PV</td>
<td>1.1%</td>
<td>-0.4%</td>
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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 6,800 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.

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.

Imported Power

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

<table>
<thead>
<tr>
<th>Percentage of net energy from imports</th>
<th>17%</th>
<th>17%</th>
<th>17%</th>
<th>19%</th>
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<td>2016</td>
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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, totaling approximately 11,000 MW.

Wind Power

Roughly 1,400 MW of wind power is operational in the region. Developers are proposing nearly 14,300 MW of additional wind power, primarily offshore in southern New England.

Solar Power

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

ISO-NE Draft 2020 Solar PV Forecast

AC NAMEPLATE CAPACITY

<table>
<thead>
<tr>
<th>Dec. 2019</th>
<th>2029</th>
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<td>3,400 MW</td>
<td>7,700 MW</td>
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Adding renewable resources will displace fossil-fueled resources and help achieve state policy objectives, but this will require fast-responding resources like grid-scale energy storage to help balance the variability of renewables.

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.