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.

**YESTERDAY VS. TODAY**

<table>
<thead>
<tr>
<th></th>
<th>Coal</th>
<th>Oil</th>
<th>Natural Gas</th>
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<tbody>
<tr>
<td>2000</td>
<td>19%</td>
<td>0.1%</td>
<td>43%</td>
</tr>
<tr>
<td>2020</td>
<td>13%</td>
<td>0.1%</td>
<td>43%</td>
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**2020 ENERGY RESOURCES**

- Natural Gas: 43%
- Nuclear: 22%
- Renewables: 10%
- Net Imports: 21%
- Coal: 3%
- Oil: 0.1%
- Hydro: 6%

**LOOKING TO THE FUTURE**

- Wind power dominates new resource proposals: more than 15,000 MW
- 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: more than 3,600 MW

**Major Emissions Reductions**

Emissions from regional generators have fallen significantly since 2001.

- Carbon Dioxide (CO₂): 42%
- Nitrogen Oxide (NOₓ): 78%
- Sulfur Dioxide (SO₂): 99%

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

**Very Low Wholesale Prices**

Average wholesale energy prices have fallen to record low levels, reflecting relatively low natural gas prices.

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

- 2008: $80.56
- 2010: $42.02
- 2019: $33.37

* The Hub is a collection of 32 locations in New England used to represent an uncongested price for electric energy.

** 2020 data are subject to adjustments.

Note: Higher prices in 2013 and 2014 were largely due to spikes in natural gas prices during wintertime fuel-delivery constraints.
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 $10.7 billion on EE between 2021 and 2029.

### 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.

- Since 2013, more than 7,000 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 over 24,000 MW of new generating resources as of January 2021.

- Wind: 18%
- Solar: 15%
- Battery Storage: 4%
- Natural Gas: 63%
- Other: <1%

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, more than 800 projects have been put into service; roughly 60 additional projects are anticipated over the next 10 years that will ensure that 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 with neighboring power systems in New York, Quebec, and New Brunswick.

<table>
<thead>
<tr>
<th>Percentage of net energy from imports</th>
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<tr>
<td>17% 2017</td>
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<tr>
<td>17% 2018</td>
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<tr>
<td>19% 2019</td>
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<td>21% 2020</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 3,400 MW.

### Wind Power

Roughly 1,400 MW of wind power is operational in the region. Developers are proposing over 15,000 MW of additional wind power, primarily offshore in southern New England.

Adding renewable resources will displace fossil-fueled resources and help achieve state policy objectives. This will require fast-responding 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 Draft 2021 Solar PV Forecast

- **AC NAMEPLATE CAPACITY**
  - 3,994 MW (Dec. 2020)
  - 10,031 MW (2030)

Adding renewable resources will displace fossil-fueled resources and help achieve state policy objectives. 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.