

New England power plant emissions declines have been led by gas and wind

By Jared Anderson

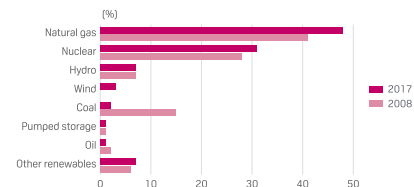
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Despite a spike in **fuel oil** use for power **generation** in 2018, ISO-New England's **greenhouse gas emissions** have substantially decreased over the past decade due to its fuel mix transitioning toward more **natural gas** and **wind generation**, the grid operator said.

"During the ten-year period from 2008 through 2017, total system **emissions** have decreased overall: **NOX** by 53%, **SO2** by 96%, and **CO2** by 37%," ISO-NE said in its draft 2017 **Electric Generator Air Emissions Report**, dated January 2019.

The **emissions** decline reflects shifts in the regional fuel mix, with increasing **gas generation** and **wind generation** offsetting decreases in **coal** - and oil-fired **generation**, according to the report.

ISO-NE ENERGY GENERATION BY FUEL TYPE,
2008 COMPARED WITH 2017



Source: ISO-NE

From 2016 to 2017, **generation** from **hydro** power, **wind**, and **solar** resources increased by 20%, while nuclear **generation** declined by 4%. All fossil **generation** decreased from 2016 to 2017, with **coal** -fired **generation** down by 34%, oil-fired **generation** down by 16%, and **natural gas** -fired **generation** down by 5%, ISO-NE said.

CO2 emissions declined 6.7% from 2016 to 2017, decreasing from 37,468,000 tons to 34,969,000 tons, according to the **emissions** report.

An environmental regulatory update presented to ISO-NE's Environmental Advisory Group Tuesday showed that from 2017 to 2018 deliveries of **coal** and **natural gas** to **New England** power plants decreased, but **fuel oil** deliveries climbed by over 40%.

Fuel oil deliveries rose from about 503 million barrels in 2017 to 719 million barrels in 2018, with much of the increase occurring in January when the region was hit with two weeks of extremely cold weather.

During the first week of January 2018, high **gas** demand for heating caused **natural gas** pipeline constraints that sent **gas** prices to record highs at some locations, which in turn drove up wholesale **electricity** prices offered by **gas** -fired power plants. As such, both oil- and **coal** -fired power plants ran "at much higher levels" than normal that week, the grid operator said.

New England power plants received nearly 500 million barrels of **fuel oil** in January 2018, compared with roughly 130 million barrels in January 2017, according to the update.

New England power plant **CO2 emissions** were dominated by **gas** -fired **generation** in both 2017 and 2018, followed by refuse- and **coal** -fired plants. **CO2 Emissions** from **gas** and **coal** declined slightly year on year, while **emissions** from oil-fired units increased.

Marginal units

The environmental regulatory update showed the marginal ISO-NE **generation** unit in 2017 and 2018 was predominantly **gas** fired. According to load-weighted real time marginal unit fuel data by month for the two years, on average the marginal unit was **natural gas** at 75% of the time.

This was followed by pumped-**hydro** storage (17%); oil (2%); **coal** (1.9%); **hydro** (1.9%) and **wind** (1.1%), according to the update.

Natural gas was the primary marginal fuel type from 2013 through 2017, ISO-NE said in the **emissions** report. From 2016 to 2017, the percentage of time that **gas** was marginal decreased by 12%, while the percentage of time that "Other **Renewables**" was marginal increased by 14%.

This was due to the higher frequency of marginal **wind** generators and in 2017 **wind** often displaced **gas** as the price-setting fuel, ISO-NE said. However, importantly the grid operator noted that **wind** "predominantly set price in small, local export-constrained areas of the system, as opposed to setting price for large parts of the system."

Though **wind** in 2017 was marginal 18% of the time, it was generally marginal in a "very local congested area and did not directly impact system price," ISO-NE said. At the system level, **wind** was the marginal fuel less than 1% of the time.

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