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Regional Electricity Outlook

20 Years of ISO New England

Grid in Transition: Opportunities and Challenges

Fuel Security for Natural-Gas-Fired Generators

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Retirements of Non-Gas-Fired Power Plants

More than 4,200 megawatts (MW)—an amount equal to almost 15% of the region’s current generating capacity—will have shut down between 2012 and 2020 and is being replaced primarily by new natural-gas-fired plants. The upcoming closures of just two of those resources—Brayton Point Station in May 2017 and Pilgrim Nuclear Power Station by May 2019—will remove 2,200 MW of non-gas-fired capacity. Over 5,500 MW of additional oil and coal capacity are at risk for retirement in coming years, and uncertainty surrounds the future of 3,300 MW from the region’s remaining nuclear plants.



With aging non-gas-fired plants closing, New England will need new ways to meet peak demand and make up for [natural gas constraints](#)



The Economics of Retirement

Several factors are making it hard for coal- and oil-fired resources to recover the cost of capital investments to maintain their older plants and ensure performance or invest in new control technologies to meet stringent state, regional, and federal environmental requirements.

- The rising environmental and economic costs associated with oil and coal have made it difficult for older power plants that use these fuels to compete against newer, faster generators that run on cleaner fuel sources, such as natural gas.
- These older plants can require up to 24 hours to reach full power production, making it difficult for ISO operators to rely on them when system conditions are tight. Their age and lack of regular runtime can also sometimes lead to operating problems.
- Oil units tend to have very limited fuel supplies on site to avoid the expense of purchasing oil that they may not use. So, even when called to run, they often can't run for very long. (The [winter reliability programs](#) implemented by the ISO over recent winters have helped address this by incentivizing on-site oil storage.)
- Low wholesale electricity prices over recent years, largely a result of typically low natural gas prices, have also reduced revenues for these resources when they run.

For many coal- and oil-fired resources, the only option is to retire.



The region's nuclear power plants, which for years have provided baseload generation—as well as major sources of emission-free generation—face similar challenges in recouping enough revenue to support long-term operations and the costs of compliance with regulatory requirements. The closure of Vermont Yankee Nuclear Station in late 2014 removed 604 MW from the region, and its impact was seen in [higher annual air emissions](#).

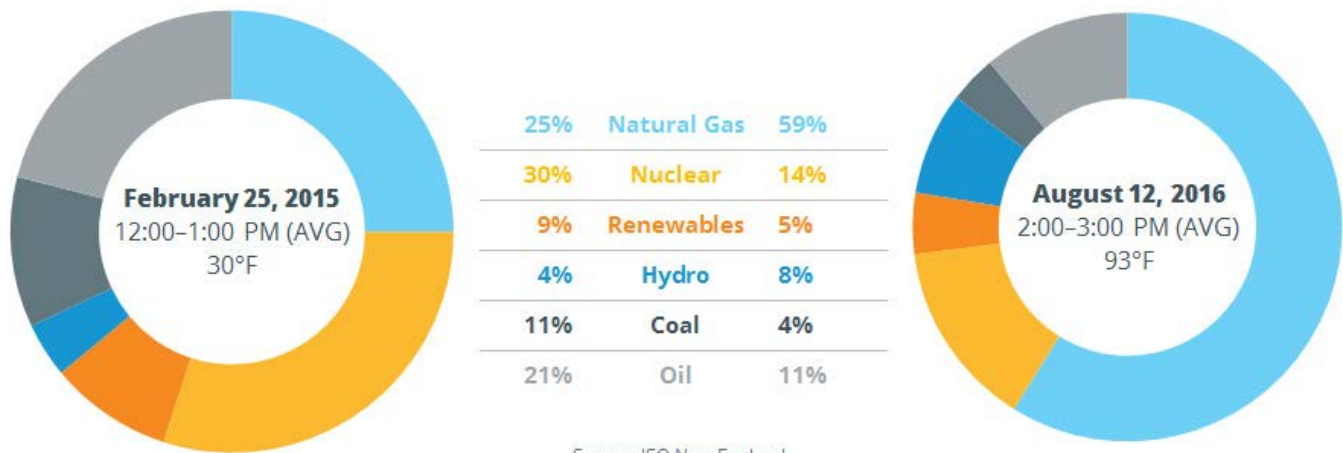
These retiring resources are likely to be replaced by more natural-gas-fired resources, thereby exacerbating the [region's already constrained natural gas transportation system](#).

Generator Retirements Limit the ISO's Options for Meeting Winter and Peak Demand

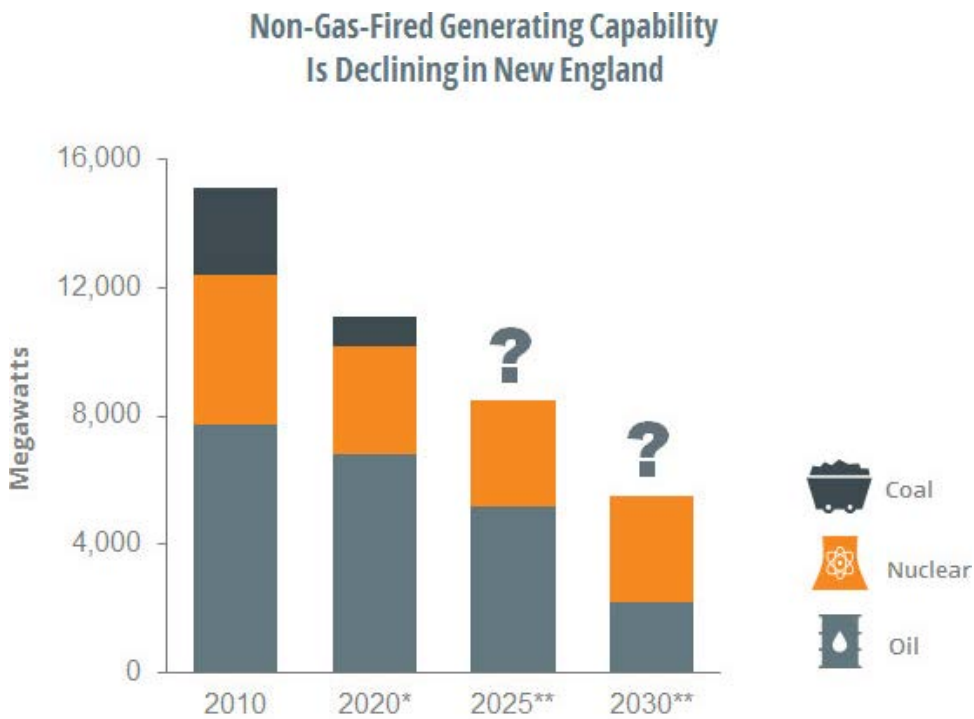
On days when natural-gas-fired generators have unconstrained access to low-cost Marcellus shale gas, they often produce the majority of New England's electricity. This is in stark comparison to winter, when heating needs claim most of the regional natural gas supply.

Nuclear power typically provides around 30% of the region's energy. Coal- and oil-fired resources, despite providing only about 3% of the region's electricity last year, can also make valuable contributions on the coldest days of winter, as well as on the hottest days of summer when demand is very high or major resources are unavailable. For example, on the 2016 summer peak day shown below, a nuclear generator was unexpectedly off line and coal and oil filled the gap. Within a decade, though, the region may have little to no generating capacity left fueled by coal and oil, and is also at risk of losing more nuclear generators.

Non-Gas-Fired Resources Are Critical During Winter and on the Summer Peak



Source: ISO New England



*Includes major planned retirements

**Hypothetical values assuming the loss of over 5,500 MW from generators identified as being at-risk of retirement due to plant age and infrequent operation

Source: ISO New England, *Forecast Report of Capacity, Energy, Loads, and Transmission* (2010, 2016), *Status of Non-Price Retirement Requests and Retirement De-List Bids* (August 2016), and 2016 Economic Studies Phase I Assumptions, ISO-NE (2016)

Will Adding More Renewables Help?

Wind and solar resources can offset some natural gas use, but their help with the [fuel-security challenge](#) is limited by still-low levels of regional installation and other factors. Learn more in [Integration of Renewable Resources and Other New Technologies](#).

APPLICATIONS

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Power System Status



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