

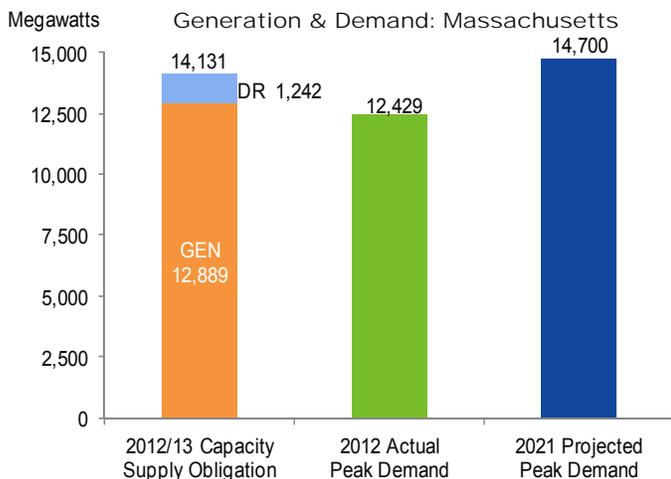
The New England electric grid is an 8,000-mile high-voltage transmission system that connects electric utilities, publicly-owned electric companies, power generators, suppliers, alternative resources and end users in the six-state wholesale electricity marketplace. This is a brief profile of the electric grid and wholesale markets serving Massachusetts based on information from New England's regional system planning process and wholesale market reports.

Introduction

Massachusetts represents approximately 46% of the population in New England and 46% of the region's total electricity consumption. The Greater Boston area, which includes the North Shore, represents about half of the state's electricity use. The state relies on both in-state resources and imports of power over the region's transmission system to serve electricity customers. Transmission, generation and demand resources are being added to ensure that the reliability of the system is maintained. ●●●

Growth in Demand

In the 2012 Regional System Plan, ISO New England (ISO) forecasted the state's overall electricity demand to grow at a rate of 1.0% annually over the next decade. The ISO forecasts the state's peak (summer) demand to grow 1.6% annually over the next decade. Overall and peak-demand growth in Massachusetts are slightly above the rate projected for the region.



Energy Efficiency

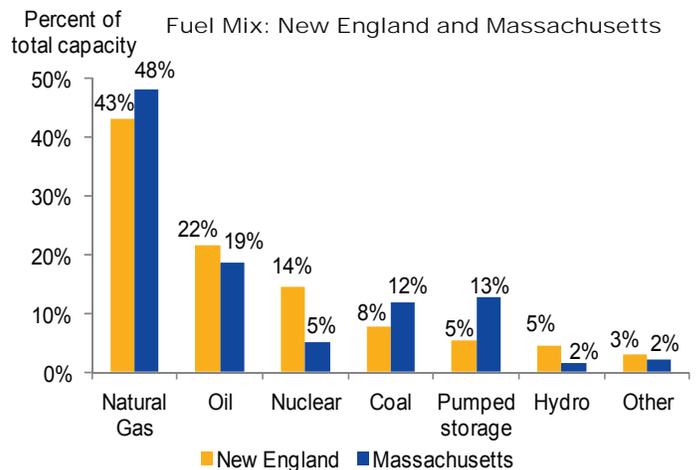
In 2012, the ISO completed its first energy-efficiency (EE) forecast to estimate the long-term effects of state-sponsored EE programs. Regionally, the EE forecast for 2015 to 2021 shows lower annual growth in *peak demand* (0.9%) than the traditional forecast (1.5%), and annual *energy use* is actually flat (0.0%) compared to a modest (0.9%) rate of growth under the traditional forecast. The results for Massachusetts show a slowing growth rate for peak demand with a total projected reduction in peak demand of 853 megawatts (MW) from 2015 to 2021. Under the EE forecast, the peak in 2021 will be about 9% lower than would be expected using the traditional forecast. For energy, the EE forecast shows a modest increase in energy use with total projected energy savings of over 5.5 billion kilowatt hours by 2021. Under the EE forecast, the energy use in 2021 will be about 13% lower than would be expected using the traditional forecast. ●●●

Generating Resources

The total capacity of existing generating plants in Massachusetts is approximately 13,100 MW. This is 41% of the total for New England. About 13,000 MW in Massachusetts cleared in the FCM with obligations to be available from June 1, 2012 to May 31, 2013. Generator availability has increased systemwide in New England since the start of competitive markets, from 81% in 1999 to 86% in 2011. At any given time, however, individual generators may not operate due to planned or unexpected outages, environmental restrictions, or other reasons. Some resources do not operate because their offers to sell electricity in the wholesale market are above the market-clearing price. In Massachusetts, generators are owned and operated by private generation companies and municipal utilities. ●●●

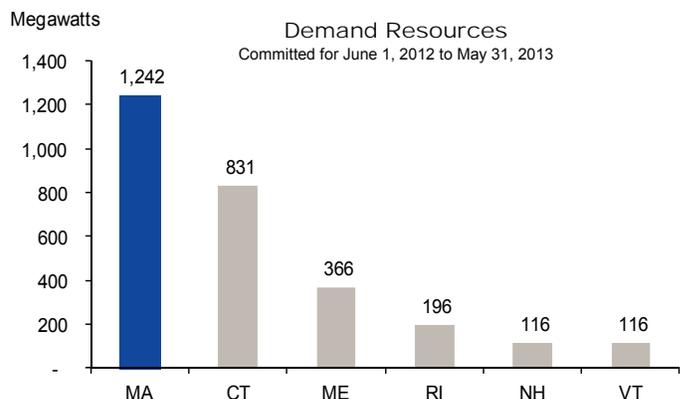
Fuel Mix

Natural gas is the primary fuel for more than 40% of the existing generating capacity in the state and region.



Demand Resources

New England has about 2,900 MW of customer-side Demand Resources (DR) that can reduce demand on the power grid through both active measures, such as shifting to on-site distributed resources, and passive measures, such as EE. Massachusetts has about 1,200 MW of DR with obligations in the Forward Capacity Market, equivalent to 10% of the state's peak demand.



Proposals for New Resources

In order to connect to the grid, a proposed generator must be studied and approved under the ISO's Generator Interconnection Procedures to ensure the project will not adversely impact the reliability of the electric grid. This is known as the "queue" process.

At the start of 2013, approximately 1,700 MW of proposals in Massachusetts were active in the queue (primarily natural-gas-fired generation and wind power). This represents 35% of the proposals in New England. Historically, not all of the proposals in the queue have been developed, but proposals in the queue are an indication of the potential for new resources.

In New England, the FCM provides opportunities for existing and new generation, DR, and imports to compete to provide the capacity resources the region needs to meet future reliability requirements.

Resources must qualify, clear (i.e., be selected) in the auction, and then perform when called by the ISO to be eligible for capacity payments.

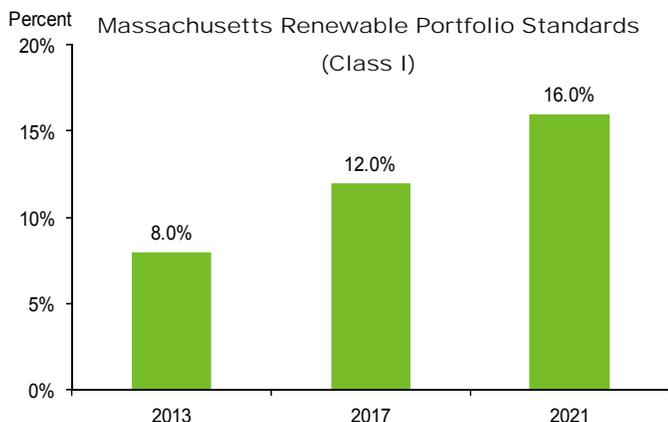
Through a series of annual auctions, ISO has procured resources to meet reliability needs for the seven-year period June 1, 2010 to May 31, 2017. In this period, these auctions cleared:

- More than 2,500 MW of *new* generation resources from Massachusetts, representing 56% of the new generation cleared in New England, and
- About 1,550 MW of *new* DR from Massachusetts, representing 47% of the new DR cleared in New England.

The ISO conducted the seventh auction (FCA-7) in February 2013, for resources needed in the 2016–2017 timeframe. The next regional capacity auction, FCA-8, is scheduled for February 2014. ●●●

Renewable Resources

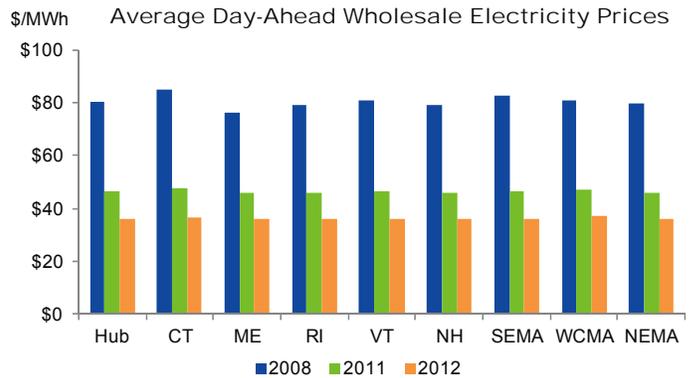
To meet Massachusetts' renewable portfolio standard (RPS), utilities and competitive suppliers must obtain specified percentages of the electricity they provide to customers from renewable sources, or make alternative compliance payments. Massachusetts has two classes of renewable resources that include certain types of solar, wind, ocean energy, biomass, hydro, landfill gas, geothermal, and fuel cells. Renewables developed in 1998 or later are Class I; resources developed before 1998 are Class II.



Massachusetts also has an alternative energy portfolio standard where suppliers must obtain a certain percentage of electricity from alternative energy systems, such as combined heat and power, flywheel storage or efficient steam technologies. ●●●

Wholesale Market Prices

Locational pricing is a key feature of New England's wholesale electricity markets. The ISO administers Day-Ahead (DA) and Real-Time (RT) Energy Markets and calculates prices for eight zones in New England. Each state is one zone, except for Massachusetts, which has three zones: Southeastern (SEMA), Western/Central (WCMA), and Northeastern/Boston (NEMA). Average wholesale prices have dropped with lower demand and fuel prices. Prices remain below 2008 levels. In 2012, average wholesale electricity prices in New England fell to nearly 23% below prices in 2011, and 26% below prices in 2003, the year that competitive markets in their current form were introduced in the region.



Transmission

Several major transmission projects and studies developed through the ISO's regional system planning process are underway in Massachusetts. The Greater Springfield Reliability Project is under construction and is expected to be complete in 2013. Other projects to strengthen and improve the long-term reliability needs of the transmission system in the central, southeast and North Shore areas are also underway. The ISO is studying reliability needs for Southeast Massachusetts and developing transmission solutions to meet long-term reliability needs for the Greater Boston and Berkshire County areas. Changes in the forecast for electricity demand or development of market-based responses to system needs can affect the need for transmission projects, and the ISO re-evaluates these needs as part of the planning process. ●●●

Strategic Planning Initiative

The ISO and stakeholders are evaluating several key risks that will impact the region's power system and wholesale electricity markets. Near-term risks include resource performance and flexibility, and increased reliance on natural gas-fired capacity. Long-term risks include potential retirement of generators, integration of a greater level of variable resources (e.g., wind and solar), and alignment of markets with planning. ●●●

About ISO New England

ISO New England is the Independent System Operator responsible for ensuring the reliable operation of the New England electric grid, administration of the region's wholesale electricity markets, and administration of the regional Open Access Transmission Tariff, including regional system planning. The ISO is a not-for-profit corporation governed by an independent board of directors. The ISO does not own transmission or generation assets and has no financial interest in any companies participating in the region's wholesale electricity markets. ●●●

Sources and Additional Information

U.S. Census Bureau, *2012 Regional System Plan, 2011 Annual Markets Report*, FCA results, and other public ISO information.
 ISO New England: www.iso-ne.com
 MA Dept. of Public Utilities and Dept. of Energy Resources:
www.mass.gov (State Agencies: Energy & Environmental Affairs)