



USAID/NARUC East Africa Regional Regulatory Partnership Exchange:

New England Power Sector Overview

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New England's Electric Power Grid at a Glance



- 14 million residents
- 6.5 million meters
- 31,750+ megawatts (MW) of generating capacity and approximately 1,850 MW of demand resources
- 8,500 miles of high-voltage transmission
- 13 interconnections with neighbors
- 28,130 MW all-time peak demand
- \$8 billion total energy market (2013)





ISO New England is Part of a Larger Electric Power System

- Eastern Interconnection spans from Rocky Mountains to East Coast and Canadian Maritimes
 - Primarily alternating-current (AC) transmission
 - New England linked to rest of Eastern Interconnection via transmission ties to New York and New Brunswick
- Tied to Quebec only through direct-current (DC) lines
- 2003 Blackout ushered in wide-area monitoring and mandatory reliability standards







2014 Mix of Electricity Consumption in New England

End-Use Market Share in New England 2014







Energy has Shifted from Oil to Natural Gas Percent of Total Electric Energy Production



Other renewables include landfill gas, biomass, other biomass gas, wind, solar, municipal solid waste, and misc. fuels.





About ISO New England

- Private not-for-profit
- Regulated by the federal government
- Independent of companies doing business in market
- Primary Responsibilities
 - Operate the regional power system
 - Administer wholesale electricity markets
 - Power system planning







Federal Energy Regulatory Commission (FERC)

- FERC regulates the following:
 - Electric transmission and wholesale rates and services in interstate commerce
 - Monitors and investigates energy markets
 - Natural gas and oil pipeline transportation rates and services
 - Hydroelectric dam licensing and safety
 - Reliability of the high voltage interstate transmission system through mandatory reliability standards
- FERC has the ability to enforce its regulatory requirements through imposition of civil penalties and other means.





Legal Basis – Regional level

- ISO-NE was created by FERC and must submit tariff changes to FERC for approval.
 - ISO-NE through a stakeholder process develops the rules that govern the markets, assesses the needs of the region, and plans for the future reliability of the grid and functioning of the markets.
 - State utility commissions have the right to participate in proceedings before FERC regarding any tariff changes.





Legal Basis – State level

- State public utility commissions have jurisdiction over the distribution functions of the utilities within their state (retail electricity sales) and approval for the physical construction of electric generation facilities.
- Five of the six New England states passed laws requiring utilities to divest themselves of their generation assets.





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Robust Stakeholder Process, Independent Board and Federal Oversight Key to Success







Energy is Primary Driver of Wholesale Costs

Energy Market Wholesale price for electric energy is determined by supply and demand in daily energy markets – about \$6-\$12 billion annually

Capacity Market ISO determines capacity needs three \$10 years into the future and resources compete to sell capacity to system through annual auctions – about \$1-\$2 billion annually



Resources are compensated for providing regulation services and reserves to ensure the reliability of the transmission system in real time – about \$40-370 million annually







Location Marginal Prices

New England has eight energy zones each with a unique price







Wholesale Electricity Prices Track Natural Gas













Power Plant Emissions have Declined with Changes in the Fuel Mix

Reduction in Aggregate Emissions (ktons/yr)

Year	NO _x	SO ₂	CO ₂
2001	59.73	200.01	52,991
2012	20.32	16.61	41,975
% Reduction, 2001–2012	♦ 66%	↓ 92%	₹ 21%

Reduction in Average Emission Rates (Ib/MWh)

Year	NO _x	SO ₂	CO2
1999	1.36	4.52	1,009
2012	0.35	0.28	719
% Reduction, 1999–2012	↓ 74%	₽ 94%	₹ 29%

Source: 2012 ISO New England Electric Generator Air Emissions Report, January 2014





Transmission Investment in New England







Present and Future Challenges For New England Electricity Sector

- Natural gas pipeline capacity is not adequate to support current levels of gas-fired generation in cold winter months
- Customers will be seeing significant electricity price increases in the coming year or longer – especially during the winter
- Significant CO₂ reduction goals for Massachusetts (80% lower by 2050) and other New England states will require major investments in renewables, efficiency and electrification technologies