Offshore Wind Resources in the ISO-NE Power Market

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November 15, 2010

LEVITAN & ASSOCIATES, INC.
MARKET DESIGN, ECONOMICS AND POWER SYSTEMS

Wind Contribution in New England

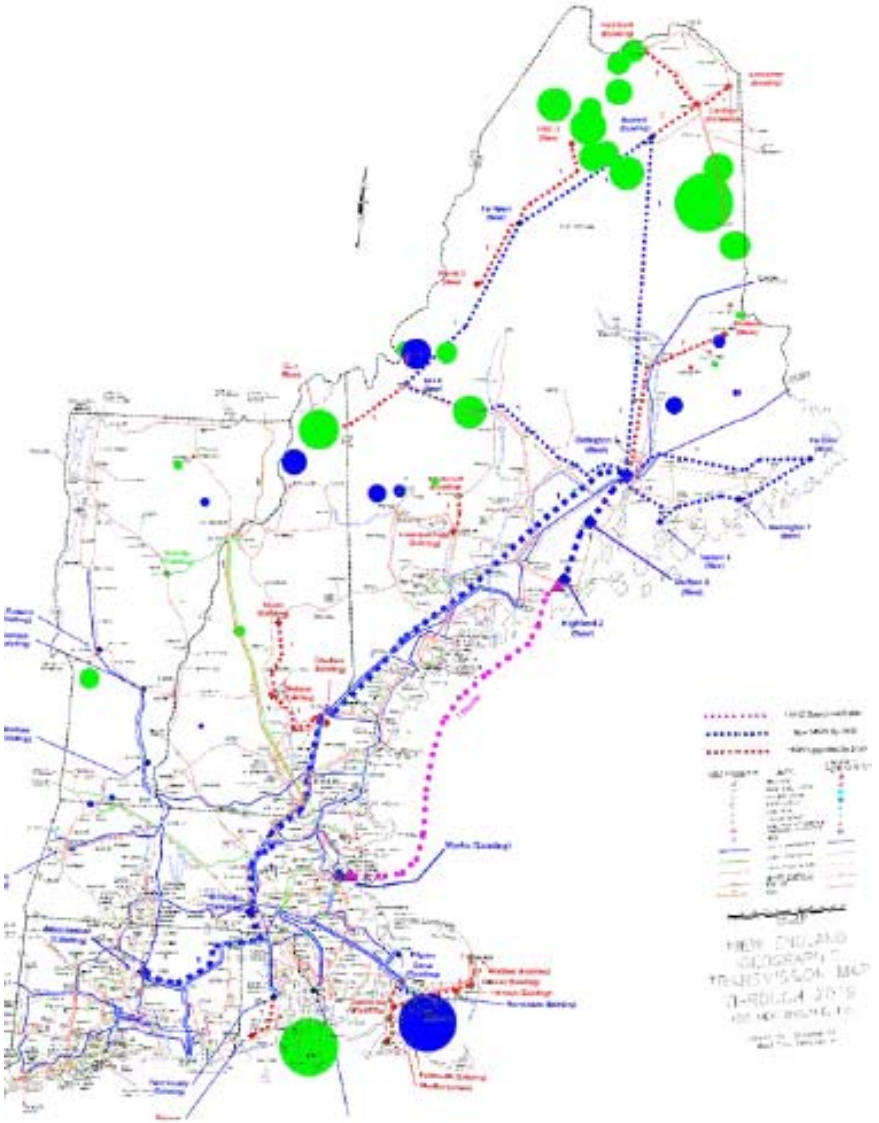
- Historical ISO-NE energy data

	2007	2008	2009
Wind	-	-	261
Landfill Gas	-	-	256
Solar	-	-	1
All Renewables	147	372	518
Total Generation	124,749	130,723	119,437
Renewables (%)	*0.12%*	*0.28%*	*0.43%*

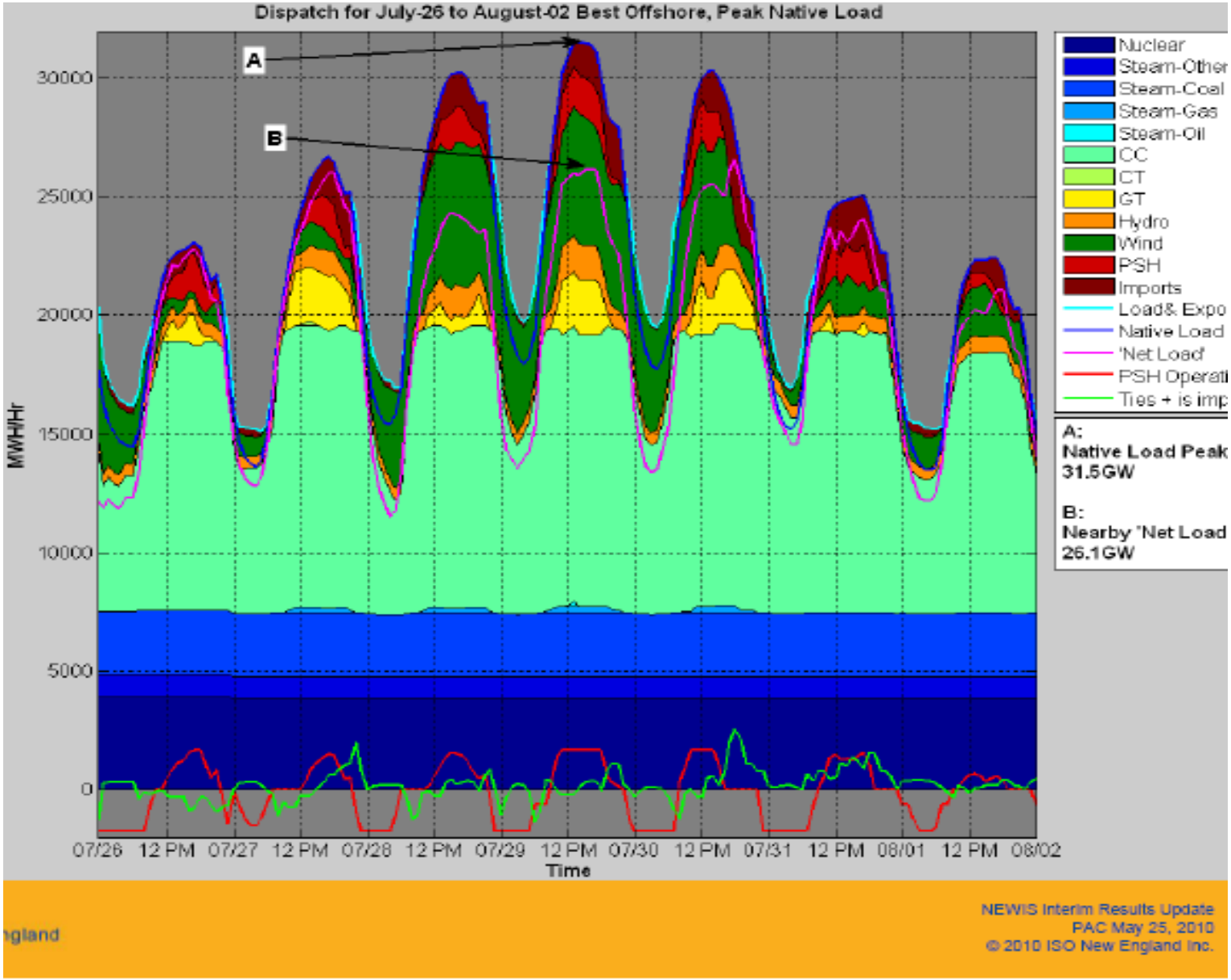
- Review of NEWIS / operational impacts
- Future contribution will depend on:
  - Direct value of wind generation
  - Price suppression benefits / allocation
  - Transmission requirements / cost allocation
  - Environmental benefits valuation / allocation
  - States' policies / Renewable Portfolio Standards

ISO-NE Wind Integration Scenario Planning

- Many scenarios evaluated
- More wind will require transmission investment and operational changes
- Big difference between on-shore and off-shore wind transmission requirements
- Example: Wind projects currently in ISO-NE interconnection queue →



ISO-NE Wind Integration Scenario Planning



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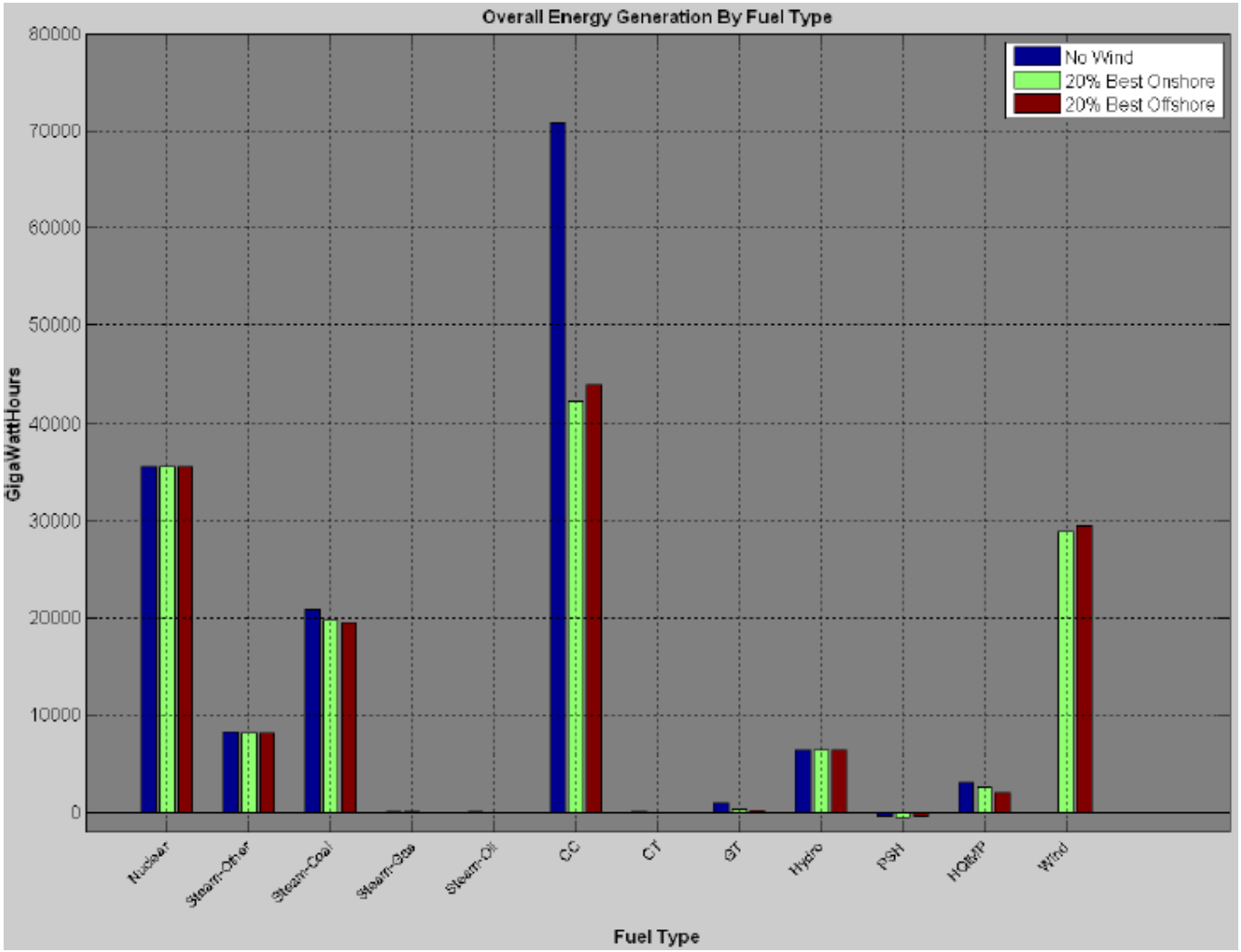
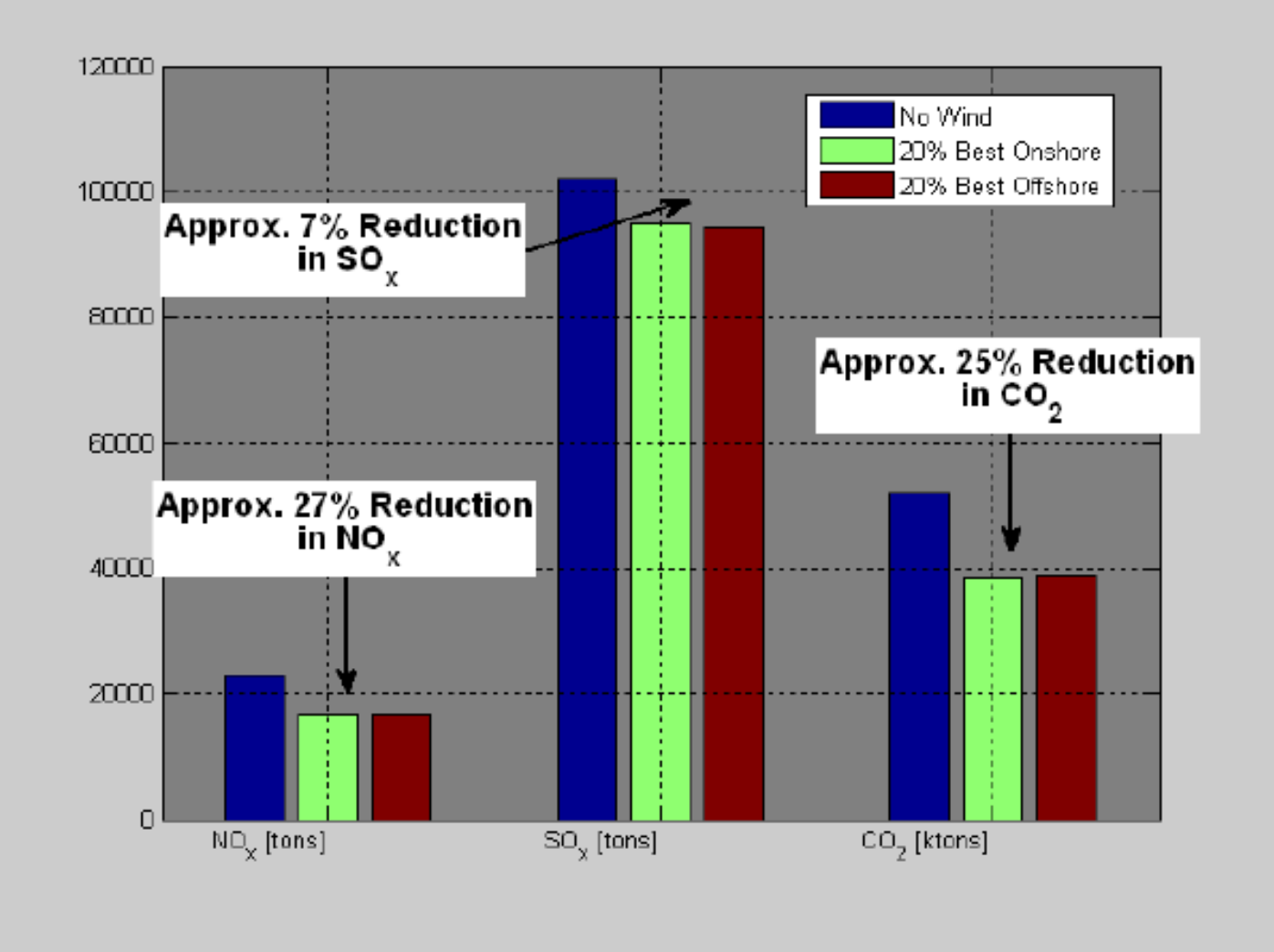
ISO-NE Wind Integration Scenario Planning

- Large impact on combined cycle plants

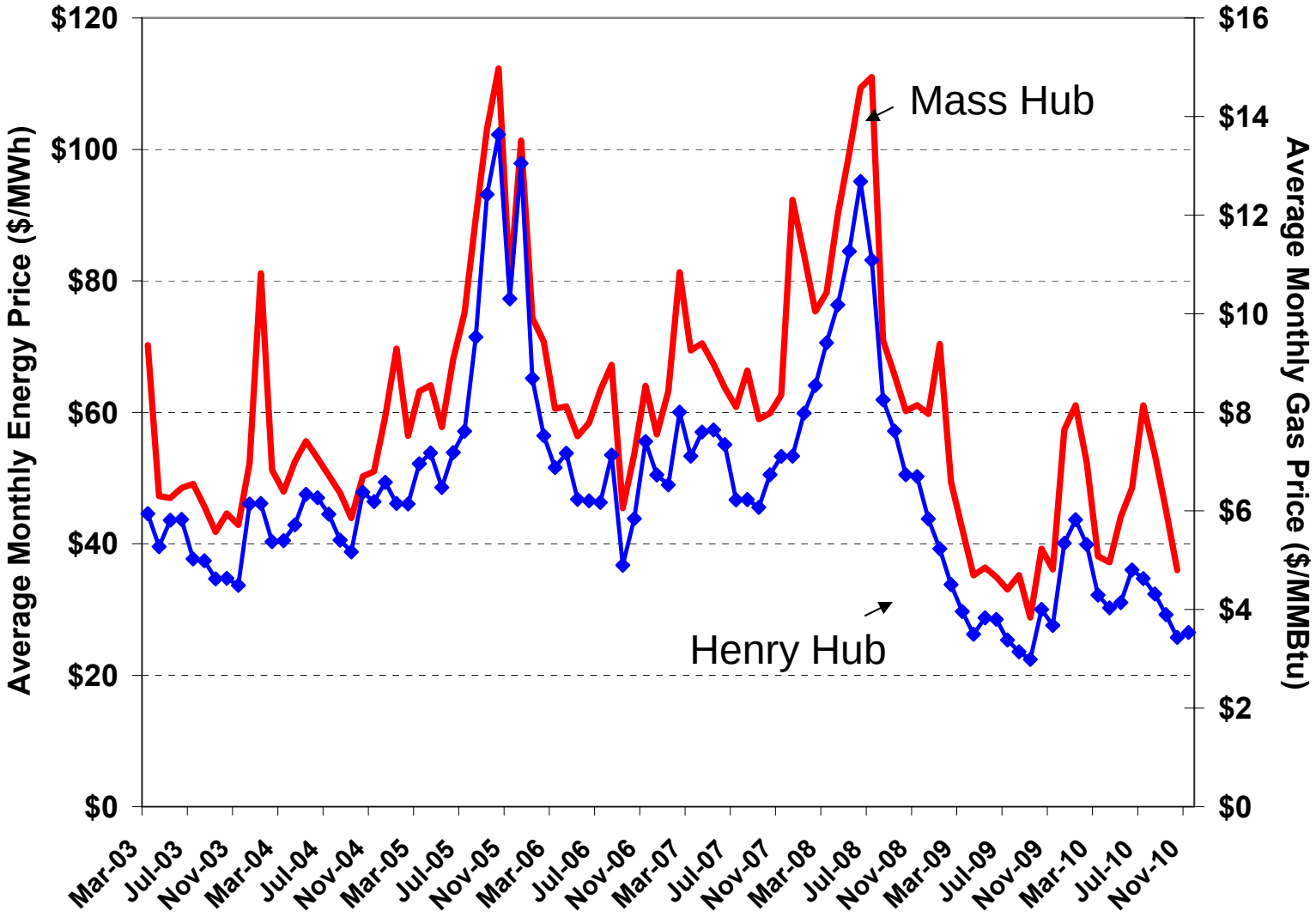


ISO-NE Wind Integration Scenario Planning

- Emission reductions accrue broadly

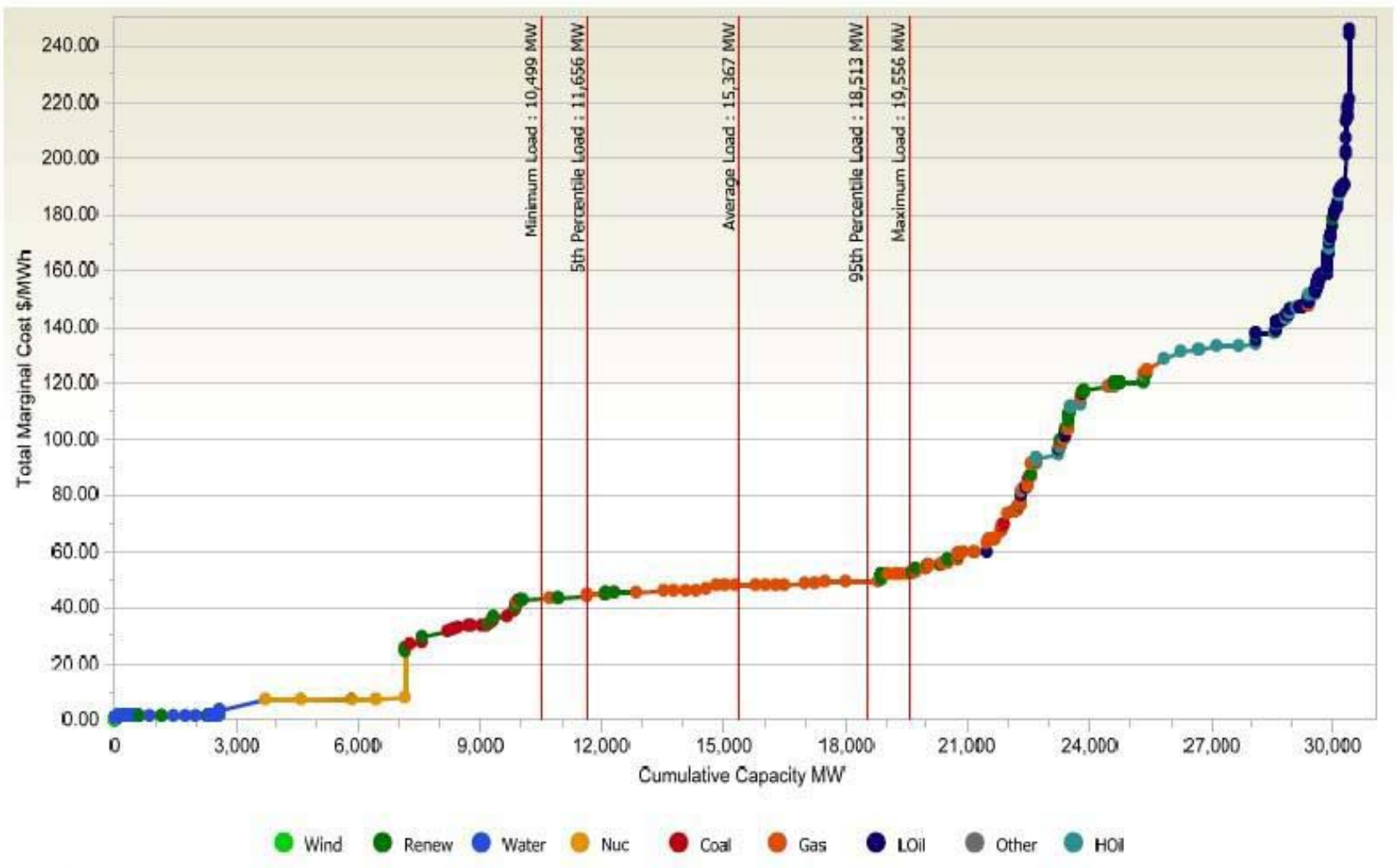


Value of Wind Generation in New England



Source: Bloomberg

Price Suppression Benefits

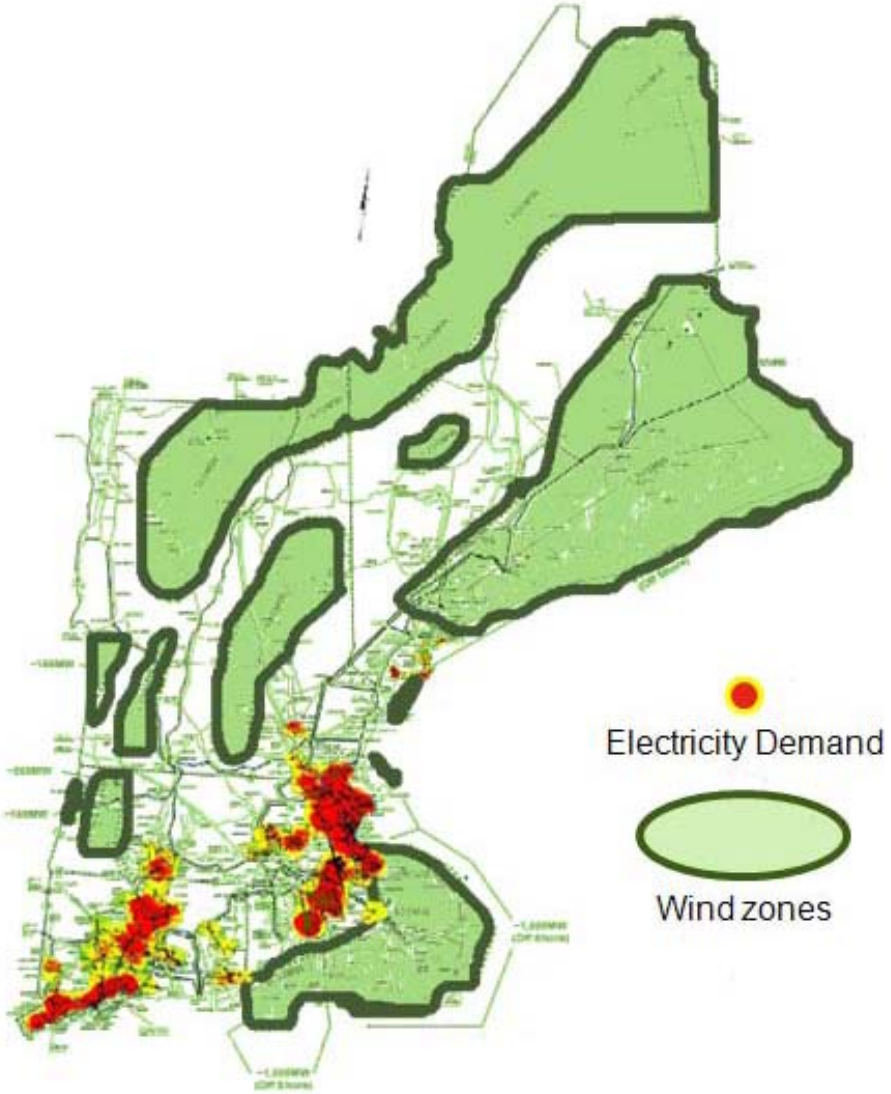


Source: Ventyx
April 2010 Northeast Snapshot Report

Updated April 9, 2009

Transmission Requirements and Cost Allocation

- Customer demand is concentrated along southern NE coast
- Transmission will require significant investment
- On-shore and off-shore wind siting and cost differences
- Cost allocation for “economic upgrades” is a key question



Source: ISONE 2030 Power System Study