Roadmap to Renewable and Demand Resource Integration in New England

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NECPUC Symposium
May 2009

ISO new england

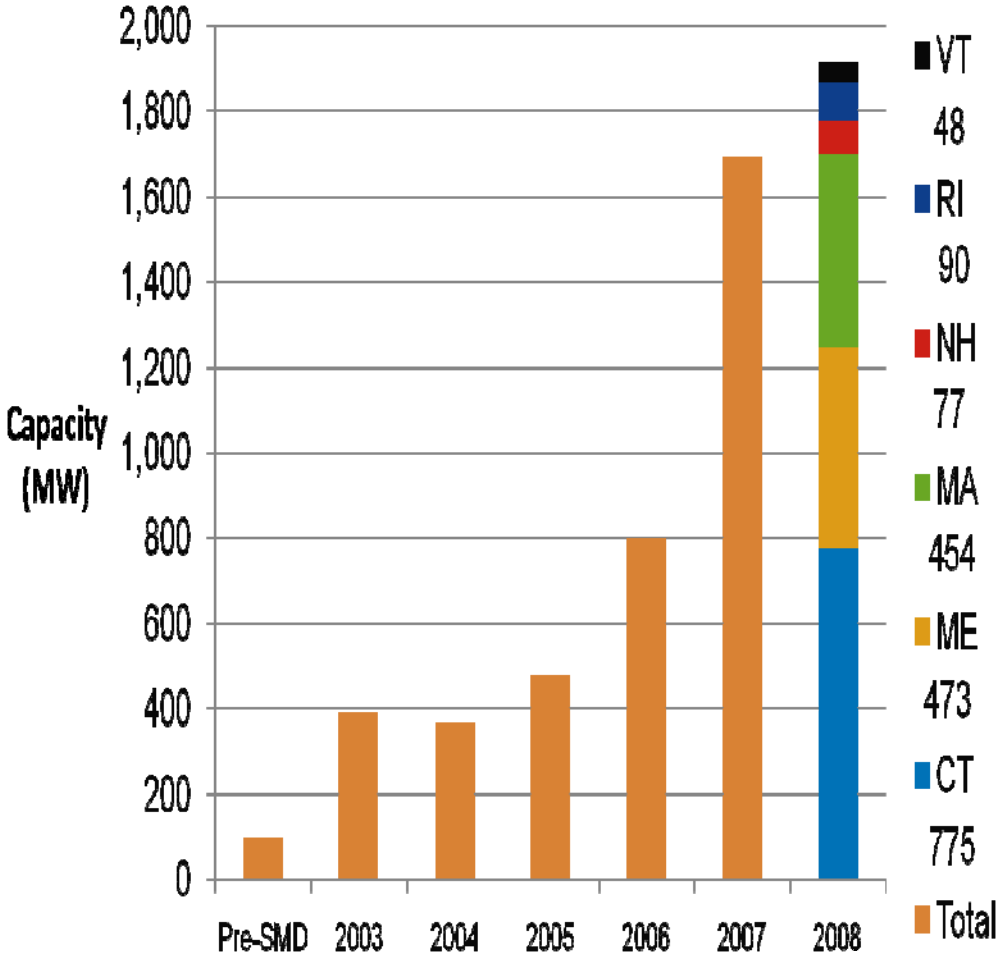
New England's Future Grid

- Distributed and renewable resources are starting to become main-stream
- The power system grid is evolving from a traditional generation base to various different kinds of resources:
  - Demand Resources
  - Wind and other intermittent renewable resources
  - Storage devices such as flywheels, batteries and plug-in hybrids
- Wind resources present the largest opportunity for growth in renewable integration

Operational Challenge

- Integration of demand and renewable resources effectively into real-time operations is critical to maintain reliability
  - Today, the ISO is focused on the integration of Demand Resources
  - Next, the ISO will be focused on the integration of wind and “smart grid” resources

Demand Resources Integration

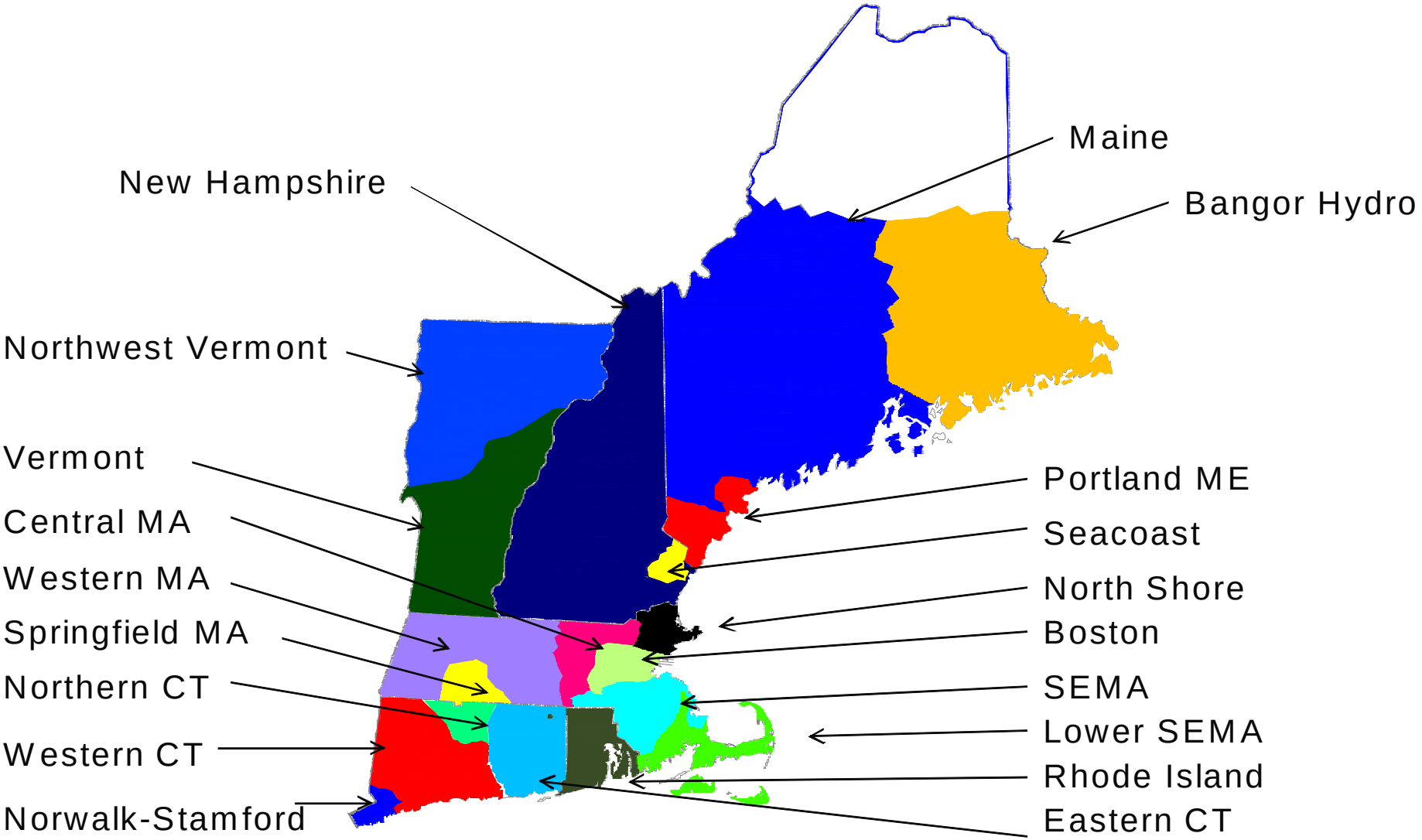


- Growth of Demand Resources (DR) continues under FCM
- DR Clearing in Forward Capacity Auctions:
  - FCA #1: over 2500 MW
  - FCA #2: over 2900 MW

New Dispatch Rules Improve DR Performance

- DR to be dispatched in “Dispatch Zones”
  - Allows dispatch of resources only when, where and in amounts needed
  - Dispatch in 19 targeted areas:
    - Prevents unnecessary activation of DR
    - Limits customer fatigue
  - Flexibility allowed for providers to use a portfolio of assets to respond within a zone

Dispatch Zones Under FCM



Improved DR Software & Communications Infrastructure

- Developing enhanced and secure communication with DR
- Improving forecasting of DR availability and projected use
- Implementing new software that will fully integrate the DR solution into the Energy Management System

Integrating Wind Resources

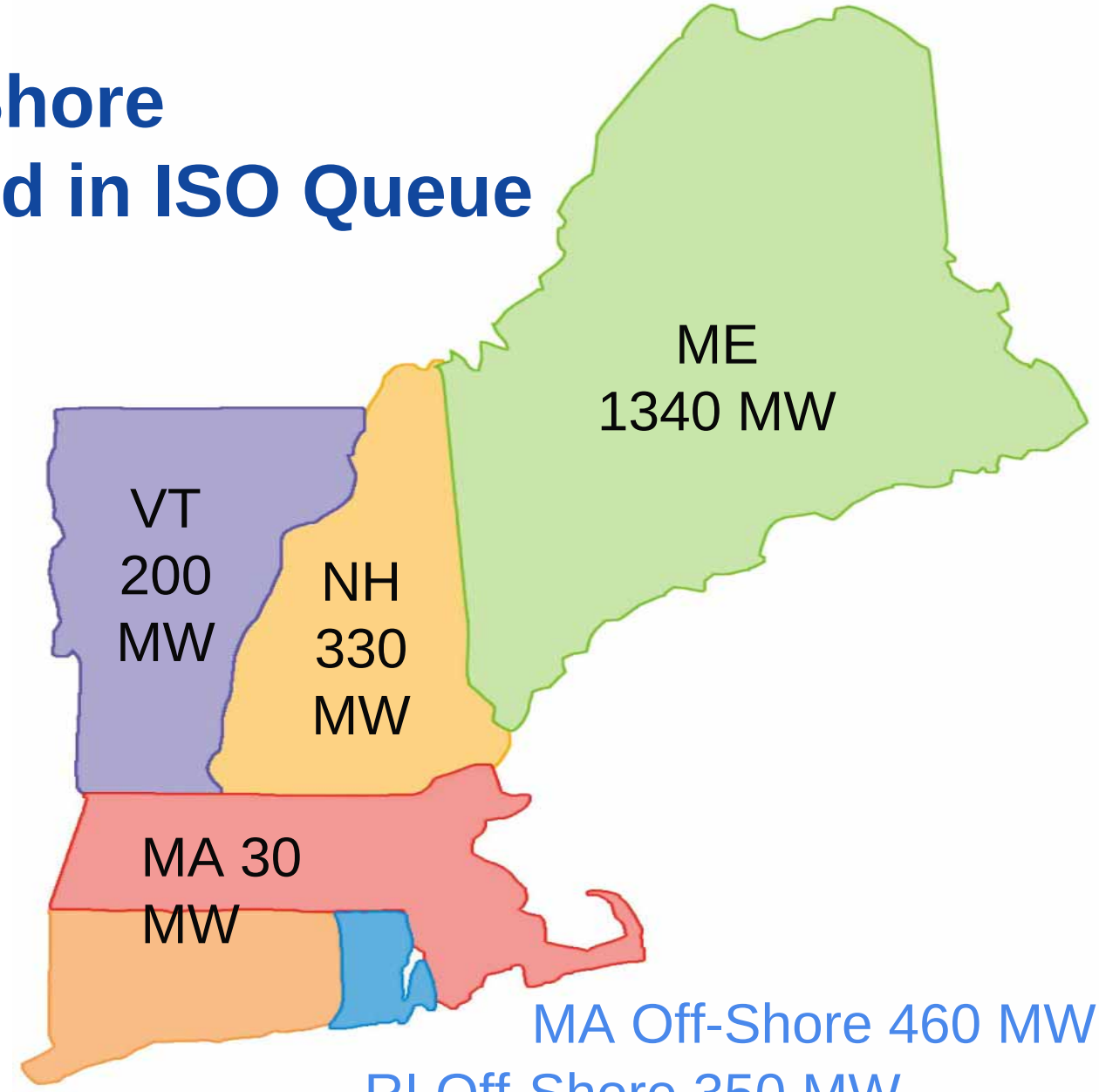
- Transmission infrastructure to deliver large-scale wind from remote areas to load centers
- Transmission funding mechanisms
  - i.e., participant funding, cost sharing agreements, federal incentives
- Favorable investment and regulatory environment
- Identification and resolution of operational challenges

On- and Off- Shore Wind Proposed in ISO Queue

On-Shore = 1900 MW

Off-Shore = 810 MW

Total = 2710 MW



MA Off-Shore 460 MW

RI Off-Shore 350 MW

Roadmap to Wind Integration

ISO's objectives:

- Understand New England-specific characteristics
  - How wind, load, generation and transmission interact
- Determine forecasting needs and techniques
- Develop operating requirements and solutions

Regional Wind Patterns and System Characteristics

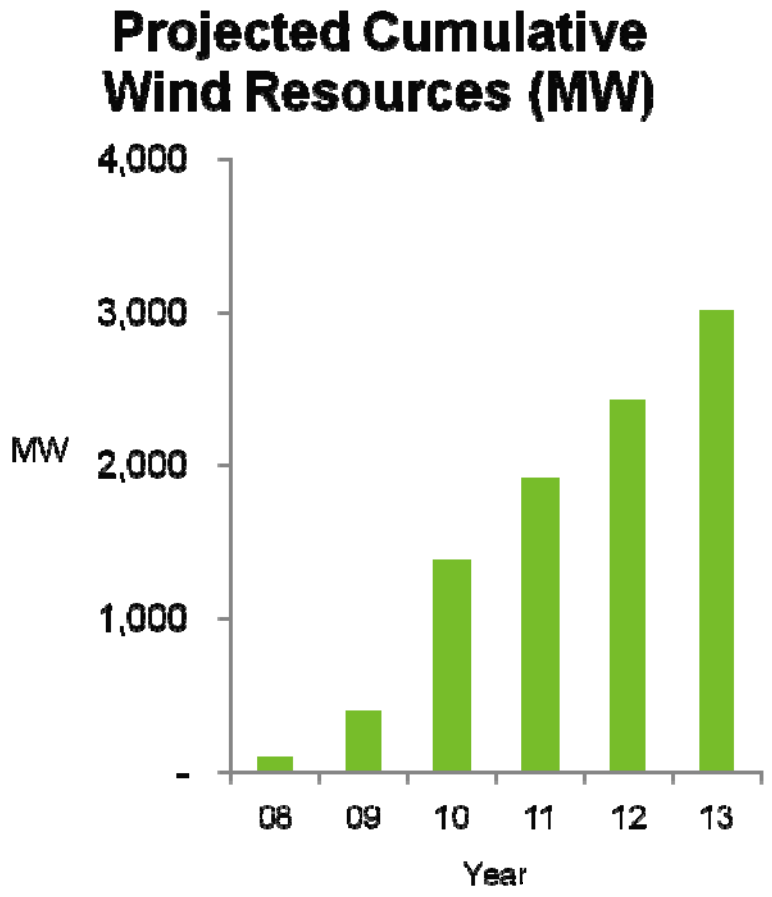
- Wind diversity and interactions
  - Wind and load patterns
  - Installed generation
- Impact of region-specific characteristics
  - Off-shore
  - Neighboring control areas with strong wind resources
  - Located near the end of the Eastern Interconnection
  - Market systems

Operational Issues

- Over/under commitment caused by forecast uncertainty
- Wind curtailments due to lack of transmission
  - Minimum generation and congestion management issues
- Variability may require additional resources including regulation, load following, and reserves
- Coordination of variability with neighbors

New England Wind Integration Study

- Determine technical requirements
- Create wind model including on-shore and off-shore capability
- Assess impact of wind development scenarios on system operations
- Identify best practices to forecast wind
- Determine contribution of wind to system adequacy



Wind Integration Study (cont.)

- Through RFP, ISO has selected industry leaders to complete the study:
  - General Electric (Project Leader)
  - Enernex
  - AWS Truewind
- Study Completion in Summer 2010
  - Technical Review Committee established
  - Scenario assumptions to be reviewed with the Planning Advisory Committee

Integration of DR and Renewables

Sets the stage for the development of the Smart Grid

- Greater reliance on demand and renewable resources will increase complexity of bulk power system management
- From a grid operator perspective, balancing a diverse set of technologies and resources requires controllability and visibility
- Smart Grid technologies and applications will increase the efficiency of the grid
  - Advanced Metering
  - Storage technologies
  - Advanced Grid Simulator
  - Various other technologies and software applications