

Overview of System Planning

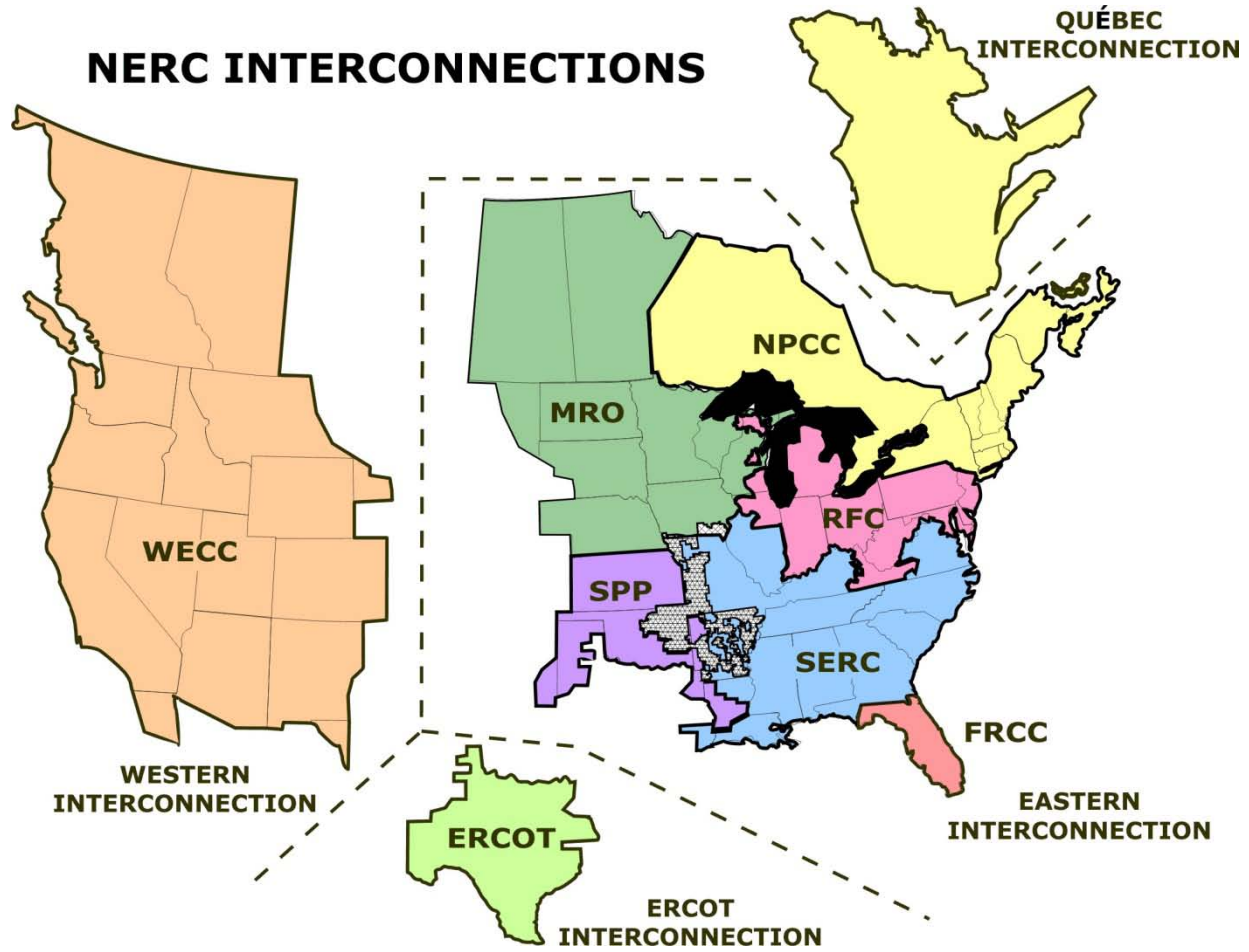
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System Planning

Module Objectives

- At the completion of this module, you will be able to:
 - ✓ State key responsibilities of System Planning and their impact on electric markets.



Part of the Eastern Interconnection



Reliability Standards Guide Regional Transmission Planning

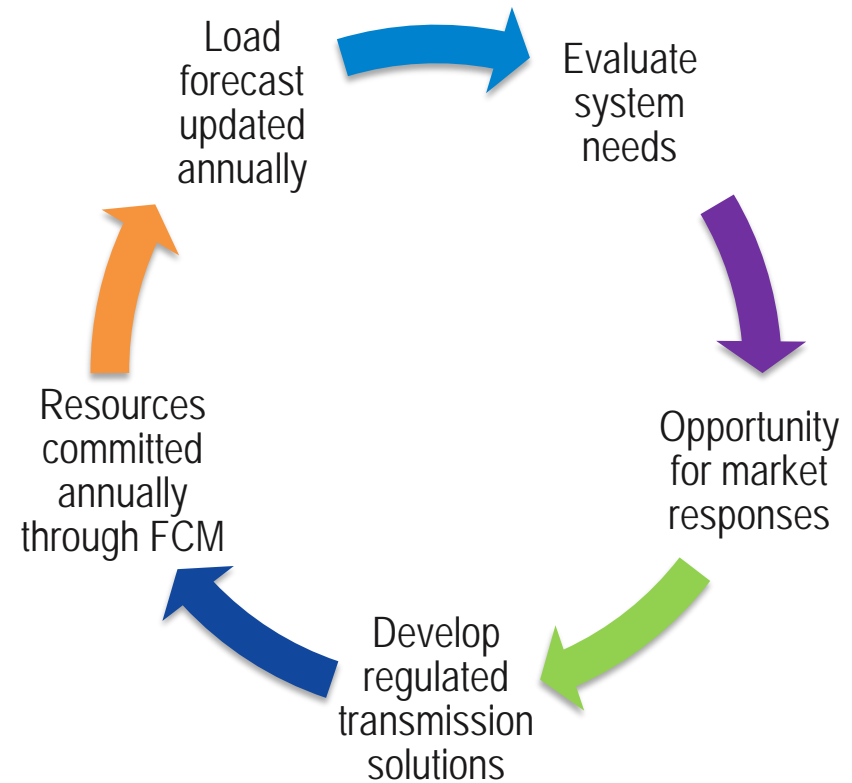
- North American Electric Reliability Corporation
 - Reliability Standards for the Bulk Power System in North America
- Northeast Power Coordinating Council
 - Basic Criteria for the Design and Operation of Interconnected Power Systems
- ISO New England
 - Reliability Standards for the New England Area Bulk Power Supply System



Standards are used to ensure that the regional transmission system can reliably deliver power to consumers under a wide range of future system conditions.

New England's Planning Process is Continuous, Adaptive, Successful

- Transparent, 10-year annual needs assessment reflects:
 - Updated load forecasts
 - Market responses
 - Timing of future resource needs
- Identifies regionally preferred transmission solutions
- Results: Incorporation of new market resources and reliability-based transmission investment across the region



New England has Well-established Framework to Develop Infrastructure

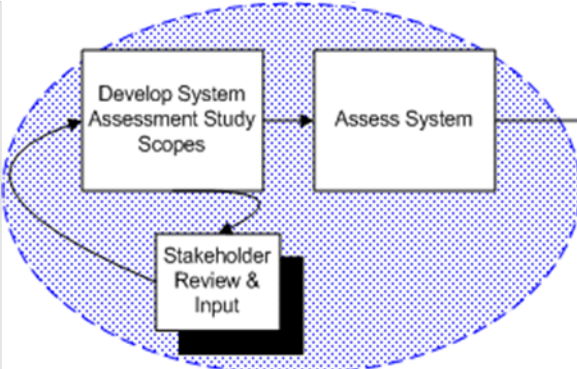
- ISO performs transmission system planning as part of its obligation to provide Regional Network Service
 - Governed by FERC-approved tariff, stakeholders provide input
 - Approach is not to do integrated resource planning
 - Transmission and generation are not always interchangeable
 - Transmission system must reliably serve load and generation
- Resources are obtained through competitive markets and market participant actions
 - Market participants and states influence the amount, location and types of resources that get developed
 - ISO is responsible for administration of the FERC approved generation Interconnection process

ISO Support for State Planning Efforts

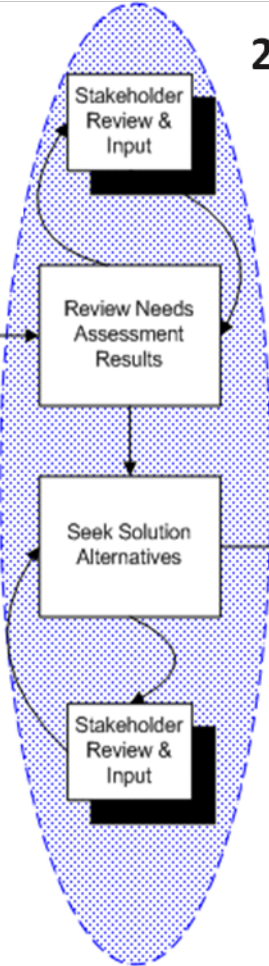
- ISO Staff provides support to New England state regional planning activities, as well as individual states as input to state sponsored planning efforts.
- New England States Committee on Electricity (NESCOE), Power Planning Committee of the New England Governor's Conference (NEGC-PPC), Northeast International Committee on Energy (NICE) and Eastern Interconnection States' Planning Council (EISPC) are regional and interregional efforts supported by all six New England states that actively interface with the ISO Planning staff and the regional planning process.
- The Vermont System Planning Committee (VSPC) and the Connecticut Energy Advisory Board (CEAB) are examples of two individual state activities supported by the ISO.

Transmission Planning Process

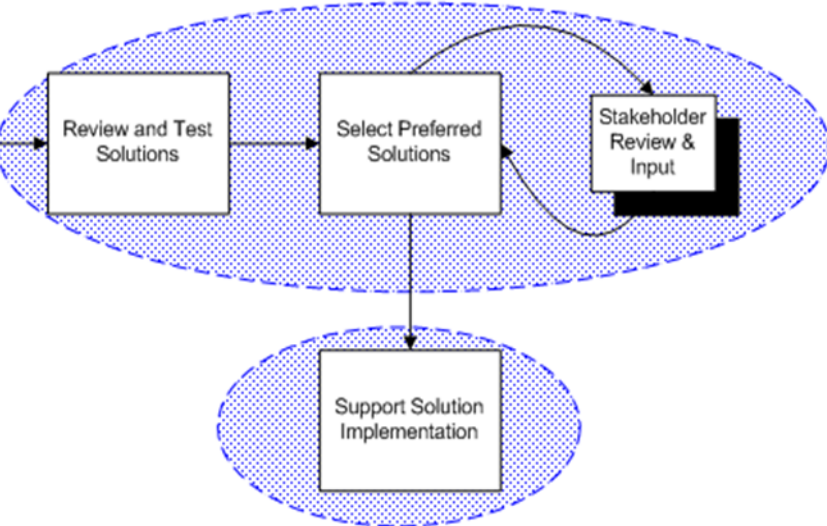
1. Assess PTF* System



2. Explore Transmission Solutions



3. Select Preferred Solution

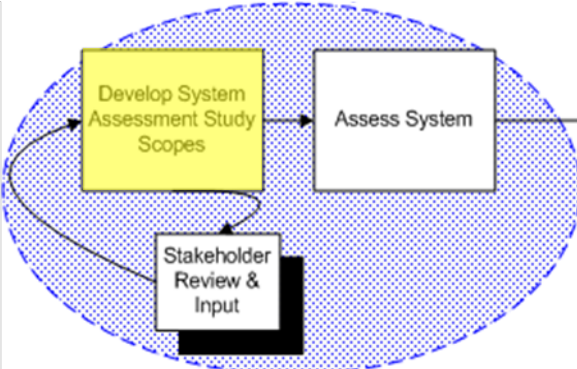


4. Monitor Implementation

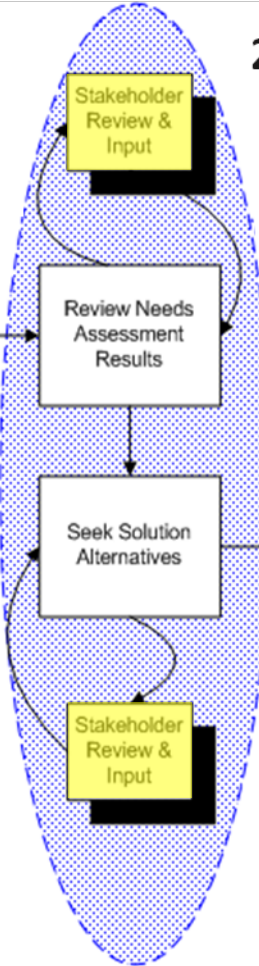
*PTF: Pool Transmission Facilities

Transmission Planning Process

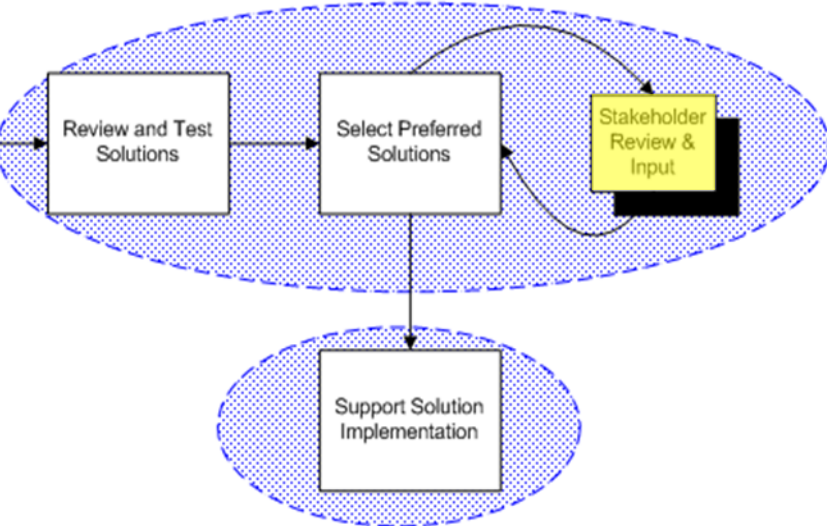
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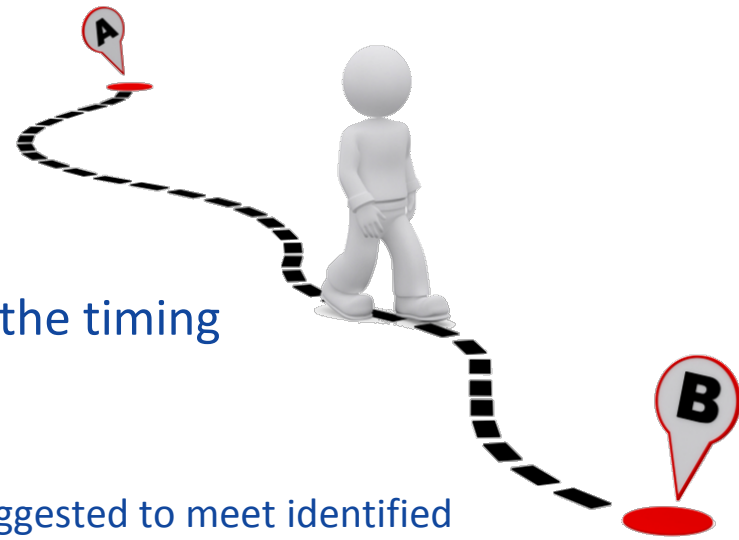
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Major Milestones



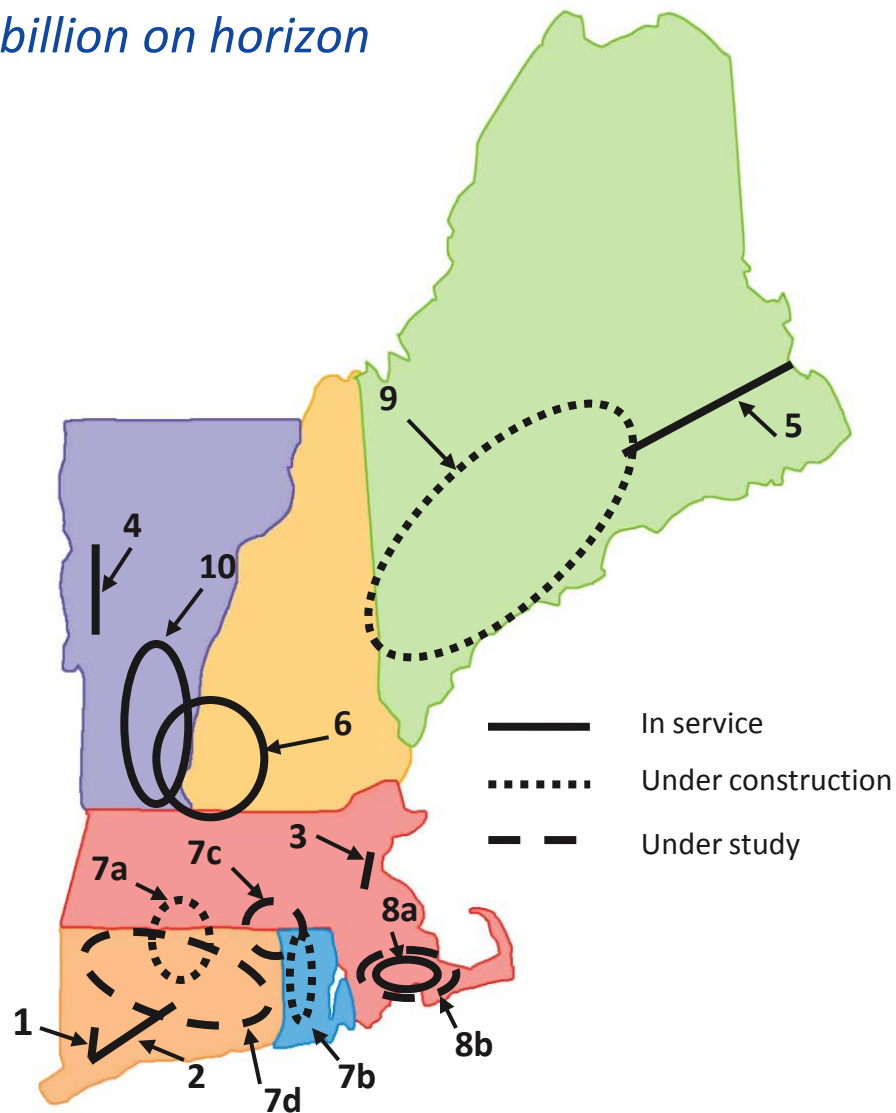
- ISO performs Needs Assessment to identify the timing and details of system needs
 - Stakeholders provide input
 - Conceptual transmission solutions may be suggested to meet identified system needs
 - Recognizes Market Solutions
- Solution Studies identify the most cost-effective transmission solutions
 - Planned transmission solutions are identified through Solution Studies
 - Must address needs established in Needs Assessments, and
 - Must have received ISO approval under reliability review of the ISO Tariff
- Transmission Cost Allocation review determines costs eligible for regional support
 - Localized costs are excluded

Transmission Projects to Maintain Reliability Are Progressing

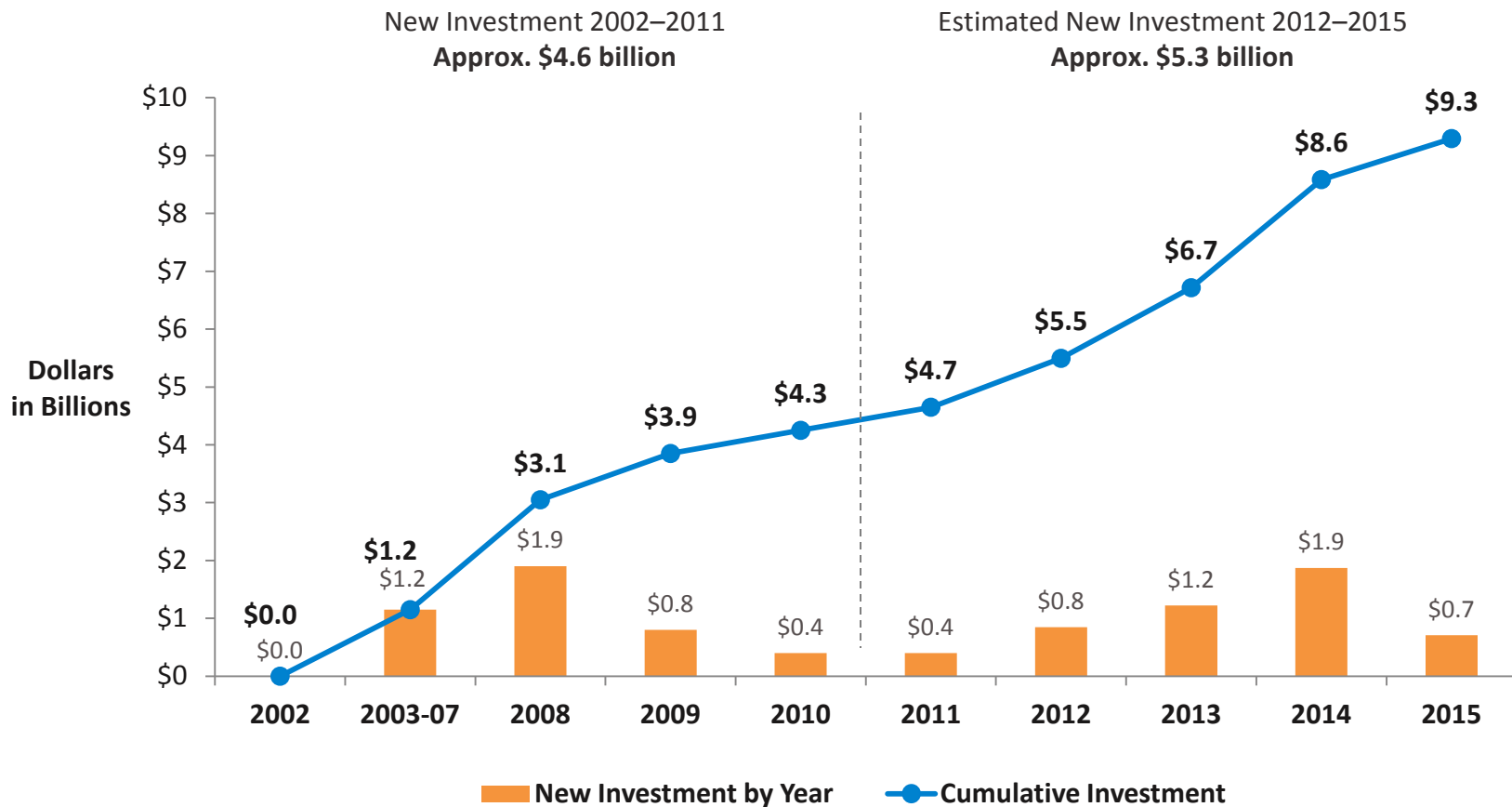
\$4.6 billion invested since 2002, \$5.3 billion on horizon

Recent Projects:

1. Southwest CT Phase I
2. Southwest CT Phase II
3. NSTAR 345 kV Project, Phases I & II
4. Northwest Vermont
5. Northeast Reliability Interconnect
6. Monadnock Area
7. New England East-West Solution
 - a. Greater Springfield; b. Rhode Island;
 - c. Interstate; d. Grtr. Hartford/Central CT
8. Southeast Massachusetts
 - a. Short-term upgrade ; b. Long-term project
9. Maine Power Reliability Program
10. Vermont Southern Loop



Transmission Investment in New England



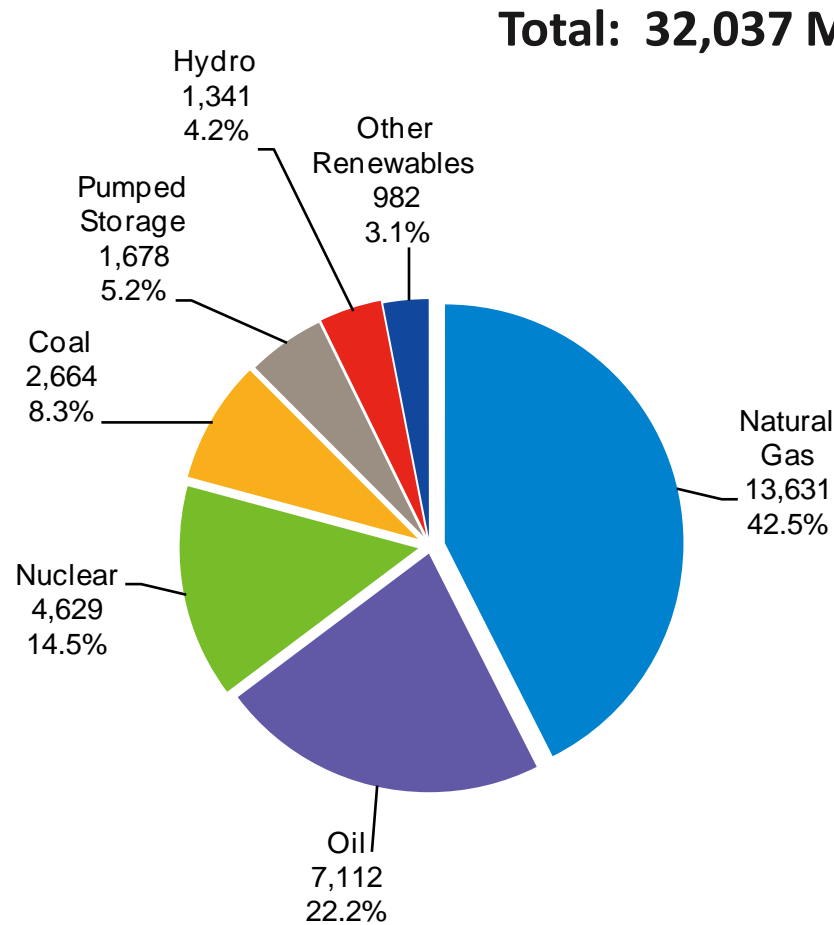
Source: ISO New England Transmission Project List, through April 2011 Update.

Overview of Resource Planning

- Markets provide signals to establish sufficient resources (generation, demand resources and imports) to satisfy regional capacity needs
 - Development of Installed Capacity Requirement (ICR)
 - Reports such as Capacity, Energy, Load, and Transmission (CELT) and Regional System Plan (RSP)
- ISO-NE is responsible for administration of the FERC generator interconnection process
 - Generation proposals are subject to ISO reliability review
 - Proposals are studied in the order received and maintained in the generator interconnection queue
 - The end result is a three-party Interconnection Agreement between ISO, the generator, and the interconnecting transmission owner

New England Generation Capacity for 2011

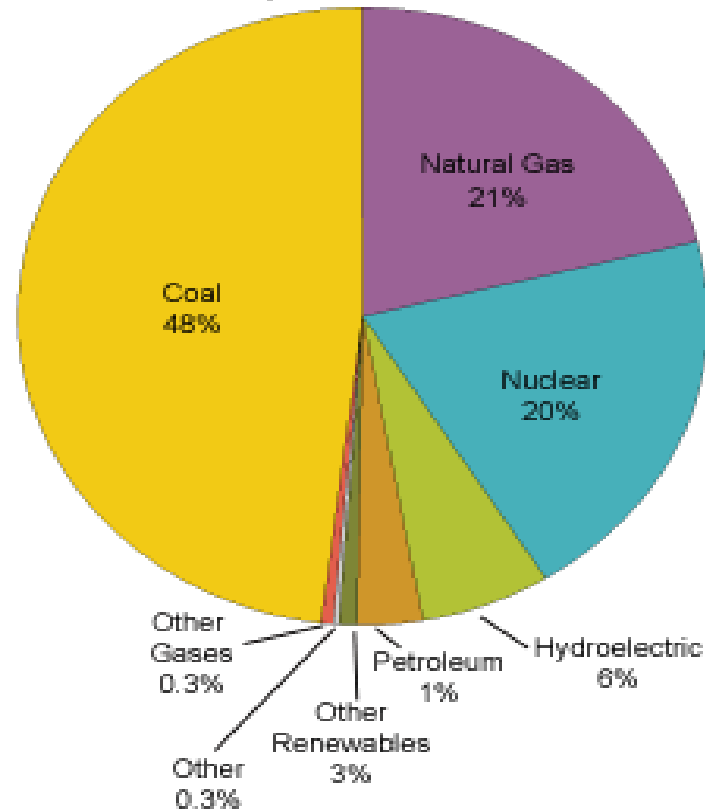
By Fuel Type



Source: April 2011 CELT Report. "Other" includes landfill gas, other biomass gas, refuse, wood and wood waste, wind solar and misc. fuels

U.S. Electric Power Industry Net Generation

U.S. Electric Power Industry Net Generation by Fuel, 2008

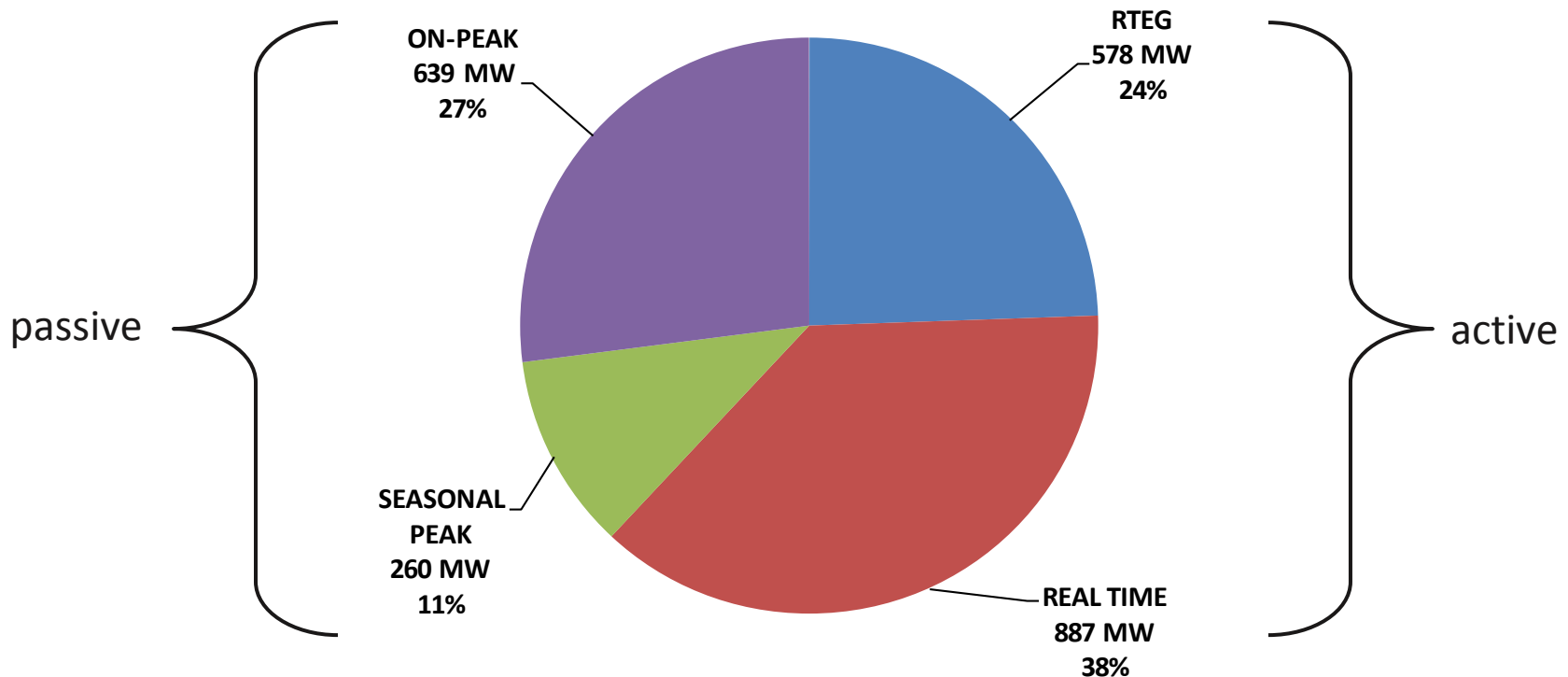


Source: U.S. Energy Information Administration, *Electric Power Annual* (2010).

New England Demand Resources for 2011

By Type

Total: 2,362 MW

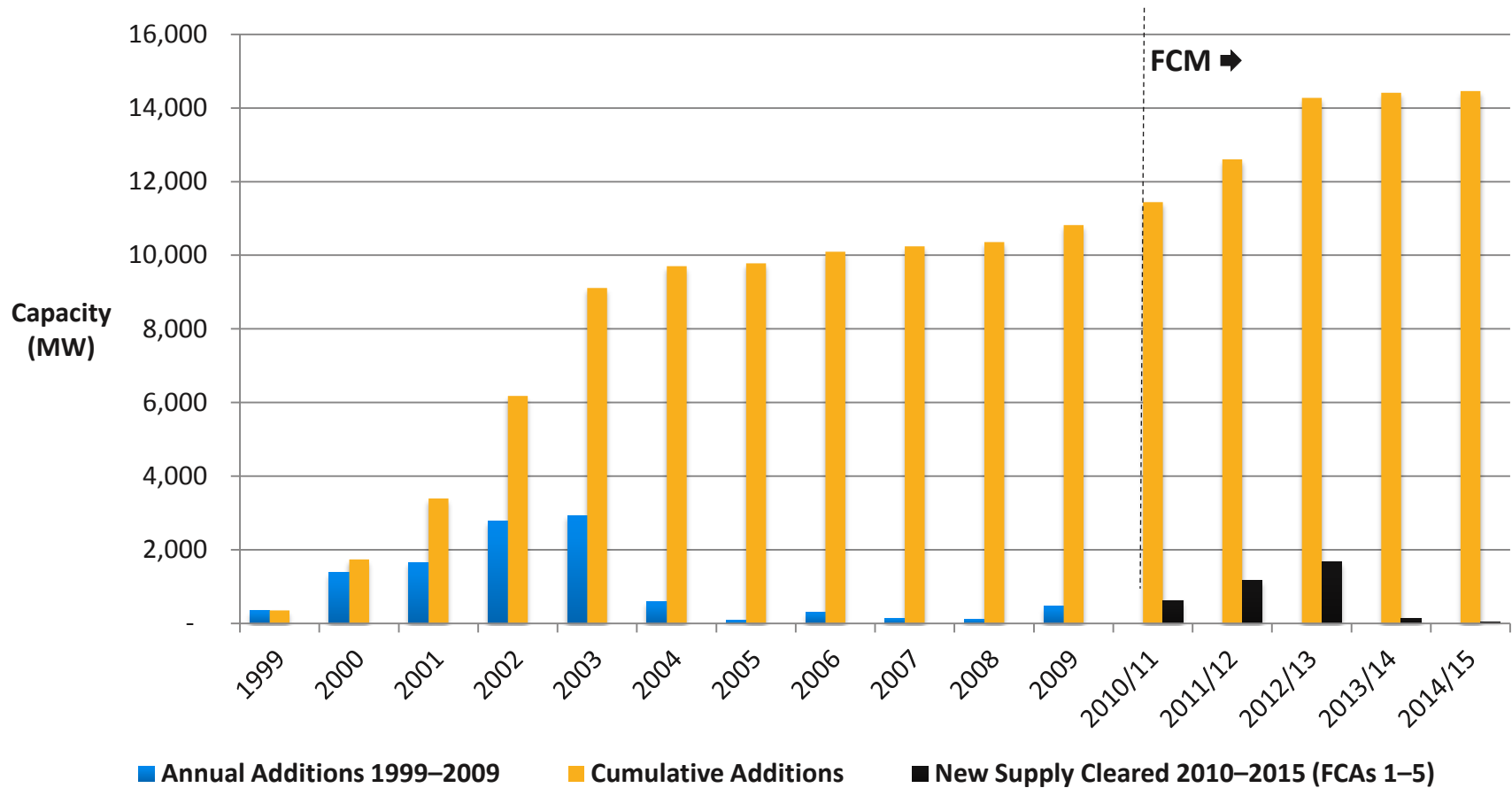


RTEG – Real-Time Emergency Generation
DR – Demand Resources

Source: April 2011 CELT Report

New Generation Additions in New England

10,800 MW Added Since 1999; Plus 3,600 MW Committed for 2010-2015



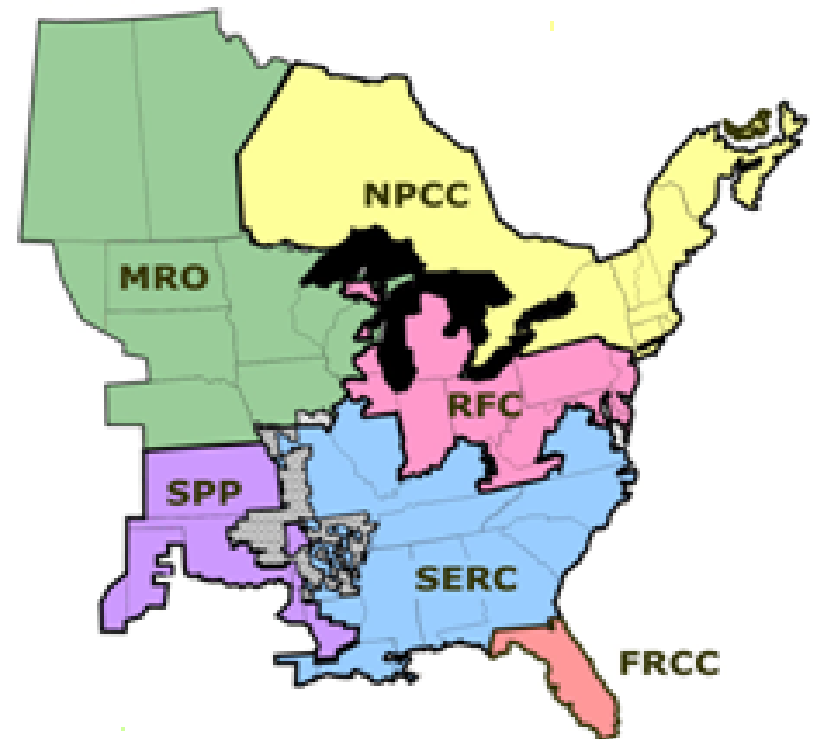
Planning has Evolved

- New England's planning process has evolved since FERC granted ISO-NE a planning authority a decade ago
 - Market responses and state RFPs are factored into needs assessments (Order 890)
 - Stakeholders can request economic planning studies (Order 890)
 - New England States Committee on Electricity (NESCOE) is active in ISO's planning process, transmission and resource adequacy reviews; developed regional energy blueprint adopted by the New England governors
 - Mandatory reliability standards give added importance to planning
 - Generator Interconnection Procedures are aligned with the qualification process for resources participating in the Forward Capacity Market (FCM)



Geographic Scope is Expanding

- ISO and other planning authorities submitted bid to U.S. DOE for “Eastern Interconnection Planning Collaborative” (EIPC)
 - Analysis and scenarios using regional plans as foundation
 - States submitted companion bid to participate and consult on scenarios and assumptions
- FERC and Congress are seeking to broaden planning toward more inter-regional planning and integration of renewable resources



State Efforts Complement Regional Plans

- States are active in the regional planning process, but also establish their own priorities and planning objectives
 - For example:
 - Fund conservation and load management programs through retail rates
 - Give priority to energy efficiency in procurement plans
 - Issue RFPs for resources, such as capacity, peaking generation, wind power
 - Require electric distribution companies to develop integrated resource plans
 - Provide financial incentives for distributed resources
 - Set renewable portfolio standards
 - Influence generation mix through cap-and-trade program to control greenhouse gas emissions (RGGI)

These approaches are compatible with the regional planning process

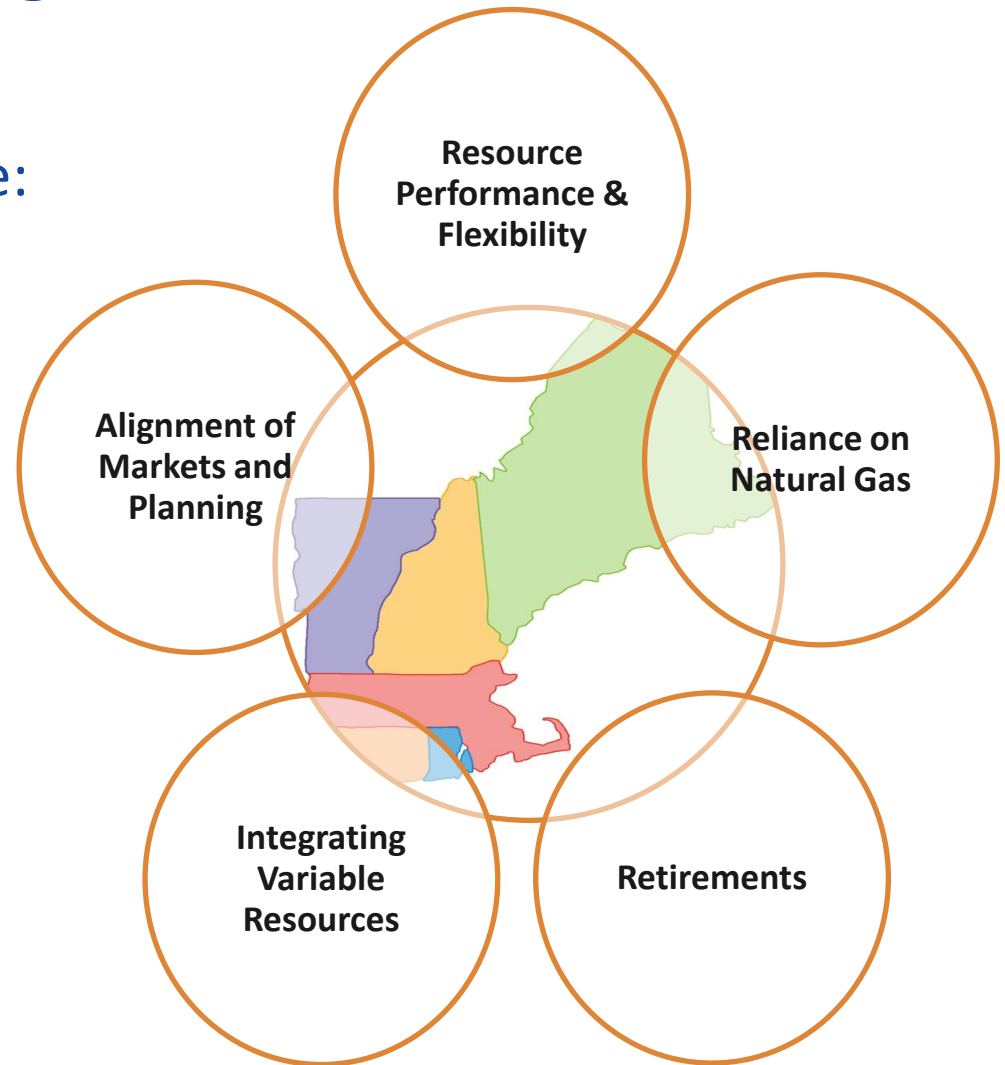
Challenges for the Region

- FERC Order 1000
 - Issued in July 2011, Order 1000 pertains to intra- and interregional transmission planning and cost allocation practices in both ISO/RTO and non-ISO/RTO regions
 - Establish planning processes and cost allocation methods that will support transmission development to meet public policy objectives
 - Establish planning processes and cost allocation methods with neighboring systems to support inter-regional planning and transmission development
 - Remove arrangements that protect the right of first refusal for incumbent transmission providers
 - Regional stakeholder meetings currently underway to comply with new requirements
 - ISO to submit compliance filing in 2012

Challenges for the Region (cont.)

- Strategic Planning Initiative:
Create Strategic Vision for the Region

- 5 risks identified
- Region-wide and industry-wide participation
- Region considering and developing solutions
- For more information, visit [Strategic Planning page](#) on ISO's website



Conclusions

- New England's planning process and wholesale markets have brought forward significant investments in generation, transmission, and demand resources.
- New England has strong potential for developing renewable resources.
- Integrating demand resources, wind and smart-grid technologies will increase complexity in power system operations and planning.
- New England is actively planning for its energy future on a regional and interregional basis.

