

Development of an All-In Hourly Real-Time Price

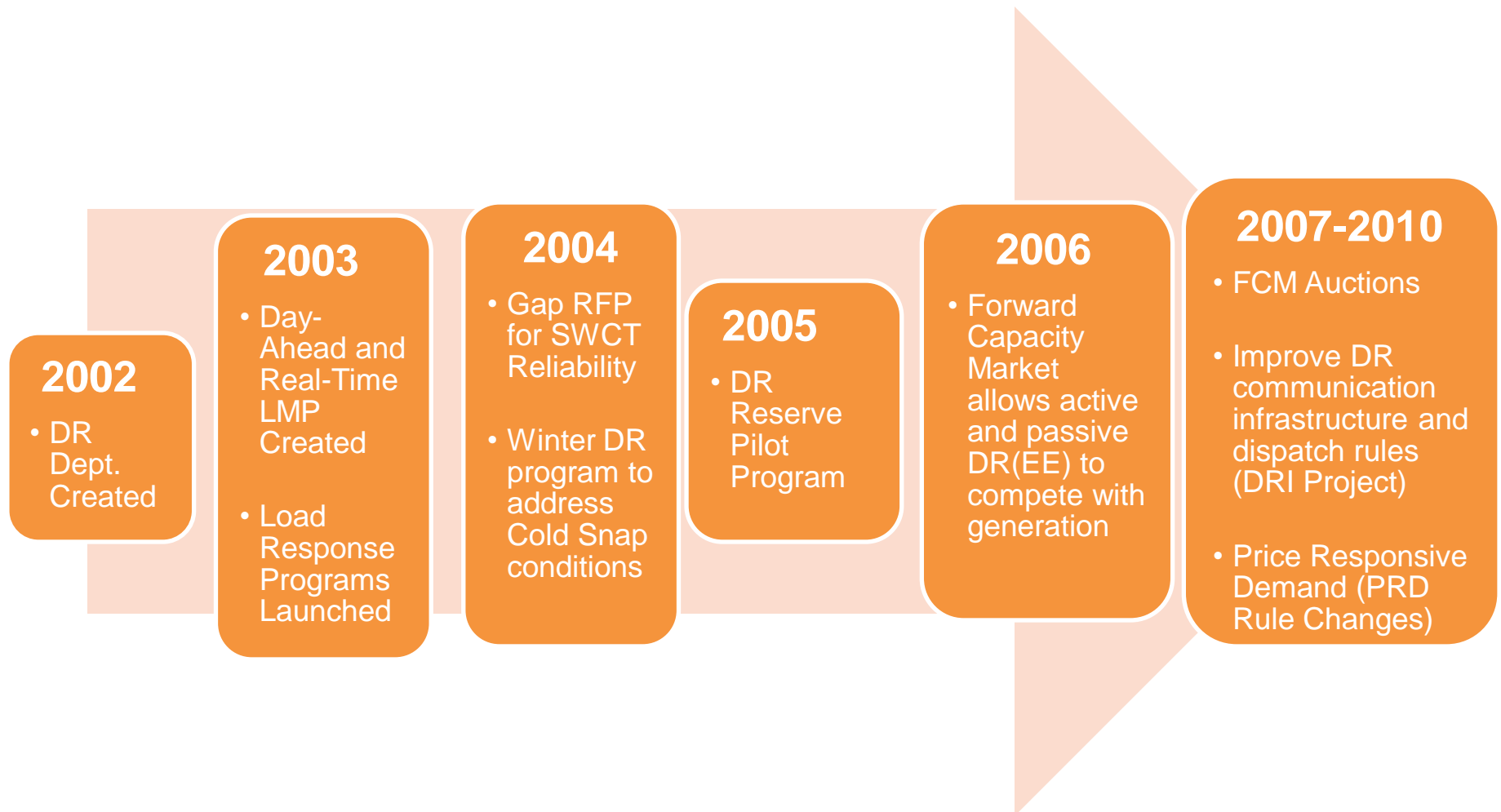
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ISO New England

9 November 2009

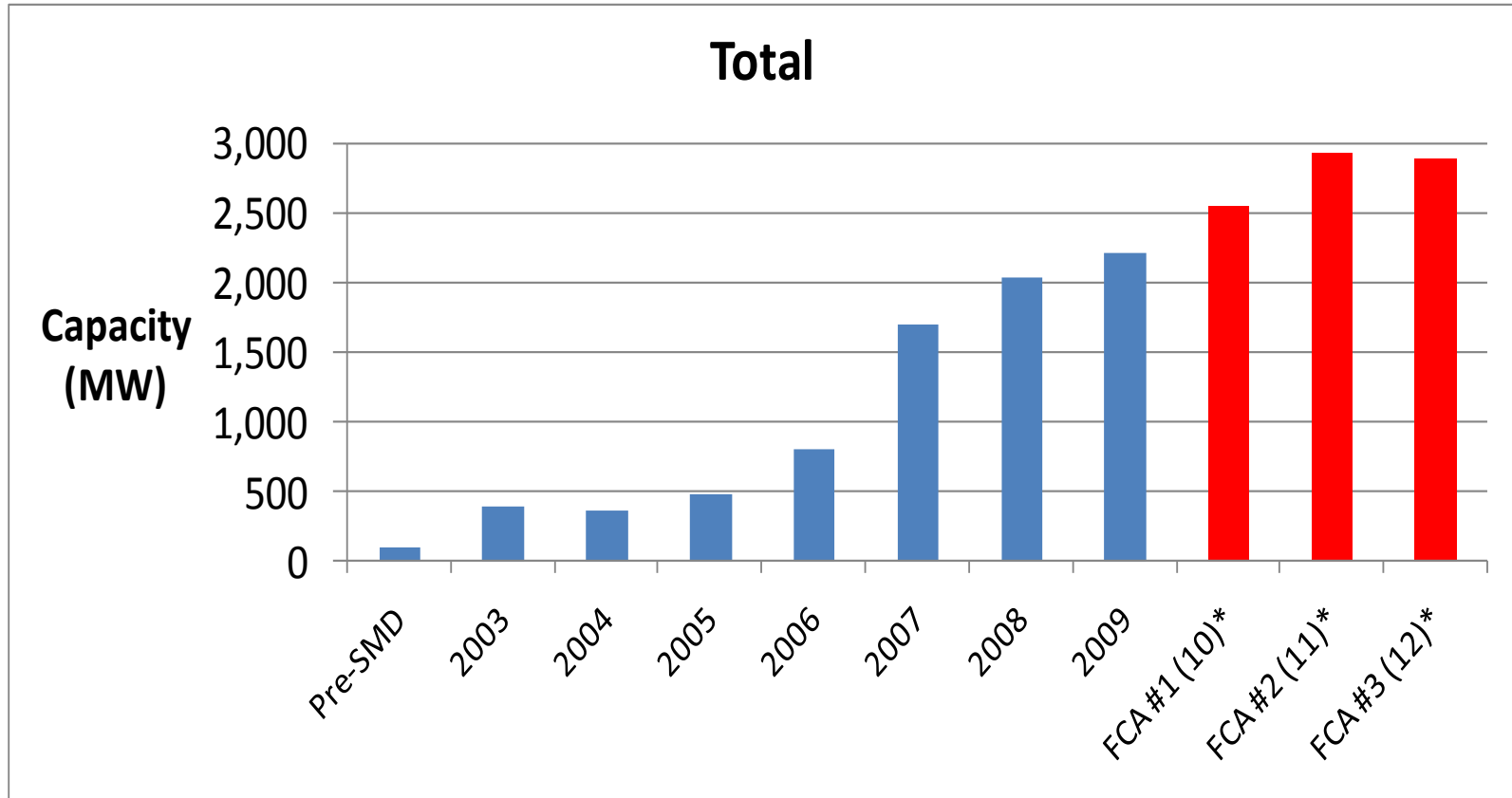
The Role of Demand Resources

- Improves efficiency of electricity use
 - Shifts consumption to lower cost periods
 - Relies on more efficient and cleaner supply to meet demand
 - Reduces peak load – mitigating the need for additional transmission and generation
- Improves reliability in times of tight supply

ISO New England Efforts to Expand DR



Demand Resources Growing in New England

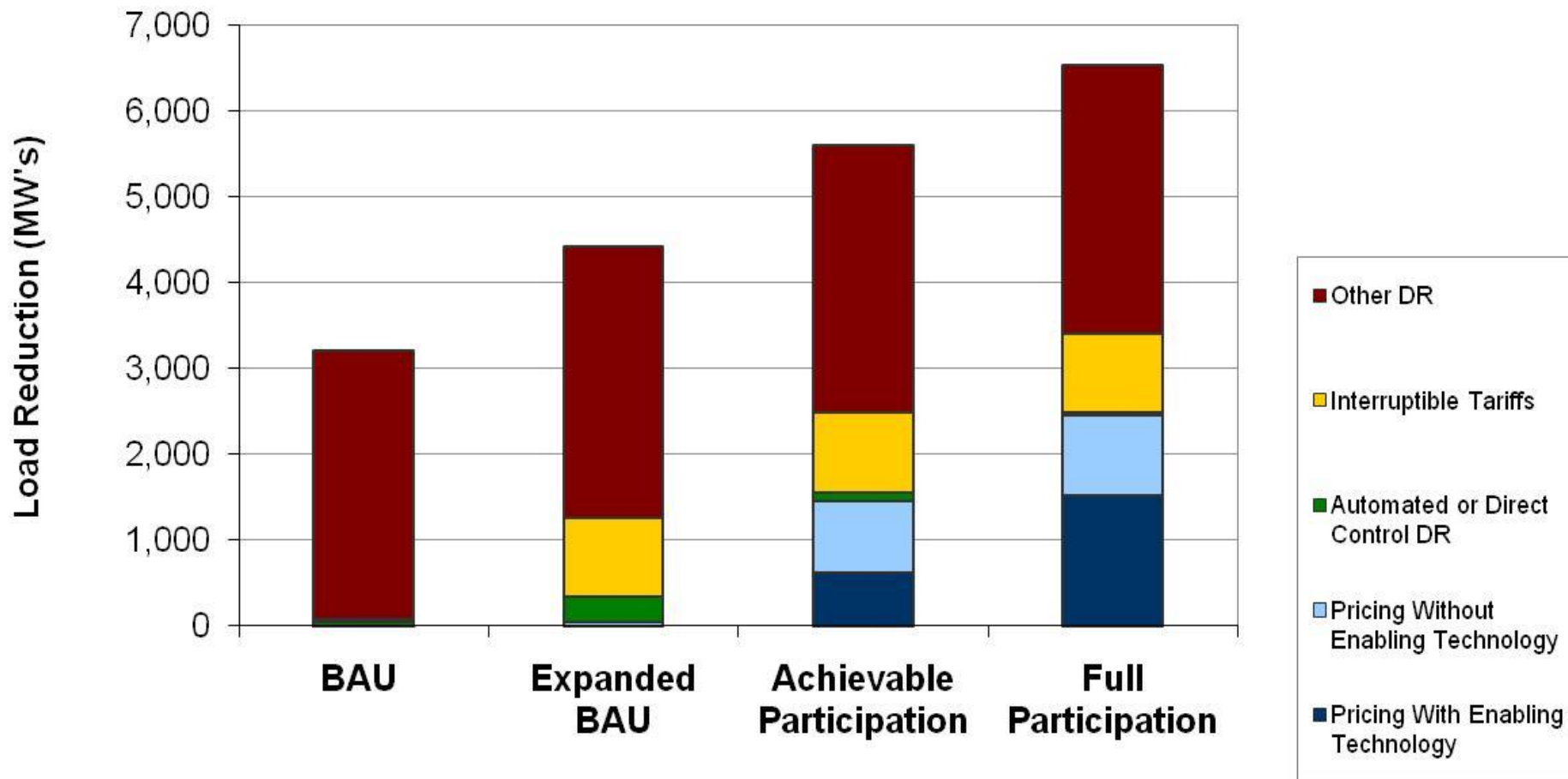


* Represents Demand Resources that cleared respective capacity auction

FERC National DR Potential Assessment

1. New England DR Potential in 2019, by DR Type

(2019 System Peak = 32.2 GW)



Integration of Price Responsive Demand

- Allow consumers broader access to the wholesale market, either directly or through intermediaries such as demand response providers
- Preferences of demand is reflected directly in the clearing of the energy markets, with consequent impacts on reserve and capacity markets
- Additional infrastructure is required, technology and policy, to support a transition from the status quo to desired future state

Approaches to PRD in New England

- ISO New England has proposed two complementary approaches
 - **Demand-side:** customers change consumption in response to real-time price information
 - **Supply-side:** demand response providers submit and clear demand reduction offers through the market
- Customers with advanced meters and access to dynamic prices can benefit from these approaches

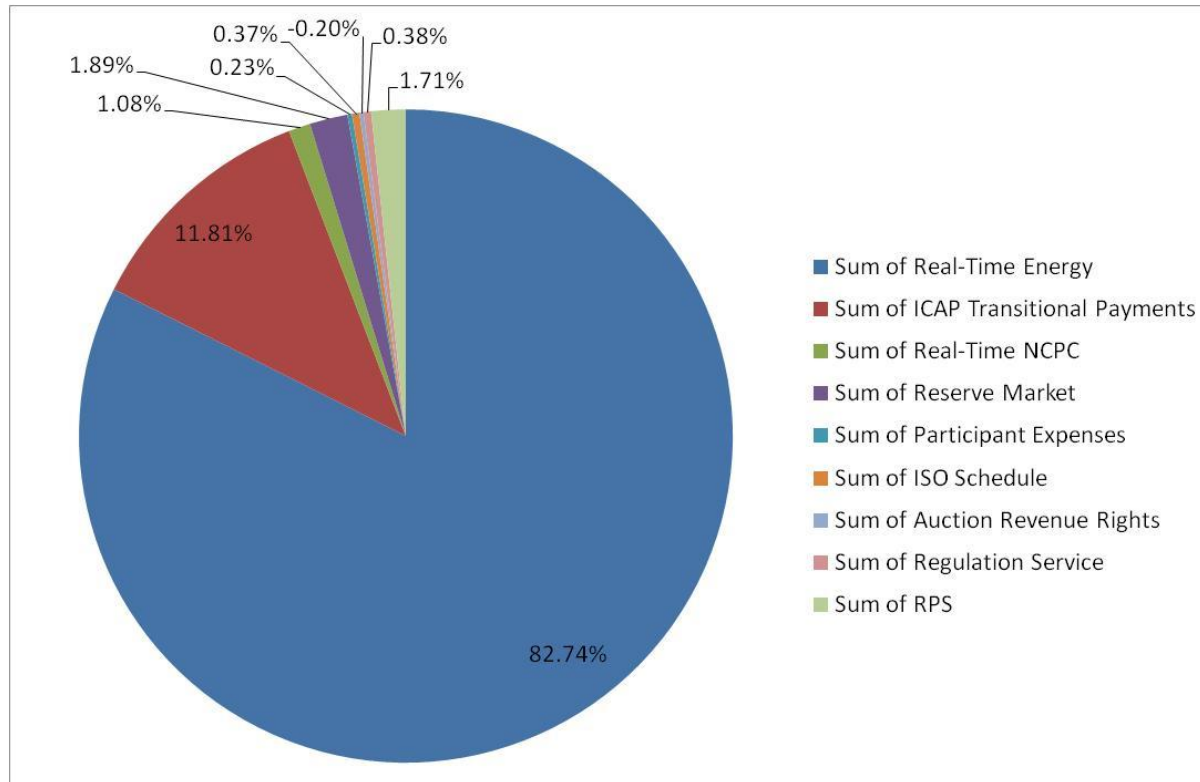
Demand-Side Approach to Price-Responsive Demand

- Market Participants may elect to purchase wholesale electricity at a real-time price
- The \$/MWh price includes energy and an allocation of capacity charges
- Market Participants that reduce load in high value hours avoid energy charges and enjoy a reduction in future capacity charges

Why Price Capacity on a \$/MWh Basis?

- The “value” of capacity varies with consumption
- When capacity is short relative to demand, prices should increase until the market clears
- Prices are constrained for a variety of reasons
- Constrained prices dampen incentives for price-responsive demand

Energy and Capacity are the Most Significant Part of Wholesale Power Costs*

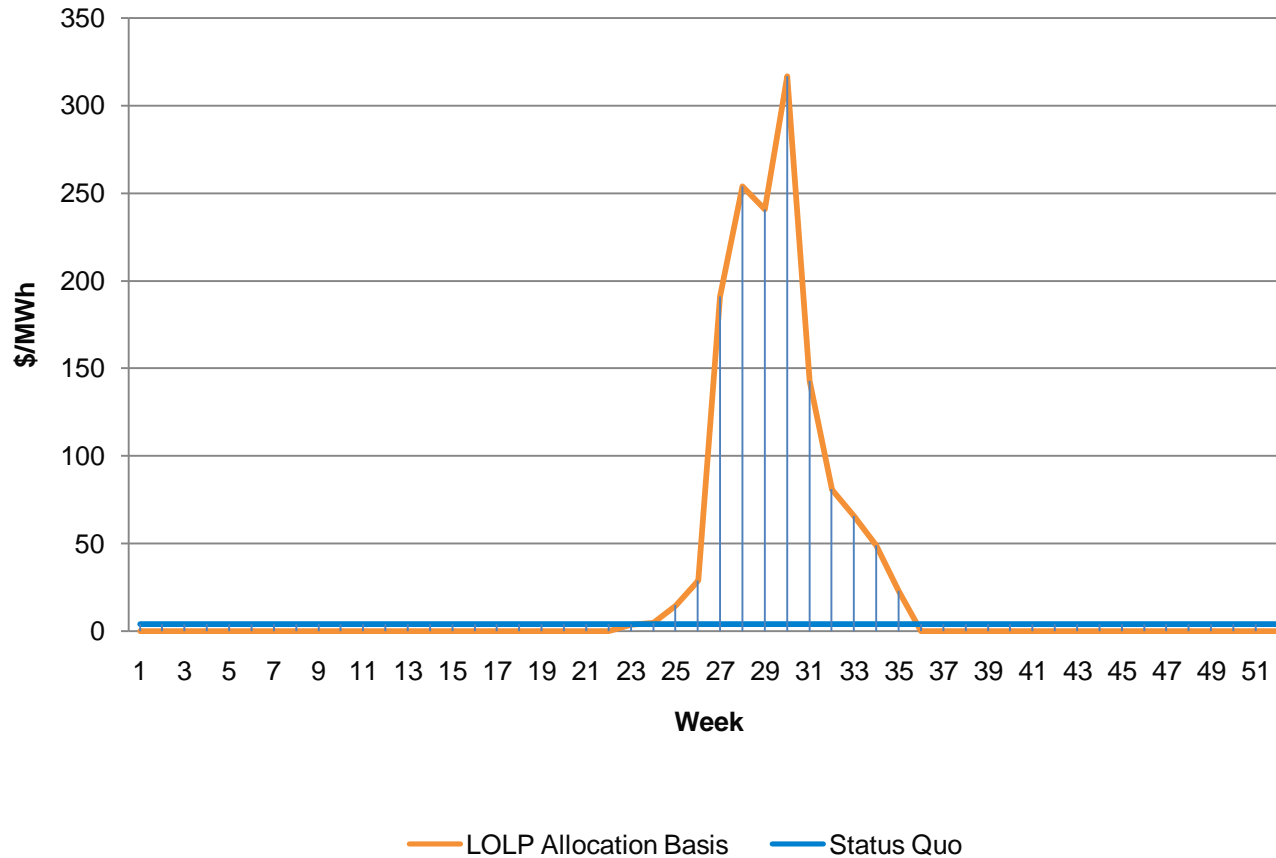


*A matrix describing the major components of a wholesale load customer's bill is located at:
http://www.iso-ne.com/stlmnts/cost_comp/index.html

Capacity Pricing as Cost Allocation

- Capacity costs are currently allocated on an annual average basis charged monthly
- GOAL: Develop a methodology that allocates costs in proportion to the marginal value of capacity
- ISSUES:
 - Selection of allocation basis
 - Management of cash flow
 - Under/over collection of the revenue requirement
 - Allocation of the under/over collection

Value of Capacity as a Function of System Loss of Load Probability

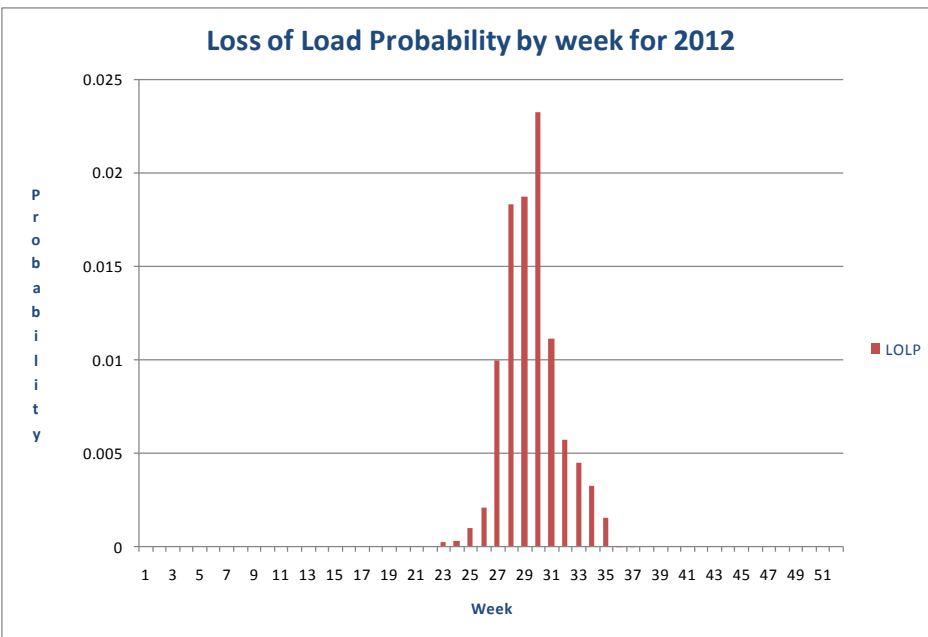


Capacity Pricing Proposals

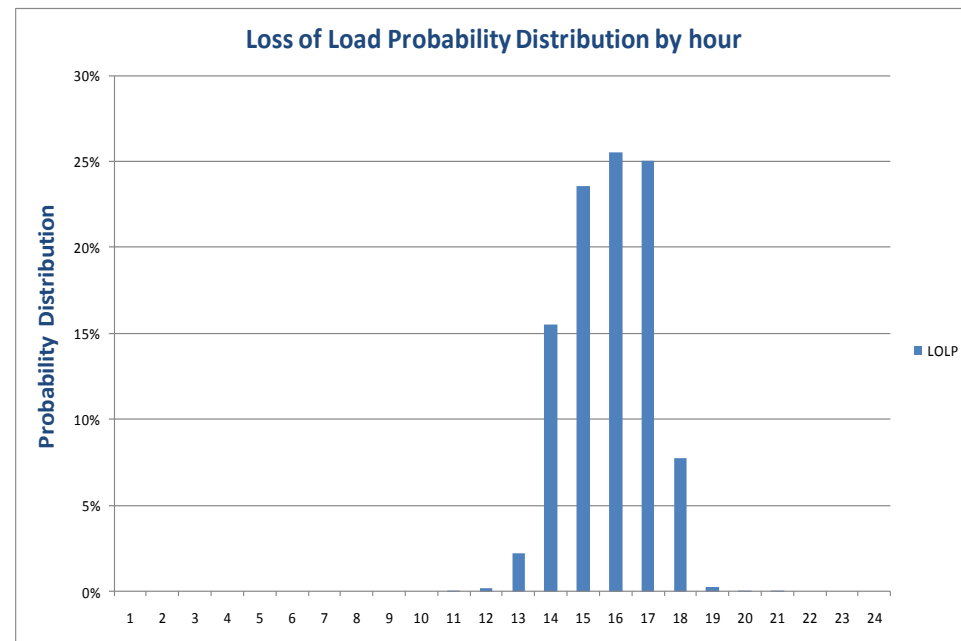
- ISO New England has considered two capacity pricing alternatives
 1. A method based on expected Loss of Load Probabilities (“LOLPs”)
 2. A dynamic Critical Peak Pricing (“CPP”) method where the ISO calls a critical peak hour based on system conditions at the time

LOLP Approach

LOLPs by Week in 2012



LOLP Distribution by Hour in 2012



CPP Approach

- The Demand Response Operable Capacity Cap Analysis calculates the expected number of Demand Resource Critical Peak Hours and days within each month
- Demand Resource Critical Peak Hours are assumed to occur during the hours with the highest loads in the month
- Actual Demand Resource Critical Peak Hours in a Capacity Commitment Period will be based on anticipated (day-ahead) or actual (real-time) system conditions

Advantages and Disadvantages

- LOLP Basis
 - LOLP is a more precise allocation basis than annual system peak
 - Based on historical patterns of consumption, LOLP approach enables customer planning
- CPP Approach
 - Capacity costs are allocated over a small number of hours creating a very strong price signal
 - The capacity rate is “called” in response to actual system conditions
 - CPP may produce greater revenue collection variances

Complex Issues and Differing Opinions

- Interaction with the Forward Capacity Market
- Estimation of demand elasticity in setting the Capacity Requirement
- Cost shifting
- Perception: the ISO is treading on Load Serving Entity's business

QUESTIONS