# Capacity Market Design

*Aligning Energy and Capacity Markets to Improve Performance and Investment*

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# The Main Points

## Capacity Market Design Challenges:

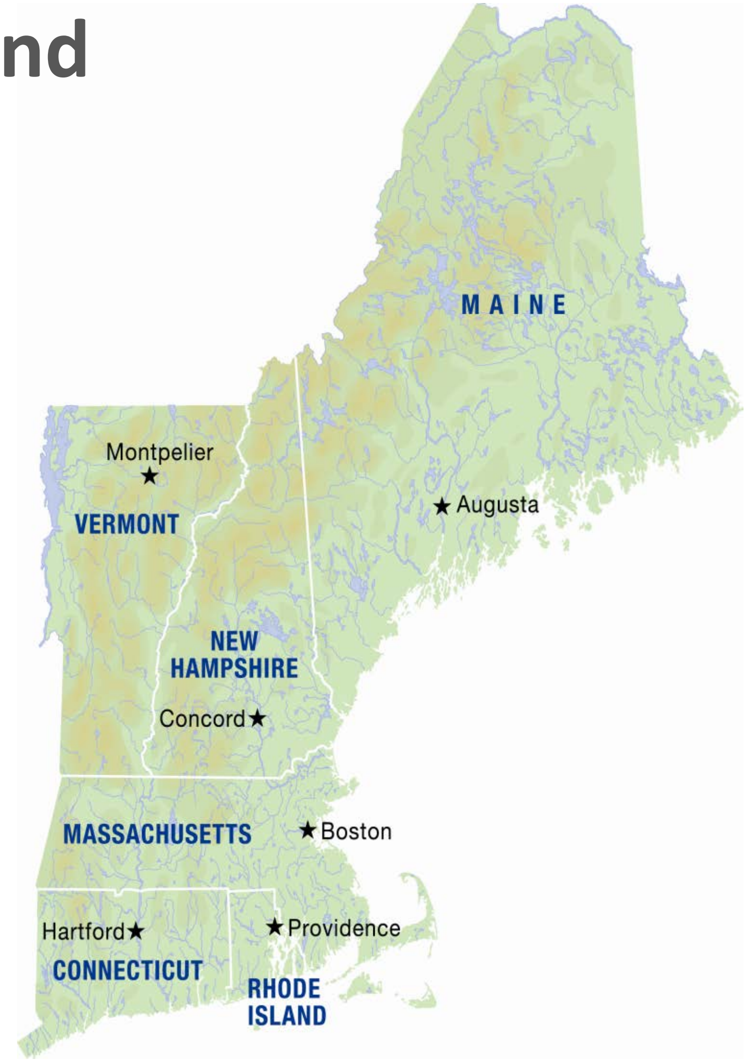
1. **"Missing money" problem also causes *missing incentives*.** Good capacity market design must address *both* problems.

2. **Capacity product definitions are vague.** Using a standard forward contract structure would improve these markets.

*ISO New England is reforming its forward capacity market to address both challenges*

# Background: ISO New England

- **Regional market and grid operator**
- **Full suite of auction-based energy and capacity markets**
  - Capacity is a three-year forward, cleared at auction annually
- **500+ market participants**
- **Regional population** of 14 million



# Emerging Market Challenges:  Context

- **New England** is increasingly reliant on resources with uncertain performance and availability.
  - **Gas units***:*  "just-in-time" fuel
  - **Coal, oil-steam fleet**:  50+ years old
  - **Intermittent resource growth** with inherently uncertain output

- **'Systemic risk'** that too many units may be unable to perform simultaneously.

# The Missing Incentive Problem

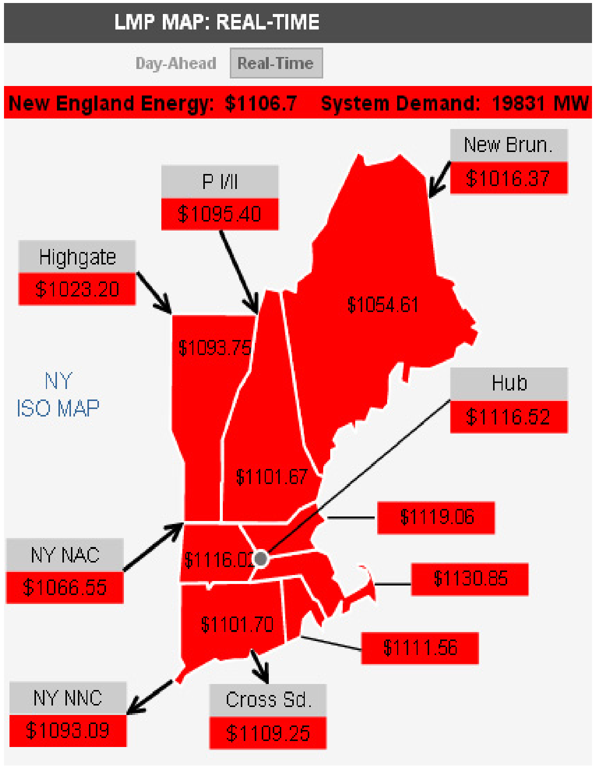
- **Many additional investments *could* reduce this risk, at new *or* existing facilities**
  - Dual-fuel, non-interruptible gas transport, backup LNG, greater liquid fuel storage & improved re-supply chains, and so on…
  - Entry of reliable, flexible generation and/or fast demand response
- **Current market design provides insufficient incentives for resources to undertake these investments**
  - These investments are typically needed few hours per year
  - Revenue in these hours is insufficient to justify the investment

# Restoring Incentives:  An Economic Perspective

- **Theory.** In tight conditions, price rises to value consumers place on reliable service. *Could be very high.*

- **Reality.** LMPs reflect short-run marginal costs and administrative reserve prices. *Much lower.*

- **Concept.** The "missing money" that a capacity market provides *should depend on performance during tight system conditions.*



# Design Insights:  Capacity Product Definition

- **Current capacity 'product definition' is… *hard to define***
  – *Common view:* Payment (subsidy) for "steel in the ground"
- **Better:  A standard forward contract.** Two key concepts:
  – **Two-settlement principle** (think of DA forward energy markets)
  – **A scarcity pricing premium** as RT incentive in tight system conditions
- **Goal:  Three desirable outcomes**
  1. **Strong performance incentives** of an efficient energy market;
  2. **Reduced revenue volatility** from a long-forward contract market;
  3. **Stability of system reliability** (capacity levels) over time.

# ISO New England's Reforms: Make Capacity a Proper Forward-Sold Good

## Forward-Sold Goods

- Initial revenue on fwd sale
- Specifies a forward financial commitment ('position')
- 2$^{nd}$ Settlement based on *deviations* at delivery …
- … at a contract rate, or at replacement (floating) price

## ISO's Capacity Reforms

- ✓ Auction-based fwd sale (FCA)
- ✓ *Pro-rata share* of system demand (load + reserves) during RT reserve shortages
- ✓ 2$^{nd}$ Settle, for delivery (energy + reserves) delta from share
- ✓ At (high) tariff-specified rate (analogous to scarcity pricing)

# ISO New England’s Reforms – Practicalities

- **Capacity Obligations:  A Standard Incentive Contract**
  - Base payment set in forward auction, and a performance payment
- **Performance Payment:**
  - Delivery of energy & reserves during (reserve) shortage conditions
  - May be positive or negative (on top of base payment)
  - Not based on “availability,” or EFOR-type measures.
- **Resource Neutral, No Exemptions**
  - **All** resources have same base and performance payment rate.
- **Who pays what?**
  - **Loads** pay the base payment set by the forward clearing price
  - **Performance payments** are transfers among suppliers.

# Expected Benefits of Improved Capacity Design

- **Greater operational-related investments** at existing resources to improve resource performance.
  - Esp.: Fuel arrangements and/or secondary fuel supplies

- **Efficient resource evolution.** Strong incentives for investment in new capacity that is either:

  (1) Low-cost and highly reliable (nearly always operating); or

  (2) Highly flexible and highly reliable (gets online quickly and reliably)

- **A more reliable power system.** Market design rewards suppliers with cost-effective investments that enable them to deliver energy during tight system conditions.

# For More Information

- **ISO New England** White Paper:

  *FCM Performance Incentives*

- **And related presentations at:**

  www.iso-ne.com/key_projects/fcm_perf_incentives/index.html