



# Capacity Market Design

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*Enhancing Capacity Markets to Improve  
Resource Performance and Investment*

**Matthew White**

SENIOR ECONOMIST



# The Main Points

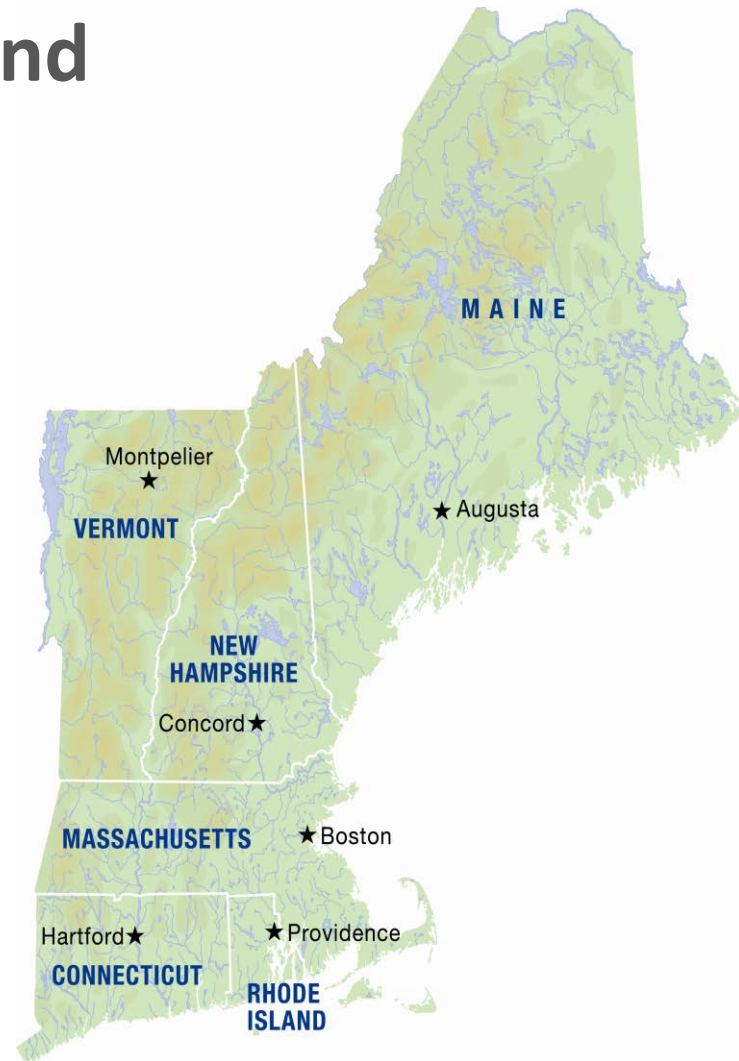
## Capacity Market Design Challenges:

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 markets to address both challenges*

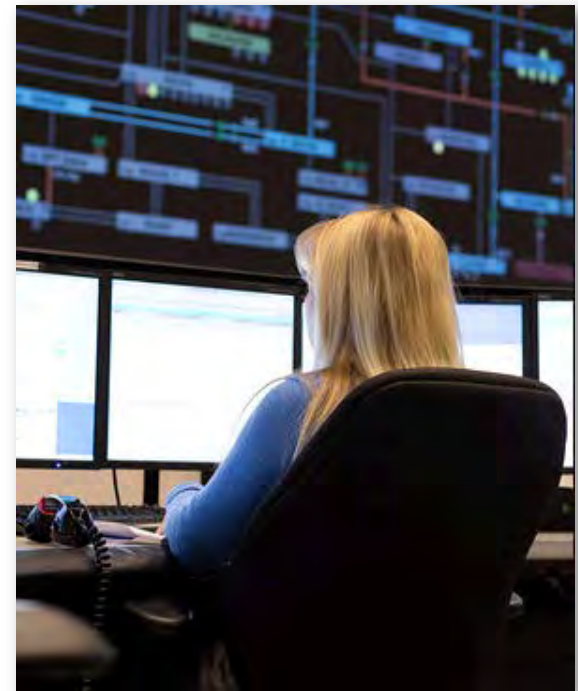
# Background: ISO New England

- 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 Capacity 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.

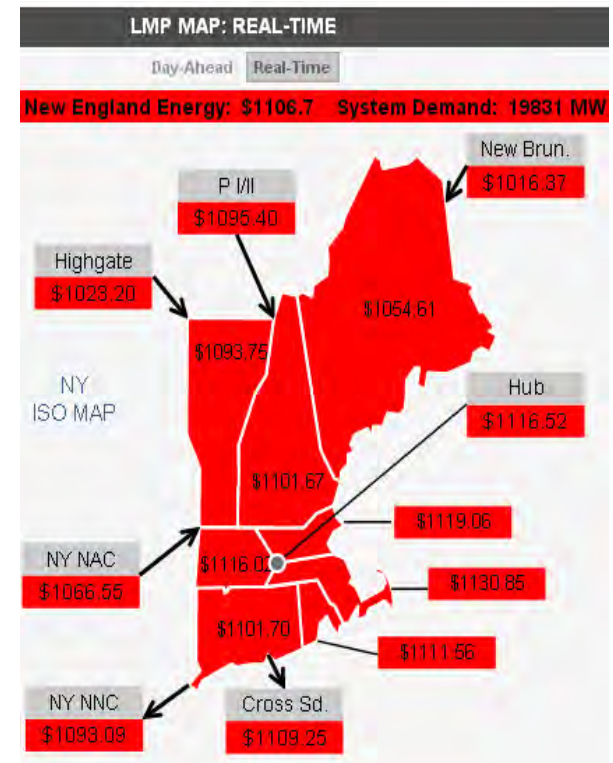


# The Missing Incentive Problem

- **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 markets provide 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.*



# Capacity Product Definition: Problems

- **Capacity sellers' obligations, generally:**
  - Build something, and operationally test it;
  - Be “available” during the capacity commitment period
- **“Available” is ill-specified and fraught with problems**
  - Lead time? *E.g.:* Available on 2 hours or 20 hours notice?
  - Exemptions? For intermittent resources? Lack of fuel generally?
- **Adverse consequences:**
  - Adverse retention/selection of poor-performing resources;
  - System not resilient to fuel-supply (or other) disruptions.

# A Contrast: Standard Forward-Sold Goods

## Forward-Sold Goods

- Initial revenue on fwd sale
- Specifies a forward financial commitment ('position')
- 2<sup>nd</sup> settlement based on *deviations* at delivery ...
- ... at a contract rate, or at replacement (floating) price

## Current Capacity Product

- ✓ Auction-based fwd sale (FCA)
- ☒ *Just be "available"*
- ☒ *None -- but penalties for non-availability (unless exempted circumstance)...*
- ☒ *... with penalties limited to initial revenue*



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

## Forward-Sold Goods

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## ISO's Capacity Reforms

- ✓ Auction-based fwd sale (FCA)
- ✓ *Pro-rata share* of system demand (load + reserves) during RT reserve shortages
- ✓ 2<sup>nd</sup> 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](http://www.iso-ne.com/key_projects/fcm_perf_incentives/index.html)