## Resource Adequacy in the Provision of Electricity

Ensuring Adequate Energy Supplies in a Volatile Environment

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#### **Resource Adequacy**

- · Adequate resources to meet system loads
- Resources include transmission, generation, demand response, and energy efficiency
- NERC planning standard: involuntary loss of load not more than "one day in ten years"

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· Price signals for investments



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### **Regional Planning Process**

- Annual evaluation of existing system
- Forecast future system over multiple time horizons (5y, 10y, 15y)
- · Estimate load growth
- · Estimates of new resource additions
- · Estimate transmission upgrades/expansions
- · Estimates congestion costs/savings
- · Integrated and iterative process

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#### Special Factors

- · Demand response programs
- · Targeted energy efficiency programs
- · Distributed generation programs
- · Merchant transmission projects
- · Short-term interim RFPs
- · RMR agreements to retain resources

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Incentives for New Resources

- Energy Markets with Locational Marginal Pricing (LMP) and Single Clearing Price (SCP) bidding
- Locational Forward Reserve Market (LFRM)
- Capacity Markets (ICAP, LICAP, RPM)

**ISO-NE Demand Curve** 

• Uncapped Energy Markets



### Capacity Markets

- Single regional market
  Traditional approach used in many regions
- Locational (sub-regional) markets
- Target capacity price signals to specific zones

#### Demand curves

- NY ISO implemented in 2003 (LICAP)
- ISO-NE proposed in 2004 (modified LICAP)
- PJM proposed in 2005 (RPM)
- Under consideration by CA ISO

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#### Demand Curve Issues

- Setting the capacity goal
- · Setting the benchmark proxy
- · Setting the maximum purchase
- Setting the maximum cap
- Setting the capacity target
- · Revenue adjustments
- Penalties for non-performance
- · Time horizon and supplemental bidding

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### Price 2×EBCC EBCC $C_{xyet}$ = 1.037 $C_{xyet}$ = 1.058 $C_{xyet}$ = 1.150 $C_{xyet}$ = 1.150

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#### Fundamental Flaws of Demand Curves

- Administrative determinations
  - Capacity goal
  - Benchmark peaker cost
  - Maximums, minimums, penalties
- Formula rate!
  - Full compensation for new resourcesGross overpayment for others
- Risk shifts to stakeholders
- · Uncertainty remains

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#### Fundamental Principles for Resource Adequacy

- Provide incentives for all solutions
- · Coordinate market revenue mechanisms
- Balance risks among stakeholders
- · Encourage competitive mechanisms
- · Provide targeted solutions for local areas
- · Ensure that payments produce resources
- Encourage long-term bilateral contracts
- Ensure fair, reasonable rates

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# **QUESTIONS**?

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