

Wholesale Electricity Markets in New York

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Why is a Capacity Market Needed?

- Three sources of generator revenues
 - Energy
 - Ancillary services
 - Capacity
- Regulators need strong reliability assurance, so established a required capacity reserve margin
- Generator revenues from sales of energy plus ancillary services is insufficient to cover cost of new entry
- Capacity revenues from capacity market provide the difference
- Eventually, capacity market should get eliminated

Energy Market – Scarcity Prices

- Normal hours energy prices set by the offer price of generator that is on the margin
- Scarcity hours demand resources called upon to reduce load, energy price = \$500 per MWh
- Extreme scarcity hours all generators are fully used for energy or operating reserves, yet still a shortage.
 Scarcity price set by formula, can reach \$1000 or higher
- Why scarcity prices?
 - Needed in short-run to ration demand, maintain reliability
 - Needed in long-run to signal the need for and to attract entry of new generators

Pricing of Operating Reserves – Opportunity Cost

- Energy and operating reserves (and regulation), are cooptimized each day
- Generators that can provide both, submit offer prices for both
- Example: Generator bids \$70 for energy and \$2 for operating reserves.
 - Market price of energy is \$200
 - If generator selected for energy, price is \$200, profit is \$130
 - If generator is selected for operating reserves, price is \$130.
 \$130 equals the generator's opportunity cost of providing operating reserves when it otherwise could have provided energy

Trade Across ISO Boundaries

- Energy market trading with PJM (Pennsylvania, New Jersey, and Maryland ISO) and New England
- Energy market trading with Canada
- Capacity market trading
- Transmission across boundaries
- There is no ancillary services trading across ISO boundaries, but may be coming soon with Canada

Market Monitoring Entities

- Four organizations do market monitoring
 - NYISO
 - Independent Market Monitor
 - Federal Energy Regulatory Commission (FERC)
 - New York Department of Public Service (NYDPS)
- Independent Market Monitor evaluates the competitiveness of the market, publishes a report once per year and recommends mitigation measures
- The NYISO implements the set of approved mitigation measures and provides data and support to the Independent Market Monitor

Market Monitoring Entities (con't)

•The FERC has formal authority over the work of the above two organizations

•The NYDPS does its own market monitoring and recommends mitigation measures as needed

•All of the above have access to confidential data

Mitigation Measures in the Energy Market

- Use of thresholds
 - Bid threshold
 - Price threshold
- Loose thresholds (200%) for geographic markets thought to be generally competitive, such as upstate NY. Tight thresholds for uncompetitive transmission constrained markets – New York City
- Automated Day-Ahead-Market Mitigation

Mitigation Measures in the Energy Market

- •New York City Market
 - Constrained hours versus unconstrained hours.
 - Automated for both Day-Ahead and Real-Time Markets
- Physical withholding versus Economic Withholding
- •Mitigation in the New York City capacity market

Renewable Generation Central Procurement Model

- All renewable subsidies are provided from a single state government entity
- Electric utilities' only obligation is to provide the funding for the central procuring entity
- Potential developers of renewable generation receive two revenue streams:
 - payments for electricity itself, are received from wholesale market
 - a subsidy payment, per MWH, is received from the central procuring entity

Renewable Generation Central Procurement Model

• Once or more each year, the central procurement entity holds a solicitation in which renewable generation developers bid for the right to receive subsidy payments

- A pre-specified amount of money, such as \$100 million, is available in a given solicitation
- Winners are the lowest bidders, in terms of the subsidy, per MWh, that is requested
- Subsidy payments are in the form of a 10-year contract that pays a fixed price, per KWh to each winning bidder

Renewable Generation Central Procurement Model

- Competitive procurement applies to a subset of technologies. All sell directly to the wholesale market. This is called the "Main Tier"
 - Eligible Technologies are:
 - Wind
 - Run-of-River hydro, tidal power
 - Biomass/biogas
 - Landfill gas
 - Minimum size is 1MW
 - Must be new. 2003 or later.
- Standard offers (for the subsidy payment, not for the electricity) apply to smaller generators that are on the customer's side of the meter. This is called the "Customer Sited Tier"
 - Eligible Technologies are:
 - Solar Photovoltaic (PV)
 - Anaerobic digesters
 - Fuel cells
 - Small wind
 - Solar thermal
- Standard offer price varies by technology and can be raised or lowered as circumstances require (e.g., increased federal or state tax credits) 12

Renewable Generation Central Procurement Model

- How it works in practice:
 - Commission authorizes a solicitation, along with the budget for that solicitation (e.g., \$100 million)
 - The New York State Energy Research and Development Authority (NYSERDA), which is the central procurement entity announces the due date for bids.
 - Renewable developers submit bids, along with a deposit. Each bid specifies the \$ per MWh subsidy payment requested and the MWhs per year that will receive the subsidy
 - Bids are opened, lowest bidders are selected up to the point that the budget is used up. (Economic development scoring also comes into play)
 - Winning bidders sign 10-year contracts with NYSERDA governing the subsidy payments, with each winner receiving its own bid price. (Penalties for non-performance)
 - NY utilities collect a \$/KWh fee from all delivery customers, transfer the money to NYSERDA, who then uses it to pay the renewable developers

Advantages Central Procurement Model

- The program involves no purchases of electricity. This eliminates the need to assess the value differential among renewable projects associated with geographic location and pattern of production (e.g., day versus night, summer vs. winter). It allows a very streamlined, price-only, scoring process (except for economic development)
- Neither the program, nor any of NY's utilities, are required to enter into any power purchase agreements
- The renewable developers compete via price for the subsidies, minimizing the price paid by New York (compared to a standard offer)
- Administration of the program is centralized; no need for the regulator to interact separately with NY's 6 utilities; efficient to start up and to administer.
- Does not disturb wholesale market or retail market