OLR RESEARCH REPORT

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ELECTRIC GENERATION FORWARD RESERVE MARKET

By: Kevin McCarthy, Principal Analyst

You asked for a description of the locational forward reserve market (LRFM), which is part of the regional wholesale electric market. Much of the information in this report comes the market rules of the Independent System Operator (ISO)-New England, which administers the wholesale market and from a July 2011 ISO-New England report on the LFRM. Additional information on the wholesale market is available at www.iso-ne.com.

SUMMARY

In order to maintain system reliability, generators and other participants in the wholesale market need to provide reserve capacity. Reserve capacity is the ability to provide additional power if a transmission line or another power plant serving an area goes out of service. It is a separate product in the wholesale market from the energy (power) produced by generating plants and other resources.

ISO-New England has established rules governing how (1) forward (future) reserve requirements are determined, (2) generators and other market participants can offer capacity to meet these requirements, and (3) prices for this capacity are set. The LFRM requirements are found in Section III 9.2.3 of Market Rule 1, one of ISO-New England's principal governing documents.

Sandra Norman-Eady, Director
Phone (860) 240-8400
FAX (860) 240-8881
http://www.cga.ct.gov/olr

Connecticut General Assembly
Office of Legislative Research

Room 5300
Legislative Office Building
Hartford, CT 06106-1591
Olr@cga.ct.gov

The prices are set in a reserve procurement auction for different zones in New England, including two in Connecticut. The auctions are held for the summer (June – September), when demand is typically at its highest, and the rest of the year (October – May), to reflect the different need and the different value of reserves at different times of the year. The costs of the reserves are allocated to electric companies and competitive suppliers. Market participants selected in the auction process must also agree to offer the energy associated with their capacity.

The LFRM began operating in October 2006. In the past, the prices paid in the LFRM were higher in Connecticut than elsewhere in New England, but that was not the case in the auction to meet the summer 2011 reserve requirements.

INTRODUCTION

With the approval of the Federal Energy Regulatory Commission, ISO-New England has established rules governing a variety of wholesale markets for energy and capacity. Energy is electric power itself; capacity is the availability of generating plants and other resources that provide power. Since electricity cannot be readily stored, electric companies and competitive suppliers need to purchase both energy and capacity to serve their customers. Capacity is analogous to the retainer a law firm charges its clients so that it is available to serve them, while energy is analogous to the firm's hourly rate for its services.

SETTING FORWARD RESERVE REQUIREMENTS

Because electricity cannot be readily stored, the electric system needs reserve capacity in order to maintain reliability in the event of contingencies. Typical contingencies are the loss of a supply source, such as a generating plant, or a transmission line. Under ISO-New England rules, the local forward reserve requirements are set to reflect the amount of reserves required to meet the losses caused by a local second contingency under normal operating conditions. An example of a local second contingency is the simultaneous loss of a power plant and transmission line serving a specific area.

The forward reserve requirements are derived by analyzing the prior two years of daily peak hour electric demand for each day and reserve zone during the summer (June 1 through September 30) and winter (October 1 through May 31). There are two zones in Connecticut, southwest Connecticut and the rest of the state. The daily requirements are modified to reflect any subsequent changes in the transmission system and additions to or retirements of major generating resources.

For each zone, the daily reserve requirement is calculated for the peak hour of each weekday. The requirements are updated from auction to auction, as required to reflect changes in the transmission system and additions to or retirement of major generating resources. For each zone, the reserve requirement is calculated for the peak hour of each weekday. These forward reserve requirements are set at a level that would meet real-time requirements 95% of the time.

AUCTIONS

The market is a mechanism to acquire commitments to ten-minute non-spinning reserves (TMNSR) and 30-minute operating reserves (TMOR). The former are plants that do not operate all of the time but that can be online within ten minutes; the latter are plants that can be online within 30 minutes.

Auction Process

Forward reserve auctions are held in advance of each summer and winter period. Generators and other market participants make separate offers for each period and each period has separate clearing prices. The offers made by generators and other market participants must specify where the capacity is located, the amount of capacity being offered, and the price bid in dollars per megawatt (MW) per month. The market participant can offer up to 20 blocks of capacity in each reserve product (TMNSR and TMOR). Each block must be at least 1 MW in size and be in ascending $/MW/month cost order. For example, a generator could offer 10 MWs at $1,500/MW/month; 10 MWs at $2,500/MW/month; and 10 MWs at $3,500/MW/month.

At least 20 business days before the auction begins for a procurement period, ISO-New England publishes the forward reserve requirement for each zone and the factors be used to calculate the associated threshold price for the energy produced by these resources. Winning bidders must offer to sell the energy produced by these resources at or above this price in order for the capacity assigned to these resources to qualify as meeting their reserve obligation. ISO-New England sets this price monthly at a level that is designed to generally keep the power produced by capacity participating in the forward reserve market from being dispatched for energy under “normal” conditions, so that the resource will be available to meet contingencies that may occur.

Starting 10 business days before the first business day of the month preceding the procurement period, ISO-New England opens a five business day bidding period. Market participants may submit offers to

sell reserves that are specific to a zone and the delivery period. The delivery period is 8 a.m. to 11 p.m. weekdays, other than holidays. The forward reserve market does not presently acquire reserves for off-peak hours.

Selection of Winning Bidders

Within five business days of the quoting period closing, ISO-New England analyzes the bids and posts the clearing prices and amount of capacity cleared for each zone. ISO-New England sets the clearing price by choosing the least expensive reserve resources needed to meet the zone's forward reserve requirement. If during real-time operation there are inadequate reserves in a zone, the price paid for the energy in that zone will increase, subject to a cap as specified under the rules.

Winning Bidders' Obligations and Compensation

Each generator or other participant that wins the bid must assign resources to meet its forward reserve obligations on daily basis, and each participant's aggregate assignments must be greater than or equal to its reserve obligations. The rules allow bilateral trading of obligations. Thus, a generator that has successfully bid its reserve resources can contract with another eligible generator to meet its obligations. For example, if a winning bidder's generating capacity will not be available at the time it is obligated to provide reserves, the generator can pay another market participation to assume its responsibility. The market participant ultimately responsible for meeting an obligation must assign an eligible resource, such as a specific power plant, in advance of the day it has pledged to provide reserves.

The winning bidders are paid if their resources are available, as determined by ISO-New England, on the day they are obligated, whether or not a contingency occurs. Resources that provide these reserves on a forward basis are compensated for this service though the forward reserve market. Resources that provide reserves in real-time, but to which a forward reserve obligation has not been assigned, are paid based on the value of the hourly reserve clearing price for the appropriate zone and product. The costs of the forward reserve market as allocated to each load zone are allocated to electric companies and competitive suppliers in proportion to their sales within the applicable zone for each hour. Winning bidders who do not meet their obligations are not paid and are subject to penalties and resources that do not perform when called to respond to a contingency are also penalized.

CURRENT MARKET CONDITIONS

An analysis of the summer 2011 auction prepared by the energy firm GDF-Suez notes that for the first time since it began operations, the LFRM price for Connecticut was the same as for the rest of New England ($4,500/MW/month). The cost of reserves has declined due to an increase in supply of generation in Connecticut that is able to go on-line quickly and the decrease in the local reserve requirement, which is attributable to new transmission lines in the state. Given the supply-demand trends in recent auctions, the report anticipates that this cost for Connecticut is expected to remain low compared to historical levels.

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