New England's Forward Capacity Auction

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This note provides a brief description of New England's Forward Capacity Auction (FCA) for the procurement of electricity capacity. The description is based on the 6 March 2006 Settlement Agreement.[1] The description here presents a simpler description of the auction mechanics, and limits the presentation to the key elements relevant to someone providing software and other support to implement the primary auction. In addition, some motivation for the approach is given. The description here is not a software specification, but rather a high-level description of the auction. Many implementation details are yet to be resolved. These details will be resolved in the Market Rule for the Forward Capacity Market. The Market Rule document is not yet available.

Auction mechanics

The auction would be conducted annually. The main features of the auction are:

1. *Three-year planning period*. The auction takes place about 42 months before the commitment period begins. However, to limit the length of the transition period the first auction will be held in the first-quarter of 2008 for delivery in June 2010. Subsequent auctions will gradually reach the 42-month commitment period.
2. *One-year commitment period for existing capacity and up to five-year commitment period for new capacity*. Existing capacity participates in the auction each year and has a one-year commitment. New capacity has an *N*-year commitment, where *N*, between 1 and 5 years is chosen by the supplier at the time of qualification. The price paid to new capacity after the first year is indexed. Both new and existing capacities are paid the same market-clearing price in the first year, provided there is sufficient competition and adequate supply. Capacity may be provided by both demand and supply resources.
3. *Descending-clock auction*. A simultaneous descending-clock auction is used to determine the market clearing prices and the capacity suppliers for each zone. The descending-clock auction is an iterative auction procedure in which the auction manager announces prices, one for each of the locational products being procured. The bidders then indicate the quantities of each product they wish to supply at the current prices. Prices for products with excess supply then decrease, and the bidders again express quantities at the new prices. This process is repeated until, for each product, supply equals demand. We expect that supply resources will be treated as positive quantities, and demand resources will be treated as negative quantities in the auction.
4. *Capacity requirements and transfer limits*. Before the auction, the ISO determines for the first year of the commitment period the minimum capacity required in each zone and in the system, as well as the transfer limits between zones.

[1] The settlement was filed at FERC and included as Attachment 1 in ISO-NE's 6 March 2006 filing to FERC, "Explanatory Statement of the Settling Parties in Support of Settlement Agreement and Request for Expedited Consideration" available at http://www.iso-ne.com/regulatory/ferc/filings/2006/mar/index.html.

5. *Zonal selection criterion*. The ISO determines zones before the auction based on an identification of transmission limits that may bind in the auction. Before the start of each auction, the capacities installed in a zone, less retirement and export bids, will be compared to the zone's local sourcing requirement in the first year of the commitment period. For an import-constrained zone, if the capacity in the zone is greater than its local sourcing requirement, the zone will not be a separate zone in the auction. Export constrained zones are modeled in the auction.
6. *Starting price*. A starting price for the auction is specified before the auction begins. The starting price is 2 times the Cost of New Entry (CONE) where CONE = $7.50/kW-month in the initial auction.
7. *Qualification process*. Before the auction, potential bidders submit a predefined package of qualification materials to the ISO. Each bidder specifies the location and capacity of its existing resources. Each bidder also specifies the location and capacity of its potential projects that could be completed by the beginning of the commitment period. This is the capacity that the bidder offers at the starting price. The qualification includes satisfying credit as well as other terms. The qualification deadline for existing capacity is approximately six weeks before the deadline for new capacity.
8. *Reconfiguration auction*. Reconfiguration auctions will be conducted to allow minor quantity adjustments, and to facilitate the trading of commitments made in the forward auction.

Planning period

The planning period is the time between when the auction is held and when the supply commitment begins. The planning period is necessary for vigorous contestability. It is important that the market not favor only the quickest plants to build because a wide variety of plants will be needed in the future as in the past. The design calls for a planning period of about 42 months. However, the initial auction is scheduled for the first-quarter of 2008 for the power year beginning in June 2010. It will take a number of auctions to reach the design planning period.

Commitment period

For new capacity a long commitment period is desirable. The longer the commitment period the more risk is reduced for new projects. Risk is costly to load, hence as long a commitment period as load and the market administrators are comfortable with should be used. New capacity specifies its commitment period in qualification, between one and five years. Since the auction mechanics only depend on the first-year of commitment, this detail is not relevant to the suction manager.

In contrast, existing capacity has a one-year commitment. Unlike new capacity, extending the commitment period does not decrease risk, but instead increases it for existing capacity.

Mechanics of the descending-clock auction

The descending-clock format is well-suited for high-stake procurements of one or more products. The auction is similar to a sealed-bid uniform-price auction for each of the products. A chief advantage over sealed-bid formats is that a bidder can condition its bids on information

from early bidding rounds. This process of price discovery improves efficiency, especially when there are multiple products.

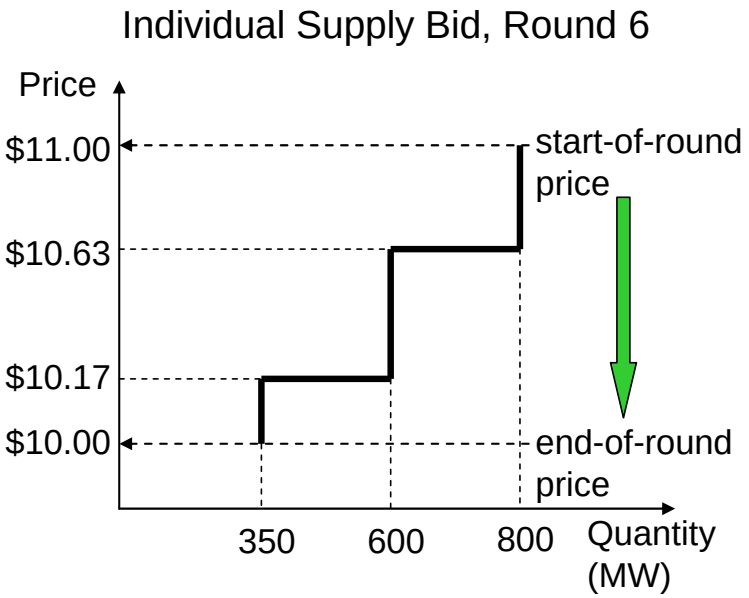
Single zone

This description starts with the simplest case of a descending-clock auction, the auction of a single product. This would be the case if no separate zones were selected. The net capacity requirement is the total requirement in the first year of the commitment period less the capacity that has already been procured in earlier auctions. This is the demand that is procured in the auction. The auction identifies the least-cost suppliers and the market-clearing price.

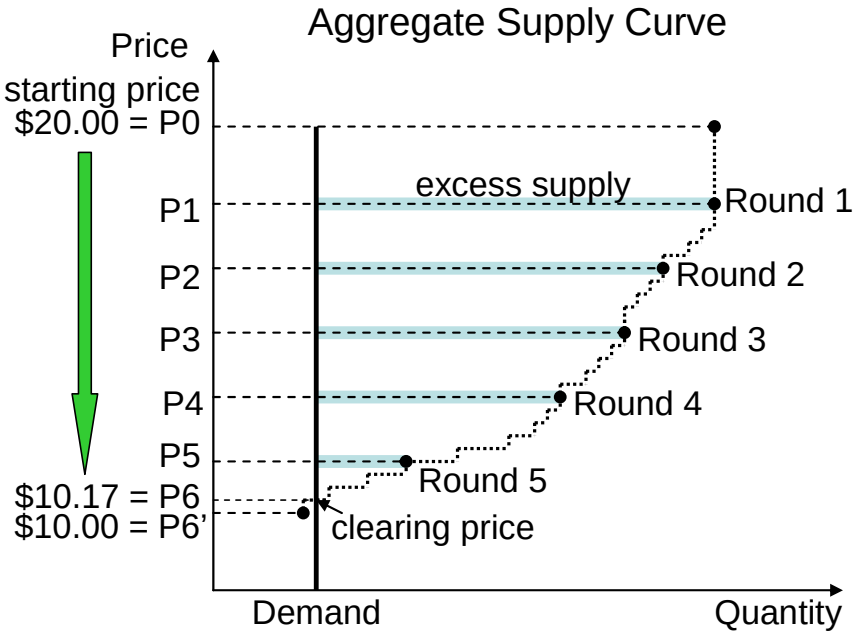
Although in theory one can imagine implementing a descending-clock auction with a price clock that declines continuously, in practice discrete rounds are used. An important issue in discrete-round auctions is the size of the bid decrements. Larger bid decrements enable the auction to conclude in fewer rounds, but the coarse price grid potentially introduces inefficiencies. Large decrements also introduce incentives for gaming as a result of the expanded importance of ties. But using small decrements can greatly increase the number of rounds and, hence, the time required to complete the auction. Fortunately, it is possible to capture nearly all of the benefits of a continuous auction and still conduct the auction in a limited number of rounds, using the technique of intraround bids.[2]

With intraround bids, in each round, the auctioneer announces a start-of-round price and a (lower) end-of-round price. Each bidder then expresses its supply curve for all prices between the start-of-round price and the end-of-round price. Supply curves are constrained to be increasing step functions: as the price falls, a bidder can maintain or decrease the quantity; the quantity cannot increase in response to lower prices. In every round, the bidder names the prices between the start-of-round and end-of-round prices at which it desires to reduce its quantity. For example, let $11.00 be the start-of-round price and $10.00 be the end-of-round price in round 6. Suppose the bidder's quantity at $11.00 is 800 MW, and the bidder wishes to reduce quantity to 600 MW at $10.63 and to 350 MW at $10.17. Then the bidder's bid consists of two price-quantity pairs: ($10.63, 600 MW) and ($10.17, 350 MW) as shown in the figure below. The bidder is offering the quantity of 800 MW for prices from $11.00 to $10.63, 600 MW for prices from $10.63 to $10.17, and 350 MW from $10.17 to $10.00. At each step, we assume that the bidder is indifferent among all quantities between the two end points. Thus, at $10.17, the bidder's bid is satisfied by any quantity between 350 MW and 600 MW.

[2] A related implementation is "exit bids," which have been used in the New Jersey auctions for Basic Generation Service. One or the other of these techniques should be employed.



At the end of the round, the auction manager forms the aggregate supply curve from the individual bids. Then, if there is excess supply at the end-of-round price, the auctioneer reports the excess supply at the end-of-round price and a new round begins. Otherwise, the auction manager reports the clearing price and each bidder is informed of the quantity it won.



The figure above shows a sample auction, which lasts six rounds. The auction begins with a starting price P0 = $20.00. At the end of round 1, no bidder reduced quantity, so the aggregate supply curve is vertical between P0 and P1. At P1, there is substantial excess supply indicated by the light-blue shading. In each subsequent round, one or more bidders reduces quantity at prices between the start-of-round price and the end-of-round price, and the excess supply shrinks. As a result of the intraround bidding, the reductions are at numerous prices and are small relative to the total demand. In round 6, the tentative end-of-round price is P6' = $10.00, but at this price,

demand exceeds supply. Thus, the auction manager backs up to the price P6 = $10.17 at which supply and demand intersect. The auction manager reports that the auction concluded at the clearing price P6 = $10.17.

If the auction were to exactly match supply and demand, it would likely be necessary to ration the bidders whose bids set the clearing price. However, there is a problem with rationing new projects and retirements, because they are lumpy. For example, at $10.17, the bidder may be indifferent between dropping from 600 MW to 350 MW, because the bidder has a 250 MW project that breaks even at $10.17. Thus, the bidder is happy with either 600 MW or 350 MW at $10.17, but not with any intermediate quantity. Rationing the bidder exposes the bidder to risk and complicates the bidder's bidding strategy. To accommodate lumpy new projects and retirements, these reductions are not rationed. In our example, the clearing price would remain $10.17, but the bidder would supply 600 MW and the ISO would procure 200 MW more than the requirement. If multiple bidders make reductions from new projects at the clearing price, then the projects are selected to minimize the excess supply. The details will be described in the Market Rule.

A lumpy project may be rejected even though the clearing price is above the project's exit bid. This would occur if accepting the project would result in a higher total capacity cost in the first commitment year, than rejecting the project and thereby setting a higher clearing price. For example, the auction may clear at $10.10 with a 1100 MW project of which only 100 MW is needed, resulting in 1000 MW of excess supply. The auction manager then backs up the supply curve (to higher prices), and sees that at $10.30, a 100 MW project exits; thus, supply and demand would balance without the 1100 MW project with a clearing price of $10.30. The auction manager calculates the first-year total capacity cost under each alternative and selects the clearing price and projects that minimize first-year total capacity cost. If 30 GW are required, then since $31 \times \$10.10 > 30 \times \$10.30$, the clearing price is set at $10.30 and the 1100 MW project bid at $10.10 is rejected. However, if the project exited at $9.96 or below, then $31 \times \$9.96 < 30 \times \$10.30$, and the 1100 MW project would be accepted, together with the lower clearing price. Ties are broken in favor of greater capacity. The details will be described in the Market Rule.

An export bid at the clearing price may be partially filled. Moreover, export bids may be partially filled as a result of an export limit.

Multiple zones

Now suppose there are multiple zones identified by the zone selection criterion. To be specific, suppose Connecticut is a zone of potential undersupply and Maine is a zone of potential oversupply.[3] The auction would then have three products: capacity in Connecticut, Maine, and Other. The net capacity requirement is calculated for the system (r_S), the minimum net capacity required in Connecticut assuming maximum import into Connecticut (r_C), and the maximum net capacity in Maine assuming maximum export out of Maine (R_M). r_C is a lower bound on the capacity that must be procured in Connecticut: i.e., the local requirement not filled in prior auctions. R_M is an upper bound on the capacity that can be procured in Maine: the local need not filled in prior auctions plus the export limit.

[3] Oversupply means that the capacity in the zone is greater than the peak load plus reserves plus the maximum that can be exported to the rest of pool.

With multiple zones, the auction manager announces a price for each zone and bidders respond with quantities for each zone. Let (p_C, p_M, p_O) be the price vector and (q_C, q_M, q_O) be the corresponding aggregate quantity vector for Connecticut, Maine, and Other. q_C is the total capacity, both existing and planned, located in Connecticut that is bid at the price p_C; q_M is the same quantity for Maine; and q_O is all other capacity including imports bid at the price p_O. The auction seeks to find a price and quantity vector that satisfy the following constraints.

System requirement: $q_C + q_M + q_O = r_S$

Connecticut undersupply constraint: $q_C \geq r_C$

Maine oversupply constraint: $q_M \leq R_M$

Since existing capacity and new projects are specific to a zone, we require that as a zone price decreases the bidder either maintains or reduces its quantity in that zone.

In each round, the auctioneer announces a start-of-round price and an end-of-round price for each zone. The bidder expresses its supply curve for each zone for all prices between the start-of-round price and the end-of-round price.

Initially, all prices are equal and decrease together. The starting price is set sufficiently high that there is excess supply in the system and the Connecticut undersupply constraint is satisfied. System excess supply is calculated as $q_C + \min(q_M, R_M) + q_O - r_S$; that is, if there is oversupply in Maine, the contribution of the Maine capacity to the system constraint is limited to Maine's local need plus the quantity that can be exported from Maine to the rest of the system. Capacity in Maine beyond its local need plus its export limit cannot be used by the system.

The prices evolve in four different ways depending on which, if any, of the supply constraints bind at the final clearing prices. Thus, we have four distinct cases:[4]

1. *Neither the Connecticut nor the Maine constraint binds*. The three prices decline together until the system excess supply is zero. At this point the auction ends, with $p_C = p_M = p_O$, since all local supply constraints are satisfied by assumption.
2. *Only the Connecticut constraint binds*. The three prices decline together until the Connecticut constraint binds. At this point, the Connecticut price p_C and quantity $q_C = r_C$ are fixed. The remaining two prices, p_M and p_O, decline together until the system excess supply is zero. At this point, the auction ends with $p_C > p_M = p_O$, since the Maine oversupply constraint is satisfied by assumption.
3. *Only the Maine constraint binds*. The three prices decline together until the system excess supply is zero. At this point, the only constraint that is violated is the Maine oversupply constraint. The Connecticut and Other prices are fixed with $p_C = p_O$. Then

[4] In fact, the description below is a bit simplistic due to the complication caused by lumpy projects. The actual clearing process with lumpy projects is necessarily more complex. One sensible approach is to run the clocks possibly further than necessary to gather information about supplier preferences in each zone at prices near but possibly below the eventual clearing prices. Then the auctioneer solves the winner determination problem (a problem closely related to the knapsack problem) to determine the winner's and prices that minimize total year-one cost. One problem is that exact prices may not exist due to the duality gap caused by lumpy projects (the linear-programming (LP) solution may be non-integer so the dual to the LP, which gives prices provides only bounds on prices for variables constrained to be integers).

the Maine price is reduced until the point where the Maine constraint is satisfied ($q_M = R_M$), concluding the auction with $p_C = p_O > p_M$.

4. *Both the Connecticut and Maine constraints bind*. The three prices decline together until the Connecticut constraint binds. At this point, the Connecticut price p_C and quantity $q_C = r_C$ are fixed. Then the two remaining prices decline together until the system excess supply is zero. This fixes p_O and $q_O = r_S - r_C - R_M$. Finally, p_M is reduced until the Maine constraint is satisfied, resulting in $p_C > p_O > p_M$.

This same approach works with any number of zones, provided all local constraints can be represented by a requirement that supply in the zone must satisfy some lower bound (an undersupply constraint) or some upper bound (an oversupply constraint). The process is as follows. Reduce all prices together until the first undersupply constraint binds. This fixes the price and quantity for that zone. Continue dropping the remaining prices until another undersupply constraint binds. This fixes another price. Continue this process until system excess supply is zero. Finally, drop the prices in each oversupplied zone until the oversupply constraint is satisfied. This fixes the prices and quantities in the remaining zones. Additional export constrained zones may be modeled to reflect transmission constraints.[5]

Notice that if no transfer limits bind at the clearing price, then the system excess supply reaches zero before any undersupply constraints bind, and at this point no oversupply constraints bind. All prices will be equal. If instead, one or more transfer limits bind, then the clock auction will find higher (lower) prices in the undersupplied (oversupplied) zones, reflecting the different values of capacity in the different zones.

An important element of the design is the information policy—what the bidders are told during the auction. At the end of each round, the auctioneer reports the system excess supply at the end-of-round price. System excess supply is always calculated using the upper bound on supply (the maximum usable capacity) for zones with a binding oversupply constraint. The excess oversupply (zone supply minus the upper bound on supply) is also reported for zones for which it is positive. This information facilitates price discovery, and thus, helps the bidder develop its supply strategy. For example, if there is substantial oversupply in a zone, a bidder may decide to abandon a new project in that zone in favor of an alternative new project in a zone without oversupply.

Zone-specific information about excess supply (zone supply minus the lower bound on supply) in import-constrained areas is not provided. Likewise, bidder-specific information is not provided to other bidders. This detailed information is not needed for price discovery and it may promote collusive bidding strategies if provided.

The above approach accommodates the “no rationing” rule for new projects. This means that zones with new projects at the clearing price will have some modest excess supply. However, the “no rationing” rule is limited to zones for which the oversupply constraint does not bind. This prevents the ISO from procuring a quantity that exceeds the zone’s upper bound on supply.

[5] For example, several new projects may require connection to the same bus. Suppose the bus has 400 MW of available capacity, and its capacity cannot be expanded without considerable expense. In this case, the new projects would compete to be among the 400 MW of new capacity that can use the bus.

Price formation

A major challenge of the auction design is assuring that the clearing price is determined from competitive forces, rather than the exercise of market power. Successfully meeting this challenge is important because the market design relies upon the unmitigated bids of new entry for price formation. In addition, for every year the quantity of existing capacity dwarfs the quantity of new capacity, the concentration of ownership is high, and the elasticity of demand is zero for a vertical demand curve. For much of the existing capacity, going forward costs are small relative to CONE, as a result of substantial sunk costs. Thus, it is tempting for existing capacity to withhold, either physically or economically, to achieve a high clearing price. Our goal is to prevent this possibility without distorting the competitive price-setting forces.

First, at qualification, existing suppliers must enter all import/export, Permanent De-list, and De-list bids that are above .8 CONE.[6] For transparency, these bids (price, quantity, and zone) are posted one day after the qualification bid deadline. If a unit's Permanent De-list bid is accepted in the auction, the unit is not eligible to receive capacity payments in this or any future commitment period. Permanent De-list bids above 1.25 CONE and De-list and export bids above .8 CONE must be reviewed and qualified by the market monitor before they are entered into the FCA. Bids at qualification indicate the physical resource, the type of bid, the quantity, and the price.

Second, we conduct a descending clock auction for the required new capacity, recognizing bids from existing supply. The descending clock auction determines the clearing price paid to all capacity procured in the primary auction. Since the bids from existing supply are submitted at qualification, we know the quantity of new capacity required to reach ICR as a function of price, recognizing any accepted bids from existing supply. De-list bids from existing supply at or below .8 CONE can be directly entered into the descending clock. These bids do not require approval of the market monitor and are eligible to set the price. De-list bids at or below .8 CONE may be rationed, if so designated by the supplier.

Offers from existing capacity. All Existing Capacity must submit appropriate information in the qualification process. All De-list Bids above 0.8 times CONE from Existing Capacity, all Import/Export Bids, and all Permanent De-list Bids must be submitted to the ISO before the bid qualification deadline to be considered in the FCA. All Permanent De-list Bids above 1.25 times CONE and De-list Bids from Existing Capacity, including exports, that are above 0.8 times CONE must also be submitted to the ISO's Market Monitor before the bid qualification deadline to be considered in the FCA. Full information about Permanent De-list Bids will be posted one day after the bid qualification deadline.

The quantity, price and zone of each De-List Bid above 0.8 times CONE will also be posted one day after the qualification deadline; if approved by the Internal Market Monitoring Unit, full information will be posted. The state regulatory commissions will be provided confidential access to full information about posted De-List Bids pursuant to the current Information Policy prior to monitoring review.

New capacity offers. All offerors of New Capacity must submit appropriate information, designed to demonstrate that the project is viable, in the qualification process. The filing deadline for New Capacity will be approximately six weeks after offers from Existing Capacity are

[6] Mothballing units can be accomplished through a series of De-list bids.

posted. One hundred percent of the ICR, taking into account forecast error, as appropriate, not including Permanent De-list Bids and De-list Bids, will be purchased in the FCA at prices up to 2 CONE. The definition of New Capacity will include appropriately eligible repowerings and reactivated reserves.

Starting price. The first round of the descending clock auction will have a starting price of 2 CONE, with CONE initially set at $7.50/kW-month (therefore, the initial starting price will be $15).

1. Before three successful auctions have occurred, CONE is determined as follows:

Year 1 (First auction): $7.50.

Years following the first successful auction but prior to the second successful auction: $3.75 (50% of $7.50) plus 50% of the successful clearing price.

Years following the second successful auction but prior to the third successful auction: $1.88 (25% of $7.50) plus 75% of the average of the two previous successful clearing prices.

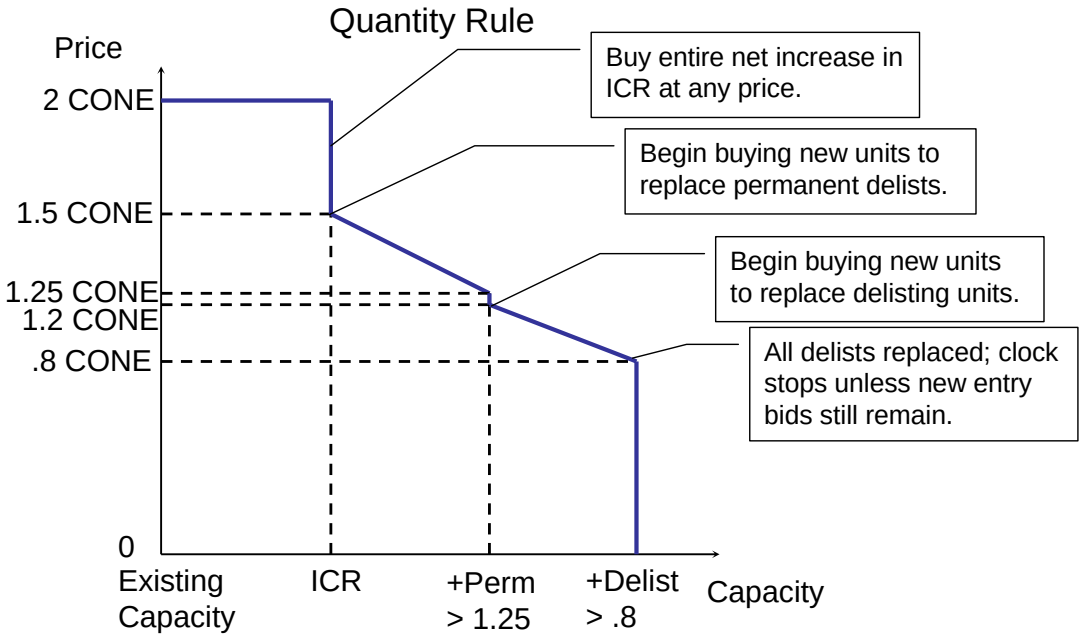
2. Following the third successful auction, CONE will be based on the historical average capacity price using exponential smoothing with a parameter of 30 percent. That is,

CONE in year t+1 = (70% of CONE in year t) + (30% of Capacity Clearing Price in year t),

with the exception that if the auction failed in year t (either due to insufficient competition or inadequate supply) or if no new entry is required, then

CONE in year t+1 = CONE in year t.

Quantity rule. To address market power by existing suppliers, the quantity rule shifts some of the capacity purchased from the primary auction to a reconfiguration auction. The amount shifted depends on price as shown in the figure below.



The full ICR quantity, ignoring Permanent De-list and De-list bids, is purchased in the primary auction at prices up to 2 CONE. For prices below .8 CONE, the full ICR quantity,

including all accepted Permanent De-list and De-list bids, is purchased in the primary auction. For prices between 1.5 CONE and 1.25 CONE, the quantity of capacity purchased to replace Permanent De-lists in the primary auction increases linearly. At 1.5 CONE, no Permanent De-list bids are covered (that is, purchased in the primary auction); at 1.25 CONE, all Permanent De-list bids are covered. Similarly for prices from 1.2 CONE to .8 CONE, the quantity of De-list bids purchased in the primary auction increases linearly. At 1.2 CONE, no De-list bids are covered; at .8 CONE, all De-list bids are covered. Any Permanent De-list or De-list bids that are not filled in the primary auction are filled in a reconfiguration auction. If the quantity of unfilled Permanent De-list and De-list bids is sufficiently large, the ISO may choose to conduct the first reconfiguration auction six months from the date of the primary auction.

Out-of-market bids. New Capacity that intends to bid below .75 times CONE must be submitted to the Internal Market Monitoring Unit before the bid qualification deadline to be considered in the FCA. If the Internal Market Monitoring Unit finds that the New Capacity bid is consistent with the unit's long run average costs (absent contractual considerations), then the bid can set the price. Otherwise, the New Capacity bid is entered into the FCA pursuant to the Alternative Price Rule. If an ISO RFP covers any part of capacity costs, that capacity will be subject to the Alternative Price Rule.

Alternative price rule. If system-wide or in any import-constrained Capacity Zone: (a) new capacity is needed in the relevant Power Year; (b) the FCA is competitive (that is, the FCA does not have Inadequate Supply or Insufficient Competition); and (c) at the Capacity Clearing Price the out-of-market new capacity purchases exceeds the required new entry, then the Capacity Clearing Price for that Capacity Zone will be raised to equal the lesser of: (1) the price at which the last New Capacity withdrew from the auction (excluding out-of-market bids and bids in export-constrained Capacity Zones) minus $0.01; or (2) CONE.

Carry-forward rule. If as a result of the no rationing rule, the ISO purchases megawatts through a FCA in excess of the ICR requirements for an import-constrained zone, these extra megawatts create "carry-forward" accounts for the particular zones in which the corresponding physical assets are located.

Going into an FCA, if there are positive carry-forward balances, these megawatts are treated as out-of-market New Capacity under the Alternative Price Rule with one exception: if no new capacity is required in the zone, the resulting price cannot be greater than the clearing price in the FCA in which this carry-forward capacity originally cleared. Consequently, this rule is used even if the subsequent year's FCA was not competitive, provided that the earlier FCA (which set the clearing price for these carry-forward megawatts) was competitive. The carry-forward provision can apply to any import-constrained zone.

De-list bids. An existing unit wishing to opt out of the capacity market at a specified price submits a De-list bid during qualification. A unit with a De-list bid at or above the clearing price, that is not required for reliability, does not have a capacity obligation. It can participate in any reconfiguration auction and in the monthly capacity market. As is current practice, it cannot mothball or retire without applying to the ISO. Dynamic de-list bids are allowed at prices of .8 times CONE and lower. Dynamic de-list bids may be directly entered into the auction at prices at and below .8 times CONE.

Rejected bids for reliability reasons. A Capacity Resource having a Permanent De-list Bid or De-list Bid that is rejected for reliability reasons will be paid a just and reasonable price (as

determined by FERC) from the beginning of the Commitment Period and, for Permanent De-list bids, for each subsequent Commitment Period (unless the reliability concern is addressed before the start of the Commitment Period) until it can be released to de-list. In such cases, the ISO will attempt to procure replacement capacity at each FCA and reconfiguration auction in order to release the Capacity Resource to de-list. Payments to such resources will continue only until the reliability concern is addressed (through procurement of replacement capacity or other means, such as a transmission enhancement). The auction process must allow for review of the reliability impact of units with cleared de-list bids.

Review by Internal Market Monitoring Unit. In reviewing bids from Existing Capacity, the ISO's Internal Market Monitoring Unit will review that the proposed bid is consistent with the resource's net risk-adjusted going-forward costs, recognizing, among other things, infra-marginal rents, availability adjustments, and PER deductions. Permanent De-list Bids below 1.25 times CONE should be presumed competitive unless the monitor determines that the bid is an attempt to raise the clearing price above its competitive level.

Self-supply option. The FCM shall include a "self supply option." A LSE will have the right, prior to the conduct of each auction, to designate owned or contracted Capacity Resources sufficient to cover all or part of the LSE's corresponding ICR obligation.

1. *Rights and obligations*. A self-supplied resource would be required to assume the same "Rights and Obligations" (as defined in the final Settlement Agreement) as any other Capacity Resource that is participating in the FCA.

2. *Qualification*. Prior to the FCA, a resource or a portion of a resource may be designated pursuant to Market Rules as a self-supplied resource. The resource would have to meet the same qualification standards as any other resource that will be allowed to participate in the FCA. The total quantity of designated self-supplied resources may not exceed the LSE's projected share of ICR. To be considered a capacity resource, the resource must be offered into the FCA. If designated as self-supply, the resource will clear the auction and offset an equal number of megawatts of the LSE's capacity obligation in the Commitment Period.

3. *Locational issues*. In order to qualify as a self-supplied resource for purposes of fulfilling a local sourcing requirement applicable to a load in an import-constrained region, the self-supplied resource must be located in the same zone as the associated load, unless the self-supplied resource is a Pool-Planned Unit with a special allocation of CTRs up to the number of allocated CTRs. Although the ISO will continue to model any such Pool-Planned Units in their actual location, the combination of the physical asset and the CTR will fully offset the financial obligation of the self-supplier.

4. *Availability penalties*. Self-supplied resources would be subject to the same availability penalties as any other resource participating in the FCA. If a self-supplied resource is unavailable during a Shortage Event, the associated load is responsible for paying the associated availability penalty based upon the FCA price for that Commitment Period. Self-supplied units will be eligible to receive their pro-rata share of availability penalties paid by other capacity resources.

5. *PER adjustment*. Self-supplied resources do not pay a PER adjustment. Load served by a self-supplied resource does not receive a PER payment.

Protections in the event of auction failure

The forward auction approach presumes that potential new projects will produce a competitive auction. Nonetheless, it is important to have rules that address what happens if the presumption is not realized. The failures can take two forms: inadequate supply and insufficient competition. This section defines each term and describes what happens in either event. In each case, the auction is used to the extent possible; that is, the remedy is limited to the zones with inadequate supply or insufficient competition. In addition, the remedy is chosen so as to encourage the development of new projects, since it is the absence of new projects that has created the auction failure.

Inadequate supply

In a Capacity Zone. A FCA will be considered to have inadequate supply in a Capacity Zone if at the Starting Price the amount of New Capacity bid in the Capacity Zone is less than the amount of new capacity required in that Capacity Zone. In such an event, Existing Capacity in that Capacity Zone will be paid 1.1 times CONE, New Capacity in that Capacity Zone will be paid the Starting Price, and the deficiency is made up in subsequent reconfiguration auctions. A de-list in the capacity zone will be paid its bid or 1.1 times CONE, whichever is higher. Inadequate supply in one or more Capacity Zones will not affect the FCAs for Capacity Zones having adequate supply.

System-wide. If the system-wide ICR cannot be satisfied at the Starting Price, then, Existing Capacity will be paid 1.1 times CONE, New Capacity will be paid the Starting Price, and the deficiency is made up in subsequent reconfiguration auction. A de-list will be paid its bid or 1.1 times CONE, whichever is higher. System-wide inadequate supply will not affect the FCAs for Capacity Zones having adequate supply, except that in those Capacity Zones having adequate supply, New Capacity will be paid the Capacity Clearing Price, and Existing Capacity will be paid the lower of: (1) the Capacity Clearing Price; or (2) 1.1 times CONE.

Insufficient competition

The FCA will be considered to have insufficient competition system-wide (or in any Capacity Zone) if system-wide (or in any Capacity Zone):

- supply is adequate.
- the amount of Existing Capacity is less than the ICR, and
- at the Starting Price, (1) less than 300 MW of New Capacity (to be reconsidered in the case of creation of import-constrained zones of less than 5000 MW total requirement) is bid; (2) the amount of New Capacity bid is more than the amount of new capacity required but less than twice the amount of new capacity required; or (3) any Market Participant's New Capacity is pivotal unless that Market Participant's New Capacity is out-of-market New Capacity. A Market Participant is pivotal if, at the Starting Price, some of that Market Participant's potential New Capacity is required to satisfy the ICR.

If the FCA has insufficient competition, New Capacity will be paid the Capacity Clearing Price, and Existing Capacity will be paid the lower of: (1) the Capacity Clearing Price; or (2) 1.1 times CONE.