ISO-NE FCM Capacity Market Design
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Summary

The ISO-NE FCM capacity market design embodies many improvements over the prior ISO-NE capacity market. Five of these improvements are particularly important. First, the FCM capacity market procures capacity in a three-year forward timeframe. Second, the FCM capacity market introduces zonal locational requirements for capacity. Third, the FCM design includes improved performance incentives for suppliers. Fourth, the FCM design procures capacity on an annual basis and allocates the capacity costs to LSEs on a daily basis. Fifth, market power mitigation mechanisms are explicitly defined.

1. Incentive to Attract Efficient Level of Investment

The ISO-NE FCM design has a number of features that could potentially work together to produce the level of investment needed to sustain the target level of generating capacity. The target level of generating capacity will be supported by a capacity payment in addition to net energy and ancillary service market revenues. The capacity payment is partly based on an initial estimated cost of new capacity (CONE-$90,000 per megawatt year),\(^1\) partly based on calculated peak energy rents over the prior 12 month period, partly market based, determined by the offer prices of new capacity and adjustments over time to CONE based on outcomes in the forward capacity auction,\(^2\) and partly performance based, depending on the resource’s availability during shortage conditions as discussed under item 6 below.

Unlike the current PJM (RPM) and New York capacity markets, the ISO-NE FCM capacity market does not include a demand curve for capacity. Instead, the FCM design has a single target level of capacity procurement and the level of capacity procured through the base residual auction will not exceed this reliability target. There are a number of provisions, however, that may cause the quantity of capacity procured to be less than the reliability target. In particular, the FCM design will potentially procure less than the target level of capacity if the forward auction clearing price is greater than .8 of CONE through the operation of provisions relating to the replacement of delisting

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\(^1\) See Section III.13.2.4 a (i)

\(^2\) See Section III.13.2.4
capacity. If the capacity clearing price in a zone is greater than or equal to 1.5 times CONE, then the amount of capacity procured in the auction will be reduced by the amount of permanently delisting capacity offered at prices above 1.5 times CONE. A sliding scale will be applied to the procurement of capacity to replace permanently delisted capacity for clearing prices between 1.25 and 1.5 times CONE (with 100% replaced at 1.25 times CONE and none replaced at 1.5 times CONE). A similar provision would reduce the procurement of capacity by the amount of static delisting bids and export bids for capacity clearing prices above 1.2 times CONE, with a sliding scale applied to the procurement of capacity for clearing prices between .8 and 1.2 times CONE.

Levels of CONE that understate the competitive price of capacity within the FCM market design could therefore cause the forward capacity auction to purchase materially less than the target level of capacity if delisting bids are submitted at levels in excess of .8 times CONE. Since the going forward costs of all generating capacity must eventually rise above the actual cost of new entry, these features of the FCM market design appear likely to cause a portion of existing high cost capacity to not be replaced in the forward auction as it is mothballed or retired. While permanently delisted capacity would not affect the procurement of capacity in forward auctions after the initial delisting, capacity that is mothballed and static delisted would never apparently be replaced in the forward auction as long as forward auction prices remained above 1.2 CONE.

ISO-NE would attempt to procure capacity in subsequent annual or seasonal reconfiguration auctions to replace delisting or export capacity not procured in the forward capacity auction. Offer prices in these reconfiguration auctions would not be subject to mitigation and could clear as high as two times CONE. It is uncertain how these provisions will operate in practice. Projects that were not selected in the forward auction because of the operation of these clearing rules for delisting resources would

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3 Delisting capacity ceases to have a capacity obligation to ISO-New England, need not be offered in the day-ahead or real-time market and may be mothballed or permanently shut down.

4 See Section III.13.2.5.2.1

5 Static delisting bids withdraw the resource from the capacity market for the delivery year (to be mothballed, for example) but allow the resource to re-enter the forward capacity auction in a subsequent year.

6 See Section III.13.2.5.2.2

7 The capacity of resources supporting capacity sales out of New England might or might not be replaced in subsequent forward auctions. Exports covered by a multi-year contract in another control area would be administratively delisted in subsequent auctions (see Section III.13.1.2.3.1.4). Administratively delisted export capacity would be fully replaced in the forward auction (see Section 13.2.5.2.4).

8 Section III.13.4

9 See Section III.13.4.2
presumably recognize that they would likely be selected at higher, perhaps much higher, prices in the subsequent reconfiguration auction and would therefore have an incentive to remain qualified for that auction. It is uncertain, however, whether most such projects would move forward to construction before the time that they cleared in a reconfiguration auction and thus whether they would be available for the delivery period.\textsuperscript{10} It appears that the 5-year lock-in of capacity payment for new entrants is available only to capacity procured in the forward auction, and is not applicable to capacity procured in reconfiguration auctions.\textsuperscript{11} Capacity offers submitted, but not accepted, in forward auctions may therefore not be submitted in subsequent reconfiguration auctions.

How these delisting provisions will operate in practice is uncertain. These provisions will have the largest impact on the procurement of capacity if CONE understates the actual competitive capacity price, so that the market level of capacity prices is in the range in which permanently delisted capacity would not be replaced in the forward auction.\textsuperscript{12} The impact of these procurement rules would be less material if most existing capacity had very low fixed O&M costs so that its going forward costs would not rise to .8 CONE for many years. The impact of these procurement rules would also be less material if most capacity reaching the point at which going forward costs warrant permanent delisting instead become new capacity under the repowering and related provisions of the FCM design.\textsuperscript{13}

The first annual reconfiguration auction will be 26 months prior to the beginning of the capacity period. The second reconfiguration auction will be 14 months prior to the beginning of the capacity period. The third will be 2 months prior to the capacity delivery period.\textsuperscript{14} The FCM design also includes provisions for seasonal and monthly

\textsuperscript{10} It is possible for these rules to produce a situation in which permanently delisting capacity would have set the clearing price and enabled ISO-NE to procure sufficient capacity to meet the capacity requirement but that there is not enough new capacity offered but not taken, and thus likely to be available in the reconfiguration auctions, to meet the capacity target.

\textsuperscript{11} See Sections III.13.1.1, 13.1.1.2.2.4, and 13.7.2.1.

\textsuperscript{12} The definition of existing capacity (III.13.1.2.1) states that any capacity that is not new capacity is existing capacity, thus apparently including previously permanently delisted capacity in existing capacity that would be included in the forward auction. (Similarly, see February 15, 2007 Filing Letter at p. 36.) This is presumably not the intention as other sections provide that permanently delisted capacity cannot be offered in subsequent forward auctions (see III.13.1.2.3.1.2).

\textsuperscript{13} See Sections III.13.1.1.1.2 and 13.2.3.2 (e).

\textsuperscript{14} Thus, all will be in April for capacity delivery periods beginning in June, see Section III.13.4.5.1. The tariff also includes provisions for the acceleration of the annual auction in the event of a sufficiently large gap between the contract capacity and the capacity requirement, see Section III.13.4.5.2.
reconfiguration auctions during the delivery year. Delisted capacity cannot be offered in reconfiguration auctions.

The actual capacity payment will be the clearing price in the capacity auction less calculated peak energy rents, plus or minus performance penalties or payments. Peak energy rents will be calculated monthly based on LMP prices in the relevant zone for a hypothetical unit with a 22,000 Btu/KWh heat rate, no start-up costs, no ramp constraints, and no-minimum run time. The calculated peak energy rents will be averaged over the 12 months prior to the capacity month and the average deducted from the capacity payment, independently of performance penalties. The peak energy rent adjustment will therefore be known prior to the capacity month, but would not be known at the time capacity suppliers submit offers in the forward auction.

The degree to which the FCM capacity model will provide incentives for the efficient level of investment depends on a number of features of the RPM design:

- How well the initial CONE value approximates the actual capacity payment required to support the development of new capacity;
- The degree to which the estimated net energy and ancillary services revenues (peak energy rents) are consistent with market expectations for net market revenues; and
- Whether the process used to generate the forecast of capacity needs produces forecasts consistent with actual consumer requirements.

2. Allow Generation, Transmission and Demand Response to Compete

Under the FCM design, demand response resources directly compete with existing and new generation resources to satisfy the resource adequacy requirement in the forward auction. Transmission upgrades will affect the local sourcing requirements in import

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15 See Sections III.13.4.6 and 13.4.7.
16 See Section (III.13.4.2.1.3).
17 See Section III.13.7.2.7.1.1.
18 This will depend both on the load forecast (see Item 22 below) and on the resource mix assumed in developing the capacity requirement (see Item 21 below).
19 See Section III.13.1.4.2.1.
20 The base residual auction conducted three years prior to the year of delivery.
constrained zones by changing the network model used in the forward auction.\textsuperscript{21} The forward auction will procure capacity for the entire year under the FCM design, and demand response resources must be able to reduce demand in both the summer and during the winter. The design includes rules allowing summer demand response resources to partner with resources able to provide winter capacity, in order to meet the year round capacity target.\textsuperscript{22}

Demand response resources will be subjected to essentially the same forward qualification process applied to generators, which would apparently require committing to provide demand response about three and one-half years prior to the delivery year. It will be seen how this affects participation by demand resources in the forward capacity market. Rather peculiarly, it appears that existing demand response resources are generally required to participate in the forward auction as a price taker,\textsuperscript{23} with no provision for delisting bids until prices fall to $.8\text{ CONE}.\textsuperscript{24} If this is not a drafting error, it might be a deterrent to the development of demand response. Perhaps, the rationale for such a provision is that since capacity payments cannot go negative (and existing resources need not provide financial assurance), there would be no potential loss to an existing demand response provider that clears at a price at which it is unwilling to provide demand response, as it could simply ignore the program and, at worst, earn nothing. This would not be consistent with New England reliability needs, however.

CTRs, interzonal capacity transfer rights analogous to FTRs, will be allocated to loads with the load zone, reducing capacity charges.\textsuperscript{25} There are apparently no special rules regarding allocation of CTRs to transmission expansions within the capacity market rules.

3. \textbf{Does the Proposal Ensure Retention of Existing Economic Resources?}

The FCM capacity market is generally designed to ensure that existing capacity resources will be able to recover their going-forward costs. The provisions for counting delisting capacity and export capacity as meeting the capacity target in the forward auction and

\textsuperscript{21} See Sections III.12.5 and 12.6.1. The grid model will reflect transmission upgrades that the ISO determines are expected to be in service by the beginning of the capacity delivery period. See February 15, 2007 Filing Letter, p. 183.

\textsuperscript{22} See Section III.13.1.5. Thus, demand response based on air-conditioning load would not be able to participate in the forward auction unless it partnered with a generator or demand resource with excess winter capacity. The effect of this structure has been a source of concern to demand response providers, see ISO-NE Feb 15, 2007 Filing Letter, pp. 19, 51-53.

\textsuperscript{23} See Sections III.13.4.2.5.2; 13.2.3.2(c),(d); and February 15, 2007 Filing Letter, pp. 92, 114.

\textsuperscript{24} See Section III.13.1.2.3 and February 15, 2007 Filing Letter, pp. 73-74.

\textsuperscript{25} See Section III.13.7.3.3
replacing the capacity in reconfiguration auctions appear to potentially cause the retirement of economic existing resources, however.

A potential result of these provisions is that the price paid to new capacity resources in reconfiguration auctions could exceed the price at which existing resources were offered in the forward auction and existing resources could retire despite costs that are lower than the prices paid for new capacity. These effects will likely be small if the value of CONE is close to, or in excess of, the actual annual capacity payment needed to maintain the target level of capacity (because these rules for replacing delisting capacity will not come into operation or will have limited impacts for capacity prices close to CONE). If the current value of CONE were materially less than the payment required to maintain the intended level of capacity, these provisions might have noticeable impacts.\(^{26}\)

The FCM design also contains provisions that would subject existing capacity that has shut-down to the offer caps applied to existing generation in the event that the unit considered coming back in service in response to a forecasted capacity shortage. This might deter the return to service of economic capacity.\(^{28}\)

There are also three provisions of the FCM design that appear to have the result that economic existing capacity would be shut down, even in shortage conditions, but this is presumably not intended. These provisions are:

- Price collar for existing capacity at 1.4 times the current CONE.\(^{29}\)
- Price cap for existing capacity at 1.1 times the current CONE in the event of a capacity shortage.\(^{30}\)

\(^{26}\) This situation could arise because the initial value of CONE understates the cost of entry, because of the way peak energy rents and performance charges are determined, or because of material changes in the cost of entry that have not yet worked their way into the current CONE value.

\(^{27}\) The provisions regarding delisting bids for existing capacity require these bids to be submitted roughly nine months before the forward auction (see Item 5 below). These bids may therefore reflect different expectations regarding going-forward costs and revenues than those prevailing around the time of the forward auction. Since these delisting bids cannot be changed, there is a potential for the bids of delisting resources to be inconsistent with market conditions at the time of the auction. Given the complexity of the rules affecting prices for existing capacity, it is unclear how these provisions will operate in practice.

\(^{28}\) See Section III.13.1.1.6.

\(^{29}\) See Section III.13.2.7.3.

\(^{30}\) See Section III.13.2.8.1.
• Price cap for existing capacity at 1.1 times the current CONE in the event of inadequate competition in a zone.\textsuperscript{31}

The first of these provisions, the provision applying a price collar, does not appear to contain any language distinguishing delisting capacity with offer prices above 1.4 CONE from other existing capacity, so if payments to existing capacity are capped at 1.4 CONE, existing resources with delisting offers at prices above this level would apparently have their offers accepted and would be inactivated or permanently retired, and replacement capacity procured at presumably higher prices in subsequent reconfiguration auctions in which the delisted capacity could not participate.

The second of these provisions, applying a price cap at 1.1 times CONE in the event of a shortage (insufficient capacity is offered at two times CONE to meet the capacity target) contains language indicating that delisted resources would not be paid the capped price, but delisted resources are not identified as eligible to be paid the auction starting price paid to new capacity resources. It is presumably not intended that existing resources with going-forward costs in excess of 1.1 CONE would retire in a capacity shortage, but this appears to be the implication of the FCM tariff language.

The third of these provisions, capping payments to existing resources at 1.1 CONE in the event of inadequate competition, does not contain any reference to delisting capacity, so existing capacity with delisting offers above 1.1 CONE would apparently be delisted and replaced in subsequent reconfiguration auctions, despite delisting offers that were lower than the clearing price in the auction.

This tariff language regarding payments to delisting resources may not correctly reflect the intent and does not appear to be an intrinsic feature of the FCM design. Since the FCM design has not yet been utilized, it is unclear what is intended. One possibility is that capacity with delisting offers above these price caps but below the auction clearing price would be retained and paid its bid price.

The tariff contains provisions for minimum offer prices for new generation and demand response resources\textsuperscript{32} but these provisions appear meaningless given the ability of capacity buyers to self-supply capacity in the forward auction at a zero offer price. Indeed, in a situation in which capacity buyers may be contracting forward for baseload generating capacity with a development time longer than the three year FCM cycle, one should anticipate that new capacity might be offered into the market as a price taker, covered by longer-term energy and capacity contracts. This circumstance could result

\textsuperscript{31} See Section III.13.2.8.2.

\textsuperscript{32} See Sections III.13.1.1.2.2.3; 13.1.1.2.6; 13.1.3.5.6 and 13.1.4.2.4 and item 20 below.
both in the shutdown of economic generation and provide a muddled price signal to guide new investment.

4. **Promote Acquisition of Capacity in Advance of Needed Timeframe**

The FCM design will cause most capacity to be procured slightly more than 3 years prior to the delivery year. The provisions relating to delisted capacity discussed above, however, give rise to a likelihood that some capacity will be procured in the annual reconfiguration auction two years prior to the delivery year. Additional capacity may also be procured in the annual reconfiguration auctions if the load forecast on which the original capacity procurement was based appears to be low as the delivery date approaches. The annual reconfiguration auctions can also be used by capacity sellers to replace delayed or cancelled projects.\(^{33}\)

Market participants can only trade supply obligations in the annual reconfiguration auctions, not load obligations. The ISO will participate in the reconfiguration auctions to buy or sell capacity to account for year to year variations in installed capacity requirements and to purchase capacity not procured in prior years as a result of inadequate supply, or acceptance of delisting or export bids. The ISO would also participate in the auction to replace capacity shortfalls due to failure of new capacity resources to perform as specified in testing.\(^{34}\)

Load serving entities are free to enter into longer term capacity contracts and to purchase capacity more than three years prior to the delivery year. The FCM design assures that most capacity will be procured on behalf of consumers served by LSEs lacking a long-term obligation to serve no less than three years prior to the delivery year. It does not preclude LSEs from contracting for energy and capacity more than three years prior to the delivery year. The term of the procurement in the forward auction will generally be one year at a time, but new capacity has the option to lock the capacity price in for an additional four year term.\(^{35}\)

Similarly, the FCM design should not interfere with the procurement of baseload capacity (typically capacity having a greater than three year development time) by LSEs with a long-term obligation to serve. Such LSEs can enter into contracts for baseload capacity more than three years prior to delivery and then offer the capacity or self-supply

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\(^{33}\) See Section III.13.1.10. The Delivery year will run June through May. The timetable will be slightly compressed during transition period to the FCM design.

\(^{34}\) Section 13.4.3. Additional capacity might also be procured in a reconfiguration auction if the actual resource mix differs significantly from that assumed in developing the capacity requirement (see Item 21 below), although this does not appear to be explicitly provided for in the tariff.

\(^{35}\) See Sections III.13.1.1, 13.1.1.2.2.4 and 13.7.1.6.
the capacity in the forward auction when the project’s completion date enters the time frame of the FCM capacity procurement process.

It is unclear, however, whether the three year forward procurement will result in the efficient level of contracting for baseload resources on behalf of consumers served by LSEs lacking a long-term obligation to serve.36 There is some level of expected future prices relative to long-run generating costs that would induce the construction of baseload capacity to serve load under short-term contracts, but it is possible that in the absence of longer than three year forward energy and capacity contracts for four years of payments, various regulatory, political and market risks may lead to a suboptimal level of investment in baseload capacity to serve retail access load.

5. Does the Proposal Make Available Transparent Price Signals?

If capacity is procured by the ISO in the forward capacity auction, then there will be a forward price signal to guide investment decisions in generation and demand response projects, to support a pipeline of generation and demand response projects in the development stage, and to provide information supporting regulatory decisions.37

If much or all of the capacity cleared in the forward auction is self-supplied, including capacity acquired through bilateral long-term contracts, the auction clearing price may not provide a meaningful price signal. However, if the implementation of the FCM capacity market were to lead to all consumer capacity needs being met through long-term bilateral contracts and self-supplied in the forward market, the FCM design would likely be viewed as working extremely well without regard to the quality of the price signals in the forward auction.

Special capacity rationing rules in the ISO-NEFCM design for handling lumpy investments could potentially introduce some murkiness into the auction price signal.38

More consequentially, as mentioned above, there are a number of special rules regarding price collars and pricing in the event of inadequate supply or inadequate competition that would cause the clearing price to differ from the price paid to existing capacity and from the price paid by LSEs. First, the FCM design includes a “price collar” for existing capacity at clearing prices above 1.4 times the estimated cost of new entry. That is, if the clearing price exceeds 1.4 times the estimated cost of new entry,

36 The extent to which the efficient level of baseload capacity is built depends in part on the willingness of the owners of such resources or other entities in the market to accept the energy price risk associated with such resources.
37 Zonal capacity price differences will also provide a price signal to guide transmission upgrade decisions.
38 See Sections III.13.2.6 and 13.2.7.4.
existing capacity resources would be paid the higher of 1.4 times the estimated cost of
new entry or their offer price, while new capacity resources would be paid the clearing
price. 39 Second, the FCM design also provides that in the event of inadequate supply at
any price to meet the amount of new capacity required to meet the requirement for a zone
or New England as a whole, existing resources would be paid the higher of 1.1 times the
estimated cost of new capacity or their offer price, while new capacity resources would
be paid the auction starting price. 40 Third, the FCM design provides that in the event of
inadequate competition, defined as an auction in which the amount of capacity offered
from existing resources is less than the installed capacity requirement and the amount of
qualified capacity offered by new resources is less than 300 MW, or in which the amount
of capacity offered is less than twice the amount of required new capacity, or in which
any market suppliers new capacity offer is pivotal,41 then existing resources would be
paid the lower of the clearing price or 1.1 times the estimated cost of new capacity.42

In addition, whenever delisted capacity or export capacity is not replaced in the
forward auction, the forward auction clearing price is not actually the market clearing
price for target level of capacity, (i.e., it is the market clearing price for a meeting a
portion of the capacity target). This procurement rule could lead to higher prices in
subsequent annual reconfiguration auctions than in the forward auction, but the
expectation of such higher prices in subsequent reconfiguration auction prices could lead
to higher offers from new capacity in forward auctions in which capacity is attempting to
delist at prices above .8 times the estimated cost of new entry.

Delist bids must be submitted prior to the existing capacity qualification deadline,
roughly nine months prior to the beginning of the forward auction and a month and a half
prior to the new capacity qualification deadline.43 These bids are then to be published by
ISO-NE. The published data would include the quantity of delisting capacity, the delist
price and the load zone.44 The price at which capacity would not be procured in the
forward auction would therefore be known to suppliers of new capacity when they are
determining whether to participate in the forward auction and at what price to offer their
capacity. The potential under-procurement of capacity in the forward auction would

39 See Section III. 13.2.7.3. As noted above, the draft tariff does not provide that delisting capacity would be paid
more than 1.4 CONE but it is presumed that it is not intended that such high-cost capacity would shut down in a
capacity short period in which forward auction clearing prices exceed 1.4 times CONE.
40 See Section III.13.2.8.1.
41 See Section III.13.2.8.2.
42 See Section II.13.2.8.2.
43 See Section III.13.1.10.
44 See Section III.13.1.8.
therefore presumably be taken into account in the offer prices of new capacity. It will need to be seen how much noise these provisions introduce into forward capacity prices.

There is also a price floor at .6 of CONE.\(^{45}\)

6. Does the Proposal Provide Performance Incentives?

The FCM design retains day-ahead and real-time bidding obligations for capacity resources similar to those in ISO-NE’s UCAP market design. Thus, generation resources must be offered in the day-ahead market and must also be offered in real-time.\(^{46}\) Import supply must also be offered in the day-ahead market and at least 16 hours of each weekday in the real-time market.\(^{47}\) Intermittent resources, on the other hand, must submit bids in real-time but have the option of submitting bids in the day-ahead market. Intermittent resources are required, however, to submit day-ahead supply projections.\(^{48}\) Fully delisted resources, i.e., resources none of whose capacity has been purchased in the capacity market, are not obligated to offer their output in either the day-ahead or real-time market.\(^{49}\) Demand resources, on the other hand, are not permitted to submit supply offers in either the day-ahead or real-time markets.\(^{50}\)

In addition, a system of performance payments and charges based on resource availability during shortage conditions will provide improved incentives (relative to the prior ISO-NE UCAP market design) for generation resources to be available during stressed system conditions under the FCM design. The application of charges will be based on resource availability during shortage events, essentially hours of reserve shortage.\(^{51}\) Generators whose availability during these hours is less than their qualified capacity will have their resource adequacy payment reduced proportionately.\(^{52}\) Units that are on-line and available for dispatch or off-line and available to come on-line within 30 minutes will be treated as available up to their economic maximum limit. There are a number of special rules governing the circumstances in which resources will not be assessed penalties because the resource was not committed as a result of a transmission

\(^{45}\) See Section III.13.2.7.3.

\(^{46}\) See Section III.6.1.1.1.

\(^{47}\) See Section III.13.6.1.2.1. The requirement differs slightly between dispatchable and fixed energy transactions.

\(^{48}\) See Section III.13.6.1.3.1.

\(^{49}\) See Sections III.13.6.2.1.1 and 13.6.2.3.

\(^{50}\) See Section III.13.6.1.5. The purpose of this rule is not clear and it is simply repeated without exploration in the February 15, 2007 Filing Letter (p. 161).

\(^{51}\) See Section III.13.7.1.1.1.

\(^{52}\) There are exceptions for generation resources that are not available for reasons outside management control, such as transmission outages, gas pipeline outages, etc.
outage (on the transmission grid, not of the generator lead), because the resource is unavailable due to an approved maintenance outage (during the normal maintenance seasons), or because it was offered but not committed in the day-ahead market (and has a notification plus start-up time of 12 hours or less).53

Economic outages are not permitted under the FCM design. If bid caps prevent a resource from offering its capacity at a price reflecting its actual costs (such as during periods when winter gas balancing rules are in effect and spot gas prices are extremely high), then capacity resources are to offer their supply at the bid cap and notify ISO-NE that their actual costs were higher.54

The FCM availability incentives will accommodate the needs of energy limited resources by allowing these resources to, within the constraints of the overall ISO-NE market power mitigation plan, limit the amount of energy they are dispatched to provide during shortage events by raising their offer price, without being penalized for reduced availability as long as the resource is on-line and available to be dispatched for energy during the shortage event (and thus providing reserves if it is not dispatched for energy). How the FCM availability penalties will in practice affect the performance of energy limited resources in ISO-NE will be observed in coming years but is not yet known. ISO-NE has more significant energy limited resources than PJM but still fewer than California. The application of the FCM design in ISO-NE may not fully demonstrate the workability of the shortage event availability penalties for the CAISO resource mix because the New England market is not subject to long-term energy limits such as those associated with the Western hydro cycle..

Resource qualified capacities are determined by the ISO rather than the resource owner.55 It is therefore possible for the owner of an existing resource to be assigned capacity obligations that exceed the performance capabilities of the resource. One source of such overrating, basing ratings on capacity at 90°F Fahrenheit, is addressed by provisions permitting resource owners to submit delisting bids for this capacity at 2 times CONE.56 Since capacity payments cannot go negative,57 absent market power there does not appear to be any reason for capacity suppliers to delist capacity ranges in which the resource might not actually be able to operate.

53 See Section III.13. 7.1.1.3.
54 See Section III.13.6.1.1.3. The February 15, 2007 Filing Letter notes that the details of how this provision would operate remain to be worked out, p. 20.
55 See the discussion under Item 21 below.
56 Section III.13.1.2.3.2.4.
57 See Section III.13.7.2.7.1.3.
A potentially significant feature of the ISO-NE FCM design is that all availability penalties deducted from the capacity payment of capacity resources that were not available during a shortage event are paid to the capacity resources that were available.\(^\text{58}\) The total capacity revenue received by suppliers is therefore the capacity payment times the gross capacity requirement, while the gross capacity requirement increases with the average expected forced outage rate. Selection of low availability resources in the forward auction therefore tends to raise total capacity payments by load, holding the market clearing capacity price constant. If the effect of procuring low availability resources on total revenues is anticipated in the bids of new suppliers, the impact of low availability resources on penalty revenues of other suppliers will be reflected in lower offer prices and forward capacity clearing prices.\(^\text{59}\)

7. **Allow for Cost-Effective Tracking Mechanism for Monitoring and Compliance**

Under the FCM design, ISO-NE is responsible for procuring capacity through the forward auction, enabling ISO-NE to ensure that the target level of capacity is procured. Under the FCM proposal, each capacity resource must be qualified by ISO-NE prior to participation in the forward capacity auction. For new generator resources, this process entails submission of data including the expected commercial operation date, the project location, the status of the project under generator interconnection procedures, the economic minimum limit of the resource, a location plan and a diagram of the plant and facilities. The resource owner must also show control of the project site for the duration of the relevant capacity period, submit a critical path schedule for the project, estimate required project financing, identify the expected source of financing and specify the expected closing date for project financing. In addition, the project sponsor must provide a list of all major components for the project and the date on which all major components have been or are expected to be ordered and a variety of other information.\(^\text{60}\) There is a similar qualification process for import supply.\(^\text{61}\)

Demand response resources must go through a similar qualification process, which includes submission of data. The required data includes the load zone location, estimated

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58 See Section 13.7.2.7.1.4.

59 This potential for low availability resources to raise total load payments for capacity is perhaps the rationale for the special rules for poorly performing capacity resources. See Section III.13.7.1.1.5.

60 See Sections III.13.1.1 and 13.1.1.2; Filing Letter, pp. 20-27.

61 See Sections III.13.1.3.3 and 13.1.3.5.
demand reduction value, demand resource type, source of funding and a measurement and verification plan. 62

The ISO-NE FCM design also contains extensive provisions governing ISO-NE monitoring of the development and construction progress of new capacity resources once they have been selected in the forward auction. 63

The purpose of the extensive data submission process is to enable the ISO to perform a detailed evaluation of each proposal to ensure that the proposed capacity assets can satisfy their obligations and that procured capacity is built and achieves commercial operation. 64 The extent of ISO review and analysis required by the proposal is expected to impose significant resource burdens on the ISO. 65 While this ISO review of plans and schedules may assure that a proposed project could be built, it is not explained in the Filing Letter how it ensures that the projects will be completed or completed within the required timeframe.

The ISO-NE FCM design provides a mechanism for generation developers to buy replacement capacity, either through bilateral contracts or in annual reconfiguration auctions, in the event that their contracted project is delayed or becomes infeasible (as a result of permitting issues for example). 66 Both auction purchases and bilateral transactions are subject to review and approval by the ISO to ensure that the replacement resources satisfy New England reliability needs. 67 If a resource’s capacity declines by more than 20% or 40 MW between the forward auction in which it sells capacity and the capacity procurement period, then the seller is obligated to replace the capacity through bilateral purchases or in the reconfiguration auction or to put in place a plan to restore the capacity. 68

The ISO-NE FCM tariff also incents compliance by imposing a credit requirement on entities seeking to supply capacity in an FCM auction from new generation resources or new demand response resources until such time as the resources are declared commercial and successfully tested for their capacity rating by ISO-NE. Once new

62 See Section III 13.1.4.2.
63 See Section III.13.3.2.
65 Filing Letter, pp. 9-14, 30-31.
66 See Section III.13.3.4.
67 See Section III.13.5.1.1.3.
68 See Sections III.13.6.1.1.4 and 13.6.1.3.2.
resources are successfully tested, they will be treated as existing resources. New capacity resources must provide $2000/MW of financial assurance in order to participate in the forward auction. If they are selected in the auction, then they must provide sufficient additional financial assurance to cover the calculated monthly CONE payment for that auction (for one month). Fifteen days prior to the next forward auction the supplier would be required to provide financial assurance covering the calculated monthly CONE payment (for the auction in which the capacity cleared) for two months, and 15 days prior to the next forward auction they would be required to provide financial assurance covering the calculated monthly CONE payment (for the auction in which the capacity cleared) for three months. This financial assurance would be drawn down by the ISO in various circumstances in which the capacity supplier fails to provide capacity. The financial assurance provisions are intentionally not burdensome, as compliance is intended to be primarily assured through the ISO qualification and monitoring process.

Resources must make a deposit in order to participate in the auction process, and comply with financial assurance policies. If resources fail to participate in the auction, they also must reimburse the ISO for expenses incurred in evaluating their application.

8. Does the Proposal Complement the MRTU Market Design, Systems and Operations?

The ISO-NE FCM design provides for the development of multiple zones and includes a process for ISO-NE to identify additional capacity regions over time. How well this process for identifying new capacity regions works in practice will not be known for several years.

One likely issue in applying a FCM like capacity market design to California would be that ISO-NE’s energy markets provides for a somewhat greater level of disaggregation of energy pricing than the current CAISO MRTU design. It is likely that the number of capacity regions in California under a FCM type capacity model would exceed the three LAPs currently proposed for energy pricing under the MRTU tariff.

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69 See Exhibit IA, Section VB5.
70 See Exhibit IA, Section VB2.
71 See Exhibit IA, Section VC.
72 See also February 15, 2007 Filing Letter, pp. 8, 24.
73 See Section III.13.1.9.
74 Section III.13.1.9.3.2.2.
75 See Sections III.12.2 and 12.4.
Inconsistency between the locational requirements under a FCM type capacity market and those relevant for energy market pricing could adversely impact both investment incentives and forward hedging in energy markets. Transmission upgrades, for example, that benefit capacity buyers within a narrow capacity market region would also affect congestion and energy prices in the LAP, with the impact on energy prices spread over all buyers in the LAP, rather those within the capacity zone. This divergence in the incidence of impacts between the capacity and energy markets could complicate evaluation of both market-based and regulated transmission investments.

The FCM design does not appear to provide for the definition of intra-capacity zone delivery rights which would define entitlements to capacity transfer rights in the event new zones were created in the future, but the tariff does contain rules regarding allocation of CTRs when capacity zones change.76

9. How Does the Proposal Provide Incentives for a Diverse Resource Mix?

The ISO-NE FCM model provides incentives for the development of demand response by allowing these resources to compete with generation resources within the forward auction. The ISO-NEFCM model does not directly provide incentives for fuel diversity or for a mix between baseload and peaking generation. The FCM proposal has rules governing intermittent generation, including some special information to be submitted as part of the qualification process.77

9a-10. Locational Requirements

The ISO-NE FCM market design provides for the development of four capacity regions, and includes a process for ISO-NE to identify additional capacity regions over time. The local sourcing requirement will be determined by ISO-NE prior to each forward auction for each load zone, accounting for relevant transmission limits and based on the existing capacity resources that are expected to be available.78 These local sourcing requirements would be filed with FERC at least 90 days prior to each forward auction.79 How well this process for identifying new capacity regions works in practice will not be known for several years. Even then it may not be clear whether the process would be applicable to the geographic distribution of load and resources in California.

76 See Section III.13.7.3.3.3.
77 See III.13.1.2.2.6.
78 See Sections III.12.2 and 12.4.
79 See Section III.12.3.
The handling of intra-zonal transmission constraints on resource delivery was an unresolved issue discussed in the ISO-NE filing letter.\(^\text{80}\)

9b-11. Quick Start, Fasting Ramping, and System Requirements

The ISO-NE FCM capacity market design does not include features involving payments for quick start and fast ramping units. ISO-NE operates a separate forward reserves market for 10 and 30 minute reserves and payments to suppliers in the forward reserve market are adjusted based on revenues from the capacity market.

9b-12. Resources Able to Shift Intermittent Resource Output from Off-Peak to On-peak

The ISO-NE FCM design does not provide any special incentives for the development of resources with inter-temporal energy shifting capability. However, a pumped storage resource capable of providing 4 hours of continuous operation can qualify as providing capacity,\(^\text{81}\) so pumped storage and other energy shifting resources can qualify for capacity payments. The ability of output shifting resources to qualify for capacity payments in the ISO-NE FCM model does not depend on whether they are inter-temporally shifting the off-peak output of intermittent resources or of baseload resources.

13. Does it Minimize or Eliminate Need to Rely on Backstop Capacity?

How well the ISO-NE FCM model will avoid the need to rely on a backstop mechanism to support needed capacity depends in part on whether the estimates for CONE, the estimates of net energy and ancillary service market revenues, and adjustments for penalties and risks are accurate. The process for the value of CONE to shift over time will help to gradually resolve such errors if the errors are not too large.

The extent to which the ISO-NE FCM model will be successful in avoiding the need for reliance on a backup mechanism will also depend on ISO-NE ability to analyze potentially constrained capacity regions and to create new capacity zones in time to be accommodated within the forward auction design. As a backstop, the delisting process provides for existing capacity to be procured at a just and reasonable rate if it is needed to maintain reliability.\(^\text{82}\)

\(^{80}\) See February 15, 2007 Filing Letter, pp. 16-17.


\(^{82}\) See Section III.13.2.5.2.1 and February 15, 2007 Filing Letter, pp.18-19, 20. The tariff contains language stating that the fact that failure to procure the capacity “may result in the procurement of less capacity than the Installed Capacity Requirement or Local Sourcing Requirement for load zones” shall not be a reason for rejection. How this provision will be applied in practice will likely be interesting.
14. How Does the Proposal Allow for Effective use of Imports to meet RA R Requirements?

The ISO-NE FCM model accounts for import supply in two ways. First, the model allows resources located outside the ISO-NE control area to supply capacity into New England. Imported capacity clearing in the forward auction must be backed either by one or more external resources or by an external control area. The capacity market design includes a number of special rules regarding the ties to Quebec, reflecting both the reliability constraints affecting use of the tie and historic entitlements to use of the tie. In addition, ISO-NE will take account of the capacity assistance available from other control areas in determining the overall New England capacity requirement. Unlike California, however, the supply of import resources available to ISO-NE during emergency conditions does not vary over a hydro cycle. The ISO-NE capacity requirement is defined on an annual basis so would not readily accommodate capacity available in other regions as a result of peak diversity, although this can be accounted for by ISO-NE in its determination of the overall capacity requirement.

Import supply must be offered over specific external ties and each external tie is mapped to specific NEPOOL capacity zones.

The FCM design has rules that are intended to ensure that exports to other control areas during ISO-NE shortage events are not supported directly or indirectly by New England capacity resources.

15. How Does the Proposal Ensure that all LSEs Recover the Cost of their Capacity Requirements and Ensure that Cost Shifting Does Not Occur between LSEs?

Under the ISO-NE FCM design, ISO-NE will procure capacity in the forward auction for an annual term, will pay for the capacity on a monthly basis during the delivery year, and will allocate the cost of this capacity to, and recover the cost from, the LSE serving the load on each day during the delivery year. The ability of LSEs to recover these costs is essential to ensure that all LSEs are treated fairly and that cost shifting does not occur.
capacity charges in unregulated retail prices or in their regulated rates will depend on market conditions and the policies of state regulators. By defining the obligation on an annual basis and allocating all of the annual costs to LSEs on a daily basis, the ISO-NE FCM design avoids the potential for cost shifts arising from differences between daily, monthly or seasonal capacity prices.

LSEs that choose to contract forward for capacity outside the framework of the ISO-NE forward auction could incur higher or lower capacity costs than LSEs contracting for capacity through the auction, but that is a result of contracting choices, not cost shifting.

Importantly, self-supplied capacity is not paid the auction price. Instead, this capacity is deducted from the capacity obligation of the self-supplying LSE. A provision of this nature serves to protect self-supplying LSEs from the various rules that may pay a lower price for existing capacity than is paid to new capacity. Absent such a rule, an LSE that self-supplied its entire capacity obligation with existing resources in the forward auction could owe additional payments if the price of existing resources were lower than the price of new capacity as a result of the provisions relating to the price collar, capacity shortages or inadequate competition. However, this provision would apparently also insulate self-supplying LSEs from various capacity market uplift costs. These uplift costs appear to include the costs associated with over procurement of capacity by the ISO in the forward auction, and the multi-year lock in provision for new capacity.

It is hard to predict whether these differential rules regarding self-supplied resources will have material effects on cost-shifting among LSEs. In particular, it is unclear whether the level of self-supply will be material, given generation divestiture by most traditional utilities in New England. The main issues appear to be:

- Since the costs of over-procurement of capacity by the ISO will be borne by LSEs procuring capacity through the auction, will recognition of costly ISO load forecast error cause LSEs lacking an obligation to serve to reduce their load-serving obligation to the amount of self-supplied capacity, shifting these costs to the default provider?

- Will the level of capacity self-provision be high enough that differences between the current capacity price and the locked-in capacity price (for entrants choosing to lock-in the forward auction price for additional years)

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90 See Section III.13.7.2.6.
fall on a limited set of LSEs procuring capacity through the forward auction?

- Will high levels of self-supply of capacity shift the potentially high cost of replacing delisted capacity in reconfiguration auctions to a small set of LSEs procuring capacity through the forward auction?

These kinds of provisions could potentially lead to very volatile outcomes in a California capacity market in which a significant portion of the capacity market needs might be self-supplied, such as existing must-run resources and long-term contracts.

Another unresolved cost allocation issue concerns the “reconstitution” of load providing demand response. If capacity market costs are allocated based on metered load (net of demand response), LSEs whose customers provide demand response potentially benefit twice, once in the payment for demand response capacity and again by not being assigned capacity market responsibility for this load. No reconstitution is included in the current FCM tariff but this topic is to be considered further. 91

16. How Does Proposal Accommodate Load Migration?

Each LSE pays the capacity cost on the days for which it is responsible for serving its load, see 15 above.

17. Is the Proposal Compatible with Short-Term and Long-Term Bilateral Procurement and/or Resource Ownership by LSEs?

Yes. LSEs can enter into long-term capacity contracts and self-supply the contracted capacity in the forward auction to cover their delivery year capacity obligation. 92 LSEs that self-supply capacity will apparently not be exposed to the potential for higher capacity prices in annual reconfiguration auction procurement to replace delisting capacity. LSE’s that self-supply capacity would also not be exposed to the cost of purchasing power in the reconfiguration auctions to account for load forecast error, as long as the LSE did not make a similar load forecast error in determining the amount of self-supplied capacity.

Bilateral contracts entered into more than three years prior to the delivery year to support the development of baseload capacity hedging both energy and capacity costs should be readily accommodated by the FCM capacity market design. Conversely, LSEs

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91 See Filing Letter, p. 167.
92 Self-supplied capacity must be located in the same zone as the LSE load serving obligation in order to satisfy the requirement for import constrained zones. Section III.13.1.6.2.
that do not wish to enter into forward contracts for capacity need not do so and will pay the capacity price determined in the forward auction.

However, the special provisions regarding price collars on existing capacity at 1.4 times the current CONE and other price provisions applying in the event of inadequate capacity and inadequate competition\(^{93}\) could deter LSEs from entering into forward contracts at prices above 1.1 times the current CONE. When these provisions apply, the FCM capacity price paid by LSEs will be lower than the clearing price for new capacity in the forward auction, so entities that have entered into forward contracts at prices above 1.1 times the current CONE will pay a higher price than LSEs relying on the spot market. This possibility should not have a material impact on forward contracting incentives as long as the value of CONE is close to the actual market clearing price of new capacity, but if the value of CONE does not accurately reflect the cost of capacity, these provisions would tend to deter forward contracting by entities with long-term obligations to serve.

18. **How Does Proposal Facilitate Competitive Market Outcomes Regardless of Some Self- Provision of Capacity?**

The ISO-NE FCM proposal accommodates self-provision of capacity.\(^{94}\) The combination of market power mitigation applied to the offer prices of existing resources and self-supply of new capacity could result in forward auction prices that are lower than the long-run supply price of capacity. The potential for strategic actions to depress capacity market prices in a capacity subregion is limited by the price of capacity in the rest of pool region and by competition among capacity buyers to the extent it exists.

19. **How Does the Proposal Mitigate Market Power?**

The FCM proposal has extensive rules governing the circumstances in which previously existing generating capacity can be treated as new capacity for the purpose of the capacity auction. In particular, capacity at an existing generation facility can be treated as new capacity for the auction if substantial investments are made in the existing facility, if the capacity reflects an increase in the capacity of the resource, or if the capacity reflects a restoration of derated capacity.\(^{95}\)

Existing generation resources that do not qualify as new capacity and that do not want to be price takers in the forward auction (i.e., that do not want to provide capacity at capacity prices above .8 CONE), must submit static delist bids or permanent delist bids.

\(^{93}\) See Sections III.13.2.7.3 and 13.2.8.

\(^{94}\) See Section III.13.1.6.

\(^{95}\) See Sections III.13.1.1.1.2, 3 and 4.
Delist bids in excess of .8 times CONE are subject to review by the market monitor.96 Existing generation resources seeking to permanently withdraw from the capacity market can submit permanent delist bids which are also subject to review by the market monitor if they exceed .8 CONE, however, they will be presumed to be competitive if they are less than 1.25 times CONE unless the market monitor determines that the delisting is an attempt to manipulate the forward capacity auction.97 Existing capacity resources can submit “dynamic delisting bids” during the auction if the clearing price falls below .8 CONE.98 Delisting resources are also subject to a reliability review.99

These provisions constraining the offer prices of existing resources are presumably intended to prevent physical or economic withholding by the owners of generation resources. As noted above (see discussion under Item 2), however, it appears that the requirement to offer existing resources in the forward auction as a price taker also applies to demand response resources, with no provision for delisting bids until the capacity price falls below .8 CONE. Such a requirement for demand response resources does not appear sensible from the standpoint of market power mitigation.

Existing generation resources seeking to sell capacity outside New England must submit an export bid in the forward auction. Export bids in excess of .8 times the estimated cost of new entry are subject to review by the market monitor.100

The market monitor’s review of generation delisting bids will determine whether the bid is consistent with the resource’s net risk adjusted going forward costs. The FCM design also includes rules governing the evaluation of a delisting resource’s risk adjusted going forward costs and opportunity costs.101 All delisting bids above the safe harbor level .8 CONE for static delisting bids and 1.25 CONE in the case of permanent delisting bids, will be subject to this review of going forward costs, without regard to the potential for the exercise of market power. The workability of these provisions has not yet been tested.

In addition to the provisions regarding economic withholding of capacity in the forward auction through high offer prices, the FCM design has delisting provisions apparently intended to make it unprofitable for suppliers to withdraw generating capacity

96 See Sections III.13.1.2.3.1.1, 13.2.3.2(c) and 13.1.2.3.2.1.
97 See Sections III.13.1.2.3.1.2 and 13.1.2.3.2.1.
98 Section III.13.2.3.2(d).
99 See Sections III.13.1.2.3.1.1; 13.1.2.3.1.2 and 13.2.5.2.5.
100 See Sections III.13.1.2.3.1.3.
101 See Section III.13.1.2.3.2.
from the forward auction, either by shutting it down or by using it to support exports, in order to raise capacity prices.\textsuperscript{102} Similarly, the rules governing the determination of qualified capacity, discussed under Item 21 below, are intended to preclude physical withholding.\textsuperscript{103}

With regard to buyer market power (monopsony), the ISO-NE FCM rules contain provisions for review by the market monitor of offer prices for new generation or demand response resources that are less than 75\% of CONE,\textsuperscript{104} but these provisions appear to have limited practical significance given the ability of LSEs to self-supply capacity (i.e., offer capacity at a price of zero).\textsuperscript{105}

If the market monitor determines that an offer is not consistent with the going forward cost of the unit, then the capacity clearing from that offer will be considered to be out of market under the alternative price rule.\textsuperscript{106} The alternative rule sets the price at the lower of 1 cent under the price at which the last new generating, import or demand resource withdrew from the auction or at CONE.\textsuperscript{107}

20. Will the Proposal Create Material Barriers to Entry?

The FCM designs mechanism for handling intra-zonal interconnection requirements appears to create barriers to entry for new generation seeking to displace incumbent generation and can serve to limit competition between new generation. This potential arises in the event of overlapping interconnection impacts between resources seeking to qualify in the forward auction. If because of these interconnection impacts only some of the capacity seeking to qualify can satisfy the interconnection requirement, priority will be given to existing generation and new capacity resources with higher priority in the generation interconnection queue.\textsuperscript{108} The potential for this provision to act as a barrier to entry was discussed at length in the ISO-NE filing letter.\textsuperscript{109}

\textsuperscript{102} These provisions are discussed in Sections 3 and 5 above.
\textsuperscript{103} Filing Letter, pp. 37-38.
\textsuperscript{104} See Sections III.13.1.1.2.2.3, 13.1.1.2.6, 13.1.3.5.6, and 13.1.4.2.4.
\textsuperscript{105} See discussion under Items 3 and 17 above.
\textsuperscript{106} See Section III.13.1.1.2.2.3, 13.1.1.2.6, 13.1.3.5.6, and 13.1.4.2.4.
\textsuperscript{107} See Section III.13.2.7.8.
\textsuperscript{108} See Section III.13.1.1.2.3, particularly Subsection (f).
\textsuperscript{109} See February 15, 2007 Filing Letter, pp. 16-17, 32-33, 64-65.
On the other hand, there are provisions enabling entrants to lock in the initial auction price for a five-year term (i.e., four additional years), which would tend to reduce some entry risks.\textsuperscript{110}

Credit coverage costs requirements are placed on generators, transmission projects and demand response projects that are in the planning stage. These credit coverage requirements for new resources are intentionally relatively modest and are discussed under Item 7 above. These credit requirements are not necessarily barriers to entry as they serve to assure performance, as do the sunk costs of incumbent suppliers.


The ISO-NE capacity requirement under the FCM design is defined in terms of installed capacity. The installed capacity requirement will be determined by ISO-NE to result in a loss of load expectation of no more than .1 day per year.\textsuperscript{111} The determination of the gross capacity procurement will be based on the EFORD of the capacity in operation prior to the auction. The FCM capacity procurement process will tend to procure the target level of capacity availability if the resources procured in the auction have similar availability factors to the resources assumed in setting the capacity target. If delisting capacity is replaced with capacity with a different availability factor or if the capacity procured in the auction has different availability factors than assumed in setting the capacity target, then more or less capacity than intended may be procured.\textsuperscript{112} The qualified capacity of new capacity resources will be determined by ISO-NE based on information provided to it.\textsuperscript{113} The qualified capacity of existing capacity will be determined by the median of the resource’s claimed capability rating for the most recent five years (at the time of the auction), the median of the summer ratings being used to determine the qualified capacity for the summer period and the median of the winter ratings being used to determine the qualified capacity for the winter period.\textsuperscript{114}

The qualified summer capacity of existing intermittent resources will be determined by the median output during hours ending 14 through 18 of the months June

\begin{itemize}
\item[] \textsuperscript{110} See Sections III.13.1.1, 13.1.1.2.2.4, and 13.7.2.1 This provision appears to be applicable only to resources procured in the forward capacity auction (i.e., not to resources procured in reconfiguration auctions)
\item[] \textsuperscript{111} See Section III.12.1.
\item[] \textsuperscript{112} See Section III.12.7.3.
\item[] \textsuperscript{113} See Section III.13.1.1.2.5.
\item[] \textsuperscript{114} See Section III.13.1.2.2.1 the claimed capability is subject to review by the market monitor if it is reduced below historical levels, Section 13.1.7.
\end{itemize}
through September and all shortage event hours for the relevant location, while the qualified winter capacity will be determined by the median output for hours 18 and 19 for the months of October through May and all shortage event hours for the relevant location.115

The qualified capacity of demand response resources in the forward auction will be the average of the demand response value for the months of June, July and August.116 Although the qualified capacity of demand response resources will be based on the average value for the summer months, their performance obligation is year round. Demand response resources based on summer load patterns may need to supply capacity through a composite offer of summer demand response and winter generating capacity.117

22. How Will the Target Level of Capacity be Established?

The ISO-NE FCM design contains very general provisions regarding the determination of the load forecast.118 It is not clear what power price will be used for the load forecast.

23. How Will the Cost of Excess Capacity be Allocated to LSEs Across the Various Zones?

The cost of excess capacity procurement (arising from load forecast errors) will apparently be allocated prorata to all LSEs procuring capacity through the forward auction. It appears that LSEs that self-supply their capacity would not bear these costs.119

24. How Will the Proposal Account for the Affect of Low Hydro Years on Resource Capacity?

The ISO-NE FCM model does not explicitly account for variations in the available capacity of hydro generation associated with low hydro conditions. ISO-NE requires that pumped storage capacity resources be able to sustain their capacity rating for four continuous hours, and other hydro for two hours.120 In addition, capacity resources would be subject to penalties for outages during the peak hours. There is no other explicit adjustment for the impact of hydro conditions on hydro capacity.

115 See Section III.13.1.2.2.2.
116 See Section III.13.1.4.2.1. Additional rules govern the capacity that demand response resources may offer in monthly auctions.
117 See Section III.13.1.5.
118 See Section III.12.8.
119 See Sections III.13.7.3.1 and 13.7.2.6.
25. How Will the Proposal Account for Energy Availability Constraints Associated with Western Hydro Cycle? Will all Resources have an Unlimited Energy Availability Requirement?

The FCM model does not explicitly account for energy constraints on generation availability. ISO-NE currently requires that capacity resources be able to sustain their capacity rating for varying number of continuous hours for a claimed capability audit, ranging from two hours for gas turbines, jet engines and diesel-fueled units, to four hours for a combined cycle and eight hours for nuclear and other fossil fuel. This does not appear to change under FCM. In addition, capacity resources would be subject to penalties for outages during reserve shortage hours. The only energy availability requirement is the ability to generate for continuous hours, but this does not mean continuous hours 365 days a year. Importantly, the number of hours an energy limited resource might be called upon to supply capacity depends on the characteristics and performance of the other resources supplying capacity. It is not known how the FCM capacity model would perform during a Western energy constrained low hydro year.

26. Does the Mechanism Assure Performance by Capacity Suppliers?

Generation and demand response resources are subject to penalties based on their performance during shortage hours. As discussed above, the FCM tariff also imposes a credit requirement on entities supplying capacity from new generation resources or from new demand response resources to ensure that resources procured in the forward auction have a financial commitment to carry though on the construction of the resource.

27. How Will Performance Incentives for Suppliers Affect the Incentive of LSEs to Bid in the Day-Ahead Market?

The ISO-NE availability incentives will not undermine the incentive of LSEs to buy power in the day-ahead market as the availability charges take account of resources not available in real-time because they were not committed. Resources will not incur availability charges if they are not on-line because they were not committed in the day-ahead market due to under bidding by LSEs and ISO-NE load forecast error. The peak hour performance charges will therefore not serve to insulate LSEs from the financial consequences of failing to buy power in the day-ahead market during high load conditions.

122 See discussion under Item 7 above.