

# **Demand Response Issues Facing ISO New England**

**February 2016**

## **Demand Response Issues Facing ISO New England [February 2016]**

### ***Supreme Court Affirms FERC Order 745***

On January 25, 2016, the Supreme Court released its decision in the EPSA case in which the D.C. Circuit Court had vacated FERC Order 745. At issue was the question of FERC's statutory authority under the Federal Powers Act and, second, whether FERC's decision to base compensation for demand response on locational marginal price is 'arbitrary and capricious'. The Supreme Court ruled in favor of FERC on both matters. The court determined that FERC did indeed have jurisdiction and that FERC's decision to base compensation on LMP was well reasoned. This decision establishes a legal foundation for additional FERC actions to permit additional distributed resources in the market.

### ***Overview of New Market Under Full Integration***

Three markets will be affected by full implementation of FERC Order 745: capacity, energy and operating reserves. Participants will still make a forward commitment to provide capacity. In the new market this will be used to produce energy or operating reserves. Measurement of resource performance will depend on the amount of energy or reserves that are provided during scarcity conditions. To properly designate resources as energy or reserves, market offers must include not only price and quantity, but also the dispatch range (minimum and maximum kW) for resources within 10 or 30 minutes that can sustain energy production for at least one hour.

### ***Reserves Market***

Compliance with FERC Order 745 required development of new rules for how demand response will provide real time reserves in the Forward Capacity Market. FERC approved these new rules in January 2015 for implementation. The new Reserves Market changes how demand response participates in the FCM. Demand response must be bid into the day-ahead market. Bids must include operational characteristics of each resource such as fast start capabilities, documented with audit data. The information will be analyzed by ISO software to determine which resources are designated as energy and which will provide 10-minute or 30-minute reserve requirements.

### ***Common Dispatch Model***

ISO-NE will begin implementing a common dispatch model for demand resources when the new market opens in June 2018. This model will co-optimize generation and demand resources, and designate capacity resources that meet certain criteria as reserves. In other words, separate assets at a facility will be modeled together, with ramp rates and other operating characteristics applicable to the collective asset (today they are modeled separately).

With the integration of the Forward Reserve Market into the Forward Capacity Market the wrong number of MWs could be designated as reserves without a co-optimized model. This is because separate assets at a facility are not truly independent. If facility load is reduced as a result of a demand

response dispatch then on-site generation would often not be available within the first ten minutes or so. Often only one or the other can reliably ramp quickly. As a result, it is the collective resource that the grid operator should evaluate.

### *June 2018 Implementation of New Market*

In January 2015, FERC had approved proposed market rules consistent with full integration of demand resources into the new energy and reserves markets. The ISO had originally been instructed to fully comply by June 2017. In November 2015, ISO-NE and NEPOOL requested a delay in implementation of the new market until June 2018. This is because work to transition its markets needed to slow down in order to minimize wasted resources in the event that the order was overturned.

### *Issue of Duality*

The concept of duality is emerging in the industry conversation. Consider that demand response can modify (reduce) demand for electricity and also be used as a source of supply. Electric supply and demand must remain in perpetual balance, and demand response provides both. In ISO-NE, the same demand response resource that serves as a supply resource provides a retail customer with additional compensation from a reduced electricity bill. Consequently, this customer could offer demand into the wholesale market at a price lower than its true cost of supplying it. Demand response could potentially displace a different resource that has a lower true cost.

### *Improved baselines*

*More frequent baseline adjustments.* FERC has approved an ISO-NE proposal for improved forecasting of demand response baseline energy consumption. The existing method adjusts baselines once per day after the operating day is over. This approach will not suffice for designating cleared resources as reserves. The new rules require that baselines be adjusted every ten minutes. This should provide an accurate account of what can be counted on to meet system reserve needs by location. When an energy dispatch occurs the adjusted baseline is used to determine resource performance. Afterwards, the adjusted baseline is restored and continues to be used by ISO software to monitor options.

*Adjustments for assets that provide net supply to the grid.* The majority of assets in the market still cannot inject energy onto the grid. However, distributed resources are becoming more commonplace and a critical mass of facilities could become net supplier of power. ISO rules currently specify that demand response baselines be adjusted on the day of an event based on usage in the hours preceding a dispatch. For demand response assets that cannot inject energy, these adjustments will never result in a negative baseline because rules specify a floor of zero. This is a problem if a facility becomes a net supplier. The proposed solution is to set the baseline floor equivalent to the MWs indicated on the customer's utility interconnection agreement.

*Rolling average baseline.* ISO-NE rules historically specified a baseline methodology that created ‘infinite tail’ in which old and erroneous telemetry data never disappears. The ISO-NE system was being taxed by the requirement that the entire baseline be recalculated and stored as a unique version every five minutes. ISO-NE is proposing to FERC a method that is based on a 10-day rolling average of historic usage, which was determined to be just as accurate. A variation of this approach will be used for two new day types under full integration (Saturday and Sunday/holiday) starting in June 2018.

### ***Stricter telemetry requirements***

Demand response that is currently in the market must submit 5-minute telemetry data to ISO-NE. Although this is sufficiently granular for a 30-minute reserve product in the new market it will not suffice for 10-minute reserves. More frequent data readings will be needed to assess a resource’s ability to dispatch energy within the designated time frame, and to monitor performance after dispatch. Consequently, 1-minute telemetry data will be required for resources that provide 10-minute reserves.

### ***Less Demand Response in the Market***

The contraction of demand response in ISO-NE Forward Capacity Market continues. In FCA #9 a total of 2,803 MWs cleared the market compared to 3,041 MW in FCA #8, a drop of about 8%. This is a continuation in the decline since FCA #6 in which 3,645 MW cleared.

### ***New Kinds of Demand Response***

Utilities and states have been experimenting with faster and more targeted forms of demand response that can improve the management of electric distribution systems. Advances in automation, communication, signaling and dispatch are a departure from the kind of demand resources in the FCM today. The richest opportunities are among larger poor load factor customers that are served by the most congested feeder lines. Over time, the lessons from early experience will be leveraged to economically develop broader demand response options and the balance of power between ISO-NE and its market participants.

### ***Audits of Reserve Resources***

Market rules for demand response resources that can provide 10-minute or 30-minute reserves are being developed. These will allow combined audits for energy and for reserves. The combined audit of each resource will normally take one hour for the seasonal audit plus the amount of time it takes for the particular resource to fully ramp up. If a resource is able to achieve its full demand reduction in ten minutes, then the overall audit will last one hour and ten minutes.

### *Consolidation of market assets*

In compliance with FERC Order 745, the retail delivery point will serve as the basis for calculation of demand reductions. Facilities with both load reduction and distributed generation will consolidate these into one combined asset. Consolidated assets will capture net load at the utility meter, which can be negative for facilities with distributed generation and a utility interconnection contract.

### *Aligning dispatch and reserve zones*

With the new Forward Reserves Market, ISO-NE needs to define new rules for the treatment of demand response in dispatch zones that are not yet fully aligned with reserve zones. Because dispatch zones and reserve zones are determined at different times it is still possible for a dispatch zone to span more than one reserve zone.

### *Passive Demand Response Resources*

To date, resources in the Forward Capacity Market that cannot be dispatched by ISO-NE are mainly comprised of energy efficiency, but may also include distributed resources such as solar. The total MWs of passive demand response has been rising due to the acceleration of energy efficiency programs and the long lives of installed measures. Utilities have been taking conservative market positions with their passive resources. These MWs normally do materialize, often ahead of schedule, and have a history of performance that often exceeds market obligations.

### *Highly Variable Loads*

ISO-NE has been pursuing ideas to better manage demand response resources characterized by highly variable load patterns. Baselines are a poor predictor of usage for HVL assets; estimates of performance can be off by an order of magnitude. DNV GL performed an analysis of HVLs and made some recommendations, but there is not yet a decision on how ISO-NE will proceed.

### *Baseline accuracy and on-site diesel generation*

The use of behind-the-meter generation at customer facilities is growing and ISO-NE needs new rules to address this. As a start, ISO-NE asked participants to submit information on generation at all facilities that have demand response in the market. The issue is that diesel generators can be turned on/off at will and can, therefore, potentially manipulate a demand response baseline. To safeguard against potential manipulation these assets must report 5-minute interval data on all output. Solar, wind and certain cogeneration that is not controllable will not be subject to this metering requirement.

### *Scheduled and unscheduled outages*

Rules went into effect in 2014 to handle scheduled and unscheduled facility curtailments. These rules will carry over into the new market under full integration. Participants with such curtailments not make any offers into the day-ahead energy market and must submit adjustments to their resource availability data. Participants are required to submit unadjusted baseline data for any intervals that occur during such an outage unless it coincides with an ISO dispatch, in which case actual meter data should be provided.

### *Simultaneous Auditing of Real Time Demand Response and Real Time Emergency Generation*

ISO-NE has developed a proposed that would permit the first hour of an ISO dispatch to serve as a Real Time Demand Response seasonal audit. The seasonal audit for emergency generators would be performed at a later date. Performance data for RTEG would be capped to minimize any potential for market manipulation. Specifically, RTEG performance from the audit plus RTDR performance from ISO-NE cannot exceed total facility load. Simultaneous audits will still be necessary for specific RTDR and RTEG assets that are co-located, but the entire RTDR resource would not need to be audited. In the event that no demand response events are called the existing rules requiring combined audits will still apply.

### *Limited Visibility of Distributed Energy Resources*

Demand response is a type of distributed energy resources. DERs are being deployed at an increasing pace. Much of this will be from on the customer side, and distribution systems will take on a greater role in control and dispatch of these resources. An important problem is the lack of real-time visibility and dispatch control over these resources. Uncoordinated changes may make the system less reliable, particularly in constrained areas. Additionally, DER located in an export-constrained area may not match the transfer capability of the T&D system, which can lead to potential overload.

### *Winter Reliability Program*

The Winter Reliability Program permits demand response resources to participate this winter (2015-2016). This is a special out-of-market program that was originally designed for oil and gas peaker units to address location-specific problems on the network (natural gas constraints, delayed liquefied natural gas shipments) to help ISO-NE maintain 30-minute operating reserves. For the past two winters demand response has been permitted to participate.

In July 2015, ISO-NE proposed to FERC that the winter program exclude demand response, while NEPOOL made a separate filing to FERC proposing that demand response be included. FERC's ruling in September 2015 has settled the matter. Demand resources may include assets that are mapped to a Forward Capacity Market resource. When dispatches in the two programs overlap, only the incremental MWs in excess of the FCM obligation apply to the Winter Reliability Program.

## *Voluntary Load Reductions*

There are two problems with the way ISO-NE currently handles voluntary load reductions. First, ISO-NE does not have a satisfactory system in place for making decisions about when to call for such reductions or communicate this information. Second, voluntary demand response can be harmful for market participants with dispatchable assets that reduce load ahead of the curtailment period. This is because metered data in these pre-event hours is used to adjust customer baselines. A downward adjustment reduces measured performance and penalizes these resources.