

To: New England States Committee on Electricity
From: ISO New England
Date: July 9, 2018
Subject: Responses to Questions on Fuel Security

The New England states have asked several questions of the ISO on issues related to fuel security. ISO New England provides the following responses to those questions below. It should be noted that these responses are based on our current thinking, which could evolve over time. Furthermore, some of the questions do not have answers yet, as those issues will be discussed during the stakeholder discussions this summer, and throughout the fall and first half of 2019.

[STATE QUESTIONS 1-4] Pay-for-Performance

When the Forward Capacity Market (FCM) transitioned to a two-settlement market design with the Pay-for-Performance (PfP) reforms, ISO-NE commissioned the Analysis Group to perform a market impact analysis and sponsored testimony by six experts when ISO-NE advanced the proposal to the Federal Energy Regulatory Commission (FERC). Analysis Group stated that its market impact “analysis indicates that [PfP] would induce actions aimed at mitigating performance risks associated with gas supply curtailments, particularly during the winter gas season.” PfP commenced on June 1, 2018. ISO-NE has recently indicated that PfP may not adequately address fuel security risks and that additional measures to mitigate such risks are necessary.

1. What specific actions and circumstances lead ISO-NE to believe that PfP will not adequately address fuel security risks, such that additional measures are necessary?
2. Given that PfP began on June 1, 2018, and the actual economic impacts of its incentives will not be observable until the winter 2018-2019, please explain why ISO-NE lacks confidence in the ability of this major market reform to address fuel security risks before it becomes effective?
3. What analysis has ISO-NE conducted recently to specifically evaluate the likelihood of PfP’s ability to mitigate fuel security risks? Is ISO-NE able to share that analysis with states and market participants?
4. If PfP is not going to mitigate performance risks associated with gas supply curtailments should ISO-NE modify it?

[ISO RESPONSES TO QUESTIONS 1-4]

PfP is now in effect and the ISO believes that these rules will create incentives for generators to improve performance, including by firming up fuel supplies. That said, the first phase of PfP has been

in effect for only a month; we do not have sufficient experience with PfP to determine the extent to which it will address fuel security. Therefore, we cannot assert with assurance that the PfP improvements will be sufficient to replace the output of retiring units with firm energy, particularly given the compromises that were made in the PfP design, including the six-year transition to the full payment rate and the stop-loss mechanisms.

Dual Fuel Investments

PfP was not specifically designed to incent the development of dual fuel, but rather to improve the performance of capacity suppliers during stressed system conditions more generally. However, the installation of dual fuel represents one of the many investments that a supplier may make in order to improve its performance. The impact of the fully phased in PfP design on the region's dual fuel capability was analyzed as part of the Analysis Group's October 2013 report (AG report) that was distributed to stakeholders. The AG report estimated that PfP would increase the region's dual fuel capability, though the magnitude of this effect was highly dependent on the assumptions made and broader market conditions.

To date, there has been only modest additional investment in dual-fuel capability. Several factors help explain why the region has not experienced a more sizeable increase in dual-fuel resource capacity.

1. Siting, Permitting, and Other Mechanisms to Improve Resource Performance During Gas Shortage Events

The AG report was conducted in 2013. In the intervening years, siting and permitting for dual fuel, and in particular local opposition, has become very challenging, due in large part to an increase in opposition to the use of oil as a fuel source. Furthermore, state policy has evolved, with stringent run time limits for oil in Connecticut (e.g., limited to emergencies¹) and the introduction of new greenhouse gas emission limits in Massachusetts.

These policies and local opposition reduce the incentive to install dual fuel because they decrease the profits associated with burning oil. Participants may instead choose to take on more performance risk in the winter months or make other arrangements to improve performance during gas shortage events.

2. Performance Payment Rate

The Performance Payment Rate (PPR) represents the spot (per MWh) rate at which suppliers are credited or charged for over and underperformance during scarcity conditions relative to the CSO MW they sold forward. This rate directly impacts the incentive to take actions to ensure performance during winter scarcity conditions. More specifically, a participant's incentive to install dual fuel or take other actions to improve performance during winter gas scarcity conditions increases when this PPR value is large and the charge associated with underperformance is great.

¹ For example, page 3 of the Connecticut air permits for CPV Towantic state "[o]il firing for the turbines is limited to ultra-low sulfur distillate No. 2 fuel oil during periods of natural gas curtailment."

The PfP design phases the PPR in over a period of seven commitment periods, with the value starting at \$2,000/MWh in Capacity Commitment Period (CCP) 9 and finally reaching its full value of \$5,455/MWh in CCP 15. The lower PPR during the phase-in reduces the risk associated with underperformance and therefore may lead some resources to take a 'wait and see' approach rather than install dual fuel for the first winter where PfP will be in effect.

The AG report calculates dual fuel additions assuming that the full PPR value is in place. This analysis may therefore conclude that it is economic for resources to invest in dual fuel at a PPR of \$5,455/MWh, whereas resources may lack the necessary economic incentives to do so at a PPR of \$2,000/MWh.

3. Winter Scarcity Hours

A resource's total capacity performance charge associated with nonperformance during winter gas scarcity conditions is equal to the product of the PPR, the resource's performance relative to its forward position during scarcity conditions, and the total quantity of scarcity conditions (in hours). The total quantity of winter gas scarcity conditions (not all scarcity conditions in the winter) therefore plays a critical role in a participant's decision of whether to install dual fuel (or incur other costs to improve winter performance during gas scarcity conditions).

When making forward-looking investment decisions to improve resource performance during winter gas scarcity conditions, a participant does not know the quantity of scarcity hours that will occur. If participants use history as a guide, they will expect very few winter gas scarcity conditions.

Such expectations would reduce incentives to invest in dual fuel because, in such cases, this investment would not materially reduce their expected performance charges under PfP. This observation is consistent with the estimates included in the AG report, which finds that the incremental dual fuel added is highly dependent on the number of winter gas scarcity conditions assumed.

4. Stop Loss

The PfP provisions include monthly and annual stop losses, which 'cap' the performance charges that a resource can incur. These stop loss limits reduce a participant's incentive to invest in dual fuel or other mechanisms to improve performance because they limit the tail risk associated with nonperformance. More specifically, if a high number of gas scarcity conditions occur in a month and the resource is unable to perform, its losses in the month are limited to the FCA starting price times its CSO, and a similar calculation is performed to impose an annual stop loss. As a result of the stop loss, the participant could end up receiving a positive net capacity payment for the entire commitment period. This may lead a risk averse participant that would otherwise invest in dual fuel to avoid a 'catastrophic losses' scenario to not invest because the stop loss addresses this concern.

Potential adjustments to PfP

In "Chapter 3," the ISO and stakeholders will be discussing the PPR and stop-loss provisions to determine if adjustments could address fuel security concerns.

[STATE QUESTION 5] Given that auctions have already occurred and participants have made plans based on certain rules and auction results, is ISO-NE precluded from making any rule changes for Capacity Commitment Periods associated with auctions that have already occurred? For example, if ISO-NE views the existing PfP penalties as too low, would ISO-NE consider changing those penalties for the 10th through 12th Capacity Commitment Periods, if not precluded from doing so?

[ISO RESPONSE TO QUESTION 5] The ISO is not precluded from applying market rule changes to FCM commitment periods for which the auction has already run. Most recently, ISO-NE applied changes in this manner in raising the Reserve Constraint Penalty Factors and in making modifications to the method for calculating the Peak Energy Rent mechanism. In PJM, FERC accepted changes to non-performance penalties in the PJM capacity market, applying it to periods for which the auction had already run. In these instances, FERC has sometimes applied a “balancing of equities” or “balancing of interests” standard to weigh the interests and expectations of participants in the market against the need for the proposed change. The ISO would therefore consider such factors in evaluating the need for a proposed change and its application to FCM commitment periods for which the auction has already run.

[STATE QUESTION 6] Please provide a description of any benefits ISO-NE has observed that may be related to the implementation of PfP.

[ISO RESPONSE TO QUESTION 6] As PfP is phased in over the next several years, the experience and data during periods of stressed conditions will determine how well it achieves its objectives. There have been some early observed improvements; namely the response rate of the fast-start fleet has improved steadily. Also, the ISO has been told that several of the large power plants in the region have accelerated major maintenance in order to be ready to meet their obligations. The ISO discontinued its Winter Reliability Program beginning 2018/19, largely to understand the market response to PfP and preserve its incentive structure. The ISO will share its findings from this winter with its stakeholders.

[STATE QUESTION 7] Given the region has seen about 3 GW of new generation since FCA 9 (which included PfP), is the issue ISO-NE identifies with PfP that it has not brought in enough resources or that it has not brought forward the type of resources ISO-NE wishes to secure for reliability purposes?

[ISO RESPONSE TO QUESTION 7] The ISO’s concern is not with the total quantity of new capacity (or the total quantity of installed capacity in the region), but rather with the ability of the region’s capacity to produce sufficient energy to meet load during a sustained period of cold during the winter. During sustained cold winter spells, the constraint under current conditions is not the quantity of installed capacity, but rather the performance of certain types of capacity resources (e.g. fossil fuel resources that may not be able to procure fuel). For example, approximately 800 MW of new entry is not dual fuel, approximately 750 MW of new entry has a two-day dual fuel tank, and roughly 500 MW is two years behind schedule. This concern places heightened focus on the mix of capacity supply expected in the future, especially with the anticipated retirements of non-gas resources.

[STATE QUESTION 8] OFSA Assumptions Regarding Renewables and Sponsored Policy Resources

What would be necessary for ISO-NE to assume: (a) RPS attainment and/or 1,200 MW of additional offshore wind, and (b) 1,000 MW of additional imports in its OFSA/tool for assessing fuel security risk?

[ISO RESPONSE TO QUESTION 8] In the reference case of the OFSA, the ISO included existing renewables and projections from the EE and DG forecasts. The OFSA also included several scenarios that raised the level of renewables by including approximately 1,400 MW of offshore wind and 1,000 MW of imports to reflect state goals. One scenario increased the amounts even further to 2,000 MW of offshore wind and 5,330 MW of solar by 2024. The scenarios were intended to show the range of outcomes under the various resource mixes.

Going forward, the ISO has indicated that when applying the OFSA model to fuel security reviews for resources seeking to retire in FCAs 14 or 15, it will include scenarios that increase the range of imports to account for a new transmission line from Canada or New York and, further, will account for additional resources that have enforceable contracts under a state procurement and will be in-service by the study timeframe.

[STATE QUESTIONS 9-10] The Nature of Fuel Security Needs

ISO-NE conducted the Operational Fuel Security Analysis without regard to natural gas infrastructure and/or transmission system constraints (in other words, on a regional rather than zonal basis), and has otherwise concluded that fuel security risks are regional in nature.

9. What analysis if any has ISO-NE conducted to examine local fuel security issues?
10. What information leads ISO-NE to conclude that all fuel security risks are inherently regional in nature?

[ISO RESPONSE TO QUESTIONS 9-10] During the winter, the northeast interstate natural gas pipelines are constrained in their capability to transport gas from the west into New England. The liquefied natural gas (LNG) facilities all inject gas at the eastern portion of the pipeline infrastructure. These injections counter the pipeline constraints, so that the pipelines can accept the levels of LNG injections studied in the OFSA. Even if certain units that experience lateral pipeline constraints cannot arrange for gas, other generators that are connected to either the main pipelines or other laterals are able to use the LNG injections that are assumed in the OFSA. Therefore, it is reasonable to assume the gas usage is not locationally constrained.

It is also reasonable to assume no transmission constraints within the OFSA. The New England Transmission System is planned, designed and constructed to satisfy peak summer conditions. The winter load is approximately 75% of the summer peak. Also, during the winter, the transmission equipment typically can be loaded to higher thermal ratings and the system exhibits better voltage performance.

Based on the above reasons, the ISO believes that fuel security is a regional and not a locational problem.

[STATE QUESTIONS 11-12] Impact of Potential Cost of Service Agreements on Competitive Market

Solving for regional fuel security via cost of service agreements for resources that may retire could have an impact on the wholesale competitive markets.

11. If cost of service agreements may become available to retiring resources to address regional fuel security, how will ISO-NE ensure that such agreements do not erode incentives for wholesale market competition?

[ISO RESPONSE TO QUESTION 11] Based on feedback from stakeholders, the ISO has decided to expressly limit the use of the fuel-security reliability review to a two-year period (FCAs 14 and 15), with an expectation that the market-based solution developed in chapter 3 will replace these reliability review provisions. This limited applicability, along with the requirement of a binding retirement request to trigger the fuel-security reliability review, should help narrow the use of cost-of-service agreements.

The ISO will be discussing potential solutions to addressing the price suppressive effects of cost-of-service agreements over the summer.

12. Can ISO-NE envision a situation in which a resource that gets a cost of service agreement could be brought back into the market, or would it be forced to retire? Under what circumstance(s) does ISO-NE believe such a return to market status would be appropriate? What specific market rules, if any, would require modification to implement such a return?

[ISO RESPONSE TO QUESTION 12] The ISO has emphasized that any resource, including Mystic 8 & 9, that agrees to be retained under a cost-of-service agreement must be prepared to retire permanently. We believe that it is important to keep the “barrier to entry” for cost-of-service agreements relatively high. That said, the “Chapter 3” stakeholder process may include discussions of market re-entry for retained units.

[STATE QUESTIONS 13-14] Short-Term Solution Cost Allocation

13. If ISO-NE enters into cost of service agreements with retiring resources retained for fuel security reasons, how does ISO-NE plan to allocate their costs across the region? Please explain the rationale for ISO-NE’s preferred approach.

[ISO RESPONSE TO QUESTION 13] In New England, costs are allocated either to Regional Network Load (through the transmission owners’ rates) or to suppliers of load. In its order on the ISO’s waiver request, FERC stated that a cost allocation mechanism must be included as part of any solution to address retention for fuel security.

The ISO has already commenced stakeholder discussions of cost allocation in connection with “Chapter 2,” and will accelerate those discussions in order to meet the filing deadline required in the recent FERC order.

14. What information will ISO-NE provide to states and market participants regarding the potential cost impacts by load zone of such cost of service agreements?

[ISO RESPONSE TO QUESTION 14] The ISO will not be able to provide precise cost numbers by load zone because these numbers will be heavily dependent on 1) the final terms of any COS agreements that are approved by the Commission; 2) the resources' actual performance and costs during the COS period; and 3) the realized load values. However, the ISO can provide the allocator itself on a load zone basis and may be able to provide indicative estimates before these charges are allocated.

[STATE QUESTIONS 15-21] Market-Based Fuel Security Solution

As ISO-NE commences regional discussion of a market-based solution(s) to address fuel security risks, the states are interested in better understanding resource eligibility for such a solution(s). See, the External Market Monitor's (EMM) comments in the tariff waiver proceeding at Sections IV.B and C, specifically pages 9-12. The EMM noted, for example, the wide variation in the manner and effectiveness with which certain types of resources mitigate fuel security risk and the importance of accounting for these differences when defining the market product and obligations.

15. What are the performance characteristics and/or performance obligations that ISO-NE believes resources must have in order to alleviate fuel security risk to reliable operation of the grid during winter periods?

16. What is the duration of performance needed from such resources? Can this performance duration be subdivided by peak and off-peak periods? (e.g., 24/7 over ninety days seasonal period; ten-day cold snap; peak hours during a cold snap, etc.)

17. Must dispatchability be a qualifying factor for eligibility in the market-based solution?

18. In what year (winter) will such resources be needed to avoid otherwise expected fuel security risk?

19. What is the quantity of such resources that will be needed in that year? While a specific amount of additional fuel secure resources may be subject to a number of variables, has ISO-NE assessed the minimum amount of resources that may be required to meet fuel security concerns? Is there a potential range of additional resources that ISO-New England identified? Is there an equivalent amount of natural gas storage or resources that would similarly address the perceived fuel security concerns?

20. Are there other non-fossil fuel resources that, in aggregate (and/or with some discount factor applied) could substitute for or reduce the quantity of resources needed to alleviate fuel security risk (e.g., energy efficiency)?

21. What is the minimum amount of time in advance of the year (winter) when such resources will be needed that ISO-NE can identify the needed quantity? Said differently, would ISO-NE be able to identify the quantity need closer to the actual winter period or would it have to align with the FCM auction calendar three years ahead of time?

[ISO RESPONSES TO QUESTIONS 15-21] The ISO will provide responses to these questions as part of its efforts to develop a market based approach to solve for fuel security. The ISO expects those discussions to begin late summer and continue through early 2019.