

March 14, 2019

TO: Jeff Bentz, NESCOE

FROM: James F. Wilson, Wilson Energy Economics

SUBJECT: Questions re: the ISO's Winter Energy Security Problem Definition and Proposals

Per your request, this memo provides my initial thoughts, questions, and possible areas of clarification regarding the ISO's updated Winter Energy Security problem statement and proposals presented to the Markets Committee on March 6, 2019. You asked me to comment at a high level regarding the identified problems and to identify areas of clarification that might be useful to the ISO, and in turn to NESCOE, as the ISO continues to develop their proposals and discussion paper and as NESCOE continues to assess that work. I focused on the ISO's March 6, 2019 presentation, however, as you are aware I have also reviewed the ISO's prior presentations (September 2018 through January 2019), along with the presentations of other stakeholders (Calpine, NextEra, Massachusetts AGO, a few others). This memo represents my current thoughts and questions with regard to the winter energy security problem and the ISO's proposals.

First I discuss the ISO's current problem statement, and suggest some questions and clarifications in that regard. Then I identify initial concerns and questions about the ISO's new proposals, intended to highlight areas where clarification will be helpful to NESCOE to better understand the proposals and the potential impacts and benefits to New England consumers.

Please note that this memo may emphasize inquiries rooted in ISO's current problem statement, more than the details of the specific, evolving proposals. This is because a clear identification of the problem guides the design of the solutions, and the ISO is still developing its proposal based on its own continuing analysis and in response to feedback. I believe it is therefore too early to drill down with questions about specific product details at this juncture beyond how the requirements would be set. Also, I think it is worthwhile at this stage of program development to make sure that consumers are getting the full value from *existing* mechanisms so that the requirements and details of any *new* proposal can be set properly. At this point I haven't evaluated and don't have an opinion on the ISO's proposals, and the questions set forth below should not be interpreted as suggesting a view.

I. The ISO's Updated Problem Statement

The ISO's Problem Statement as elaborated in the March 6 presentation brings a new focus to incentive and efficiency issues, and is, in my view, very constructive. The ISO now identifies three problems, recognizing that the three are interrelated (pp. 6-7):

1. Incentives – inefficiently low incentives to make advance fuel/energy supply arrangements.
2. Operational uncertainty – there may be insufficient energy in the event of an unexpected, extended supply loss.
3. Inefficient schedules – energy inventories may be prematurely depleted absent a mechanism to coordinate dispatch of energy-limited resources.

A. Goal: Market Efficiency or an Even Greater Energy Security Cushion?

The ISO's presentation suggests that these problems lead to market inefficiency (that is, the actions are not profit-maximizing, and result in outcomes that are higher cost to consumers). For example, ISO's "bottom line" (p. 9) states that under the current market design, arrangements that would be beneficial and cost-effective for the system may not be in a generator's commercial interest.

However, I note a concern that at the end of the day, the ISO's proposals may call for a higher level of energy security than even a totally efficient market will provide. This could be a key issue going forward. If the proposals are directed only at achieving maximum efficiency, market participants and consumer representatives should find it hard to object to the identified market design changes. But if instead the proposals are designed to achieve a higher level of energy security than an efficient market would provide, this would likely be more controversial, as it would increase the expected cost to consumers, and it would also impact some resource owners' asset values. In particular, market participants with existing assets that are well-positioned to contribute to energy security may anticipate negative impacts to their asset values as a result of market design elements that attempt to attract to the market additional assets and arrangements that provide energy security.

The ISO should clarify whether the goal of its proposals will be only to achieve maximum efficiency, or whether instead the ISO seeks to achieve a greater level of energy security than an efficient market would provide.

Question 1: Energy Security Goal and Reliability Criterion? Does the ISO seek only the energy security that an efficient market would provide, or instead a greater level of energy security than an efficient market would provide? If a greater level, how will this be defined; will a reliability criterion be applied, and if so, how will this be defined? (I note that this issue has been raised earlier, in particular in a December 2018 memo from the Massachusetts AGO).

Question 2: Energy Security Evaluation Methodology? To the extent the proposals will seek to accomplish a greater level of energy security than an efficient market would provide, what methodology will be used to evaluate energy security and to determine the required quantities of new and existing products to achieve the selected level of energy security (analogous to the technical methods for determining the Net Installed Capacity Requirement to satisfy a "one day in ten years" capacity requirement)?

B. Shortcomings in Existing Market Mechanisms?

However Questions 1 and 2 are answered, it is valuable to identify, understand, and attempt to address any inefficiencies in the current markets. By "markets" in this context, I refer not only to the various markets administered by the ISO (energy, ancillary services, and various forward reserve and capacity markets), but also the closely related financial and physical markets for energy and fuel inputs. While the ISO and its stakeholders obviously have greater ability to fix any shortcomings in the ISO's markets than in the other, related markets, in some instances there may be ways to encourage valuable changes in the other markets. In any case, the need for additional market design elements depends on the extent of the issues and shortcomings in these other markets. Getting the prices right in the real-time, day-ahead, and other existing markets lessens the cost of additional products to address remaining issues.

Two key market mechanisms, discussed throughout the stakeholder process and mentioned in the ISO's presentation, are:

1. The existing daily forward markets for peak and off-peak energy and natural gas;¹ and
2. Rules that allow market participants to offer into the energy markets based on their opportunity costs, including opportunity costs resulting from limitations on a resource's fuel supply.

The ISO's problem statement suggests there are inefficiently low incentives to make advance fuel/energy supply arrangements, as quoted above. The ISO's presentation also suggests (p. 8) that market participants only make arrangements for their *expected* energy output, and may be unwilling to incur costs associated with advance arrangements for fuel that may not be needed. However, at least some market participants, such as marketers and financial players, are likely to be profit-maximizing and close to risk-neutral, and may well be willing to take risks that are profitable in expectation, even if the likelihood of profiting is low. While forgoing use of fuel in the near term may entail a lost opportunity, that same fuel may be extremely valuable in future days if a large resource is lost and prices spike.

Furthermore, some market participants may have the opposite incentive – inefficient incentives to hoard energy or fuel. This could be the case if they believe they may face asymmetric regulatory consequences of running short of fuel (some local gas distribution companies might have this concern, under some circumstances), or if they have other assets in the market that benefit from the higher near-term prices that result from hoarding fuel (market power).

Question 3: Inefficiently Low Incentives? The ISO should further elaborate and explain its view that, overall, there are inefficiently low incentives to make advance fuel arrangements and to conserve fuel. For this and the following questions, it is likely necessary to discuss the incentives in different forward time frames, including day-ahead, multi-day, months ahead, and years ahead.

The ISO's problem statement also suggests (p. 18) that forward markets do not “have access to system-level supply information” and do not “have the ability or means to price the value of *preserving* energy for future days.” [emphasis in original] However, as a general matter, markets reflect, through prices, private information about market participants' costs, production, and other circumstances that is not available to other parties (including the ISO) in any other manner. A market participant's purchases and sales in spot and forward markets, based on their private circumstances and judgements, impact prices to some extent; and in the aggregate, prices should therefore reflect the overall market circumstances, including such key issues as the amount of fuel conserved for future days, whether market participants generally consider it to be enough or not, and views on the likelihood of scarcity and a price spike. The daily forward energy and natural gas prices signal to all market participants the aggregate view on the scarcity or lack of scarcity of energy and fuel over the coming days, and provide a mechanism for market participants to take positions in that regard; which positions may be hedging for some, and speculating for other market participants.

¹ Specifically, the following daily futures are traded on the ICE exchange: ISO New England Massachusetts Hub Day-Ahead Peak Daily Fixed Price Future (“EDP”), ISO New England Massachusetts Hub Day-Ahead Off-Peak Daily Fixed Price Future (“POP”), ISO New England Massachusetts Hub Real Time Peak Daily Fixed Price Future (“NMD”), Algonquin Citygates Swing natural gas (“ALS”).

Question 4: Information Available to the ISO, to the Market? The ISO should discuss in more detail what information the ISO has that is not available to the market, and whether the ISO could provide more relevant information more frequently (for example, by expanding the information included in the 21-Day Energy Assessment Forecast and Report prepared according to Operating Procedure No. 21, and perhaps issuing such reports much more frequently during the winter period). The ISO should also explain what information it believes is and isn't reflected in forward market prices, in principle and in practice. The ISO should further explain its view that forward markets do not reflect information about the market's view of energy scarcity, or lack of scarcity, at any time, and do not reflect the value of conserving fuel for future days.

The ISO's problem statement also suggests (p. 18) that forward markets do not have the ability to "coordinate suppliers' production over multiple days in an efficient way", and may result in "inefficient schedules" that do not preserve enough energy for future days. Additional clarity and information on these statements would be beneficial.

Question 5: Market Participants' Ability to Manage Fuel Efficiently? The ISO should further explain its view that market participants' rights to offer energy based on opportunity costs, and access to daily forward markets, do not provide an effective market mechanism for them to manage their limited energy profitably over time. In this context, the ISO should discuss the impacts of the recent changes to the rules for including opportunity costs in energy offers, and whether further reforms to these rules are needed. To the extent market participants have appropriate incentives to manage fuel (setting aside the separate question of whether incentives are appropriate), can they manage fuel efficiently and profitably through opportunity cost bidding and forward markets, and to the extent not, why not?

Question 6: Efficient System-Level Management of Limited Energy? Setting aside incentive issues, and to the extent market participants can use opportunity cost bidding and forward markets to effectively manage their limited energy, what other problems exist that prevent efficient schedules and efficient system-level management of limited energy over time?

II. The ISO's Winter Energy Security Proposals as of March 6, 2019

A. M-DAM and EIRC

The ISO has reconsidered its EIRC proposal, and states that it is also reconsidering the look-ahead for its M-DAM proposal, which will likely be less than the originally-proposed 6 days. ISO did not provide additional discussion of M-DAM.

B. Proposed New Ancillary Services

The ISO proposes three new or modified ancillary services. The key characteristic of the ISO's proposals is that they address MWh, not just MW. This added dimension introduces a lot of complexity, as discussed at the meeting. I am not aware of another market where similar mechanisms (to acquire ancillary service products with a multi-period MWh characteristic to them) are in place.

Question 7: Precedents for Such Energy-Related Ancillary Services? The ISO should provide basic education on similar energy-related ancillary services elsewhere in the U.S. or internationally; where such services have been discussed, where implemented, details of the products, experience to date.

A key issue is how the purchase quantities would be determined for these new ancillary services. Presumably the quantities would vary over time and under different system conditions, and would be based on analysis.

Question 8: Target Requirements for New Ancillary Services? The ISO should further elaborate as to how the target requirements would be determined for the proposed new ancillary services. In particular, if a modeling approach is under consideration, the ISO should identify the structure, inputs, outputs, etc. of such a model as soon as possible to give stakeholders sufficient time to review, understand and make suggestions. This question is of course related to Questions 1 and 2 above.

The new market design elements are intended to (among other things) lead some market participants to conserve more fuel or energy than they otherwise would have. While many market participants may have sufficient incentives to conserve energy efficiently under the current regime, other, more costly or marginal conservation efforts would benefit from the additional incentives provided by new products.

Question 9: How Will the Proposed Ancillary Services Lead to Increased Energy Security? The ISO should provide specific examples illustrating how its proposals will lead some market participants to manage energy more efficiently than under the current regime.

Question 10: Will the Proposed Ancillary Provide Adequate Energy Security? The ISO should also explain how its proposals would provide adequate energy security, or whether it believes that will remain unclear and additional market design elements may also be needed.

Many questions were raised in the March 6, 2019 meeting about how the proposed new ancillary services would be defined, acquired, co-optimized, activated, and settled in practice. In light of the fact that other market participants will likely submit many detailed questions in this regard, I do not go into great detail on these issues here.

Question 11: How Will the Proposed Ancillary Services Align with the M-DAM? Which of the products will have the same multi-day time horizon as the M-DAM; what are the trade-offs in imposing such alignment.

Question 12: Product Definitions for the New Ancillary Services? Details regarding the obligations, penalties, and offer structure, and the rules for how the energy is called and settled, etc. need to be further explained.

Question 13: How Will the Proposed Ancillary Services be Acquired and Co-Optimized? Will there be a strict value relationship between the ancillary services; which will be treated as substitutes; will a sloped demand curve concept be used in the acquisition of the ancillary services?

Question 14: Role of/Relationship to the Forward Reserve Market? Will the Forward Reserve Market be modified or eliminated; what will the relationship be, if any, between the FRM and the new ancillary services products.