ATLANTIC
ECONOMICS

MEMORANDUM

DATE: January 19, 2021

TO: Mike DeSocio and Nicole Bouchez

FROM: Mike Cadwalader

RE: Prioritizing Grid in Transition Recommendations

Last month, the ISO presented its proposal for prioritizing recommendations made in the Grid in Transition report[1] (as well as some other reports, such as the Climate Change Phase II report). It categorized those proposed changes as:

- Short-term or underway, consisting of projects that "should be considered over the next 3+ years."[2]
- Medium-term, consisting of projects that "should be considered beyond 3+ years or after all Short-Term items have been considered."[3]
- Long-term, consisting of projects that "are not pressing and should be considered after Short-Term and Medium-term items have been considered."[4]

The ISO sought comment on this proposed prioritization. Specifically, the ISO indicated that it most urgently needs comment on (1) recommendations that it identified as short-

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[1] Reliability and Market Considerations for a Grid in Transition (Dec. 20, 2019) at 70, available at: https://www.nyiso.com/documents/20142/2224547/Reliability-and-Market-Considerations-for-a-Grid-in-Transition-20191220%20Final.pdf/61a69b2e-0ca3-f18c-cc39-88a793469d50.

[2] Nicole Bouchez, Proposed Approach for Considering Grid in Transition Recommendations (Dec. 7, 2020) at 20, available at: https://www.nyiso.com/documents/20142/17450815/20201201%20NYISO%20-%20Approach%20for%20Considering%20Grid%20in%20Transition%20Recommendations%20FOR%20POSTING.pdf/72e26e3e-448f-36e3-7a7f-7d5f3920fa65.

[3] *Id.*

[4] *Id.*

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term projects that should not be short-term projects, and (2) recommendations that it did not identify as short-term projects that should have been short-term projects, to inform the ISO's resource allocation decisions for 2021.

In the interest of responding to the ISO's inquiry as quickly as possible, the Transmission Owners' ("TOs")[5] comments are limited to these two questions. Accordingly:

- The first section of this memo describes an additional short-term project proposed by the TOs, which would focus on assessing the flexibility needed to balance increasing intermittency on the system and ancillary services that would provide the needed flexibility.
- The second section of this memo lists recommendations that the ISO identified as short-term projects in cases where the TOs would like to suggest modifications, or require further information.[6]
- The third section of this memo lists three recommendations from the Grid in Transition report's Reliability Gap Analysis (i.e., Appendix B of that report) that the TOs believe should be classified as short-term projects.

The TOs plan to return later with additional comments that will address the other aspects of the ISO's proposed prioritization that was described in the December 7, 2020 presentation.

I. BALANCING INTERMITTENCY (SHORT-TERM PROJECT)

The Grid in Transition report recognizes the need to identify the attributes necessary to meet increasing intermittency on the system. The TOs believe it is important for the ISO to analyze the attributes that will be needed to provide the amount of system flexibility that will be needed at different levels of system intermittency. This would include the amounts of existing Ancillary Services which would be required at each such level of intermittency. Additionally, since the suite of existing Ancillary Services may not be the most effective tools for managing intermittency, it would include other solutions that may be more efficient, including procuring ramping services (both up and down) and

[5] The NYTOs are: Central Hudson Gas & Electric Corporation, Consolidated Edison Company of New York, Inc., New York Power Authority, New York State Electric & Gas Corporation, Niagara Mohawk Power Corp. (d/b/a National Grid), Orange and Rockland Utilities, Inc., Long Island Power Authority, and Rochester Gas and Electric Corporation.

[6] While the ISO proposed a large number of short-term projects in its December 7, 2020 presentation, the TOs only comment on a few of those recommendations here. The TOs concur with the ISO's recommendations regarding the other projects that it should undertake in the short term.

committing and/or scheduling resources after the close of the DAM, but before the current RTC window, as wind and sun forecasts four or five hours in advance will be much more accurate than day-ahead forecasts, so more efficient solution sets will be available.

Several of the short-term projects identified in the ISO's December 7, 2020 presentation are dependent on and limited to existing Ancillary Services without recognizing alternative products may be more effective in terms of both operations and cost.

This project can be broken into two phases. The first phase would consist of identifying the system attributes and flexibility necessary to maintain reliability on a system with identified levels of intermittent resources in various locations and should consider locational balancing requirements. This analysis will be important in guiding additional projects and potential solutions. This analysis may build on work the ISO has undertaken with Brattle and The Analysis Group.

The second phase, which can be scheduled following the first, would determine optimal products for solving intermittency and market rules to facilitate efficient solutions. This phase of the project should recognize that it may be necessary to develop the needed market rule changes soon, even if the demand for these products is several years away, because lead time may be required in order to retain existing needed resources, to incentivize upgrades to existing resources or to attract investment in new resources. For this reason, the TOs do not believe Phase I can be put off and Phase II should proceed promptly thereafter.

The California ISO has had significant operational challenges in balancing intermittency, and approximately 33% of its energy is renewable. As New York moves to 70% renewable energy over the next nine years, we need to make sure we meet the challenges. NYSERDA has signed contracts for and is soliciting up to 4,300 MW of off-shore wind. Other renewable procurements will be accelerating. We cannot afford to look at this as a medium-term project. Accordingly, the NYTOs would like to add as a short-term project the following:

- In the first phase:
    - Identify the level of system flexibility which will be required at specified levels of intermittency at identified locations; and
    - Develop and conduct analysis to identify needed or valuable performance attributes that would permit the ISO to balance the system more optimally as intermittent renewable resource levels grow at an unprecedented pace.

- In the second phase, after the first two sub-projects are completed:
    - Develop requirements for resources to be eligible to provide such attributes;
    - Develop market rules and price signals to provide efficient incentives for the investment in and retention of resources capable of providing these attributes;
    - Start implementing needed changes to the energy and ancillary service markets in a timely manner; and
    - Provide for the phase-in of such requirements and pricing to coincide with system needs, so that consumers are paying for what is needed.

II. RECOMMENDATIONS THAT THE ISO IDENTIFIED AS SHORT-TERM PROJECTS

Consider tracking Energy Limited Resources' available energy over the operating day (page 27)[7]

While the TOs agree that this should be a short-term project, the TOs believe that it should be expanded to include Energy Storage Resources ("ESRs"), and potentially some Special Case Resources, in addition to Energy Limited Resources. Large amounts of ESRs are expected to come online in the near future to meet the state's objectives with respect to climate change, and if significant numbers of those ESRs start to provide operating reserves, it will become necessary to consider how long these resources are able to provide energy once activated.

Need for cataloging/tracking energy/run-limited resources such as ESRs, demand response, emissions restricted output, noise restricted output, etc. (page 31)

It is not clear to the TOs what the purpose of this project is, so we request clarification before the ISO decides to classify this as a short-term project.

Consider increasing the energy offer floor for internal resources (SOM-2019-2) (page 31)

Under this recommendation from the State of the Market (SOM) report, the minimum offer would increase from –$1000/MWh to –$150/MWh. This would only matter in the rare cases when all suppliers are attempting to act as price takers; if those circumstances start to occur more often, one would expect entities that are attempting

[7] All page references are to the ISO's December 7, 2020 presentation.

to act as price takers to change their bidding behavior. Therefore, the benefits from this project appear to be very limited, so it should be classified as short-term only if it can be accomplished with minimal effort. Otherwise, it should be deferred.

Increasing locational 30-minute operating reserve requirements (page 32)

We do not understand the basis for this recommendation, or why it focuses upon locational 30-minute reserve requirements in particular. In the third section of this memo, we propose that the ISO consider revising its procedures for establishing operating reserve requirements in general. Therefore, if that project is included in the list of short-term projects, this project may no longer be necessary. If the ISO believes this should remain a short-term project, the TOs request additional explanation of what the ISO is proposing and the rationale for it.

Monitor and manage sustainability of resources providing 10-minute and 30-minute reserves (page 32)

While this is an issue that deserves the ISO's attention, the TOs are concerned that this project is too ambitious to be a short-term project, because the software modifications that would be needed in order for the ISO to incorporate these constraints into these markets will likely be significant. Therefore, we recommend modifying this project so that it would focus on **evaluating** and **monitoring** this issue, which can be achieved in the short term, rather than **managing** it. Moreover, this project should be influenced by the results of Project I (Balancing Intermittency).

Revisit regulation pricing (page 33)

The regulation market is inefficient, because it relies on a simplifying, but incorrect, assumption that the ratio of regulation movement to regulation capacity will be the same for all regulation providers. Software changes that would permit the ISO to eliminate that assumption should permit the market to identify regulation providers more efficiently, but it is not clear how much that would save, given the relatively small dollar volume of the regulation market. Therefore, while revisiting regulation pricing is a reasonable short-term project, it should include assessment of the potential benefits from market improvements. (We also asked the MMU to try to estimate the benefits that would result from improvements to the regulation market that it proposed in its review of the operation of the NYISO's market during the third quarter of 2020.[8])

[8] Pallas LeeVanSchaick, Quarterly Report on the New York ISO Electricity Markets: Third Quarter of 2020 (Nov. 2020) at 10, available at: https://www.nyiso.com/documents/20142/17450815/NYISO%20Quarterly%20Report_2020Q3__12-01-2020.pdf/5bf1be12-3ab6-70b2-f7ed-69be8bec5189.

Investigate how to include transmission congestion when awarding regulation capacity (page 33)

The TOs do not understand what this project intends to do. Accordingly, we request additional clarification before the ISO decides to make this a short-term project.

Consider shortening the real-time market close process from 75 minutes before the top of the operating hour (or in the alternative, consider allowing updating certain offer data closer to the binding RTC/RTD evaluation window) (page 35)

While delaying the time when real-time bids must be submitted should be beneficial, we believe that it is likely that the ISO will need to develop and implement broader changes to the structure of RTC/RTD to accommodate increased penetration of intermittent resources and ESRs. Given that, this project should focus on benefits that can be realized fairly easily, as it would not make sense to make larger investments in RTC/RTD when they are likely to be overhauled imminently. Additionally, this project should be influenced by Project I (Balancing Intermittency).

III. ADDITIONAL RECOMMENDATIONS FROM THE RELIABILITY GAP ANALYSIS THAT THE ISO SHOULD IDENTIFY AS SHORT-TERM PROJECTS

Additionally, the TOs propose adding the following proposals, which were identified in the Reliability Gap Analysis, to the short-term projects identified in the December 7, 2020 presentation.

Consider revising procedures for calculating operating reserve requirements as the current approach for establishing those requirements becomes obsolete

In order to maintain resource adequacy at desired levels, the Reliability Gap Analysis indicates that traditional contingency-based approach to defining operating reserve requirements will need to be revised to reflect the potential for correlated reductions in output by multiple intermittent generators.[9] These requirements would vary from hour to hour in the DAM and will need to be updated in real time to reflect current conditions. Locational requirements may also need to be revised for similar reasons, both in the DAM and the real-time market. This project should be influenced by the results of Project I (Balancing Intermittency). We should not assume that 10- and 30-minute operating reserves will be the optimal solution to intermittency, or that requirements for providers of those products will remain as they are currently defined.[10]

[9] Reliability Gap Analysis at 88.

[10] For example, in the long run, the ISO will need to consider the requirement that all operating providers must be able to provide energy for one hour.

While the TOs do not believe that these revised procedures need to be implemented in the short term, the TOs believe that the ISO should begin the process of identifying the needed revisions to these procedures in the short term. That should include consideration of whether resources creating the need for increased operating reserve requirements should be assessed the costs associated with those increased requirements. It should also consider procedures for forecasting future levels of these requirements, for consideration by prospective generation developers.

Consider accounting for flexibility when setting capacity requirements and calculating market-clearing prices for capacity

The ability of the resource mix to meet ramping requirements will depend on how flexible those resources are. For example, the Reliability Gap Analysis indicates that there may be a tradeoff between installed capacity and ramping capability with respect to meeting reliability targets, and as a result, it suggests that "the NYISO's process for setting the LCR and IRM may need to take account of these ramp capability needs."[11] If increased ramping capability would permit reductions in the IRM or LCR, it would be efficient to reflect such a tradeoff in the capacity market, which would separately price ramping capability to reflect its marginal value toward meeting capacity requirements.[12]

The TOs recognize that the software currently used to determine the IRM and LCRs does not have the capability to recognize ramping requirements, so it cannot currently make this trade-off. It would take some time to make the necessary software modifications that would be necessary to evaluate this trade-off, should the ISO and stakeholders conclude that it is necessary to do so. For that reason, this should be a short-term project, so that the ISO can assess the need for such modifications. This project will be influenced by the results of Project I (Balancing Intermittency).

Consider expanding eligibility for spinning reserve providers

Under one of the short-term projects proposed by the ISO, it would consider if improving the modeling of the slow-ramping/duct-burning region of combined cycle units would better reflect the amount of operating reserve those resources can provide. In a similar vein, the Reliability Gap Analysis proposes that the ISO explore permitting thermal resources that are not generating energy, combinations of batteries and quick-starting

[11] *Id.* at 108.

[12] While the specific example here focuses on ramping capability, flexibility is a broader concept that includes, but is not limited to, ramping capability. There may be other ways in which the value of flexibility should be considered when setting capacity requirements, and when determining market-clearing prices for different types of capacity.

thermal resources, and imports to provide spinning reserve, and the ISO should consider including these in its short-term plans.[13]

[13] *Id.* at 90.