

New England States Committee on Electricity

June 13, 2014

Don Gates, Planning Advisory Committee Chair
ISO-New England
67 Sullivan Road
Holyoke, MA 01040

Re: Inclusion of Solar PV Forecast in Transmission Planning Studies and Resource Adequacy Assessments

Dear Mr. Gates,

At the April 2, 2014 Distributed Generation Forecast Working Group (“DGFWG”) meeting ISO-NE presented information regarding the use of the Solar PV Forecast developed by the DGFWG in 2013-2014. ISO-NE indicated it intends to use the Solar PV Forecast in transmission planning studies, proposed plan application studies, and system impact studies.¹ In the same presentation, ISO-NE stated it would wait for guidance from FERC on outstanding market issues before determining the best methods to incorporate the forecast into the resource adequacy process. ISO-NE also stated that the use of the forecast in planning studies may be impacted by the resolution of voltage and frequency concerns and state-jurisdictional interconnection standards. Further discussion is scheduled to occur at the June 19 Planning Advisory Committee (PAC) meeting.

Through this letter, the New England states urge ISO-NE to use the Solar PV Forecast – in the nearest possible term – when determining needs for transmission planning studies and the value of the Installed Capacity Requirement (ICR).

The Solar PV Forecast represents substantial levels of electric ratepayer investment in clean energy resources developed consistent with state laws, Renewable Portfolio Standards, climate change and greenhouse gas emission requirements, and other important policies. The states note that these resources are already being discounted for capacity factors and other uncertainties. Additionally, solar PV represents less than one percent of system capacity resources at this time. Considering the level of embedded conservatism in current forecast assumptions, and the strong policy and economic commitments made by the various states, not accounting for these MWs in resource adequacy determinations will likely overstate the region’s need for power every year. When ISO-NE determines the ICR, the amount of MW to be procured in the Forward

¹ ISO-NE Update: Use of DG Forecast and Interconnection Issues, David Forrest. DGFWG 04/02/14.

Capacity Auction, each incremental MW increases consumer cost and depending on the MW increase, could increase the price paid to all other MW procured. If ISO-NE does not reduce ICR by the MW in the Solar PV Forecast, consumers could pay millions of dollars of additional – and perhaps unnecessary – costs. While these costs would be contingent on a variety of competitive risks, market perception, and economic variables, they could range from \$100 million to over \$1 billion dollars annually.

Process to Date

In September 2013, ISO-NE, at the request of stakeholders, began an effort to forecast the growth of solar PV in New England. The DGFWDG was established to develop a forecast methodology associated with a large number of small, distributed generators interconnecting to the New England electric power system. In a letter to ISO-NE dated September 27, 2013, the New England states requested that ISO-NE account for the MW values forecast for distributed generation in transmission system planning studies and resource adequacy assessments in order to achieve the full range of benefits associated with consumers' investments.

While working toward an interim Solar PV Forecast, ISO-NE began pointing to one issue in particular that would require further discussion: state-jurisdictional generator interconnections at the distribution level. ISO-NE identified concerns related to solar PV inverter settings for voltage and frequency, established by the interconnection standards that are primarily written in accord with IEEE 1547.² ISO-NE described concerns related to the potential for many MW of solar PV units to disconnect at once due to a fault on the transmission system.

Over the past six months, ISO-NE has taken several steps to better understand the potential transmission system impacts of increasing solar PV penetration and to communicate its concerns to stakeholders. ISO-NE indicated that it attended IEEE 1547 Standard Development meetings, which discussed inverter settings for interconnection of solar PV units at the national level. ISO-NE also met with members of the DG Forecast Technical Review Committee, which is focused on efforts to amend interconnection standards in California. ISO-NE presented its concerns to the Massachusetts Technical Standards Review Group (MTSRG), a collaborative effort of Massachusetts utilities, solar developers, state agencies, and others working together to facilitate efficient interconnection of solar PV units.³ In that meeting, the utilities agreed to document how their technical standards can and will address the issues raised by ISO-NE, rather than reforming the state's interconnection tariff through a DPU adjudicated proceeding. At the next TSRG meeting on September 17th, the discussion about under-voltage ride

² IEEE standards are set by the IEEE Standards Development Committee process and are not changed frequently or quickly. An amendment to IEEE 1547 standard (that guides interconnection of small generators to the distribution network) is underway to accommodate the enormous increase in solar PV unit interconnections occurring in California and in other states.

³ ISO-NE's presentation is available under Meeting #3 (April 16, 2014):

<https://sites.google.com/site/massdgic/home/interconnection/technical-standards-review-group>

through settings will continue and the group may begin discussing under-frequency ride through as well.

Accounting for Solar PV in Transmission Planning Studies and Setting ICR Value

While resolution of some concerns regarding high penetration of solar PV on electric systems is underway, ISO-NE should begin implementing the forecast that it has prepared in consultation with states and stakeholders. The purpose of developing the solar PV forecast was to determine what level of solar penetration New England is likely to experience in the next ten years. The forecast is based on policies with reliable funding sources in each New England state. The forecast is, importantly, discounted for uncertainty and seasonal claimed capability of solar PV. After these discounts, the region expects almost 500 MW of installed solar by 2018 and up to 632 MW by 2023. Given this detailed level of information, not accounting for these MW in system planning studies is more likely to provide an inaccurate picture of future system conditions than would excluding them altogether.

As the forecast makes clear, solar PV is growing significantly in New England due to its declining cost and electric consumers' investment in this resource to meet Renewable Portfolio Standards and greenhouse gas emission reduction requirements, among other state-level clean energy policies.

For comparison, the Energy Efficiency (EE) Forecast was created to account for the large increase in EE MW expected over time due to substantial spending on state-sponsored EE programs. Prior to implementation of the EE Forecast, ISO-NE did not carry forward any MW of passive demand resources beyond those participating in the FCM. Accordingly, until recently, transmission planning studies, and consumer investment in transmission projects, did not account for the expected increase in EE over time. The EE Forecast appropriately closed the gap between EE purchased in the FCM and the treatment of EE resources in transmission planning studies over the full ten-year period.

Like EE, it is important to consumers that ISO-NE account for the significant increase of distributed solar PV MW due to growth of state program funding for these resources in both transmission planning studies and in determining the ICR.

With respect to ICR, it is critically important for ISO-NE to discount the ICR by the number of solar PV MW because these MW are not expected to bid into the FCM and obtain a capacity supply obligation as EE MW have in the past. The data requirements around bidding into the FCM are economically infeasible for distributed solar resources. Energy efficiency resources are bid into the FCM because utility program administrators control almost all of the funding for and deployment of energy efficiency. Solar PV resources are in a different situation. Solar units are installed by multiple development companies that are not affiliated with the company that also monitors load and meter activity. There is no central program administrator of solar PV development; however, that does not mean solar PV's impact on system load is not meaningful in aggregate. Ignoring it is misleading and inaccurate.

Balancing Cost and Reliability

Electric system planning principles should balance reliability with cost to consumers. Disregarding the contribution of solar PV in system planning imposes high and unnecessary costs on electric consumers. For example:

1. Increased ICR results in over procurement

ISO-NE will procure additional MW of capacity in the FCM for which consumers will pay the capacity clearing price times the MW of unneeded capacity.

2. Capacity Clearing price increase

The capacity clearing price paid to *all* capacity suppliers will be higher, increasing total capacity costs to consumers. This effect will be more certain when a demand curve is implemented in New England.

Consumers will benefit from ISO-NE including solar PV MW in resource adequacy determinations and transmission planning studies in the nearest possible term. To date, the reliability concern ISO-NE has identified relative to planning and operations (potential loss of many solar units due to frequency and voltage ride-through inverter settings) has occurred in Germany where solar PV penetration levels are approaching 30 percent or higher.⁴ NESCOE shares ISO-NE's interest in reliable power system operations, however the current maximum forecast to date in New England represents just 1.7 percent of total system MWs by 2023.⁵ While the penetration in New England is *substantially* lower than the levels where reliability concerns emerge, and smaller than first and second contingency resources used in planning studies, including the current maximum amount forecast could save consumers millions of dollars.

To the extent ISO-NE has continued reservations about implementing the Solar PV Forecast, states and stakeholders would benefit from updated and detailed information about the magnitude of ISO-NE concerns. Further discussion can clarify how ISO-NE concerns can be satisfied. For example, the geographic spread of solar PV across New England may reduce the risk that any one transmission fault would affect a large volume of solar PV MWs.

State signatories to this letter believe the developments in CA (including a role for IEEE, UL certification, testing labs, and inverter manufacturers) will lead to a national industry standard mitigating these concerns well ahead of significant solar PV penetration in the ISO-NE system. While that process unfolds, ISO-NE should continue to work with New England distribution companies to determine settings for solar interconnections. ISO-NE would not serve New England consumers well by any other course, whether urging states to adopt a different standard in the short-term or otherwise halting progress on DG as described above.

⁴ Western Utilities Call for Smart Solar Inverters, Greentech Media 08/09/13.

<http://www.greentechmedia.com/articles/read/western-utilities-call-for-smart-solar-inverters>

⁵ Cumulative Total Discounted SSCC value is 632 MW in 2023 out of 35,800 MW Indicative ICR in 2023. Final Interim Solar PV Forecast, DGFVG 04/02/14.

Conclusion

ISO-NE should acknowledge solar PV MWs in the ground (or on the roof) in system planning studies and in its ICR determinations. Doing so will have considerable positive electric consumer economic impacts in the near-term without presenting system reliability challenges given this region's very modest penetration rates.

Sincerely,

Heather Hunt