Case No. 15-E-0302
-Via Electronic Filing-
January 22, 2024

Hon. Michelle L. Phillips
Secretary to the Commission
New York State Public Service Commission
Three Empire State Plaza
Albany, New York 12223-1350

Re: Proceeding on Motion of the Commission to Implement a Large-Scale Renewable Program and a Clean Energy Standard – Zero Emissions Target

Dear Secretary Phillips,

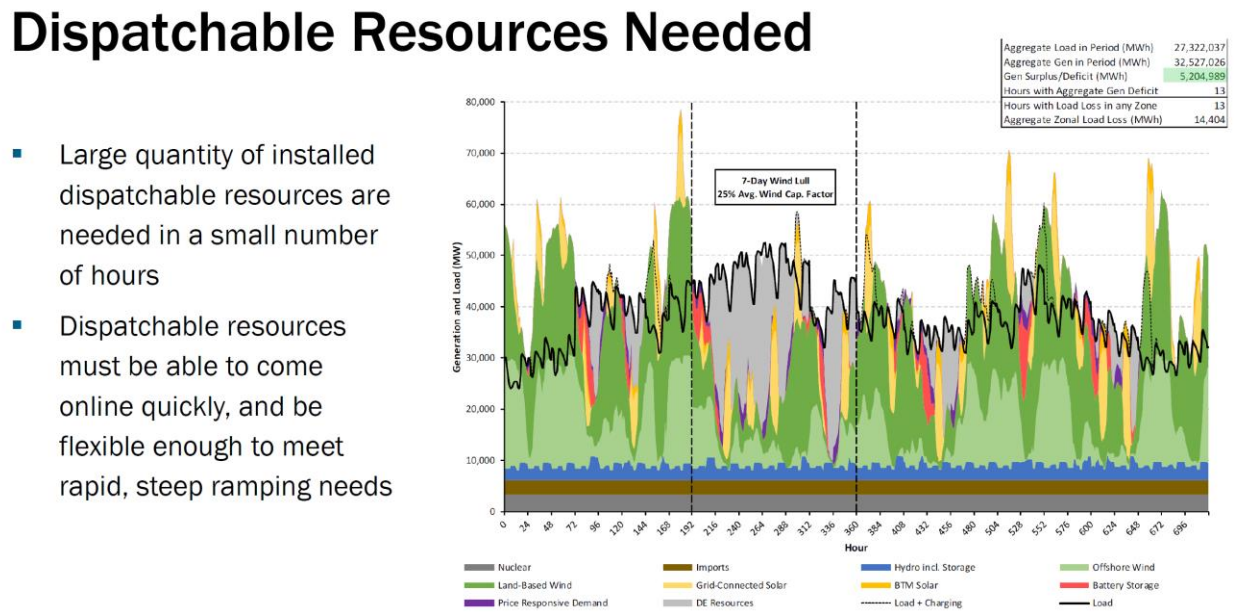
I am writing in response to the suggestion that "post-conference comments that respond to points made – or missed – by Zero Emissions by 2040 Technical Conference participants" would be welcome. I previously submitted comments recommending a study that the Commission should undertake with respect to the development and deployment of resources capable of achieving a zero emissions grid. The presentation by Zachary Smith of the New York Independent System Operator (NYISO) included a description of the attributes of Dispatchable Emissions-Free Resource (DEFR) that needs to be emphasized relative to my previous comments.

I have been following the Climate Leadership & Community Protection Act (Climate Act) since it was first proposed, submitted comments on the Climate Act implementation plan, and have written over 380 articles about New York's net-zero transition. I am a meteorologist with over 40 years-experience in the electric generating sector. I represent the Environmental Energy Alliance of New York on the New York State Reliability Council Extreme Weather Working Group (EWWG). The opinions expressed in this comment do not reflect the position of the Alliance, the Reliability Council, the Extreme Weather Working Group, or any of my previous employers or any other company I have been associated with, these comments are mine alone.

Ultimate Reliability Problem

Smith's presentation listed ten attributes for reliability that must be provided by DEFR. His second attribute is that DEFR must be "non-energy limited and capable of providing energy for multiple hours and days regardless of weather, storage, or fuel constraints". This is a particular concern of mine. Wind and solar resources correlate in time and space as shown by the NYISO analysis referenced in Smith's presentation (Figure 1). The seven-day wind lull example in the dispatchable resources needed figure illustrates the problem. If there are insufficient resources during a wind lull, then load cannot be met. The consequences of that situation would be catastrophic.

Figure 1: Dispatchable Resources Needed from Zero Emissions by 2040 Technical Conference Slide Presentation Dispatchable Emission-Free Resources (DEFRs) by Zachary Smith NYISO



The root concern for reliability in an electric system that depends on wind and solar is illustrated in Figure 1. It highlights a 7-day wind lull when the average wind capacity is 25%. The sum of the grey area under the curve during that period is the amount of energy (MWh) that must be provided by DEFR sources based on an analysis of historical weather data.

Since the time of the analysis that was used to prepare this figure, the NYISO has contracted DNV to develop a database based on historical meteorological data that projects onshore wind, offshore wind, and solar resource availability over 21 years which is a longer period than that used in this analysis. Although the results of a similar analysis using that data are not available, I am confident that a longer wind lull will be discovered that would require an even larger energy target that must be used to determine the amount of DEFR necessary. My previous comments recommended an analysis over as long a period as possible to determine the worst case.

Ramifications

The underlying nature of low wind and solar resource availability complicates reliability planning. The current loss of load expectation analysis uses a one in ten-year metric for generating resources based on observed characteristics of the existing components of the electric system. There is little expectation that component failures or availability reductions will happen at the same time across different resources in this assessment. On the other hand, that presumption is no longer true when wind and solar are incorporated in large quantities. The availability of all solar resources in New York goes to zero at night and is markedly reduced in the winter. Wind resources depend on the atmospheric pressure gradient and the atmospheric conditions that reduce it are large enough

to affect all New York resources. The ultimate problem is that worst low pressure gradient conditions occur over very large areas on the order of the eastern half of the country so low wind availability will occur far beyond the boundaries of New York State.

I believe that the reliability planning process requirement for component failures in a wind and solar dependent electric system must increase to greater than ten years to be protective of electric system reliability. Wind and solar resource availability gets worse when longer periods are considered because the likelihood of a larger high-pressure system with lower wind resources increases. The EWWG has discussed the ramifications of this and the New York State Reliability Council is considering new reliability standards to address it. I was disappointed that the Technical Conference did not explicitly address this issue.

Feasibility and Affordability

There is no mention in the Order initiating this Proceeding of New York Public Service Law § 66-p (4). "Establishment of a renewable energy program" that includes safety valve conditions for affordability and reliability that are directly related to the zero emissions resource. § 66-p (4) states: "The commission may temporarily suspend or modify the obligations under such program provided that the commission, after conducting a hearing as provided in section twenty of this chapter, makes a finding that the program impedes the provision of safe and adequate electric service; the program is likely to impair existing obligations and agreements; and/or that there is a significant increase in arrears or service disconnections that the commission determines is related to the program".

I believe that the zero emissions resource could be a primary driver of the reliability and affordability provisions of § 66-p (4) so it is incumbent upon the Commission to address these considerations in this Proceeding. The criteria used to define "safe and adequate electric service" and "significant increase in arrears or service disconnections" should be defined as part of this Proceeding. This is necessary so that there is a clearly defined standard for the zero-emission resources considered. Secondly, a feasibility analysis for the costs and potential reliability risks to electric service must be developed for each zero emissions resource.

Smith's list of DEFR attributes including that it must be "non-energy limited and capable of providing energy for multiple hours and days regardless of weather, storage, or fuel constraints". My impression of the demand flexibility, virtual power plants, and many of the zero emissions distributed energy resources mentioned during the technical conference is that they don't fulfill this requirement. If a particular zero emission resource cannot meet this criterion, then it should not be considered an acceptable DEFRR.

There is an affordability issue related to the worst case low renewable energy resource availability problem described earlier. In order to provide the electric energy necessary to cover the wind lull NYISO has found that DEFR is needed. As the evaluation period for the worst-case scenario is extended the DEFR required will increase. For example, Judith Curry and I prepared a white paper Historical Weather and Climate Extremes for New York for the EWWG that identified a 15-day period from January 20 until February 3, 1961 that will likely turn out to be the worst-case cold wave. To provide the DEFR necessary for this event it is likely that significant additional investments will be required beyond those needed for the worst-case scenario identified over 21 years. The costs and impact on affordability to cover this event will be high but failure to provide the necessary resources means catastrophe. The feasibility analysis should address the total costs to provide safe and reliable electric power in these situations.

Conclusion

To prevent a catastrophic blackout, the first consideration for this proceeding should be to determine how much energy will be needed from the zero-emissions resources described. I recommend a comprehensive analysis of historical meteorological data to define the worst-case renewable resource drought.

There are over-arching concerns related to reliability timing horizons that should also be considered in this proceeding. I recommend that the Proceeding establish links with similar work at the NYSRC and NYISO. There are reliability standard considerations that need to be resolved.

The Proceeding must also consider the § 66-p (4) "Establishment of a renewable energy program" provisions for affordability and reliability. The Proceeding should define acceptable criteria for both. All zero-emissions resources must meet those criteria to be considered acceptable.

Sincerely,

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