July 1, 2019

EDF Renewables is pleased to have the opportunity to provide some constructive comments in response to the New York ISO white paper "Reliability and Market Considerations for a Grid in Transition", from the experience of a developer of renewable energy generation projects.

A. Transmission Planning:

1. The NYISO should adopt a *forward-looking approach* to transmission expansion planning that more quickly develops the New York electric grid into the platform it will need to be by 2030. The historical practice of planning transmission expansion in reaction to proposals from wholesale market participants must be replaced by a visionary approach that provides better coordination between the Generation Interconnection process and the targets and dates that are laid out in the *Climate Leadership and Community Protection Act* ("CLCPA").

2. The CLCPA was enacted on June 19th and awaits the governor's signature. The law requires:

   a. That the Public Service Commission establish a renewable energy program by June 30, 2021.

   b. This program shall "require that: (a) a minimum of seventy percent of the state wide electric generation secured by jurisdictional load serving entities to meet the electrical energy requirements of all end-use customers in New York state in two thousand thirty shall be generated by renewable energy systems; and (b) that by the year two thousand forty (collectively, the "targets") the statewide electrical demand system will be zero emissions."

   c. that "the commission shall consider and where applicable formulate the program to address impacts of the program on safe and adequate electric service in the state under reasonably foreseeable conditions. The commission may, in designing the program, modify the obligations of jurisdictional load serving entities and/or the targets..."

3. The above provisions mean that two full years may pass before a program plan is adopted, and by that time the Commission may be obligated to reduce the targets.

   a. Waiting for the program to be established before undertaking transformative change in the planning process will increase the risk that the Commission will reduce the targets.

   b. In the meantime, many renewable resources are being proposed for interconnection on the 115kV network in locations which do not have the capacity to accommodate them. This situation will lead to curtailment of renewable energy production, most likely that of older resources. "Cannibalization" of renewables will be the result, which slows progress toward the goals mandated in the law and may force the Commission to reduce the targets.

c. The NYISO's Minimum Interconnection Standard ("MIS") sometimes assumes the future curtailment of existing renewables in favor of new renewables. The MIS lowers the bar for new resources to interconnect by not requiring transmission upgrades ("system upgrade facilities", or SUF) be made if local existing generation can be backed down to cure potential overloads on transmission facilities. Many renewable energy projects are being proposed nearby existing renewable energy producers. Page 16 of the white paper alludes to this issue.

4. The risk of future curtailment of renewable energy production is already known to the NYISO.

   a. In July 2018, the NYISO published a high-level study showing that most of the upstate grid will require transmission reinforcement to un-bottle large amounts of energy that would be curtailed from future renewable energy projects absent such reinforcements.

   b. In 2010, the NYISO published a "Wind Expansion Study" that accurately identified several weak areas of the transmission grid where renewable projects are today clustering together because land is available, or wind energy resources are exploitable. Conceptual solutions and cost estimates were described in that report.

   c. The NYISO has begun a program of gradually monitoring additional 115kV transmission facilities in the market dispatch software. This practice is focused on areas where local congestion problems have already been shown to exist.

5. Transmission expansion plans should be developed assuming that a significant capacity of renewable generation projects will be developed in regions of the state where the number of Interconnection Requests is large. (Compare the CREZ transmission projects in ERCOT).

   a. Funding for the expansion should be provided by, or shared by, the rate-payers. Without the public funding of transmission expansion, the energy resources available in many locations across upstate New York will not be economic to exploit.

   b. Uncertainty about transmission congestion risk can lead developers of renewable energy resources to delay their projects.

   c. More efficient cost allocation of needed transmission upgrades would help clear the path for developing renewable energy resources.

   d. "Transmission topology optimization" could be considered as a means to alleviate real-time congestion. This category includes
      i. circuit-breaker switching to prevent overloads by removing facilities from service
      ii. implementing weather-dependent dynamic ratings
      iii. equilibration of line impedances to balance the loading rate of facilities that provide outlet from "pockets" of renewable generation (to prevent one of several facilities from reaching its limit well before other facilities do and prematurely causing congestion).

6. Interconnection studies need to be streamlined and completed more expeditiously. This is particularly the case for projects that need to take advantage of financial incentives that are due to expire in the next few years. (Described on page 25 of the white paper.)

7. EDF Renewables recommends fast-tracking interconnection processes for Generation projects that have been awarded NYSERDA contracts for RECs. Doing this would reduce the risk of these projects being cancelled.

B. Capacity Market

1. Variable Energy Renewable resources cannot replace existing thermal power plants on a 1 MW for 1 MW basis so far as Capacity is concerned. Energy Storage that can be co-located and operated cooperatively with generation may be a remedy for this. NYISO rules should be adjusted to allow this "hybrid" type of resource.

2. The assumption that CONE can be based on a fossil-fired generation unit must be changed, since within twenty years it will be illegal to operate such a unit in New York. Twenty years may no longer be sufficient time to allow the cost of new entry to be fully amortized.

C. Energy and Ancillary Services Markets

1. The markets for Energy and Ancillary Services must be adjusted to ensure continued predictability and sufficient revenues to incentivize continued (rapid) investment in new renewable resources, without necessarily resorting to procurement by contract as has been the recent trend. (Pages 32-35 discuss this.)

   a. Carbon pricing is one solution to support Energy revenues when a large proportion of energy offers are price-taking (including negatively priced offers). See Page 36 of the white paper.

   b. Carbon Pricing is also one means to encourage consumption during hours when the available Supply emits less carbon dioxide per Megawatt-hour. See Page 37.

   c. Understanding how renewables obtain their financing is important to the market design, since renewables are required to make up the majority of energy supply within ten years. Very often congestion risk appears to be high on transmission facilities rated below 230kV. This risk is likely to encourage the development of very large capacity (over 300 MW) renewables on 345kV circuits where congestion may be deemed less significant, and to discourage development on lower voltage circuits. Difficulty in predicting this risk may create an obstacle to development of individual projects smaller than about 150 MW, which threatens to slow overall progress toward the targets.

   d. Energy Storage that can be co-located and operated cooperatively with generation may be a remedy for this. NYISO rules should be adjusted to allow this "hybrid" type of resource to participate in the markets for Energy and Ancillary Services.

2. As variable energy resources are expected to supply the majority of electric energy in New York in the future, EDFR suggests that the various authorities (including NYISO, NY PSC and NYSERDA) explore ways to encourage demand to follow available supply. See Page 39.

3. Demand could be permitted to set real time price (this is not trivial, see page 40).

4. Aside from time-of-use rates that could be offered to retail customers, more can be done to allow aggregation of smaller resources and loads, to take advantage of any flexibility (including ramping capability) that they can offer in combination.

5. Reliability Gap #4 may be challenging to close: “Maintain ability to meet daily energy requirements”. Renewables are incapable of being dispatched up. Meeting this requirement will require over-building capacity to allow for rainy or calm days and may require compensating renewable resources for following load (producing less than their available energy).

Respectfully submitted,

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