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February 11, 2014

Via email (deckels@nyiso.com)

Ms. Deborah Eckels
The New York Independent System Operator
10 Krey Boulevard
Rensselaer, New York 12144

Re: NYISO Distributed Energy Workshop
Post-Workshop Comments of Viridity Energy, Inc.

Dear Ms. Eckels:

Viridity Energy, Inc. ("Viridity") appreciates NYISO's leadership in convening the December 13, 2013 Distributed Energy Workshop. Viridity requests NYISO's consideration of the following comments regarding the issues discussed at the Workshop.

I. SUMMARY

In accordance with NYISO's objectives in its study of DERs, Viridity's comments seek to categorize DER technologies by their uses. Specifically, Viridity distinguishes between DER technologies that can be used only to support resilience in extreme circumstances, and DER technologies that can also be used to support day-to-day reliability and economic sustainability. Although both types of DER technologies have value, Viridity suggests that investments in DERs that support day-to-day reliability and economic benefits, in addition to resilience, will provide more value for a given level of investment.

Also in accordance with NYISO's study objectives, Viridity's comments describe regulatory and market-based drivers for DER adopters, and assess best practices in ISO/RTO treatment of DERs. Wider adoption of such best practices will further enhance the ability of DERs to support reliability and resilience.

II. INTRODUCTION

Experience over the past few years has shaped a change in how we view DERs. A decade ago, expectations for DERs focused on their ability to provide cleaner sources of energy that could reduce the environmental impacts of electric generation. After Hurricane Irene, the Halloween snowstorm of 2011, Hurricane Sandy, and a series of severe weather events in the winter of 2013-2014, DERs are now more commonly – and still accurately – viewed as assets that can improve resilience.

At the same time, our focus on the value of DERs must not be limited to resilience. Even if severe weather events continue to grow increasingly frequent and severe, those events still account for a relatively small number of hours over the course of a year. A wise and economically sustainable investment in DERs must also be able to tap opportunities to support day-to-day reliability and efficiency over a much larger set of hours, even when the weather is clear and calm. In exchange for providing that support to reliability, DERs can earn revenues and create savings for their host sites, improving the economics of DER investments. This enhanced investment in DERs will be particularly valuable to the grid when financiers of traditional resources undergo cyclical downturns in their willingness to make a very large investment in a single large resource.

DERs that support day-to-day reliability and efficiency will maximize the benefit from the finite funds available for DER investments. This is true whether the investor is a site owner, a developer, a utility, or NYSERDA. DERs that do not provide value between disasters are nothing more than very expensive insurance.

III. STREAMS OF VALUE

DERs, including distributed generation, distributed storage, and load management, can support at least three streams of value for the host customer site:

1. Reducing "pass-through" charges on the customer's electric bill.

Although the largest part of the customer's electricity bill is the cost of the electricity commodity, as many as 15-30 different components typically account for a third or more of the bill. These components may include the customer's proportionate share of the cost to procure capacity, costs to maintain and upgrade the transmission and distribution infrastructure, ratepayer-supported energy efficiency and renewable energy programs, and others.

The key to reducing these charges is to understand how they are calculated. For example, a charge may be based on the customer's kW of demand during certain peak hours on the NYISO grid, or during certain peak hours on the local utility's distribution grid; or it could be based on the customer's own non-coincident peak demand during a month. With an understanding of how the charges are set, the customer can use distributed generation, distributed storage, and load management capability to reduce those charges, or to prevent increases in those charges.

2. Improving the customer's retail electricity supply contract.

Changes in electric utility regulation have empowered customers in many markets to purchase their electric power from a supplier other than the traditional utility. As a result, customers now have a wider choice of retail electricity supply products, and have more opportunity to tailor a retail supply contract to their needs.

Many customers have responded to that opportunity by choosing contract structures with a fixed price for all or part of the electricity that the customer purchases. These structures are appealing to customers, because they add some certainty to the customer's cost of electricity. However, that certainty comes at a price. When the retail supplier agrees to provide electricity at a fixed price, the supplier shoulders the risk that it may be selling power at a loss. The price to the customer therefore includes a premium to reduce this risk.

Customers can use distributed generation, distributed storage, or load management capability to reduce consumption from the grid during spikes in wholesale prices, and can work advantageously with their electricity supplier to reduce the risk premium.

First, the customer can substantially reduce the premium that the supplier earns for the risk associated with fixed-price contracts. A customer without on-site generation, storage, or load management capability pays to be protected from price spikes; a customer equipped to respond to those spikes and take action to avoid them need not buy that protection. Instead, the customer can purchase its supply of power at prices more closely linked to fluctuating wholesale prices. This approach reduces the supplier's risk and enables it to offer the customer a better price for power.

Second, the customer can turn spiking prices into savings opportunities. Reducing consumption during those spikes, or shifting consumption into lower-priced hours, cuts overall electricity costs effectively. And the benefits to the grid of such behavior should be obvious.

The ability to use DERs to reduce the risk premium and create savings during price spikes depends on several elements:

- Having the ability to forecast transient increases in wholesale energy prices;
- Knowing how customer assets can be deployed to prepare for those increases;

- Understanding how the wholesale markets are designed and how they work in practice;
- Using technology to support forecasting, to plan the necessary deployments of customer assets, and to take the appropriate actions in the markets; and
- Using telecommunications and automation technologies to enable the customer to deploy its resources for maximum advantage, without disrupting its business and without imposing burdens on facility staff.

3. Participating in NYISO markets.

The same elements described above, which support the use of DERs to reduce the risk premium and create savings during price spikes, also support participation in NYISO wholesale electricity markets. A customer site with on-site generation, storage, or load management capability can use those capabilities to earn revenues from NYISO wholesale markets:

- As capacity resources, through the Special Case Resource Program and the Emergency Demand Response Program;
- As energy resources, through the Day-Ahead Demand Response Program;[1] and
- As a supplier of ancillary services, through the Demand Side Ancillary Services Program.

Using DERs to support participation in these markets also advances the economic sustainability of the investments in those DERs.

4. Value to the grid.

The value that DERs can provide to the host customer, and the value to NYISO of the services DERs can provide to the grid, tell only part of the story. Other benefits can flow to the electric distribution company. Distributed resources can help to address vulnerable points on the electric distribution network, reducing and/or delaying investments in upgrading distribution infrastructure, such as substation upgrades.

[1] NYISO's tariff provisions that establish the terms of the DADRP currently exclude demand response facilitated by behind-the-meter generation from participation in the DADRP. However, the FERC has found this exclusion to be unduly discriminatory, and has directed NYISO to develop and file appropriate tariff language for integrating into the DADRP demand response facilitated by behind-the-meter generation.

IV. CATEGORIES OF ASSETS

1. Assets to support resilience.

An emergency generator is the classic example of an asset that can support resilience, but is unlikely to offer any benefits beyond resilience. A residential emergency generator can prove invaluable in continuing operation of refrigerators, air conditioners, and electric heaters when a storm or other disruption renders the usual source of power unavailable. However, the generator will normally sit unused except when such a disruption occurs.

Similarly, emergency generators at critical gas stations serve an essential purpose, making it possible to preserve mobility for affected residents. Governor Cuomo's Fuel NY initiative targets that need to improve access to gasoline after a severe storm or extreme weather event. However, the emergency generators are unlikely to be used between disasters.

2. Assets that support both resilience and economic sustainability.

a. Energy storage

Energy storage resources can support resilience by providing a backup source of power with some ability to ride through disruptions on the larger grid. Storage resources can create additional value outside of such disruptions. For example, batteries can respond quickly and accurately to a NYISO regulation signal, contributing to maintaining stable voltage on the grid and earning revenues from the frequency regulation market. Storage resources can also charge during times when LBMP is low, and discharge that energy to the grid during periods of peak pricing, providing an additional source of revenue to support the economic sustainability of the storage resource.

In addition, strategically timed discharges of energy from the on-site storage resource can support reduction of various utility bill charges linked to the customer's demand during particular intervals. Additional strategically timed discharges can improve the customer's ability to respond to forecasted peaks in wholesale electricity prices.

b. Solar/storage combinations

Customer-sited photovoltaic generation that is net-metered or otherwise connected to the grid may not be able to provide power to the host customer when operations on the grid are disrupted. Disconnection of the PV facility is a safety precaution to protect utility workers repairing downed lines.

However, PV generation combined with storage contributes to resilience. Using the PV generation to charge the battery during a grid disruption, and using the stored energy to support loads on the customer site, assists the customer in riding through the disruption.

In addition, the economic value provided by a storage resource alone (as described in (b) above) is available throughout the year, even when there is no disruption on the grid.

c. Load management capability

As discussed above, a customer's load management capability can support efforts to reduce "pass-through" charges on the customer's electric bill, to improve the customer's retail electricity supply contract, and to participate in NYISO markets. In addition, NYISO can use that load management capability as a resource to help maintain balance between supply and demand.

Load management capability can also support resilience during disruptions on the grid.

d. Combined Heat and Power

Combined heat and power facilities can provide efficient, low-cost generation of electric and thermal energy to a customer site. That same generation can also continue to provide those vital services during a severe storm or a disruption on the distribution or transmission system.

For example, New York University has a CHP system that's designed to operate and remain fully functioning during a power outage. The CHP system uses much less fuel than supplying electricity from the grid and producing steam with a boiler. When Hurricane Sandy disrupted power in lower Manhattan for several days, the CHP system not only provided uninterrupted electricity, heating, and cooling to the campus as it was designed to do, but also enabled NYU and New York City officials to set up a command post on the campus as well as serve area residents forced to evacuate their homes in the wake of the storm. NYU's CHP system illustrates how an asset can provide value during a disaster and during the rest of the year as well.

V. Best practices in ISO/RTO treatment of DERs

1. Minimum size.

As a general rule, larger DERs cost more than smaller DERs. A high minimum size for DERs to participate in NYISO markets translates into a high cost of entry into the market, and a barrier to DER entry.

NYISO's current threshold for participation in the markets is 1 MW. NYISO has mitigated this barrier to some extent, by allowing the 1 MW threshold to be met through aggregation. Nonetheless, if the need for a larger capital investment inhibits the deployment of larger DER, and unnecessarily high eligibility thresholds inhibit the deployment of smaller DERs, we will see less DER capacity deployed.

Until recently, PJM had required a minimum size of 500 kW for a resource to participate in the ancillary services market. Recognizing the barrier this created, PJM lowered the threshold to 100 kW. Viridity suggests that the 100 kW threshold is a best practice to reduce barriers to DER entry.

2. Sub-metering for regulation resources.

Measuring and verifying regulation performance by a behind-the-meter regulation resource can be challenging. Other loads on the site, unrelated to the regulation resource, can confuse the measurement. PJM now allows sub-metering of behind-the-meter regulation resources, while prohibiting gaming (such as reducing loads on the regulating resource and shifting load to similar resources on the same site). Viridity suggests that this is a best practice.

3. Ability to provide ancillary services and energy.

Current NYISO rules prohibit a demand response resource from being enrolled in the ancillary services markets and the energy market. It may be impractical for one resource to provide both energy and ancillary services at the same time, but it is entirely practical to have one resource provide energy in some hours and ancillary services in other hours.

NYISO is working on enabling the use of "dispatchable demand resources" that could provide energy in some hours and ancillary services in other hours. Successful completion of this effort will enable DERs to maximize the service they can provide to NYISO and also enhance the revenues they can earn from providing a diverse set of services. This is a best practice from other RTOs and ISOs that do not impose this prohibition.

4. Use of behind-the-meter generation to support demand response.

NYISO currently prohibits the use of behind-the-meter generation to support demand response in the energy market. The FERC has ruled that this prohibition is unduly discriminatory. Elimination of this prohibition, in accordance with the FERC's direction, would be a best practice. Viridity notes that the elimination of the prohibition would not change the need for compliance with environmental regulatory requirements.

5. Gold-plating

Major generating facilities use expensive remote telemetering units ("RTUs") and the use of expensive leased lines to communicate with the NYISO and the local electric distribution company ("EDC").

The best practice from other RTOs and ISOs is to allow smaller DERs to have their telemetry data transmitted via encrypted DNP3 protocols, using a DNP3-capable device. This reduces the cost of enabling a DER to provide telemetry data.

6. Distribution Company Issues

Finally, while not an ISO specific issue, it is worth noting that unduly burdensome or slow-moving distribution company interconnection processes, can act as a barrier to entry for bi-directional distributed resources. NYISO and the Public Service Commission should be cognizant of this possibility and ensure reasonable interconnection processes for utilities subject to its jurisdiction.

Thank you for your consideration of these comments.

Very truly yours,

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