Renewable Electric Storage Working Group Meeting Notes
June 24, 2015
Conservation Services Group – Iselin, NJ

Disclaimer: *This Renewable Electric Storage Working Group meeting is an opportunity for stakeholders and other interested parties to have open and frank discussions regarding policy and issues confronting the renewable energy community that are within the jurisdiction of the Board. These meetings are intended to address issues of general concern. Staff cannot comment on or provide specific answers to questions about pending applications or petitions. Ultimately, information provided and positions developed during these meetings may or may not form the basis for Staff recommendations to the Board. By law, statements made by Staff cannot bind the Board in its decisions. Only the Board can make decisions on these matters at its Open Public Meetings. While attendees may choose to record or take notes of the meeting, please refrain from interrupting the flow and/or tenor of the discussion with questions that pertain to your note-taking.*

I. Welcome and Introductions (Ron Reisman and Tammy Gray – Market Manager Team; Scott Hunter – OCE)

Mr. Reisman called the meeting to order at 1:00 pm and asked the participants in the room and those on the phone to introduce themselves. Mr. Hunter read the disclaimer above.

II. Update on PJM Frequency Regulation Market (Scott Baker – PJM Interconnection LLC)

Mr. Baker presented a brief overview of PJM's regulation market *(Previously distributed as Presentation 1).* He said the regulation market is part of PJM's wholesale marketplace and serves a role "to provide that fine-tuned balancing between generation and load that we need to maintain the frequency of the system". He said there is presently about 135 MW of grid-connected and 15 MW of qualified behind-the-meter energy storage resources operating in this market for PJM. In describing how the market works and how resources are compensated, he noted that PJM's performance based regulation system assigns a score to each resource based on how well it follows PJM's dispatch signal. That score "becomes a multiplier in the revenue stream that is ultimately paid to that resource." He said performance is calculated on three factors: accuracy, delay and correlation. In answer to a question about calculating "mileage", Mr. Baker defined it as "the absolute value of the difference between two 10-second intervals", with total mileage calculated on the value of all the 10-second intervals within an hour. He said most storage devices follow the fast response signal because there is an additional payment associated with it.

Mr. Baker said the average clearing prices for the first five months of 2015 were slightly more than $42 per megawatt per hour. He explained that the payment is based on the capacity of the resource, not on energy. However, he said each individual resource will have a revenue stream that takes into account the clearing price plus other specific factors such as the performance score and the type of response signal it follows.

In answer to a question about the size of the market, Mr. Baker said that PJM procures 700 MW between the hours of 5:00 am and midnight, and 525 MW between midnight and 5:00 am. However, he said the amount of capacity cleared on an hourly basis can vary greatly. He added that there were 495 MW in the interconnection queue as of a few weeks ago, with an additional 89 MW under construction. In response to another question,

Mr. Baker said the regulation market is "an RTO-wide market" with no geographical element to either procurement or compensation. He also noted, in answer to another question, that the signal is energy neutral. In response to a question about the U.S. Supreme Court case on whether demand response is a retail product, Mr. Baker said that PJM does not believe that ancillary services are part of that proceeding. However, he said that could change based on the court's decision as it regards the scope of this issue.

III. NJ Department of Community Affairs Presentation (David J. Greenhill)

Mr. Greenhill addressed the permit application process as it relates to renewable electric storage installations. He said that his job is to answer questions about the permit process and listen to installers and developers who may be having problems with individual code inspectors. He said anyone with questions or problems should email him at dave.greenhill@dca.state.nj.us or call him at 609-984-7609.

IV. PSE&G's Solar 4 All Extension program segment on "Grid Security / Storm Preparedness" (Andy Powers, Walt Sparrow-Hood – PSE&G)

Mr. Powers gave a presentation *(Previously distributed as Presentation 2)* on the first pilot project that PSE&G is doing in the Grid Security / Storm Preparedness segment of its Solar 4 All Extension program. He said the objective of this segment is to (1) combine solar with other technologies to help mitigate the impact of solar on the distribution system; and (2) to develop feasible solutions to provide enhanced reliability during prolonged outages.

He said the project is located at Hopewell Valley Central High School, which would act as a community shelter in the event of a prolonged outage. He noted that this is a grid-tied project that is not behind the meter. The project involves both roof-mounted and parking lot-mounted solar panels with a total capacity of 882 kW. The system is integrated with a lithium-ion battery capable of storing 444 kWh; at full discharge, it would last for half an hour, but the intent is to spread the discharge over a much longer time to support lighting, refrigeration and other critical load. He said the system would participate in the frequency regulation market while acting as an emergency back-up system to the school. He said the contract was executed in May, work was begun in June and the expectation is to have the project in service by the end of this year. Mr. Powers said extensive training would need to be done with the school's operating staff to ensure the proper operation of the system, particularly in emergencies.

A discussion ensued among several participants regarding the eligibility of behind the meter integrated solar + storage systems in PJM's frequency regulation market, and the financial impact it would have on future development. Mr. Baker of PJM explained that PJM's tariff, as approved by FERC, defines demand response resources as those which only offset load – not those which inject power into the grid. He said that storage does not clearly fall into either the generation or demand response buckets, and added that PJM is looking into ways of resolving this issue without violating its tariff.

V. Update on FY2016 CRA and NJCEP Programs and Budgets (Scott Hunter – BPU Office of Clean Energy)

Mr. Hunter reported that the Board approved Staff's recommendations on the FY2016 Comprehensive Resource Assessment (CRA) at its June 17, 2015 agenda meeting and, in a subsequent action at the meeting, approved the clean energy programs and budgets for FY2016. He explained that the CRA establishes the amount of money collected through the Societal Benefits Charge (SBC) for funding clean energy programs. Mr. Hunter said the budget contains $6 million for renewable electric storage incentives, with the program itself to be developed through a stakeholder process. He said Staff expects to have a program recommendation to present to the Board in an August-September timeframe.

VI. Review of FY2016 Renewable Electric Storage Straw Proposal and Presentation of Public Comments

Mr. Reisman presented a brief overview of the program development process *(Previously distributed as Presentation 3)*, noting that a Straw Proposal was issued on May 7 based on input received at an April 13 working group meeting. Comments on the straw were received from 12 organizations prior to the May 29

submittal deadline. These included two comments directed toward the CRA but relating to storage issues that were also raised in the straw.

Mr. Reisman summarized the key changes to the FY2015 Renewable Electric Storage Solicitation recommended in the straw. These included transitioning from a competitive solicitation to an open enrollment program with a prescriptive rebate; carving out two-thirds of the program budget for public and critical facilities and offering them a higher rebate; offering higher rebates to storage systems that do not participate in frequency regulation; limiting eligibility to existing solar systems; and subsidizing 50% of Level 3 interconnection studies.

He then asked representatives from each of the organizations that submitted comments to briefly summarize their positions.

a. Peter Mendonez, A.F. Mensah, Inc.

Mr. Mendonez said he had four key points to make: (1) battery systems should be incentivized if they provide enhanced reliability to the distribution grid; (2) the battery system should not have to be integrated with the renewable energy system and could instead essentially be virtual. He suggests putting batteries on saturated distribution circuits in order to free up capacity for additional solar on those circuits. Point (3) is that the addition of batteries should be incentivized for solar systems that may otherwise not be financially viable or could contribute to grid reliability. Point (4) is that the market should decide the amount of the program budget directed at any one segment, rather than having a set-aside for public and critical facilities.

b. David Eisenbud, Sun Edison

Mr. Eisenbud said he also had four points to make: (1) oppose the limitation on funding only those projects integrated with existing solar systems; (2) support the continuation of a competitive solicitation, since the drawbacks of a prescriptive rebate outweigh its advantages in terms of "getting bang for the ratepayer buck"; (3) do not see a reason for a bonus incentive for systems that don't participate in frequency regulation, since multiple revenue streams are essential in making storage work; and (4) subsidizing Level 3 interconnection studies should not be interpreted as an endorsement of those studies, since Sun Edison believes these studies are often unnecessary.

c. Todd Olinsky-Paul, Clean Energy States Alliance

Mr. Olinksy-Paul said he supports the doubling of the budget to $6 million based on the interest demonstrated in the FY2015 solicitation. He said limiting eligibility to existing RE systems "seems to run counter to the stated aims of the program" since many public and critical facilities don't have existing systems. He also said the limitation would have an impact on eligibility for the Federal Investment Tax Credit. He said he supports a minimum duration standard for islanded operation in order for a system to be considered resilient. Mr. Olinksy-Paul noted that CESA supports an open enrollment program with a prescriptive rebate but urged the BPU to require minimum warranties on equipment and installation given that the technology is fairly new and lacks a long track record. He said CESA supports the carve-out and higher incentives for public and critical facilities, but believes the term should be more clearly defined and should include affordable housing. He said it was not necessary to "penalize" projects participating in the frequency regulation market with a lower incentive, but added that quarterly performance reports and revenue statements should be required and made public.

d. Jeff Cramer, Energy Storage Association

Mr. Cramer said that systems in front of the meter, as well as those behind the meter, should also be eligible in this program because of their contribution to system reliability and "their ability to serve the grid with multiple value streams". However, he recognizes that this expansion of the program may have to wait until the future. He also urged greater transparency in communicating with the industry, engaging stakeholders and providing webinars and other instructional resources.

e. Thomas Donadio, Jersey Central Power & Light

Mr. Donadio focused his comments on the distribution system impact and net metering implications of storage and the economic impact of storage on the distribution system. He said JCP&L believes frequency regulation is more effective at the transmission level than the distribution level. He said that while it is hard to determine a level of saturation that would impact the distribution system, increased activity could result in adverse impacts on distribution circuits, including increased wear and tear on voltage regulators. He added that JCP&L wants to ensure that safeguards are in place to ensure that system owners who receive a higher incentive for not participating in frequency regulation don't turn around and participate in the future.

f. Sarah Steindel, New Jersey Division of Rate Counsel

Ms. Steindel said Rate Counsel supports a continuation of the competitive solicitation with an important caveat that the incentives be designed to reward those aspects of storage related to offsetting the intermittent nature of solar – and thereby supporting its development – rather than frequency regulation. She added that Rate Counsel also supports data reporting and collection to ensure that these ratepayer-funded programs are doing what they are intended to do.

g. Larry Barth, NJR Clean Energy Ventures

Mr. Barth said NJR applauds opening the program to categories other than frequency regulation, since that is more consistent with state energy policy. He said the design of the program – solicitation vs. open enrollment – should be dictated "by what the use case should be" and by the state's intention to serve these other categories, such as "clipping non-coincident peak demand at commercial and industrial sites". He suggested installing batteries at the facilities of existing demand response participants to see if the battery can actually be deployed when they get the signal from PJM to curtail load. He also echoed the earlier point of creating safeguards against "gaming the system" by opting for the higher rebate and then participating in frequency regulation at some point in the future.

h. Betty Watson, SolarCity Corporation

Ms. Watson said battery system duration must be considered in this program. She said SolarCity's batteries are designed with a minimum duration of two hours, which is necessary for load shifting and resiliency. She added that systems should be evaluated and incentives should be based on energy capacity (kWh) rather than power capacity (kW). She said SolarCity recommends that the program offer two rebate levels: One for short duration systems, and a higher level for longer duration systems. Ms. Watson noted that SolarCity believes the program should not be limited to existing solar systems, since it is more economical to install the solar and battery components together rather than adding the battery component to an existing system. In addition, the add-on system would not receive the benefit of the federal investment tax credit.

i. Katie Bolcar Rever, Solar Energy Industry Association

Ms. Rever said the program must be designed to have the incentive match the program's three objectives of load shifting, resiliency and frequency regulation. She said this could be done by "splitting the incentive available between kilowatts and kilowatthours" thus allowing developers to balance their intentions. She also noted that allowing batteries to be installed with new solar systems would leverage federal funds through the investment tax credit. Ms. Rever said SEIA generally supports open enrollment programs, but the limited resources available require that submitted projects be "real" to ensure that they don't take funds away from others. She suggested a two-track program, with a "maturity track" that requires applicants "to take a project to a more mature level before coming to the incentive program" and a second track that would require the placement of a deposit until the project reaches a more mature stage. She also said that the BPU must make clear that the reimbursement of 50% of the cost of a Level 3 interconnection study is not an endorsement of the need for that study.

j. Lyle Rawlings, MSEIA

Mr. Rawlings said MSEIA supports the integration of storage systems with new as well as existing solar systems for the economic reasons identified by the earlier speakers. He added that the restriction on new systems limits

the number of systems in the state that can be retrofitted for storage. He said MSEIA opposes "disincentivizing" frequency regulation participating through lower rebates, noting that revenues received from frequency regulation reduce the amount of ratepayer-funded incentives needed to make a project economically viable. He cautioned against "disallowing projects based on how many hours a battery can operate", calling it a "simple measure" that doesn't truly reflect the battery's ability to provide resiliency. He also called for a stakeholder process to ensure that incentive levels are "meaningful".

VII. Facilitated Discussion on Comments and Other Program Issues

Mr. Reisman identified several issues that were common to two or more of the comment summaries and suggested that the discussion focus on a resolution of those topics.

On the issue of program design, there was a split between those supporting a solicitation versus those supporting open enrollment, although Mr. Hunter cited "the benefits of competition" in supporting the solicitation model along with the issue of a prescriptive rebate being too high for some projects and too low for others. There was also significant support for the "two-track" approach outlined in SolarCity's comments.

On the issue of restricting eligibility to existing RE systems, Mr. Hunter argued that state energy policy needs to be consistent and that all programs "should be pulling in the same direction". Therefore, he feels that encouraging new solar development in a period of significant oversupply in the SREC market does not meet the consistency test. However, several participants said they believe the impact on SREC markets would be "de minimus" based on the amount of capacity involved in the storage projects, and that the cost of retrofitting an existing solar facility is greater than installing the solar system and battery together.

On the issue of a minimum discharge time, a participant pointed out that since all battery applications are not the same and have different operating parameters, it is difficult to have a one-size-fits-all requirement for every scenario. Another participant suggested that the simplest way to address this issue is to base the incentive on kilowatthours instead of kilowatts, or at least split it between the two.

VIII. Review of Proposed Performance Reporting Form (David Hill – VEIC)

Mr. Hill reviewed a draft version of a Performance Reporting Form *(Previously distributed as Presentation 4)* that would be submitted quarterly for the first 12 months of a system's operation. He mentioned that the requirement should protect proprietary information while at the same time allowing Board Staff access to meaningful data. He reviewed each of the metrics and explained the rationale for the data requested.

Several participants raised questions about the relevance and use of some of the metrics and the data requested, and made suggestions for revisions to the form. Board Staff and the Market Manager will consider those comments in finalizing the document.

IX. Next Steps and Adjournment

There being no further business, the meeting was adjourned at 3:40 pm.