

Energy Storage Working Group Meeting

July 23, 2013

NJDEP Hearing Room - Trenton, NJ

1:00 pm to 3:00 pm

Agenda

- I. Introduction and Purpose of the Working Group (Scott Hunter – BPU Office of Clean Energy)
 - a. This is a new initiative for the BPU; there have never been any incentives for Energy Storage. This process began with the Comprehensive Resource Assessment (CRA) that was conducted for 2013-2016. During this CRA, we changed program years from a calendar year to a fiscal year basis to align better with the state budget process. This working group will be a long term effort, because of the directive from the Board to implement this Energy Storage program for Fiscal Year 14, and also for the development of FY's 15 through 17. The CRA is kicked off by market assessments being performed by independent contractors. The renewable energy market assessment that was completed by Navigant focused on Energy Storage for the first time to give a gauge of what the market potential is and to help inform staff on what the funding level should be. That information went into a straw proposal that went through several iterations of public feedback and resulted in the June 21st Board Order that finalized the CRA and established the budget for FY 14. There was a budget of \$17.5 million for renewables in general; the CRA that preceded that recommended \$2.5 million for the first year of the Energy Storage funding cycle. There may be some flexibility in that number, with midterm corrections, but going forward we will proceed with expectations of a program with a \$2.5 million budget.
 - b. In the budget order, staff laid out framework for a plan for working with stakeholders in this quarter toward developing concepts and fleshing out the framework for a solicitation. A first solicitation will be held in the 1st quarter of 2014, with award of incentives in mid-2014. Staff is expecting to build up demand and supply of funds for this incentive over time. One of the goals is to commit the funds as early as possible and the other is to expend them as early as possible to demonstrate demand for this market segment.
- II. Review of NJCEP Energy Storage Plans, Navigant Study and ESTAP Presentation (Charlie Garrison – Market Manager Team) – Full Presentation on NJ Clean Energy website here:
http://www.njcleanenergy.com/files/file/Renewable_Programs/REIP/Energy_Storage_WG_Presentation_07_23_2013.pdf
 - a. FY 14 Proposed Funding levels for Solar (\$2.5M), Biomass (\$2.5M), and Energy Storage (\$2.5M) for a total of \$7.5M under Renewable Energy.
 - b. Key findings from Navigant Consulting study identified two potential opportunities for energy storage in the near term (2012-2016):
 - i. Shifting renewable generation to more optimal times of day
 - ii. Providing some of the additional frequency regulation that may be required with higher levels of intermittent renewable energy.
 - c. FY14 Energy Storage Program Plan
 - i. New incentive program for energy storage technology

1. Develop program guidelines, incentive structure and target market with Board Staff, Market Manager & interested stakeholders
 2. Findings utilized to develop competitive solicitation process
 3. Proposal will be presented to the Board for its review and approval at a Board Agenda meeting.
- ii. Evaluation Committee consists of Office of Clean Energy, Market Manager, Program Coordinator and other NJ State agencies as applicable.
1. Any incentive award that exceeds the current threshold established by the Board will require approval by the Board
 2. Awards will be based on the criteria established within the solicitation.
 3. BPU Priorities include:
 - a. Emphasis on projects that can be completed within 1 year (but not exclusively).
 - b. Desire to build a sustainable market that does not rely on NJCEP funding.
 - c. Presence of storage can firm the PV production to allow facilities to participate in other available incentive programs such as demand response.
 - d. Explore the role of energy storage as means of ensuring the operation of critical facilities during power outages.
 4. Working group will look into program development issues including but not limited to:
 - a. Eligible technologies
 - b. Incentive Structure
 - c. Solicitation structure and timing
 - d. Application criteria and process
 5. Key concepts will be identified and distributed in a straw proposal for future discussion.
- iii. ESTAP (Energy Storage Technology Advancement Partnership) Overview
1. Purpose is to create new DOE-state energy storage partnerships and advance energy storage, with technical assistance from Sandia National Laboratories.
 2. Focus is distributed electrical energy storage technologies
 3. Outcome is near-term and ongoing project deployments across the U.S. with co-funding from states, project partners, and DOE
 4. ESTAP is a project of Clean Energy States Alliance (CESA).
- iv. Join Energy Storage Working Group Email list:
<http://mail.njcleanenergy.com/mailman/listinfo/energystorage>
- d. Comments:
- i. **Audience Question:** Are we limiting this to battery storage only?
 1. **Scott Hunter:** We will be discussing what it includes, but the only limitations so far are that the electricity is coming from a renewable energy source.
 - ii. **Audience Comment:** All the eligible technologies should be considered. When it comes to the potential co-funding from the DOE that funding might be focused on electrical energy storage. Also, the DOE is in the middle of a national energy storage roadmap that the Energy Secretary has put in play about a month ago.
 - iii. **Lance Miller:** Scott, if you could clarify on the statement you made on energy storage being from renewable energy only- thinking of a PV system that is grid connected, it could have battery storage. When that battery storage is storing

electricity could be dependent on cost factors, i.e. night vs. day. It only works when integrated with a solar system.

1. **Scott Hunter:** Ron (Reisman) has done research on California's program and they've taken 600 applications and installed only 2 or 3 systems. A key primary barrier has been interconnection issues. We're now confronting interconnection and net metering issues when solar is coupled with CHP. The statute allows for net metering for Class I renewables, but not for fossil fuel generators. We're running into an issue of how do we ensure that the power that is getting netted and getting the financial benefit of net metering, is a renewable source and not from the grid or CHP fossil generation? We may have the same issues with battery storage.
- iv. **Lance Miller:** You could also potentially have two meters, one metering the solar power going into the grid and another meter for whatever is being drawn from the grid to charge the batteries.
 1. **Scott Hunter:** Yes, but we have \$2.5 million and one of the criteria to be evaluated is that the storage be located at a critical facility that provides public benefits and resilience to the grid. I don't think a grid supply system (merchant renewable generator with storage) would get high priority, but I don't want to judge things at the outset.
- v. **Audience Comment:** My recommendation is to be able to have these proposals go through that can also support the grid as well as individual consumer side projects.
 1. **Scott Hunter:** You'll be given ample opportunity for public comment; we'll take all the comments in consideration when making a recommendation to the Board. However, there are limited amount of funds, and the Board priorities are resilience and enabling public facilities to operate when the grid goes down. Another element we expect is competition.
- vi. **Lance Miller:** Is there a definition for "critical facilities?"
 1. **Scott Hunter:** I think Mike Winka explored this with the CHP working group
 2. **Mike Ambrosio:** I think it is still a work in progress; he just received a lot of comments on it. It seems to me the Board would want to be consistent though, so I would recommend using the same definition that he winds up with.

III. Facilitated Discussion Forum on FY2014 Program Design

- a. Eligible technologies discussed:
 - i. Ice or chilled water storage
 - ii. Battery back up
 - iii. Fuel cells and natural gas projects - not eligible
 - iv. The RE system is not required to be a new system, preferably an existing system
 - v. Must be renewable source
 - vi. Preference will be given public facilities and projects that allow a facility to operate when the grid is down
 - vii. Innovative and emerging technologies (FY2015-17); focus now on existing, mature technologies
 - viii. Some inverters may need to be replaced soon due to equipment lifespan – opportunity to integrate storage at that time
 - ix. 2 meters-PV solar and ES battery back up

b. Discussion:

i. **Question from Audience:** One of the potential revenue streams for the systems comes from providing services to the grid as well as providing services to the facility that it's actually located. They tend to be expensive systems. I was wondering if you were going to consider allowing for services to be sold into the ISO, by providing ancillary services.

1. **Scott Hunter:** Yes, I think that is what Charlie alluded to in his slides, a desire to build a sustainable market that is not reliant upon the Societal Benefit Charge funds. That is one of the elements that we'll pull out of the solicitation as an evaluation criteria or at least account for it in some way so that when awards are made we have some metrics for judging this progress (in the effort to account for all available revenue streams and value other benefits not currently monetized).

ii. **Question from Audience:** Was the criteria that it may or may not be grid connected or was it that you wanted to make sure you were always storing renewable energy as opposed to fossil fuel generated energy? You can have a grid connected system that stores renewable energy, which would be eligible. Lance's question was that in the event of a business model which may intake energy off the grid and therefore contains some fossil fuel content that is part of your question, correct?

1. **Scott Hunter:** Correct, all of this hasn't been laid out or refined. It may be part of the evaluation criteria that judges the amount of renewable electricity that's used by the storage medium. (Note: the distinction between the concepts of a grid connected system (could include net metered customer-generators and/or merchant wholesale power generators) and a grid supply system (a euphemistic term referring to a merchant wholesale power generator) needs to be understood. Staff believes all grid connected systems will be eligible but net metered systems where public critical infrastructure exists will receive preference over grid supply systems where no ability to island and support public critical infrastructure is proposed).

2. **Audience member:** But it was more the type of energy, correct?

3. **Scott Hunter:** Correct. This is a renewable energy incentive program.

iii. **Comment from Audience:** One of the things that must be recognized is that energy storage systems are still quite expensive and in order to be cost effective, it must take advantage of all of the services it can provide, including in the PJM markets, but also the grid support it can provide. It would be most beneficial to the state.

iv. **Question from Audience:** Is our focus on developing sustainable markets ranked as a higher in evaluation criteria over others?

1. **Scott Hunter:** There are a lot of goals, and that is one of them. There is no ranking, but if you want to make a recommendation on why one should be ranked higher we would welcome your comment. We need to recognize the barriers that other states have seen, interconnection barriers especially when the system is net metered. Quick turnaround times will be important. We are also not looking for new renewable energy systems to be created, there are plenty that already exist that are logical candidates for energy storage. It might even be a priority that it be an existing system.

- v. **Pam Frank:** There is probably going to be a timeline with PJM that has to be taken into consideration that may make a one year completion timeline difficult. It will require a PJM process to be laid out.
 - 1. **Scott Hunter:** Is that required upfront before the installation? Can a solar system with a battery backup that exists apply for the opportunity for frequency regulation market after the fact? They don't require it to be a new installation.
 - 2. **Pam Frank:** I think PJM is still figuring it out.
- vi. **Lance Miller:** Focusing in on the priority of the role of energy storage as a need of ensuring the operation of critical facilities during power outages, don't we still have the issue of the connection to the grid if you have an operating renewable energy system and the grid goes down? If you want to have critical facilities to operate during power outages they can do that during daylight hours just by having the islanding with their inverters, but that's not storage. There's a conflict in the priorities.
 - 1. **Scott Hunter:** We're not mandating participation in this program. An extra weighting will be given to public facilities that are considered critical and can operate when the grid goes out. If you wanted to install an inverter that enabled you to use diesel energy onsite, you just wouldn't participate in this program.
 - 2. **Lance Miller:** Even with storage on PV system at a critical facility, without changing out the inverter you're not going to have power during a power outage.
 - 3. **Scott Hunter:** I think all battery backups enable you to island. However, that is correct those systems without battery backup currently don't have the proper inverter.
 - 4. **Lance Miller:** That last priority item seems like it can be significantly addressed through inverter technology rather than storage
 - 5. **Scott Hunter:** Not necessarily, because what allowed the Bayonne project to operate during Sandy was the existence of diesel generator. There was no storage there. So there are limitations to the effectiveness of that approach. 5 years ago we had 4 MW installed, and inverter life is about ten years. There's a population out there that are looking at replacing their inverter and now is the time to look at the need for storage given their experiences during Sandy.
- vii. **Comment from Audience:** What this program will need to deal with is the scenario of a renewable system with storage that may have a component of fossil fuel energy. It is not a black or white issue, especially when driven by economics.
- viii. **Question from Audience:** Question about "microgrids" (a small grid that is not connected to a larger grid) How do you deal with a situation where there's a proposal for an "islandable" system with a storage component, a renewable component and a non-renewable generator?
 - 1. **Scott Hunter:** Aren't most of these projects microgrids? We're not planning to do any residential retrofits.
- ix. **Comment from Audience:** I do think the microgrids idea is gaining traction. It is becoming a construct in which distributed energy resources of all types can reside. The Hoboken announcement that they will be using the Sandia methodology called Energy Surety Design Methodology that is the methodology of defining where the islands would be in Hoboken and how they would interact

with PSE&G. That is a framework that could be considered, and that it is a microgrid it might get some sort of preference.

- x. **Neil Zislin, Renew Energy (phone):** What is the interpretation over what service area would an energy storage device being capable of delivering electricity? Is it something that falls under the definition of contiguous or is it beyond that?
 - 1. **Scott Hunter:** There hasn't been much thought (on service area) but one of our criteria is making commitments to projects that have a reasonable likelihood of being constructed within a year. We also have a net metering and interconnection stakeholder meeting on September 11th that you may want to attend.
 - 2. **Neil Zislin:** The other question I would raise is in the event that the grid is out of service and the energy storage system is activated and providing electricity to consumers that are connected to that network, there have to be safeguards in place to keep that system isolated from the rest of the grid while the utility companies are repairing the damage. There would have to be an interface between the boundaries of what the energy storage system would be serving and the rest of the grid that was down.
 - 3. **Scott Hunter:** What you're describing are out in FY15 as issues. Community energy with a microgrid. We need to take one step back from what you're describing; those programs are being drawn up now. We need to implement projects that are simple and ones that will result in a firm foundation for FY15. I think there are 3,000-5,000 systems on public entities in NJ. These funds are designed to be incremental. We only want to give enough incentive to make the project go forward.
 - xi. **Question from Audience:** How would the DOE funding play into that?
 - 1. **Scott Hunter:** That would be a great question for the application process. Do they have funding levels set yet?
 - 2. **From Audience:** That would be part of the Energy Storage roadmap that should be finalized at the end of the year.
 - xii. **Todd Olinsky, Clean Energy States Alliance:** From what I have currently heard is that DOE has expressed that the ideal situation for funding is that the state agency would put in 25%, DOE would be 25% and the other 50% would present other sources, private or utility funds.
- c. Incentive structure and caps
- i. **Janja Lypse:** There has mostly been an estimate of a 100 kW=\$400,000-500,000 (incentive under \$500,000-good range)
 - ii. **Question from Audience:** Have decisions already been made about the incentive structure?
 - 1. **Scott Hunter:** No, the only decisions that have been made are the ones in the Board Orders. We're looking for input on everything. What we're trying to achieve is competition, so you can get the most bang for the buck. The incentive should be structured by using some kind of standard metric that we can compare and make an evaluation based on objective criteria.
 - iii. **Charlie Garrison:** We also want to come up with essential requirements and then also more desirable attributes that will be weighted. That's what this group needs to decide.
 - iv. **Lance Miller:** Going back to the four priorities that were listed earlier, sustainable markets could apply more to the third priority, and critical facilities

priority, it sounds like two separate and distinct applicability categories under energy storage. You could apply under energy storage category a, demand response, or category b, critical facilities. They would then have different incentive structure and criteria under those categories, which could allow both types of categories to move forward.

1. **Charlie Garrison:** That is consistent with what was discussed at the Biopower meeting this morning. We might have a set aside for different projects. However, with only \$2.5 million you run into limitations with different groupings.
- v. **Question from Audience:** Can you go into the timeframes that you want to spend the money in?
 1. **Charlie Garrison:** If you go back through the Clean Energy Program timeline, there was always a lot of money that was allocated but not spent or committed. The point is that if we give money to a project for 18 months that is very unfavorable in light of how quickly these funds could disappear. We need to demonstrate that some amount of funds are being used in the short term, we need a portfolio of both short and long term projects.
 2. **Scott Hunter:** If you have two subsets, and you're looking at 3 projects in one and 3 in the other, and you have the minimum amount of dollar requests. Now you have 3 projects that are long term, you are ignoring FY's 15, 16, and 17.. You don't want to cover these innovative projects at the expense of the long term program. It is a balancing act. The more you carve out market segments, the more you are putting the whole program at risk. A lot of this is strategy. If we demonstrate a need early on, the opportunity for a bolster in the budget in the market for other segments can present itself.
 3. **Lance Miller:** To me, the storage priority seems to holler for a grid connected battery storage system as one category, and the critical structures priority should be for existing net metered systems with solar PV systems that you're now going to incorporate batteries and islanding capabilities so that a facility can operate during an outage.
 4. **Comment from Audience:** If we're talking about that sort of breakdown, we're really talking about putting an expensive asset on the sites that are almost never going to be used. Whatever type of project it is we need to be able to get the maximum value from all sorts of revenue.
 5. **Lance Miller:** The battery storage technology doesn't always need to be used during an outage. It can be used almost daily if you wanted to extend the hours of solar value. You may not choose to do that because it could decrease its useful life. However you may decide to use it during times of peak cost.
- vi. **Pam Frank:** There are similar themes from both meetings today. There is a very small budget and we need to demonstrate success in short period of time to live to fight another day. Everything we think about doing here, those items need to be the overarching priorities. So with that in mind, we need to grab the low hanging fruit, using solar facilities that are on public buildings, inverters that are nearing the end of their useful life. There are probably a healthy amount of potential applications that can demonstrate success within a year, and then maybe a smaller amount of funding that we set aside for projects that are a little more long term or innovative.

- vii. **Question from Audience:** Are municipal electric companies not eligible to participate because they do not pay into the SBC funds?
 1. **Scott Hunter:** That has always been a limitation for the clean energy program funding, that the application be located on the site where the customer pays into the SBC, but there are municipal bonding improvement authorities throughout the state that have done energy efficiency and renewable energy programs and other Bond programs.
- viii. **Scott Hunter:** All of the comments we've discussed today, if you would like to submit a formal comment on it you can submit it to the Market Manager.
- ix. **Comment from the Audience:**
- x. Proposal was made to allow ES incentive for residential projects, two scenarios were mentioned;
 1. Applicants would aggregate multiple individual residential ES systems into one project
 2. Applicants would install a central energy storage system that would serve multiple residential PV systems.
 3. In both cases, the applicant would be the single point of contact with the NJCEP and would be responsible for educating all customers and addressing all questions or issues they may have. The payment would be based upon the aggregate size of the system(s) participating in the REIP ES program.
 4. Incentive paid on equipment only with a cap based upon x% of total project cost (TBD)
- d. **Comment from Audience:** If you have a vehicle that is participating in a vehicle grid program and has storage elements part of that would it be eligible under this program? I think it should be.
- e. **Comment from Audience:** With the limited funding, it would be good to be associated with university programs, so you could get a lot of leverage for funding by offering education through the structures. I don't know if that's part of the criteria, but it could be.
- f. Solicitation structure, timing and frequency
 - i. Possible options:
 1. Offer \$2.5 in 1st solicitation, keeping it competitive rather than splitting it up; 1st solicitation target in Q1 2014
 2. Ideal scenario: one year completion with flexibility and possible adjustment to incentive amount based on completion timeline. For example, projects completed within one year would receive the full approved payment but after one year the payment would be reduced using a predetermined reduction schedule
- g. Next steps
 - i. Working on developing a concept straw proposal to circulate.
 - ii. The next possible meeting of the Energy Storage group will be after Labor Day, date and location TBD.

IV. Adjournment

PLEASE SIGN IN AND TAKE A BADGE ↑

Sign in Sheet for
Energy Storage Working Group

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Tuesday, July 23, 2013

1:00 pm - 3:00 pm

1st Floor Hearing Room of the NJ Department of Environmental
Protection building at 401 E. State St., Trenton NJ

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1:00 pm - 3:00 pm

1st Ho Clearing Room of the NJ Department of Environmental
Protection building at 401 E. State St., Trenton NJ

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