Clean Energy States Alliance and Clean Energy Group Comments to New Jersey BPU and the Market Manager regarding the proposed Renewable Electric Storage Incentive Program for FY2016

In general, the New Jersey BPU has proposed an excellent incentive program, and we view many of the proposed changes as improvements over the previous year's program. Here are our specific comments on the current straw proposal:

- Limiting the incentive to applicants with existing RE systems runs counter to the stated aims of the program, since many critical public facilities will not have existing RE systems and will therefore be ineligible. Furthermore, this restriction means that energy storage systems installed under the BPU's program will not be eligible for the federal solar investment tax credit, which would help to leverage the state's investment in these projects.
- Not setting a minimum duration for islanded operations will continue to result in projects that are sized to optimize income from frequency regulation and peak shaving, rather than with the primary goal of providing a reasonably significant resiliency benefit to the facility and the community. Results from round 1 prompted numerous queries as to the utility of an energy storage system that offers only two to three hours of islanded operation. Two or three hours of islanded operation is of questionable value given the historic evidence that storms can knock out grid power for weeks. For this reason, FEMA recommends four days of continuous islanded operational capacity for backup generators. If providing significant resiliency benefits to New Jersey communities is a goal of the program, the BPU should consider setting a minimum number of hours or days of continuous islanded operation, that proposed projects must achieve in order to be considered "resilient."
- We applaud the decision of the BPU to propose an open enrollment program with prescriptive rebate. However, given the newness of the technology, and the decreased scrutiny of proposals likely under a rebate format, we urge the BPU to require minimal warrantees on equipment and installation.
- We applaud the decision of the BPU to propose a set-aside for projects at public and critical facilities, and a higher per-watt incentive for these projects. With regard to this, we make the following suggestions:
    - It would be helpful if the BPU would define the term "public and critical" for this program, if public and critical facilities are to receive an added incentive.
    - Affordable housing facilities should be considered "public and critical" under this program, as they serve a public purpose and receive public funding. It is safer and less expensive for residents of affordable housing facilities to shelter in place rather than to be evacuated during a disaster or grid outage.

    - The BPU should consider similar additional incentives or set-asides for projects located in low- and medium-income communities, as these communities are often harder hit by disasters and grid outages, have fewer resources with which to recover after such disasters, and have more difficulty in attracting investors or financing for resilient power systems. Alternately, the BPU might use the per-capita income of the municipality in its award calculation, as was done by Massachusetts DOER in its recent Community Clean Energy Resiliency Initiative.
- We recognize the reluctance of developers to divulge technical and financial information about projects, however, we believe it is in the public's interest that as much information as possible be made public, where public funding is committed. It is also in the state's interest, as this information will help to inform future energy storage projects. At the very least, quarterly performance reports should be made public, however, we urge the BPU to also make public the full project proposals for awarded projects, including financial and technical details.
- We understand the intention of the $0.05 per watt higher incentive for projects agreeing not to participate in the frequency regulation and demand response markets as a means to better understand the financial value of FR and DR; however, we see no reason to penalize projects for market participation, so long as they can ensure that market participation will not impair the project's ability to provide resiliency benefits. In addition, the proposed two-tiered incentive structure will not necessarily result in the BPU gaining the desired market information. We suggest instead requiring some degree of revenue reporting as an alternative method for gauging the financial value of FR and DR.

We appreciate the opportunity to comment on this straw proposal. Questions may be directed to Todd Olinsky-Paul, at Todd@cleanegroup.org

Philippe Bouchard
Eos Energy Storage
214 Fernwood Ave.
Bldg. B, Edison, NJ 08837

Regarding: Response to inquiry for public comments on FY2016 Renewable Electric Storage Incentive Program Straw Proposal

About Eos

Founded in 2008, Eos Energy Storage is a New Jersey-based battery storage producer. Our mission is to develop cost-effective energy storage solutions that are not only less expensive than other battery technologies, but less expensive than the most economical alternative used today to provide the same services – a gas turbine for peak power generation and transmission and distribution assets for delivery capacity.

Eos views energy storage as a solution to real business problems, and has developed a battery technology that responds directly to the requirements of the business case at hand. Our chemistry resulted in a novel, proprietary Znyth™ technology—the first low-cost, long-life, inherently safe, energy dense, and highly efficient aqueous battery.

Comments on Straw Proposal

Eos would like to thank the New Jersey Board of Public Utilities' Staff and the Market Manager for requesting feedback on the straw proposal and allowing us to respond.

Overall, we are glad to see continued interest and growth in the funding of Renewable Energy (RE) projects in New Jersey and see the renewal of 2015's solicitation as a continued sign of positive development.

Please allow us provide our comments on the proposal below.

1. There should be an equal pool of funds for non-municipal and municipal load.

We disagree with the position that, "Limiting incentive eligibility in this early iteration of the program to non-residential customer-generators allows funds to be used at facilities that serve the broader public need, rather than residences where benefits are limited to the individuals who reside there."

A key position of this proposal is to prioritize critical areas for RE development. By appropriating equal funds to all critical areas (both municipal and non-municipal), the market will be able to determine which areas are the most necessary and economic. Additionally, the purpose of the program is to provide reliability and resiliency. Although municipal facilities are good and generally accessible to the public—they don't represent the best fit lowest-cost means to provide reliability to the public

From the perspective of program-funding design, we suggest that we leave this open to the market to decide where projects for battery and solar PV should be installed and developed. This will produce the most reliability to ratepayers.

2. Incentives should be higher, allocated on a $/watt-hour basis, and distributed equally in all pools.

We believe the rebate amounts given at all four segmentations ($0.15 - $0.25 per watt) are too low to incentivize significant project build-out. As the Staff and Market Manager mention, the average request in 2015 was $0.39 per watt, and the average award received was $0.33 per watt. The prospective parties who are interested and would benefit from these programs have already analyzed and announced the rebates that they deemed appropriate for these projects. The Staff and Market Manager's inclination to "adjust as appropriate," will be an inevitable reaction to the interested parties' responses and will only delay the timeline for future projects and the build-out of resiliency infrastructure.

Emerging technologies have a significant amount of initial capital cost before they can be viable, standalone, and profitable resources. We encourage the Staff and Market Manager to incentivize increased applicants with a favorable rebate. An increased rebate with a result of too much interest is a better problem to have than a lower rebate with a much smaller pool of applicants.

In tandem, we believe incentives should come on a $/kWh basis, rather than the proposed $/kW. A $/kw rate incentivizes power batteries, not energy batteries. This does not align with the core objectives of this program to strengthen reliability and protect NJ ratepayers during catastrophic events like Hurricane Sandy. Power batteries are geared toward 15-30 minutes of total power, and energy batteries can provide 4 hours of use. We strongly suggest a rate on a $/kWh to: give longer duration for back-up power, provide resources with increased resiliency, and better align with the programs goals.

3. We would like clarification on the net-energy metering policy

We are unsure if the stipulation for inclusion mandates that projects have to be behind the actual meter, or if it is stating a resource must be under a net-energy metering tariff.

We suggest that both net-metered and non-net-metered projects be considered eligible for this incentive. Both sites still pay into the systems' benefits charge, and both types of projects benefit the grid. This promotes further competition and equal access for as many viable sites in New Jersey as possible.

Thank you for your time.

Philippe Bouchard

Eos Energy Storage

pbouchard@eosenergystorage.com

BEFORE THE NEW JERSEY BOARD OF PUBLIC UTILITIES

FY2016 Renewable Electric Storage Incentive Program

Straw Proposal

COMMENTS OF THE ENERGY STORAGE ASSOCIATION

Pursuant to the FY2016 Renewable Electric Storage Incentive Program Straw Proposal (”Proposal), the Energy Storage Association (“ESA”) appreciates the opportunity to submit the following comments and information for the Board of Public Utility’s (“Board”) consideration.

I. ABOUT THE ENERGY STORAGE ASSOCIATION

The ESA is an international trade association that was established over 20 years ago to foster development and commercialization of electricity storage technologies. Since then its mission has been the promotion, development and commercialization of competitive and reliable energy storage delivery systems for use by electricity suppliers and their customers.

ESA members represent a diverse group of entities, including electric utilities, energy service companies, independent power producers, technology developers involved with advanced batteries, flywheels, compressed air energy storage, thermal energy storage, pumped hydro, supercapacitors and component suppliers, such as power conversion systems. ESA’s members also include researchers who are committed to advancing the state-of-the-art in energy storage solutions. With that diversity in mind, we approach state programs with an eye toward a technology neutral, competitive, and transparent process that takes full advantage of the multiple benefits energy storage can provide.

II. COMMENTS OF ESA

ESA has participated in the working group process and has submitted formal comments to the Board previously.[1] ESA is pleased at the effort the Board and staff have put into this effort and believe that increasing deployment of energy storage in New Jersey will help the grid, the consumers, and the environment of the state.

III. ELIGIBILITY REQUIREMENTS

ESA is pleased that the Board has undertaken this effort and understands the overarching goals of the program to be focusing on applications behind the meter; limiting incentive amounts to allow for a greater number of projects; prioritizing facilities based on critical needs; facilitating integration with renewable energy systems; ensuring benefits accrue to the New Jersey taxpayer; and demonstrating energy storage value streams with a sustainable future market. We understand that a key driver to this program is the need to increase resilience and flexibility on the distributed grid serving New Jersey residents. We believe energy storage is well suited to meeting this need and that these technologies and applications can fulfill the goals of this initiative. It will be helpful to understand how this program functions in relation to other incentive programs, such as the Energy Resilience Bank, that the state has been undertaking.

IV. TECHNICAL REQUIREMENTS

ESA understands that the solicitation is limited to behind-the-meter systems at locations serving the overall public good and that those systems are to be installed in locations with

[1] See comments filed in FY2014 Energy Storage Straw Proposal Docket No. NOI-2014-0001: http://energystorage.org/system/files/resources/esa_nj_board_commentsfinal.pdf

existing renewable energy systems. In the future, ESA recommends broadening the scope to include distribution side systems in front of the meter as well so that increased storage capacity can be available for use on the grid. In addition to increasing resilience and enhancing reliability, those systems can provide resource adequacy in areas of local capacity constraint, serving the grid with multiple value streams, enhancing the benefits of energy storage, and lowering the cost of deployment. While we understand the need to stay focused on certain types of projects during this first year, ESA urges that future energy storage programs allow for multiple uses of these systems such that the grid and electricity consumers can access the full range of benefits energy storage can provide.[2]

V. PROGRAM OPTIONS

ESA recommends that the final proposal include a detailed schedule based on the structure of the program as well as an indication of how interested parties receive notices, participate in webinars and workshops, and other ways in which stakeholders can engage in the program. We believe that energy storage companies will be able to most effectively participate in the program with continued transparency of process.

ESA appreciates the opportunity to offer recommendations in this FY2015 Renewable Electric Storage Incentive Program Straw Proposal and looks forward to continuing to work with the Board and its stakeholders as this program is implemented in New Jersey.

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[2] A report by The Brattle Group, November 2014, analyzed the need to include multiple value streams in calculating the cost of storage, including reliability benefits.
http://www.brattle.com/system/news/pdfs/000/000/749/original/The_Value_of_Distributed_Electricity_Storage_in_Texas.pdf

Respectfully submitted.

ENERGY STORAGE ASSOCIATION

By its Policy Director,

Katherine Hamilton
ESA Policy Director
1155 15th Street, NW, Suite 500
Washington, DC 20005
k.hamilton@energystorage.org
202-524-8832

From:	Donald Powell
To:	publiccomments@njcleanenergy.com
Subject:	Straw proposal being considered
Date:	Friday, May 22, 2015 12:13:39 PM

To whom it may concern:

I am STRONGLY opposed to two provisions in the proposal.

1. Commercial solar systems (assuming they are "behind the meter") should not to choose between SRECs and net metering. This is a further erosion of the intent of the solar program. While I understand the need to maintain stability in the SREC market, this is the wrong way to go about it. Either increase the RPS requirements or exclude grid supply projects. This is a slippery slope that will end up killing the solar program in NJ which is doing so well at the moment bringing jobs and a better, cleaner environment to all the residents.
2. Excluding systems with batteries from SRECs is just plain ridiculous and wrong headed. Through net metering a solar system can make as much electric as the facility size is capable of and can send it to the grid for credit. With batteries in a system the stability of the grid is enhanced, resilience is increased, there is still no net increase in electric produced. All that happens is that what was originally "dumped" on the grid during daylight hours can now be stored for later use and can act as a buffer resource for the EDC. Batteries are a win/win. Why on earth would you want to penalize a customer who spends the extra money to install a better, more stable system. If anything, you should be incentivising battery systems.

--

Donald Powell LEED AP
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4308 Bridgeboro Road
Moorestown, NJ 08057
Donaldgpowell@gmail.com
856-380-0709 ph
856-380-0710 fax

Thank you.

May 28, 2016

VIA EMAIL

RE: COMMENTS OF SUNEDISON, INC.
ON PROPOSAL FOR FY'16 RENEWABLE ENERGY STORAGE PROGRAM

B. Scott Hunter
Renewable Energy Program Administrator
Office of Clean Energy
Division of Economic Development & Energy Policy
New Jersey Board of Public Utilities
44 S. Clinton Ave.
Trenton, NJ 08625

Dear Scott:

SunEdison appreciates the opportunity to comment on the New Jersey Board of Public Utilities' Staff and Market Manager Straw Proposal for a FY2016 Renewable Energy Storage Program (Straw Proposal). Under the Straw Proposal, the DPU would make available up to $6 million in funding for the integration of storage with qualified existing Class I RPS behind-the-meter systems through a standard offer incentive. As the world's leading renewable energy project developer, with a growing portfolio of customer-sited storage/renewable energy systems active in organized frequency regulation markets, SunEdison has a keen interest in the outcome of this matter.

SunEdison generally applauds the BPU for its early-stage support of the energy storage industry, and in particular the Staff Straw proposal. As the Straw Proposal notes, energy storage paired with clean and renewable on-site generation provides unique and significant benefits, including but not limited to enhanced energy resiliency and uninterrupted power supply for critical loads, consumer and grid benefits through the reduction in peak loads, and contribution to grid stability through the provision of ancillary services such as frequency regulation. Just as we saw in solar, the costs of storage will continue to come down – and we predict dramatically, particularly as valuable services provided by on-site storage can be recognized and monetized in organized markets. Early stage support like that offered by the BPU, and hopefully other jurisdictions as well, will be critical to accelerating storage adoption that will provide multiple benefits to solar customers, the grid. and ratepayers.

Notwithstanding this overarching support for the Staff Straw Proposal, SunEdison offers the following *four* specific comments and suggested revisions. Overall, these changes will support the BPU's deployment objectives at lower cost to ratepayers.

First, SunEdison urges the BPU Staff to remove the limitation on funding to customers with existing Class I facilities. This limitation will discourage customers from pursuing an integrated energy solution to meet their specific energy needs. Not only will this required "staging" result in a higher total cost of installation and foregone efficiencies, it is out of step with what the market demands. Moreover, while we appreciate the BPU's desire to avoid further contributing to the current SREC market oversupply, we believe this is a crude, indirect and ineffectual means of addressing the problem. In essence, denial of incentives for prospective storage applications will likely only impact the customer's decision to deploy storage today; it will not foreclose their ability to install on-site solar. Then, once a customer has an operational system, they will qualify for storage incentives in future funding rounds as an existing solar customer. In any event, even if it is assumed that but for the storage incentive the solar installation would not have gone forward, at a $6 million funding level for storage this will have an immaterial effect on the 1,500 MW New Jersey solar market. In short, we believe this restriction will do more harm than good and should be removed.

Second, we would urge the BPU to reconsider the transition away from a competitive solicitation. The Straw Proposal provides a fairly complete enumeration of the advantages and disadvantages of alternative incentive delivery mechanisms, so we will not repeat them here. Further, New Jersey has an extensive history with each of the described approaches that it can draw on. Suffice it to say that, in our view, the main advantage of a prescriptive rebate format (e.g., incentive level transparency) is outweighed by its drawbacks; namely, a lesser "bang for the ratepayer buck" in terms of both installed capacity and project quality. A competitive solicitation format encourages market discipline and "right sizing" of incentives, and better allows the BPU to emphasize other non-economic criteria in project selection.

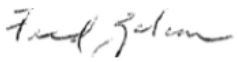
Nonetheless, should the BPU opt for a prescriptive rebate format for the next round of storage grants, given the limited funding available, it should take care to ensure that only advanced-stage projects can reserve incentives. Our experience has been that without these entry conditions, immature projects can crowd out those in more advanced stages of development, resulting in high attrition rates. Some key milestones for the BPU to consider would be: 1) certification that all non-ministerial permits have been applied for; 2) preliminary interconnection reviews conducted by the utility; and 3) evidence of a binding contractual agreement between the project developer and customer. We also support the Straw Proposal's provision for forfeiture of 10% of incentive funding for projects that cannot achieve commercial operation within 12 months.

Third, we see absolutely no legitimate reason to provide a bonus incentive if systems do not participate in frequency regulation or demand response. Why would the program want to incentivize systems that have less overall value to customers, the grid, and ratepayers? A benefit of taking advantage of multiple revenue streams is exactly how to best reduce cost and increase value of solar plus storage systems –benefits that accrue to both solar customers and ratepayers.

Lastly, the Straw Proposal provides for underwriting of 50% of the study costs in the event Level 3 interconnection review is required by the distribution utility. As we have argued in other BPU venues, we believe that the presumption of a Level 3 review for all storage systems participating in frequency

regulation markets is not justifiable from a safety or reliability perspective, and imposes undue burdens on customer participation in FERC-jurisdictional markets. We are concerned that subsidization of developer costs associated with Level 3 review will be interpreted as a blanket invitation by the distribution utilities to direct such studies. The BPU should make clear that its agreement to co-fund such studies not be construed as an endorsement of the need for such study in a particular application, and that the BPU will retain its independent authority to review all such requirements per the BPU's interconnection regulations.

Respectfully submitted,



Fred Zalcman
SUNEDISON, INC.

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May 29, 2015

B. Scott Hunter
Renewable Energy Program Administrator,
Office of Clean Energy
Division of Economic Development and Energy Policy
New Jersey Board of Public Utilities
44 S. Clinton Ave., POB 350
Trenton, NJ 08625-0350

Scott,

NJR Clean Energy Ventures provides the following comments on BPU staff's EY16 battery storage incentive proposal.

We agree with staff's approach to reserve a portion of the budget dollars for projects other than frequency regulation and for critical public facilities. Frequency regulation is not a priority in the Energy Master Plan, and there are indications this market may become saturated and unsustainable to support battery projects in the near term.

With a continued program requirement that the project be installed behind the meter and connected to a solar system, the most relevant battery storage use case to be pursued is "load shifting" for commercial sites subject to utility demand charges. The BPU should encourage projects which demonstrate that batteries can be used to clip peak loads for commercial customers and save demand charges, and to act as capacity resources to reduce the costs of meeting coincident system peaks. Rather than differentiate rebates based on "ancillary" and "non-ancillary" uses, we would explicitly define the target use case as "commercial load shift".

To implement a program targeted to this market segment and for this specific use, the BPU proposed incentives will need to be increased from the $.15 to $.20 per watt with a 30% cost cap to over $2.00 per watt with a 50% cost cap. Additional technical requirements should be implemented to minimize the potential that participants would benefit from any higher incentive while also participating in the frequency regulation market. Suggestions are provided below:

> **Incentives**: The most relevant comparable benchmark we are aware of is Con Ed in NY, which has recently implemented a $2.10 per watt rebate for commercial battery storage projects with a 50% cost cap (>50kW) which can reduce load at times of system coincident peak. With this incentive plus demand charge reductions which accrue at rates in excess of $20 per kW per month, we estimate a NY storage project could realize a 3 year simple payback. With NJ demand charges less than $10, the payback at $2.10 per watt rebate is over 7 years. Given the early stage of this market, and the need to encourage participants to take risks and prove the technology, incentives for NJ projects may need to be higher than those offered in NY. Given uncertainty on install costs at this time, a competitive

solicitation rather than a prescriptive rebate may be better suited for this use case. Regardless of incentive structure, while sensitive to administrative costs and burdens of measurement and verification, we believe incentives with payouts tied to project performance are preferable to up-front payments.

Technical Requirements: To minimize the potential that participants will use the batteries under the load shifting program for frequency regulation, batteries in the "commercial load shift" program should be sized for a minimum of 2 hours of storage duration versus 15-30 minutes which is optimal for regulation markets. In addition, the application should include a description of the software control technology which will be used to predict and clip peak loads, and the final rebate payment contingent on an onsite demonstration of the use of that control system. Contractual restrictions on use can also reinforce these technical requirements.

The BPU should seek to collect and publish aggregate information on the effectiveness of these battery projects in meeting the intended uses. If possible, battery projects should be prioritized in those sites which already participate as demand response resources, and the battery use can be operated and tracked in response to system operator calls to reduce load. In terms of reducing monthly site peaks, a performance score should be developed leveraging reports and analytics from the control system software which provides an indication of plan versus actual demand reduction as enabled by the battery.

CEV appreciates the opportunity to comment on the staff proposal and we look forward to discussing these ideas with stakeholders.

Sincerely,

Larry Barth
Director – Policy & Strategic Initiatives

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www.njrcleanenergyventures.com

SEIA Comments on EY2016 Renewable Electric Storage Incentive Program
May 29, 2016

Dear Mr. Hunter,

The Solar Energy Industries Association (SEIA) appreciates the opportunity to submit comments on Staff's May 7, 2015 Straw Proposal for the EY16 Renewable Electric Storage Incentive Program.

SEIA is the national trade association for the U.S. solar industry and is a broad-based voice of the solar industry in New Jersey. SEIA member companies have installed over 60% of all MWs currently under operation in New Jersey and work in all market segments – residential, commercial, and utility-scale. In addition, SEIA member companies provide solar panels and equipment, financing and other services to a large portion of New Jersey solar projects. When establishing its policy positions, SEIA must balance diverse needs of its membership.

In its Straw Proposal, Staff highlights three main factors motivating New Jersey to accelerate the market for and adoption of battery storage technologies: shifting the use of renewable generation to more optimal times of the day, thereby increasing the efficiency of the electricity system and reducing peak energy and capacity prices, (time shifting); providing some of the additional frequency regulation that may be required with higher levels of intermittent renewable resources (frequency regulation); and hardening the states' electric infrastructure and allowing essential services to continue to operate during power outages (resiliency). Staff built on the successes and experience gained from the EY15 program to develop its Straw of the EY16 Program.

SEIA's comments are divided into the following categories:

- Design the incentive to balance the three goals of time shifting, frequency regulation, and resiliency
- Leverage federal funds to reduce costs to New Jersey ratepayers by allowing new renewable energy systems to participate in the EY16 program
- Efficiently deploy program resources by ensuring efficient reservation of scare incentive dollars
- Provide transparency in how incentive levels may be adjusted
- Clearly state that the reimbursement for 50% of the cost of Level 3 interconnection is not an invitation to the EDCs to require Level 3 studies

I. Design the incentive to balance the three goals of time shifting, frequency regulation, and resiliency

All three of the goals outlined in the Staff Straw – time shifting, frequency regulation, and resiliency – deliver real benefits to the ratepayers and citizens of New Jersey. When designing a battery storage incentive program, it is important to consider how the

structure of the incentive – particularly whether one is incentivizing capacity (kW) or energy (kWh) – influences the design of the storage system and the ultimate ability for the program to reach each of the stated goals.

An energy storage system designed for peak shaving or time shifting, would likely be designed with a long runtime (3-5 hours), such that the system would be capable of "shifting" a relatively large quantity of solar production from hours where there is excess generation, to hours where there is a shortage of generation during peaking times. While the power capacity (kW) of this type of system is important and must be sized appropriately, it is the energy capacity (kWh) of the system that is the critical parameter that ultimately constrains how much solar production can be shifted.

An energy storage system designed to provide frequency regulation services in an RTO market will be geared with a short runtime, because power output, not energy capacity, is the critical factor for revenue potential. A participant in the frequency regulation market generates revenue by charging and discharging in response to a 2-second fluctuating signal, and is compensated on the quantity of power that it can match to this signal. The participant is thus incentivized to maximize the power capacity over energy capacity of the battery.

Historically, average blackout duration in the US has been approximately 3 hours.[1] Given the duration of the average blackout, it is logical that energy storage systems designed for resiliency purposes would be configured with an emphasis primarily on energy capacity and sufficient runtime. For example, a 500 kW / 1 MWh kWh system with a 2 hour run time arguably has 4 times the resiliency capabilities of a 500 kW / 250 kWh system (30 minute run-time).

To balance these three objects, when considering the costs of a system, it is imperative to consider system costs for power ($/kW) *and* energy ($/kWh). As previously discussed, the value and cost of an energy storage system can be measured on a power ($/kW) or energy ($/kWh) basis. One of these metrics used in isolation or without a defined runtime is insufficient in defining the overall cost and value of a system for a particular application that is supposed to meet multiple objectives.

Take, for example, the results of the FY2015 solicitation which provided for an incentive based solely on power (kW) – all of the systems proposed were roughly ½ hour runtime systems, optimized for frequency regulation over time shifting and resiliency.

Recommendation:
Since the three stated objectives of the BPU's storage program rely on two different performance requirements – power (kW) for frequency regulation and energy (kWh) for resiliency and time shifting, Staff should strongly consider options that incorporate both of these criteria in the design of the incentive structure.

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[1] Eaton Report: Blackout Tracker. United States Annual Report 2013)

[2] While the majority of system costs in the FY2015 solicitation were between $1200/kW and $1500/kW, all

The BPU could split the incentive between $/kW and $/kWh, giving projects the flexibility to optimize for more than one criteria. The below chart uses the proposed $0.2/kW incentive value for illustrative purposes only. Actual incentive level values would need to be calculated based on previous experience.[2]

Split Incentive Level		Battery System Size		
$/W	$/Wh	kWac	kWh	Total Incentive
$0.10	$0.10	1,000	1,000	$200,000
$0.10	$0.10	1,000	500	$150,000
$0.10	$0.10	500	1,000	$150,000
$0.10	$0.10	1,500	500	$200,000
$0.10	$0.10	500	1,500	$200,000

At the very least, if the BPU does not establish incentives for both energy and capacity, then the BPU should clearly state that it realizes that its incentive structure is not balancing the three goals of the program.

II. Leverage federal funds to reduce costs to New Jersey ratepayers by allowing new renewable energy systems to participate in the EY16 program

The position in the Straw Proposal to limit projects to already existing renewable energy projects is based on an assertion that allowing new projects to incorporate battery storage and participate in this program might potentially 'motivate investment in solar that would not otherwise be cost effective thereby contributing to the current SREC oversupply situation'.

There are two main issues here. First, we do not know definitively that allowing a project to also incorporate storage would cause projects to get built than would otherwise be built. At $0.2/kW, the proposed $6m budget for FY16 would incentivize roughly 30MW of storage. GTM Solar Market Insight report predicts that the NJ market will install 300MW in 2016. In comments on other issues, SEIA has focused on impact on the SREC market as a critical consideration. However, even if the assertion in the Staff Straw has some merit and some fraction of new build PV projects would not have gone forward but for the storage incentive program, the size of the budget makes any potential impact de minimus.

Such a de minimus potential impact must be balanced with the competing policy objectives of deploying energy storage systems and leveraging federal dollars to reduce the costs to

[2] While the majority of system costs in the FY2015 solicitation were between $1200/kW and $1500/kW, all of the systems proposed were roughly ½-hour runtime systems, and thus have $/kWh costs ranging between $2400/kWh and $3000/kWh.

New Jersey ratepayers. The Federal Investment Tax Credit is currently set to revert from 30% down to 10% at the end of 2016. Allowing for new solar systems that incorporate batteries are a very prudent use of ratepayer funds as such systems can include the cost of the battery in the ITC basis.[3]

Recommendation:
Realize ratepayer savings by allowing new renewable energy projects to participate in the FY2016 program and calculate the appropriate adjustment to the incentive level, based on savings from the Federal ITC and efficiencies from incorporating both solar and storage into a project.

III. Efficiently deploying program resources by ensuring efficient reservation of scarce incentive dollars

SEIA generally supports open enrollment incentive programs. Since projects reserve incentive capacity on a first come first serve basis in an open enrollment program, requiring sufficient project maturity to secure scare funds is important for a well functioning program. Ensuring that speculative projects are not allowed to reserve scarce incentive dollars will help to improve the overall quality of projects as well as the completion rate. Based on our experience elsewhere, we have found that different companies have different approaches to project development, and allowing some flexibility in the criteria for reserving program capacity is important for allowing for the different approaches.

Recommendation:
Establish two tracks for showing sufficient project maturity: a Maturity Track and a Deposit Track.

In the Maturity Track, developers should demonstrate that certain project milestones are met. In this track, no deposit is needed.

- Require certification that all non-ministerial permits have been applied for
- Require preliminary interconnection reviews conducted by the utility
- Require evidence of a binding contractual agreement between the project developer and customer.

In the Deposit Track, developers must meet a much lower threshold of project maturity and also must post a significant deposit, such as a % of the incentive amount, that is forfeited if the project is not completed in a timely manner and is returned to the developer upon project completion.

Furthermore, SEIA supports the Straw Proposal's provision for forfeiture of 10% of incentive funding for projects that cannot achieve commercial operation within 12 months and require a 6 month extension.

[3] http://www.chadbourne.com/In_Other_news_Batteries-04-01-2013_projectfinance/

IV. Providing transparency on how incentive levels may be adjusted

SEIA agrees with Staff's stated approach to establishing incentive levels of starting off with a more conservative number for incentive levels so as not to over incentivize projects but reserving the ability to revisit and readjust the incentive level upwards if uptake is not sufficient. However, we have also found that transparency to the market around this adjustment mechanism is critical for a successful program.

Recommendation:
Establish transparency as to how incentive levels will be adjusted based on market conditions, including which factors Staff will consider and at what point in time.

V. Clearly state that the reimbursement for 50% of the cost of Level 3 interconnection is not an endorsement of the EDCs requiring Level 3 studies

The Straw Proposal provides for the reimbursement of 50% of the study costs of any Level 3 interconnection study required by the EDCs. As we have argued to the BPU in other venues, we do not believe that Level 3 interconnection reviews for all projects participating in frequency regulation markets is not justified from a safety or reliability perspective. We are concerned that the reimbursement provided for in this program would set the expectation amongst the EDCs that the BPU agrees that Level 3 interconnection studies are necessary for these projects.

Recommendation:
The BPU should make it clear that the reimbursement for 50% of Level 3 study costs under this program is not an endorsement of the necessity of such studies for all projects and that the BPU maintains its independent authority to review such requirements per the BPU's interconnection regulations.

In closing, SEIA understands the normal CRA funding cycle is done on a multi-year basis and that the current year-by-year approach is not normal. We look forward to working with the BPU on a multi-year approach to energy storage as soon as the 4-yr CRA cycle resumes.

Thank you again for the opportunity to provide comment.

Sincerely,

Katie Bolcar Rever
Director, State Affairs
Solar Energy industries Association
krever@seia.org

Jersey Central Power & Light
A FirstEnergy Company

300 Madison Avenue
P. O. Box 1911
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May 29, 2015

Via email to publiccomments@njcleanenergy.com

B. Scott Hunter
New Jersey Board of Public Utilities
Office of Clean Energy
44 South Clinton Avenue
P.O. Box 350
Trenton, New Jersey 08625

Re: FY2016 Renewable Electric Storage Incentive Program Straw Proposal

Dear Mr. Hunter:

Jersey Central Power & Light Company ("JCP&L" or the "Company") is pleased to submit comments on the Board of Public Utilities ("BPU") Staff's ("Staff") "FY2016 Renewable Electric Storage Incentive Program Straw Proposal" dated May 07, 2015. While JCP&L is supportive of the State's renewable energy goals, it is important that the BPU recognize the potential impacts and associated costs that energy storage projects can have on a utility's distribution system, and its ability to provide safe and reliable electric service.

The straw proposal states, within the "Program Goal" section on page 2, that the Program seeks to benefit New Jersey ratepayers by supporting the installation of renewable electric storage systems for a variety of reasons, including "…helping to stabilize the electric distribution system through the provision of frequency regulation services." The Company points out that when it comes to system frequency, there is basically one system. That is the entire PJM system, from a 120 volt service to a street light to the 500 kV, or higher, transmission system. System frequency is monitored on the transmission system, which is where Frequency Regulation ("FR") is best applied. Frequency regulation occurring on the distribution system may help maintain the 60 Hz frequency on the entire electrical system. However, depending on the amount of FR deployed on the local distribution system, there could be adverse effects to the voltage on the distribution circuit, increased wear and maintenance on the distribution circuit voltage regulation equipment and other power quality problems. The Company is still analyzing the additional impacts on distribution equipment and operations, as well as the maintenance costs, associated with the operation of FR on the distribution system. The Company reserves the right to assess fees appropriate to help offset those additional costs.

The Company also notes that within the "Technical Requirements" section on page 4 of the straw proposal, the language of the second bullet has been modified from the requirements of the current program by allowing for charging of the storage device by on-site fossil-fueled generation, or by import from the distribution system solely for the purpose of "…short-term charging and discharging that enables ancillary services with no material net import or export from the grid." By law, net metering is only available to Class I renewable energy production. Despite the fact that there may be minimal "net" energy flow while participating in the PJM FR market, the actual

energy flows on the electric distribution company's ("EDC") electrical distribution system can be substantial. These FR systems have the potential to have twice the impact on the distribution system voltage and voltage regulation equipment than a PV system of comparable rating would have. JCP&L believes that those using the distribution system should be paying for the use of the system. Otherwise, these costs must be inappropriately shifted to other customers. The Company is also currently investigating FR operations to assess the impacts and potential additional maintenance and cost resulting from increasing amount of frequency regulation

The Company recognizes that frequency regulation is one potential use of energy storage devices. Their installation and proposed use must be thoroughly studied in order to assess any impact they may have on the distribution system and circuit configuration. However, despite the fact that the straw proposal would limit use for frequency regulation so "no material net import or export from the grid" is realized, there is an issue of non-renewable energy that is used to charge and discharge the storage device. If the intent is to use energy storage devices for frequency regulation, a configuration such as this should not be eligible for net metering. In order for a storage device installed with a PV system that is also designed to provide frequency regulation services to be eligible for net metering, the appropriate additional metering should be installed to properly record the energy produced that qualifies as renewable and qualified for net metering, as opposed to that which would be sourced from grid supply or ineligible for net metering and therefore subject to retail energy charges.

The EDCs have engaged in discussions with the Net Metering and Interconnection Working Group relative to the issues of energy storage and the proper metering. The EDCs have developed and presented methods of metering that appropriately accounts for renewable energy eligible for net metering, as well as energy that is not eligible for net metering.

In addition, PJM has certain conditions relating to demand response and frequency regulation. The Company proposes that the following bullet be added to the "Technical Requirements" section to address this:

- Energy deliveries into the EDC's electrical system are not permitted under PJM's Demand Response Frequency Regulation program. The customer will be required to cease all energy exports during scheduled participation in the Frequency Regulation program. The EDC will determine the need for any additional metering required to verify performance.

The Company observes that the program's incentive structure provides for a higher per-watt incentive for projects that agree not to participate in ancillary markets such as FR and demand response ("DR"). This incentive structure would raise the possibility that some participants may install projects that initially are not participating in FR and DR activities in order to receive a higher incentive amount, and later convert the projects to participate in such ancillary markets. While the program proposes quarterly reporting requirements for the first 12 months of operation that should identify this behavior, it appears as if there is no continuing oversight beyond this time period. The Company recommends that the program develop the proper safeguards to protect against this possibility for overpayment of incentives.

Lastly, maintaining circuit reliability in the face of additional distributed energy resources is of particular concern to the Company. Depending upon the distribution circuit, the Company needs the ability to require that some energy storage systems cease operations during times of localized

system constraints (storm damage, car-pole accidents, maintenance, etc.) or permanently cease frequency regulation in the event the Company needs to reconfigure the distribution system to accommodate future load growth. Additional impacts and costs associated with mitigating the variable operations of renewable electric storage on distribution equipment, operations and maintenance must be identified and recovered.

The Company appreciates the opportunity to provide these comments.

Very Truly Yours,

Thomas R. Donadio

Comments on New Jersey's FY 2016 Renewable Electric Storage Incentive Rebate Program

A.F. Mensah, Inc.

Comment 1

- This year's program should also look into grid reliability and resiliency from the point of view of an Electric Utility
- The program should consider providing rebates to private developers that can demonstrate reliability and resiliency benefits through partnership with an electric utility.
- From a grid reliability perspective, benefits other than frequency regulation can be achieved by managing high penetration solar and by demonstrating a flattening of the Utility's load duration curve.
- Battery Storage systems may not necessarily need to be installed on public and critical facilities to demonstrate grid reliability and resiliency in partnership with a Utility.

Comment 2

- The requirement for integration to a RE system should not be a physical one, but a virtual one.
- To that end, a stand-alone storage deployment should be considered to the extent it is supporting more deployment of renewable energy on saturated feeders or enhancing the stability of feeders to enable better performance on existing renewables.

Comment 3

- One of the Program's goals is to support installation of renewable energy systems. If a new renewable energy project is currently not cost effective because of market dynamics or grid conditions and a battery storage can solve those issues while at the same time addressing resiliency, and reliability of the grid, then this new project should be supported by this incentive rebate program.

Comment 4

- Rather than having a set aside, the program should just provide a higher per watt incentive for public and critical facilities, along with some performance conditions.
- These public and critical facility projects that seek a higher incentive must also demonstrate that battery can use the entire daily generation from the RE system on a daily basis during an outage.

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CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

STEFANIE A. BRAND
Director

May 29, 2015

By Hand Delivery and Electronic Mail
Honorable Irene Kim Asbury, Secretary
NJ Board of Public Utilities
44 South Clinton Avenue, 9th Floor
P.O. Box 350
Trenton, New Jersey 08625-0350

Re: Comments of the New Jersey Division of Rate Counsel
Fiscal Year 2016 Renewable Electric Storage Incentive Program
Straw Proposal Issued May 7, 2015

Dear Secretary Asbury:

Please accept this original and ten copies of Comments submitted on behalf of the New Jersey Division of Rate Counsel ("Rate Counsel") in connection with the above-captioned matter. Copies of the comments are being provided to all parties on the e-service list by electronic mail and hard copies will be provided upon request to our office.

We are enclosing one additional copy of the comments. Please stamp and date the extra copy as "filed" and return it in our self-addressed stamped envelope.

Thank you for your consideration and assistance.

Respectfully submitted,

STEFANIE A. BRAND
Director, Division of Rate Counsel

By: Felicia Thomas-Friel
Felicia Thomas-Friel, Esq.
Deputy Rate Counsel

FTF/kf

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Comments of the New Jersey Division of Rate Counsel
Re: Fiscal Year 2016 Renewable Electric Storage Incentive Program Straw Proposal
May 29, 2015

The Division of Rate Counsel would like to thank the Board of Public Utilities ("Board") and its Office of Clean Energy ("OCE" or "Staff") for the opportunity to present comments in response to the Fiscal Year 2016 Renewable Electric Storage Incentive Program Straw Proposal ("Straw Proposal") issued by OCE on May 7, 2015.

INTRODUCTION

OCE's Renewable Electric Storage Incentive Program, formerly referred to as the Energy Storage Program, originated with a proposal in the Fiscal Year 2014 Clean Energy Program ("NJCEP") Compliance filings, which was adopted by the Board in June 2013. I/M/O the Clean Energy Programs and Budgets for the Fiscal Year 2014, BPU Dkt. No. EO12050376V, Order at 7, 32 (June 23, 2013) ("FY14 Budget Order").[1] Staff initiated a stakeholder process which resulted in the Board's approval of an initial solicitation with a budget of $3 million in Fiscal Year 2015.[2] The Board approved awards totaling $3 million to 13 of the 22 applicants on March 18, 2015.[3] The Straw proposal was issued following an April 13, 2015 meeting of OCE's Energy Storage Working Group at which the participants discussed results of the solicitation and issues related to the future design of the energy storage program.[4]

In the Straw Proposal, Staff proposes a fundamental change in the structure of the program, from a solicitation process to an open enrollment process with administratively prescribed rebate amounts.[5] Rate Counsel opposes this proposed change. As is explained in more

[1] Straw Proposal, p. 1.
[2] Straw Proposal, p. 1.
[3] Straw Proposal, p. 2.
[4] Straw Proposal, p. 1.
[5] Straw Proposal, p. 7.

detail below, a competitive process is needed to achieve the objective of incentivizing energy storage in the most cost-effective manner. Instead of abandoning the competitive process, OCE should seek to improve it by soliciting input from the participants in the first solicitation and developing ways to simplify and streamline the process. Rate Counsel supports OCE's efforts to assure that storage projects receiving NJCEP incentives are integrated with and being used to support renewable generation facilities.

RATE COUNSEL COMMENTS

I. Proposed Change From Competitive Process to Open Enrollment

In the Straw Proposal, OCE considers three "program delivery options" for the energy storage program Fiscal Year 2016: (1) the same competitive solicitation process that was used in Fiscal Year 2015, (2) a "rolling solicitation" that would retain an evaluation process but would have an open enrollment period rather than a limited window for submitting applications, and (3) a "traditional" open enrollment process with administratively determined rebate amounts. The Straw Proposal presents three tables cataloguing advantages and disadvantages of each approach, and concludes: "weighing the positive and negative factors of each option against the others, an open enrollment program with a prescriptive rebate offers greater benefits to both applicants and ratepayers than either the competitive or rolling solicitation formats."[6] As further explained in the Straw Proposal:

> The open enrollment/prescriptive rebate with multiple funding cycles provides greater flexibility in allowing for mid-course adjustments to budgets, incentive levels and marketing efforts; quicker turnaround in processing and approving applications; greater convenience for applicants in submitting applications on their own schedules; and fewer commitments of time and resources by outside organizations involved in the evaluation process. Having gained some insight to storage project costs and benefits with the experience from the FY15 program design, the benefits from the proposed approach are anticipated to outweigh the

[6] Straw Proposal, p. 6-7.

> drawbacks of potentially overfunding projects; funding projects submitting complete applications without regard to cost-effectiveness; and operating on a first-come, first-served basis instead of ranking applications against each other.[7]

The above explanation is not an adequate justification for abandoning a competitive solicitation process. While an open enrollment process may be more convenient and flexible for applicants and program administrators, it is in no way beneficial to ratepayers.

Of the three options presented in the Straw Proposal, the competitive process followed in Fiscal Year 2015 is the only one that has the advantages of "ensur[ing] that only the most cost-effective projects are funded" and providing "[m]ore effective budget management and control."[8] These benefits are not listed for either of the other two options. In fact, the "rolling solicitation" option lists as an "advantage" that it would remove the element of competition that creates "winners and losers"[9]—apparently suggesting that the selection of less economically viable projects is a benefit. The Straw Proposal also explicitly recognizes that the option proposed by OCE, open enrollment with prescriptive rebates, will "[f]und all projects that submit complete applications regardless of cost effectiveness" and may provide higher-than-necessary incentives.[10]

The option that offers the greatest benefits to ratepayers is continuation of the solicitation process followed in Fiscal Year 2015. Energy storage technologies are relatively new and rapidly evolving. As the Board and its Staff are aware, the price of solar photovoltaic technology has declined dramatically in recent years.[11] It is likely the cost of renewable electric storage will also fall as technologies improve. The removal of competition in favor of an open enrollment policy

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[7] Straw Proposal, p. 7.
[8] Straw Proposal, p. 5.
[9] Straw Proposal, p. 6.
[10] Straw Proposal, p. 6.
[11] See NJCEP SREC Pricing Archive, available at http://www.njcleanenergy.com/renewable-energy/project-activity-reports/srec-pricing/srec-pricing/archive.

will likely result in funding fewer, and less economic, projects than would be the case if applicants for incentives are required to "sharpen their pencils" in order to submit a winning application.

The disadvantages cited by OCE for the competitive solicitation process are not sufficient to outweigh its clear economic advantages. The cited disadvantages include an application and approval process that is less convenient and more time consuming for applicants and evaluators, and its prohibition on communications with applicants who have submitted incorrect or incomplete applications.[12] These disadvantages could be addressed without abandoning the competitive process. For instance, improved information and marketing could assist applicants in submitting complete applications, and more widely publicized and/or more extended schedules could facilitate participation from entities that require longer lead times to prepare application packages. Elements of the application packages that were difficult for applicants, or that were less useful in evaluating and ranking applications, could be modified or eliminated.

It would be premature to change the entire structure of the program after only one solicitation. Instead, OCE should use experience gained from the first solicitation to improve the next one. OCE could solicit feedback from participants in the first solicitation on ways the process could be improved. Applicants and prospective applicants, as well as members of the evaluation committee, may have suggestions for simplifying and streamlining the process.

II. Integration With Renewable Generation

As acknowledged in the Straw Proposal, energy storage is neither energy efficiency nor renewable energy, and therefore is appropriate for NJCEP funding only if it serves to support the

[12] Straw Proposal, p. 5.

development of renewable energy markets.[13] At the April 13, 2015 Working Group meeting, and in the Straw Proposal, OCE has recognized that storage projects participating in the PJM Interconnection ("PJM") ancillary services markets may have less capacity available for load shifting and emergency backup for the renewable facility they were installed to support.[14] Rate Counsel has previously expressed concern about the use of New Jersey ratepayer funds to support projects that may be used to alleviate transmission-level operational constraints.[15] Rate Counsel supports the elements of the Straw Proposal that seek to assure that ratepayer funding is limited to projects that used are to support renewable generation.

First, the Straw Proposal includes maintaining eligibility and technical requirements that assure that projects receiving funding are integrated with existing Class I renewable resources.[16] Rate Counsel supports these continue requirements.

Second, the Straw Proposal's recommended administratively determined incentives are 5 cents per watt higher for projects that will not participate in the PJM ancillary service markets. The Straw Proposal states that the differential will facilitate OCE's understanding of the financial value of frequency regulation and demand response, and help inform the design of future storage incentive programs.[17] While Rate Counsel does not support administratively determined incentives for the reasons explained above, Rate Counsel supports the objective of recognizing that projects not participating in the ancillary services markets will have more capacity available for load-shifting and backup power for solar facilities. Rate Counsel

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[13] Straw Proposal, p. 2.
[14] Straw Proposal, p. 8.
[15] I/M/O the Comprehensive Energy Efficiency and Renewable Energy Resource Analysis for the 2013-2016 Clean Energy Program, BPU Dkt. No. EO11050324V, Rate Counsel Comments, p. 20-21 (Nov. 7, 2011).
[16] Straw Proposal, p. 2, 3 & 4.
[17] Straw Proposal, p. 8.

accordingly would support inclusion of eligibility and evaluation criteria that would achieve this same objective in the context of a competitive solicitation.

Third, the Straw Proposal includes proposed reporting requirements for projects receiving incentives. These include collecting and reporting data on how the storage capacity is being used.[18] Rate Counsel supports the proposed reporting requirements, which will help identify any program changes that are needed to assure that ratepayer funds are used for proper purposes.

CONCLUSION

For the foregoing reasons, Rate Counsel opposes OCE's proposal to change the Renewable Electric Storage Incentive Program from a competitive solicitation process to an open enrollment process with administratively determined incentive levels, and recommends instead that the OCE seek to improve the competitive process based on experience and lessons learned from the first solicitation. Rate Counsel does support OCE's proposal to assure that incentives under this program are limited to projects that are used to support renewable generation.

[18] Straw Proposal, p. 9.

NEW JERSEY BOARD OF PUBLIC UTILITIES

FY2016 Renewable Electric Storage Incentive Program
Straw Proposal (May 7, 2015)

Comments of SolarCity Corporation

Introduction

SolarCity strongly supports the New Jersey Board of Public Utilities and Staff in their efforts to advance development and implementation of renewable energy storage systems and the expansion of the FY2016 Renewable Electric Storage Incentive Program. Based on its experience developing and operating energy storage systems, SolarCity respectfully submits these comments regarding the FY2016 Renewable Electric Storage Incentive Program Straw Proposal. New Jersey has found that its ratepayers can benefit from the installation of renewable energy storage systems in three ways: load shifting, back-up power for critical loads, and frequency regulation. These comments outline our approach to accomplishing these program-wide goals while acknowledging the fundamental differences inherent in deploying systems that meet each individual goal. Specifically, SolarCity suggests that in order to accomplish its goals regarding load shifting and back-up power, the FY2016 program must value energy storage systems with the extended runtimes required to achieve these goals.

One corollary incentive program that we feel the NJBPU can utilize as a reference point when structuring their proposed program requirements is the California Self-Generation Incentive Program (SGIP). With over 144 MW of storage projects either reserved, in progress, or completed, the SGIP program is definitively the most successful storage rebate program in the U.S. and we feel the NJBPU can apply lessons learned from SGIP to improve the effectiveness of the storage incentive funds deployed in New Jersey. One requirement of SGIP is a 2-hour runtime requirement for any storage system participating in the SGIP program. We highlight this 2-hour SGIP requirement early in the document as it will become a recurring theme throughout our comments.

Experience in Energy Storage and New Jersey Market

SolarCity's involvement in the energy storage space has evolved from a five-year effort to develop, pilot, and deploy stationary energy storage systems that allow solar customers to extract additional value from their distributed generation and provide additional benefits to the grid. This collaboration began with grant funding from California Public Utilities Commission to pilot and deploy Tesla stationary storage systems at SolarCity customer sites. To date, SolarCity has deployed over 340 of these battery systems for residential customers and over a dozen installations for commercial customers including WalMart, BJs Wholesale, and others. In addition to our considerable experience with energy storage, SolarCity has installed over 22 MWs of PV serving over 2,800 residential, commercial, and public sector customers in the New Jersey area. SolarCity also employs more than 250 and maintains 2 warehouses in the state.

SolarCity Product Application – Peak Load Reduction or "Load Shifting"

The FY2015 Renewable Electric Storage Incentive Program found that the program would ultimately benefit New Jersey ratepayers by supporting the installation of renewable electric storage systems for three specific purposes: offsetting peak loads by shifting electricity produced by the solar generating system to hours of higher demand, providing back-up power for essential services, and providing frequency regulation services. SolarCity strongly believes that energy storage systems with longer durations are necessary to achieve a balance between all of New Jersey's program goals.

SolarCity's primary commercial application for the battery product today is offsetting commercial and industrial customers' peak loads by shifting electricity generated from the customers' solar panels to hours of higher demand ("load shifting"). In order to accomplish these load shifting applications, SolarCity's commercial battery systems are designed with a 2-hour runtime, which results in these systems also being capable of providing multiple hours of back-up service to the customers' critical loads with the additional capability of peak load reduction.[1] The majority of SolarCity's comments represent the changes to the program we feel are necessary to properly incentivize these "load shifting" systems that also provide robust resiliency capabilities.

Customers benefit through reduced demand charges utilizing a proprietary SolarCity software platform called DemandLogic. As opposed to the frequency regulation business model, where the majority of the income stream accrues to the developer's benefit, our systems provide a direct reduction to the host customer's monthly utility bill providing benefit to the customer and the ratepayer. Under SolarCity's DemandLogic product, the battery hardware is controlled by a proprietary SolarCity software suite, which can dynamically charge and discharge the battery – in concert with generation from a solar PV array and facility load – to reduce spikes in load and generally provide for a smoother load curve. In addition to the economic benefit to the host customer, the systems deployed by SolarCity also help in shifting the use of renewable energy to hours of greater system need.

Below are 3D graphs showing the load profile of an example K-12 school project before and after the implementation of DemandLogic. DemandLogic applies solar PV and battery storage to consistently meet the school's peak loads. As you can see, the load profile is significantly reduced / flattened after the installation of DemandLogic, leading to reductions in the customer's demand charges. These images should provide clear outline for how these types of systems will meet the load shifting goals of the NJBPU.

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[1] While a "two-hour" battery system has sufficient energy capacity (kWh) to export electricity at the system's full power capacity (kW) for two hours, the same system may provide back-up service for critical loads less than the battery's power capacity for more than two hours, until the full energy capacity of the battery has been utilized.

Figure 1 - Example Load Profile, Pre PV + DemandLogic

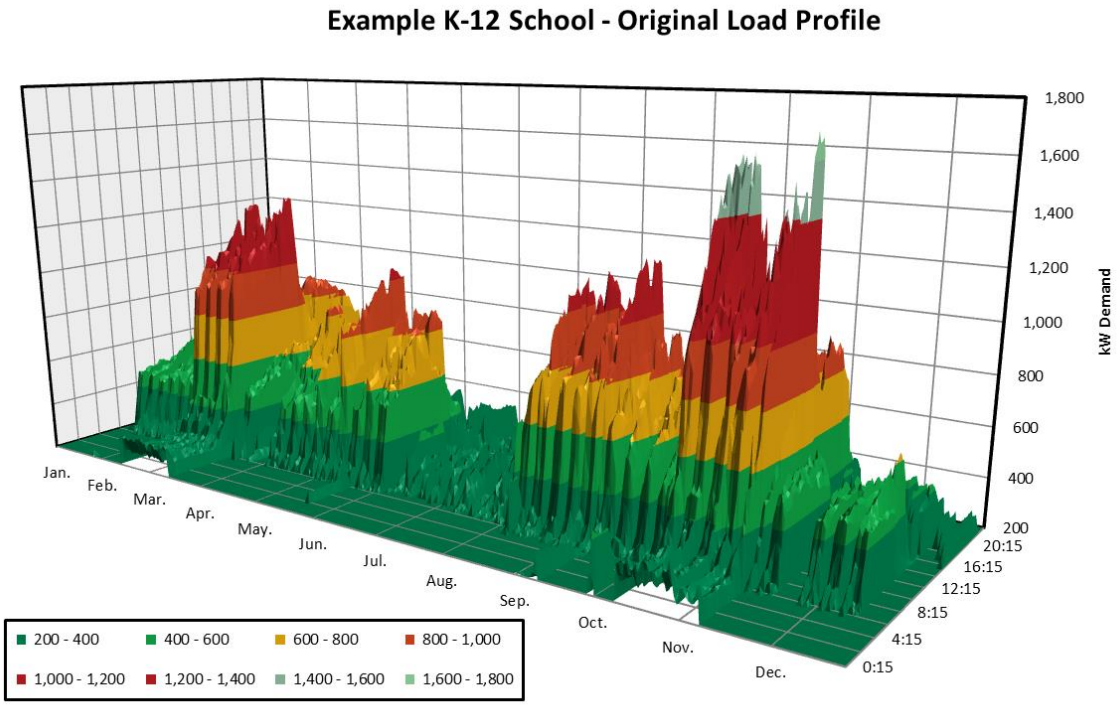
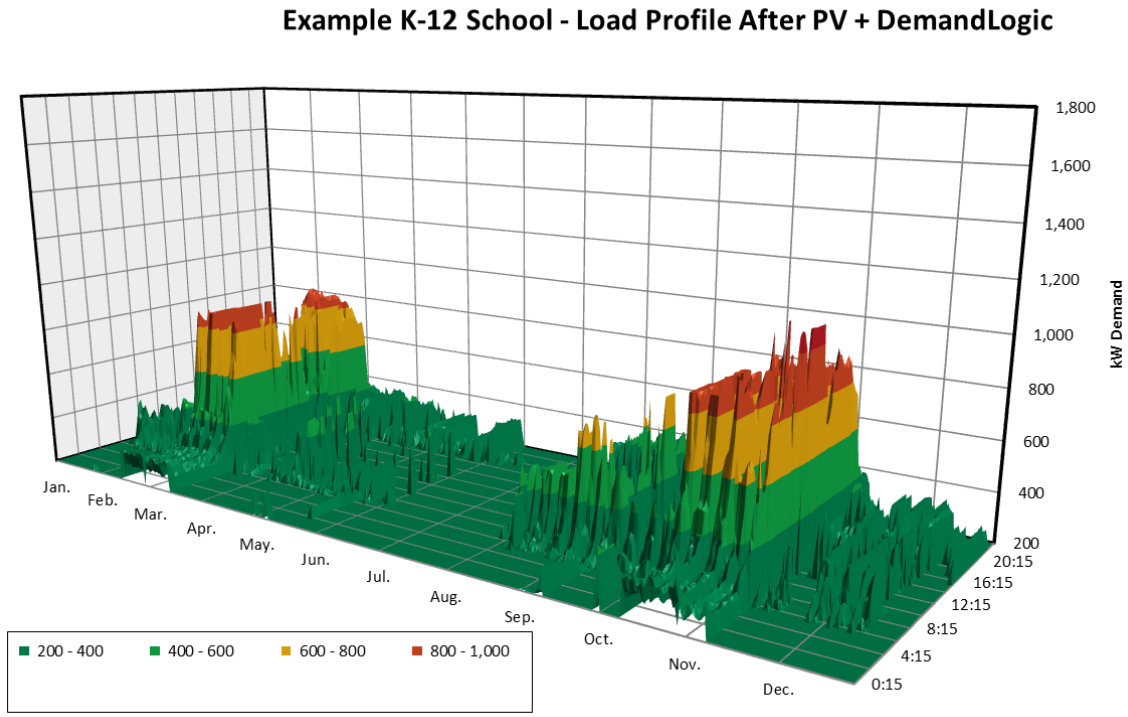


Figure 2 - Example Load Profile, Post PV + DemandLogic



Economic Benefit to Host Customer of Load Shifting

The economic benefit of DemandLogic is realized through reductions in monthly demand charges for host customers. Under the DemandLogic contract, with no upfront costs, SolarCity will provide demand reduction services at a $/kW rate lower than what the local utility would charge them for the kW demand they would otherwise incur, and guarantee a monthly reduction amount. The demand shaving capability of DemandLogic systems can further magnify energy savings for the customer by intelligently reducing monthly peak charges, which solar PV systems alone cannot fully address because solar output may not be coincident with the customer's peak demand and is intermittent.

Table 1, below, shows the economic benefit of the DemandLogic system for an example school.

Table 1 - Economic Benefit of SolarCity PV + DemandLogic - Example K-12 School

Economic Benefit of SolarCity PV + DemandLogic - Example K-12 School

	Historic Utility Costs		Utility Costs after PV + DL		Total Utility	SolarCity Charges		Total Project
	Energy	Demand	Energy	Demand	Savings	Energy	Demand	Savings
Jan	$ 19,095	$ 3,997	$ 7,051	$ 2,497	$ 13,545	$ 8,448	$ 1,125	$ 3,972
Feb	$ 26,851	$ 7,557	$ 13,119	$ 6,057	$ 15,232	$ 8,341	$ 1,125	$ 5,766
Mar	$ 27,548	$ 7,845	$ 9,447	$ 6,345	$ 19,600	$ 12,986	$ 1,125	$ 5,489
Apr	$ 19,757	$ 5,069	$ 1,629	$ 3,569	$ 19,628	$ 14,995	$ 1,125	$ 3,508
May	$ 22,783	$ 6,319	$ 1,557	$ 4,819	$ 22,726	$ 17,647	$ 1,125	$ 3,954
Jun	$ 15,438	$ 5,351	$ (4,549)	$ 3,851	$ 21,487	$ 18,144	$ 1,125	$ 2,218
Jul	$ 15,286	$ 2,569	$ (2,677)	$ 1,069	$ 19,464	$ 15,949	$ 1,125	$ 2,390
Aug	$ 24,732	$ 6,912	$ 4,145	$ 5,412	$ 22,087	$ 16,446	$ 1,125	$ 4,515
Sep	$ 26,820	$ 7,332	$ 7,648	$ 5,832	$ 20,672	$ 14,355	$ 1,125	$ 5,193
Oct	$ 36,330	$ 9,677	$ 17,351	$ 8,177	$ 20,479	$ 11,727	$ 1,125	$ 7,627
Nov	$ 27,020	$ 10,195	$ 12,746	$ 8,695	$ 15,774	$ 8,897	$ 1,125	$ 5,752
Dec	$ 16,496	$ 3,790	$ 6,645	$ 2,290	$ 11,351	$ 6,687	$ 1,125	$ 3,540
	$ 278,156	**$ 76,614**	**$ 74,111**	**$ 58,614**	**$ 222,045**	**$ 154,622**	**$ 13,500**	**$ 53,923**

Assumptions:

PV System Size (kW DC)		1,100
Energy Storage Power Capacity (kW)		250
Energy Storage Energy Capacity (kWh)		500
Runtime (hrs)		2.00
Utility Energy Rate ($/kWh)	$	0.10
SolarCity PPA Rate ($/kWh)	$	0.09
Utility Demand Rate (Post-Solar Rate Plan) ($/kW)	$	6.00
SolarCity DemandLogic Rate ($/kW)	$	4.50

Providing Back-up Power for Essential Services

Historically, the **average blackout duration in the US has been approximately 3 hours** (Eaton Report: Blackout Tracker. United States Annual Report 2013). Given the long duration of the average blackout, it is only logical to suggest that energy storage systems designed for resiliency

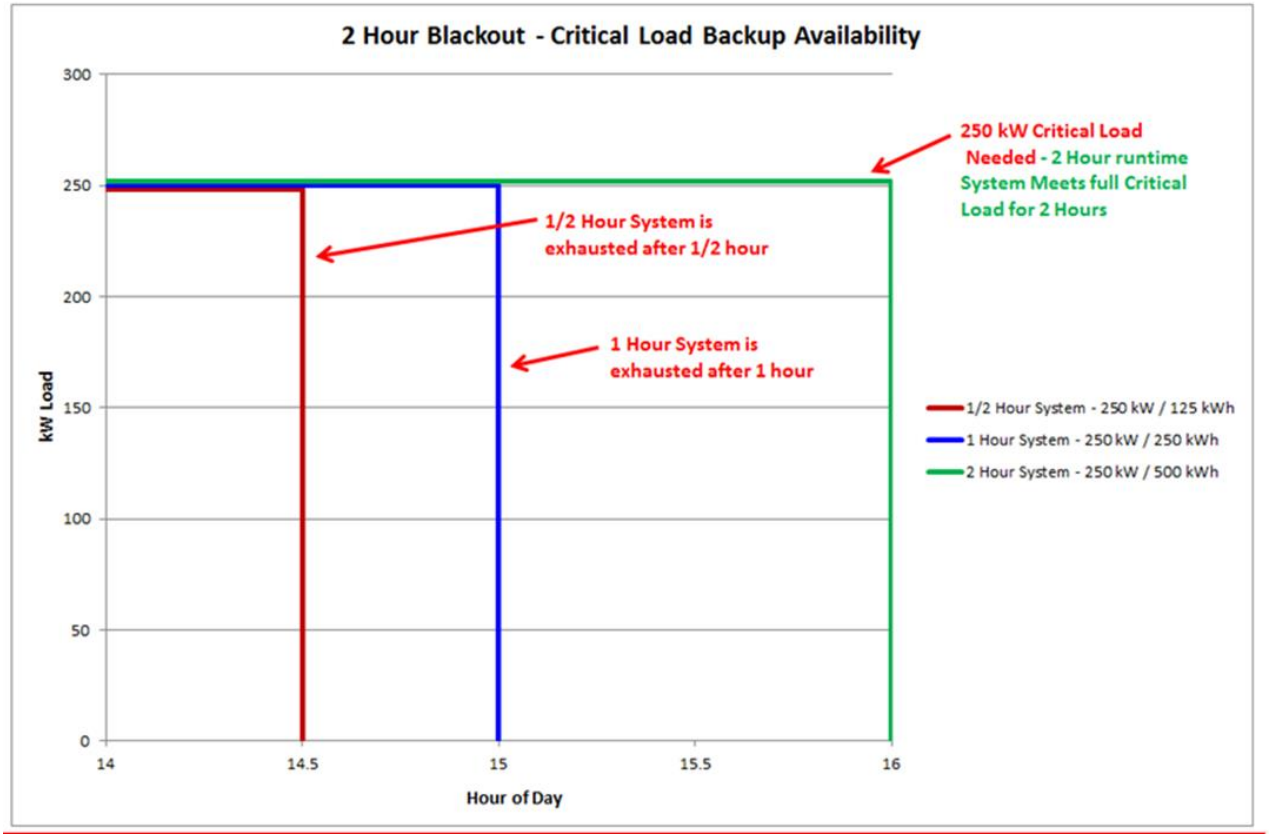
purposes should be configured with an emphasis primarily on energy capacity and sufficient runtime. Not only are customers interested in back-up service to address average outages, interest in back-up service is increasingly motivated by the desire to maintain critical loads over longer periods of time in the event of prolonged outages resulting from force majeure or other large-scale outage events. A 500 kW / 1 MWh system (2-hour runtime) arguably has 4 times the resiliency capabilities of a 500 kW / 250 kWh system (30-minute runtime). This indicates that it is imperative to consider the number of hours of runtime for resiliency purposes and benchmark both $/kW and $/kWh.

For example, if the identified critical loads at a school amounts to 500 kW, and the blackout period being designed for is 2 hours in duration, then 1MWh of energy capacity is needed. A facility's critical loads typically represent a reduced level of usage to serve only the facility's most important electrical needs. The optimal configuration is therefore a 2-hour runtime system (500 kW / 1MWh) that can discharge at full power capacity for the full 2-hour event duration. Alternatively, a 4-hour system (250 kW / 1 MWh) is not optimal because its power rating is insufficient to meet the 500 kW critical load. Importantly, a 1/2-hour runtime system (2 MW / 1 MWh) is not optimal because the system will be discharging at 25% of rated power capacity, thus underutilizing its inverter, and implying that the inverter is oversized and not economically efficient.

Most importantly, when you view the same kW rating for a 2-hour system vs. a 1/2-hour system, the differences in resiliency capabilities differ dramatically. Using the example above with 500 kW of critical loads, a 500 kW / 1 MWh system (2 hours) would keep the critical loads intact for 2 full hours. A 500 kW / 250 kWh system would run out of energy in only 30 minutes (far shorter than the average blackout duration of 3 hours).

Figure 3, below, represents how three 250kW energy storage systems with different runtimes (1/2-hour, 1-hour, and 2-hour) would perform in the event of a grid outage.

Figure 3 - Critical Load Backup Availability



As can be seen, there is a clear benefit to a storage system with 2 hours of runtime when designed for resiliency purposes, and a clear disadvantage for utilizing < 2-hour systems for this purpose. SolarCity believes that without changes to the program that require certain minimum runtime requirements for systems providing resiliency to essential services (e.g. 2 hour minimum runtime requirement) there is risk that the Back-Up Power for Essential Services goals for the program will not be met.

Different Battery Configurations Based on System Application

As we discuss the configuration of energy storage systems, it is important to note that energy storage differs from traditional generation resources in that it is an "energy-limited resource." PJM has pointed out that the energy output of an energy-limited resources is determined by its storage capacity (PJM, Ancillary Services- Regulation, 2013). The energy output of traditional generation resources is determined by their power capacity, measured in kW. However, because storage resources are energy-limited, their storage capacity must be measured in two ways:

1. Power capacity (kW)- the maximum amount of power a resource can provide at any one time; and

2. Energy capacity (kWh)- the maximum amount of energy a resource can provide before it must be "refueled" or recharged.

The energy capacity of a storage system is the most important measure of the system's overall capacity and is an inherent part of its design, just as power capacity is inherent to the design of traditional generation resources. For battery storage systems, the energy capacity will be clearly stated on the manufacturer's specification sheet, just as the power capacity of a generation resource, sometimes called nameplate capacity, is stated on the manufacturer's specification sheet. Examples of specification sheets showing kW nameplate rating and kWh energy capacity can be provided to NJBPU upon request.

The energy capacity of storage systems, the maximum amount of energy the resource can provide before being recharged or refueled, is not a measure of the unit's actual energy output over time. Therefore, no technical analysis is required to assess the energy capacity of a storage system. Similarly, the cost of a storage system's energy capacity, expressed in $/kWh installed, is an expression of fixed costs and is separate from the system's marginal cost of energy.

Storage systems can be designed to provide a range of benefits, which dictate the system requirements and configuration. Stationary energy storage technologies are being deployed at rapidly increasing rates throughout US markets for a growing number of diverse applications. Lithium ion storage technologies in particular have become a favored technology because of their ability to configure and scale to very specific applications ranging from small residential applications (<10 kWh) to large utility scale applications (10-100 MW+). Additionally, the runtime of the lithium ion storage system (ratio of kWh to kW) is flexible and can be optimized for a particular application's technical and economic requirements. For example, SolarCity's solar and storage systems can provide both load shifting and back-up power functions utilizing a 2-hour architecture. Other systems could potentially provide frequency regulation in addition to back-up power. However, the configuration of the battery system will be significantly different based on the primary service provided by the system, as outlined below.

Load Shifting

An energy storage system designed for solar energy load shifting would likely be designed with a long runtime (2-4 hours), such that the system would be capable of "shifting" a relatively large quantity of solar production from hours where there is excess generation, to hours where there is a shortage of generation. While the power capacity (kW) of this type of system is important and must be sized appropriately, energy capacity (kWh) is the critical system parameter that ultimately constrains how much solar production can be shifted. As such, any system with capabilities for load shifting will have a minimum 2-hour runtime.

Frequency Response

Aside from load shifting, other applications may be better optimized with a short runtime energy storage system. For example, a system designed to provide frequency regulation services in an ISO market will be geared with a short runtime, because power output, not energy capacity, is the critical factor for revenue potential. A participant in the frequency regulation market

generates revenue by charging and discharging in response to a 2-second fluctuating signal, and is compensated on the quantity of power that it can match to this signal. The participant is thus incentivized to maximize the power capacity of the battery. However, because the charge/discharge cycles are merely 2 seconds in duration, a significant energy capacity (runtime) is not needed. The participant will therefore increase the power rating of the system (kW) and minimize the energy capacity of the system (kWh) in an effort to reduce the overall cost of the system.

This type of short-runtime system will appear to be very "cheap" when viewed through a $/kW perspective, yet very "expensive" when measured by energy capacity ($/kWh). Importantly, a high kW / low kWh configuration will accomplish the goals of frequency regulation but will have insufficient energy capacity to be reliable as a resiliency measure.

Back-up Power

As outlined above, the key requirement of a truly resilient battery system is the kWh capacity that is stored for usage in the event of a power outage. We feel that systems sized with only a 1/2-hour runtime are woefully inadequate to be used for Back-up Power purposes, especially for Essential Services. As such, any system that is designed to provide Back-Up Power should be designed with a minimum 2-hour runtime for the battery. This two-hour requirement is in line with the battery configuration that applies to the Load Shifting application outlined above.

Multi-functional Systems

Multi-functional energy storage systems, such as Ancillary Services + Critical Load Backup or Load Shifting + Critical Load Backup, require configurations that meet the performance requirements for both their primary function as well as their critical load backup function. The key distinction here is that a system with sufficient kWh to serve Critical Load Back-Up can likely be applied for other applications (e.g. load shifting). In other words, these systems provide significant option value due to the range of use cases they are able to address. In contrast a system designed primarily for Ancillary Services will have adequate kW capacity for Ancillary Services but insufficient kWh for Back-Up Power or Load Shifting.

For example, a project that has a 250 kW / 125 kWh battery system architecture (1/2-hour runtime) will meet the needs for participation in the Frequency Regulation market, but will be severely limited in its resiliency capabilities and load shifting capacity. As such, we do not feel that a system with this architecture should be incentivized as a "resiliency measure." Rather, it should be viewed as achieving the frequency regulation goals of the program but not the load shifting or resiliency goals.

Likewise, a 250 kW / 500 kWh battery system will meet the needs of the load-shifting application but will be less economical in the Frequency Regulation market because of the low kW rating. However, this same 250 kW / 500 kWh system will be capable of acting as a resiliency measure in addition to load shifting because of the 2 hour runtime of the storage system. As such, the 2-hour runtime is capable of serving multiple applications, while the 1/2-hour system is really only capable of serving the needs for Frequency Regulation.

Based on this thinking, we feel that there is a clear distinction that can be made in the program going forward by distinguishing project applications as follows:

1) Projects that are capable of providing resiliency services in addition to other applications (e.g. systems with minimum 2 hour runtime). These types of systems are referred to herein as "Resiliency Systems."
2) Projects that are capable of providing ancillary services in PJM but are not capable of providing resiliency measures (e.g. anything less than a 2 hour runtime). These types of systems are referred to herein as "Ancillary Systems."

Cost Evaluations For Different Applications ($/kW vs. $/kWh)

As we have outlined, the application(s) for a battery storage system will dictate its kW and kWh rating, and as a result, the costs. Based on this, it is imperative to consider system costs for both power ($/kW) and energy ($/kWh) when considering the costs of a battery storage system. These metrics, when used in isolation or without a defined runtime, are insufficient in defining the overall cost and value of a system for a particular application. While the majority of system costs in the FY2015 Renewable Electric Storage Incentive Program were between $1200/kW and $1500/kW, all of the systems selected were roughly 1/2-hour runtime systems, and thus have $/kWh costs ranging between $2400/kWh and $3000/kWh. Because *energy capacity* is the critical performance requirement for resiliency applications, the $/kWh metric and/or runtime metric should be given appropriate weight in the valuation and comparison of different proposals. Furthermore, solicitations that award incentive on a $/kW basis- with no minimum runtime requirements- encourage bidders to maximize the power rating of their systems while minimizing energy capacity, resulting in low runtime systems. On the other hand, incentives awarded on a $/kWh basis encourage high energy capacity and long runtime systems.

Therefore, any competitive solicitation designed to encourage systems that provide resiliency or load shifting to the system, must consider the cost per kWh ($/kWh) and the runtime of the proposed storage systems. SolarCity recommends that the NJBPU develop a rebate program that requires a minimum 2-hour runtime for any storage system and provides a $ / kWh based incentive that steps down over time to gradually reduce the reliance on rebates of these technologies.

Impact of Energy Storage Incentives Based on Configuration

As introduced above, SolarCity's DemandLogic offering generates value for the host customer by reducing a guaranteed quantity of the customer's billed demand each month, and charging a lower $/kW rate for each kW of reduction versus the utility's $/kW demand charge. The $/kW rate that SolarCity is able to offer the customer varies on a project-by-project basis, being a function of unique project costs, load profile shape, PV system characteristics, etc. The typical utility demand rates in NJ are relatively low, and thus, there is a need for some subsidization in order to show explicit economic value to the host customer from load shifting applications that also provide resiliency services.

On the contrary, in PJM there is a lucrative income stream available to developers who participate in frequency regulation. These projects would require fewer incentives than a load shifting project, but as previously discussed these frequency regulation projects are not capable of also meeting resiliency needs. With this in mind, SolarCity proposes that NJBPU bifurcate the rebate program into two project segments as shown below:

- Ancillary Systems
  - No runtime requirement, lower $ / W incentive, ability to pursue wholesale market activities for additional income stream.
- Resiliency Systems
  - 2 hour runtime requirement, higher $ / kWh based incentive, benefits will accrue directly to host customer,
  - Resiliency Systems would be restricted from participation in wholesale markets to avoid over-subsidization and provide enhanced certainty of their ability to come online for resiliency measures in the event of a grid outage.

Added Costs for Resiliency Projects

SolarCity has reviewed the proposed $/W rebate values provided in Staff's May Renewable Electric Storage Incentive Program Straw Proposal ("Straw Proposal"). While these incentive levels may support 1/2-hour and potentially even 1-hour runtime systems, our analysis has shown that the proposed $0.20-$0.25/W rebate for non-ancillary systems will be inadequate in supporting the development of load shifting systems with 2-hour+ runtimes and reasonably robust resiliency capabilities. Furthermore, we believe that there should be a greater differential in rebate values between those projects that participate in Ancillary Markets and those that don't, given the significant cost disparity between the two types of systems, and the lucrative revenue stream already in place for systems participating in Ancillary Service Markets.

Table 2, below, summarizes SolarCity's proposed rebate levels.

Table 2 - SolarCity Proposed Rebate Levels

Program Segment	Minimum Run Time Requirement	Public & Critical ($ / W)	Non Public & Critical ($ / W)
Ancillary	No Minimum	$ 0.20	$ 0.15
Resiliency / Load Shifting	2 Hours	See Table 4 Below	See Table 4 Below

Structure of Program for Ancillary Systems

As proposed in the Straw Proposal, we feel that the $0.20 / W for Public & Critical facilities ($0.15 / W for Non-Public & Critical) is sufficient to foster the development of Ancillary Systems. However, we do not feel that structure appropriately incentivizes the added costs of Resiliency / Load Shifting systems with significantly more kWh energy capacity (and associated costs). There are added costs from installing this additional battery capacity that we feel needs to

be addressed in the form of a higher rebate value. Below, we have outlined a proposed alternative structure below for Resiliency Systems also capable of Load Shifting.

Structure of Program for Resiliency Systems

As proposed above, any systems participating as a Resiliency System will require a minimum 2-hour runtime (e.g. 2kWh for each kW). This resiliency / load shifting benefit will come with additional costs given the additional kWh capacity required. In order to properly incentivize these systems and acknowledge that their primary benefit is in the kWh of energy capacity in the event of a resiliency event, SolarCity would proposed that NJBPU incentivize Resiliency Systems on a $ / kWh basis.

Based on our experience in many other markets throughout the US, SolarCity would also propose that NJBPU pursue a rebate program with a "step down" function, whereby the incentive level provided declines as a function of energy capacity deployed (measured in MWh). This design is intended to reduce the reliance on rebates over time as the industry gains experience and progresses along the learning curve.

- Each step would have a dedicated $$ value for rebates and would grant these rebates on a declining $/kWh basis. Thus, each step would result in more MWh being deployed for the same budget.
- An example program structure based on this thinking would be as follows:

Table 3 - Example Program Structure

Step	$$ Value in Step	**$ / kWh Rebate**	kWh Deployed Under Step
1	$4,500,000	**350**	7,500
2	$4,500,000	**300**	8,182
3	$4,500,000	**250**	9,000
4	$4,500,000	**225**	10,000
5	$4,500,000	**200**	11,250
6	$4,500,000	**175**	12,857
7	$4,500,000	**150**	15,000
8	$4,500,000	**125**	18,000
9	$4,500,000	**100**	22,500
10	$4,500,000	**75**	30,000
Total Budget	$45,000,000	**Total kWh Deployed**	144,289

The above table is intended to provide a framework for the broader step-down program, and any specific values past Step 1 should be considered indicative metrics for discussion purposes. However, the $350 / kWh rebate for Step 1 is a specific value that SolarCity would propose NJBPU pursue for an incentive value for Resiliency Systems.

This proposed program would result in the deployment of ~144 MWh of Resiliency Systems throughout New Jersey – in line with the MWh of 2-hour storage systems currently in process under California's SGIP.

The below table shows how a 250 kW / 500 kWh Resiliency System incentivized at $350 / kWh would equate to on a $ / W basis.

Table 4 – Resiliency System Incentive

Metric	Value
$ / kWh	350
kWh	500
Incentive Value	$ 175,000
Equivalent $ / W	$ 0.70

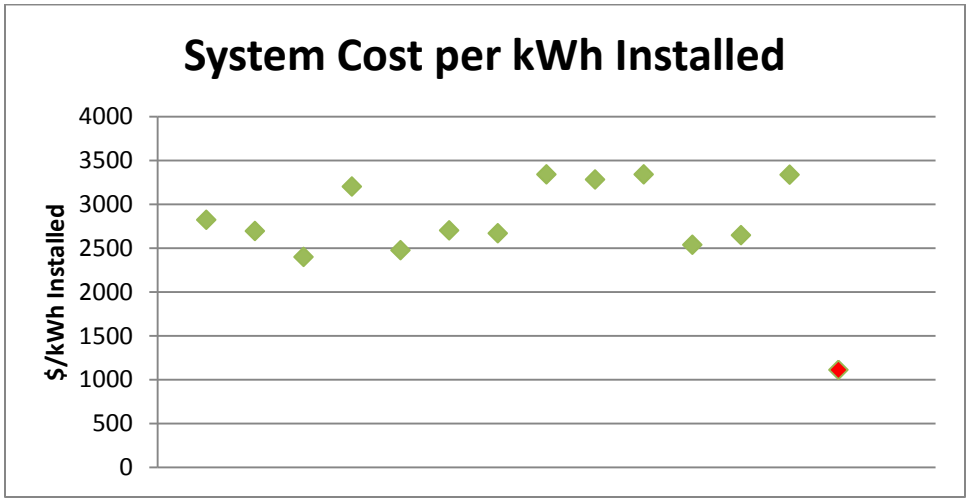
Difference in Rebate Values for Ancillary Systems vs. Resiliency Systems
As you can see, the $ / W for this Resiliency Systems would work out to $0.70 / W, a value that is significantly higher than the $0.20 / W being proposed for Ancillary Systems. However, the additional funding for the Resiliency System is going to capture the following added benefits of this system architecture:

1) Four times the resiliency capabilities of Ancillary systems (2 hour runtime vs. 1/2 hour runtime);
2) Ability to meet multiple program goals (both load shifting and resiliency);
3) Significantly less income available from host customers when compared to frequency regulation income streams;
4) The economic benefits of demand charge savings accrue to the host customer (as opposed to the developer monetizing the ancillary services income).

FY 2015 Applicants Analyzed on $ / kWh Basis

The chart below shows the results of the FY 2015 solicitation, including the 13 selected applicants (green) as well as the final data point, an example SolarCity project that was not selected (red). As you can see, the cost per kWh installed of the winning systems varied between $2,000/kWh and $3,500/kWh. However, **systems with significantly lower installed $ / kWh costs were not selected in the solicitation.** As you can see, our proposed project was by the far the lowest cost system when measured on a $ / kWh basis, and many of the selected projects had $ / kWh values that were over 2 times ours.

Figure 4 – System Cost per kWh Installed



Data from: NJ BPU (March 18, 2015), Order, Docket Nos. QO14050489 and QO14090953; and New Jersey's Clean Energy Program (April 13, 2015), "FY16 Renewable Electric Storage Program Plan Overview," Renewable Electric Working Group.

With this in mind, costing and evaluation of energy storage projects is most prudently accomplished by measuring both $/kW *and more importantly,* the all-in $/kWh and number of hours of runtime provided. It is imperative to measure the $/kWh figure as this type of long-runtime system, with greater resiliency capabilities, can be mistakenly viewed as "expensive" when viewed through a $/kW perspective exclusively. Holistic evaluation of the energy storage system, with an emphasis on energy capacity and runtime, is critical in selecting an effective and cost effective resiliency solution.

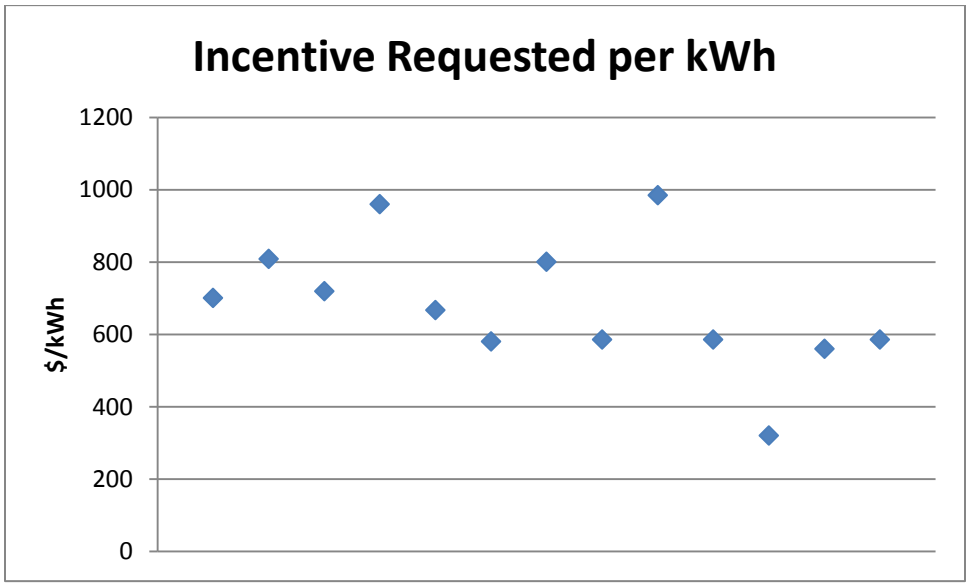
The following table shows how the $/kW and the $/kWh will vary based upon different project costs for battery systems of varying kW/kWh sizes. These are all illustrative examples, and the purpose of this table is to demonstrate that the $/kW value in and of itself is not a proper metric from which to make a decision on economics. Particularly when considering the value of resiliency, the $/kWh is a critical variable to consider. As you can see, the 1/2-hour battery structure does in fact have a lower $/kW value, but this comes at the expense of a much higher $/kWh value. Given that the Renewable Electric Storage Incentive Program is primarily focused on resiliency, we feel that the $/kWh figure is a better economic variable from which to benchmark any resiliency based projects as it weighs their project costs directly against their ability to serve critical loads during an extended outage.

Table 5 - $/kW and $/kWh Costs for Different Runtime Systems

Configuration	Project Cost	$/kW	$/kWh
250 kW / 500 kWh (2 Hours)	$500,000	$2000	$1000
250 kW / 250 kWh (1 Hours)	$400,000	$1600	$1600
250 kW / 125 kWh (1/2 Hour)	$300,000	$1200	$2400

Also, the $350 / kWh rebate value proposed by SolarCity for Resiliency Systems is in line with the incentive amount requested in FY2015 when assessed on a $/kWh metric. Below is a table that shows the incentives awarded in FY2015 when measured on a $/kWh basis. As you can see in Figure 5 below, the vast majority of projects requested significantly higher than $350 / kWh, so by instituting this level of rebate for Resiliency Systems the NJBPU will be driving the market toward further cost reductions.

Figure 5 – Incentive Requested per kWh



Data from: NJ BPU (March 18, 2015), Order, Docket Nos. QO14050489 and QO14090953; and New Jersey's Clean Energy Program (April 13, 2015), "FY16 Renewable Electric Storage Program Plan Overview," Renewable Electric Working Group.

SolarCity acknowledges that NJBPU may wish to standardize the unit used for rebate values across both Ancillary Systems and Resiliency Systems (e.g. use a $/W value for both types of projects). If this is the case, we think this can be easily achieved by simply requiring a 2 hour runtime for all Resiliency Systems and calculating what the $/W would be for the equivalent $/kWh rebate. As shown in the example above, this can be easily calculated, and the $350 / kWh value equates to $0.70 / W. Should Staff be interested in using a $/W rebate value for both

Ancillary Systems and Resiliency Systems, we would propose using this $0.70 / W as the rebate value attributed to Resiliency Systems.

Expand the Program Participation Requirements

In addition to the above proposed changes, SolarCity would propose that NJBPU implement the following program participation requirements to ensure successful implementation of the projects awarded incentives:

- Before applying for the rebate the applicant must provide a signed customer contract (ensures no "speculative" rebate reservations);
- Any battery storage systems must have a minimum 2-hour runtime (to ensure resiliency needs are met);
- Each battery storage system must come with a 10 year manufacturer's warranty including a specific energy retention component (kWh remaining at year 10)
- Applicants should be required to furnish a meaningful security deposit, such as 2.5% of the rebate value, within 10 days of notice of rebate reservation;
- Projects should have a requirement to reach substantial completion within 12 months of notice of award (substantial completion would not be subject to any utility delays on interconnection).

This proposed rebate structure is in line with the MW Block program launched by NYSERDA after several years of managing rebate programs. We feel the lessons learned from NYSERDA that were implemented in MW Block can be ported to the NJ REIP program to address various deficiencies in the current program structure.

Incentive Program Eligibility – New Projects

Finally, SolarCity believes that the proposed requirement that electric storage projects must be integrated with an existing renewable installation is unwarranted and will unfairly exclude New Jersey tax payers who wish to install new PV + Storage systems with resiliency capabilities. SolarCity has a number of potential customers, such as Warren County and others, that would benefit from both an economic and resiliency perspective if storage could be incorporated with their PV system from the onset.

In addition, retro-fitting PV systems with batteries that can work in conjunction to provide back-up power for critical loads is significantly more complicated than designing systems that address this application for new projects. As a result, the costs of storage systems retro-fitted to existing PV projects is necessarily going to be higher than if those same projects were installed in tandem on a new project. Therefore, if the program focuses exclusively on retro-fitting PV projects with batteries, the program will result in fewer aggregate kW ultimately being deployed in NJ.

Furthermore, energy storage systems that are installed as part of a new PV system will benefit from Investment Tax Credit dollars that would otherwise be unavailable to an "add-on" storage project. Thus, when energy storage rebate dollars are applied to new PV + Storage projects,

additional federal funds are unlocked, increasing the overall benefit of the deployed NJ Clean Energy Program funds.

It is for these reasons that excluding new projects from participation in the program has serious negative consequences to the program on a going-forward basis. We strongly encourage NJBPU to re-consider this program eligibility requirement and allow new PV + storage projects to participate in the program.

Conclusion

SolarCity believes that there are both economic and logistical characteristics of energy storage systems that need to be addressed in future NJBPU solicitations. Specifically, we feel that the program could be improved by implementing the following conditions:

1) The economic consideration for projects should include an assessment of the $ / kWh costs and value, as opposed to examining the $/kW value which does not address or appropriately consider the resiliency benefits of energy storage.
2) The program should be split into "Ancillary Systems" and "Resiliency Systems" with the following attributes for each:
    a. Ancillary Systems would receive the $/W values proposed by NJBPU in the Straw Proposal and would not have any limitations on runtime requirements;
    b. Resiliency Systems would be required to have a minimum 2 hour runtime and would be provided a $350 / kWh rebate value (equal to $0.70 / W)
        i. The Resiliency Systems would be compensated at a higher rate for the following reasons:
            1. Need to cover the additional costs necessary to install the 2 hours of energy capacity that enables a truly resilient system;
            2. Economic benefits of demand charge reductions associated with load shifting will accrue directly to the NJ rate-payer ;
            3. Increased option value/versatility - the Resiliency Systems will accomplish multiple program goals (both resiliency and load shifting), as opposed to only one.
3) The program participation requirements should be expanded to ensure projects awarded rebates do in fact move forward in a timely manner.

SolarCity believes that there is a fantastic opportunity to expand the impact of the Renewable Electric Storage Incentive Program and expand the resiliency capabilities of PV + storage projects in NJ. However, as outlined in this document, some aspects of the proposed FY2016 program severely disadvantage the participation of our resiliency systems in the future. We look forward to discussing how we can improve the program for the benefit of NJ ratepayers and the facilities in need of resiliency.

In closing, SolarCity strongly supports New Jersey's efforts to provide its citizens and ratepayers with the benefits that can be provided to them through renewable energy storage systems. We appreciate the opportunity to provide comments on the Renewable Electric Storage Incentive Program and look forward to continued engagement on these important issues.

Respectfully submitted,

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SolarCity Corporation