New York Battery and Energy Storage Technology Consortium, Inc.

VIA ELECTRONIC FILING

June 9, 2016

Hon. Kathleen H. Burgess
Secretary to the Commission
New York State Public Service Commission
Empire State Plaza, Agency Building 3
Albany, New York 12223-1350

Re: CASE 15-E-0302 – Proceeding on Motion of the Commission to Implement a Large-Scale Renewable Program and a Clean Energy Standard.

CASE 14-M-0101 - In the Matter of Reforming the Energy Vision.

Dear Secretary Burgess:

The New York Battery and Energy Storage Technology Consortium (NY-BEST) is pleased to submit the enclosed comments as a follow-up to information presented at the May 26th Technical Conference convened by the Department of Public Service (DPS) on May 26, 2016, to discuss energy storage and explore actions the Commission may take in furtherance of Clean Energy Standard (CES) and Reforming the Energy Vision (REV) objectives. On behalf of our more than 150 organizational members, NY-BEST is grateful to the DPS staff and the Public Service Commission for recognizing the critical role for energy storage in transforming the state's electric grid and achieving the State's renewable energy and climate protection goals and for your interest in stimulating markets for storage.

Should you have any questions or require additional information, please contact me at 518-694-8474.

Respectfully Submitted,

Dr. William Acker
Executive Director

SUPPLEMENTAL COMMENTS OF
THE NEW YORK BATTERY AND ENERGY STORAGE TECHNOLOGY CONSORTIUM
(NY-BEST)

NY-BEST is grateful to the Department of Public Service (DPS) staff for hosting an informative Technical Conference on May 26, 2016 in New York City to discuss energy storage and explore actions the Commission may take in furtherance of Clean Energy Standard (CES) and Reforming the Energy Vision (REV) objectives.

These comments are intended as a supplement to information shared at the Technical Conference. As we discussed at the Conference, the Clean Energy Standard and REV initiatives are cornerstones to transforming and modernizing the grid in New York. To ensure the success of these initiatives, the role for energy storage must be solidified and near term steps must be taken to stimulate markets for energy storage in New York. Accordingly, in our comments below we provide the following:

1) NY-BEST's recommendation for a "no-regrets energy storage goal" for the State specifying the amount of energy storage that should be added to the state's electric grid and providing analysis to support that goal.
2) Specific recommended actions the PSC can take to advance energy storage as a solution and to stimulate and animate markets for energy storage in New York.

ABOUT NY-BEST

The New York Battery and Energy Storage Technology Consortium ("NY-BEST") is a not-for-profit industry trade association that serves as a voice of the energy storage industry for more than 150 member organizations on matters related to advanced batteries and energy storage technologies. Our membership covers the full span of activities related to research, development, production and deployment of energy storage devices, and includes companies ranging in size from small start-up companies to global leaders, renowned research institutions and universities, national labs and numerous companies involved in the electricity and transportation sectors.

NY-BEST has been actively engaged in New York State's Reforming the Energy Vision (REV) initiative and its related proceedings since its inception and supports NYS Public Service Commission's (PSC) efforts to transform New York's electric industry with the objective of creating market-based, sustainable products and services that drive an increasingly efficient, clean, reliable, and customer-oriented industry.

NY-BEST strongly supports the goals of the New York State Energy Plan and the State's efforts to establish a Clean Energy Standard to generate 50 percent of the state's electricity

from renewable sources by 2030. We further applaud and support the State's goal of reducing greenhouse gas emissions by 40 percent by 2030 and 80 percent by 2050. Importantly, energy storage is a key enabling technology for the State to achieve its grid transformation, renewable energy and climate protection goals. Accordingly, NY-BEST strongly supports the Commission's efforts to establish mechanisms to open markets for energy storage in New York.

WHY STORAGE IS ESSENTIAL TO NEW YORK'S ELECTRIC GRID

New York has established aggressive goals for reducing greenhouse gas emissions and adopting renewable energy sources. The 2015 State Energy Plan states that 50 percent of all electricity used in New York State by 2030 should be generated from renewable energy sources (the 50 by 30 goal.)

The State goal of having 50 percent of generation from renewable energy by 2030 implies that nearly 30 percent will likely have to come from solar and wind since according to the State Energy Plan, the potential contributions for hydropower and bioenergy are 20 percent and 3 percent, respectively. According to projections by DPS staff in the *Staff White Paper on Clean Energy Standard*[1], overall electricity demand in New York by the year 2030 will exceed 185,000 GWh. However, DPS staff further estimates that 35,000 GWh of this demand can be addressed by energy efficiency measures, resulting in a statewide energy need by generation of 150,000 GWh. Meeting this need with 50 percent renewable energy sources implies that 75,000 GWh of renewable energy will be needed in the state by that year. Factoring in hydropower and bioenergy, the remaining renewable energy to meet the 50 percent goal could be achieved, for example, by equal amounts of solar and wind power. With a typical capacity factor of 17 percent, producing that amount of energy from PV would require 14 GW of installed capacity. With a capacity factor of 35 percent, 7 GW of wind power capacity would be needed. In total, therefore, meeting the 50% renewable goals will require deploying approximately 21 GW of intermittent renewable energy in the state.

A growing number of studies have looked at how large amounts of intermittent renewable energy can be incorporated into the grid and they conclude that substantial amounts of storage will be required. The intermittent nature of wind and solar power leads to two problems related to flexibility:

1) the need for backup capability, and

[1] http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7b930CE8E2-F2D8-404C-9E36-71A72123A89D%7d (January 25, 2016)

2) the potential for necessary curtailment.

In the absence of substantial amounts of energy storage, the first problem results in the continued need for costly conventional peaker plants that produce substantial carbon emissions and criteria air pollutants. The second problem results in wasted energy and reduced capacity factor.

Flexibility indicates the capability of the system to accommodate variability and uncertainty in demand, production from variable renewable resources like wind and solar, and other unforeseen events. Historically, flexibility has not been a primary concern and has not been systematically evaluated in utility planning studies. Growth in the share of energy produced by variable renewable energy will increase variability and uncertainty, potentially making flexibility more important in the future. A recent study by the Lawrence Berkeley Laboratory[2] assessed the importance of having a sufficient flexibility supply in the presence of increasing amounts of variable renewable generation on the grid. Bulk energy storage is particularly well-suited to providing flexibility because it can provide its full nameplate capacity bi-directionally: it can both provide needed power and absorb excess power on short notice. This capability is important for eliminating the impact of short-term fluctuations in renewable output. Having enough storage on the grid will greatly decrease the need to turn to gas-fired generation plants to meet any short-term demand and eliminating the use of these plants is an essential part of achieving the State's emissions goals.

Of at least equal importance is the ability to time-shift renewable energy in order to match the demand profile. This is an important consideration because a major fraction of the state's electricity demand is in the greater New York City area. That is also where a large amount of behind-the-meter solar generation capability is being installed, for the most part in the outer boroughs. The load curve in those areas does not match up well with the generation profile, which peaks in the afternoon. For example, peak demand in Manhattan occurs during the afternoon and in the residential areas of the City and the New York Metro suburbs, peak demand occurs in the evening, when people have returned from work. Thus, in these areas, there is significant value in time-shifting the output of suburban solar generation by roughly four to six hours. Substantial storage resources can provide this capability. In general, the ability to time-shift the output of both solar and wind generation sources using storage greatly enhances the value of those sources to the grid.

[2]Flexibility Inventory for Western Resource Planners, Ernest Orlando Lawrence Berkeley National Laboratory, October 2015, https://emp.lbl.gov/sites/all/files/lbnl-1003750_0.pdf

With today's intelligent energy storage systems installed behind-the-meter, one integrated technology package can control a customer's entire load so the technology remains the same while the functions are different. Energy storage combined with auto-demand response software provides a firm, dispatchable supply side resource. Energy storage combined with building management control software provides permanent load shifting. Energy storage combined with distributed solar turns an intermittent resource into flexible capacity and permanent load shifting.

Strategic deployment of energy storage, both in-font–of-the-meter and behind-the-meter, can substantially reduce the need for costliest peak electricity demand, provide flexibility for substantial amounts of new renewable energy and provide resilience and back-up power throughout the grid. Energy storage can de-couple supply and demand on the grid and, as a result, create efficiencies for the electricity system. Importantly, as discussed at the DPS Energy Storage Technical Conference, storage need not be paired with renewable generation to achieve these benefits and efficiencies.

ESTABLISHING A NO-REGRETS TARGET FOR ENERGY STORAGE

As discussed at the Technical Conference, energy storage is critical to providing flexibility for renewable resources, as well as achieving a host of REV objectives. There are multiple analyses which support the assertion that multi-hour storage assets of 4 GW or more will be needed in order for New York to meet the energy and emissions goals it has set for 2030, and NY-BEST concurs with these analyses. Using this estimate as a long-term benchmark, NY-BEST believes that a reasonable "no regrets" target for energy storage on the State's electric grid is **1 GW of multi-hour storage by 2022 and 2 GW by 2025**. These targets represent conservative near-term achievable goals that could be used to establish procurement targets for energy storage and set a path toward having 4 GW or more of multi-hour storage installed by 2030. These higher levels of storage will be necessary to achieve the State's renewable energy, greenhouse gas emissions reductions and grid transformation goals established in the Clean Energy Standard, State Energy Plan and REV.

NY-BEST offers the analysis and studies below to support our recommendation:

> First, as presented at the Technical Conference, General Electric has modeled the requirements for energy storage as a function of the penetration of renewable resources[3]. GE's model examined New York's load curve as renewable energy is added to the state's generation mix. The information presented by GE demonstrates, at a macro level, how energy storage can be successfully used to shave peak load

[3] GE Energy Storage presentation at NYSDPS Technical Conference, Rick Cutright, May 26, 2016

and that, as renewable assets are added to the grid, storage increases the capacity factor and effective utilization of assets. GE's model suggests that, as renewable energy is added to the State's grid, an increasing percentage of energy storage should be added as well. At 50 percent renewable energy, GE suggests that 25 percent of the system peak should be energy storage. For New York in 2030, this would be equivalent to more than 8 GW of storage. GE further modeled the overall effects of deploying both 4 GW and 8 GW of four-hour storage in New York upon the levelized cost of energy, carbon emissions, the need for peaker plants, and the need for curtailment of renewable resources. At the 4 GW level of energy storage, the model shows a positive cost-benefit ratio and significant reduction in the curtailment of renewable resources. It further shows a reduction in carbon emissions of more than 42 percent, from the 2015 baseline level, when the State's renewable energy mix is at 50 percent, with an additional decrease in carbon emissions of more than 13 percent when storage is added to the mix. However, under that scenario, there was still a significant reliance on peaker plants. At the 8 GW level, the use of peakers and the need for curtailment are both virtually eliminated. The GE model highlights the need to examine and manage load profiles and ensure system optimization as increasing amounts of renewable generation are added to the grid. It further shows that energy storage is a key enabling technology for maximizing the benefits of renewable energy and reducing carbon emissions from the state's electricity sector.

Secondly, the National Renewable Energy Laboratory (NREL) in its 2012 *Renewable Electricity Futures Study*[4], examined a variety of scenarios for the adoption of 80 percent renewable electricity sources nationwide by the year 2050. Under these various scenarios, the study concluded that a total deployment of energy storage between 100 and 152 GW would be required. They also concluded that the bulk of these deployments would need to take place much sooner than 2050 in order to support the expansion of renewable energy. According to their analysis, New York would need to deploy 3.2 GW by 2030 for this purpose[5]. In a closer review of the NREL study, NY-BEST and our expert members believe the NREL study underweighted the contributions of battery technology because it did not anticipate the rapid pace of battery cost reductions that have occurred in the past few years. The current and projected economics of battery storage, as we shared at the Technical Conference, are substantially better than the assumptions of the study.

[4] *Renewable Electricity Futures Study* 2012, National Renewable Energy Laboratory http://www.nrel.gov/docs/fy12osti/52409-2.pdf

[5] Ibid., http://www.nrel.gov/analysis/re_futures/data_viewer/

The study also did not reflect the changing nature of New York's energy mix, overemphasizing biomass energy over solar power. In addition, it did not address the impact of storage in dealing with constraints on the distribution system, such as the limited hosting capacity of distribution circuits. The rapid proliferation of residential PV in New York's downstate suburban communities is already highlighting this problem.

A third study by the Union of Concerned Scientists study, *Achieving 50 Percent Renewable Electricity in California,*[6]released in August 2015, examined the issue of preventing the curtailment of renewable generation by the use of non-generation strategies including energy storage. The UCS study examined achieving 50 percent renewable energy by 2024 in California and concluded that an additional 6-9 GW of non-generation flexibility was required to eliminate curtailment and avoid the use of fossil fuel generation sources to provide flexibility. Notably, UCS included natural gas plants as part of the approach for providing flexibility to renewable energy resources.

Finally, in 2012 NY-BEST published its first *New York Energy Storage Roadmap*.[7] In that Roadmap, we set a goal of having 1 GW of energy storage on the grid by 2020. In 2016, we published the *Energy Storage Roadmap for New York's Electric Grid* [8]and updated our goals for storage to 2 GW of multi-hour storage by 2025 and 4 GW by 2030. In both of these reports, NY-BEST analyzed available research studies, developments in similar markets and industry use cases to support our recommended goals. In the 2016 Roadmap we illustrated how having 4 GW or more of multi-hour storage capacity in the state by 2030 will support multiple needs of the energy system beyond the need for flexibility for renewable resources. The Roadmap showed how the same storage assets that would be used to avoid curtailment of renewable assets, provide fast ramping in response to drop-offs of renewable generation, and address peak demand can also provide services such as frequency regulation and spinning reserves.

Based on the above, NY-BEST recommends that "no regrets" targets for energy storage on New York's grid be established at 1 GW of multi-hour storage by 2022 and 2 GW by 2025. These represent conservative near-term achievable target that could be used to establish

[6]http://www.ucsusa.org/sites/default/files/attach/2015/08/Achieving-50-Percent-Renewable-Electricity-In-California.pdf
[7] https://www.ny-best.org/sites/default/files/type-page/4254/attachments/NY-BEST%20Roadmap_final-1.pdf
[8] https://www.ny-best.org/sites/default/files/type-page/39090/attachments/NY-BEST%20Roadmap_2016_finalspreads.c.pdf

procurement targets in the state. We further strongly believe that measures should be put in place now toward achieving a goal of 4 GW of multi-hour storage by 2030, and that it be recognized that increasing targets beyond 4 GW in 2030 will be necessary to continue to increase the State's renewable energy portfolio and achieve the State's aggressive greenhouse gas emissions reduction goals.

RECOMMENDED ACTIONS TO ADVANCE ENERGY STORAGE

In this section, we outline three specific actions for the Commission's consideration to advance the role of energy storage in the Clean Energy Standard and in achieving the objectives of REV.

Establishing new regulatory and programmatic measures to support 1-2 GW of multi-hour energy storage will be necessary to achieve the following objectives:

- change the current outdated decision-making paradigms and create new market drivers for storage;
- allow for the monetization of the benefits and services provided by storage; and
- reduce project soft costs to facilitate increased project volume, the creation of common financing mechanisms and developing the industry to scale.

While REV ultimately envisions a full functioning market for Distributed Energy Resources (DERS) including storage, these interim measures are needed in the near term to jump start the market. Taken together, the following proposed actions achieve the above objectives and will create a pathway for the energy, environmental and economic benefits of energy storage to be realized in New York.

1. Energy Storage Procurement Target

NY-BEST recommends that PSC establish an energy storage procurement target for Distributed System Platforms (DSPs) in New York State.[9] We recommend that New York adopt a procurement program similar to the State of California[10]. In 2013, the California Public Utilities Commission (CPUC) adopted a 1.325 GW procurement target for energy storage by 2020, with targets increasing every two years from 2016 to 2020. The targets were broken into three "domains" (transmission-connected, distribution-connected, and customer-sited, i.e., behind-the-meter) and divided among California's three investor-

[9] We also recommend setting a procurement target for the Long Island Power Authority as a major Load Serving Entity in New York State and in keeping with the Commission's goals to ensure state-wide policy consistency.
[10] California PUC D.13-10-040 ("Decision Adopting Energy Storage Procurement Framework and Design Program" issued on October 2013 http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M078/K912/78912194.PDF

owned utilities (IOUs). Additionally, electric service providers and community choice aggregators were directed to procure energy storage resources equivalent to 1% of their peak capacity by 2020.

Under the California program, the IOUs are required to procure energy storage through competitive solicitations involving Request For Offers (RFOs) for third party-owned or – aggregated resources, or other processes authorized by the CPUC. Storage projects involving distribution reliability applications are required to be procured via existing processes used by IOUs for other distribution reliability utility assets. The first competitive solicitation involving third-party owned storage was held in 2014, with additional solicitations taking place biennially thereafter, in 2016, 2018, and 2020.

Under the California program, eligible projects must be able to to meet one or more of the following purposes: grid optimization, integration of renewable energy, or reduction of greenhouse gas emissions; and projects must be operational by no later than the end of 2024. CPUC restricted some technologies and project sizes from the procurement order. For example, pumped hydropower projects greater than 50 megawatts (MW) in capacity are not eligible.

Each IOU is allowed to request a deferment of up to 80 percent of its procurement targets with an affirmative showing of:

1) unreasonableness of cost based on CPUC's approved evaluation methodology or
2) the lack of operationally viable number of bids in the energy storage solicitation.

Each IOU has the burden to show that a deferment of its procurement target is warranted.

CPUC must also conduct a comprehensive evaluation of the program no later than 2016, and at least once every three years thereafter through 2022. Based on the findings of the evaluation, the Commission may make adjustments to the program if needed.

To date, California's program has resulted in energy storage procurements greater than those included in the State's mandate. For example, energy storage procurements by IOUs totaled 378 MW in 2014, as compared to the mandated target of 200 MW. By changing the decision making paradigm at the IOUs and forcing IOUs to examine the cost effectiveness of energy storage against other grid alternatives, California's energy storage mandate has facilitated the selection of storage as a solution.

NY-BEST believes that California offers an excellent model for New York to adopt similar energy storage procurement targets. NY-BEST suggests some deviations from the

California model based on lessons to date from California and New York's interest in fostering new markets.

We recommend the following elements be included in an energy storage procurement target program for New York:

a. Establish targets of 500 MW by 2020; 1 GW by 2022; 1.3 GW by 2023 and 1.6 by 2024 and 2 GW by 2025, of multi-hour (average four-hour duration) installed energy storage.
b. Set targets for each DSP proportional to the energy storage target, based on each DSP's percentage of the total load. We also recommend an energy storage procurement target be set for the Long Island Power Authority, consistent with the Commission's goals to ensure statewide policy consistency with REV objectives.
c. Define Energy Storage Project eligibility to include: grid optimization (including peak reduction, contribution to reliability needs, or deferment of transmission and distribution upgrade investments) integration of renewable energy, or reduction of greenhouse gas emissions. Projects can be in front-of-the-meter or behind-the-meter.
d. Allow for diversity and flexibility in project ownership models to include: utility-owned; utility-contracted; third-party owned and operated (including customer-sited/behind-the-meter).
e. Allow for Program flexibility – DSP can defer if they can show unreasonableness of cost based on DPS's approved evaluation methodology or the lack of operationally viable number of bids in the energy storage solicitation.
f. Allow for projects completed under the proposed Asset Utilization Tariff or with proposed Energy Storage Incentives funding (both proposals described below) to be counted toward the target.
g. Provide for an evaluation by DPS staff of the program's effectiveness in 2021 and 2024.

NY-BEST believes that an energy storage procurement target program as outlined above is critical to creating a driver for the energy storage market in New York State. The program will require each DSP's full consideration of energy storage as a solution, while still allowing for decisions to be based on cost-effectiveness. It will further promote market participation, as envisioned in REV, by allowing for different ownership models and both grid-connected and behind-the-meter solutions.

2. Asset Utilization Tariff Proposal

As an interim measure to monetize many the benefits and services provided by storage, NY-BEST recommends that the Commission adopt an "Asset Utilization Tariff" that is technology neutral and is based on the cost savings to each utility from reduced ICAP, T&D deferral, distribution system peak load management and energy savings. This type of tariff is consistent with the concepts advanced in the Commission's Order Adopting a Ratemaking and Utility Revenue Model Policy Framework (aka "REV Track 2 Order").[11] In that Order, PSC states that a new ratemaking framework must be developed to reward services that are beneficial to the grid and a way for these services to receive fair compensation must be developed.

The Order further establishes new "Earnings Adjustment Mechanisms (EAM)" and specifically requires each utility to file a system efficiency EAM proposal, including peak reduction and load factor targets by December 1, 2016. Under the Order, outcome based incentives can be earned and the proposals must include a Benefit Cost Analysis to receive approval. The goal of this EAM is to improve system efficiency of the grid, reducing peak load and increasing the load factor.

NY-BEST's proposed Asset Utilization Tariff creates one such mechanism for reducing peak load, improving system efficiency and monetizing many of the benefits provided by energy storage. For example, the Asset Utilization Tariff could be applied to energy storage on a stand-alone basis or to energy storage paired with distributed solar and used to reduce peak load and increase utilization. The suggested form of this tariff is similar to the current ConEd Demand Management Incentives program, with the important difference that:

1) the compensation ($/kW) would be based on the avoided cost and not limited to 50% of the asset capital cost; and
2) Both behind-the-meter and in-front of the meter applications that provide the benefits would qualify for the tariff.

(This proposal was previously raised by NY-BEST in the Demand Response Tariff Proceeding, PSC Case 14-E-0423, and recognized by the Commission in the PSC Order dated, June 18, 2015.)

The proposed Asset Utilization Tariff is designed to improve grid utilization rates and system efficiency. Grid-connected energy storage projects and distributed solar operating

[11] PSC Order Case 14-m-0101 http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7bD6EC8F0B-6141-4A82-A857-B79CF0A71BF0%7d)

in New York today can currently only monetize the some benefits valued by either the NYISO wholesale energy market or the customer, but not distribution system benefits. However, there are a number of other benefits that this combination delivers that are not effectively captured or monetized by the owner of the asset. The proposed Asset Utilization Tariff will allow these assets to monetize new value streams in partnership with the utility.

NY-BEST believes that an Asset Utilization tariff would create benefits for the grid, the utility, the customer and third parties. For example, utilities serving as the DSP are tasked with insuring system reliability including the need to upgrade local distribution network to meet the summer peak load. PSC has estimated that the costs savings provided by improving the utilization rates by 1% (from 55% to 56%) is approximately $220-$330 million per year. The savings vary by zone, but PSC estimates that the Transmission and Distribution deferral benefits in New York City alone (Zone J) are $305/kW per year.

The proposed Asset Utilization Tariff would be based on the cost savings to each utility from a reduction in ICAP, T&D deferral, and Energy savings achieved. The proposed Tariff would be for a 15 or 20 year term. The proposed Tariff would be technology agnostic (e.g. solar, energy storage, demand response or energy efficiency), would encourage both in-front-of and behind-the-meter resources, and would allow developers to bundle products together to best meet the peak load and asset utilization requirements of the tariff. The proposed tariff will provide a win-win-win arrangement between the utility, customer, and third parties because all parties will have an incentive to perform and it is expected to lower costs to the utility customers. The utility would earn a return on this tariff as compensation for the distribution-level benefits accrued. Third parties would be able to own and operate the asset under the tariff regime and earn additional revenue in the wholesale market and/or through agreements with individual customers.

The proposed tariff would also enhance electric system reliability without producing emissions, reduce overall system emissions and increase system utilization rates.

NY-BEST recommends that PSC adopt the tariff or require DSPs to include such a tariff as part of their System Efficiency EAMs to be filed by December 1, 2016.

3. Declining Bridge Incentive for Energy Storage

NY-BEST believes strongly that energy storage is needed to support the State's long term goals of grid transformation in New York. Incentivizing energy storage now is necessary to drive energy storage down the cost curve, making it cheaper when the time comes to procure increasing amounts of gigawatts of storage. Importantly, New York will not drive down hardware costs by itself, but increasing the deployment experience for everyone in the industry: installers, financiers, utility interconnection staff, municipal permitting officials, etc., will drive down all the soft costs.

For lessons in this area, NY-BEST recommends modeling the energy storage bridge incentive program after similar programs for solar energy, such as NY-SUN. That program provides incentives for PV systems, with the level of the incentive declining over time. The program has jump-started the industry in New York, with solar installations growing by 575 percent from 2011 to 2014. NY-SUN helped reduce the solar industry's soft costs, develop replicable financing mechanisms and grow the industry to scale in New York, bringing with it hundreds of new jobs.

In looking at examples of incentive programs for energy storage, in California, the State has adopted an incentive program known as "SGIP". Initiated in 2001, the Self-Generation Incentive Program (SGIP) offers incentives to customers who produce electricity with wind turbines, fuel cells, various forms of combined heat and power (CHP) and advanced energy storage. The incentive levels ramp down over time but offer an additional 20 percent to those using technology from a California manufacturer. The program is widely viewed as being primarily responsible for the fact that California leads the nation in distributed energy storage, with almost every major energy storage company in the US employing staff in California. The SGIP program, combined with the energy storage mandate, created a powerful signal to the energy storage industry. California re-authorized the SGIP program in 2014 with $400 million in funding. In 2016, payments to energy storage under SGIP are $1.31/ W for a minimum 2-hour duration energy storage project.

To propel the energy storage industry forward in New York State, NY-BEST recommends that PSC and NYSERDA work together to invest $400 million from the Clean Energy Fund and establish an energy storage bridge incentive program to install 1.5 GWh of energy storage in New York State.

NY-BEST recommends PSC authorize an incentive based on capacity ($800/kW) AND system energy ($400/kWh) provided by energy storage, with the incentive amounts declining annually. We propose that the level of the incentive be reduced annually over four years, to coincide with progress being made on the full monetization of benefits (through REV), reduction of soft costs, and increased volume creating industry scale.

While NY-BEST fully recognizes that New York State is generally averse to creating incentive programs, preferring instead to rely on market mechanisms, we believe that our recommendations, taken together, to establish an energy storage procurement target, asset utilization tariff and declining bridge incentive, will stimulate market participation and create a line of sight to widescale deployment of energy storage in the state. We further believe that the three-pronged approach we are proposing is wholly consistent with the

State's approach to the solar industry, with parallel requirements, monetization mechanisms and incentives to stimulate markets.

ECONOMIC IMPACT OF ENERGY STORAGE

The global energy storage industry is growing at a rapid pace and New York State need to act quickly to realize the economic benefits of this growth. Navigant Research predicts that global revenues in the energy storage industry will increase from $675 million in 2014 to nearly $16 billion in 2024. Citi GPS estimates the market for storage, excluding vehicles, could be worth over $400 billion by 2030.[12]

In 2012, NY-BEST commissioned a study to examine the economic impact of the State's energy storage industry. [13]It found that in 2012, for all markets, employment in the energy storage field in New York totaled 2,992 jobs, with nearly $600 million in global sales. The Study also found that this industry could grow more than 11,400 new jobs in New York by 2020 and 43,000 new jobs by 2030, with sales growing to $3.7 billion in 2020 and $14.2 billion by 2030.

By adopting the recommendations described above, the State would send a strong signal to the energy storage industry that New York is investing in building the grid of the future and is the right place to locate and grow their business.

NY-BEST believes that by adopting our recommendations, the State will achieve its energy and environmental goals, as well as substantially grow jobs and the State's economy.

CONCLUSION

NY-BEST greatly appreciates the Department's interest in enabling a significant role for energy storage in meeting the State's energy and environmental goals. We believe that energy storage is a key enabling technology to establishing a cleaner, more efficient, reliable, cost-effective and resilient electric grid. New regulatory and programmatic measures are needed to jump start the industry and realize the many benefits energy storage can provide to New York's electric grid. The recommendations we have provided herein will achieve that objective.

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[12] Investment Themes in 2015, Citi https://ir.citi.com/20AykGw9ptuHn0MbsxZVgmFyyppuQUUt3HVhTrcjz4ibR%2Bx79LajBxIyoHIoSDJ3S%2BWRSMg8WOc%3D

[13] Economic Impact of Developing the Energy Storage Industry in New York State, ECG Consulting, https://www.ny-best.org/sites/default/files/type-page/4254/attachments/2012%2010%2005%20NY%20BEST%20Final%20Report%20%282%29.pdf

NY-BEST is grateful for the opportunity to provide these comments and we stand ready to assist you in your review. Should you have any questions about the information presented above, please contact us at 518-694-8474.