November 22, 2010

Hon. Jaclyn A. Brilling, Secretary
Public Service Commission of the State of New York
Three Empire State Plaza
Albany, New York 12223-1350

Response of
New York State Smart Grid Consortium

Matter Master: 10-02120, Case No. 10-M-0457
Petition of New York State Energy Research and Development Authority (NYSERDA)
in the Matter of the System Benefits Charge IV.

Dear Secretary Brilling:

The New York State Smart Grid Consortium (Consortium) is a not-for-profit 501(c)(6) organization formed in July 2009[1]. Its membership represents a unique public-private partnership of largely New York State utilities, authorities, universities, industrial companies, and institutions and research organizations which came together in a collaborative manner to facilitate the development of a Smart Grid in the state and nation.

We are writing to express our support for the extension and renewal of the New York State Systems Benefit Charge (SBC) program through December 2015. There are two notices for public comment with inputs due by November 22, 2010[2]. Our comments are intended to

1 It's membership includes: Advanced Energy Research and Technology Center (AERTC), Brookhaven National Laboratory, City of New York, Clarkson University, Computer Associates, Consolidated Edison, General Electric, IBM, Long Island Power Authority, National Grid, New York Independent System Operator (NYISO), New York Power Authority, New York State Energy Research and Development Authority (NYSERDA), New York State Foundation for Science, Technology and Innovation (NYSTAR), New York University Polytechnic, , Rochester Institute of Technology, State University of New York at Stony Brook, and University of Rochester.

2 I.D. No. PSC-40-10-00019-P addresses the new SBC IV covering the period from January 1, 2012 through December 31, 2015; I.D. No. PSC-40-10-00020-P addresses the extension of SBC III from June 30, 2011 through December 31, 2011

apply to both, but will be differentiated where appropriate. We will refer to them collectively as SBC IV.

On November 4, 2010 a technical conference was held at the Public Service Commission Board Room in Albany, New York. Representatives of the Consortium and individual member organizations participated in person, at the New York City 90 Church Street location and on the Telephone Bridge. The technical conference was highly instructive and greatly appreciated.

NYSERDA President Frank Murray excellently summarized the history and benefits of the SBC program from its inception in 1996. NYSERDA Vice President for Technology and Strategic Planning, Janet Joseph exemplified these benefits with data indicating that SBC investments build on an extremely successful platform that delivers value[3].

There are least six major benefits of NYSERDA's conduct of the SBC program that are germane to smart grid capabilities as the State looks toward SBC IV. NYSERDA's SBC program:

1. Provides benefits to customers and utilities including developing new technologies and products that can eventually be deployed in resource acquisition programs such as EEPS and RPS, and which can also be deployed directly by the State's utilities.
2. Provides an important gap-filling vehicle for supporting and stimulating job and technology development efforts in New York State. In particular it helps new technologies get a foothold in the market once they are "ready for prime time."
3. Improves return on investment on R&D as well as energy savings.
4. Leverages economic resources and leverages mobilization of institutional resources.
5. Helps New York State address energy efforts not necessarily met by national resources, e.g. regional and in-state needs.

3 NYSERDA's "Vision for the Future" presentation at the Technical Conference summarized on slide 5 a series of benefits for the SBC program including more than 4,000 GWh of annual energy savings, more than 1,400 MW of demand reduction, emissions reductions of 3,030 tons of Nitrogen Oxide, 5,710 tons of Sulfur Dioxide, and 2.3 million tons of Carbon Dioxide, 4,900 net jobs created or preserved through 2008, and that every dollar spent on energy R&D product development returns $5 of added value, increasing the gross state product.

6. Funding provides the "Good Housekeeping Seal of Approval" to new energy efficiency measures and systems, thereby encouraging the adoption of new technology.

For these reasons the Consortium supports a continuation of the SBC program through December 2015 under NYSERDA's administration. The Consortium would prefer to see research and development activities and dollars from the SBC work through a prioritization and review process which the Consortium would be happy to host. All parties, including the Commission and NYSERDA who are both active members of the Consortium, would be involved in this oversight process which would determine which projects move forward. In specific response to question 5 posed in SBC IV, we support allowing a balanced portfolio of resources and programs including flexibility to fund a small number of projects that have longer-term benefits that accrue beyond 2015. The Consortium also supports the Commission's proposal to maintain the overall funding levels for SBC IV from the levels from SBC III. While it is important to continue investing in new technologies and capabilities which provide benefits to the State's utility customers, in these hard economic times it is critical that the State consider the impact of funding these programs on customers.

We thank the Commission for this opportunity to share our comments. They include:

- A high level view of the lessons and experiences learned from the SBC program;
- Our perspective on smart grid as "the enabling technology" which will allow New York State and the nation to achieve a significant proportion of its energy objectives (in particular the objectives of SBC IV);
- High level overview of potential examples of smart grid research and development projects that will help achieve these objectives;
- Specific examples including the ongoing New York State Smart Grid Roadmap development and communications and the development of a Smart Grid Demonstration Center;
- The economic development benefits of smart grid deployments;
- Our recommendations on SBC program transparency and oversight; and
- Leveraging investments and benefits.

SBC PROGRAM LESSONS AND EXPERIENCES

The Consortium believes the "Lessons and Experiences" summarized by NYSERDA in its September 20, 2010 "Vision for the Future" submittal should be given particular emphasis and weighting by the PSC as it considers prioritization of funding programs for SBC IV.

The first three summary lessons, experiences and recommendations listed by NYSERDA were:

1. Technology commercialization requires both technology development and business deployment.

2. Demonstration programs can accelerate market adoption of new technology and prepare the market for deployment program success.

3. Market transformation is best delivered through the supply chain.

The Consortium believes that SBC IV should be reviewed, refined and approved with these principles of success in mind.

The Consortium wishes to facilitate the efforts of the State and work closely with the Department of Public Service, NYSERDA and utilities in their efforts to more effectively demonstrate, document and deploy technologies on a much larger and a more rapid scale than otherwise would occur. By demonstrating different technologies in a coordinated manner the Consortium can assure that the documentation of performance and proven benefits can be disseminated to a broader audience. This will reduce possibilities of duplicative pilots.

The Consortium intends to coordinate its efforts with other strategic SBC initiatives which were identified in the NYSERDA "Vision" document. Two prime examples are the initiatives targeted to "Accelerate Transition to an Electric Vehicle Infrastructure" sector and to "Enable Advanced High-Performance Buildings."

Both of these initiatives require close alignment with grid planning so that the necessary infrastructure modifications as well as codes and standards can be considered early in the process.

The Consortium was proud to have been a partner in the New York Energy Efficient Building U.S. DOE Hub proposal for which Syracuse University was the lead applicant and which garnered the participation of industry and academic leaders from around the state. It united building owners, building operators, architects, engineers and designers in a common effort to more aggressively deploy new technologies and new building design features on a much larger scale. SBC IV funding can provide strategic investments in this effort.

Uniting the design, supply and the delivery chain from the outset will allow for the greatest opportunity for success as NYSERDA's SBC experience has demonstrated.

SMART GRID AS THE "ENABLING TECHNOLOGY"

The term Smart Grid means many things to many people today. It is not a "one size fits all" technology and must be adapted and configured for each region, state, and power utility. Smart Grid is a vision for the electric delivery system of the future. One such vision was developed by the Consortium in order to evaluate the potential costs and benefits of alternative Smart Grid implementation scenarios and was filed under Smart Grid Case 10-E-0285 in September 2010[4].

The existing grid will be challenged by the need to integrate high levels of renewable resources as well as the need to manage the grid in new ways including incorporating customer-side resources such as demand reductions and Distributed Generation (DG), including combined heat and power (CHP), and the need to manage distribution system assets in new ways to target investments and reduce overall capital needs. In other words, the successful development of a Smart Grid will dramatically enhance the way we interact and use energy moving forward.

The Consortium believes that a modern integrated Smart Grid will provide an entirely transformed electrical infrastructure. It will embody a network of devices as vast, interconnected, automated, and interactive as the Internet. The fully implemented and realized Smart Grid will benefit many stakeholders – the public as consumers, homeowners, rate payers, as well as employees, businesses and institutions.

As the Consortium also indicated in our replies to the questions raised by the PSC in the Smart Grid Case[5], there are a number of benefits of potential smart grid improvements that are not recognizable currently in utility rate structure. Our Roadmap was also aimed at 2025 and most of the benefits that we identified occur between 2016 and 2025. Support for smart grid development and deployment from within the SBC IV program could be instrumental in making significant progress within the 2015 time frame targeted for the continuation of SBC III into SBC IV.

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4 See "Smart Grid Roadmap for the State of New York" submitted under "CASE 10-E-0285 – Proceeding on Motion of the Commission to Consider Regulatory Policies Regarding Smart Grid Systems and the Modernization of the Electric Grid" and filed September 16, 2010; also http://nyssmartgrid.com/download/thoughts/sg_roadmap_for_state_of_NY_9-15.pdf

5 Developed from the Consortium's Smart Grid Vision and its Smart Grid Roadmap Documents.

Our support is informed not only by the strong history of public benefit from the System Benefit Charge but also the timeliness and urgency of research and development investments resulting from the challenges that New York State is facing with respect to the economic conditions. Both challenges and opportunities arise from the emergence of renewable sources, such as wind and solar, as well as the emergence of Smart Grid technologies that can help New York to meet the dual challenges of energy independence and environmental considerations. As noted in the recent interim report of the State's Climate Action Plan, the grid is the "backbone of a low-carbon future", enabling not just renewable energy but also energy efficiency, integration of new technologies like electric vehicles and energy storage, and the ability to target investments as a means to improve system performance and control costs while providing high levels of reliability.

Drivers include:

- Gubernatorial challenges for energy efficiency targets (15% by 2015) and Renewable Portfolio Standard (RPS) targets (30% by 2015) create unique opportunity/need to take advantage of smart grid resources.
- The targets set in Executive Order No. 24 to reduce CO2 levels by 80% by 2050 will require a radical reinvention of energy and its value. Smart Grid resource mobilization will be essential.
- Governor-elect Andrew Cuomo's Energy Policy Issues paper released August 8, 2010 illustrates a strong interest in smart grid and increasing what might be called the "plug and play" mobilization of smart grid resources at the end-user level, such as active demand management.
- The Consortium's Smart Grid Road Map included extensive analyses statewide and across many measures and systems examining the horizon to 2025 in greater depth than to 2015. While the RFC identifies the 2011-2015 time-frame as a major target of interest, the cost-benefit results were positive in the longer time frame with greater costs in the front-end period.
- Providing SBC and resource acquisition funds for smart grid research and development initiatives in the 2011-2015 is extremely significant. It is very

important in this period to maintain a balanced portfolio that includes longer-term investment, such as research, development and demonstration (RD&D).

Smart grid is one of the key foundations for meeting these challenges so the Consortium agrees with the view of the Smart Grid as the “enabling technology” which will allow this state and nation to achieve a significant proportion of its energy objectives. The Consortium further believes that the Smart Grid will more fully enable New York State to achieve its SBC objectives as identified in the “Proposed SBC Mission: 2011-2016” and to the “Proposed Modifications to Overarching SBC Policy Goals: 2011-2016).” Smart grid should be a priority investment area, with significant amounts of SBC-collected funding used to support these activities. While the exact funding level can vary over time and should be based on prioritizing investments based on benefits, the Consortium believes it should fall in the range of 20-40 percent or more. The following pages provide some high level examples of smart grid R&D projects that could be developed with the benefit of this funding.

HIGH LEVEL OVERVIEW OF POTENTIAL SMART GRID INITIATIVES & PROJECTS

Areas of research and development focus related to utility operations, to potentially be addressed through NYSERDA funded Smart Grid projects include:

- Better forecasting of mid-term (day-ahead) and short-term (hour-ahead and intra-hour) variable resource production. The NYISO has already developed sophisticated wind forecasting and economic dispatch tools that help facilitate the integration of wind resources into the bulk electric grid. The long-term ideal would be to forecast all variable resource production as accurately as load can be forecast today. The market impact from excessive inaccuracies in variable resource forecasts can appear in the form of additional reserves and other product procurements. Improved forecasting will lower costs to consumers.

- Improved “grid forecasting” with as much modeling flexibility as weather forecasting has today, will enable all kinds of “smart grid” users to plan and manage their actions with as much effect as they wish. Analogous options, often transparent, frequently behind the scenes will occur due to smart grid forecasting.

- Control of smart appliances is an area where additional research is needed. This is a case where smart appliances would be installed in customer homes, and control software on both the utility side and the customer side would be developed. Information about the appliances and control functionality is provided directly to the customer via a central control and communications module (located within the home), that also sends information securely to the utility.

- Advanced analytics to use phasor measurement unit (PMU) information to enhance stability and lower the cost of dispatch. These may include new wide-area visualization tools and adaptive protection systems or centralized high-speed adaptive control algorithms and systems for stability enhancement. These will require a communications backbone.

- Utilization of new technologies such as fast response storage technologies to alleviate post contingency loadings and reduce contingency dispatch costs.

- The use of common carrier communications (e.g., cable, fiber, Internet, cellular) for smart grid applications is potentially interesting and valuable and needs to be explored. Serious investigation into the security, performance, and reliability aspects of these systems, if applied to different smart grid applications, is a high priority.

- Some new technologies are inherently mixed purpose, capable of performing market-based services such as ancillary services. In general, smart grid systems are viewed today as regulated assets that are acquired, installed, and operated by electric utilities. There may be competitive alternatives and indeed the emergence of demand response programs in New York and elsewhere demonstrate that smart grid type programs may involve both regulated and non-regulated entities. Several related technologies, such as energy storage and distributed energy resources, could be connected to the distribution feeder but may not be technically feasible on consumer premises. There are no current provisions in New York for third-party investment in, or operation of, assets that are connected to the distribution system directly other than for primary service customers, typically industrial users. The SBC IV program can serve to test new deployment of new technologies as well as facilitating the development of new business models for private sector financing of projects.

- The infrastructure necessary for adoption of smart charging of Plug-in Electric Vehicles (PEV) at significant levels is another example of a technology which needs to have a test and validation component as well as the development of various business models to support the infrastructure investment options. Smart charging has been identified as having major benefits in terms of peak market pricing, avoided T&D infrastructure spending, and ancillary services in support of renewables integration. Policies that enable smart charging technical capabilities and business processes are essential so that aggregators and utilities can plan on systems deployment, and so that consumers are well informed about smart charging as it becomes part of mainstream transportation lifestyle.

- The benefits of consumer participation in energy markets on various bases are potentially very large. However, mandating uniform customer participation in

markets for all customers regardless of their circumstances poses large risks in terms of consumer dissatisfaction and in fact, may be prohibited by current NY statutes, e.g. mandatory time of use pricing for residential customers is prohibited. From a consumer viewpoint, voluntary participation or opt-in/opt-out is essential, but in order to make informed decisions it is important that consumers have correct information. The use of SBC funds to investigate this structure; to explore development of further services; and potential customer reaction to those services is a key area of needed research.

- Interaction of renewable energy to support the distribution system is viewed as a key component of a Smart Grid future, but needs to be tested in an operational setting. Projects in this area could be a good use of SBC funds. An example of research in this area might include installing small (200Watt) solar panels on utility poles, and would communicate data back to the distribution system operator on the status of the distribution system, which is currently difficult to collect.

While developing the comments for this, the Consortium received many more examples of possible projects that are appropriate. These are presented in Appendix A.

SPECIFIC PROJECT EXAMPLE - *Ongoing New York State Smart Grid Roadmap Development and Communications*

In early 2010 the Consortium undertook the development of a state "Smart Grid Roadmap" which was intended to be a high level vision and cost-benefit analysis for state policy makers and utilities to consider in their planning for Smart Grid in New York. The Consortium undertook to develop a more detailed and flexible cost benefit analysis that would allow the exploration of how benefits over time can be aligned with investments over time. During the summer and early fall of 2010 the Consortium fulfilled this request with a new Roadmap that has unprecedented capabilities in cost-benefit analyses. This roadmap was filed with the NY DPS in September in response to the Commissions' recent inquiry on Smart Grid policies[6]. We recommend the state "Smart Grid Roadmap" to the attention of the Commission and NYSERDA as they move forward with SBC IV.

The data in the roadmap is taken from "best available" published information and utility rate filings, and was reviewed by the Consortium members in some detail. However, many of the calculations in the roadmap are as yet unproven (penetration of Electric Vehicles, for instance) and cannot be linked to well known historical data. For example in the development of the roadmap it was clear that more research is needed on customer response to Smart Grid related services.

Going forward, the preservation and enhancement of this roadmap as a policy tool would envision annual updates using latest available information and reflecting new knowledge and technologies. The roadmap is already public in published form as a Commission filing; it could become a reference for ongoing policy analyses if continuously enhanced and especially if the roadmap became "open" to submission of new data and calculations from interested parties. We recommend that NYSERDA support the ongoing development and use of the roadmap as a valuable policy and communications tool for New York and that a portion of the SBC Funds be used for this purpose.

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[6] See "Smart Grid Roadmap for the State of New York" submitted under "CASE 10-E-0285 – Proceeding on Motion of the Commission to Consider Regulatory Policies Regarding Smart Grid Systems and the Modernization of the Electric Grid" and filed September 16, 2010; also http://nyssmartgrid.com/download/thoughts/sg_roadmap_for_state_of_NY_9-15.pdf

SPECIFIC PROJECT EXAMPLE - *Smart Grid Demonstration Center*

Under the banner of Smart Grid, bold efforts are underway throughout the country to modernize power grids. Many of the efforts are complex, deploying new technologies and establishing a more collaborative framework for the way electricity customers relate to their electricity providers. Others build on existing technology, such as renewable energy, but increase the deployment to levels that will significantly impact grid operations. The modernization projects being executed are large and their success depends on the support of many stakeholders, the vast majority of whom do not yet have an emerging understanding of Smart Grid concepts and technologies (whether it might be good for them or not). In addition, some of the technologies being deployed have never been integrated together and are being designed to new industry standards.

A Smart Grid Laboratory & Demonstration Center (Lab and Demo Center) would provide a way for stakeholders to quickly and fully grasp New York's Smart Grid vision, including the technical infrastructure, systems, and policies required to deliver that vision. Recognizing the fact that National Grid already has an existing test center up and running in Syracuse and that it is being leveraged on a statewide basis, this Lab and Demo center would not duplicate any existing efforts and should in no way jeopardize the investments and/or operations National Grid has in its current facility. Via the Lab and Demo Center, key stakeholders, including legislators, regulators, universities, media, activists, consumers and utility employees, can quickly grasp the purpose and benefit planned for all New York Smart Grid projects. Key technology vendors of New York, such as IBM and GE, will be able to showcase and integrate their products and possibly cost-share in the center's development and operations. All electricity organizations in the state, including NYISO, Con Ed, National Grid, LIPA, etc, will be able to utilize the facility.

The Lab and Demo Center can encompass multiple locations and 3rd party stakeholder facilities via virtual integration, making New York a hub for smart grid activities across the nation. Separate labs or smart grid development efforts can be interconnected with the center for demonstration, interoperability testing, and R&D efforts. This will enable increased R&D collaboration among state entities, larger scope of interoperability testing, and greater potential for public outreach and engagement. Preference should be given to funding additional research activities at existing utility facilities. See Appendix B for more detailed overview.

SMART GRID ECONOMIC DEVELOPMENT BENEFITS

The SBC IV program should be, first and foremost, about bringing benefits to customers. But the program undoubtedly provides economic opportunities within the State as well, and the economic development benefits of the Smart Grid will be substantial, and should provide an important shot in the arm to the economy of New York State. It is essential that we not let this opportunity pass us by. These potential benefits include:

- Demand for new products and services. This demand will be created not only in the building of the Smart Grid but also to support consumers who wish to take advantage of its added capabilities.

- While the SBC should not be driven primarily by a desire to create new jobs, it is a secondary impact of the program that can be considered. The establishment of the Smart Grid, not only in New York State but across the nation, and the associated demand for new technologies and services, should result in a myriad of new business opportunities. With the wealth of expertise in New York at our research universities, coupled with the fact that New York City is the financial capital of the world, New York should be at the forefront of efforts to establish and attract businesses that will be at the center of the emerging Smart Grid industry.

While there are many opportunities for invention, development of products related to the Smart Grid, accessing and understanding these developing markets, identifying appropriate opportunities, and uniting the State's wealth of research and commercial assets to take advantage of those opportunities, is not now occurring in New York in any systemized fashion. The Consortium is positioned to play a significant role in enabling this function, and ensuring that the full economic benefits associated with the Smart Grid are realized by New York State. Support from SBC-collected funds, managed by NYSERDA, could be essential to stimulating the flow of these economic benefits.

SBC PROGRAM TRANSPARENCY & OVERSIGHT PROCESS RECOMMENDATIONS

The System Benefits Charge program, as proposed by NYSERDA, would continue to collect significant funds from utility customers, and would invest those funds in some potentially new and developing technologies, including Smart Grid. Because of the amounts collected from customers and the rapid innovation going on in certain areas of the energy industry, transparency and stakeholder engagement should be high priorities for the Commission when reauthorizing SBC IV. As a result, the Consortium recommends that the Commission utilize the full resources of the Consortium it has at its disposal and have it serve as the advisory committee, in conjunction with the Commission and NYSERDA, to oversee and prioritize smart grid R&D programs funded by the SBC IV. The Consortium can take a major role with respect to Smart Grid initiatives, because it is established and recognized and includes all key stake holders across the value chain dealing with Smart Grid matters. The Consortium would prioritize and recommend specific projects for research and development related funding.

The SBC IV whitepaper issued by NYSERDA focuses on investments in technologies that are at early stages of refinement, including some elements of Smart Grid and plug-in electric vehicles. In order to ensure customers receive the most benefit for their SBC IV contributions, investments in new technologies need to be guided by those with in-depth knowledge of the investment opportunity, and the Consortium, particularly as it includes members such as utilities, research organizations and equipment manufacturers, can help NYSERDA focus smart grid R&D in ways that truly add value, and are not duplicative of efforts already underway elsewhere. A critical function of this oversight process is to provide the Commission and the State the ability to balance costs in total and suggest priorities based on total value to consumers. Particularly during difficult economic times, the Commission is right to continue making investments that will benefit customers, but also needs to manage costs of these types of programs overall. This Consortium will also help focus on providing geographic balance to Smart Grid projects. There does not need to be a perfect match between where funds are collected and where they are spent, but the Commission, NYSERDA and the Consortium should make sure that the customers of all utilities benefit from Smart Grid funding by selecting projects that reflect the diverse built-environment of the State.

LEVERAGING INVESTMENTS AND BENEFITS

As proposed in the SBC IV documents it would appear that SBC-collected funds, in significant portion, could be shifted to the purposes of EEPS-type resource acquisition. We encourage keeping all SBC-collected funds as subject to SBC programmatic direction and flexibility rather than limiting some to EEPS-type criteria. We encourage the use of resource acquisition funds for smart grid purposes within the SBC IV time period and make several recommendations, especially for active demand management at the end-user level. In addition, it is important that NYSERDA work collaboratively with the utilities to offer complementary energy efficiency programs to reduce the confusion currently in the marketplace with two entities offering similar programs to customers. Since utilities have the customer relationship, they should be the entity that interfaces with customers on projects that include both utility run as well as NYSERDA run programs to eliminate this confusion for customers, provide more comprehensive projects, and allow one-stop shopping for customers so the State can meet it's 15X15 targets.

SUMMARY AND CONCLUSION

In summary, the NY Smart Grid Consortium advocates the following in the matter of the SBC IV:

1. Extension of SBC IV for a full and uninterrupted transition of SBC III to 2015, including the technology development component of the SBC.

2. We encourage keeping all SBC-collected funds as subject to SBC programmatic direction and flexibility rather than limiting some to EEPS-type criteria. The need for research and demonstration is growing – not diminishing. Furthermore, we recommend that a range of 20-40% or more of these total funds should be allocated to smart grid research and development projects which will be critical in enabling the achievement of SBC related goals.

3. We recommend the Consortium, with its breadth of membership and resources, and in conjunction with the Commission and NYSERDA, be appointed the advisory committee for smart grid research and development projects to oversee and prioritize smart grid R&D programs funded by the SBC IV.

4. In specific response to question five, we support a balanced portfolio of RD&D activities that allows sufficient flexibility for NYSERDA to support some longer-term investments where the benefits accrue beyond 2015.

5. Support for a number of smart grid initiatives, especially when they can leverage other investment, such as those identified in this comment. Smart grid initiatives should be prioritized to reflect the potential future value to consumers in the state, as well as to establish NY as a leader in its deployment.

6. Provide a transparent process for allocation of funds and a clear, effective process for stakeholder input to be considered by NYSERDA in determining the proper balance of investments for this portfolio, including inputs by the Consortium. We note that the Consortium has most utilities, many universities and research institutions, associations, and other interests represented.

7. Maximum flexible utilization of SBC funds to support technology development and deployment of a balanced portfolio of smart grid and other energy resources. Balance with the capabilities and needs of downstream programs like RPS, RGGI, EEPS, etc. It will be important for these funds to be spent equitably across the state with consideration of the customers that are funding the SBC IV.

8. Allowance for resource acquisition funds to be used for Smart Grid investments where demand reductions and energy savings can be demonstrated. For example, we support allowing resource acquisition to support "plug and play" smart grid technology, say at the residential customer level as an example, that is ready to roll-out sooner than later, e.g. active demand management.

9. Measurement of benefits across a balanced portfolio rather than a single measure, e.g. in the resource acquisition area.

The Consortium would like to thank the Commission and NYSERDA for the opportunity to comment on these critical elements of program design and planning.

Sincerely,

Robert B. Catell
New York State Smart Grid Consortium
Chairman
Robert.catell@nyssmartgrid.com

APPENDIX A – *Additional Examples of Potential Smart Grid R&D Projects*

Active Demand Management

A possible project is a pilot real time demand response demonstration program of 100 homes across the state that uniquely would provide real-time pricing functionality to residential consumers. It would use existing software, function continuously and not require the use of costly AMI smart meters at the residential level providing savings to both the consumer and the utility. The proposed program could be an evolution of a pilot in the Olympic Peninsula of Washington, organized by the Department of Energy that was identified in Governor-elect Andrew Cuomo's energy policy paper of August 6, 2010 as an indication of things to come with Smart Grid opportunities.

A consumer who elects the real-time pricing pilot will receive a home energy manager that is in constant two-way communication with the utility. The energy manager's automated interface allows the consumer to select a setting along a continuum between "comfort" and "savings", allowing the consumer to "set-it-and-forget-it". Thus, without having to compromise the desired level of comfort, the consumer automatically achieves hourly peak load reduction on participating appliances when prices are high, resulting in an energy cost savings by using electricity when prices are low.

The pilot will demonstrate the utility and cost-effectiveness of Active Demand Management operating in both rural and in dense urban environments.

Power Simulation and Analysis

A power distribution system simulation and analysis tool would be demonstrated that provides valuable information both to users who design and operate distribution systems and to utilities that wish to take advantage of the latest energy technologies. The simulation incorporates advanced modeling techniques with high-performance algorithms and can be coupled with a variety of distribution automation models as well as integrated with numerous power system analysis tools. Designed to model events lasting only minutes to as long as several months, one such tool, GridLAB-D™, is designed to analyze operational and planning issues that arise from the interactions between various parts of the electrical distribution system.

For the Pilot, we propose putting 100 homes on a virtual feeder to perform various operational and planning analyses. These analyses would consider the impact of introducing a variety of technologies including PHEVs/EVs, Community Energy Storage, volt-var control, and other grid-based distribution automation, including the possibility of distribution PMUs. The lessons learned from the virtual feeder will be used to determine (1) suitable locations for similar technologies across all of the feeders of the utility, (2) how many of each technology should be placed on which feeder, and (3) the interaction of these various technologies with one another.

Renewables and Distributed Generation Integration Roadmap

While New York has evaluated the integration of renewables in several waves of evaluation, it is proposed that a fresh look be taken with greater focus on the distribution system and the integration of distributed generation and storage. The development of business cases for the integration of distributed resources would be a primary target for the effort. One launching point could be the Smart Grid Roadmap already developed by the Smart Grid Consortium. A second launching point could be the recently released study by the Panel on Public Affairs of the American Physics Society entitled Integrating Renewable Electricity on the Grid.

Multi-utility Integration Project for PV and Small Dispersed Generation

It is proposed that the integration of small PV and other dispersed generation in the distribution system, for example by PV installations on utility poles, be evaluated across the multiple utility territories. This can be achieved by utilizing a virtual feeder data collection and simulation capability. Initiatives involving individual utilities can thus be brought together for optimizing proof of concept and further refinements that can lead to possible regulatory as well as technical changes.

Testing of Technology Related to Plug in Vehicles

The infrastructure necessary for adoption of smart charging of Plug-in Electric Vehicles (PEV) at significant levels is another example of a technology which needs to have a test and validation component as well as the development of various business models to support the infrastructure

investment options. Smart charging has been identified as having major benefits in terms of peak market pricing, avoided T&D infrastructure spending, and ancillary services in support of renewables integration. Policies that enable smart charging technical capabilities and business processes are essential so that aggregators and utilities can plan on systems deployment, and so that consumers are well informed about smart charging as it becomes part of mainstream transportation lifestyle.

Electric Vehicle Fleets and Battery Storage

In partnership with a major shipping logistics firm, this project would install EV charging stations and battery storage for a fleet of electric vehicles. The shipping logistics firm would purchase 100 electric vehicles, but additional funding is needed to install the charging infrastructure. The charging infrastructure would incorporate a controller and battery storage to enable curtailment in the event of an electric system emergency but still allow the customer to charge their fleet vehicles which are critical to their core business function.

Advanced Sensors

Improved dynamic-line ratings to increase transmission productivity and reduce congestion costs. The New York Power Authority (NYPA) is conducting a pilot project on the use of various devices such as sagometers, backscatter sensors and ThermalRate systems to calculate line sag. Other new technical solutions may already exist that use advanced sensors and analytics. Improving line ratings directly improves transmission throughput and is one of the earliest tangible benefits of smart grid applications.

Dynamic Pricing Pilot

Dynamic rate offering to customers is often considered a key potential benefit of Smart Grid. Due to various constraints, utilities have not been able to pilot dynamic rate plans as part of our smart grid pilots. An SBC funded dynamic rate pilot would allow utilities in the state to test the key benefits taunted by smart grid in their service territory. In filings with the PSC, utilities have

proposed a series of dynamic rates such as critical peak pricing, peak time rebate, etc., but have not been able to implement these pilots due to a lack of funding. Cost estimate is $1 million to $3.6 million depending on the size of the pilot.

Distribution Network Feeder Health Tool Development

New technology and connectivity offers opportunities for better diagnostic and analytic systems to better manage distribution assets, including predicting and preventing operating failures, mitigating voltage and current transients and avoiding release of high energy into structures under city streets. In partnership with manufacturers of power test and diagnostic equipments, this project could develop and demonstrate partial discharge and loss-angle diagnostics in conjunction with developing an advanced very-low-frequency test set.

Distributed Energy Resources Optimization

Presently, during high load periods and adverse system conditions, operators have little effective control of the load demanded of the distribution system.

In partnership with a provider of intelligent agent software, this project would attempt to increase the efficiency and utilization of low voltage network distribution assets by expanding operators' vision into the network and into distributed resources, including developing secure communications and standardized messaging for data and commands, extend and enhance demand response, distributed generation and network simulation tools, and develop a suite of applications that offers distribution operators the ability to act on these models.

Network Secondary Arcing Fault Detection and Location Tool Development

Thousands of miles of new, old and very old low voltage secondary cables and accessories are subjected to a wide array of environmental and operating conditions, and most replacement decisions are reactionary after significant failure. In a joint utility study, this project would develop and demonstrate detection and location of incipient fault signatures and arcing conditions.

APPENDIX B – *Smart Grid Demonstrations Centers Detail*

Background

Under the banner of Smart Grid, bold efforts are underway throughout the country to modernize power grids. Many of the efforts are complex, deploying new technologies and establishing a more collaborative framework for the way electricity customers relate to their electricity providers. Others build on existing technology, such as renewable energy, but increase the deployment to levels that will significantly impact grid operations. The modernization projects being executed are large and their success depends on the support of many stakeholders, the vast majority of whom do not have a good understanding of Smart Grid concepts and technologies. In addition, some of the technologies being deployed have never been integrated together and are being designed to new industry standards.

As home to the NY Smart Grid Consortium, NY-BEST, NYSERDA, and NYSTAR, New York State has already taken a critical leadership role in the research and development of Smart Grid technologies while the NY PSC has advocated aggressive yet prudent implementation of Smart Grid through its regulatory policies. A Smart Grid Lab & Demo Center would provide a way for stakeholders to quickly and fully grasp New York's Smart Grid vision, including the technical infrastructure, systems, and policies required to deliver that vision. Recognizing the fact that National Grid already has an existing test center up and running in Syracuse and that it is being leveraged on a statewide basis, this Lab and Demo center would not duplicate any existing efforts and should in no way jeopardize the investments and/or operations National Grid has in its current facility. Via the Center, key stakeholders, including legislators, regulators, universities, media, activists, consumers and utility employees, can quickly grasp the purpose and benefit planned for all New York Smart Grid projects. Key technology vendors of New York, such as IBM and GE, will be able to showcase and integrate their products and possibly cost-share in the center's development and operations. All electricity organizations in the state, including NYISO, Con Ed, National Grid, LIPA, etc, will be able to utilize the facility.

The Lab and Demo Center can encompass multiple locations and 3rd party / stakeholder facilities via virtual integration. Separate labs or smart grid development efforts can be interconnected with the center for demonstration, interoperability testing, and R&D efforts.

This will enable increased R&D collaboration among state entities, larger scope of interoperability testing, and greater potential for public outreach and engagement.

Benefits: A Smart Grid Demonstration Center offers many benefits to the state of New York such as:

- Leadership: With a diverse of mix of utilities, New York State is effectively positioned to demonstrate the many network permutations presented by Smart Grid, representing residential, commercial and industrial customers in urban, suburban, and rural settings.
- Finance: As a world leader in global finance and media, NY is strategically positioned to finance the smart grid infrastructure, define its value, and promote its importance on a regional, national, and global level.
- Vendor Showcase: A recent NY PSC order provided the opportunity for state utilities to articulate their respective Smart Grid visions. All are challenged with incorporating new technologies, including both hardware and software, from a multitude of vendors, requiring interoperability across multiple platforms. Vendors, particularly those of NY State but also select providers to the state's utilities, would have an opportunity to showcase their technology solutions in a centralized NY State sponsored demonstration center.
- Education: The NY State Energy Plan mandates meeting 30 percent of new energy supply with renewables by 2015 and using energy efficiency and conservation to reduce usage by 15 percent below the 2015 forecast. A demonstration center would offer stakeholders the opportunity to understand/appreciate the various means by which those aggressive targets could be achieved through introduction of Smart Grid.
- Consumers: Smart-Grid enabled devices, primarily in the HAN, would be on display to represent the future potential to residents of the state - paving the way for their full participation in future consumer-facing programs.

- Research: NY State is also home to world-renowned research institutions and universities, which could support and enhance the demonstration center by engaging in consumer and technology research around the concepts on display.
- Job Creation: A center could tout the creation of companies and jobs in NY State associated with Smart Grid. Under FOA-152, New York utilities and universities received money for workforce training which could be tied in to the demonstration center.
- Policy Validation: The center could provide corroborating data for regulatory policies associated with aspects like Communications, RPS, and cost recovery for T&D investments. The center could be used to compare/contrast various Dynamic Pricing models and demonstrate the effectiveness of different plans on peak demand.
- Coordinated Funding: Shared funding through multi-sector participation (utilities, vendors, ISO, academia, state agencies, Brookhaven National Laboratory) can result in greater overall capabilities and benefits at lower costs as compared with individual corporate and other efforts.

What it takes to build a Demo Center:

Project Step Supporting Activities

Foundation

Develop Concept and Enlist Stakeholder Support • Arrange and conduct tours of other U.S.-based smart grid demonstration centers for key stakeholders to gain first-hand exposure and develop a vision of the State Smart Grid Lab & Demo Center

- Prepare a vision statement for the Lab & Demo Center
- Make the Benefit and Cost advantages of a state level collaborative effort versus individual utility / manufacturer efforts clear and link realization of these to the goals and structure

- Develop a structural framework for the Center including the basis of funding, participation, and management
- Enlist formal stakeholder participation including funding

Contracting

- Develop an RFP for the Project Management of the Demo Center Establishment and (separately or in combination) for the ongoing management and operation of the Center
- Select organization to develop and to operate the Center and establish the funding and contracting mechanisms.

Step One

Confirm Objectives and Resource Estimate • Arrange and conduct in depth visits to other U.S.-based smart grid demonstration centers for key members of management team to gain first-hand experience and obtain direct utility feedback and lessons and learned

- Define objectives in the context of overall strategy and stakeholder needs
- Develop preliminary project budget, perform risk assessment, and specify performance metrics to measure success
- Key Deliverable: Charter document describing objectives, resources, schedule, project risks/mitigation steps, and performance metrics

Step Two

Select Location Using Defined Criteria • Identify initial candidate locations and gather data and research possible locations, using criteria for evaluation

- Specify potential partner(s) for technology contributions, hosting, and / or operations, as necessary
- Complete real estate and contractual obligations (e.g., lease arrangement, inspections) for facility location

Key Deliverable: Recommended Center location, including potential partner(s)

Step Three

Develop Framework for Participants • Develop the legal and financial framework for utilities, universities, manufacturers, and others to participate in demonstration and test development and use.

Key Deliverable: Framework and Participation Agreements, IP agreements, Technical Interface Requirements.

Step Four

Oversee Center Development and Commissioning • Develop detailed technical specifications

- Solicit participation / contributions of technologies and integration from participants for specific elements
- Prepare detailed project plan for implementation
- Oversee first phase implementation

Key Deliverable: Final script and operations manual

Examples of existing demo centers: There are a number of Smart Grid Demo Centers already in operation. Some examples are:

- Duke Energy - Envision Center, one of the largest and most complete demonstration centers in the world. KEMA is an exclusive partner to this center, which opened in October 2008 (Erlanger, Kentucky)
- CenterPoint Energy - CNP Technology Center, one of the first in the country, opening in 2005, demonstrating smart metering and smart grid technologies and benefits to customers (Houston, Texas)
- Consumers Energy - Smart Services Learning Center, also recently opened in 2008 and showcases smart metering technology and its interface to home networks and energy controls, as well as utility operations, such as outage restoration (Jackson, Michigan)
- General Electric - General Electric has a Smart Grid lab in operation in its R&D center near Schenectady, NY today, where end to end integration of GE smart grid and utility automation systems can be seen.
- National Grid US - National Grid has an extensive smart grid interoperability testing capability at its Syracuse Learning Center and has conducted extensive end to end interoperability testing.