PROGRAM PLANNING COMMITTEE
OF THE
NEW YORK STATE
ENERGY RESEARCH AND DEVELOPMENT AUTHORITY

Minutes of the 84th Meeting
Held on June 6, 2013

Pursuant to a Notice and Agenda dated May 23, 2013, the Program Planning Committee ("Committee") of the NEW YORK STATE ENERGY RESEARCH AND DEVELOPMENT AUTHORITY held a meeting at 9:00 a.m. on Thursday, June 6, 2013, in the Authority's New York City Office, located at 485 Seventh Avenue, 10th floor, New York, New York, and by video conference in the Authority's Board Room at 17 Columbia Circle, Albany, New York.

The following members of the Committee were present in New York City, unless otherwise noted:

Mark Willis, Committee Chair
Kevin Burke
Robert B. Catell
David D. Elliman
Elizabeth W. Thorndike, Ph. D.

Also in attendance in either New York City or Albany were: Francis J. Murray, Jr., President and CEO of NYSERDA; Janet Joseph, Vice President for Technology and Strategic Planning; Tom Barone, Acting Vice President for Operations and Energy Services; Jeffrey J. Pitkin, Treasurer; Hal Brodie, General Counsel; and Valerie S. Milonovich, Senior Counsel and Secretary to the Committee; and various other members of the Authority staff.

Chairman Willis called the meeting to order, noted the presence of a quorum and stated that a Notice of the meeting (see Exhibit A) was mailed to Committee members and the press on May 23, 2013. Each of the Committee members introduced themselves.

Approval of Minutes from 83rd Committee Meeting

The first item on the Agenda was to consider approval of the minutes of the 83rd meeting of the Committee held on April 16, 2013. Upon motion duly made and seconded, and by unanimous voice vote, the minutes were approved.

Remarks from the President and CEO on Future Directions of the Authority

Mr. Willis called upon Mr. Murray to provide an update on recent Authority activities. Mr. Murray reported on the possible appointment of new members to the Board to fill the current vacancies. He briefly reviewed the future status of the Authority's financial resources and expressed optimism about the continued availability of resources to support the Authority's programs and new initiatives. A more extensive discussion occurred regarding the Regional Greenhouse Gas Initiative and the impact that a change in the program's emissions cap might have on future revenues. Mr. Murray and General Counsel Hal Brodie answered inquiries from the Committee Members with regard to the regulatory rulemaking process that will be undertaken to lower the emissions cap.

Mr. Murray noted that two of the Authority's largest program portfolios, the Energy Efficiency Portfolio Standard (EEPS) and the Renewable Portfolio Standard (RPS), are each scheduled for a comprehensive mid-course review this year. He stated that he believes there to be a good deal of support for the extension of the EEPS and RPS portfolios. Mr. Murray also stated that he expects that the Authority will be asked to continue to step up and help with multi-year efforts that address emerging issues across the State, particularly with regard to resiliency efforts, energy financing, and possibly with regard to the future of energy efficiency efforts on Long Island.

Presentation from the Vice President for Technology and Strategic Planning on the Authority's 2013-2016 Strategic Plan

Janet Joseph, Vice President for Technology and Strategic Planning, presented an overview of the strategic planning activities underway at NYSERDA and described the changes in the strategic plan relative to last year. Ms. Joseph described staff efforts to define the next generation of energy technologies and program needs while also articulating the Authority's overall role in ten year planning increments for each of the technology spaces within the different energy consuming sectors.

Ms. Joseph stated that the Authority must be nimble and avail itself of outside experts who have insight to offer on energy "mega trends." In that regard, she mentioned that the Authority has begun an energy future seminar series to solicit input on new trends in the energy and environmental areas.

Strategies over the three-year timeframe include assessing the priorities of each major Authority portfolio. Activities include: the deployment of commercially-available technologies; technology innovation; workforce development; environmental initiatives; and data analysis. In addition, the Authority is engaged in several high priority strategic, multi-year initiatives which will require significant financial and human resources. These initiatives align with the priorities and policies of Governor Cuomo's administration. Ms. Joseph also added that this year's Strategic Plan is written at a higher, strategic level and the Authority's Mission and Vision Statement are still on point with the broad program portfolio of the Authority. She also noted that the Strategic Plan has been reworked so as to not be repetitive of the Authority's program portfolio operating plans.

Ms. Joseph stated that the long-term challenge of the Authority will be to increase the penetration of energy efficiency and renewable energy technologies but without increasing the infusion of public funding on an annual basis. She stated that Authority management is comfortable with the current funding situation and is confident that there will be no substantial decrease in the foreseeable future. Management will continue to examine ways to provide increased value and greater penetration of new technologies at the current funding levels.

Ms. Joseph presented the funding levels that the Authority expects to invest over the next three years in each of its major portfolio areas. About 86% of the funding level, approximately $3 billion dollars over three years, is focused on deployment of commercially-available technologies through the EEPS, RPS and Regional Greenhouse Gas Initiative (RGGI) portfolios. She described the major funding challenges as the need to adjust programs and funding to capitalize the $1 billion Green Bank Initiative and to address the reduced statutory R&D funding resulting from the loss of a $1.6 million annual contribution from the Long Island Power Authority (LIPA). It was emphasized that the R&D statutory funding is the one funding source that permits the Authority to engage in efforts that are statewide and that address non-electric, non-gas research areas. Ms. Joseph characterized the R&D budget as being "smaller dollars, but strategically significant."

Mr. Catell expressed his concern that no other State entity can replace the value of the Authority's R&D efforts if the amount of funding allocated to it decreases - an issue that decision-makers should consider during future planning. The Members asked staff to prepare a briefing paper on the value of R&D and present it at the September 2013 PPC meeting.

Mr. Murray explained that there appears to be a perception that the Authority is awash with vast amounts of funding without further recognition that there are many demands, requirements and limitations associated with each source of funding. He also added that the demands on the amount of flexible funding available to the Authority have been increasing. He noted that Authority management often discusses the value proposition of funding longer term R&D efforts that may ultimately provide more benefit for the dollar than funding more, shorter-term solutions.

In response to Mr. Elliman's inquiry as to how much of the Authority's funding is flexible, Mr. Pitkin provided clarifications on the different funding sources, associated parameters, and necessary approvals associated with funds earmarked for specific activities.

In presenting the Authority's funding by sector, Ms. Joseph stated that the funding for transportation efforts remains rather small and the Authority had been hoping to increase that funding during this year. She is hopeful that the Cleaner, Greener Communities Initiative may advance some additional transportation efforts, and if so, this information will be available within the next six months.

Mr. Elliman inquired as to whether the Authority would earmark more funding toward transportation if it had more discretionary funding. Mr. Murray responded by stating that transportation is a very large contributor to greenhouse gas emissions, yet, relatively speaking, the Authority is able to spend very little of its funding to address those issues.

Mark Torpey, Director of Clean Energy Research and Market Development, added that in its internal strategic planning efforts, R&D staff are taking a broad approach in addressing transportation efforts. These efforts include electric vehicle infrastructure, compressed natural gas, biodiesel, heating and transportation fuels, subway system infrastructure, freight delivery, and other technologies and sectors. However, the bulk of the funding is federal and any State funding that becomes available is leveraged to take full advantage of the available federal funding.

John Williams, Director of the Energy Analysis Program, suggested that all of the programmatic initiatives mentioned by Mr. Torpey should be supported and advanced in many different ways. An upcoming initiative that will support many of them is the RGGI Transportation and Climate Initiative. This initiative includes all of the RGGI participating states plus additional states, and focuses on programmatic issues and stronger policy foundations. The rationales and alternatives are analyzed with a focus on securing additional revenues to support transportation efforts.

Reports on Upcoming Strategic Initiatives

Green Bank

Mr. Pitkin described efforts undertaken to launch the New York Green Bank announced by Governor Cuomo in his January 2013 State of the State message. The Green Bank is anticipated to use $1 billion to leverage private capital to accelerate the deployment of energy efficiency and renewable energy technologies. It will be accomplished by employing various financial strategies aimed at addressing gaps and barriers that are impeding the flow of financing capital to support energy efficiency and renewable technologies.

Mr. Pitkin described that one of the challenges to increasing the number of viable financing strategies involves tapping into the secondary, or bond, market. The Authority expects to complete a secondary market financing securitizing approximately $24 million in Green Jobs/Green New York program loans. As an asset class, energy efficiency bonds are often considered to be an unknown commodity and to lack sufficient performance data. Mr. Pitkin stated that the Green Jobs/Green New York financing effort is a type of Green Bank financing strategy. Mr. Elliman inquired as to how much of the initial Green Jobs/Green New York capitalization is still available. Mr. Pitkin explained that of the initial $112 million available for the Green Jobs/Green New York effort, about $42 million has been allocated to the revolving loan fund. Of that, about $32 million has been lent out to residential, multi-family and small commercial entities. The $24 million bond issuance represents the first recapitalization of the revolving fund, and it is intended to set the program on a path to sustainable financing for energy efficiency loans.

Mr. Murray explained that the Authority is partnering with the New York State Environmental Facilities Corporation (EFC) to take advantage of its strong financial standing. The two public authorities are working toward the same goal. In response to an inquiry from Mr. Elliman, Mr. Pitkin replied that the bond rating will be based largely on the credit worthiness of EFC.

Mr. Pitkin also reported that the U.S. Environmental Protection Agency has approved the use of the Clean Water State Revolving fund to back the issuance of the NYSERDA bonds owing to the nexus between clean water and energy efficiency and air emissions. This approach is innovative and highly replicable, and Mr. Pitkin stated that there has been a positive reaction from other

States. He credited the staff at EFC and attributed the success to the closely aligned missions between the two entities and the notable collaboration between the two staffs.

Mr. Pitkin also reported on the Resiliency Retrofit Fund which would be a $30 million effort tied to Sandy Relief Funds by which the Authority would provide credit enhancement through loan loss reserves. A competitive, shared-risk effort is envisioned whereby lenders would provide loans to support combined heat and power, distributed generation, electric grid support, financing of hardening measures, and other efforts. The Authority would then provide credit support protection against losses up to a certain percentage of the portfolio. Caps on the amount of default coverage would be set on both a transactional and a portfolio basis such that $30 million in loan loss reserve protection could support $300 million in total financing. Mr. Pitkin acknowledged that there are regulatory hurdles as the Sandy Relief Funds are directed specifically toward restoration efforts.

Mr. Catell inquired as to how this falls in line with utility activities. Mr. Pitkin responded that the Authority would continue to provide technical assistance and incentives and continue to work with the utilities as partners. Critical facilities, such as healthcare and multi-family buildings, may have challenges with up front capital and securing financing in efforts to protect against future power outages. Mr. Murray added that this effort is not meant to replace what the financial markets currently provide but would be designed to fill the niche of what private markets are unable or unwilling to do.

In response to inquiries regarding the development of the caps and equity requirements, Mr. Pitkin explained that, after looking at other models, the technologies at issue, and the desire to provide robust support, the transactional and portfolio caps were developed. He also explained that the lender would engage in the typical underwriting standards and equity contributions, but that the Authority is not stipulating any particular level.

The launch of the Green Bank is still in the development stage and is meant to finance energy efficiency and renewable energy end-use installations rather than technology development. However, it is unclear as to whether the Green Bank will support large-scale renewable projects. Mr. Willis stated that, as presented, this focus on end-use installations already represents a big decision, in the somewhat narrower definition of deployment activities.

Mr. Pitkin reported that the Authority will be contracting with an international strategic consulting organization to undertake market research of financial institutions and energy providers and to develop a business plan. Strategies will be developed, and these activities are anticipated to be completed by the end of August in order to support a filing with the New York State Public Service Commission (PSC) that would propose funding for the Green Bank capitalization. There was also considerable discussion among the Committee Members on the potential funding sources for the Green Bank and the potential ramifications of each option for the Authority and its program portfolios. The Committee Members asked to be kept informed of activities as they progress over the near-term.

Mr. Willis suggested that, in addition to technical and substantive impediments, the market often has imperfections and real risks. He advised that when the private sector is not undertaking some action, filling the void through public sector action is not always the solution.

Mr. Pitkin listed potential funding sources for the Green Bank, including: 1) the possibility of repurposing currently authorized EEPS and RPS funds that are authorized through 2015; 2) potentially earmarking any additional RGGI proceeds that are received over time; or 3) potentially earmarking any new EEPS or RPS collections beyond 2015 that may result from the 2014 mid-course PSC review, which are also received over time.

Mr. Burke stated that a broader approach should be taken in considering the funding source as all three sources of funding presented originate with the electric customer.

In response to an inquiry from Mr. Willis, Mr. Pitkin stated that the consultant will complete its analysis in about eight weeks and that a Project Advisory Committee of key stakeholders will be finalized. He stated that all of the information will be shared with the interested Committee Members.

Improving Resiliency

With regard to improving resiliency efforts, Mr. Torpey described the Authority's most recent Smart Grid efforts, including a recently released $10 million solicitation that addresses product development and demonstrations. Mr. Torpey also described work in conjunction with the utilities and the Smart Grid Consortium and the possibility of leveraging recent Federal Energy Regulatory Commission settlement funds with Technology and Market Development funds to support related efforts.

In describing an ongoing Micro-Grid Study, Mr. Torpey stated that Authority staff is coordinating with the Department of Public Service (DPS) and the Department of Homeland Security. The focus of the study is how better to provide mission critical services during extended outages and extreme weather events. Staff has prepared a high level scoping document and is gathering feedback from key stakeholders. The Study is expected to be completed by April 1, 2014.

Mr. Torpey described four additional studies that are addressing issues such as a strategic petroleum reserve, fuel supply terminal hardening, a cost-benefit assessment of the gas station generator and wiring program in Upstate areas, and an analysis of the Buckeye Pipeline Booster Station that is aimed at increasing fuel flow capacity into the State.

In response to an inquiry by Mr. Willis, Mr. Torpey further elaborated that the micro-grid efforts that are to be addressed through these efforts are aimed at those facilities, such as hospitals, that intend to provide service for mission critical functions during disaster relief.

Mr. Burke cautioned that identifying the real issue to resolve is necessary so as to avoid fixing the "wrong" problem. He stated that this entails seeking the input of the right experts. Mr. Williams added that a part of the analysis is to examine whether a particular effort would result in a true benefit in an emergency recovery situation. Mr. Elliman added that, depending on the standard, whether it is a 100-year storm or a 500-year storm, much money could be spent on what amounts to a theoretical risk. Mr. Torpey emphasized that these efforts are attempting to focus on the locations that are the hardest and most frequently hit.

Mr. Douglas, Director of End-Use Application and Innovation, described additional programmatic efforts that included the establishment of an Advanced Building Consortium which is intended to leverage the strengths of the State's architects, engineers, systems designers and researchers. He also stated that efforts are being undertaken to develop and deploy products which increase building resiliency to manage disruptions including ride-through capabilities and critical load support. That investment tends to reduce the public cost of extra shelters and policing evacuated areas.

Mr. Douglas also described efforts to support product development and demonstration to allow photovoltaic systems to operate independently of the electric grid, similar to the work that was undertaken for combined heat and power equipment. He stated that the Authority is endeavoring to support technologies that have the traditional merits of an energy efficiency investment and that also perform in a manner similar to an insurance premium against power disruptions.

In response to an observation by Mr. Willis about the different layers of protection in the quest for resiliency and the potential overlap, Mr. Torpey assured the Members that the Authority is using its best efforts to avoid duplicate efforts and is assessing the value proposition associated with each individual effort.

Charge NY Initiative

With regard to the Charge NY Initiative, Mr. Torpey provided a status report on the approximately 900 Authority-funded electric vehicle (EV) charging station installations, noting the variety of locations and applications, such as apartment complexes, parking garages, fleets, and hospitals. Data collection and analysis is ongoing for these installations so that future efforts may benefit from any lessons learned. Mr. Torpey also provided details on the available New York State tax credit that he believes will provide additional demand for the program, as well as details about the different levels of charging stations. Level 1 and Level 2 charging stations are the types funded by the Authority for this effort, while the faster, Level 3 charging stations are still under development and not yet standard installations.

In response to questions from Ms. Thorndike and Mr. Willis, Mr. Torpey explained that the installations are generally in public spaces and are clustered around major cities based on the results of competitive solicitations. A web-based map showing the geographic installations is under development.

In response to a question from Mr. Elliman, Mr. Torpey spoke about the costs per charging station and explained that certain data collection parameters are required from the participants to track usage patterns. He also mentioned market analysis activities underway by companies, particularly in the retail sector, as a means of determining appropriate fee structures for the charging capabilities outside these establishments or as part of a particular business model.

Future work will include additional grants for EV planning efforts through the upcoming Cleaner Greener solicitation which is a $30 million competitive solicitation for project implementation grants. Specific funding is available for municipalities to engage in streamlined permitting and to develop comprehensive plans and ordinances that will address transportation improvements. There will also be available funding for large-scale sustainability projects.

NYSERDA is also working with DPS on its new proceeding that is examining electric vehicle policies. In response to clarifying questions from the Members, Mr. Torpey explained that the focus of that proceeding is on the role of utilities and whether charging stations should be regulated in a similar fashion as a seller of electricity or a utility.

Mr. Torpey also added that staff continues to gather feedback regarding consumer attitudes toward EVs, to better understand what "range anxiety" means to consumers, and to support research in order to better understand the impact of EVs on local electricity distribution circuits. In this regard, staff wants to ensure that there are no negative impacts on the electric grids, particularly when Level 3 fast charging technology eventually takes hold in the market.

NY Sun Initiative

Karen Hamilton, Director of Residential Energy Services, described the Authority's efforts under the NY-Sun Initiative to install 81 MW of the 120 MW goal of installing photovoltaic systems through the Authority's standard offer and competitive incentive programs. The goal of NY-Sun, a collaborative effort among the Authority, the New York Power Authority (NYPA) and LIPA, is to dramatically increase installation of PV systems in New York State. The goal this year is to quadruple the installations that took place in 2011. Ms. Hamilton reported that, in his 2013 State of the State Address, Governor Cuomo extended the commitment to NY-Sun through 2023, at a statewide funding level of $150 million per year.

For the Authority, this represents a doubling of the RPS customer-sited tier PV incentive budget (from $54 million to $108 million per year), and installations of PV through both the standard offer and competitive incentive programs. Of the 120 MW goal for installations during 2013, NYSERDA is seeking to achieve 81 MW, with the balance to be achieved by LIPA. As with the standard offer program, the competitive PV incentive program will also transition from the Authority's R&D group to the Deployment group and that transition is expected to be completed by early 2014.

Ms. Hamilton also reported that the Authority continues to work with NYPA to look for opportunities to reduce the balance-of-system costs associated with the installation of PV systems. She also mentioned ongoing R&D efforts to improve continually PV technologies and to grow New York's clean technology economy; the growing interest in financing strategies for customer-sited installations; and Authority efforts to provide education, training and assistance to local officials to address permitting, siting, and inspection of these systems.

In response to Mr. Willis' inquiry, Ms. Hamilton clarified that high-leveraging research investments are an opportunity to combine the Authority's relatively limited budget with other funds, typically federal funds. Ms. Joseph also added that a good example of a high-leveraging research investment would be the $5 million RGGI investment in the thin film PV project that is underway at the College of Nanoscale Science and Engineering that was part of a project that received a $60 million federal grant. Ms. Joseph also added that, as the Authority does not have the amount of resources that it would like for each of its efforts, it must be very strategic with its investments. In this vein, the Authority has chosen to focus on ways to reduce the BOS costs.

Dr. Thorndike also stated that the Authority has leveraged a large amount of federal funding over the years and those efforts have been very effective. In response to an inquiry by Dr. Thorndike as to the status of the funding between upstate New York and the New York City region, Ms. Hamilton described a Petition that the Authority submitted to the PSC to encourage more PV installations in New York City. She also mentioned ongoing efforts on these issues with the New York City administration and the City University of New York. Mr. Murray and Mr. Douglas added that, in addition to finding additional ways to facilitate installations in New York City, staff is working to manage the balance between Upstate and Downstate efforts and continues to work with DPS on these issues.

Reports on Authority Program Portfolios and Priorities

Energy Efficiency and Renewable Energy Development

Mr. Barone, Acting Vice President for Operations and Energy Services, presented a summary of the Authority's broadest portfolio. The energy efficiency and renewable energy development activities and planned future efforts are designed to help New York achieve its aggressive energy efficiency and renewable energy goals by achieving greater market penetration of these technologies while minimizing ratepayer costs. Mr. Barone also mentioned that Green Bank activities should increase the availability of private capital and reduce first cost and other market barriers as ways to achieve these goals.

With regard to the commercial and industrial market, vertical market contractors are identifying sector-specific barriers to energy efficiency and helping Authority staff to develop solutions to those barriers. Staff is also working on improving energy savings estimates generated by models, and performing more analysis based on energy bills, so that applicants have a more accurate estimate of expected energy savings. Staff continues to evaluate new energy models that are easier to use, better validate energy savings predictions, and provide contractors additional modeling choices.

Mr. Barone described marketing outreach efforts through print media and the development of social media marketing efforts through Twitter, Facebook, and Instagram. He described the development and maintenance of customer relationships as an important long-term strategy that has already paid dividends, particularly through the use of key account managers for the Authority's largest customers.

Mr. Barone reported that staff will deploy a web-based interface for the Home Performance program that will simplify and speed up the application, approval, financing, and project completion processes. Working with its trade allies, the Authority will also focus on educating its contractor and builder partners on new technologies and practices to increase market penetration in a more effective manner.

Mr. Barone identified the resolution of market confusion and overlap in energy efficiency programs as a priority for the Authority. Staff has been working on a collaborative approach with the Consolidated Edison Company of New York, Inc. that would address these issues while developing an innovative statewide energy efficiency program in New York. The general premise of the approach is that there would be a single program, one application, and a single, uniform marketing message across the State. Program incentives would be similar to eliminate the inclination for a customer to shop around for the best incentive.

Innovative approaches that the Authority will advance in the coming three years include whole-building, deep energy savings projects that will be defined based on the energy consumption per square foot of the building and the potential for a new initiative with the New York State Department of Education called "Future-Ready Schools," that would develop future school construction to result in energy savings of up to 80% when compared to code-complying school buildings. Authority staff is also working on two large net-zero energy projects that are in the design stage.

The Authority continues to advocate with DPS staff the need for fuel-neutral funding that would allow more flexibility in serving customers. Mr. Barone identified possible new funding sources such as increased revenue resulting from the lowering of the RGGI cap, and Federal Congestion Mitigation and Air Quality funds for transportation efficiency.

There was additional discussion among the Committee Members on the constraints associated with some existing and future funding sources that discourage fuel-neutral energy programs and the challenges these constraints present for the Authority in designing its overall program portfolio. Mr. Burke commented on the extent that electricity consumers are asked to fund much of these activities. Mr. Barone and Ms. Hamilton offered that there are continuing discussions with the oil heat industry on potential approaches that might enable more fuel-neutral program offerings and mitigate cross-subsidization, but that it may take an act of the Legislature to enhance such funding. Mr. Willis added that this is an important issue to the Authority.

Mr. Barone also reported that, with the move of the RPS Customer-sited Tier Competitive Program from R&D to deployment, Authority staff is seeking ways to integrate more effectively renewable technologies with energy efficiency projects, as the demand for this type of integrated service continues to increase.

Mr. Barone identified another priority as defining what future energy programs might look like beyond 2015. To that end, future efforts will focus on positioning the Authority to deliver value-added services, innovative approaches to achieve deeper energy savings, and to incorporate resiliency measures into deployment programs. As a result of the most recent storm, the Authority routinely attempts to incorporate resiliency measures into deployment projects, when cost-effective. Resiliency measures can be most easily incorporated into new construction, but it is more challenging for existing buildings. In discussions with program applicants, they are asked to consider location of electrical panels, fuel supply resiliency, and emergency generation.

In addition, the Authority is working to install distributed generation systems into selected facilities of refuge that would offer a safe place for families to ride out any emergency event while having necessary food, water and electricity.

Mr. Barone also presented information on the Gas Station Backup Program called "Fuel NY" which is intended to keep certain gas stations open during a major power outage. The first phase of the program, to provide funding for project expenses associated with installing the necessary transfer switches for emergency generators, is underway. The second phase, to develop a pool of emergency generators, is under development. A potential source of funding identified for the generator pool program, namely the R&D funding, generated a discussion among the Members about the erosion of the R&D budget over time. Mr. Catell suggested that this may be one area where the Authority Board may want to take a position from a policy standpoint with regard to the decreasing R&D budget. Mr. Barone offered that purchasing the generators over time may be a better option to effectuate this effort and to mitigate the impact on the R&D budget.

Mr. Willis suggested that, aside from a possible resolution from the Board regarding the R&D funding, perhaps the Members would like to devote a future session specifically to R&D to make a stronger case of the importance of the R&D portfolio and raise its visibility. Ms. Joseph stated that the Authority has R&D performance metrics and case studies that support the value of R&D. Mr. Burke added that five years ago much of the resiliency response activities would not have been possible without the prior R&D efforts.

Energy Technology Innovation and Business Development

With regard to Energy Technology Innovation and Business Development, Mr. Peter Douglas, Director of End-Use Application and Innovation, described future priorities to help stimulate a vibrant innovation ecosystem and clean energy economy. The focus will be on efforts to strengthen the network of business development services and to establish new business models that increase leveraging of private investment for technology commercialization projects. Mr. Douglas also described future opportunities in high-impact clean energy markets such as those for off-shore wind, PV BOS costs, energy storage, electric vehicles, distributed generation and micro-grids. Overall, the focus will continue to be on leveraging the Authority's deployment capability to accelerate market introduction of innovative, made-in-New York technologies and systems, particularly those that advance both sustainability and resiliency objectives. Mr. Douglas stated that this program continues to help shape an environment that accommodates innovation and contributes to growth of clean-energy economic activity in New York.

Future priorities include development and support of a network of energy business development services which is anchored by incubator networks, the recently added "Proof of Concept" Centers, and a social media platform called CleanTech NY Connect.

Authority staff have cultivated relationships with specific classes of investors, including corporate, strategic, angel, and impact investors to help fill financing gaps for pre-revenue start-ups. The Authority has also supported forums that enable the introduction and promotion of these investor communities. For example, in October 2012, the Authority supported an event held by Green Capital Empire which identified the "Green Tech 50" – a group of promising New

York State-based start-up companies. Six months later, nine of the Green Tech 50 companies have successfully raised capital, and each of them had been past beneficiaries of NYSERDA support.

The focus of the Authority's efforts in high-impact clean energy markets is offshore wind, PV balance-of-system costs, energy storage, electric vehicles, distributed generation, and micro-grids. The goal is to leverage NYSERDA's deployment capability to accelerate market introduction of innovative made-in-New York technologies and systems.

Working with the Emerging Technologies and Accelerated Commercialization team, staff is exploring highly visible demonstration of a low-voltage, dedicated circuit for light emitting diode (LED) lighting in buildings. Low-voltage systems have less stringent code requirements, that when coupled with long life LEDs, could be a very compelling proposition from both a first cost and an operating cost perspective.

Mr. Douglas identified activities that accelerate innovation in technologies and systems that advance both sustainability and resiliency objectives as priorities, as well as energy storage efforts. Two recent projects exemplify future activities in this area. One is a 100 kW, low-cost, commercial storage technology provided by a New York City based start-up that is being deployed in a City University of New York facility that will support electricity peak-shaving. The other is demonstration of ultra capacitor-based "wayside energy storage systems" that help reduce electricity voltage sag through the recovery and reuse of electricity on the Metropolitan Transit Authority system. One of the two systems was provided by a company based in Oneonta, New York. The goal of these projects is to show that despite the fact that storage technology is expensive, financially viable business opportunities exist for a needed technology.

Mr. Murray highlighted the testing and commercialization center to be located in Kodak Park in Rochester as an additional battery storage technology. This effort is being funded through New York Battery and Energy Storage Technology (NY-BEST). Mr. Torpey added that this is also a step toward financial self-sufficiency for the NY-BEST organization. Mr. Torpey also added that General Electric, which has some of the most sophisticated storage laboratories in the world, has an interest in using the facility.

Energy Education and Workforce Development

Ms. Hamilton presented the goals of this portfolio as building a workforce and a public ready to thrive in a clean energy economy. She described past efforts that developed a statewide network of training partners to deliver energy efficiency and renewable energy systems training. She described the investments in curriculum and certification development, training trainers, and developing training tools, as well as the educational approaches. With that strong infrastructure now in place, Ms. Hamilton stated that new efforts will focus on adjusting the strategy to more fully leverage those past investments.

Future priorities include: delivering a portfolio of year-round, statewide technical training; developing advanced courses for renewable energy and energy efficiency that can be offered as continuing education or certificate programs; expanding on-the-job training, internship and apprenticeship initiatives; supporting Regional Economic Development Council initiatives; and implementing behavioral-based strategies to elicit long-term changes in energy consumption patterns.

Ms. Hamilton stated that the focus will be on ensuring that there is a broad portfolio of year-round, statewide technical training and the development of advanced courses for renewable energy and energy efficiency that can be offered as continuing education and as part of certificate programs to ensure technicians and designers remain current with technology developments. The goal is to fill what has been expressed as a void in the marketplace for on-the-job training, internship and apprenticeship initiatives for clean energy career fields.

Additional goals were identified as the establishment of stronger and more effective connections between training organizations and potential employers. In particular, the Authority will be collecting better data on the value of the various aspects of the training to employers to target better funds toward activities that build the capabilities of the workforce, to ready the workforce for career ladder opportunities, and to improve the quality of the work performed. Outreach services that support Regional Economic Development Council (REDC) objectives will also be provided, building participation in NYSERDA programs, facilitating public-private partnerships and encouraging local investment in energy projects.

In addition, Ms. Hamilton stated that efforts to identify and implement behavior-based strategies to elicit long-term changes in energy consumption patterns will be pursued. She mentioned that these may take the form of community and neighborhood-level challenges, household-level education, a focus on resolving challenges for lower income households through community-level collaboration, and other means to develop preferences for clean energy and energy efficiency.

Energy and Environment

John Williams, Director of Energy Analysis, reported on the Authority's efforts to assess and mitigate environmental impacts of energy production and use. Mr. Williams described one future priority to launch community-based clean energy and environmental sustainability initiatives, primarily through a $30 million solicitation through the Cleaner, Greener Communities effort. Building on the work undertaken by the REDCs, the latest solicitation builds upon the already-developed sustainability plans and provides support for the adoption of streamlined permitting process for PV and electric vehicles and land use planning, and the funding of large-scale projects, such as transportation or smart growth efforts, that would further the goals of the sustainability plans. The focus is to fund new and unique projects that do not duplicate ongoing deployment programs. These newly funded projects must further the goals of the sustainability plans and can be showcase projects that can both benefit the sponsoring community and be considered models for other communities in the State.

Another priority described by Mr. Williams is the Authority's work with the Department of Environmental Conservation (DEC) to establish a lower carbon emission cap for electric generation to serve as a national model for climate action policy. The Authority is in the process of finalizing a Memorandum of Understanding that resulted from the program review process engaged in by the nine participating RGGI states. The program review process resulted in decisions on program architecture and market corrections that need to be addressed if the RGGI policy platform is to continue to move toward a lower carbon intensive power sector.

The rather significant decrease in the newly agreed-to cap, from about 164 million tons of emissions to about 91 million tons, will put the region in line with approximate emission levels over the past two to three years due to structural changes in the way energy is generated. These structural changes have been primarily driven by lower natural gas prices. Modeling efforts account for an extended forecast of continued lower natural gas prices and the remaining effects of the economic downturn.

Mr. Williams stated that each RGGI state will adopt its own process for implementing the new lower emissions cap. In New York, this will primarily be accomplished through a DEC rulemaking process. Authority staff is undertaking an assessment of any potential impacts on the Authority's current auction process. It is anticipated that any new regulations would be in place by the end of 2013 and become effective in early 2014.

The new, lower cap of 91 million tons of emissions would be subsequently reduced by 2.5% annually beginning in 2015 and through 2020, thereby tightening the allowance market over time. Another market correction that will be considered will address the surplus allowances currently in the market. A variety of market structures, such as annual rather than three-year compliance periods and annual true-up accounting, are being considered to account for the bank of allowances currently in the market. To the extent there may be some supply/demand imbalances over the next few years, options for the retirement of unsold or undistributed allowances by DEC will be explored. Ultimately, the goal is to keep as close to the cap level as possible going forward. The dramatic reduction in the cap will necessitate a cost-containment reserve where certain price triggers would result in the release of additional allowances into market.

Changing topics, Mr. Williams continued his presentation with information on the Authority's Environmental Research Program. A stakeholder meeting in April resulted in good direction from stakeholders. Identified priorities are in the areas of biomass heating and technology, climate change adaptation, long-term monitoring of acid and mercury, life-cycle assessment decision-making, and environmental agriculture projects, particularly with regard to the dairy sector. Mr. Williams also mentioned the potential for some additional environmental research funding due to settlement funds as a result of the environmental efforts of the Attorney General's Office.

Finally, Mr. Williams mentioned that efforts involving the Western New York Nuclear Services Center remain a very high priority for the Authority. Specifics on these activities are reported through the Authority's Waste and Facilities Committee.

In response to Mr. Burke's inquiry with regard to activities related to biomass, Mr. Torpey explained three types of applications, but focused on the high-efficiency, low-emitting biomass applications and the opportunities to manufacture these technologies in New York.

In response to a question by Dr. Thorndike on the absence of mercury on the Authority's traditional emissions tracking parameters, Ms. Joseph explained that mercury is already on the radar screen in terms of research efforts, but that it is difficult to apply a standard emission factor to mercury. Mr. Torpey added that efforts to examine the effects on the eco-system remain a high priority.

Dr. Thorndike also highlighted that the RGGI effort continues to be a regional effort and that certain states in close proximity are not as involved as they could be.

Energy Data Planning and Policy

Mr. Williams reported information with regard to energy data, planning and policy efforts. He presented the future priority as continuing to ensure that policy-makers and consumers have objective and reliable information to make informed energy decisions. Particular projects include: some highly technical market assessments; completing the State Energy Plan; developing additional tools for energy emergencies and service disruptions, particularly with regard to liquid fuels; expanding analytical capabilities that quantify the economic development value of clean energy efforts; and building on the energy data in the clearinghouse that serves as a resource for policy and program decisions.

In response to an inquiry by Mr. Willis on how New York compares to other states in terms of data collection, Mr. Williams stated that his observation is that New York's data collection and reporting efforts are very strong and there are many New York publications that receive a good deal of attention from other states. Mr. Pitkin added that data collection with regard to performance data represents both a challenge and an opportunity and the Authority continues to improve these efforts. Ms. Joseph added that one of the goals of the State's new open data initiative is to provide the types of data mentioned by Mr. Williams to the public and that the Authority continues to provide additional data toward that effort.

In response to an inquiry by Mr. Burke on data related to fuels, Mr. Williams admitted that securing certain types of that data can be difficult. Mr. Williams reported that the Authority has a good amount of data with regard to fuel system capacity, but "through-put" information is often difficult to obtain. As many companies do not carry large inventories and storage is limited, the through-put data is what is needed to provide baselines for fuel movement among regions, yet it is very closely guarded.

Resolution Regarding Regional Greenhouse Gas Initiative (RGGI) Operating Plan Amendments

David Coup, Assistant Director of Energy Analysis, briefed the Committee on proposed changes to the RGGI Operating Plan and described the stakeholder process and proposed changes, which included input from the RGGI Advisory Group and the general public.

Mr. Coup described the revenue assumptions for the RGGI Operating Plan as conservative. The Plan assumes a budget of approximately $55 million per year for program activity, net of administration and evaluation expenses. The current budget projection is for a two-year period, rather than three, as it has proven difficult to estimate reliably the amount of auction proceeds three years into the future during this time of market transition.

Mr. Coup emphasized that, with regard to individual program budgets for the 2013 through 2015 period, all of the programs included in the portfolio for RGGI funding are either a continuation or an evolution of programs presented in previous RGGI Operating Plans. Program highlights presented included that the Cleaner, Greener Communities effort is moving from the planning stage to the implementation stage and that effort represents the largest allocation of future proceeds. The Authority will continue to commit funds for residential petroleum efficiency, including low-income program activities, and has increased this effort by 5% over the 2012 Plan. Expanded RGGI funding will be provided for the Industrial Process Improvement program that accelerates the adoption of emerging and under-used technologies to foster energy efficiency and provides assistance for the development of manufacturing methods and tools to support the production of clean energy technologies in the State. Any additional revenues could be earmarked for the existing program portfolio, including the Green Bank efforts, climate resiliency, and sustainability initiatives.

Appreciating the breadth of information presented, Mr. Catell asked advice as to what specifically he should focus his attention on. Ms. Joseph suggested that he focus on how the Authority is allocating its funds, also noting that there is a placeholder for potential Green Bank Initiative support, an increase for residential efficiency services to handle the increased demand for residential non-electric efforts, and a small research increase. Overall, about 75% of the current RGGI portfolio is geared toward a reduction in greenhouse gas emissions with the remaining 25% devoted to long-term efforts.

Mr. Williams added that the latest auction was held the day previous to this meeting and the auction price was higher than the reserve. Mr. Coup also added that it is difficult to gauge how purchasers will use their banked allowances and the effects that may have on the market.

At the conclusion of the presentations and discussions, the PPC voted unanimously to recommend that the full Board approve the proposed amendments to the RGGI Operating Plan as presented at the June 6, 2013 PPC meeting. A copy of said resolution is attached hereto as Exhibit B.

Resolution Regarding 2013-2016 Multi-Year Strategic Plan

The Members were then asked to consider and act upon a resolution recommending approval of the Multi-Year Program Plan entitled *"Toward a Clean Energy Future - A Three-Year Strategic Outlook 2013-2016."* Based on all the reports and discussions regarding the Plan as presented, upon motion duly made and seconded, and by unanimous voice vote, the Committee recommended that the full Board adopt the resolution approving the Plan. A copy of said resolution is attached hereto as Exhibit C.

Other Business

Mr. Willis indicated that the last item on the agenda was other business and asked if there were any other matters the Committee members wished to discuss. No matters were raised.

Chairman Willis announced the time and location for the September 2013 Committee Meeting. Upon motion duly made and seconded, and by unanimous voice vote, the meeting was adjourned.

Respectfully submitted,

Valerie S. Milonovich
Secretary to the Program Planning Committee

Exhibit A

NOTICE OF MEETING AND AGENDA

May 23, 2013

TO THE MEMBERS OF THE PROGRAM PLANNING COMMITTEE:

PLEASE TAKE NOTICE that a meeting of the Program Planning Committee (the 84th meeting) of the New York State Energy Research and Development Authority will be held at the Authority's New York City Office at 485 Seventh Avenue, 10th Floor, New York, New York, and by video conference at the Authority's Albany Office at 17 Columbia Circle, Albany, New York, on Thursday, June 6, 2013, commencing at 9:00 a.m., for the following purposes:

1. To consider and act upon the Minutes of the 83rd meeting held on April 16, 2013.

2. To receive an overview from the President and CEO on NYSERDA's future directions.

3. To receive an overview from the Vice President for Technology and Strategic Planning on the multi-year strategic plan entitled *Toward a Clean Energy Future - A Three Year Strategic Outlook 2013-2016*.

4. To receive reports on certain upcoming strategic initiatives for the three-year planning horizon.

5. To receive reports on NYSERDA's program portfolios and priorities for the three-year planning horizon.

6. To consider and act upon a resolution recommending approval of revisions to the plan entitled *Operating Plan for Investments in New York Under the CO_2 Budget Trading Program and the CO_2 Allowance Auction Program*.

7. To consider and act upon a resolution recommending approval of the multi-year strategic plan entitled *Toward A Clean Energy Future - A Three Year Strategic Outlook 2013-2016*.

8. To transact such other business as may properly come before the Committee.

Members of the public may attend the meeting at either of the above locations. The Authority will be posting a video of the meeting to the web within two business days of the meeting. The video will be posted at http://www.nyserda.ny.gov/en/About/Board-Governance/Board-and-Committee-Meetings.aspx.

Valerie A. Milonovich

Valerie S. Milonovich
Secretary to the Program Planning Committee

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Exhibit B

Resolution No. ____

RESOLVED, that revisions to the "Operating Plan for Investments in New York Under the CO_2 Budget Trading Program and the CO_2 Allowance Auction Program" as presented to the Members for consideration at this meeting, with such non-substantive, editorial changes and supplementary schedules as the President and Chief Executive Officer, in his discretion, may deem necessary or appropriate, are adopted and approved;

AND BE IT FURTHER RESOLVED, that the Members direct the President and Chief Executive Officer to develop a revised operating plan incorporating such revisions as soon as reasonably possible.

Exhibit C

Resolution No. ____

RESOLVED, that the multi-year strategic plan for the Authority's energy, economic environmental program priorities and strategic vision entitled "Toward a Clean Energy Future: A Three Year Strategic Outlook (2013-16)," submitted to the Members for consideration at this meeting with such non-substantive, editorial changes and supplementary schedules as the President, in his discretion, may deem necessary or appropriate, is adopted and approved as the Authority's updated multi-year Strategic Plan;

BE IT FURTHER RESOLVED, that the Authority's Mission Statement and Performance Measurements for the year ended March 31, 2013, as contained in the multi-year Strategic Plan, are approved for submission as required by Section 2800 of the Public Authorities Law.