

MINUTES OF THE ONE HUNDRED NINTH MEETING OF THE
PROGRAM PLANNING COMMITTEE
HELD ON JANUARY 28, 2020

Pursuant to a notice and agenda dated January 21, 2020, a copy of which is annexed hereto, the one hundred eighth (109th) meeting of the Program Planning Committee (the “Committee”) of the NEW YORK STATE ENERGY RESEARCH AND DEVELOPMENT AUTHORITY (the “Authority”) was convened at 12:00 p.m. on Tuesday, January 28, 2020, at the office of the New York State Dormitory Authority (“DASNY”), One Penn Plaza, 52nd Floor, New York, New York, and in the Authority’s Albany Office located at 17 Columbia Circle, Albany, New York. The two locations were connected by videoconference.

The following members of the Committee were present:

Mark Willis, *Committee Chair*
Richard Kauffman, *Chair of the Authority*
Sherburne Abbott
Charles Bell
Kate Fish
Jay Koh
Gil Quiniones

Member Ken Daly was unable to attend.

Also present were Alicia Barton, President and CEO; Janet Joseph, Senior Vice President for Strategy and Market Development; John Williams, Vice President for Policy and Regulatory Affairs; Jeffrey J. Pitkin, Treasurer; Peter J. Costello, General Counsel; Sara L. LeCain, Senior Counsel and Secretary to the Committee; and various other staff of the Authority.

Mr. Willis called the meeting to order and noted the presence of a quorum. The meeting notice and agenda were forwarded to the Committee Members and the press on January 21, 2020.

Mr. Willis indicated that the first item on the agenda concerned the approval of the minutes of the one hundred eighth (108th) meeting of the Committee, held on October 8, 2019.

Whereafter, upon motion duly made and seconded, and by unanimous voice vote of the Committee members, the minutes of the hundred eighth (108th) meeting of the Committee, held on October 8, 2019 were approved.

Mr. Willis indicated that the next item on the agenda was consideration of the Authority's strategic plan entitled *Toward A Clean Energy Future – A Strategic Outlook 2020-2023* ("Strategic Plan"). He then asked the Authority's President and CEO, Alicia Barton, and the Authority's Vice President for Strategy and Market Development, Janet Joseph to present the Strategic Plan.

Ms. Barton explained the Authority's strategic priorities are based upon a timeline beginning January 2020 and extending out through 2050 when the Climate Leadership and Community Protection Act ("CLCPA") requires an 85% reduction in greenhouse gas emissions. The CLCPA further calls for the development of strategies to achieve net zero, carbon electricity requirements, and renewable energy standards achieving 70% renewable by 2030. These targets are some of the most aggressive in the United States.

Next, Ms. Barton discussed the Authority's plans to meet the 2050 target for reduction in greenhouse gas emissions. First, the President and CEO will serve as Co-Chair of the Climate Action Council, which will work to craft a roadmap of policies needed to achieve the goals in the CLCPA. Authority staff will also guide and facilitate the State Energy Plan development and shape energy policies throughout New York State. In addition, staff will work to identify and implement strategies for energy sector emissions reductions, as well as develop and track statewide greenhouse gas inventory. Lastly, the Authority will facilitate State agencies' efforts to Lead-by-Example.

Ms. Barton indicated that the pathways for achieving the renewable energy targets are laid out in the CLCPA with specific sub-targets. These include facilitating market growth and sustained markets for renewable and zero-emission generation; reducing renewable soft costs and

barriers to deployment; building community support for renewables; spurring cost reductions through innovation; building supply chain and workforce capabilities; and providing financing.

Ms. Barton indicated that there is a baseline of in-state and imported existing renewables. The in-state renewables contain a substantial hydrogen, as well as approximately 2000 megawatts of wind. The imports are mostly from Hydro-Quebec at this time. Approximately 30% of the 70% target are the renewables that are currently installed and operating. The next group of renewables are those that are under contract right now. The Authority has completed three solicitations in the large-scale renewables sector under the Clean Energy Standard (“CES”), as well as one solicitation for large-scale offshore wind. Together these translate to approximately 7,500 megawatts of new generation under contract, which would be about 15% of the 70% goal. This leaves 25% to either be put under contract or otherwise incentivized. Ms. Barton explained that there may also be privately sponsored renewable energy that would also fall under this category. In order to meet the target, all of these projects would need to be completed and in operation.

Ms. Barton went on to detail the energy efficiency goals. Energy efficiency is a cornerstone of the Authority’s climate efforts. There is a technical goal of 185 trillion British thermal units (“BTUs”) of onsite energy savings that come from the New York State Public Service Commission (“PSC”) Order. The Order builds off of the Efficiency in New York white paper that was co-authored with the New York State Department of Public Service (“DPS”). This target is referenced in law as well. There have also been substantial new budgets allocated for energy efficiency to be delivered by utilities as well as endorsing new commitments to clean heating and cooling technologies and a statewide effort to ensure expanded access to energy efficiency for low- and moderate-income New Yorkers. Ms. Barton noted that to further increase clean heating and cooling technologies, she had committed to a suite of market enablement activities that are different than the incentives the utilities will be delivering. Ms. Barton also explained that there is a 2025 target that will be a significant area of focus for the Authority within the area of building electrification, which is a new investment that will help to reach these close targets.

Ms. Barton continued by reporting that the clean energy economy continues to be a bright spot for New York State, with nearly 160,000 workers employed. The rate of growth has been very significant and over the last two years it has been collectively over 7.5%, which makes it one of the fastest growing sectors of the New York State economy. The key to the growth is ensuring that a trained and skilled workforce does not become a barrier to the achievement of targets. To that end, the recent announcement of an additional \$40 million towards clean energy workforce training will bring the total to \$100 million of planned activities for workforce training. Target strategies include on the job training, and targeting specific sectors such as offshore wind and clean heating and cooling technologies.

In response to an inquiry from Mr. Willis, Ms. Barton explained that the jobs range from lawyers for renewable energy to installation and maintenance in a given field. She noted that the majority of these jobs are within the installation and maintenance categories, while there is also a fair amount of jobs in manufacturing. These jobs are statewide, although there is a larger concentration within downstate New York. Ms. Barton believes this is due to the larger population of downstate. New York City in particular stands out nationwide as the fastest growing job market for clean energy jobs.

Ms. Barton continued her report, stating that there is a focus on the ability to deliver renewable energy power in the future and enhancing the flexibility and resiliency of the electric grid. She explained that there are a number of initiatives and programs related to this, including energy storage deployment efforts, market bridge incentives, many of which are pairing energy storage with community solar. Pairing the two is a good driver of value for energy storage projects, in addition to the current federal tax credit rules that make it attractive on a paired basis rather than as standalone investments. Ms. Barton indicated that there have been bulk scale deployments proposed, such as the Ravenswood Generating Station. The Authority has made a residential storage incentive available that is designed to be paired with a dynamic load management tariff, providing both resiliency to the homeowner and value to the grid through operation of the tariff.

In response to an inquiry from Mr. Kauffman, Ms. Barton stated that the generation station would be accessing the market bridge incentive for a bulk storage system. She explained that it is a per kilowatt hour incentive in a declining block program.

In response to an inquiry from Mr. Koh, indicated that the 300-megawatt target is a small subset for targeting storage deployment only. The incentive is designed to send a market signal on foreign investment. She noted that over the last year the New York Independent System Operator interconnection queue has jumped from an extremely small number to approximately 6,000 megawatts, which means that there are roughly double the number of projects to meet the State target in the interconnection queue. This demonstrates that there is strong market interest in developing storage projects in New York.

Ms. Joseph continued the presentation, stating that in terms of strategic focus areas, there will be four areas: resilience, energy affordability and equity, de-carbonization of the transportation sector, and electrification of buildings.

Ms. Joseph explained that building a resilient energy system, begins with improving the resiliency of the energy system to disruptions from climate change. Specifically, ensuring that both the physical assets are resilient and the populations that are served by those assets have built-in resilience safety. The second part of this is the protection of low-income and disadvantaged communities from the impacts associated with climate change and severe weather. The last part of this is the assessment and mitigation of risks for the range of investments made.

Ms. Joseph indicated that the Authority will be investing billions of dollars in infrastructure over the next couple of years, as the energy system is transitioned. She stated that one of the top priorities is to ensure that as investments are being made, the appropriate resilience considerations are built into the investment decisions. A top priority will be incorporating resilience provisions into large-scale renewables work, offshore wind work, and energy storage work. Looking at the resiliency of the infrastructure over time, including the items regarding siting in potentially high-risk areas and looking at flood zones across New York State, as well as a range of other factors.

Ms. Joseph stated that the Authority will be looking at developing the kind of framework and a toolkit for deployment across all the Authority's infrastructure investments. She explained that they are also working to ensure that there is resiliency consideration in policy deliberations. Another important activity over the next couple of years is to explore and better support issues around passive survivability, for example if a house is built that is highly energy efficient, that home can potentially write out a disruption in the energy system while still protecting the health and safety of their pets. She explained that they are working to better understand how the efficiency investments and carbon objectives can lead to better resiliency for those who occupy the dwelling.

Next, Ms. Joseph indicated that the shift to building electrification needs to ensure that if buildings are electrified, that in the event of an electric outage that the health and safety of the occupants is protected.

In response to an inquiry from Ms. Abbott, Ms. Joseph stated that the Authority is engaged with the New York State Department of Environmental Conservation and others in State government to ensure that localities have the best available tools that they can access as they do their planning. This ensures that any kind of infrastructure and planning decision can be made with the best available science. She noted that this is still a work in progress, but localities are in a much better position to identify those tools than they were ten years ago.

Ms. Joseph explained that the next area of discussion focused on energy affordability and equity. She noted that with the signing of the State climate legislation, equity in climate outcomes for disadvantaged communities is presented as a co-equal objective with achieving emissions reductions. She explained that if 45% of the population are low- and moderate- income consumers, who on average face significant energy burdens, nearly half our population would be locked out of clean energy markets, and the clean energy goals will never be met. In order to help with this issue, the utilities will be investing substantially more resources in energy efficiency for low- and moderate- income New Yorkers. The Authority will be working with the utilities to co-design programs to increase the impact of rate payer funded low- and moderate- income initiatives. Ms. Joseph noted that the Authority will also be working to drive replicable models of energy

efficiency that incorporate health outcomes. She went on to explain that clean energy training will be targeted at disadvantaged communities, in order to provide clean energy opportunities for those communities. Another goal is to improve community level outreach and engagement, to increase access from trusted local resources.

Next, Ms. Joseph reported that transportation is responsible for about 36% of the greenhouse gas emissions in New York State. She noted that the transportation sector is a challenging sector, and the Authority will be developing a roadmap specifically focused on the decarbonization of transportation. She explained that staff will be looking at the electrification of transportation, looking at mobility solutions, and looking at a range of low carbon fuels with other state agencies. She explained that first is driving a very aggressive electric vehicle agenda, continuing with incentives for infrastructure as well as auto rebates. The Authority will be leveraging community-based groups, in hopes of spreading knowledge about electric vehicle options. The Authority will be working with NY Green Bank to roll out financing solutions and will be advancing a mobility challenge to engage communities on a range of mobility solutions.

Ms. Joseph stated that the last strategic area focus would be the electrification of buildings and this is quite significant as far as greenhouse gas emissions. She explained that approximately one third of greenhouse gas emissions are from the heating and cooling of buildings. She noted that when talking about all electric, cleaner energy homes and buildings, they are talking mainly about heat pumps, both air source and ground source which are more efficient ways of thermal energy.

Ms. Joseph explained that there are barriers that currently stop heat pumps from scaling, the first of these barriers are the costs of heat pumps. The costs will need to come down so that heat pumps will be available to a wide range of New Yorkers. The heat pumps also need to be able to work in more building types, right now there is a limited market space for where heat pumps work well. The labor market, the supply chains, and the regulatory infrastructure for heat pumps all need to be built up as well.

In response to an inquiry from Mr. Willis, Ms. Joseph explained that the efficiency is good now, but the costs need to come down.

Continuing, Ms. Joseph noted that the PSC had recently advanced a major initiative to support energy efficiency and building electrification, investing nearly \$450 million over the next five years. She explained that this will have the utilities delivering incentive programs for approximately four to five trillion BTUs of energy savings, which means that the costs are still much too high. In order to help eradicate this, the Authority will be launching a program that will pair the utility incentives with well-designed market enablement and cost reduction strategy. She explained that this means that costs need to come down and the whole market infrastructure needs to be built. The Authority will be partnering with businesses and training providers to accelerate workforce development for labor supply. The Authority will also be working with consumers to provide consumer education and community engagement to build demand and reduce soft costs. Additionally, the Authority will be providing technical assistance to consumers so that they can navigate the options in the market. Most importantly, the Authority will be investing in technology, innovation, and demonstrations to drive down costs.

In response to an inquiry from Mr. Willis, Ms. Joseph explained that the Authority is actively involved with the New York City Law Advisory Board, and agreed that this is an opportunity to drive progress. She also noted that they are engaged with the New York Industry Association quite frequently, explaining that they have very aggressive goals for conversion to renewable biodiesel.

Whereafter, after motion duly made and seconded, and by unanimous voice vote of the Members present, the following resolution was adopted.

Resolution

RESOLVED, that the outlook for the Authority's energy, economic environmental program priorities and strategic vision entitled *Toward a Clean Energy Future: A Strategic Outlook 2020-2023*, submitted to the Members for consideration at this meeting with such non-substantive, editorial changes and supplementary schedules as the President, in her discretion, may deem necessary

or appropriate, is recommended to be adopted and approved by the Board as the Authority's updated Strategic Outlook.

Mr. Willis indicated that the next item on the agenda was a report on the Authority's Innovation Portfolio, from the Authority's Vice President for Technology and Business Innovation, John Lochner.

Mr. Lochner began with a brief overview of the importance of innovation to the economy of the United States. He explained that the Authority's innovation investment between 2009 and 2018 led to over a billion dollars of private investment, nearly \$350 million in non-Authority grants, and provided leverage for every Authority dollar spent. The commercialization of products and the revenues generated by the companies that we support are just a few more metrics that innovation uses to measure its impact. Some of the companies that they have supported with commercial products are those unique electric solutions.

Mr. Lochner explained that innovation can catalyze alongside the economic development value, with substantial reductions in greenhouse gases and substantial energy efficiency. An example is the multi-year study funded by the Authority at the Brookhaven Lab, that projected environmental benefits and costs from fuel-switching. The study provided key analysis to de-risk the phase out of dirtier fuels. He noted another innovation example, the direct commercialization of a new product innovation to develop the drive system for the Orion hybrid bus. This was one of the first hybrid buses, as well as the first to achieve significant sales. As a result of the successful development and prototype demonstration, the New York Metropolitan Transit ("MTA") went on to purchase Orion buses.

Mr. Lochner continued, explaining how the Authority will use innovation dollars for the CLCPA. He stated that they must work with partners to achieve results larger than their own, clearly identify pathways to market value that they expect their investments to make, and they must ensure that their investment choices have the opportunity to provide substantial scalable impact. With an eye toward meeting the needs of the CLCPA, Mr. Lochner believes that innovation could play a new role. The role would be unlocking the "pathways for innovation", which would be opportunities for more systematic change to current practices across an industry

or geography where these changes could support CLCPA goals or enabled innovation more broadly by reducing barriers or providing supportive mechanisms. Many of the systematic changes involve a mix of private and public sector work.

Mr. Lochner stated that insurance company assets make up nearly 20% of the \$60.7 trillion dollars in global assets under management, and New York State has one of the largest footprints in the industry nationally. Many insurance firms currently face two issues with respect to climate risk. The first is if their actuarial methodologies have the required data to incorporate the risks, then they will likely face climate challenges. The second is that most insurance companies' investment portfolios include a broad range of market investments without an investment framework in place. If they are able to support new investment frameworks, the Authority will not only help the insurance sector evolve towards a sustainable model, but they will also have the potential to send market signals on whether or not to build fossil fuel projects. He explained that given the scale of insurance assets, the shift has the potential to make a tremendous impact. Similar changes are possible in the wealth management business, where many firms do not provide investment solutions that take climate risk into account.

Mr. Lochner concluded his presentation by briefly highlighting some action that is being taken around the world in technology innovation for climate change.

Mr. Willis indicated that the next item on the agenda was a presentation from the Authority's Treasurer, Jeffrey J. Pitkin, on the Authority's fiscal year 2020-2021 Budget ("Budget").

Mr. Pitkin explained that the Budget document contains extensive information on the individual line item variances. He stated that on the revenue side of things, total revenues are expected to decrease \$239 million to about \$1.28 billion from the current year's budget. This is primarily due to the offset of revenues that offset expenditures.

Mr. Pitkin indicated that overall program expenditures are expected to decrease about \$222 million from the current year's budget, that decrease is due to certain expiring programs

under the energy efficiency portfolio and the systems benefit charge. Additionally, the NY Sun Program expenditures budget that was established for the current year was overstated. This number was based upon a significantly higher number of project completions in the fiscal year 2019-2020, which ended up doubling the amount projected. He explained that despite this change, NY Sun is still on track to achieve its 3000-megawatt goals. Lastly, Mr. Pitkin stated that 2019 was a record year for commitments, noting that the Authority committed over \$9 billion across its programs, which is three times more than was committed the previous years.

Next, Mr. Pitkin detailed the Budget's salaries and benefits. He explained that there was an addition of ten new positions at the Authority, including positions that are meant to assist with responsibilities under the CLCPA. There was a decrease in administrative expenses of about \$267,000, while there was an increase of \$436,000 in capital assets.

Mr. Pitkin continued, noting that overall the net position has stayed consistent. The difference between cumulative revenues and cumulative expenditures is projected to decrease about \$78 million to \$340 million. NY Green Bank's net position is anticipated to be \$556 million, a slight increase. The unrestricted net position, which is effectively working capital is projected at \$4.9 million. The amount is sufficient to meet working capital needs and unanticipated expenditures that may result in programs.

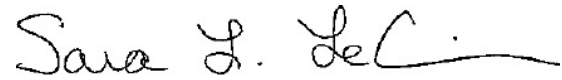
Whereafter, upon motion duly made and seconded, and by unanimous voice vote of the members present, the following resolution was adopted.

Resolution

RESOLVED, that the proposed fiscal year 2020-21 Budget and Financial Plan submitted to the Members for consideration at this meeting, with such non-material, editorial changes and supplementary schedules as the President and Chief Executive Officer, in her discretion, may deem necessary or appropriate, be and it hereby is recommended for approval by the Board for submission to the persons designated in Sections 1867(4) and 2801 of the Public Authorities Law.

Mr. Willis then indicated that the next item on the agenda was other business. There being no other business, the meeting was adjourned.

Respectfully Submitted,

A handwritten signature in black ink that reads "Sara L. LeCain". The signature is written in a cursive style with a long horizontal flourish at the end.

Sara L. LeCain
Secretary to the Committee