



July 1, 2022

NYSERDA
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RE: Draft Scoping Plan Comments

In response to the New York State Climate Action Council Draft Scoping Plan (“Plan”) issued on December 30, 2021, H.Q. Energy Services (U.S.) Inc. (“HQUS”), the U.S. subsidiary of Hydro-Québec (“HQ”), submits the following comments for consideration by the Climate Action Council:

1. New York should leverage all available options to achieve its clean energy transition and avoid creating undue barriers.
2. Operating characteristics of HQ’s system necessary to achieve deep decarbonization should be duly considered.
3. Market based mechanisms may be part of the solution, but in order to be effective, these mechanisms should be designed and applied uniformly.
4. New York should advance/pursue near-term actions which maximize existing infrastructure and resources as part of a comprehensive approach.

Introduction

Addressing climate change is critically important, and the State of New York should be commended for leading by example through its current efforts and the creation of a proactive plan to achieve nation leading climate targets over the following decades. Climate change remains a global challenge, and regions will need to collaborate in order to optimize the use of available resources and effectively mitigate the associated risks and costs – which are often borne by the most vulnerable communities.

Hydro-Québec is one of the largest clean energy supply companies in the world, with a generation portfolio comprised of close to 37,000 MW (nearly 100% of which is renewable energy) and operates a system with the ability to store up to 176 million MWh of energy. Hydro-Québec is committed to the goal of deep decarbonization, with a corporate commitment to sustainably developing renewable energy resources in the Province of Québec and to pursuing cooperation with neighboring markets to achieve GHG reduction and decarbonization goals.

This commitment is demonstrated through HQUS’s traditional role in providing clean and reliable electricity supply to New York. As an example, over the last decade, HQUS has delivered an average of close to 8 million MWh to New York each year,

representing nearly 5% of the State’s total annual electricity demand. These deliveries contribute to New York’s renewable energy portfolio, representing 20% of the State’s renewable generation supply in 2020.¹ The clean energy partnership between Québec and New York has recently been expanded by the approval of the HQUS Tier 4 Contract for the Champlain Hudson Power Express Project (“CHPE”).²

The HQUS Tier 4 Contract will supply New York City more than 10 million MWh of renewable hydropower through CHPE each year over a 25-year agreement, delivering significant emission reduction and air quality benefits to the State.³ CHPE will continue to provide lasting benefits well beyond the term of the HQUS Tier 4 Contract, as the new HVDC transmission interconnection between Québec and New York City will continue to operate for several decades beyond the initial 25-year term. CHPE is yet another significant opportunity for the State to secure the services necessary to meet the evolving needs of the New York electricity grid.

While CHPE and NYSERDA's Tier 4 contracts are tremendous achievements for the region (collectively representing the largest renewable energy and transmission investment in New York in the last 50 years), it is well understood that the challenge of decarbonizing New York is larger than any single project or program. Going forward, New York has the opportunity to further leverage the unique operational capabilities of HQ’s hydropower system, such as:

- Offering a viable source of firm, zero-emission dispatchable capacity
- Reliably integrating higher penetration of intermittent renewables into the New York system
- Providing unparalleled long-duration storage to maintain system reliability during prolonged periods of low renewable production and high electricity demand
- Facilitating and reducing the cost of New York’s clean energy transition through optimized 2-way exchange of electricity between New York and Québec.

Coordination between Québec and New York may also extend beyond clean energy solutions, through continued collaboration on adapting common strategies to decarbonize the buildings sector. The successful high adoption rates in Québec of building and heating electrification may be used as a model for New York, as the regions share many common features, most notably the challenges of a colder climate with significant winter heating requirements. A mutual objective of reaching greater electrification across both regions presents an opportunity to share experiences and understand and overcome future challenges through a joint effort currently underway between HQ and NYSERDA.

¹ NYSERDA 2022-2025 Strategic Outlook page 27, renewable generation of 40,572 GWh.

² The CHPE project is a collaboration between HQ and TDI to develop a new intertie between the HQ and New York transmission systems. It creates a new transmission facility into New York City, using a fully underground/underwater 1,250 MW high-voltage direct current (“HVDC”) transmission line spanning 375-miles from the Hertel substation in Québec to a converter station located in the Astoria Annex substation in Queens, New York, delivering renewable generation directly in New York’s Zone J.

³ Order Approving Contracts for the Purchase of Tier 4 Renewable Energy Certificates, Case 15-E-0302 (April 14, 2022).

As the Plan is finalized and implemented, HQUS remains ready and willing to participate in that process and expand the partnership fostered with the State of New York to deliver clean energy solutions to help facilitate this transition. HQUS offers the following recommendations on the Plan, designed to ensure that a full array of clean energy solutions remain available to the State to deliver an affordable, reliable, just and clean energy future.

1. New York should leverage all available options to achieve its clean energy transition and avoid creating undue barriers.

Powering New York’s economy in the future will require a significant increase in clean generation and a shift to where solar, wind, and battery storage will necessarily play a central role in serving New York’s clean energy needs. The current trajectory of planned procurements and clean energy incentive programs are based on achieving the mandate of obtaining 70% of the State’s electricity from renewable resources by 2030. The increase in the capacity additions of these resources envisioned in the Plan far exceeds that target. Figure 29 in the Plan shows installed capacity of renewable generation by 2050 for Scenario 3 exceeding 60 GW for solar, 16 GW of onshore wind, nearly 20 GW of offshore wind and 19 GW of battery storage.⁴

This scale of clean energy additions will require a broad and inclusive approach, including continued and expanded contributions from resources external to the New York Control Area. New York should preserve access to all clean technologies listed as Renewable Energy Systems in the Climate Leadership and Community Protection Act (CLCPA) and avoid undue restrictions which act to limit participation of resources by technology or geography.

An “all of the above approach” will deliver a number of benefits to the State. Amongst these is the ability for New York to achieve its goals at the lowest cost to ratepayers, as the most cost-effective combination of solutions can be pursued. Allowing for the broadest set of resources will also provide valuable resource diversity, enabling New York to capture synergies and portfolio benefits by combining resources with complementary production and operating characteristics. These benefits will flow through to more effective and efficient planning, and better inform investment decisions in non-generation projects that will be required to work in concert with clean energy additions, such as load management, energy efficiency, and new and upgraded transmission and distribution systems throughout the State.

Harnessing the clean energy contribution from resources that are currently operational and readily available is also an integral part of an inclusive approach and will mitigate the risk and uncertainty associated with future project developments.

Given the unprecedented scale of New York’s clean energy transformation, preserving the broadest set of clean energy options available for the State will be critical to achieving the State’s climate goals while preserving the affordability and reliability of the electricity system.

⁴ Section 1 page 44 of the Integration Analysis Technical Supplement.

2. Operating characteristics of HQ’s system necessary to achieve deep decarbonization should be duly considered.

HQ is uniquely positioned to collaborate with New York in developing optimized solutions to more effectively enable New York’s clean energy transition and reliable operation of an electricity system powered primarily from renewable resources. Potential operational capabilities include firm, zero-carbon capacity, long duration storage, and fast ramping service, and will be required as New York’s electricity supply mix becomes more reliant on variable renewable energy and duration-limited storage resources.

The Plan identifies electrification as a key strategy that is fundamental to achieving GHG emissions limits.⁵ Electrification of the building and transportation sector will require that greater volumes of clean energy generation be made available to the New York grid, as both demand for electricity and peak load will roughly double from today’s levels by 2050.⁶ Under this transition, the way New Yorkers use electricity will also change, as New York is projected to become a winter peaking system by 2035.⁷

As described in Section 1, New York will rely primarily on electricity generation from renewables and battery storage to power this transition as “wind, water, and sunlight power most of New York’s economy in 2050 in all Pathways.”⁸ However, evolving system needs will also require major contributions from other clean resources with firm and dispatchable characteristics to serve load and maintain system reliability during multi-day periods of low renewable output where short-duration battery storage is limited and as the current fossil based system is phased out.⁹

Zero-Carbon Firm Resources

The Plan’s analysis identifies that in addition to the State’s existing hydro and nuclear facilities, between 21-27 GW of firm, zero-carbon capacity will be needed by 2050.¹⁰ That need will be even greater if the use of hydrogen, nuclear, and biofuels are limited (as recommended by the Climate Justice Working Group).

The specific composition of these additional resources may take many forms (e.g., green hydrogen, hydrogen fuel cells), and deployment will be based on numerous factors, including the level of technology innovation, future cost, system needs, and environmental impacts. Due to the scale of these necessary resources, combined with the accelerated requirement to transition New York’s electricity system to achieve the 2040 goal of a zero-emission electricity grid, New York should prioritize the use of resources that are proven to be effective and affordable at scale to provide this service.

⁵ New York State Climate Action Council Draft Scoping Plan, page 31.

⁶ New York State Climate Action Council Draft Scoping Plan, page 74.

⁷ New York State Climate Action Council Draft Scoping Plan, page 84.

⁸ New York State Climate Action Council Draft Scoping Plan, page 84.

⁹ Section I page 46 – Integration Analysis Technical Supplement.

¹⁰ Section I page 46 – Integration Analysis Technical Supplement.

HQ's hydropower portfolio and interconnected reservoir system could play an important role in stabilizing capacity to support New York's transition. This system is capable of providing large volumes of clean capacity which has historically demonstrated an extremely high level of reliability in satisfying capacity requirements when it is most needed in neighboring markets.

The additional capacity of firm, zero-carbon capacity required by New York over the next decades is well beyond what can be provided by any single resource type. The result is that there will be significant opportunities for the continued development and participation of promising emerging technologies in the New York system. A parallel approach which leverages proven resources while actively working to advance new technologies will enable New York to build on the State's existing portfolio of zero-emission firm resources in order to manage the State's transition more reliably and cost effectively.

Long-Duration Storage

There is a clear need for additional dedicated storage resources in New York to facilitate a future electricity grid sourced primarily from weather dependent renewable energy sources and operated exclusively from zero carbon resources.

As stated in the Plan, “[a]chieving the CLCPA’s high renewable energy, zero-emission electricity system will require substantial amount of energy storage operating over various timescales—spanning from minutes to hours, days, weeks and even longer—to maintain grid flexibility, reliability, and resiliency.”¹¹

The HQ system is uniquely positioned to provide storage services. Using proven technology that is currently available at scale, HQ's system could provide the level of duration required by a deeply decarbonized grid at different times and across varying system conditions (spanning from minutes to months). New York's proximity to Québec and access to this resource to support regional decarbonization efforts represents an enormous opportunity for New York.

The Plan should leverage that and facilitate the process to deploy this storage (now, or in the future). HQUS is willing to work with New York toward making this part of a broader strategy to achieve New York's clean energy goals.

Ramping

In addition to clean dispatchable capacity, New York's future grid will also require resources capable of meeting rapid and steep ramping needs, which are estimated to reach upwards of 20,000 MW¹² in certain system conditions. HQUS deliveries can both contribute to the need for dispatchable emissions-free capacity and provide fast ramping capabilities. With the ability to ramp between 0 and full line capacity within minutes, HQ's controllable and flexible generation can respond rapidly to the higher magnitude of ramping events that

¹¹ New York State Climate Action Council Draft Scoping Plan, page A-80 (Initiative #11: Long Duration Storage Technology).

¹² The Analysis Group Climate Change Impact and Resiliency Study – Phase II.

are expected to occur as greater levels of variable generation are added to the New York system. HQ's ramping capability is able to operate in both directions, offering the capability to increase and decrease clean energy deliveries to reliably serve the needs of an increasingly complex electricity system.

These resources are already available and could significantly contribute to New York's future electricity system through existing, new, and expanded transmission lines, but will require appropriate market signals and policy design to foster these services. The Plan should support these required actions.

3. Market-based mechanisms may be part of the solution, but in order to be effective, these mechanisms should be designed and applied uniformly.

New market mechanisms to assist in the removal of fossil fuel-fired generation can be an effective tool in providing appropriate incentives to drive efficient entry and exit of generation resources in the market, but the design and implementation of these programs require careful consideration to avoid unintended consequences. The Plan should help guide that process to navigate these pitfalls.

As a guiding principle, all market-based mechanisms should be applied on a uniform basis, allowing for full eligibility and participation based solely on the product being sought. Imposing additional restrictions that differentiate among clean energy resources based only on factors not related to the targeted product, such as technology or location, will result in suboptimal outcomes for ratepayers - and may even act to unintentionally incentivize increased fossil generation in New York or the broader region.

In particular, it is critical that external clean resources receive equal treatment to resources located within the New York Control Area. This will both preserve and expand the contribution of external resources to New York's climate goals. This is in addition to the complementary benefits external resources provide in more effectively integrating new clean energy resource development within New York (as described in previous sections). Market design elements which fail to apply standard treatment across resource locations will act to limit New York's access to imported clean energy, especially considering that competition for these resources amongst regions will continue to grow in response to increasing renewable energy and decarbonization goals throughout the Northeastern United States and Eastern Canada.

Any policy that effectively prices GHG emissions should be applied across all sectors, not just to the electricity sector. An economy-wide policy is a more prudent approach. It will produce more efficient outcomes in reducing emissions across all sectors by promoting the most effective solutions, while mitigating (and possibly eliminating) the risk of cross sector leakage. Policies applied only to select sectors may also unintentionally disadvantage carbon reduction strategies by creating additional costs and making sector specific actions appear more expensive relative to actions in other sectors and to the status quo. For instance, applying a carbon price only to the electricity sector will increase the cost of heat pumps and electric vehicles compared to conventional non-electric heating and

transportation options. This could undermine the tremendous potential for beneficial electrification.

4. New York should advance/pursue near-term actions which maximize existing infrastructure and resources as part of a comprehensive approach.

Achieving New York’s climate targets and emission reduction goals for the 2040 and 2050 timeframes will require near-term action, recognizing the conventional multi-year timeframe of developing, permitting, and constructing large infrastructure projects. To complement these actions, New York should simultaneously identify and pursue opportunities to harness and optimize the value of existing energy resources and transmission assets. This synergistic effort will increase New York’s access to clean electricity supply and enable the delivery of electricity in a manner which facilitates New York’s clean energy transition.

Intra-Hour Dispatch

Current market rules allow HQ imports into New York to be scheduled in 15-minute increments. Ongoing efforts are underway that recognize the value of a further reduction to a 5-minute basis in facilitating New York’s clean energy transition. Pursuing market rule changes which allow for more granular dispatch over all of HQ’s interconnections into New York will better enable HQUS to provide dispatchable firming and balancing capabilities to reliably integrate higher levels of wind and solar on to the New York system. This more precise matching of system demand with available supply will be crucial to preserving reliable and efficient system operations as conditions can change rapidly on an intra-hourly basis.

Increasing HQ Transfer Capability into New York

HQ imports over existing interties are generally filled in peak periods when consumer electricity demand is at its highest. New York and HQUS should collaborate to identify and enact changes to increase operational capacity of these existing facilities.¹³ This can be done through market rule changes, which could allow for existing lines to operate at a higher capacity, as well as evaluating potential for physical upgrades to increase intertie capacity between the regions. This type of proactive planning was recently achieved with the expansion of the Cedar Rapids intertie,¹⁴ providing HQUS the capability to deliver an additional 80 MW of energy and capacity into the New York Control Area.

¹³ Development of new transmission interties between Québec and New York may also be considered as part of a broader strategy for achieving deep decarbonization more affordably, which is supported by a study conducted by MIT (Emil Dimanchev, Joshua Hodge & John Parsons, MIT Center for Energy and Environmental Policy Research, Two-Way Trade in Green Electrons: Deep Decarbonization of the Northeastern U.S. and the Role of Canadian Hydropower (Feb. 12, 2020) at p. 54, available at <https://ceepr.mit.edu/wp-content/uploads/2021/09/2020-003.pdf>

¹⁴ The project involved reconducting a three-mile long line owned by Niagara Mohawk Power Corporation (“NMPC”) d/b/a National Grid, upgrades to two substations owned by NMPC and upgrades to one substation owned by Alcoa Power Generating, Inc. The project achieved commercial operation in October 2021 and is also known as the Q430 project in the NYISO.

Enable Ancillary Services

New York and HQUS should work together to explore potential ways to allow HQUS to participate directly in the ancillary services market administered by the NYISO, enabling HQ to provide regulation service, operating reserves, and black-start capabilities. These actions will become increasingly important as new ancillary services expected to be created and implemented by the NYISO will address the evolving system needs of the future electricity system. The HQ system has the capability to provide a significant volume of both current and expected future ancillary services. Fostering greater competition in these markets will deliver more efficient market outcomes for consumers.

Conclusion

Through extensive and effective collaboration, the Plan has established pathways to guide achievement of the State's climate targets, while preserving the flexibility to allow New York to adopt strategies to harness future technologies, tools, and resources as they become available. As the State works to implement the actions required by the CLCPA (as informed by the final Scoping Plan), continuing that inclusive approach will be essential.

Consistent with that approach, the recommendations described above will:

- leverage all available clean energy options as part of a comprehensive solution,
- secure and expand the base of resources with the operating characteristics which will enable New York to achieve deep decarbonization,
- ensure that the implementation of market-based mechanisms effectively support the State's planning, and
- extract full value from existing infrastructure.

By drawing on all available resources, this will enable the State to achieve its goal of transitioning to an affordable, reliable, just and clean energy future.

Throughout this process, HQUS stands ready to partner with New York to make the State's vision a reality and collaborate with stakeholders to develop and implement the policies and actions necessary to capture HQ's unique operational capabilities and expand HQ's role as a clean energy solutions provider in New York.

Respectfully submitted,

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