



October 31, 2022

New York Independent System Operator
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Via E-mail: PublicPolicyPlanningMailbox@nyiso.com

Hydro-Québec (“HQ”), through its U.S. subsidiary H.Q. Energy Services (U.S.) Inc. (“HQUS”), hereby submits the following recommendation to advance the Climate Leadership and Community Protection Act (“CLCPA”) goals in response to the Notice of Request for Proposed Transmission Needs Being Driven by Public Policy Requirements for the 2022-2023 Transmission Planning Cycle issued by the NYISO on August 31, 2022.

A Public Policy Need should be identified for transmission projects that increase New York’s access to Dispatchable Emission-Free Resources (“DEFER”) in order to advance the cost-effective achievement of New York’s clean energy objectives in the CLCPA. Clean and dispatchable supply can be delivered to New York by the HQ system over new transmission projects, which will be particularly valuable in the Upstate region where this is a current and growing need for these resources.

Introduction

HQ is the largest generator of clean energy in North America, 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 177 million MWh of energy in multiannual reservoirs. HQ has extensive experience in the development and operation of transmission, with a system of over 21,000 miles of transmission lines and managing 15 interties with neighboring control areas. The HQ system shares two interconnections with New York with an aggregate capacity of over 2,000 MW, resulting in nearly a century of clean energy collaboration between Québec and New York.

HQ is committed to the reduction of GHG emissions and decarbonization both within Québec, and in neighboring markets. The clean and reliable supply delivered by HQUS provides a significant component of New York’s renewable portfolio, importing 8.2 million MWh in 2021. Deliveries from HQUS contribute approximately 20% of New York’s renewable energy supplies.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

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

(“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

Existing interties connecting New York and Québec, with the addition of CHPE, provide a strong foundation for accelerating decarbonization efforts and supporting achievement of New York’s nation leading clean energy goals codified in the CLCPA. But greater action is needed. As stated in the NYISO 2021 – 2040 System & Resource Outlook (“Outlook”), New York will require both (1) significant additions of dispatchable and emission-free resources,⁴ and (2) transmission expansion (both at the bulk and local level). Both are critical to achieving CLCPA targets as today’s system is inadequate to attain current policy objectives.⁵ New Public Policy transmission between Québec and Upstate New York can contribute to fulfilling both these needs.

Increasing transmission capacity between Québec and New York through new and expanded interconnections will provide the operational flexibility necessary to support greater wind and solar integration and reliably serve growing electricity demands as the State progresses on its clean energy transition.⁶ The ability of the HQ system to offer dispatchable and long-duration storage services can:

- (1) act as a backstop to ensure adequate clean supply remains available to New York during periods of low renewable production, using HQ’s extremely controllable capabilities to precisely match supply and demand, and
- (2) HQ can import energy from New York using bidirectional transmission under conditions where renewable generation exceeds local load and would otherwise need to be curtailed.

Surplus renewable energy that is imported from New York to Quebec can be stored using HQ’s vast reservoir storage system and redelivered back to New York in future periods to serve increased demand.

The opportunity to leverage the HQ system and provide transmission solutions is more immediate in the Upstate region. Specifically, the Outlook has identified Watertown (X3) in Northern New York as one of four locations with renewable generation pockets that would benefit from near-term transmission expansion.⁷ Harnessing the flexibility of HQ’s system can aid in maximizing the contribution of renewable generation in the Upstate system by reducing the risk of renewable curtailment.

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 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).

⁴ NYISO System 2021 – 2040 System & Resource Outlook, page 12.

⁵ NYISO System 2021 – 2040 System & Resource Outlook, page 15.

⁶ NYISO System 2021 – 2040 System & Resource Outlook, page 8.

⁷ NYISO System 2021 – 2040 System & Resource Outlook, page 14.

To implement this solution, HQ offers the recommendation that a Public Policy Need be identified for transmission projects that increase New York’s access to Dispatchable Emission-Free Resources (“DEFER”) in order to advance the cost-effective achievement of New York’s clean energy objectives in the CLCPA.

HQ’s clean energy system is a readily available source of DEFER. Enhancing interconnection capacity between the regions through new and expanded transmission into Upstate New York will be critical to addressing the State’s evolving energy system needs, while simultaneously delivering a host of environmental, economic, and reliability benefits.

New Transmission will Address Challenges in New York’s Clean Energy Transition

Increasing transmission capacity through new transmission projects between Québec and Upstate New York is needed to help address a number of electricity system challenges New York is experiencing today and will expect to face in the future such as:

- the need for additional sources of clean energy to meet growing electricity demand from electrification, enabling the replacement of fossil fuel generation using emission free resources that can reliably provide the same operating characteristics,
- reliably integrating high penetrations of wind and solar resources into the New York system, and
- expanding access to resources with long-duration storage capability and firm capacity.

Increased access to the HQ system through new transmission projects will provide a source of additional clean energy to help serve the growing electricity demands in New York. The Outlook confirms that meeting New York’s clean energy needs in 2040 will require resource additions at an unprecedented pace, with total installed generation capacity to range from 111 GW to 124 GW, with at least 95 GW consisting of new or modified generation.⁸ The rapid increase and transformation of New York’s energy supply mix will necessitate a broad and inclusive approach, which leverages all clean resources to ensure affordable and reliable electricity supply remains available to consumers. As existing interties with HQ are fully utilized in peak periods, additional transmission will provide New York with greater access to cost competitive clean supply from Québec to help fulfill this need.

Through enhanced interties, HQ also can offer the operational services required to balance the future zero-emissions electricity system in New York. This will allow New York to retire fossil fuel generation that currently serves as the market’s primary balancing resource. Clean resources that can deliver dispatchable and long duration reliable supply are necessary to meet the objectives of the CLCPA, but options outside of hydropower resources are currently limited. Therefore, a parallel approach which includes expanding transmission capacity with Québec while simultaneously working to advance emerging technologies will ensure a broad range of cost effective and viable solutions remain available to New York.

⁸ NYSO System 2021 – 2040 System & Resource Outlook, page 12.

HQ's highly flexible hydropower resources, combined with the long duration storage capability of the HQ reservoir system, can help address the challenge of reliably integrating high volumes of intermittent renewable energy into the New York system. By leveraging HQ's capability to quickly ramp up and down to precisely match system demand with more dynamic supply under various weather and operating conditions.

There is a clear need for additional dedicated storage resources serving New York to facilitate a future electricity grid supplied primarily from weather dependent renewable energy sources and operated exclusively from zero carbon resources.⁹ 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). This long duration storage capability can be accessed through additional transmission interconnections and will complement New York's investment in battery storage. The combination will work to address the evolving needs of the State's energy system.

HQ's controllable and long-duration storage services will be crucial to preserving reliable and affordable electricity supply as New York's resource mix shifts towards a higher dependence on renewable resources. However, because demand for these services is expected to grow rapidly as annual electricity consumption and peak demand increases due to electrification of the heating and transportation sectors,¹⁰ the capacity of existing interties will quickly become fully utilized, requiring additional transmission interconnections.

HQ's hydropower portfolio and interconnected reservoir system could play an important role in stabilizing capacity to support New York's transition. HQ's 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. In the future, through additional transmission interties, the high-capacity contribution from DEFRs and effectiveness in meeting capacity requirements provided by the HQ system can offer a cost-effective approach to preserving reliability margins and supplement the declining reliability contribution of intermittent renewable resources as more are added to the system.¹¹

New Transmission will Provide Significant Net Benefits to the State

Expanding transmission interties between HQ and Upstate New York through additional transmission projects will produce significant net benefits for the State. These benefits will include:

- Reliability and resiliency benefits through greater interregional connectivity,
- Environmental benefits from accelerated emission reductions, and
- Economic benefits from achieving policy targets more predictably and cost effectively.

⁹ "The scope of planned battery storage alone, given its current capabilities and technological advancements, however, will not meet system needs to balance intermittent resources when renewable resources are unavailable." NYSO System 2021 – 2040 System & Resource Outlook, page 29.

¹⁰ The Outlook forecasts future overall energy demand over 235 TWh in 2040, page 9.

¹¹ NYSO System 2021 – 2040 System & Resource Outlook, page 51 & 60.

Further accessing the HQ system through expanded transmission will strengthen the reliability and resiliency of the New York system by increasing the clean and reliable capacity available to New York and providing the capability for HQ to offer more of the reliability services increasingly demanded in a system predominantly sourced from renewable generation. Greater interregional connectivity results in more reliable systems, and the potential for increased exchange of capacity. Additional transmission interties with Québec are particularly valuable for New York as capacity sales from HQ are backed by a system of geographically diverse resources connected with a high degree of transmission redundancy, which has historically demonstrated an extremely high level of reliability.

Additional high voltage DC transmission to the Québec system can also offer a number of unique reliability and operational services, such as black start, dynamic reactive power, and fast frequency response. Black start (listed as an essential service in the Outlook¹²) helps to restart the system in the event of a blackout. Because the HQ system is asynchronous to New York and HQ generation resources are geographically distributed, it is extremely unlikely that black out events which impact New York will simultaneously affect Québec, and the HQ system will remain available to restart the New York system as expeditiously as possible and minimize the public health and economic impacts from a loss of electricity service.

The HQ system has the capability to provide a significant volume of current reliability services and may also offer the new ancillary services and products expected to be created and implemented by the NYISO to meet the evolving system needs of the future electricity grid.¹³

HQ can deliver environmental benefits to New York by reducing GHG emissions by decreasing the operation of fossil-fuel generation. With expanded transmission capacity, HQ can help to reduce emission by:

- (1) delivering more clean energy during times of high demand when current interties are fully subscribed and fossil-fuel generation would otherwise need to be dispatched, and
- (2) maximizing the deliveries of renewable generation in Upstate New York by leveraging HQ's dispatchable characteristics to reduce renewable curtailments.

The DEFR capacity offered by HQ, combined with coordinated additions of renewable resources, will be essential to facilitate the staged retirement of fossil fuel resources over the next 18 years.¹⁴

¹² NYISO System 2021 – 2040 System & Resource Outlook, page 60.

¹³ NYISO Grid in Transition (2019), page 46 “NYISO intends to conduct analyses to evaluate whether today’s energy and ancillary service products will continue to support reliable operations and investability as the system evolves. If that is not the case, the NYISO will evaluate the need for new products and the potential for increasing current ancillary services requirements that would have the effect of providing incentives for more flexible resources to be retained or attracted as new entry.”

¹⁴ NYISO System 2021 – 2040 System & Resource Outlook, page 8.

Figure 30¹⁵ in the Outlook shows increasing levels of wind, solar, and hydropower curtailments in the North Country region in 2030 and 2035. More effective use of transmission interties can reduce the occurrence and magnitude of these curtailments as HQ has the ability to quickly ramp down exported generation to respond to unexpected periods of high renewable production which exceed local demand. In the future, additional bidirectional transmission will allow HQ to provide storage services by absorbing and storing energy from excess renewable production in New York, and to redeliver it back into the New York Control Area in periods when energy is needed.

Near term expansions of transmission capacity between Québec and New York will create economic benefits by enabling additional clean energy deliveries from HQ during periods of high demand, which contribute to New York's 70% by 2030 renewable target mandated under the CLCPA. Investments which allow contributions from the broadest set of clean resources will provide valuable resource diversity - enabling New York to capture synergies and portfolio benefits by combining resources with complementary production and operating characteristics - and deliver the most cost-effective combination of solutions. 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. Ultimately, these factors will act to reduce clean energy compliance costs and result in more predictable electricity costs to ratepayers.

Conclusion

HQ appreciates the opportunity to provide the recommendation and supporting comments for a Public Policy Need for transmission projects that increase New York's access to Dispatchable Emission-Free Resources. The Public Policy Transmission Planning Process will be an increasingly vital tool in achieving the ambitious pace and scale of New York's clean energy objectives, as part of a broad and coordinated approach. Utilizing this process to enable expanded transmission with Québec is a necessary part of this approach, particularly in the Upstate region where there is a more immediate need. HQ remains prepared to explore solutions and clean energy projects capable of meeting the evolving needs of the New York system, delivering substantial benefits, and complementing New York's existing clean energy initiatives in a cost effective and reliable manner.

Respectfully submitted,

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¹⁵ NYISO System 2021 – 2040 System & Resource Outlook, page 66.