



November 30, 2017

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Secretary to the Commission
New York State Public Service Commission
Empire State Plaza
Agency Building 3
Albany, NY 12223-1350

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Re: Matter 17-01821 – In the Matter of Carbon Pricing in New York Wholesale Markets

In response to the Notice on Process, Soliciting Proposals and Comments, and Announcing Technical Conference issued October 19, 2017; H.Q. Energy Services (U.S.) Inc. (“HQUS”), the U.S. subsidiary of Hydro-Québec (“HQ”) in the United States, hereby submits these comments regarding the market design options for pricing carbon emissions in the wholesale energy markets administered by the New York Independent System Operator (“NYISO”).

HQ is one of the largest suppliers of clean energy in North America. Through functionally separated entities, HQ generates, transmits and distributes energy within the province of Québec and exports electricity to external markets in Northeast North America including New York. Over 99 percent of Hydro-Québec Production’s¹ electricity generation is renewable as it is produced from a hydropower system of more than 62 geographically diverse stations that comprise over 37,000 MW of capacity.² This hydropower fleet is supported by a system of 27 reservoirs that allows for 176 TWh of electricity to be stored for future use or to be dispatched to meet real time changes in consumer demand. An extensive network of over 21,000 miles of transmission reliably and efficiently delivers electricity to customers within Québec and to our external markets.

Hydropower resources developed in Québec and operated by HQ have a greenhouse gas (“GHG”) emissions profile similar to wind and solar, and significantly less than fossil fuel

¹ Hydro-Québec Production generates power for the Québec market and sells its surpluses on wholesale markets.

² Besides its hydro fleet, HQP owns one gas-fired power plant that is used as a back-up generator.

generation.³ Imports from HQ provide a strong foundation of New York's clean energy portfolio, as the 7 TWh of clean energy delivered annually represents approximately 5 percent⁴ of New York's annual electricity consumption, and 17 percent⁵ of the state's renewable energy supply. Because of the reliability and flexibility of HQP's supply mix, HQ imports can play a key role in helping New York achieve clean energy and carbon reduction objectives, through providing scalable and cost competitive clean energy supply to New York, and assisting in integrating larger quantities of variable resources into the bulk electricity system.

Summary of Comments

HQUS appreciates the opportunity to participate in initiatives to harmonize New York state policy and wholesale electricity markets. As stated in HQUS' comments submitted to the Federal Energy Regulatory Commission,⁶ HQUS strongly supports efforts to achieve policy objectives (such as carbon reduction) through wholesale markets, and believes that utilizing market forces will result in the most efficient and cost effective outcomes for consumers in the long-run.

Integrating the cost of carbon within the market dispatch price, as proposed in the Brattle Report,⁷ represents such an opportunity to employ market forces to help achieve New York's ambitious environmental policy objectives. While HQUS supports these measures, we caution that the design and implementation of specific elements of the program will have a critical impact on its overall effectiveness. In order to ensure that this initiative results in the most effective program design, HQUS provides the following comments:

1. New York should adopt a granular border adjustment mechanism to prevent the potential for leakage
2. Clean imports from Québec should not be considered as a shift in regional carbon abatement
3. New York should consider the broader impact of carbon pricing mechanisms on clean energy programs and market outcomes
4. Carbon price analysis should consider the total benefits and costs of the program and program design elements

³ Hydro-Québec, Environnement et développement durable; CIRAIG; Tirado-Seco, 2014, Comparing Power Generation Options and Electricity Mixes, 48 p., annexes. (Study available on Hydro-Québec's website at <http://www.hydroquebec.com/sustainable-development/documentation-center/pdf/comparing-power-generation-options-and-electricity-mixes.pdf>).

⁴ HQ has historically exported between 7 and 9 TWh of energy into New York each year, delivering 8.5 TWh in 2016

⁵ Staff White Paper on Clean Energy Standard, 2016, Appendix B.

⁶ HQUS Comments on Docket AD17-11-000, June 2017

⁷ Pricing Carbon into NYISO's Wholesale Energy Market to Support New York's Decarbonization Goals, Brattle Group, August 2017

1. New York should adopt a granular border adjustment mechanism

HQUS recognizes that an important aspect of carbon pricing is the treatment of energy imports from regions which do not assign identical emissions costs to external generators. If generation from neighboring regions is not subject to the same cost of carbon assigned to New York generators, generators in New York may be competitively disadvantaged, and leakage may occur, where the emissions reduced in New York will be replaced with higher emissions rates in surrounding areas.

To address this issue, the Brattle Report identifies two broad border adjustment mechanisms which New York may adopt to prevent the disadvantaging of New York generators. The “simple” approach would assign the marginal emissions rate within New York to all energy imports into the state, and credit back New York’s marginal emissions rate to exports out of the state. It is important to note that this approach will eliminate any incentives for clean generators to import energy into New York, obscure the true carbon footprint of imports, and create other distorting effects in resource dispatch.

The alternative approach in the Brattle Report is to employ a more granular border adjustment mechanism, where each import is assigned an emission rate based on the actual resource, or the average rate from the jurisdiction of origin (potentially varying by season and on-peak vs. off-peak).⁸

For the following reasons, HQUS recommends that a more granular/sophisticated approach should be adopted by New York in assigning emission rates to importing resources:

Preserve incentives for clean imports

Safeguarding a competitive environment for clean imports will be instrumental for New York in preserving affordable and reliable clean energy supply, and achieving policy targets in the most cost effective manner. If clean imports are disadvantaged compared to clean generation within New York due to a distorted price signal, the volume of clean imports will decrease as they will appear less competitive in New York’s system dispatch. Reduction in clean imports will also occur if these resources choose to respond to opportunities in competing markets. As such, this artificially high carbon charge would deprive NY of less costly renewable resources.

In order to ensure that the highest value and most cost effective carbon abatement measures are deployed, a carbon pricing approach which creates incentives that can be fully captured by both internal and external resources should be pursued. Through this approach, a carbon price signal will act to incent the most effective carbon reduction measures in terms of selecting the optimal mix of internal and external resources to deliver clean energy at the time and location with the greatest impact.

⁸ Brattle Report, page 25

In the Clean Energy Standard⁹ (“CES”), New York acknowledged the ability for external resources to contribute to the state’s energy policy objectives. HQUS commends New York for setting ambitious energy policy objectives, including a goal to reduce carbon emissions 40% by 2030, but estimates that to achieve these objectives all deliverable clean energy resources will be needed.

Clear and consistent incentives for clean imports can drive new transmission investment for low carbon deliveries within and into New York. Areas with a greater dependence on high emitting resources will attract both new local generation resources and interconnecting transmission linked to control areas with available low carbon generation. Removing the incentive for clean imports to respond to these opportunities will lead to the selection of less cost-effective solutions, or even prevent solutions from being implemented.

Therefore, to fully leverage the value of market forces in achieving New York policy objectives, the state should remain diligent in preserving incentives for clean and low carbon imports in efforts to integrate a carbon price into wholesale markets.

Accurate and appropriate emissions rate for imports

Another important factor New York should consider in implementing a carbon price is ensuring accurate accounting of carbon emissions from the resources powering New York’s electricity sector. Not only will accurate assignment of emissions rates for New York imports continue to incentivize the delivery of clean imports into the state, but also facilitate more accurate monitoring of the state’s progress in reducing emissions and achieving policy objectives.

Assigning the same emission rate to all imports despite their carbon output will act to obscure the actual carbon emissions assignable to New York. This approach will make emissions accounting in New York more difficult (as New York would need to account for actual emission from imports after the fact), and will deter low carbon imports into the state.

Lastly, utilizing the most accurate information on carbon emissions from generation resources is consistent with the efforts New York has undertaken to develop and implement the New York Generation Attribute Tracking System (NYGATS), which is intended to precisely account for the source and characteristics of electricity production.

Consistency with program intent

Adopting a more granular border adjustment approach will achieve greater carbon reduction in New York. According to the Brattle Report, a differentiated border charge for imports would incentivize 1.8 TWh of additional clean energy from Canada, and deter 4.4 TWh of high emitting generation from PJM, inducing 1.6 million tons per year of emission reductions.¹⁰ Obtaining the greatest degree of carbon reduction is consistent with New

⁹ Case 15-E-0302 Order Adopting a Clean Energy Standard (issued August 1, 2016)

¹⁰ Brattle Report, page 56

York's broader policy objectives, and should be a priority in evaluating border adjustment mechanisms.

Conversely, applying a generic emissions rate to imports in New York will have the perverse effect of attracting higher emitting resources, as external generators with higher emission rates will be assigned an artificially low carbon charge compared to comparable in-state resources. This result would be inconsistent with both the CES program and the carbon pricing initiative.

Long-Term costs to customers

Through broadening the supply of potential carbon abatement measures in New York, the state can reduce costs to ratepayers in meeting carbon reduction goals. A carbon price which allows clean imports to respond to price signals in New York and compete with in-state resources will produce the most efficient outcome by selecting the most cost effective offers. If clean imports are not accurately valued, New York will need to replace these resources with more expensive carbon abatement measures. While the Brattle Report estimates that a differentiated border charge will increase net customer costs from \$1.7/MWh to \$2.6/MWh,¹¹ HQUS estimates that the ultimate cost to customers will actually be much higher using the simple, undifferentiated border charge approach. A uniform border charge on all imports will, in the long run, result in less clean imports into New York, which will need to be replaced with more expensive alternatives. Since the modeling approach utilized in the Brattle Report did not consider reductions in clean imports resulting from an undifferentiated border charge, the cost to replace these resources (and other associated costs) was not captured in the cost estimate. Ultimately, well-functioning competitive markets, including adequate price signals, will deliver the most cost-effective long-term results.

Participation in the Western Climate Initiative

Generation resources in regions participating in the Western Climate Initiative ("WCI")¹² are already being assessed the equivalent of a carbon charge. Applying an additional carbon charge in New York which fails to reflect the existing WCI charge will result in a double counting of the cost of these emissions.¹³ By not accurately reflecting the true cost of carbon on a regional basis, New York will not achieve the most efficient outcomes in meeting state or regional carbon abatement objectives.

¹¹ Brattle Report, page 56

¹² Québec is part of the Western Climate Initiative a regional cap and trade program which requires generating resources to purchase carbon emission allowances for each ton of carbon dioxide emissions produced. The program reduces the total number of allowances available over time, in order to decrease carbon emissions throughout the regional economy.

¹³ While the Brattle Report acknowledges carbon pricing exists in Western Climate Initiative regions, it does not account for double counting in assigning emissions to imports with a near zero carbon footprint

2. Clean imports from Québec should not be considered as a shift in regional carbon abatement

The Brattle Report assumes an emissions rate of 0 tons/MWh on imports from Québec under a differentiated border charge,¹⁴ but goes on to question whether imports from Québec really produce near-zero emissions, since “marginal emissions might be higher if imports to New York were supplied by diverting flows that could have gone to other neighbors.”¹⁵ Not only will estimating where carbon reduction could have otherwise occurred be extremely difficult to calculate, but HQUS contends that the merits of the question are flawed and are not applicable to Québec imports into New York. HQUS recommends that all imports should be assessed at an emission rate based solely on the generating resources and marginal emissions rate within the market of origin, and submits the following arguments in support of this approach:

New York should encourage early actions on clean energy development

Since the early 2000’s HQ has commissioned nearly 5,000 MW of additional clean energy resources available for export. Due to the long lead time of developing and constructing large-scale hydropower resources (10-15 years), HQ has undertaken this development in anticipation of clean energy policies in export markets that value the characteristics these resources provide. While HQ projects that with appropriate market signals, total exports will increase into the future, the allocation of exports between markets will be impacted in response to changing market dynamics and differences in clean energy incentives.

The northeastern region (including New York) has already seen increased imports of electricity from Québec over the last decade, and benefited from the associated accelerated carbon reductions attributable to HQ imports. However, this early access should not disadvantage HQ resources against projects which have been waiting for clean energy programs to be fully implemented. By applying higher standards to imports from Québec in displacing regional emissions, New York may hinder future actions from external suppliers looking to take early actions to displace emissions prior to the full implementation of clean energy programs.

Any methodology should protect against bias or discriminatory practices

An approach to assigning emissions, which considers where a generator could otherwise deliver energy, should apply equally to all resources. Similar to HQ imports, resources within New York also have the capability to sell energy to adjacent regions (evidenced by New York wind exports to New England). If resources within New York stop exporting to alternative markets in response to carbon pricing, these resources would also need to be assigned an emissions rate based on the replacement rate in the alternative market. Therefore, the methodology for assigning emissions rates should be applied in a non-discriminatory manner.

¹⁴ Brattle Report, page 55

¹⁵ Brattle Report, page 24

Surrounding regions share clean energy market objectives

In addition to New York, surrounding regions in New England and eastern Canada have adopted clean energy and carbon reduction objectives. These clean energy goals, such as the Global Warming Solutions Act in Massachusetts¹⁶ require actions to decrease emissions relative to current levels (with emission reduction targets increasing over time). Therefore, any clean energy supplies shifted to New York in response to carbon pricing incentives do not increase regional emissions because the energy will need to be replaced with alternative clean energy supplies (not simply with resources at the marginal emissions rate in that region). As part of a regional market for clean energy, New York will need to compete with surrounding states and provinces for the most effective clean energy resources.

3. Broader Impact on the New York market and clean energy goals

New York's treatment of imports in adopting a carbon price will likely have broader impacts beyond the factors examined in the Brattle Report. Therefore, HQUS recommends that the following factors are examined in more detail, to ensure that the full cost and value of the potential mechanics can be accurately assessed by stakeholders and policy makers in New York.

Impact on meeting CES objectives

The Brattle Report envisions carbon pricing to be implemented in addition to existing clean energy programs in New York, such as the Regional Greenhouse Gas Initiative ("RGGI") and CES. While the Brattle Report does consider the impact of carbon pricing on these programs in the context of changes to wholesale market prices, the impact of retaining legacy clean imports, which are included in New York's renewable baseline, should also be considered. If the contribution of these legacy resources is reduced due to decreases in clean imports, the lost renewable energy will need to be replaced before any progress can be made towards increasing the percentage of renewable supply in New York. If energy from existing resources is replaced using new Tier 1 resources, there will likely be an increase in total program costs to ratepayers.

Since HQ imports represent nearly 17% of the renewable baseline in New York, replacing up to 7 TWh of legacy HQ deliveries represents a significant cost risk to the state. Thus, enacting a carbon pricing policy which helps to secure baseline resources represents sound policy, consistent with the objective of reducing carbon in the state. Such actions will also mitigate the risk of erosion in the renewable baseline in meeting the 50% by 2030 objective.¹⁷

¹⁶ An Act Establishing The Global Warming Solutions Act, Massachusetts, Chapter 298 of the Acts of 2008

¹⁷ Further explained in the HQUS comments submitted November 10, 2017 in Case 17-01821

Integrating renewables

Another factor not explicitly examined in the Brattle Report, is the cost of integrating a higher penetration of intermittent resources into New York's bulk electricity system. Securing and increasing clean imports with dispatchable characteristics may reduce these costs, while further contributing to carbon reduction by replacing fossil fuel resources in performing this integration. Imports from HQ are well positioned to provide this service, due to the controllable nature of HQ resources, and the ability for HQ imports to respond in 15 minute increments over the Chateaugay interface.

An increased penetration of intermittent resources will result in an increase in the NYISO Installed Reserve Margin ("IRM") due to a higher dependency on low capacity factor resources. In supplemental comments submitted by the NYISO in the CES proceeding, the NYISO estimates that achieving the 50% by 2030 objective using the resource mix envisioned by the Department of Public Service in the 2016 Draft Supplemental Environmental Impact Statement,¹⁸ will increase the IRM from 17.5% to up to 45%.¹⁹ The NYISO goes on to state "If the NYISO were to assume long-term committed Canadian hydroelectric imports with historically high performance factors, those resources would put downward pressure on the IRM [Installed Reserve Margin] percentage."²⁰

Furthermore, investments in transmission infrastructure to deliver renewable energy from upstate New York to load centers in the south can be better utilized when variable generation is paired with controllable resources. More efficient utilization of the transmission system will displace the need for additional transmission assets, improving efficiency and reducing costs in New York.

4. Carbon price analysis should consider the total benefits and costs of the program and program design elements

The October 19th notice invited comments on the analysis which should inform the initiative to harmonize New York state policy and New York wholesale markets. In response, HQUS recommends that any evaluation in carbon pricing approaches (or program mechanics) compare the ratio of the total benefits and total costs of any proposals. Factors to be considered in this approach should contain all measurable and relevant impacts on the New York electricity system, including total carbon emission reductions, wholesale price impacts (energy, capacity and ancillary services), any required transmission upgrades, cost of generation re-dispatch (including imports) and the total cost impact of achieving environmental policy objectives in New York.

Conclusion

The joint effort between the NYISO and Department of Public Service to harmonize wholesale markets and policy objectives through a price on carbon reflects New York's

¹⁸ Case 15-E-0302, DPS Draft Supplemental Environmental Impact Statement, February 2016

¹⁹ Supplemental Comments on the Clean Energy Standard Case 15-E-0302, NYISO, July 8, 2016, page 11

²⁰ Supplemental Comments on the Clean Energy Standard Case 15-E-0302, NYISO, July 8, 2016, page 9

continued commitment to achieving policy objectives which are amongst the most ambitious in the nation. To achieve these objectives, HQUS recommends that New York should:

1. Adopt a granular border adjustment mechanism in pricing carbon which preserves incentives for clean imports
2. Assign appropriate emission rates for clean imports based on the carbon content of the importing resources
3. Examine the broad impact of carbon pricing mechanisms on meeting clean energy objectives and cost impacts on consumers
4. Analyze the total costs and benefits of program design elements

Considering the recommendations above will secure a foundation of reliable and clean deliveries for New York. HQUS appreciates the opportunity to participate in this process, and looks forward to continued collaboration between Québec and New York.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'S. Molodetz', is written over a horizontal line.

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HQUS