

CANADIAN ENERGY REGULATORS AND NEW TECHNOLOGY: THE TRANSITION TO A LOW CARBON ECONOMY

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INTRODUCTION

In the past, Canadian energy regulators have been reluctant to fund new technology through rates because they were experimental or research in nature. For example, applications to both the Ontario and Nova Scotia regulators to fund electric vehicle (EV) charging were declined.¹ Things have changed. In 2020, energy regulators in British Columbia, Ontario, and Nova Scotia for the first time took steps to promote new technology using technology pilots.

This is a new line of work for Canada's energy regulators. Introducing new technology into the grid is important particularly in today's environment where carbon reduction is a major objective of all governments. The electricity grid is highly regulated and those regulations can block new technology. Energy regulators are in a unique position to address that problem. It will however require new regulatory procedures. This article reviews the relevant regulatory decisions that were made in 2020 to address new technology.

BACKGROUND

On December 11, 2020, the Canadian government announced new legislation entitled *A Healthy Environment and a Healthy Economy*, to accelerate climate change initiatives throughout the country.² The December 2020 plan included 64 different programs to cut pollution and build a clean economy at a cost of \$15 billion. The investments include \$2.5 billion for clean power projects over three years, \$1.5 billion to develop low carbon fuels, \$287 million over two years to promote zero emission vehicles, \$3 billion over five years to decarbonize large-scale emitters, \$2.6 billion over seven years to improve home energy efficiency, and \$3 billion over 10 years to plant 2 billion trees. In April 2021, the Biden administration announced that it would spend \$2 trillion on clean energy investment over the next four years.

On April 22, 2021 at an international climate summit Canada pledged that it would reduce carbon emissions by 40 to 45 per cent below

¹ *Re Toronto Hydro-Electric System Limited* (22 February 2012), EB-2010-0142, online: Ontario Energy Board <www.rds.oeb.ca/CMWebDrawer/Record/329716/File/document> [*Toronto Hydro-Electric*]; *Re Nova Scotia Power Incorporated* (4 January 2018), 2018 NSUARB 1, online: Nova Scotia Utility and Review Board <www.canlii.org/en/ns/nsuarb/doc/2018/2018nsuarb1/2018nsuarb1.html>.

² The Right Honourable Justin Trudeau, "Prime Minister Announces Canada's Strengthened climate plan to protect the environment, create jobs, and support communities" (11 December 2020), online: <pm.gc.ca/en/news/news-releases/2020/12/11/prime-minister-announces-canadas-strengthened-climate-plan-protect>.

2005 levels by 2030. The previous Canadian goal set at the Paris climate talks in 2015 was 30 per cent by 2030. At the same meeting the Biden administration committed to cutting US emissions by 50 to 52 per cent below 2005 levels by 2030. That was twice the level President Barack Obama had committed to for the same time period.

Global investment in renewable energy will reach a record high in 2021 and spike to \$16 trillion by 2030.

The year 2020 also saw an important shift in financial markets. Renewable energy now dominates capital markets in both Canada and the United States. Next Era Energy, the world's largest supplier of wind power, replaced Exxon Mobil and Chevron Corporation to become the world's most valuable energy company. In August 2020, Exxon Mobil disappeared from the Dow Jones industrial average. It had been a member since the company was Standard Oil of New Jersey in 1928.

Private corporations have also entered the renewable energy market in a significant fashion. In April 2020, BlackRock, one of America's largest venture firms, raised \$5 billion for its Global Energy Infrastructure fund. In January 2020, Microsoft launched a new climate innovation fund to invest \$1 billion over the next four years, while in June 2020, Amazon pledged an initial \$2 million in funding for its venture investment program.

Canadian pension plans have also been very active. By September 30, 2020 the Canada Pension Plan Investment Board had committed an investment of \$9 billion to renewable energy globally. In 2020, the fund closed the transaction to acquire all of the renewable assets of Pattern Energy for \$6 billion which included a portfolio of 28 renewable energy projects with an operating capacity of over 4 GW in the United States, Canada, and Japan.

THE NEW REGULATORY LANDSCAPE

In 2020, the British Columbia Utilities Commission heard two applications for ratepayer funding of new technology. The exact nature of the technology was left up to the utility to determine. One application was approved. The second was turned down.

In the same year, the Ontario regulator approved three technology pilots for two specific technologies. The first involved blending hydrogen into natural gas while the second involved blending bio-methane into natural gas. The Nova Scotia regulator approved a technology pilot for smart grid software.

The Ontario Energy Board (OEB) also introduced a new service called the Innovation Sandbox. This service provides Board staff opinions in the form of OEB Bulletins to address areas of regulatory uncertainty that may be preventing the introduction of new energy services that could improve energy efficiency and/or decarbonize the grid. In the first year 33 applications were received from utilities and non-utilities. These applications produced one Bulletin which allowed behind the meter energy storage.³

In June 2020, the British Columbia Utility Commission (BCUC) issued a decision in response to an application by FortisBC to establish a Clean Growth Innovation Fund.⁴ The evidence filed by the applicant included an article published in this publication a year ago.⁵ The utility actually proposed two funds — one for a gas utility and one for an electricity utility. The application by the electricity utility failed but the one by the gas utility succeeded.

The utility proposed a charge of \$0.30 per customer per month for the electric utility and \$0.40 per customer per month for the gas utility. The anticipated annual funding based on the number of forecasted customers was \$ 4.9 million for the gas utility and \$.5 million for the electric utility.

³ Ontario Energy Board, Bulletin, "Ownership and Operation of Behind-the-Meter Storage Assets for Remediating Reliability of Service" (6 August 2020), online (pdf): <www.oeb.ca/sites/default/files/OEB-Staff-Bulletin-owners-hip-of-BTM-storage-20200806.pdf>

⁴ *Re FortisBC Energy Inc. and FortisBC Inc.* (22 June 2020), G-165-20, G-166-20 at 148, 154, online: British Columbia Utilities Commission <www.bcuc.com/Documents/Decisions/2020/DOC_58466_2020-06-22-FortisBC-MRP-2020-2024-Decision.pdf> [FortisBC].

⁵ James Coyne et al, "Should ratepayers fund innovation?" (2018) 6:3 Energy Regulation Q 45.

The BCUC approved the innovation fund for the gas utility because it had “demonstrated its needs to accelerate its innovation activities...in light of increasing governmental climate policies aimed at decarbonization and electrification.” The Province of British Columbia had legislated a 40 per cent reduction GHG emissions over the next decade.”⁶

The decision represents a key milestone for innovation funding. Previous applications were directed at specific projects. This application however created a fund for projects that would be considered from time to time. The application also proposed a governance model to ensure that the funds were applied to innovations that would benefit customers. The decision also addressed accountability and annual reporting by the utility.

The starting point in the Board’s analysis was to determine the demand or need for funding. The Commission relied on the evidence from the utility that pointed to Canada’s commitment to reduce GHG emissions by 30 per cent between 2005 and 2030 and BC’s commitment to reduce the emissions 40 per cent by 2030 and 80 per cent by 2050. To this were added commitments the City of Vancouver. The panel concluded that the utility had demonstrated the need to accelerate its innovation activities in light of governmental climate policies with respect to decarbonization and electrification.

Three Technology Pilots

The British Columbia regulator was not alone in financing new technology in 2020. In December 2019, Nova Scotia Power submitted an application to the Nova Scotia Utility and Review Board to approve a \$7 million capital expenditures on a smart grid pilot. The purpose of the pilot was to determine if new software developed by Siemens could monitor and manage distributed energy resources (DERs) in a fashion that would increase grid reliability and reduce costs.

The project was driven the growing importance of distributed energy resources in the operations of Canadian electricity utilities. The DERs used in this project were solar generation, battery storage, and electric vehicle charging.

The overall cost of the pilot project was \$19 M. Of that amount nearly \$12 million was external funding leaving one third to be funded by Nova Scotia Power customers. The criteria the Board applied in determining whether this capital investment was justified was called the Innovation Justification Criteria (IJC). The IJC test was — can the project be reasonably expected to produce valuable data and learning to develop a business case prior to full-scale development?

One of the issues the Board had to contend with was a concern by interveners about the lack of competitive bidding in putting the project together. In particular, there was a significant reliance on Siemens with respect to software. This was discounted when it was explained that Siemens was largely responsible for obtaining the federal funding which was supporting the project. There was also some concern about potential cost overruns. The Board made it clear that its decision approving the pilot project was limited to the expenditure of \$7 million and recovery of any cost overruns would require Board approval.

This decision by the Nova Scotia Board⁷ is a rare but important example of ratepayer funding of new technology. The Board’s decision was clearly influenced by significant funding from outside sources such that only one third of the total capital cost was being borne by ratepayer as was the condition that the utility was at risk for any cost over runs. The Board also established a meaningful compliance and reporting structure that will be instructive to other regulators examining similar ventures. The extensive evidence from independent outside experts also provides some useful lessons for future applicants.

⁶ *Supra* note 4 at 154 (The Innovation for the Electric Utility was denied due to the lack of a business plan showing ratepayer benefits).

⁷ *Re Nova Scotia Power Incorporated* (7 May 2020), 2020 NSUARB 63, online: Nova Scotia Utility and Review Board <www.canlii.org/en/ns/nsuarb/doc/2020/2020nsuarb63/2020nsuarb63.html> [*Nova Scotia Power*].

On October 30, 2020 the Ontario Energy Board issued a decision⁸ approving an application from Enbridge Gas to construct a pilot project which blends hydrogen into conventional natural gas to be distributed in an area north of Toronto. The Board approved the application and allowed Enbridge to construct the necessary facilities and set rates related to the project. The rates were designed to ensure that the ratepayers that receive blended gas did not pay more than other Enbridge gas customers.

The objective in the pilot is to reduce the GHG emissions relating to the sale of natural gas. Hydrogen has no carbon emissions when it is burned. As a result, combining hydrogen with natural gas reduces the overall carbon footprint.

In this pilot 2 per cent of the total product will be hydrogen. Because hydrogen has a lower heating value than conventional natural gas it takes a greater volume of hydrogen to provide the same energy content. The result is that customers receiving blended gas must consume a higher volume than customers receiving conventional natural gas. This requires a price adjustment which the Board approved to compensate customers in the blended gas district for the cost of the extra gas.

The pilot project will deliver blended gas to approximately 3600 customers over five years. At the end of that period, Enbridge is required to file a detailed report to the regulator that will assess the costs and benefits of the project. Enbridge has indicated that it plans to apply for similar projects in other gas markets it is currently serving in Canada.

On March 31, 2020 Enbridge Gas Inc. applied to the OEB under section 36 of the *Ontario Energy Board Act* for approval to implement a pilot program that would inject bio methane into the natural gas. It will supply customers that volunteer for the project. The application asks the Board to approve a surcharge of \$2 per month on the rates of the customer that do volunteer.

The objective of the project is to lower the carbon content of regular natural gas. Bio methane has lower carbon content than regular natural gas and the injection therefore reduces GHG emissions. Enbridge proposed to fund the project through its regular operating costs which means there would be no rate increases for nonparticipating customers.

On September 24, 2020, the OEB released a decision approving the pilot project⁹. One of the issues in contention is whether all customers should pay. The OEB agreed with Enbridge that all customers would contribute to the increase in operating costs but only the customers that volunteered would pay the \$2 per month. The Board directed Enbridge to file a progress report at the time of its next rate rebasing application.

New Regulatory Guidance

On January 16, 2019 the Ontario Energy Board introduced a new consulting service that allows both utilities and non-utilities to obtain guidance from Board staff on regulatory issues relating to new energy services that have “a clear potential to benefit consumers.” The new service called an Innovation Sandbox is designed to address regulatory barriers to the introduction of new technology. There are however limits to this assistance. The Innovation Sandbox cannot:

- a. offer long term policy change
- b. provide funding for projects
- c. endorse specific technology
- d. provide relief not within its jurisdiction or
- e. support projects that shift costs between customers

While the OEB will consider proposals from both utilities and non utilities the Board has said that non-regulated companies should “keep in mind that in most cases a utility partner will be considered to be key for carrying out a trial in Ontario.”

⁸ *Re Enbridge Gas Inc.* (29 October 2020), EB-2019-0294, online: Ontario Energy Board <www.rds.oeb.ca/CMWebDrawer/Record/691859/File/document>.

⁹ *Re Enbridge Gas Inc.* (24 September 2020), EB-2020-0066, online: Ontario Energy Board <www.rds.oeb.ca/CMWebDrawer/Record/687754/File/document>.

As of June 2020, the OEB had received 33 proposals from utility and non-utility companies. One of the proposals resulted in the Bulletin issued on August 6, 2020,¹⁰ which is attached as Appendix A. That Bulletin ruled that a local distribution company may own and operate behind the meter energy storage and treat the assets as part of regulated operations if the purpose is to remediate poor service reliability.

The Bulletin cautions that the Bulletin only expresses the opinion of Board staff and is not binding on Board members or Commissioners that will ultimately determine contested matters. The Bulletin states that the opinion was a response to an Innovation Sandbox proposal from a regulated electricity distributor that wanted to use behind-the-meter storage assets to improve service reliability. The Bulletin does not disclose who the applicant was but many speculate it was Toronto Hydro. That utility had previously applied to the Board for this type of relief and had been turned down.¹¹

It is not unusual for energy regulators to issue Bulletins from time to time. To date, the OEB has issued close to 50 Bulletins. Of those 29 were called Compliance Bulletins, 9 were called Information Bulletins and the last 8 were just called Bulletins.

Generally speaking, Bulletins issued by the regulators concern their enforcement policies and often reflect opinions on what the regulator can and cannot do under their legislation. Both the Ontario and Alberta Securities Commission make extensive use of Bulletins as does the federal Competition Bureau

The Competition Bureau has been issuing bulletins for 20 years.¹² The goal is to update the marketplace on the Bureau enforcement policies. Like the OEB Bulletins the Competition Bureau bulletins are not binding on the on the Commissioner of Competition. However, in all cases they reflect the policy of the Commissioner

and are changed before the Commissioner departs from that policy. If this were not the case, the Bulletins would not be very useful.

Bulletins can be an important policy instrument. They offer real time regulation that can prevent regulation from becoming a barrier to the introduction of new technology.

Regulatory Guidance Bulletins will become more important as energy regulators become more involved in the promotion of new technology. An earlier Bulletin of July 7, 2016¹³ falls into that category although it came before the Innovation Sandbox was introduced. That Bulletin sets out a finding by OEB staff that ownership and operation of an EV charging station and the selling of EV charging services from that facility does not constitute distribution or retailing of electricity. In other words, those activities would not be regulated by the OEB.

The EV Charging Bulletin indicates that electric vehicle charging service is not subject to OEB regulation because EV charging services including charging stations should be treated as competitive products and services for which no OEB license is required. OEB staff also noted that electricity distributors may be permitted to own and operate EV charging station because these are services that assist the government in achieving its electricity conservation goal.

The EV Charging Bulletin was apparently issued in response to a number of inquiries. As noted by OEB staff, the interest in EV charging is increasing in response to the parts of the Ontario Climate Change Action Plan that target significant increases in electricity vehicles in the coming years.

The EV Charging Bulletin is a good example of regulatory guidance that will promote the development of new carbon reduction technology. The British Columbia Utility Commission came to a similar conclusion

¹⁰ Ontario Energy Board, *supra* note 3.

¹¹ *Re Toronto Hydro-Electric System Limited* (19 December 2019), EB-2018-0165, online: Ontario Energy Board <www.rds.oeb.ca/CMWebDrawer/Record/663131/File/document> [*Toronto Hydro-Electric* 2019].

¹² All of the current Bulletins are set out in Brian A. Facey & Cassandra Brown, *Competition Act: Commentary and Annotation*, 2021 (Lexis Nexis Canada, 2021) at pp 339–57.

¹³ Ontario Energy Board, Bulletin, “Electric Vehicle Charging” (7 July 2016), online (pdf): <www.oeb.ca/oeb/_Documents/Documents/OEB_Bulletin_EV_Charging_20160707.pdf>.

but did so after an extensive consultation and report¹⁴ that led to changes in the regulations.

The EV Charging Bulletin is also a good example of a situation where regulatory ambiguity can create a barrier to entry. The Board noted that the provincial governments policy with promoting electric vehicles and carbon reduction required such a clarification because regulation this particular activity could deter investment by private parties in that sector.

This will not be the last case where utilities, developers and investors in Ontario requires clarification regarding the OEB jurisdiction or policy with respect to a particular activity that relates to carbon reduction technology. These Bulletins, whatever they are called, will become an important policy instrument in this initiative.

The Michigan Decision

Ontario and Nova Scotia are not the only jurisdictions struggling with technology pilots. On October 17, 2019, the Michigan Public Service Commission started an inquiry to review past and current Michigan pilot projects, pilot best practices, and future pilot issues. A 95-page report was published on September 30, 2020.¹⁵

The Commission directed that going forward any applicants seeking funding for a technology pilot must comply with the definition of a technology pilot and the criteria set out at page 12 of the decision.¹⁶ That finding is reproduced in Exhibit A of the decision. A link to Exhibit A is provided in Appendix B.

The definition of the technology pilot and the criteria on which it would be evaluated will not be the same in every jurisdiction. The Michigan decision is just one example. All provincial and state regulators will have to address question. What is important is to get it right in terms of the jurisdiction in which it has to operate.

THE REGULATORY ISSUES

This article examines three new policy instruments that will become essential to energy regulators as they attempt to increase the access to new technology that will help Canada meet its carbon reduction goals. This is an important exercise that will quickly become the responsibility of all Canadian energy regulators.

The three policy instruments are brand-new. They first arrived on the scene in 2020. This article reviews the first three decisions and the first year of operation for the new OEB Regulatory Guidance Bulletins. All three of these instruments will likely be implemented by Canadian energy regulators in the near future.

There may be some regulators that decide not to create an innovation fund but they will certainly conduct hearings for technology pilots. Technology pilots require active participation from the utility serving that area. It is likely that all Canadian regulators will start issuing Regulatory Guidance Bulletins. Regulations can be a barrier to entry particularly in the case of new technology. Long drawn-out hearings with appeals are not the best way to address regulatory uncertainty.

The goal of this article is not just to examine what happened in 2020. It also attempts to define the best practices. The following section examines the different regulatory issues that arose in the first Technology Pilot hearings.

The Threshold Test

Of the three Technology Pilot decisions examined in this article, the Nova Scotia decision is a textbook examination of the need to establish meaningful upfront criteria regarding the object and purpose of the technology pilot in question. In the Nova Scotia case,¹⁷ Nova Scotia Power applied for approval of a four-year pilot project at a cost of \$7 million. The purpose of the pilot was

¹⁴ British Columbia Utilities Commission, Report, "Inquiry into the Regulation of the Electric Vehicle Charging Service" (26 November 2018), online (pdf): <www.bcuc.com/Documents/Proceedings/2018/DOC_52916_2018-11-26-PhaseOne-Report.pdf>.

¹⁵ Michigan Public Service Commission, Report, "Utility Pilot Best Practices and Future Pilot Areas" (30 September 2020), online (pdf): <www.michigan.gov/documents/mpsc_old/MPG_Pilots_Report_Draft073120_698001_7.pdf>.

¹⁶ *In the Matter of The Commission's Own Motion to Establish MI Power Grid* (4 February 2021), U-20645, online: Michigan Public Service Commission <mi-psc.force.com/sfc/servlet.shepherd/version/download/068t000000J90K1AAJ>.

¹⁷ *Nova Scotia Power*, *supra* note 7.

to better understand how new software can be used to monitor and manage distributed energy resources to achieve customer benefits such as maintaining reliability and grid stability and reducing costs. The Nova Scotia Board has established a Capital Planning and Capital Planning and Capital Expenditure Justification Criteria. Projects developed to pursue emerging issues were developed under the Innovation Justification Criteria and criteria of that standard stated as follows:

[5] Prior to commencing its analysis of the application, the Board considers it helpful to outline the basis for reviewing such capital projects, which is carried out under the Capital Planning and Capital Expenditure Justification Criteria (CEJC). More specifically, projects developed to pursue emerging issues are evaluated under the Innovation Justification Criteria of the CEJC. The Innovation Justification Criteria provides, in part, as follows:

17.2 Innovation

...Justification Criteria

Innovation capital projects are justified on the basis that there is a reasonable expectation that they will provide customer value in some or all of the areas of reducing upward pressure on revenue requirement, reliability and grid stability, government policy compliance, and customer experience, through the deployment of proven technologies in innovative ways. In addition, innovation capital investments may be justified on the basis that they are reasonably expected to allow for testing before deploying at scale, provide valuable data and learnings, or aid in the development of business cases where applicable.

Sub-Justification Criteria

Innovation capital projects may be justified under one or more of the following sub-criteria:

- reduce upward pressure on revenue requirement
- reliability and grid stability
- environmental and other compliance
- customer experience improvements
[Emphasis added]

The Nova Scotia Board retained an expert to evaluate the application and determine whether the application met the necessary criteria. Based on the evidence of its expert the Board found that it did not, stating as follows:

[6] In its application, NS Power asserted that the proposed pilot project is justified under the second branch of the test in the Innovation Justification Criteria. The project is the first capital project submitted under the Innovation Justification Criteria in the CEJC.

[7] A project falling under the Innovation Justification Criteria differs from the typical capital work order approval for projects usually undertaken by a utility. In most cases, under the latter type of applications, the approval is sought based on a business case to meet a normal operational requirement of the utility. Projects that are innovative in nature would generally fall outside what would normally be experienced in the everyday operations.

[8] However, for projects falling under the Innovation Justification Criteria, the Board still requires that rigor be applied to the supporting material filed with the application. In this case, the Board was not satisfied with the initial application filed in support of the capital work order. The Board expected greater

detail to support the application. Given that applications under the Innovation Justification Criteria are somewhat novel, the Board provides the following guidance for future applications.

[9] In the present case, the initial application filed with the Board lacked supporting material, particularly with respect to the benefits of the project. As canvassed in greater detail later in this Decision, Synapse stated that the initial proposal did not provide a complete pilot study design because it failed to:

- clearly describe the knowledge gaps that the proposed research is intended to address
- consider whether an alternative, less expensive pilot study design could achieve the same objectives
- describe how the proposed methodology is the best way to achieve the goals
- adequately show how the innovation justification criteria are met

[10] Further, Synapse suggested it was not clear whether the pilot will provide the information needed to decide whether to proceed with a full roll-out of the ESP. It noted it was not clear that NS Power presented a case that properly conveyed a plan that would compare the costs and benefits with and without the ESP, adding that NS Power was still considering the metrics to track during the pilot and various elements of the project were still under development.

[11] The Board shares Synapse's concerns with the quality of the initial application. Much of the initial filing was very general in nature, sparse in terms of details about the proposed project, and relied more on experience in other jurisdictions (much of it in the form of generic studies or reports) rather than an analysis of what was planned on the ground in

Nova Scotia and with NS Power's other partners. It may be tempting in some cases to adopt projects undertaken in other jurisdictions or utilities in their testing of emerging technologies, including distributed energy resources and their integration into an energy grid. However, useful resources and time may be wasted if specific measurable outcomes and success factors are not clearly identified for the Nova Scotia context. In terms of projects to be considered under the Innovation Justification Criteria, the Board expects that NS Power will outline in sufficient detail the scope and design of the project, and what specific data, learnings, and measures of success will be adopted to evaluate the project. Further, the Board cautions NS Power that it will not be sufficient to generally extrapolate certain isolated results of a pilot project to justify its subsequent full-scale deployment. Any standard capital expenditure application for full deployment will need to be detailed in every respect as to design, sourcing, implementation and benefit for customers, at the lowest cost.

[12] In the present case, various concerns of the Intervenor were addressed by NS Power when it filed its [information request] responses and Reply Evidence. However, the timing of the receipt of this information means that the Intervenor, Board staff and Board Counsel's consultants were unable to review and engage in a meaningful manner about this project with NS Power. In the view of the consultants, these shortcomings clearly jeopardized approval of this application. The engagement of NS Power's customer representatives and the Board is as important for innovative projects as it is for normal capital work orders. As noted later in this Decision, the ongoing work by NS Power on this project will likely result in delays in the implementation of some elements of the proposal and may lead to incomplete data or learnings at its completion.

[13] The Board trusts future applications under the Innovation Justification Criteria will be more comprehensive and better informed by the above guidelines.

The Nova Scotia Board asked Nova Scotia Power to amend and refile its application which is ultimately proved stating “The Board trusts future applications under the Innovation Justification Criteria will be more comprehensive and better informed by the above guidelines.”

It follows from this brief discussion that without a comprehensive upfront standard and criteria a technology pilot is likely to fail. We should also remember that for most utilities an application to fund the technology pilot is likely a new undertaking is important that the utility had some guidance as to what the application should contain and what standard the regulator will apply in assessing an application.

The Use of Experts

It is not unusual to have experts testifying in regulatory proceedings. In the two technology pilots we saw different approaches — a very extensive use of experts in the Nova Scotia case and virtually none in the Ontario case — despite the fact that there is brand-new technology at issue in both cases.

The main reason for that, however, is that Nova Scotia had a much higher threshold test — the application filled out on that test is resolved on the evidence of the expert. In the Ontario case, the regulator took a different view and found it was premature to get into a detailed examination of the technology or even how that technology compared to alternative technology. The feeling was that the technology pilot was a limited pilot and was based on the assumption that if a preliminary examination of the technology warranted it there would be further pilots with respect to the same technology on a more extensive basis.

The Nova Scotia case also underscores the importance of regulators retaining experts to assist in evaluating the feasibility of technology pilots. As the Nova Scotia Board states in paragraph 30 of the decision the analysis in an application for a pilot project can often be more complicated than a garden-variety application:

[30] While the Board recognizes that measuring the benefits of

pilot projects under the Innovation Justification Criteria may be more difficult than capital expenditure projects undertaken as part of a utility’s normal operations, it could be argued that the evaluation of an innovative initiative is even more critical. Since many projects under the Innovation Justification Criteria are likely destined for full-scale deployment, it is essential that NS Power, Intervenor and the Board understand the implications of that undertaking. Thus, it is important that NS Power be able to define the data it is seeking to collect, the learnings it wants to obtain, and specifically how success will be measured. Without these specifics and a clear baseline comparison against the pilot results, the anticipated benefits of moving towards full-scale deployment are nothing more than mere speculation.

[31] In the Board’s view, NS Power’s responses to NSUARB IR-25 to 29 do not provide sufficient specifics to determine how success will be determined. In its Reply Evidence, NS Power elaborated on those IR responses and provided some additional insight:

Finally, NS Power will be gathering baseline data under the Project to compare to outcomes with Energy System Platform (ESP) monitoring and management. Load profile and power quality information are currently being collected at potential commercial customer sites for the roof-top solar installations; available load information will be collected from the metering history of other customer sites as they are identified through the recruitment process. Further, once DERs are installed at customer sites, measurements will be taken before the application of utility control of the DERs dependent on the use

cases being tested and the capabilities of each DER. Comparison measurements will also be conducted in parallel during the Project with one control DER and one ESP DER at the same time under the same conditions.

[32] Any pilot project like the present application should contain sufficient baseline data which can be later used to compare the results of the pilot to the status quo. In the Board's opinion, such information would be invaluable to building a business case in support of full-scale deployment. However, it is not clear to the Board whether the baseline data in this project will be sufficiently complete in duration or robustness to provide a meaningful comparison against the pilot project results. This should be more clearly explained in a Compliance Filing.

A technology pilot application is important. A pilot project decision can lead to very significant capital expenditures. It is important to get the decision right. To do that, regulators need both the data and a carefully drafted criteria. The Nova Scotia decision is a good model.

The Reason for the Application

This article reviews four decisions. One considers an application for funding innovation generally. Three decisions relate to applications to fund specific technology known as technology pilots.

In each case the first question from the regulator hearing the application is this: What is the rationale for this expenditure? In all cases the answer was the same. We need to promote clean energy. It is not being adequately funded. And as a result, Canada and the province and municipalities we serve are not going to meet their carbon reduction goals.

The British Columbia case is an application to establish an innovation fund.¹⁸ No specific technology was nominated although the general

class was described as follows at page 145 of the decision:

...the fund is designed to address perceived gaps in FortisBC's current innovation activities. This fund will finance GHG reduction activities that:

- Cover the entire utility value chain;
- Are outside of DSM;
- Relate to pre-commercial and commercial activities (with the former likely to comprise the majority); and
- Are supported by predictable funding levels.

FortisBC anticipates that given the ambitious renewable gas target in the Clean BC Plan blending hydrogen and renewable gas will be high priorities for funding.

The technology would be nominated by a special committee established for that purpose. The applicant Fortis BC described the rationale for the new fund as follows at page 145 of the decision:

The Innovation Fund is required to accelerate the pace of clean energy innovation, to achieve performance breakthroughs and cost reductions, and to provide cost effective, safe and reliable solutions for customers. The Innovation Fund will assist FortisBC in addressing the expectation to reduce emissions, and forms part of FortisBC's proactive strategy to support the transition to a lower carbon economy, while maximizing the use of its energy delivery systems for its customers...The Innovation Fund is complementary and incremental to FortisBC's current innovative activities and is ultimately required to meet British Columbia's energy objectives.

¹⁸ *FortisBC*, *supra* note 4.

Fortis BC elaborated on the need for the fund at page 148 of the decision:

FortisBC notes that, provincially, the CleanBC Plan targets 25 million tonnes of GHG reductions by 2030, with 15 percent of that to come from renewable gas. However, at recent average gas throughput on FEI's system, 15 percent renewable gas would require approximately 30 petajoules (PJ) of renewable supply. FortisBC states that the current renewable supply in the FEI system only totals 0.03 PJ, which will necessitate a 100 times scaling of renewable gas supply to reach the 2030 CleanBC Plan target. To achieve the Province's target FEI will be required to quickly advance innovation and develop new renewable gas sources.

The Ontario rationale was similar, as set out at page 7 of the decision¹⁹:

However, there was also general acknowledgement by the parties that the reduction in carbon emissions targeted by the Provincial Government cannot be achieved without exploring a variety of approaches to achieve such reduction. Enbridge Gas has proposed a pilot to inject a controlled quantity of hydrogen into its natural gas system for a small number of customers. This Project is expected to provide detailed information on the impact of hydrogen blending on the level of carbon reduction, the risk to the distribution system and customers' equipment, the potential for the expansion of hydrogen blending into other areas of its distribution system, and details on the hydrogen gasification process. The OEB agrees that despite the apparent limited potential of hydrogen blending, the learning from the proposed Project would be beneficial and the Project should proceed.

Regulators in Ontario and Nova Scotia heard applications to allow funding for specific

technology. Nova Scotia Power described the rationale for its investment as follows:

[1] Nova Scotia Power Incorporated has applied for approval of a capital project entitled the Smart Grid Nova Scotia Project in the amount of \$7,053,622. The purpose of the four-year pilot project is to better understand how a centralized Energy System Platform (ESP) software can be used to monitor and manage Distributed Energy Resources (DERs) to achieve customer benefits such as maintaining reliability and grid stability, and reducing costs.

[2] The DERs to be used in the project include a variety of newer technologies such as solar photovoltaic generation from a community solar garden and from commercial roof-top installations, distributed in-home or in-business battery storage, and in-home or in-business electric vehicle smart charging. The ESP will allow for the visibility, control and dispatch of the DERs.

Enbridge Gas in the Ontario technology pilot offered a rationale similar to that made by Nova Scotia Power to the Nova Scotia regulator, as set out at page 1 of the decision:

This first phase is a pilot undertaking designed to be of limited scope to determine if hydrogen blending should be pursued at a large scale. Enbridge Gas also applied to the OEB under section 97 of the OEB Act for approval of the form of a temporary land-use agreement and under section 36 of the OEB Act for approval of rate riders to compensate affected customers for costs associated with increased fuel consumption in the [blended gas area].

When combusted, hydrogen is a zero-carbon emission fuel source. As a result, the use of blended gas would produce less GHG emissions

¹⁹ *Enbridge Gas Inc.*, *supra* note 8.

relative to combusting standard natural gas. Enbridge Gas estimates that the GHG reductions associated with using blended gas having 2% hydrogen by volume in the BGA would be between 97-120 tonnes of carbon dioxide equivalent (tCO₂e) per year. The Project could potentially help Enbridge Gas comply with the requirements of the pending Federal Government's Clean Fuel Standard (CFS).

The Project would enable Enbridge Gas to study the effects of blended gas on its existing distribution system and consumers' end-use equipment. Based on the results of the Project, Enbridge Gas could seek OEB approval to discontinue, continue or expand its distribution of blended gas.

What is interesting is that in one year, 2020, we saw for the first time three provincial regulators in Canada approved ratepayer funding of new technology that would help the province meet its carbon reduction commitments. We can expect more of these applications.

Cost-sharing

One feature of these cases is that the regulators do have an interest in ensuring that someone other than the ratepayers has money on the table. The Nova Scotia Board took some comfort in the fact that funding was coming from government agencies stating that:

[40] Finally, the Board has taken into account the fact that this project has been obtained by NS Power at a significantly reduced cost to ratepayers through government support and cooperation with various private and governmental partnerships. These financial contributions effectively mean that ratepayers will only pay approximately 1/3 of the total project cost.

In the Ontario hydrogen blending case the regulator took some comfort from the fact that a \$221,000 grant from Sustainable Development Technology Canada would be covering part of the total project cost of \$5.23M. It will not be surprising if a principle develops in these cases that establishes a requirement that some financial contributions

come from outside parties. Regulators like to see that knowledgeable outside investors also see some merit in the exercise.

Who Pays?

As in all regulatory hearings, the issue arises as to who pays. Is that the ratepayers or the shareholder? Which customer should pay? In the British Columbia case some believed the shareholder should pay. The regulator dismissed that proposition but the shareholder was required to pay if the amount of expenditure went over the amount of the fund that the BCUC had approved. In the BC case all ratepayers paid as they did in the Ontario decision.

Intellectual Property Rights

As one might expect some interveners raised the question of who should benefit from any new intellectual property that is developed as a result of the investment being approved by the regulator. In the Enbridge hydrogen blending decision the Board stated at page 12 as follows:

The question of the potential for, and ownership of, intellectual property was raised by some intervenors. Enbridge Gas indicated that if any benefits materialize from the intellectual property gathered, the OEB may find it appropriate for customers to share in the benefits. The OEB expects Enbridge Gas to notify the OEB if any benefits arise from the intellectual property as part of the Project, for a determination by the OEB at its rebasing application on how these benefits will be treated. Enbridge Gas is also expected to comment on the proposed sharing of benefits from the intellectual property when it seeks any changes to, or expansion of, the Project.

The Board did however attach the following condition to its decision in Schedule B, section 5 as follows:

5. Enbridge Gas must notify the OEB if any benefits arise from the intellectual property as part of the Project, for a determination by the OEB at their rebasing application of how these benefits will be treated. Enbridge Gas is also expected to comment on the proposed sharing

of benefits from the intellectual property when it seeks any changes to, or expansion of, the Project.

Technology Options

In both of the Ontario decisions the Board faced arguments that the applicant may not have chosen the best technology and other technology might be better in terms of carbon reduction. The Board quite properly took the position as it does in merger and acquisition cases²⁰ that the Board was going to examine the proposal the applicant had put forward and not investigate other technologies that it had not proposed.

The Board explained that this was the proper approach in a technology pilot which is a unique application because the applicant is not quite sure what the merits of the technology are at the outset.

Reporting Requirements

In all three decisions the regulator granted the application subject to conditions. One of those conditions deals with the reporting requirements. In the Ontario case — after some debate between the utility and the interveners — the regulator agreed that reporting at the end of five years would be satisfactory.

The Ontario Board accepted reporting at the end of five years although the parties agreed there would be a review of the project at the next rate hearing. The Board also insisted on a regular report regarding communications with stakeholders including customers. Enbridge agreed that reporting with respect to the customers was appropriate in order to ensure that the Board had an accurate understanding of the customer experience regarding the new product.

The Report at the end the five-year period was to include an accounting of the cost of the project relative to the budget, any evidence of negative impacts on the distribution system, all communication with customers and a recommendation whether Enbridge should discontinue or expand the project. There was

also a discussion about confidentiality and Enbridge put the parties and the Board on notice that they may claim that portions of the final report is confidential because it represents very valuable information that third parties may be willing to pay for.

Five years was not satisfactory for the Ontario Energy Board. They insisted on annual reporting.

Customer Communication

The decisions to date often impose a requirement that involve customer communications. This was particularly the case in the two Enbridge cases that involved customer participation in the technology pilot. In the Enbridge case involving hydrogen blending, the Board made the following statement at page 14:

Enbridge Gas agreed with the reporting requirements proposed by OEB staff. Enbridge Gas agreed that some reporting will be appropriate in the context of the upcoming rebasing proceeding, providing the OEB and parties with interim information about the Project before full reporting is provided. Reporting on the ongoing customer communication is required to ensure that customers report on their experience with the blended gas and the performance of their equipment. The OEB makes these reporting commitments a condition of proceeding with the Project.

In the Enbridge bio-methane decision customer communication was particularly important because certain customers had volunteered and were paying a \$2 per month surcharge. The Board stated at page 17:

Enbridge Gas stated that it plans to provide annual communications to participating customers outlining information such as the total amount of RNG procured, related GHG emission reductions, future forecasts, Program participation, and/or other relevant metrics. A number of parties articulated their expectations

²⁰ See *Re Greater Sudbury Hydro* (31 August 2005), EB-2005-0234 at 6, online: Ontario Energy Board <www.oeb.ca/documents/cases/RP-2005-0018/decision_310805.pdf>.

that customer communications be accurate and complete, and provide customers with information sufficient to make an informed decision about whether to enroll in the Program.

The Board further commented at page 18:

This is a pilot program and the learnings about how to best communicate with customers remain with the utility to consider and reflect in any proposed changes to the Program. The OEB directs Enbridge Gas to provide accurate and sufficient information to its customers on an annual basis as proposed by Enbridge Gas, that will facilitate informed decisions by customers. Enbridge Gas is to remind customers in these annual communications that they can stop their participation in the Program or join the Program at any time.

Burden of Proof

The burden of proof varies depending on the regulator. In the Ontario hydrogen blending case the Board granted Enbridge considerable latitude because the project was experimental, stating at page 6 of the decision:

The OEB finds that Enbridge Gas has satisfied the evidentiary burden of proof in the value of proceeding with this Project as a first phase pilot. The proposed Project is a limited scope opportunity to determine if hydrogen blending should be pursued at a larger scale. The OEB supports innovation and recognizes that some initiatives might not produce the desired results but accepts that this Project will increase the learning on hydrogen fuel blending, and it should proceed.

Regulatory Jurisdiction

The British Columbia Utility Commission faced a major hurdle when one of the interveners argued that the Commission did not have jurisdiction to order rate increases to fund new technology. This is not a unique argument. In the past Canadian energy regulators have often faced objections regarding new rate classes including most recently special rates for Indigenous customers²¹ and previously rates for low-income consumers.²²

The BC regulator found that the innovation fund rates did not offend cost of service principles relying on section 59 of the *Utilities Commission Act*²³ that gave the BCUC broad discretion to use any mechanism or method for setting a rate that it considered advisable. The Commission concluded that a fixed rate adder to support the innovation fund was one such mechanism. The Ontario decisions — in both *Natural Resource Gas*²⁴ and *Waterfront Toronto*²⁵ — support a finding that if the funding is part of the Board's rate setting activities, it falls with the Board's jurisdiction.

The bottom line is that as long as the applications to fund technology pilot relate to rate applications there should be no difficulty. Ontario has an additional advantage. In October 2020, the Ontario Energy Board's objectives with respect to electricity changed by amendments to section 1 the *Ontario Energy Board Act* that added the objective to "facilitate innovation in the electricity sector."²⁶ That will help in the case of any jurisdictional disputes.

BEST PRACTICES

The increase in federal and provincial carbon reduction goals has created new challenges for Canadian energy regulators. The number of technology pilots will grow in the coming years. All Canadian energy regulators will be developing new practices and procedures that apply to this unique type of application.

²¹ *Manitoba Hydro Electric Board v Manitoba Public Utilities Board*, 2020 MBCA 60.

²² *Dalhousie Legal Aid Service v Nova Scotia Power*, 2006 NSCA 74.

²³ *Utilities Commission Act*, RSBC 1996, c 473, s 459.

²⁴ *Re Natural Resource Gas Limited* (7 February 2013), EB-2012-0396 at 4, online: Ontario Energy Board <www.rds.oeb.ca/CMWebDrawer/Record/382636/File/document>.

²⁵ *Re Enbridge Gas Inc.* (22 January 2021), EB-2020-0198, online: Ontario Energy Board <www.rds.oeb.ca/CMWebDrawer/Record/700885/File/document>.

²⁶ *Ontario Energy Board Act*, 1998, SO 1998, c 15, Schedule B, s 1(1).

The Importance of Regulators

There are those who argue that the regulator should not be picking winners and losers when it comes to technology.²⁷ There is some merit to that proposition. But we should recognize that in the case of *Technology Pilots* the regulator is not picking the winner or the loser. The regulator is simply trying to create a process that will allow a meaningful evaluation of new technology within the electric grid.

The words “electric grid” are critical. If new technology is to reduce carbon it has to work in the electric grid. The electric grid is highly regulated. The party controlling that regulation is the energy regulator. The main actor in the electric grid is the regulated utility. The regulated utility is regulated by the energy regulator. A close liaison between the utility and the regulator is essential to the introduction of any significant technology change.

Regulatory Barriers to Entry

We are all familiar with complaints that energy regulators were the reason for the slow growth of storage²⁸ and solar.²⁹ A recent Canadian government study³⁰ adds:

An agile and high-performance regulatory system will enable innovation and competition to grow the domestic market. We also need to create regulatory pathways for new clean technology that will often fall outside our current regulatory structure.

Because the energy sector is highly regulated existing regulations can create barriers to entry for new technology. In many cases the

regulations were put in place long before that new technology existed.

A recent study by the Canada West Foundation³¹ examined the barriers to energy innovation. They identified the major hurdles for both energy innovators and energy regulators. The following factors are relevant to this discussion.

8. Lack of communication between regulators and the industry

Two-way communication between the regulator and industry is critical. The regulator needs to help the industry understand what is required. At the same time industry needs to keep the regulator in the loop on what is coming up so it can prepare. Both need to have conversations about their respective roles in promoting innovative technology.

11. Need for more experimental spaces

Experimental spaces or sandboxes allow regulators to work closely with the project proponent on and unproven innovative technology to test its effectiveness and impacts. Right now the use of sandboxes appears to be the exception rather than the norm.

14. Political expectations of the regulator

Innovation should be a nonpartisan issue but it isn't always. Different governments have different

²⁷ Michael J. Trebilcock & James Wilson, “The Perils of Picking Technology Winners in Renewable Energy Policy” in Gordon Kaiser & Bob Heggie, eds, *Energy Law and Policy* (Carswell, 2011) at 343.

²⁸ Eric Wesoff, “Long-Duration Storage Makes Progress but Regulation Lags Technology”, *PV Magazine* (27 August 2020), online: <pv-magazine-usa.com/2020/08/27/long-duration-energy-storage-makes-progress-but-regulation-lags-technology/>.

²⁹ Joshua Pearce, “Solar is Being Held Back by Regulations not Technology”, *Harvard Business Review* (15 December 2016), online: <hbr.org/2016/12/solar-is-being-held-back-by-regulations-not-technology>.

³⁰ Canada's Economic Strategy Tables, “Clean Technology” (2018) at 6, online (pdf): <www.ic.gc.ca/eic/site/098.nsf/vwapj/ISED_CleanTechnologies.pdf/\$file/ISED_CleanTechnologies.pdf>.

³¹ Maria Orenstein, “What Now? Innovation Meets Energy Regulation”, *Canada West Foundation – Policy Brief* (April 2019), online: <cwf.ca/research/publications/what-now-when-innovation-meets-energy-regulation/>.

expectations for regulators as well as different political preferences

15. Regulators mandates limit the ability to support the innovation

Regulators mandates are set out in legislation and unless innovation (or any desirable outcome such as reducing GHG emissions) is specifically supported, the way in which a regulator is required to operate may undercut its ability to possibly promote innovative approaches. Given resource constraints, it can be difficult for regulators to justify the deployment of resources to innovation efforts that are outside the defined regulatory jurisdiction over legislative scheme.

There is no doubt that the barriers described above have exist in Canada. However, a number have been removed. Today the regulatory mandate clearly includes innovation. In some cases, such as Ontario, the objectives of the legislation been changed to reflect that. In other provinces regulators are quite able to infer from government statements and clean energy objectives that carbon reduction is at the top priority for all governments. We do not need more goals. What we need is practices and procedures that will enable new technology. It is now evident that the provincial energy regulators across Canada have an important role in leading the effort.

Open competitive markets are designed to absorb new technology. That is not true of regulated markets. To meet Canada's new carbon goals new technology will be required at a much faster pace than it has been adopted in the past. We need to make it easier for new technology to become operational within the electric grid.

Regulatory Guidance Bulletins

The procedure introduced recently by the Ontario Energy Board is very important. In ordinary language it would be called a Regulatory Guidance Bulletin. In hipster language it is called the Innovation Sandbox. What that term points to is the need for open communication between the regulator and utilities and non-utilities.

The two Bulletin cited and reproduced in the Appendix represent a reversal of previous Board policy statements. The OEB told Toronto Hydro that they could not own and operate EV charging facilities³² only to reverse that by a Staff Bulletin four years later.³³ In the same manner the OEB told Toronto Hydro it could not own behind the meter storage³⁴, only to reverse it through a Staff Bulletin in the following year.³⁵

It may seem strange that Board staff would be reversing a Board ruling. There is nothing wrong with this procedure. The Board staff opinion is not binding on the Board. The Board has made that perfectly clear. Nor is this process unique. Other regulators often issue Bulletins to reflect updates on how they interpret and enforce their legislation. The advantage of this new procedure is that it offers real time regulation. This is what is needed to reduce carbon levels to the degree set out in the most recent goals established by the Government of Canada.

Other energy regulators in Canada will soon adopt this new process. The experience in Canada to date suggests that it would be best if regulators offered clear regulatory procedures for both Regulatory Guidance Bulletins and Technology pilots. In both cases the regulator has to clearly define what the application should contain and the criteria on which it will be judged. The other issue that regulators have to address is the degree of transparency of the process. We must remember that overall objective is to promote new technology that will help Canada meet its carbon reduction goals.

³² *Toronto Hydro-Electric*, *supra* note 1.

³³ Ontario Energy Board, *supra* note 12.

³⁴ *Toronto Hydro-Electric 2019*, *supra* note 11.

³⁵ Ontario Energy Board, *supra* note 3.

That will require full and detailed reporting by both the technology pilot applicants and the regulator.

Technology Pilots

In 2020, we saw three technology pilot decisions in Canada. A number of factors were considered by the two regulators in these applications. These applications are new. The process is never perfect in the first cases. As in the case of Regulatory Guidance Bulletins a number of questions come to mind.

The first question is: should there be a Technology Pilot Guideline that sets out what a successful application must contain? The next question is: what should it contain? For example, should it contain the following:

- a. a calculation of the estimated carbon reduction that the project is expected to achieve
- b. a capital contribution over an above the amount being committed by rate payers a participating technology partner
- c. a commitment to collect all relevant data and make that available to the public
- d. a commitment to develop a business case prior to full scale development

The Technology Pilot Guideline should also specify whether or not a detailed annual report will be required and, if so, what it should contain such as the following:

- a. an accounting of expenses compared to budget
- b. any communication with customers involved
- c. any evidence of harm to the network
- d. any communication with municipal partners
- e. a report on any intellectual property developed

The nature of these requirements will vary by regulator. The important thing is to define them and make sure applicants understand what has to be in the application and what the reporting requirements will be.

The Importance of the Threshold Test

This article reviews five decisions, including two decisions on innovation funding by the British Columbia Utilities Commission. There were also two decisions on technology pilots by the Ontario Energy Board. They both involved decarbonization of natural gas, one by injecting hydrogen and the other by injecting bio-methane. The one decision by the Nova Scotia regulator was a technology pilot decision that involved a proposal by Nova Scotia Power to test new software that that could potentially increase the efficiency of distributed energy resources operated by the utility.

All of these decisions were extremely well written with careful analysis. The Nova Scotia Board however had a huge advantage. The Nova Scotia Board was able to rely on a 110-page document filed by Nova Scotia Power on November 5, 2018 called the Capital Planning and Capital Expenditure Justification Criteria. That document had been filed by Nova Scotia Power line before the application was filed for the technology pilot. It turned out to be very useful because it contained in section 17.2 a definition of the justification criteria for innovation capital investments. The Ontario regulator did not have the advantage of such a definition.

It turns out that this definition is very important for both the applicant and the decision maker. In this article it is referred to as the threshold test. The applicant needs to know what tests it needs to meet and the regulator needs to rely on the same test in order to determine if it has been met. In this section we identified all of the regulatory issue that arose in the three technology pilots. Different regulators will have different responses but those policy issues will likely have to be addressed in most cases.

Conclusion

There is no shortage of capital chasing renewable energy projects in Canada. Nor is there any shortage of aggressive goals and commitments to reduce the amount of carbon in the atmosphere. Across Canada, governments are turning to their energy regulators and asking them to get moving and lead the way. That was the reason the Ontario government in October 2020 amended the *Ontario Energy Board Act* to make it clear to the OEB that it had a new objective — “to facilitate innovation in the electricity sector.” Other governments will soon follow. ■

APPENDIX A

Ontario Energy Board, Bulletin, *Electric Vehicle Charging*, July 7, 2016

https://www.oeb.ca/oeb/Documents/Documents/OEB_Bulletin_EV_Charging_20160707.pdf

Ontario Energy Board, Bulletin, *Ownership and Operation of Behind-the -Meter Storage Assets for Remediating Reliability of Service*, August 6, 2020

<https://www.oeb.ca/sites/default/files/OEB-Staff-Bulletin-ownership-of-BTM-storage-20200806.pdf>

APPENDIX B

Michigan Public Service Commission, *In the Matter of The Commission's Own Motion to Establish MI Power Grid*, Case No. U-20645, February 4, 2021

Exhibit A

<https://mi-psc.force.com/sfc/servlet.shepherd/version/download/068t000000J90K1AAJ>

APPENDIX C

Ontario Energy Board, *Enbridge Gas Inc.*, EB-2019-0294, Decision and Order, October 29, 2020 at p.15. *Condition of Proceeding with the Pilot Project*

<https://www.rds.oeb.ca/CMWebDrawer/Record/691859/File/document>