Ontario Energy Board | Commission de l'énergie de l'Ontario

BY EMAIL

September 14, 2020

Ms. Christine E. Long
Board Secretary and Registrar
Ontario Energy Board
2300 Yonge Street, 27th Floor
Toronto ON M4P 1E4

Dear Ms. Long:

Re: Enbridge Gas Inc.
Low Carbon Energy Project
OEB Staff Submission
Ontario Energy Board File Number: EB-2019-0294

In accordance with Procedural Order No. 4 please find attached the OEB staff submissions for the above proceeding. This document has been sent to Enbridge Gas Inc. and to all other registered parties to this proceeding.

Enbridge Gas Inc. is reminded that its reply submission is due by September 28, 2020, should it choose to file one.

Yours truly,

Original Signed By

Ritchie Murray
Project Advisor, Natural Gas

c. Applicant and intervenors

Encl.

OEB Staff Submission

Low Carbon Energy Project

Enbridge Gas Inc.

EB-2019-0294

September 14, 2020

1 INTRODUCTION

1.1 Overview of the Application

On March 31, 2020, Enbridge Gas Inc. (Enbridge Gas) filed an updated application (Application) seeking approvals necessary to conduct the first phase of a pilot project (Project) that would involve injecting a controlled quantity of hydrogen into an isolated portion of its existing natural gas distribution system. The resulting blended gas would be composed predominantly of natural gas with up to 2% of hydrogen (Blended Gas). When produced using electricity generated from renewable sources, hydrogen is a zero-carbon emission fuel source. As a result, the blended gas would produce less greenhouse gas (GHG) emissions relative to combusting regular natural gas.

There are examples of hydrogen blending projects in France, Germany, the United Kingdom, and the United States. However, Enbridge Gas states that the Project would be the first "utility scale" hydrogen blending project in North America.

Upon completion of the Project, Enbridge Gas would be able to provide blended natural gas to approximately 3,600 customers in Markham, Ontario. Enbridge Gas estimates that, GHG reductions associated with the Project would be between 97-120 tons of carbon dioxide equivalent (tCO_2e) per year.

In order to isolate a portion of its existing natural gas distribution system, Enbridge Gas has applied under section 90 of the *Ontario Energy Board Act, 1998* (OEB Act) for leave to construct approximately 755 metres (m) of new natural gas pipelines, three new stations[1], and two disconnects to isolate the Project from the existing natural gas distribution system. This isolated area is referred to as the blended gas area (BGA). The BGA is needed so that Enbridge Gas can study the operational impact of the blended gas in its system and consumer appliances. Enbridge Gas says the Project would be the first of its kind in North America, and its successful implementation could support additional and larger scale hydrogen blending activities in other parts of its distribution system.

Approximately 250 m of the proposed pipeline and the disconnects would be located within municipal road right-of-way. Approximately 505 m of pipeline and the three stations would be located on Enbridge Gas property. Enbridge Gas has applied under section 97 of the OEB Act for approval of its form of temporary land use agreement for use in areas where the road allowance is too narrow or confined to facilitate construction.

[1] The three stations are a hydrogen regulating station, a hydrogen blending station, and a district pressure regulating station.

Depending on the results of the Project, Enbridge Gas may file a separate application later seeking approval for a second phase of the Project. The second phase would extend the BGA and would require the construction of a series of pipeline segments totaling approximately 5.5 kilometres (km) as well as additional disconnects from the existing natural gas distribution system. Unless otherwise stated, this submission addresses the first phase only.

The total capital cost of the Project is estimated to be approximately $5.23 million. This cost would be partially offset by a $221,000 grant from Sustainable Development Technology Canada that would be payable upon completion of the Project. Enbridge Gas submits that the capital costs for the Project should be paid for by all ratepayers (not just those in the BGA) as all ratepayers would benefit from the success of the Project. There would be no immediate rate impact attributable to the Project because Enbridge Gas is currently in a price cap rate-setting regime. If approved, the costs of the Project would not be included in rates until Enbridge Gas's 2024 rebasing application.

One cost consequence related to the Project arises from the lower heating value of hydrogen gas – and the resulting blended natural gas – when compared to that of the standard natural gas that Enbridge Gas currently distributes. Because of the lower heating value, natural gas consumers in the BGA would need to consume a larger volume of blended gas to get the same amount of energy as contained in the same volume of standard natural gas. Since Enbridge Gas customers are charged a volumetric rate, customers in the BGA would experience a bill increase relative to the bills of other consumers due to increased consumption to get the same level of energy content. As part of the current application, Enbridge Gas has applied under section 36 of the OEB Act for approval of annual rate riders (credits) to offset this bill impact.

Hydrogen can be produced by many methods. One method is Power to Gas (PtG), which uses electricity from the grid to electrolyze water and produce hydrogen. An affiliate of Enbridge Gas called 2562961 Ontario Ltd. has developed and built North America's first utility scale PtG facility in Markham, Ontario. It is located at Enbridge Gas' Technology and Operations Centre in Markham. The PtG facility was developed in partnership with Hydrogenics Corporation. Hydrogenics Corporation is part owner of 2562961 Ontario Ltd.

The PtG plant is part of a pilot project with the Independent Electricity System Operator (IESO). The PtG plant is under contract with the IESO to provide a regulation service, which assists the IESO in balancing electricity supply and demand on a second-by-second basis. The IESO dispatches the PtG plant when it requires the regulation service, and hydrogen and oxygen are produced when the surplus electricity is run through the PtG plant.

Enbridge Gas is proposing to acquire hydrogen from its affiliate 2562961 Ontario Ltd. in a manner that keeps ratepayers cost-neutral; the price paid for hydrogen would be the same price paid for traditional natural gas and would fluctuate according to market conditions. Enbridge Gas is proposing to recover this commodity cost from all customers in the Enbridge Gas Distribution (EGD) rate zone until rebasing, at which time the costs would be recovered from all its ratepayers.

Enbridge Gas has requested a decision from the OEB no later than November 2020. Enbridge Gas is planning to begin construction of the Project in Q2 of 2021 in order to gain experience with hydrogen blending in advance of the pending Clean Fuel Standard (CFS).

1.2 Summary of OEB Staff Submissions

OEB staff submits that the Application should be approved subject to certain conditions. This submission only relates to the first phase of the Project. OEB staff submits that the requirements for LTC have been met, and OEB staff has no issues with the proposed form of land use agreement or the proposed rate riders.

Leave to Construct

OEB staff submits that the Application should be approved, subject to certain conditions. In OEB staff's view, while there are more cost effective alternatives to hydrogen blending for reducing GHG emissions, it would be premature to rule out hydrogen blending as a means to reduce GHG emissions before it is better understood in the Ontario context.

OEB staff also submits that:

a) The proposed facilities are appropriate to achieve the intent of the Project, which is to isolate a portion of Enbridge Gas's existing distribution system and safely distribute Blended Gas to end-use equipment.

b) The safety aspects of the Project are being appropriately managed as evidenced by the Technical Standards and Safety Authority's (TSSA) support for the Project.

c) The capital costs of the proposed facilities appear reasonable.

d) Enbridge Gas's proposal to ultimately recover the costs of the Project from all customers is reasonable as the benefits of the Project (i.e., GHG reductions) would accrue to all customers.

e) If the mitigation measures in the Environmental Protection Plan are followed, there should not be any lasting environmental impacts from the construction of the proposed facilities.

f) Enbridge Gas's land use requirements are acceptable because the Project is located within municipal road allowance and on Enbridge Gas's property.

g) Based on the opinion of the Ministry of Energy, Northern Development and Mines (MENDM), Enbridge Gas's efforts to date have been sufficient to satisfy the procedural aspects of the Crown's Duty to Consult.

Form of Land Use Agreement

OEB staff has no issues with Enbridge Gas's proposed form of temporary land use agreement because it was approved by the OEB in a previous proceeding and has not been changed since that time.

Rate Riders (Credits)

OEB staff supports Enbridge Gas's proposed rate riders (credits) as they act to compensate customers in the BGA for their increased volumetric consumption as a result of lower than otherwise energy content. As the effect is to keep customers in the BGA revenue neutral, OEB staff submits that the proposal is appropriate.

1.3 Process to Date

Enbridge Gas filed its original application on December 20, 2019.

On January 14, 2020, Enbridge Gas informed OEB staff of a change in the pipeline routing. The OEB placed the application in abeyance on January 15, 2020.

On March 31, 2020, Enbridge Gas filed the updated Application.

The Notice of Hearing was issued on April 21, 2020. The Consumers Council of Canada (CCC), Federation of Rental-housing Providers of Ontario (FRPO), H2GO Canada (H2GO), Industrial Gas Users Association (IGUA), Pollution Probe, School Energy Coalition (SEC) and Vulnerable Energy Consumers Coalition (VECC) applied for intervenor status and cost eligibility. No objection was received from Enbridge Gas.

Procedural Order No. 1 was issued on May 15, 2020 and set a procedural schedule for interrogatories on the Application and responses by Enbridge Gas. CCC, FRPO, H2GO, IGUA, Pollution Probe, SEC and VECC were granted intervenor status and cost eligibility.

On May 15, 2020, Environmental Defence filed a letter requesting intervenor status. By way of a letter issued May 21, 2020, the OEB granted Environmental Defence intervenor status and cost eligibility.

On June 3, 2020, Enbridge Gas filed a letter requesting an extension to the due date by which it must provide responses to interrogatories. Enbridge Gas stated that it had received over 240 interrogatories and was making the request due to the unprecedented COVID-19-related working conditions for its employees and the large number of interrogatories to be answered. On June 4, 2020, the OEB issued a letter that approved the request.

Procedural Order No. 2 was issued on June 16, 2020, and set a procedural schedule for the filing of evidence by the TSSA, interrogatories on the evidence, and responses by the TSSA.

On June 24, 2020 the TSSA filed a letter requesting an extension to the due date by which it must file evidence. In its letter, the TSSA explained that important information and reports from Enbridge Gas were not yet available. The TSSA stated that it required time to consider that information and review the reports before it can comment on them in its evidence.

Procedural Order No. 3 was issued on June 24, 2020, which approved a request from the TSSA to extend the due date for its evidence and also extended the balance of the procedural schedule accordingly.

On July 26, 2020, Environmental Defence filed a supplementary interrogatory request to Enbridge Gas. The interrogatory was in respect of a recently released study related to the use of hydrogen as a fuel source for heat in buildings. On July 29, 2020, Enbridge Gas filed a letter stating that it did not object to the interrogatories being included as part of the record.

On July 30, 2020, the TSSA filed a request to extend the due date by which it was required to file interrogatory responses.

Procedural Order No. 4 was issued on July 30, 2020 in which the OEB accepted receipt of the additional interrogatory and set a due date for Enbridge Gas’s response. The OEB also approved the TSSA’s extension request. The OEB also set a schedule for Enbridge Gas’s Argument in Chief, OEB staff and intervenor submissions, and Enbridge Gas’s reply submission.

Enbridge Gas’s reply submission is due by September 28, 2020.

2 SUBMISSIONS

These are the detailed submissions of OEB staff. For a summary of these submissions, refer to section 1.2 (Summary of OEB Staff Submissions), above.

2.1 Leave to Construct

When reviewing a leave to construct application, the OEB typically considers the following factors:

- Project need and timing
- Proposed facilities and alternatives
- Project costs and impact on ratepayers
- Environmental impacts of the project
- Landowner matters
- Indigenous consultation
- Proposed conditions of approval

The evidence and the submissions of OEB staff related to each of these factors are described below.

2.1.1 Project Need and Timing

OEB staff submits that the Application should be approved, subject to certain conditions. In OEB staff's view, while there are more cost effective alternatives to hydrogen blending for reducing GHG emissions, it would be premature to rule out hydrogen blending as a means to reduce GHG emissions before it is better understood in the Ontario context.

Enbridge Gas states that the goal of the Project is to provide insight into the use of hydrogen as a method for decarbonizing the natural gas grid and that it represents an important step for Enbridge Gas to prepare for the requirements of the CFS, which are expected to come into force January 1, 2023. Enbridge Gas has requested a decision from the OEB no later than November 2020. Enbridge Gas is planning to begin construction of the Project in Q2 2021.

Enbridge Gas states that it plans to carefully monitor and assess its operating experience with the Project. This will allow Enbridge Gas to understand whether and how hydrogen blending might be expanded to other parts of the distribution system. It

will also allow Enbridge Gas to assess whether different (higher) concentrations of hydrogen could be used in the future.

Enbridge Gas's preliminary assessment of hydrogen blending involved literature reviews, industry consultation, field surveys of Enbridge Gas's system, onsite surveys of residential and commercial customer equipment, analytical modeling, and risk assessments. Enbridge Gas stated that this work identified several technical constraints and unknowns that are mainly related to the impact of hydrogen on existing gas distribution infrastructure and customer-owned appliances. Enbridge Gas stated that the work also helped identify a suitable level of hydrogen that may be injected into the natural gas distribution system and where that injection could occur in an existing Enbridge Gas network. Although there are examples of projects in other jurisdictions with hydrogen concentrations up to 20% by volume, Enbridge Gas has concluded that blending hydrogen in a concentration of up to 2% hydrogen is safe and reliable for the Project. 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 tCO_2e per year.

The OEB's Marginal Abatement Cost Curve did not include the cost of hydrogen as an abatement option – noting that it was more expensive than other abatement options such as energy efficiency and Renewable Natural Gas (RNG)[2]. To better understand the cost effectiveness of hydrogen blending, OEB staff (and several intervenors) asked Enbridge Gas to compare the cost effectiveness of hydrogen blending to other activities that reduce GHG emissions[3]. In response to OEB staff, Enbridge Gas stated that it "has not undertaken any detailed review of the relative cost/benefit analysis for GHG reductions from hydrogen blending as compared to other activities with similar objectives" and that it "does not currently have enough information to meaningfully complete such analysis." For example, Enbridge Gas noted that the details of the CFS are as yet unknown. However, OEB staff notes that Enbridge Gas was able to provide similar information in the voluntary RNG proceeding[4]. In that proceeding, the cost effectiveness of RNG was estimated to be about \$338/tCO_2e, based the commodity cost alone.

OEB staff has reviewed Environmental Defence's submission, which was filed on September 8, 2020. Environmental Defence's submission compares the costs and benefits of hydrogen blending to alternative GHG mitigation activities, including energy efficiency programs and RNG. Environmental Defence based its analysis on information

[2] EB-2016-0359, Marginal Abatement Cost Curve, July 20, 2017, https://www.oeb.ca/sites/default/files/OEB_MACC%20Report_20170720.pdf
[3] E.g., Environmental Defence interrogatory No. 11, OEB staff interrogatory No. 8 d, Pollution Probe interrogatory No. 5, SEC interrogatory No. 5
[4] EB-2020-0066, Enbridge Gas's response to SEC's interrogatory No. 15

in the Application, information obtained through interrogatories, and OEB reports. The analysis indicates that the cost effectiveness of hydrogen in reducing GHG emissions is many times less than that of energy efficiency programs and RNG. For example, Environmental Defence estimates the cost effectiveness of hydrogen blending to be at over \$900/tCO_2e, based on the commodity cost alone, which is over two and a half times more expensive than RNG at \$338/tCO_2e. OEB staff notes that the cost effectiveness of energy efficiency programs range between about \$0 to -\$140 /tCO_2e[5].

In OEB staff's view, while there are more cost effective alternatives to hydrogen blending for reducing GHG emissions, it would be premature to rule out hydrogen blending before it is better understood in the Ontario context in terms of its different energy mix and environmental regulations (including the pending CFS).

Government Policy

Enbridge Gas stated that hydrogen blending aligns with federal, provincial, municipal and OEB policy:

- The Federal Government is currently developing the CFS, which is intended to incent the innovation and adoption of clean technologies in the oil and natural gas sector and the development and use of low-carbon fuels throughout the economy.
- The Project would generally align with Provincial policies aimed at reducing GHGs.
- The City of Markham has developed a long-term city-wide energy plan with the objective of net zero emissions by 2050. The City of Markham has indicated its support for the Project in a letter filed as part of the Application.
- The OEB indicated in its *Framework for the Assessment of Distributor Gas Supply Plans*[6] that it would assess a distributor's gas supply plan based on three guiding principles: cost effectiveness, reliability and security of supply, and public policy. Enbridge Gas says the Project is consistent with these principles because it provides an additional source of supply which helps to satisfy public policy related to the environment and climate change.

Enbridge Gas stated that hydrogen blending has long-term electrical system benefits because it would provide a means of storing the province's surplus electrical energy. As an intertie between the electrical grid and the natural gas distribution system, hydrogen

[5] EB-2020-0066, Enbridge Gas's response to SEC's interrogatory No. 15
[6] EB-2017-0129

blending would improve energy utilization by using existing pipeline infrastructure to effectively store surplus electrical energy for use by Ontario consumers.

OEB staff notes that, unlike RNG, the Made in Ontario Environment Plan (MOEP) does not explicitly include hydrogen as a GHG emissions mitigation measure. In fact, the MOEP only mentions hydrogen in the context of an alternative vehicle fuel. This was confirmed by Enbridge Gas's own evidence, which states that the Ontario Government seeks to "Improve rules and remove regulatory barriers that block private investors from deploying low-carbon refueling infrastructure that would help increase the uptake of electric, hydrogen, propane, autonomous and other low-carbon vehicles without government subsidies."[7] However, OEB staff supports approval of this pilot project, which takes a measured approach to determining whether hydrogen blending has a future in Ontario.

Market Research

Enbridge Gas undertook a market research and consultation program to gauge customer attitudes and acceptance of hydrogen blending. Enbridge Gas stated that most customers support its efforts to lower the carbon content of the gas it distributes.

The market research effort included:

- An open house that was in addition to the open houses required for the Environmental Assessment and, which focused on the hydrogen blending aspect of the Project
- Customer surveys across the entire Enbridge Gas franchise (i.e., in both the legacy EGDI and Union Gas Limited franchise areas)
- Customer surveys within the BGA

The additional open house was held on July 9, 2019, and was attended by 20 people. Enbridge Gas says that attendee questionnaires yielded positive feedback, with most participants showing support for the Project.

Enbridge Gas stated that the key findings from the customer surveys across the Enbridge Gas franchise area include:

- Residential customers are concerned with the state of the environment and the effects of climate change.

[7] https://www.ontario.ca/page/made-in-ontario-environment-plan at page 33

- Most customers are not familiar with low carbon initiatives such as hydrogen blending, however most customers support Enbridge Gas making investments in such initiatives (76% providing at least some support).
- Approximately half of Enbridge Gas' customers would support a small increase in their natural gas bill to allow it to pursue low carbon initiatives.

Enbridge Gas stated that the BGA survey results were consistent with those of the customer surveys from across the rest of its franchise area.

OEB staff is satisfied with the steps undertaken by Enbridge Gas to gauge customers' attitudes and acceptance of hydrogen blending, and the results of the market research which indicates that customers are generally willing to support initiatives such as the Project.

Conditions for Reporting and Future Approvals

Enbridge Gas has applied for approval of the Project as a pilot project. Enbridge Gas states that, depending on the results of the pilot project, it may seek to expand the BGA and create additional BGAs throughout its system. In its Argument-in-Chief, Enbridge Gas stated that, within five years, it would report to the OEB and stakeholders about its experience with the BGA, including observations and recommendations about whether and how to expand hydrogen blending. Enbridge Gas did not specify if this is within five years of a favourable decision from the OEB or within five years of the Project going into service. OEB staff recommends the latter and submits that this reporting requirement should be imposed as a condition of approval.

OEB staff submits that Enbridge Gas should be required to seek approval from the OEB prior to continuing or expanding its use of hydrogen blending. This would allow the OEB to reassess the potential benefits of hydrogen blending after it is better understood.

In terms of reporting, OEB staff submits that, at a minimum, Enbridge Gas should be required to report on:

a) Actual fully allocated costs of the Project relative to budget
b) Research findings including any evidence of negative impacts on the distribution system and end use appliances, and the actual $/t$CO_2$e associated with the Project
c) A log of communications with stakeholders including customers and the TSSA
d) Conclusions arising from the project-generated knowledge (e.g., risks/mitigations)

e) Recommendations for next steps (e.g., discontinue or expand the pilot, adjust the concentration of hydrogen) and the potential timing of any related applications to the OEB

Conclusion

In OEB staff's view, it would be premature to rule out hydrogen blending before it is better understood in the Ontario context. OEB staff submits that the Project is a relatively low-cost pilot project that poses little financial risk to ratepayers. OEB staff submits that Enbridge Gas's market research suggests that generally, customers are willing to support initiatives such as the Project. OEB staff supports approval of the Project subject to the conditions set out in this submission.

2.1.2 Proposed Facilities and Alternatives

OEB staff submits that the proposed facilities are appropriate to achieve the intent of the Project, which is to isolate a portion of Enbridge Gas's existing distribution system and safely distribute Blended Gas in order to study its effects on the distribution system and end-use equipment.

The proposed facilities include 380 m of nominal pipe size (NPS) 6-inch extra high pressure (XHP) steel (ST) pipeline, 350 m of NPS 6-inch high pressure (HP) ST pipeline and 25 m of NPS 8-inch intermediate pressure (IP) polyethylene (PE) pipeline, for a total 755 m of pipeline. Approximately 250 m of NPS 6 XHP ST natural gas pipeline would be constructed along the municipal road right-of-way on Woodbine Avenue. The remaining pipeline would be constructed on Enbridge-owned property.

In order to isolate the BGA from the rest of the existing distribution system, two connections within the existing system would need to be disconnected (Disconnects). They are both located at the intersection of Major Mackenzie Drive and Hazelton Avenue.

The proposed facilities also include three new stations, all of which would be constructed on Enbridge Gas property:

- The *hydrogen station* would regulate hydrogen flow from the existing hydrogen storage tanks to the inlet of the hydrogen blending station. The hydrogen station would ensure that no more than 2% hydrogen by volume is blended with standard natural gas.
- The *hydrogen blending station* would regulate the pressure of the natural gas feed from extra-high pressure to high pressure. The hydrogen blending station would also control the amount of blended gas being injected into the BGA through the district station.

- The *district station* would regulate the pressure of the blended gas from HP to IP and introduce the blended gas into the BGA.

The proposed facilities are designed to carry the entire gas demand for the BGA. However, for system resiliency, existing district stations that connect the BGA with the surrounding system would be configured to supply unblended natural gas to the BGA if the blended gas facilities were out of service. The existing district stations would also be configured to prevent blended gas from leaving the BGA.

Compliance with Applicable Standards

In accordance with Procedural Orders No. 3 and No. 4, the TSSA filed evidence in respect of the Project and answered interrogatories on that evidence.

The TSSA stated that, in respect of its mandate, the applicable regulation is *Ontario Regulation 210/01: Oil and Gas Pipeline Systems* and the key standard is the Canadian Standards Association (CSA) *Z662 - Oil and Gas Pipeline Systems* (CSA Z662), which has been adopted for use in Ontario by the TSSA through *FS-238-18 - Oil and Gas Pipelines CAD Amendment* (February 15, 2018).

The TSSA stated that it had met with Enbridge Gas a number of times regarding the Project, and that it had reviewed Enbridge Gas's pre-filed evidence. The TSSA stated that it had reviewed the technical aspects of the Project including pipeline design, material specification, wall thickness, and end-user equipment assessment.

The TSSA stated that the most important issue in its view was the impact of hydrogen blending on end-user appliances and the certification of these appliances[8] and that Enbridge Gas is required to prove to the TSSA that the Blended Gas is a suitable fuel for end-users[9]. The TSSA stated that Enbridge Gas has done sufficient assessment work on end-user equipment, and that, at the proposed hydrogen concentration level, no direct safety issues (e.g., flashback, burner overheating) related to end-use equipment is anticipated[10]. The TSSA also stated that blending 0-5% hydrogen would not have adverse effects in terms of:

- An increased risk of fires and explosions
- The hydrogen embrittlement and the durability of metal pipes
- The permeability of hydrogen through metal and plastic pipes
- Pipeline leaks and leak detection

[8] TSSA Evidence (July 8, 2020), page 2
[9] Ibid., page 1
[10] Ibid., page 3

The TSSA stated that it will audit and inspect Enbridge Gas to ensure compliance with applicable technical and safety standards for construction and operation of the Project. In response to an interrogatory from OEB staff, the TSSA indicated that it would be performing both office and field audits[11].

In response to an interrogatory from OEB staff, the TSSA indicated that, after filing its evidence, it had reviewed confidential documents that had been provided to it by Enbridge Gas in respect of computational fluid dynamic modelling for indoor leaks, dispersion modelling for outdoor leaks, fault tree analysis on end-user equipment, and an overall risk assessment[12]. The TSSA provided a summary of its findings that stated that Enbridge Gas:

- Followed the risk assessment and management processes established in the CSA Z662, Annex B
- Used adequate risk science methodologies in the risk assessment report for identification of operational hazards and qualitative evaluation of both likelihood and consequences of the hazard scenarios
- Used adequate data and methods for quantitative estimation of failure frequencies and consequence impact of the identified hazard scenarios
- Will conduct an additional risk assessment during the detailed engineering design stage of the Project to further manage risk
- Was compliant with applicable regulations, code adoption documents, and standards

Both in its evidence and in its interrogatory responses, the TSSA stated that it is supportive of the Project.

Conclusion

OEB staff submits that the proposed facilities are appropriate to isolate a portion of Enbridge Gas's existing distribution system and introduce Blended Gas into the BGA. OEB staff submits that Enbridge Gas has satisfied the TSSA in respect of the technical and safety aspects of the Project.

2.1.3 Project Costs and Impact on Ratepayers

OEB staff has no issues with the capital costs of the Project or the potential bill impacts associated with those costs.

[11] TSSA response to OEB staff interrogatory No. 4 a)
[12] TSSA response to OEB staff interrogatory No. 5 a)

Capital Costs

The total capital cost of the Project is approximately $5.23 million. This includes a 25% contingency applied to all direct capital costs – except for the station material costs that which have a 40% contingency to reflect the preliminary design stage of this specialized equipment. OEB staff notes that the 25% contingency is in line with several recent OEB approved pipeline projects[13].

OEB staff submits that Enbridge Gas's Liberty Village project[14] is suitable for comparison to the pipeline component of the Project. The Liberty Village project was composed of approximately 1,200 m of NPS 6 and NPS 8 pipeline and the estimated capital cost was $3.6 million, for a unit cost of approximately $3,000/m. Applying this unit cost to the 755 m length of pipe in the current application results in $2.26 million.

OEB staff submits that, except for the district station, there are no past projects that can be directly compared to the station component of the Project. However, OEB staff submits that collectively, the hydrogen stations are akin to a gate station in as much as they have similar systems including pressure regulation, monitoring and control, chemical injection equipment[15], and a fenced compound. OEB staff notes that recent gate station projects average about three million dollars (e.g., 2014 Cookstown at $2,974,000 and 2015 Barrie at $3,192,000[16]).

OEB staff submits that, taken together, the comparative pipeline ($2.26 million) and station ($3 million) costs are in-line with the estimated cost of the Project ($5.23 million).

OEB staff also notes that Enbridge Gas expects to receive grant funding of $221,000 from Sustainable Development Technology Canada that would be payable upon completion of the Project and would offset the capital costs of the Project.

Project Economics

Enbridge Gas did not provide the results of a profitability index or net present value calculation for the Project. Instead, Enbridge Gas argued that the Project is in the public interest because it would enable Enbridge Gas to reduce the GHG footprint of its utility gas distribution system, and therefore the Project costs should be fully attributed to system reinforcement and general distribution growth and managed within the rolling project portfolio in accordance with Enbridge Gas's normal business practice.

[13] Enbridge Gas's response to Pollution Probe interrogatory No. 8
[14] EB-2018-0096
[15] E.g., odorant at a gate station and hydrogen for the Project
[16] EB-2012-0459, Exhibit B2, Tab 5, Schedule 4, Attachment 1

In an interrogatory, Enbridge Gas was asked why a unique project such as the Project should not be accounted for discretely and outside of the rolling project portfolio. Enbridge Gas responded that, in its view, the Project facilities are a long-term gas distribution system asset and their costs should be treated in the same manner as any other gas distribution system asset[17].

Bill Impacts

There are three cost consequences related to the Project, and Enbridge Gas is proposing different treatments for each in order to minimize the impact to customer bills:

- *Consumption Impact* – This is a volumetric impact resulting from the lower heating value of hydrogen gas (about 1/3 that of natural gas). Enbridge Gas is proposing to offset this impact by including annual rate riders that would credit customers in the BGA for the cost associated with the increase in volumetric requirements. This treatment would apply to ratepayers in the BGA until rebasing or until such earlier time that a different treatment is appropriate based on future developments (e.g., the implementation of the CFS). The Consumption Impact is further discussed below in section 2.3 (Rate Riders).
- *Facilities Impact* – Enbridge Gas submits that the capital costs for the Project should be paid for by all ratepayers as all ratepayers would receive benefits from the Project. There would be no immediate rate impact attributable to the Project because Enbridge Gas is currently in a price cap rate-setting regime. The cost of the Project would not be included in rates until the next rebasing year. Enbridge Gas estimates that the increase in a residential customer's bill as a result of the Project would be less than $0.12 per year after rebasing in 2024.
- *Commodity Impact* – This is the gas cost impact associated with procuring hydrogen rather than traditional natural gas. Enbridge Gas is proposing to acquire hydrogen from 2562961 Ontario Ltd in a manner that keeps ratepayers cost-neutral; the price paid for hydrogen would be the same price paid for traditional natural gas and would fluctuate according to the market cost of natural gas. Enbridge Gas is proposing to recover this cost from all customers in the EGD rate zone until rebasing at which time this cost would be recovered from all ratepayers (or until such earlier time that a different treatment is appropriate based on future developments, e.g., the implementation of the CFS). Enbridge Gas stated that any alternate treatment would be presented to the OEB for approval.

[17] Enbridge Gas's response to VECC interrogatory No. 5

OEB staff asked Enbridge Gas to discuss the implications of the cost-neutral arrangement with respect to the Affiliate Relationships Code (ARC). Enbridge Gas responded that the ARC requires that utilities pay no more than the market price for products purchased from an affiliate and, in situations where a reasonably competitive market for the product does not exist, no more than the affiliate's fully allocated cost to provide the product[18]. For the purposes of the Project, Enbridge Gas is purchasing hydrogen from its affiliate 2562961 Ontario Ltd. at a price that is significantly below the market price of hydrogen as well as 2562961 Ontario Ltd.'s fully allocated cost to provide the hydrogen.

Conclusion

OEB staff submits that the capital costs of the Project are reasonable, and the potential bill impacts at the time of rebasing are acceptable. OEB staff has no issue with the Project being part of Enbridge Gas's rolling project portfolio. OEB staff has no issue with respect to Enbridge Gas's compliance with the ARC.

2.1.4 Environmental Impacts

OEB staff has no issues or concerns in respect of environmental matters.

Dillon Consulting Ltd. (Dillon) was retained by Enbridge Gas to undertake an environmental and socio-economic impact study (Environmental Report or ER) and help select the Preferred Route (PR) for the Project. The effort included a consultation program to receive input from interested and potentially affected parties including Indigenous communities. Two open houses were conducted that were attended by a total of 90 people. Enbridge Gas states that questionnaires completed by attendees indicated support of the Project.

Enbridge Gas says that, although it is requesting leave to construct the first phase of the Project in the Application, the ER covers both the first and potential second phase of the Project. Enbridge Gas says that, absent the second phase of the Project, the summary and conclusions of the ER are applicable to the first phase of the Project.

Two potential routes were proposed in the initial application: the PR and the Alternate Route (AR). In the initial application, Enbridge Gas proposed to construct the PR. However, it was later determined that the AR would lower project costs and decrease disruption to stakeholders. Enbridge Gas conducted additional consultation to gather feedback on changing the route, prepared an amendment to the ER (ER Amendment), and refiled the application with the former AR as the new PR. The ER Amendment states that the new PR does not result in any material change to the biophysical, socio-

[18] Affiliate Relationships Code for Gas Utilities, section 2.3.4 and section 2.3.10.

economic or technical constraints considered in the ER, and that consequently, no additional mitigation measures beyond those recommended in the ER are required.

The ER was submitted to the Ontario Pipeline Coordinating Committee (OPCC) in May 2019 and the ER Amendment in March 2020. Both documents have also been provided to the Toronto and Region Conservation Authority (TRCA).

An Environmental Protection Plan (EPP) will be developed for the Project that incorporates recommended mitigation measures from the ER and feedback from the OPCC and TRCA. Enbridge Gas says that with the implementation of the EPP, environmental impacts resulting from construction of the Project are not expected to be significant.

A Stage 1 Archaeological Assessment (AA) was submitted to the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) on March 12, 2019. The Stage 1 AA indicated that most of the Project area should be considered free of archaeological concern, and no further assessment is recommended unless Enbridge Gas proceeds with a second phase of the Project. The Stage 1 AA has been entered into the Ontario Public Register of Archaeological Reports. The MHSTCI issued a clearance letter on March 20, 2020.

OEB staff submits that Enbridge Gas's efforts to date are in accordance with the applicable requirements of the OEB's *Environmental Guidelines for Location, Construction and Operation of Hydrocarbon Pipelines and Faculties in Ontario"* (7th Edition, 2016).

2.1.5 Land Matters

OEB staff has no issues or concerns in respect of land matters.

On January 14, 2020, Enbridge Gas informed OEB staff of a change in the pipeline routing. As a result of the change, the total proposed pipeline length is reduced from approximately 1.3 km to approximately 755 metres. On March 31, 2020, Enbridge Gas filed an update to the application and an amendment to the ER reflecting the change.

Enbridge Gas states that approximately 250 m of the proposed pipeline and the Disconnects would be located within municipal road right-of-way, and approximately 505 m of pipeline and the three stations would be located on Enbridge Gas property. Enbridge Gas states that no permanent easements are required, but that temporary working areas may be required for areas where the road allowance is too narrow or confined to facilitate construction – this is further discussed below in section 2.2 (Form of Land Use Agreement).

2.1.6 Indigenous Consultation

OEB staff has no issues or concerns in respect of Indigenous consultations.

On January 4, 2019, Enbridge Gas provided the Ontario Ministry of Energy, Northern Development and Mines (MENDM) with a project description. On March 1, 2019, Enbridge Gas received a letter from the MENDM indicating that it had delegated the procedural aspects of consultation to Enbridge Gas for the Project. The Delegation Letter identified six Indigenous communities to be consulted:

- Alderville First Nation
- Curve Lake First Nation
- Hiawatha First Nation
- Huron Wendat First Nation
- Mississaugas of the Credit First Nation
- Mississaugas of Scugog Island First Nation

Enbridge Gas's Indigenous Consultation Report was provided to the MENDM on March 31, 2020. On July 17, 2020, the MENDM issued a letter to Enbridge Gas stating that, "the procedural aspects of consultation undertaken by Enbridge to date for the purposes of the Ontario Energy Board's Leave to Construct approval process for the Low Carbon Energy Project is satisfactory."

2.1.7 Proposed Conditions of Approval

In an interrogatory, OEB staff asked Enbridge Gas to review and comment on a set of draft conditions of approval. Enbridge Gas responded that it does not object to any of the proposed conditions. The proposed conditions are attached as Appendix A to this submission. OEB staff submits that, if the OEB approves the application, it should impose these conditions.

In its Argument-in-Chief, Enbridge Gas stated that, within five years, it would report to the OEB and stakeholders about its experience with the BGA, including observations and recommendations about whether and how to expand hydrogen blending. OEB staff submits that, if the OEB approves the application, it should impose this as an additional condition of approval.

2.2 Form of Land Use Agreement

OEB staff has no issues with Enbridge Gas's form of proposed temporary working area agreement.

Enbridge Gas states that temporary working areas may be required for the Project where the road allowance is too narrow or confined to facilitate construction. These areas will be identified with the assistance of the contractor that will construct the Project. If it is determined that temporary easements are required, Enbridge Gas will offer the affected landowners its standard form of working area agreement.

In response to an interrogatory, Enbridge Gas noted that the proposed form of working area agreement was approved by the OEB for use by Enbridge Gas for its Georgian Sands Pipeline[19] project and that there have not been any changes to the form of agreement since that time[20].

2.3 Rate Riders

OEB staff has no issues with respect to the proposed rate riders (credits) that would compensate natural gas consumers in the BGA for their increased volumetric consumption. OEB staff submits that, as a condition of approval, Enbridge Gas should be required to update the amount of the rate riders annually to reflect current Quarterly Rate Adjustment Mechanism (QRAM) rates.

Rate 1 - Residential

Enbridge Gas has applied under section 36 of the OEB Act for an order approving the use of an annual rate rider (credit) to compensate customers in the BGA for the additional costs associated with the increase in volumetric requirements for blended gas as compared to conventional natural gas. The rate rider would apply to customers in the BGA until rebasing or until such earlier time that a different treatment is appropriate based on future developments (for example, implementation of the CFS).

As previously described, a customer in the BGA would need to consume slightly more blended gas relative to natural gas in order to receive the same amount of energy.

Enbridge Gas explained that a typical residential customer in the BGA consuming 2,400 m^3 per year the equivalent amount of blended gas for the same amount of energy is approximately 2,433 m^3 per year. Based on January 2020 QRAM rates, these customers would pay approximately $8.99 more than a similar customer located outside the BGA[21]. In order to ensure that BGA customers are kept whole, Enbridge Gas is proposing an annual rate rider credit of $10.00 per year. OEB staff submits that the amount of the proposed rate rider is commensurate with the estimated annual bill impact.

[19] EB-2018-0226
[20] Enbridge Gas's response to OEB staff interrogatory No. 17
[21] Enbridge Gas's response to OEB staff interrogatory No. 4 a)

Rate 6 - Commercial

In response to an interrogatory, Enbridge Gas confirmed that there are 20 Rate 6 customers in the BGA[22]. Enbridge Gas stated that it would use an annual rate rider to accommodate for the higher gas demands of these customers. Based on January 2020 QRAM rates, a typical Rate 6 customer in the BGA consuming 22,606 m^3 per year of standard natural gas would have to consume approximately 22,918 m^3 of blended gas. This equates to a typical Rate 6 customer in the BGA paying approximately $76.77 more per year than a non-BGA customer. Similar to the rate rider treatment for Rate 1 customers, Enbridge Gas is proposing to provide an annual rate rider of $86.00 for Rate 6 customers in the BGA. OEB staff submits that the amount of the proposed rate rider is commensurate with the estimated annual bill impact.

Annual Rate Rider Updates

During the deferred rebasing period, Enbridge Gas would absorb the costs associated with the rate riders. In its Argument in Chief, Enbridge Gas stated that, if the OEB believes that it is appropriate, Enbridge Gas is willing to update the amount of the rate rider each year, to reflect current QRAM rates. OEB staff submits that it is in the best interest of consumers in the BGA for the rate riders to be updated annually using the QRAM rates that are in effect at the time of the update. OEB staff submits that this be a requirement as part of the condition of approval.

[22] Enbridge Gas's response to SEC interrogatory No. 11

3 CONCLUSION

OEB staff submits that the Application should be approved as a pilot project subject to the conditions set out below. OEB staff submits that the requirements for LTC have been met, and OEB staff has no issues with the proposed form of land use agreement or the proposed rate riders.

The conditions of approval proposed by OEB staff are:

1. Within five years of the Project going into service, Enbridge Gas shall report to the OEB and stakeholders about its experience with the BGA. At a minimum, the report should address:
    a. Actual fully allocated costs of the Project relative to budget
    b. Research findings including any evidence of negative impacts on the distribution system and end use appliances, and the actual $/tCO$_2$e associated with the Project
    c. A log of communications with stakeholders including customers and the TSSA
    d. Conclusions arising from the project-generated knowledge (e.g., risks/mitigations)
    e. Recommendations for next steps (e.g., discontinue or expand the pilot, adjust the concentration of hydrogen) and the potential timing of any related applications to the OEB
2. Enbridge Gas shall not continue or expand its hydrogen blending program without first applying to the OEB and receiving approval to do so
3. Compliance with standard leave to construct conditions of approval attached as Appendix A
4. Enbridge Gas shall update the amount of the rate riders annually to reflect current QRAM rates

All of which is respectfully submitted.

Enbridge Gas Inc.
Low Carbon Energy Project
OEB Act Section 90 Leave to Construct

PROPOSED CONDITIONS OF APPROVAL

1. Enbridge Gas Inc. (Enbridge Gas) shall construct the facilities and restore the land in accordance with the OEB's Decision and Order in EB-2019-0294 and these Conditions of Approval.
2. (a) Authorization for leave to construct shall terminate 12 months after the decision is issued, unless construction has commenced prior to that date.

   (b) Enbridge Gas shall give the OEB notice in writing:

   i. of the planned in-service date, at least ten days prior to the date the facilities go into service;

   ii. of the date on which construction was completed, no later than 10 days following the completion of construction; and

   iii. of the in-service date, no later than 10 days after the facilities go into service.
3. Enbridge Gas shall implement all the recommendations of the Environmental Report filed in the proceeding, and all the recommendations and directives identified by the Ontario Pipeline Coordinating Committee review.
4. Enbridge Gas shall advise the OEB of any proposed change to OEB-approved construction or restoration procedures. Except in an emergency, Enbridge Gas shall not make any such change without prior notice to and written approval of the OEB. In the event of an emergency, the OEB shall be informed immediately after the fact.
5. Enbridge Gas shall file, in the proceeding where the actual capital costs of the project are proposed to be included in rate base, a Post Construction Financial Report, which shall indicate the actual capital costs of the project and shall provide an explanation for any significant variances from the cost estimates filed in this proceeding.
6. Both during and after construction, Enbridge Gas shall monitor the impacts of construction, and shall file with the OEB one paper copy and one electronic (searchable PDF) version of each of the following reports:

   (a) A post construction report, within three months of the in-service date, which shall:

   i. provide a certification, by a senior executive of the company, of Enbridge Gas' adherence to Condition 1;

ii. describe any impacts and outstanding concerns identified during construction;

iii. describe the actions taken or planned to be taken to prevent or mitigate any identified impacts of construction;

iv. include a log of all complaints received by Enbridge Gas, including the date/time the complaint was received, a description of the complaint, any actions taken to address the complaint, the rationale for taking such actions; and

v. provide a certification, by a senior executive of the company, that the company has obtained all other approvals, permits, licenses, and certificates required to construct, operate and maintain the proposed project.

(b) A final monitoring report, no later than fifteen months after the in-service date, or, where the deadline falls between December 1 and May 31, the following June 1, which shall:

i. provide a certification, by a senior executive of the company, of Enbridge Gas' adherence to Condition 3;

ii. describe the condition of any rehabilitated land;

iii. describe the effectiveness of any actions taken to prevent or mitigate any identified impacts of construction;

iv. include the results of analyses and monitoring programs and any recommendations arising therefrom; and

v. include a log of all complaints received by Enbridge Gas, including the date/time the complaint was received; a description of the complaint; any actions taken to address the complaint; and the rationale for taking such actions.