



March 27, 2022

VIA RESS

Ontario Energy Board
P.O. Box 2319
2300 Yonge Street, 27th Floor
Toronto, ON M4P 1E4
Attention: Registrar

Dear Ms. Marconi,

**Re: Enbridge Gas Inc.
Multi-Year Demand Side Management Plan (2022-2027) Application
Board File No.: EB-2021-0002**

We are counsel to Anwaatin Inc. (**Anwaatin**) in the above-noted proceeding. Please find attached Anwaatin's compendium in aid of cross-examination for Panels 1 and 2 for the oral hearing scheduled to begin on March 28, 2022.

Sincerely,

A handwritten signature in black ink, appearing to read "Jonathan McGillivray". The signature is fluid and cursive, with the first name "Jonathan" being more prominent.

Jonathan McGillivray

c. All Parties to EB-2021-0002

Encl.

ONTARIO ENERGY BOARD

IN THE MATTER OF the *Ontario Energy Board Act, 1998*,
S.O. 1998, c. 15, Sched. B, as amended (the **Act**);

AND IN THE MATTER OF an application by Enbridge Gas
Inc. pursuant to section 36(1) of the Act, for an order or
orders approving its Demand Side Management Plan for
2022-2027.

EB-2021-0002

Anwaatin Inc.

CROSS-EXAMINATION COMPENDIUM

PANELS 1 AND 2

March 27, 2022

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BY EMAIL AND WEB POSTING

December 1, 2020

To: All Rate-regulated Natural Gas Distributors
All Participants in EB-2019-0003

Re: **Post-2020 Natural Gas Demand Side Management Framework**
Board File Number: EB-2019-0003

The Ontario Energy Board (OEB) has determined that the best approach for approving a post-2021 Demand Side Management (DSM) plan is for the OEB to consider it through an application process. For that reason, the policy consultation is being concluded. Through this letter, the OEB is inviting Enbridge Gas Inc. to develop and file a comprehensive DSM plan application for DSM programs starting in 2022. The application should include proposed targets, budgets, and programs for the next multi-year DSM plan term. This letter also provides Enbridge Gas with initial guidance to assist it in developing its application, although the proposals made by Enbridge Gas will ultimately be at the discretion of the company.

Background

The OEB began a policy consultation, to be completed in stages, through a [letter](#) dated May 21, 2019. Following a Phase 1 Stakeholder Meeting on June 13, 2019 to receive input on the scope of the consultation and the goals and objectives, the OEB [indicated](#) that it would undertake a comprehensive review of the current framework for the purpose of establishing a new framework.

In a [letter](#) issued on December 19, 2019, the OEB initiated Phase 2 of the consultation and provided a draft consultation plan identifying topics for discussion. The OEB held a Phase 2 Stakeholder Meeting on January 28, 2020 to seek input on the consultation plan and general framework ideas.

On July 16, 2020, the OEB issued a [Decision and Order](#) approving a one-year extension for Enbridge Gas Inc. to continue delivering DSM programs under the existing framework throughout 2021.

OEB Direction

Given the passage of time, and in an effort to achieve efficiencies and increase the timeliness of OEB approval of a new multi-year natural gas DSM plan, the OEB is concluding the consultation process in favour of an adjudicative process. The OEB invites Enbridge Gas to file a comprehensive multi-year DSM plan application for the OEB to review new conservation programs, budgets, and targets for the post-2021 period. With the existing 2015-2020 DSM framework set to expire on December 31, 2020, forgoing additional pre-hearing consultation will allow the process to be streamlined through the OEB's adjudicative process. The OEB and interested parties will have the opportunity to undertake a detailed review and comprehensive analysis of the application in order to assess the value and merit of all proposals related to ratepayer-funded DSM programs. This will ensure that the initial goal of the policy consultation, which was to undertake a comprehensive review of the central elements of a DSM plan, can still be achieved.

Enbridge Gas's DSM plan application should be informed by the results of the 2015-2020 DSM plans, the OEB's [Mid-Term Review Report](#), the 2019 [Achievable Potential Study](#), information received through the post-2020 DSM consultation to date, and the government's policies and commitments in the Environment Plan as they continue to evolve, including as expressed in the November 27, 2020 [letter](#) from the Associate Minister of Energy and the Minister of the Environment, Conservation and Parks to the OEB regarding the Ontario government's current policy objectives related to DSM.

The OEB's overall objectives for ratepayer funded DSM and key guidance on the main elements of natural gas DSM plans are provided below to allow Enbridge Gas to develop an application for a new multi-year DSM plan that will be subject to a hearing by the OEB. The panel of commissioners hearing the application, however, will ultimately make its decision based on the evidence and arguments before it.

Objectives and Costs of Ratepayer-Funded Natural Gas DSM

As part of Phase 1 of the OEB's consultation, the OEB received written comments from 25 stakeholders regarding the goals and objectives of ratepayer-funded DSM. Following its review and consideration of the submissions, the OEB is of the view that the primary objective of ratepayer-funded natural gas DSM is assisting customers in making their homes and businesses more efficient in order to help better manage their energy bills.

In working towards the primary objective, Enbridge Gas's future ratepayer-funded DSM plan should also consider the following secondary objectives:

- Help lower overall average annual natural gas usage
- Play a role in meeting Ontario's greenhouse gas reductions goals
- Create opportunities to defer and/or avoid future natural gas infrastructure projects¹

These secondary objectives balance input received from stakeholders and refine the objectives included in the former 2015-2020 DSM framework. The OEB is of the view that these secondary objectives are important considerations that a well-planned and effectively implemented DSM plan can help achieve.

Over the course of the 2015-2020 term, annual OEB-approved natural gas conservation budgets have doubled from the previous levels approved for the 2012-2014 term, up to approximately \$140 million per year by the end of the current term. With COVID-19 creating many financial hardships, energy conservation has a role in helping to reduce energy costs and assist customers in managing their energy bills. The OEB anticipates modest budget increases to be proposed by Enbridge Gas in the near-term in order to increase natural gas savings, and expects Enbridge Gas to seek to improve the cost-effectiveness of programs. However, the appropriate level of ratepayer funding expended for DSM programs must weigh the cost-effective natural gas savings to be achieved against both short-term and long-term customer bill impacts.

The OEB expects that all requests for ratepayer-funding to support DSM programs be accompanied by detailed evidence that shows how the programs will benefit Ontario's natural gas customers, help reduce overall natural gas usage and costs, and contribute towards meeting the Government's goals to reduce greenhouse gas emissions.

DSM Programs

Based on the OEB's evaluated results of the 2015 to 2018 DSM programs, while still cost-effective, the level of natural gas savings achieved through DSM programs for each dollar spent has been decreasing. This may be related to Enbridge Gas striving to

¹ DSM can avoid or defer infrastructure passively (by reducing overall natural gas use and infrastructure needs) or actively (by targeting specific infrastructure projects). The OEB has an ongoing hearing that is considering Enbridge Gas's proposed Integrated Resource Planning framework (EB-2020-0091). As part of that proceeding, the OEB will decide on the relationship between the IRP framework and future utility DSM plans and the extent to which Enbridge Gas will be expected to meet this secondary objective as part of its future DSM plan.

meet a number of different priorities, programs being extended to harder-to-reach customers, and recent updates to outdated assumptions.

The OEB expects Enbridge Gas to seek out elements of current programs that can be modified and consider new programs in order to optimize overall program results to make the best use of ratepayer funding. When reviewing its current suite of programs and potential future programs, Enbridge Gas is expected to consider input received through the post-2020 DSM framework consultation, lessons learned from the past six years of activity, the OEB's evaluation reports and recommendations from the Evaluation Contractor, stakeholder feedback from the Mid-Term Review consultation and the recent 2021 DSM plan proceeding, the 2019 Achievable Potential Study, as well as the Government's Environment Plan as it continues to evolve.

For example, Enbridge Gas is encouraged to find ways to increase the natural gas savings from its programs by reducing free ridership, targeting key segments of the market, including low-income and on-reserve First Nations communities, and customers with significant room for efficiency improvements, and strategically incenting customers to achieve more savings. Consistent with the OEB's direction provided in the OEB's [Mid-Term Review Report](#), Enbridge Gas is expected to be actively screening potential program participants thoroughly, and actively seeking out customers who can most greatly benefit from the programs, thereby ensuring program funds are used as efficiently as possible. Further, the OEB expects that all programs continue to be cost-effective as defined in the Mid-Term Review Report.

Additionally, consistent with the [Ministerial Directive](#) issued to the Independent Electricity System Operator (IESO) on September 30, 2020, the OEB expects that Enbridge Gas will endeavor to coordinate the delivery of DSM programs with electricity CDM programs where possible, including modifying the participant eligibility requirements of its current low-income program in order to be consistent with the electricity income-tested CDM program eligibility requirements. The centralization of electricity CDM programs under the IESO may lead to new opportunities for DSM-CDM collaboration and a greater level of overall energy savings. The OEB expects Enbridge Gas to file evidence addressing linkages to the new electricity CDM framework and to identify opportunities for efficiencies, program cost reductions, and increased natural gas savings.

Targets, Metrics and Shareholder Incentives

The OEB completed an updated Achievable Potential Study in October 2019. The study was integrated with the IESO with the objective of identifying and quantifying energy

savings (electricity and natural gas), greenhouse gas emissions reductions and associated costs from demand side resources for the period from 2019 to 2038. While not determinative, the OEB expects that the findings from the study will be used to inform future natural gas DSM plans.

Further, the OEB is generally supportive of continuing the use of a utility shareholder incentive as a reward for meeting or exceeding performance targets. The OEB expects that future performance be assessed relative to measurable, outcome-based metrics. Additional metrics should also be proposed to ensure all segments of the market are reached and small volume, low-income customers and on-reserve First Nations communities are well-served. The OEB encourages Enbridge Gas to develop a longer-term natural gas savings reduction target, separate from the annual targets, that it will work to achieve by the end of the next multi-year DSM term.

Evaluation, Measurement and Verification

The OEB will continue to provide annual oversight of DSM programs through its role in leading the evaluation, measurement and verification (EM&V) activities. The OEB expects that all future process evaluations undertaken by Enbridge Gas will be included in the OEB's EM&V Plan. These evaluations assess the design and delivery of programs, and all scope of work documents and deliverables will be reviewed by the OEB's Evaluation Advisory Committee and the OEB's Evaluation Contractor.

Additionally, as part of its application for a new multi-year DSM plan, Enbridge Gas is expected to provide information on how it has refined its processes and improved its tracking databases, as recommended by the OEB's Evaluation Contractor, to support the OEB's evaluation process, reduce costs and increase efficiencies.

Term

The OEB expects that Enbridge Gas's new multi-year DSM plan will be for a minimum term of three years up to a maximum of six years, including 2022. Enbridge Gas may consider it necessary to maintain some elements from its 2021 DSM Plan as part of its proposed 2022 DSM Plan to potentially act as a transition to the next multi-year DSM plan. Enbridge Gas should specify in its DSM Plan application by when approval of its 2022 DSM Plan would be required in order to ensure program continuity. Alternatively, Enbridge Gas may file a separate application for 2022.

Next Steps

At a minimum, the OEB expects Enbridge Gas to submit an application for a new DSM plan that includes proposed targets, budgets, programs, and performance metrics no later than May 1, 2021.

As the OEB's main objective for DSM is relevant to all Ontario natural gas customers, the OEB encourages EPCOR Natural Gas Limited Partnership to consider filing its own DSM plan. The OEB appreciates that any DSM plan filed by EPCOR would need to be devised and assessed in a different manner than that of Enbridge Gas, however, the objectives outlined in this letter are still relevant to EPCOR.

The OEB thanks all participants for their contributions to the consultation. A Notice of Hearing for Cost Awards regarding the remaining activities not yet addressed will be issued separately.

Yours truly,

Original Signed By

Christine E. Long
Registrar

PROPOSED FRAMEWORK

Enbridge Gas Inc.

Proposed Demand-Side Management Framework

Effective Date: January 1, 2023

2. Objectives of Ratepayer Funded Natural Gas DSM

As outlined in the OEB's December 1, 2020 letter, following review and consideration of written comments from stakeholders, the OEB outlined both primary and secondary objectives of ratepayer funded DSM:¹

Primary Objective: Assisting customers in making their homes and business more efficient in order to help better manage their energy bills.

In working towards the primary objective, Enbridge Gas's ratepayer-funded DSM plan should also consider the following secondary objectives:

- Help lower overall average annual natural gas usage.
- Play a role in meeting Ontario's greenhouse gas reductions goals.
- Create opportunities to defer and/or avoid future natural gas infrastructure projects.²

The OEB proposed that these secondary objectives balance input received from stakeholders and refine the objectives included in the former 2015-2020 DSM Framework. The OEB outlined that these secondary objectives are important considerations that a well-planned and effectively implemented DSM plan can help achieve.

3. Guiding Principles

In the 2015-2020 DSM Framework, the OEB outlined a list of guiding principles which it expected would help the gas utilities to develop their multi-year DSM strategies and

¹ EB-2019-0003, OEB Letter Post-2020 Natural Gas Demand Side Management Framework (December 1, 2020), p. 2.

² Ibid, reference: "DSM can avoid or defer infrastructure passively (by reducing overall natural gas use and infrastructure needs) or actively (by targeting specific infrastructure projects). The OEB has an ongoing hearing that is considering Enbridge Gas's proposed Integrated Resource Planning framework (EB-2020-0091). As part of that proceeding, the OEB will decide on the relationship between the IRP framework and future utility DSM plans and the extent to which Enbridge Gas will be expected to meet this secondary objective as part of its future DSM plan."

assess the appropriateness of their overall DSM plans.³ The OEB solicited input on these guiding principles for consideration in an updated framework as part of the Post-2020 DSM Framework consultation (EB-2019-0003). Ultimately, the inclusion of a set of guiding principles was not specifically established in the OEB's December 1, 2020 letter, therefore the following guiding principles are based on the 2015-2020 Framework guiding principles updated to reflect feedback received from stakeholders and updated policy guidance from the OEB. These guiding principles are intended to support post-2021 DSM plan development.

- **DSM plans should balance the achievement of cost-effective natural gas savings and customer bill impacts.** “The appropriate level of ratepayer funding expended for DSM programs must weigh the cost-effective natural gas savings to be achieved against both short-term and long-term customer bill impacts. The OEB expects that all requests for ratepayer-funding to support DSM programs be accompanied by detailed evidence that shows how the programs will benefit Ontario’s natural gas customers, help reduce overall natural gas usage and costs, and contribute towards meeting the Government’s goals to reduce greenhouse gas emissions.”⁴
- **DSM plans should be designed to provide opportunities for a broad spectrum of consumer groups and customer needs to encourage widespread customer participation over time and “ensure all segments of the market are reached.”⁵** “Programs should be designed to remove financial, information and other barriers in the marketplace to increase uptake of DSM programs”⁶ over time.

³ EB-2014-0134, OEB Report of the Board Demand Side Management Framework for Natural Gas Distributors (2015-2020) (December 22, 2014), p. 6.

⁴ EB-2019-0003, OEB Letter Post-2020 Natural Gas Demand Side Management Framework (December 1, 2020), p. 3.

⁵ Ibid, p. 5.

⁶ Consistent with: EB-2014-0134, OEB Report of the Board Demand Side Management Framework for Natural Gas Distributors (2015-2020) (December 22, 2014), p.8.

- **DSM plans should ensure that “small volume, low-income⁷ and on-reserve First Nations communities are well-served.”⁸** Income qualified programming should be screened at a lower threshold than other programming and be available across the province.⁹
- **DSM plans should include strategies to increase the natural gas savings by targeting key segments of the market and customers with significant room for efficiency improvements.¹⁰**
- **DSM plans should minimize lost opportunities for energy efficiency and should be designed to pursue long term energy savings.** DSM programming should pursue opportunities such as replacement of equipment with long lives that, if not undertaken during the current planning period, will no longer be available or will be substantially more expensive to implement in a subsequent planning period.¹¹
- **Where appropriate, Enbridge Gas should coordinate DSM and electricity CDM efforts.¹²** “Consistent with the Ministerial Directive issued to the Independent Electricity System Operator (IESO) on September 30, 2020, the OEB expects that Enbridge Gas will endeavor to coordinate the delivery of DSM programs with electricity CDM programs where possible.”¹³

⁷ As per: EB-2019-0003, OEB Letter Post-2020 Natural Gas Demand Side Management Framework (December 1, 2020), p. 5 - the OEB expects Enbridge Gas will modify low income participant eligibility requirements to be consistent with the electricity income-tested CDM eligibility requirements.

⁸ Ibid.

⁹ Consistent with: EB-2014-0134, OEB Report of the Board Demand Side Management Framework for Natural Gas Distributors (2015-2020) (December 22, 2014), p.8.

¹⁰ EB-2019-0003, OEB Letter Post-2020 Natural Gas Demand Side Management Framework (December 1, 2020), p. 4.

¹¹ Adapted from: EB-2014-0134, OEB Report of the Board Demand Side Management Framework for Natural Gas Distributors (2015-2020) (December 22, 2014), p.8.

¹² Consistent with: EB-2014-0134, OEB Report of the Board Demand Side Management Framework for Natural Gas Distributors (2015-2020) (December 22, 2014), p. 5 and p. 8.

¹³ EB-2019-0003, OEB Letter Post-2020 Natural Gas Demand Side Management Framework (December 1, 2020), p. 4.

- **Enbridge Gas should not have a disincentive to coordinate DSM efforts with external energy conservation and carbon reduction initiatives.** Enbridge Gas should endeavor, where appropriate, to coordinate its DSM activities with other external parties such as government partners, to achieve efficiencies and maximize results.¹⁴
- **DSM plans should support innovation, technology development and adoption of lower-carbon alternatives to enable longer term energy efficiency and conservation opportunities, consistent with the advancement of provincial policy goals.**¹⁵
- **Enbridge Gas will be able to recover costs and lost revenues associated with the delivery of DSM plans.** Enbridge Gas will be permitted to recover spending associated with the administration and delivery of DSM programs, lost revenues, and shareholder incentive amounts.¹⁶
- **Shareholder Incentives will be commensurate with both performance and efficient use of funds.**¹⁷ The amount of shareholder incentive will depend on performance against DSM targets, and will take into consideration the relative difficulty in achieving other objectives and guiding principles Enbridge Gas is expected to achieve. In addition, shareholder incentive will be in part directly related to the achievement of net benefits.

¹⁴ Consistent with: EB-2014-0134, OEB Report of the Board Demand Side Management Framework for Natural Gas Distributors (2015-2020) (December 22, 2014); EB-2019-0003, OEB Letter Post-2020 Natural Gas Demand Side Management Framework (December 1, 2020), pp. 2- 4; and the current energy market.

¹⁵ To reflect direction outlined in: A Made in Ontario Environment Plan, Ministry of the Environment, Conservation and Parks (November 29, 2018), p. 18; “our government will focus on smart regulatory and policy approaches to facilitate and enable innovation rather than hindering it.”

¹⁶ Adapted from: EB-2014-0134, OEB Report of the Board Demand Side Management Framework for Natural Gas Distributors (2015-2020) (December 22, 2014), p. 8.

¹⁷ Consistent with: EB-2014-0134, OEB Report of the Board Demand Side Management Framework for Natural Gas Distributors (2015-2020) (December 22, 2014), p. 9.

ENBRIDGE GAS INC.

Answer to Interrogatory from
Anwaatin Inc. (Anwaatin)

Interrogatory

Issue 17

Reference:

Updated Application, Exhibit A, Tab 2, Schedule 1, para 13

Question(s):

Preamble: EGI states that persons affected by the Application are the customers resident or located in the municipalities, police villages, and **Indigenous communities** served by EGI, together with those to whom EGI sells gas, or on whose behalf, EGI distributes, transmits or stores gas. [emphasis added]

- a) Please file any and all analysis EGI has performed in connection with how the Application will, or is anticipated to, affect Indigenous rights-holding communities:
- (i) that EGI serves;
 - (ii) to which EGI sells gas (e.g., Six Nations Natural Gas); and
 - (iii) on whose behalf EGI distributes, transmits, or stores gas.

If EGI has not undertaken any such analysis, please explain why no such analysis has been undertaken, in light of the statement in paragraph 13.

- b) Does EGI believe that it has a duty to consult and potentially accommodate Indigenous rights-holding communities with respect to the Application?
- c) Please provide a detailed outline of EGI's Indigenous consultation process with respect to the Application. Please include a description of all steps that EGI has taken or will take in order to engage, consult, and accommodate Indigenous rights-holding communities affected by the Application.

Response:

- a) The Application involves a Decision for the approval of the 2023+ Proposed Framework and 2023-2027 DSM Plan, inclusive of programs, targets, and budgets, for customers in EGI rate zones. In Enbridge Gas's view, Indigenous communities will be affected by the Application in a similar manner to other organizations, individuals, customers Enbridge Gas serves to promote conservation and increased energy efficiency.

- b) Enbridge Gas submits that it is committed to engaging with Indigenous peoples, in accordance with its Indigenous Peoples Policy and the duty to consult and to accommodate, where applicable and where the procedural aspects have been delegated to Enbridge Gas. Enbridge Gas does not believe the duty to consult is triggered by the DSM Application as the OEB decision in respect of the Application does not contemplate conduct that may adversely impact asserted or established Aboriginal¹ or treaty rights.²
- c) As discussed above, Enbridge Gas is of the view that the DSM Application does not trigger the duty to consult. Regardless of whether the duty to consult has been triggered by this proceeding or whether Aboriginal consultation is required, Enbridge Gas believes it is appropriate to continue consultation through the OEB-led DSM regulatory consultation process. Enbridge Gas notes that Anwaatin is an active participant in this proceeding before the OEB. Enbridge Gas will address any questions raised by members of Indigenous groups regarding the DSM programming as they arise.

Looking ahead, Enbridge Gas looks forward to meeting with all interested Intervenor groups, including Anwaatin, at the annual General DSM Stakeholder meeting. Throughout the Plan term, Enbridge Gas will remain committed to pursuing sustainable relationships with Indigenous groups in proximity to where Enbridge conducts its business and operations. Where DSM programming is contemplated, Enbridge Gas will engage with applicable Indigenous groups regarding the proposed programming and potential approaches specific to the community in question.

¹ In this proceeding, Enbridge Gas is using the terms Indigenous and Aboriginal interchangeably. A reference to “Indigenous” has the same meaning as a reference to “Aboriginal” in s. 35 of the *Constitution Act, 1982*, which defines the aboriginal peoples of Canada as the First Nations, Inuit and Métis.

² For example, see, *Haida v. British Columbia (Minister of Forests)*, 2004 SCC 73; *Taku River Tlingit First Nation v. British Columbia*, 2004 SCC 74; and *Mikisew Cree First Nation v. Canada*, 2005 SCC 69 and EB-2017-0319, OEB Decision and Order (October 18, 2018), p. 25, wherein the OEB found the Decision at issue in that proceeding to not have any direct material impact on Aboriginal or treaty rights.

ENBRIDGE GAS INC.

Answer to Interrogatory from
Anwaatin Inc. (Anwaatin)

Interrogatory

Issue 17

Reference:

Exhibit E, Tab 4, Schedule 6

Question(s):

Preamble: EGI notes that it “has been limited in the time available to engage stakeholders for a comprehensive review of proposed program updates and other topics for the new DSM Plan.”

EGI further notes that it held individual meetings with representatives from low income customer associations “to provide an update on proposed changes contemplated for the next multi-year DSM Plan, and seek feedback ahead of the submission to refine program design and program delivery strategies.”

EGI indicates that stakeholder engagements and feedback compiled throughout the 2015-2020 DSM Plan and 2021 DSM Plan application is too numerous to summarize in the Application.

- a) Please describe all steps EGI took to engage and consult with Indigenous communities through its stakeholder engagement on the DSM Plan.
- b) Please place EGI’s Indigenous consultation policy with respect to DSM and any and all related documents, presentations or guidelines on the record in this proceeding.
- c) Please indicate whether any of the stakeholders EGI consulted in March 2021 were Indigenous stakeholders (individuals, First Nations, Indigenous-owned businesses, Indigenous associations, Indigenous-rights organizations, etc.). If EGI did not consult any Indigenous stakeholders to seek feedback on proposed changes for the multi-year DSM Plan, please explain why not?
- d) Please provide and summarize all Indigenous-related feedback compiled throughout the 2015-2020 DSM Plan and the 2021 DSM Plan.

Response:

- a) There are a number of ongoing Indigenous engagement activities that Enbridge Gas undertook as part of the development of the Plan, which remain at present, to help identify DSM opportunities for Indigenous customers both in the single family and multi-family offerings.

To date, Enbridge Gas has engaged with the majority of Indigenous on-reserve communities through their Band Council's to promote opportunities through the Home Winterproofing Program (HWP). As detailed in Exhibit I.10b.EGI.STAFF.41 many on-reserve homes have sufficient levels of insulation, or have participated in an alternate weatherization program, or are not interested in participating in HWP. As a result, the Company consulted with, and continues to work with, HWP Indigenous Delivery Agents to understand where remaining DSM opportunities exist and how the offering can continue to best serve its Indigenous on-reserve customers.

Enbridge Gas is also currently working with Urban Indigenous Organizations, Indigenous Housing Entities and other collectives that serve off-reserve populations to help develop a DSM program strategy to support off-reserve Indigenous customers through HWP.

In addition, Enbridge Gas continues to monitor the IESO's progress to finalize its On-Reserve Commercial and Institutional Program. Enbridge Gas will actively pursue opportunities to collaborate with the IESO, where appropriate, to bring DSM opportunities for buildings owned and operated by the community's Band Council as part of the DSM Commercial Program.

Enbridge Gas is committed to building relationships with its Indigenous customers and continuing to work with Indigenous groups and stakeholders, consistent with our Indigenous Peoples Policy, to improve its DSM programming for the benefit of the Indigenous customers Enbridge Gas serves.

- b) Please see attached a copy of Enbridge Inc.'s Indigenous Peoples Policy.
- c) The Low Income Program Stakeholder consultation held in March 2021 were limited to low income customer associations due to the condensed time between the OEB's December Letter finalizing the Post-2020 DSM Framework Stakeholder Consultation process and the invitation to the Company to submit a new DSM Framework and Plan by May 2021. The purpose of the meetings was to provide key updates on proposed changes contemplated in the new DSM Plan, as well as seek feedback ahead of the submission date with Intervenor who the Company anticipated would be participating in the OEB's DSM Plan hearing. Unfortunately, Enbridge Gas was unaware that Anwaatin would be participating in the DSM Plan hearing, as they did not submit their Application for Intervenor Status for this proceeding until June 10, 2021.

- d) Over the last few years, Enbridge Gas has been continuously engaging in ongoing discussions with rights holders over the course of the current DSM plan. Rather than holding more formal sessions, the discussions with the various communities have been ongoing with communities from a DSM and Enbridge Gas perspective. Feedback gathered specifically regarding DSM has often been regarding the outreach methods for HWP, in order to properly engage potential participants on-reserve. Examples where this has been successfully implemented include the use of the Project Lead within each community, training required for that Project Lead to properly promote DSM, the benefits of having an in-person community launch to help support positive outreach and understanding of the program, and other methods to help gain traction and sign-up for HWP. This type of feedback has been ongoing over the years, as Enbridge Gas reaches out to each new community to deliver HWP, as communities reach out to Enbridge Gas with questions and inquiries, as well as through regular interaction with Enbridge Gas's Indigenous Affairs Team.

As the 2015 Aboriginal DSM program was developed within the Legacy Union Gas plan, there was a more formal endeavor to assist Legacy Union Gas launch and grow the offer to on-reserve communities. This included work with Legacy Union Gas' Indigenous Affairs Community Advisors, engagement with various Indigenous on-reserve communities within the Legacy Union franchise area, and discussions with the Chiefs of Ontario.

Please see response to part a for details on engagement in support of 2021 information gathering.

Enbridge Inc. Indigenous Peoples Policy

Enbridge Indigenous Peoples Policy

Enbridge recognizes the diversity of Indigenous Peoples who live where we work and operate. We understand that the history of Indigenous Peoples in both Canada and the United States has had destructive impacts on the social and economic wellbeing of Indigenous Peoples. Enbridge recognizes the importance of reconciliation between Indigenous communities and broader society. Positive relationships with Indigenous Peoples, based on mutual respect and focused on achieving common goals, will create constructive outcomes for Indigenous communities and for Enbridge.

Enbridge commits to pursuing sustainable relationships with Indigenous Nations and groups in proximity to where Enbridge conducts business. To achieve this, Enbridge will govern itself by the following principles:

- We recognize the importance of the United Nations Declaration on the Rights of Indigenous Peoples in the context of existing Canadian law and the legal and constitutional obligations governments in both Canada and the US have to protect those rights.
- We recognize the importance of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) within the context of existing Canadian and U.S. law and the commitments that governments in both countries have made to protecting the rights of Indigenous Peoples.

- We engage in forthright and sincere consultation with Indigenous Peoples about Enbridge's projects and operations through processes that seek to achieve early and meaningful engagement so their input can help define our projects that may occur on lands traditionally used by Indigenous Peoples.
- We commit to working with Indigenous Peoples to achieve benefits for them resulting from Enbridge's projects and operations, including opportunities in training and education, employment, procurement, business development, and community development.
- We foster understanding of the history and culture of Indigenous Peoples among Enbridge's employees and contractors, in order to create better relationships between Enbridge and Indigenous communities.

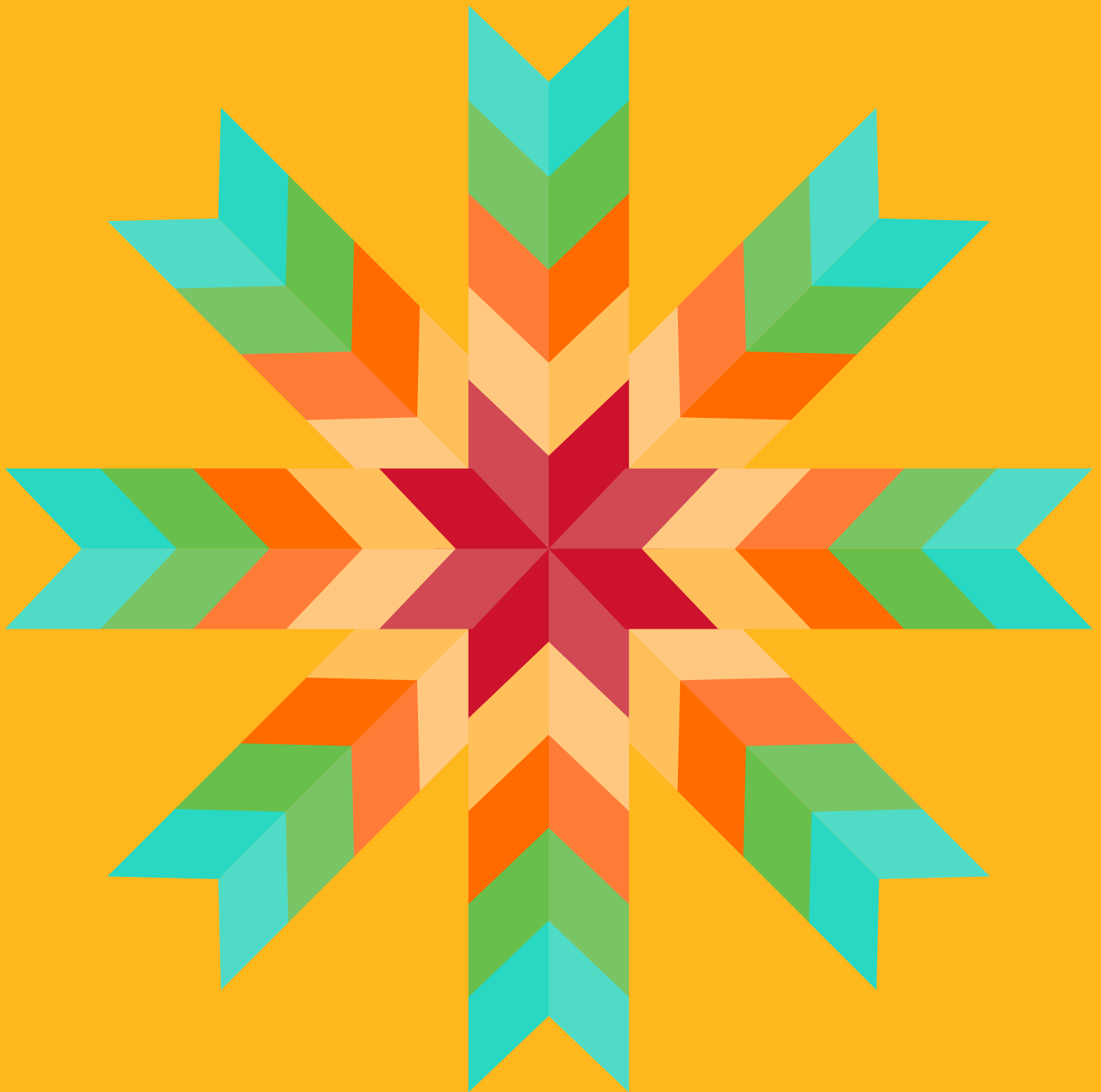
This commitment is a shared responsibility involving Enbridge and its affiliates, employees and contractors, and we will conduct business in a manner that reflects the above principles. Enbridge will provide ongoing leadership and resources to ensure the effective implementation of the above principles, including the development of implementation strategies and specific action plans.

Enbridge commits to periodically reviewing this policy to ensure it remains relevant and meets changing expectations.

Continuing our

Path to Reconciliation

Indigenous engagement
and inclusion – An update



About the design: Over the years, Enbridge has been honored with blankets gifted from Indigenous groups. We proudly display many of these blankets at our corporate and field offices as a sign of respect, inspiration and gratitude for the relationships we have built and nurtured with Indigenous peoples, and the ongoing role we play in walking the important path of reconciliation. We shared images of our gifted blankets with our design partner, a 100% Indigenous-owned creative company. The blankets have served as a source of inspiration for the design of this report and we honor these gifts and their importance to the fabric of our culture, and our dedication to continued learning and inclusion of Indigenous culture, heritage and teachings in our everyday lives.

> Cover image: Edie, a longtime Enbridge employee and part of our growing Indigenous workforce.



About this report

While we have been building relationships with Indigenous groups for many years, Enbridge made a commitment in 2017 to enhance transparency by expanding reporting on the implementation of our Indigenous Peoples Policy and the steps we are taking to integrate Indigenous¹ rights and knowledge into our business across North America. In June 2018, we began to fulfill that commitment with the release of a discussion paper, Indigenous Rights and Relationships in North American Energy Infrastructure (2018 Report), and have since provided an annual overview of our plans, commitments and outcomes with respect to Indigenous inclusion within our 2018-2020 sustainability reports.

This report augments our previous reporting and serves as a voluntary update on our progress since the 2018 Report.

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		22	The journey continues

All dollar amounts are in CAD except when specified in USD.

¹Because Enbridge's operations span North America, our use of the term "Indigenous" denotes Native American Tribes in the United States and First Nations, Métis Nation and Inuit peoples in Canada.

Indigenous engagement and inclusion:

An update on our progress



➤ Line 3 decommissioning crew (Manitoba) wearing orange shirts to mark the National Day for Truth and Reconciliation.


We are at a pivotal moment in history – an awakening – to reset and build a foundational relationship.

There is a shifting of awareness to Indigenous history, culture, rights, engagement and inclusion occurring across North America. This awareness both comes from and places more focus on the evolving legal and constitutional framework. It also fosters greater political and societal attention; provides opportunities to weave Indigenous knowledge, teachings and perspectives into decision making; and is embodied by the courageous sharing of the personal stories and experiences of Indigenous peoples in Canada and the United States.

The recent and ongoing recoveries of the unmarked graves of Indigenous children at former residential schools in Canada are a painful reminder of the inequities and injustices Indigenous peoples across North America have endured and continue to face today.

We have all inherited this position in time together – and we all have a role to play in supporting this awakening by educating ourselves about the truth of the history of Indigenous peoples and then embarking on a path toward reconciliation.

“ Reconciliation cannot begin until the truth is first accepted and better understood. ”
Cadmus Delorme, Chief of the Cowessess First Nation in Canada



Our projects and operations span Treaty and Tribal lands, the National Métis Homeland, unceded lands and the traditional territories of Indigenous Nations, Tribes, Governments and Groups (Indigenous groups)² across North America. Enbridge has consulted and engaged with more than 340 Indigenous groups in Canada and the United States.

We believe we can, and should, be a leader in our industry in Indigenous engagement, inclusion, and awareness – because we have learned we can go further together. Because inclusion creates unique, powerful, respectful and collective opportunities and benefits – for all involved. Because this matters.

Our name, Enbridge, conveys our commitment to being a bridge and leading the way to a safer, cleaner and more sustainable energy future. But a bridge is only as sturdy as its foundation and the structures that support it, and that's why we're working to strengthen an essential component of that structure – fostering trusting, respectful and mutually beneficial relationships with Indigenous peoples.

While we have expanded Indigenous inclusion within our projects and operations, we recognize our journey towards reconciliation is just that, a journey. More time is needed to listen, learn, understand and adapt in tandem with the broader changes taking place in North American society.

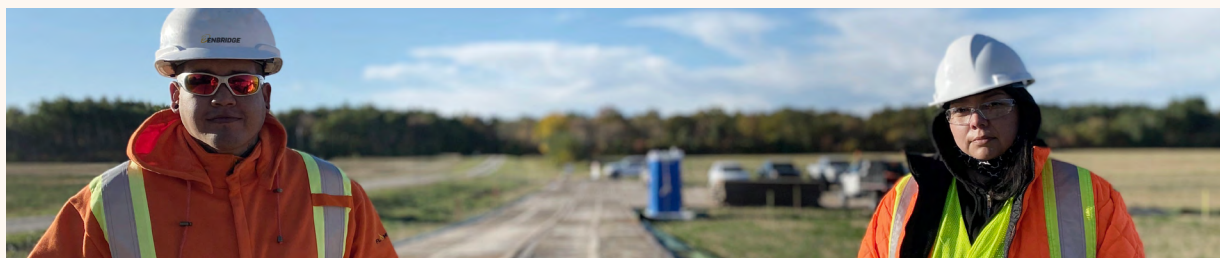
We have more work to do. We are committed to this, and we are committed to bridging the gaps that exist to develop meaningful and sustainable outcomes for Indigenous groups for generations to come.

To continue this work, Enbridge plans to develop a Reconciliation Action Plan in 2022. The Reconciliation Action Plan will outline our commitments and a plan of action going forward.

“ I'm proud of the path Enbridge has taken to increase engagement and inclusion of Indigenous peoples. Through this work we are learning from Indigenous communities and maturing as a business, resulting in better protection of valuable Indigenous resources and improved quality of life throughout the lifecycle of Enbridge's assets. ”

Paul Eberth, Director of Tribal Engagement

²In this report we are using the term, “Indigenous groups” when referring to Indigenous nations, governments or groups in Canada and/or Native American Tribes and Tribal associations in the United States. We have the utmost respect for the unique rights and individual names of Indigenous groups across North America. This collective term is used solely for the purpose of the readability of the report and is not meant disrespectfully.



> Line 3 decommissioning Canada, Indigenous Liaison and Indigenous Construction Monitor.

Spotlight: Outcomes of focused engagement and inclusion

We last provided a dedicated report on our Indigenous engagement, inclusion and outcomes in the 2018 Report. Since that time, we have:

- Adopted a lifecycle approach, inclusive of feedback received from Indigenous groups, which means we will continuously engage throughout the life of our assets, not just when we have a project to build
- Increased total spending with Indigenous businesses, including contracting and wages paid to Indigenous workers, to more than \$1.8 billion in total spend, an increase of more than \$1.3 billion dollars since the 2018 Report
- Provided nearly \$12 million in community investments to Indigenous groups
 - This included \$2.2 million in COVID-19 relief to more than 150 Indigenous groups located near our assets that faced unique hardships due to the pandemic
- Completed what we believe to be the largest Indigenous cultural resources survey in the U.S. energy industry, along the Line 3 Replacement Program route in Minnesota
- Provided Indigenous awareness training to approximately 5,500 employees online (roughly 50 percent of our workforce) and 1,500 employees in-person (roughly 14 percent of our workforce) as of February 2022
- In November 2020, committed to having 100 percent of Enbridge employees complete online Indigenous awareness training by the end of 2022
- Committed to 3.5 percent representation of Indigenous peoples in our workforce by 2025, which has considered the demographics across our operating areas in Canada and the U.S., the labor market and our anticipated pace of hiring. With a current percentage of 2.2 percent representation, we are continuing our efforts to achieve this goal.

Additional details are featured throughout this report.

Approach to Indigenous relationships



➤ Indigenous construction workers building the Line 3 replacement pipeline in the U.S.

Building respectful relationships with Indigenous groups has historically been part of our business, although our approach and guiding policies have had to evolve over time. Our first Indigenous Peoples Policy was introduced in 2001, and guided our engagement with Indigenous groups both within and outside of North America. In 2009, with assets focused solely within Canada and the United States, we updated our approach and released the Aboriginal and Native American Policy. That policy was further updated in 2016 and 2018 to the current Indigenous Peoples Policy (IPP) in response to the Truth and Reconciliation

Report: Call to Action #92 and to recognize the importance of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). At Enbridge, we're working to build sustainable respectful relationships, with the goal of working with potentially impacted Indigenous groups to identify and resolve concerns. We have been, and continue to be, focused on integrating our commitments under the IPP into our internal processes and systems and turning our commitments into concrete actions through the development of our lifecycle approach discussed later in this document.

Setting up for success



➤ Gordon Construction, an Indigenous company involved in Line 3 Replacement construction in the U.S.

In order to live our values and effectively and consistently implement our IPP commitments, we have worked internally across our organization to improve how we execute our objectives and commitments around Indigenous engagement and inclusion. This has been an important step to establish clarity on responsibilities and accountabilities and to help guide engagement that must be both consistent and flexible – taking into account the uniqueness of the geographic regions we work within and Indigenous groups with whom we engage. We continue to listen, learn and adapt – always with the objectives of improving how we build stronger relationships and working partnerships.

We are grateful for the time and energy many Indigenous leaders, Elders and Indigenous groups have provided to us while engaging on project plans, our operations and activities. By sharing their perspectives, interests and traditional and cultural knowledge, and outlining

the needs and skills of their respective Nations, groups and governments we strengthen our relationships and improve the outcomes.

Lifecycle approach

We are committed to building respectful, constructive and enduring relationships that foster trust with and generate benefits for Indigenous groups over the lifecycle of our assets – from project proposals and design through construction, operations, maintenance and, to ultimately and safely removing a pipeline from service at the end of its useful life³. We recognize consistency and continuity are important to developing and maintaining positive relationships. Long-term relationships are built on trust and respect, and are critical to creating sustainable and mutually beneficial outcomes.

We have come to recognize the need for continual engagement – not just when we're actively working in an area or during a project, but constantly and consistently with all those in proximity to our operating assets.

³ Removing the pipeline from service is called decommissioning in Canada and deactivation in the United States.



In 2019, we adopted our Indigenous Lifecycle Engagement Framework, which operationalizes our commitment and outlines internal guidelines for engagement with Indigenous groups. The framework ensures consistent engagement approaches and standards of practice across our operating regions in North America. It embeds our commitment to creating systemic and sustainable opportunities for Indigenous inclusion into our foundational processes going forward.

Through our dynamic engagement process, we are listening and learning about the interests, needs and values of the people and communities who live and work near our projects and operations. This information continues to help inform and shape our lifecycle approach. As the world changes, we expect the needs of communities to evolve, our knowledge to increase, and our framework to continue to change and grow in response.

Through the implementation of the framework in 2019, we have introduced a number of standards of practice to provide a consistent, respectful approach that aims to recognize the diversity and uniqueness of the Indigenous groups with whom we engage. This includes:

- **Long-term agreements and engagement protocols** during our operations that outline expectations and provide an avenue for ongoing information sharing and relationship building
- **Financial participation and inclusion**, including direct Indigenous participation on new or greenfield projects
- Increased transparency and participation in **historical site remediation, maintenance digs, use of Indigenous Traditional Knowledge/Traditional Land Use** data; and **facilitation of Indigenous participation**, especially as it relates to protecting Indigenous cultural resources and sites
- Creating awareness of and encouraging participation in Enbridge's **emergency response**
- The engagement and inclusion of **Indigenous contractors and businesses** through the use of tools such as our Socio-Economic Requirements of Contractors

Oversight of the framework's implementation and our approach to Indigenous engagement continues to be through an Executive Steering Committee comprised of members of our senior executive leadership team, thereby reinforcing the integration of the framework across the company. Ongoing responsibility for living our values and commitments around Indigenous inclusion permeates the organization through multidisciplinary teams and our **Indigenous Employee Resource Group**. This internal group, comprised of Indigenous employees and allies from across the company, provides Indigenous perspective and advice, supports Indigenous employees, and creates awareness and understanding of Indigenous history and culture.

Plans in action: A pioneering economic and environmental partnership

In February 2022, Enbridge and five Indigenous communities in Alberta announced our intention to partner to advance a proposed carbon transportation and storage hub west of Edmonton.

Once built, the Open Access Wabamun Carbon Hub will transport captured carbon-dioxide (CO₂) via pipeline, from large industrial operators (such as Capital Power and Lehigh Cement) in the west-Edmonton region, and safely and permanently sequester it in deep underground geological formations. Such projects are seen by organizations like the International Energy Agency as critical if countries like Canada are going to effectively combat climate change and achieve near- and long-term goals, including net-zero emissions by 2050.

The Hub proposal is being evaluated by the Alberta government, which is expected to award the rights to sequester the CO₂ underground in various regions of the province in a phased approach beginning in the first half of 2022.

Four Treaty 6 Nations which make up the First Nations Capital Investment Partnership (Alexander First Nation, Alexis First Nation,



> Colin Gruending is flanked by Treaty 6 Chiefs (from left): Chief Arthur Rain (Paul First Nation); Chief George Arcand Jr. (Alexander First Nation), Colin Gruending, Chief Billy Morin (Enoch Cree Nation), Chief Tony Alexis (Alexis First Nation).

Enoch Cree Nation and Paul First Nation), have signed an agreement with Enbridge to pursue ownership in future carbon transportation and storage projects associated with the Hub. Under a separate agreement, the Lac Ste. Anne Métis Community will also have an opportunity to acquire an equity interest.

As carbon transportation and storage projects proceed within the Hub, Enbridge will look to utilize Indigenous contractors as direct contractors, sub-contractors and suppliers.

“ This path creates an opportunity to generate wealth, but more importantly it allows sustainable economic sovereignty for our communities. We are creating a healthy future for the next seven generations to thrive. We’re looking forward to working with industry leaders who share our values of environmental stewardship and to collaborate with Enbridge on world-scale carbon transportation and storage infrastructure investments. ”

**George Arcand Jr.,
Chief of the Alexander First Nation**

“ This is an exciting opportunity to meaningfully involve local Indigenous communities in the energy transition underway today. We’re thrilled to be working with these Treaty 6 Nations and the Lac Ste. Anne Métis Community to advance projects that will benefit Indigenous people and help Alberta and Canada meet its climate change goals while supporting economic recovery. ”

**Colin Gruending,
Executive Vice President and President,
Liquids Pipelines**



Plans in action: Line 3 Replacement Program (Minnesota, United States) – Community Liaison Program

Enbridge implemented an Indigenous community liaison program in Minnesota through the construction of the Line 3 replacement pipeline. The role of the community liaisons has been instrumental in increasing awareness, information sharing and transparency between Indigenous groups and Enbridge. In alignment with our lifecycle approach, Enbridge plans to maintain components of this program to provide continuity and ongoing engagement now that Line 3 construction is complete.

“ As a tribal/community liaison, I am proud to be a part of this. I took this position on to make a difference, create awareness, educate our tribal communities on Enbridge and the opportunities they are providing for our people and sharing the truth not perception. I am a cultural resource to assist, guide and educate regarding our culture, history and knowledge. We are learning and working together for a better future for all, thank you for a chance to make a difference. ”

Diane, Tribal Liaison

“ As I look at Enbridge’s engagement with Indigenous peoples, the three L’s of Line 3 came to mind for me. Listen to it. Learn it. Live It. That’s what Enbridge did. ”

Roland, Tribal Liaison

Spotlight: Innovation in engagement

With the onset of the COVID-19 pandemic, stay-at-home orders issued across North America and with Indigenous communities locked down to outside visitors, Enbridge, like so many organizations and individuals globally, needed to find new and innovative ways to remain connected. We transitioned from in-person to virtual/online workshops and meetings to deliver materials, provide opportunities for dialogue, seek feedback on our projects and continue to ensure inclusion in field activities.

In eastern Canada, this included taking archaeological field survey video footage to share with Indigenous groups to facilitate virtual monitoring of proposed projects. In the Prairie provinces, we shifted from in-person roundtable sessions with Indigenous groups to hosting webcasts to provide updates on the Line 3 Replacement Program, including the Line 3 Decommissioning regulatory filings. In northeast British Columbia, this meant mounting video cameras on helicopters completing area flyovers to share and review with Indigenous communities to facilitate discussions around caribou habitat restoration.

Sustaining and celebrating Indigenous culture



➤ Blessing ceremony before our emergency response exercise in Manitoba.

In alignment with our IPP, we continue to bridge knowledge gaps, foster understanding, and seek further advice from Indigenous groups on the history and culture of Indigenous peoples among our employees and contractors. This knowledge and guidance from Indigenous groups has created opportunities for increased collaboration, shared understanding and protection of Indigenous cultural resources.

Traditional Land Use information

To identify areas of significant heritage, cultural and traditional importance, Enbridge regularly offers funding for Traditional Land Use (TLU) studies on our projects. Information gathered is used in route and infrastructure planning to

avoid or mitigate potential impacts on sites of importance. The information is preserved on a confidential basis to facilitate continued mitigation, should the information be applicable to future activities that could potentially impact the sites. In collaboration and alignment with Indigenous groups, Enbridge has begun to map cultural sites across our pipeline system, beginning with the Line 3 Replacement Program to ensure we avoid or mitigate potential impacts through project construction, during operation of our assets and in the unlikely event of a release. Once the mapping is complete, Enbridge will engage with Indigenous groups that provided the information during the projects to verify the sites.

Plans in action: Cultural Resources Survey

From 2017 to 2019, we conducted a first-of-its-kind Tribal Cultural Resource Survey. Managed by the Fond du Lac Band of Lake Superior Chippewa, experts from 30 federally recognized tribes collaborated on the review of the full 337-mile (541-km) Line 3 Replacement Program route through Minnesota. Sixty significant cultural locations were identified for further avoidance, mitigation treatments or tribal monitoring. Enbridge incorporated these recommendations into its project plans. To ensure cultural resources are protected, construction of the Line 3 replacement pipeline in the United States has been supervised by tribal monitors, with authority to stop construction. This is a similar approach to that

which was applied during construction in Canada, utilizing TLU studies completed by Indigenous groups to guide the protection of cultural sites through the Tribal Monitoring Program.

“A project like this has never been done across Tribal communities or energy companies. They really set a precedent.”

Jim Jones, a Leech Lake Band of Ojibwe member and a project manager for the survey

If you'd like to read more, please visit our site [here](#).

Indigenous awareness education

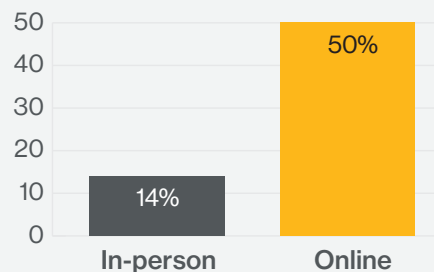
Developing a deep understanding of the history, rights, culture and knowledge of Indigenous peoples is essential to recognizing the necessity of reconciliation. Cultivating and supporting this understanding is central to our value of inclusion. While Indigenous awareness training has been a part of our approach for a number of years, it has never been required across the company – until now.

We are committed to having 100 percent of Enbridge's employees complete online Indigenous awareness training by the end of 2022.

Since 2018, we have advanced this training to provide increased exposure, experiences and relevant information to build a deeper understanding of and appreciation for Indigenous peoples. This includes an overview

Indigenous awareness education participation as of February 2022

(percent of workforce)



of key concepts, including government laws and policies and their effects on Indigenous peoples; the protection and restoration of treaty rights; and a raising of awareness of the historical injustices and lasting impacts of the treatment of Indigenous peoples.

Training is now available online and in-person for internal teams to delve deeper in their learning and understanding of Indigenous culture with a focus on the truth of truth and reconciliation. To augment this training, we have developed an Indigenous and Tribal Land Acknowledgment Guide reinforcing the importance of the Indigenous connection to the land and our role in this relationship with Indigenous groups.

The feedback we have received from employees in both the United States and Canada following Cultural Awareness training has been overwhelmingly positive, appreciative, and in some cases, transformative.

“ My participation in the training has really changed my perspective on a lot of things; woken me up to a lot of the bias that I was told/learned over the years. After taking this session it made me into someone that wanted to be involved and champion awareness not only at work but in my personal life as well. ”

Jay, Supervisor Operations



➤ Bee Schadeck, a long-time Indigenous awareness presenter for Enbridge.

“ Before attending the Indigenous Awareness training I had known very little about Canada’s history of the residential school systems and the atrocities that were committed ... I can say my attitudes, heart and overall understanding of Indigenous peoples and their history has opened entirely new perspectives for me. ”

Inara, Regional Maintenance Analyst

Project specific Indigenous Awareness training was provided to 11,600 employees and contractors working on the Line 3 Replacement Program in the United States. In addition, and in response to local concerns, Enbridge developed a Human Trafficking Awareness Prevention Program, which included a training video produced in partnership with local tribes. This program focused on Missing and Murdered Indigenous Women and Girls, and participation was required of all personnel working on the Line 3 Replacement Program in the United States.

As we gain a better understanding of the history, culture and perspectives of Indigenous peoples, we are greater prepared to have meaningful and honest conversations on our projects and operations, to better understand interests, and to ensure inclusion of Indigenous feedback into our projects and operations.

Indigenous education and employment



➤ Enbridge Indigenous Recruitment Advisor, Mark Shilliday.

There are currently more than 230 self-identified Indigenous people employed by Enbridge across North America, and approximately 34 percent of those are in specialist or leadership roles. This accounts for 2.2 percent of our workforce. Enbridge is focused on increasing employment numbers and including Indigenous representation and perspective in our day-to-day operations.

One of our 2020 sustainability goals is achieving 3.5 percent representation of Indigenous peoples in our North American permanent workforce by 2025. When we considered the demographics across our operating areas, the labor market and our anticipated pace of hiring, 3.5 percent became an appropriate target to help us be more reflective of the communities where we operate. With a workforce of roughly 11,000 employees, reaching this goal will be a challenge – but we know in order for meaningful change to occur we must challenge ourselves.

To help us meet this goal, we are working to decrease barriers to employment and increase retention. We have established an internal

Indigenous employment initiative working group; hired an Indigenous recruiter; provide guidance for culturally appropriate interview processes; continued and expanded Indigenous Employee Resource Groups within Enbridge; and continue to maintain contact information for Indigenous groups with respect to job opportunities. In addition, we offer apprenticeship/intern programs in a number of our operating regions, and annually allocate at least one of our six rotational engineering internship positions for an Indigenous engineer in training. Over the past two years, 183 self-identified Indigenous people have completed workforce training sponsored by Enbridge in the United States.

We are increasing Indigenous representation in some areas of the company; however, we know we can and must do better. We are creating multiple pathways to employment including increased permanent, contract and apprenticeship positions, as well as increasing Indigenous perspectives in more areas of our business and sustaining a culturally welcoming and supportive environment for Indigenous employees. Enbridge strives to be a preferred employer for Indigenous peoples.



On September 30, 2021, Canada's first National Day for Truth and Reconciliation, we acknowledged the importance of this day and our employees in Canada were given the day off for personal reflection or education. In 2022 in the United States, we have taken a similar approach, and provided our employees the option of taking National Indigenous Peoples Day on October 11 or Martin Luther King Jr. day on January 17 as a day off for reflection. We will continue to find ways to live our values and provide our people the space and capacity to pause, listen, honor and learn.

“ As a young Indigenous professional, one of the key considerations I've maintained as I've began my career has always centered around the word “opportunity.” For me, that meant joining an organization that not only provided me the opportunity to deliver on work that I believe in, but more importantly presented me with the opportunity to be part of an organization that both recognizes the changing landscape related to reconciliation and wants to be an industry leader in those efforts. I have been consistently reassured since joining Enbridge that this is an organization that reflects my values by taking seriously its role in reconciliation and continuing to learn how to walk the good path. ”

Matt, Senior Analyst Community and Indigenous Engagement

“ Many individuals had reached out to me to have a virtual video call to introduce themselves. This signified that they found my being here important and cleared time in their schedule to make me feel welcome ... I have never worked for an employer with as many Indigenous employees that I got to work alongside. I have also never seen another company work as hard as Enbridge does to hire on Indigenous companies to work along the pipeline. ”

T'Kaela, Summer Student



> We developed Every Child Matters hard hat stickers for those in the field to show support for the National Day for Truth and Reconciliation.

Corporate citizenship

At Enbridge, we place high priority on the role we play in contributing to safety, vitality and sustainability of the people and communities with whom we engage. Our investments are guided by dialogue with Indigenous groups and are focused on creating impactful and meaningful outcomes. Since 2018, Enbridge has contributed nearly \$12 million to Indigenous groups in North America. This investment has included over \$500,000 for Indigenous language preservation, support of nearly 300 cultural events, as well as investments that support food security, safety, youth capacity building, habitat remediation and conservation,

disaster relief, resiliency, environmental initiatives and supporting the energy transition. With the onset of the COVID-19 pandemic we focused our energy and efforts on pandemic response, including providing \$2.2 million in COVID-19 relief to more than 150 Indigenous groups located near our assets.

To learn more about our partnerships in action, such as support for the Elbow River Camp, Transition to Campus Life, Waubun-Ogema-White Earth Mahnomen and the Indigenous Peoples Resilience Fund, please visit www.enbridge.com/indigenous.



➤ One of our 2021 Indigenous summer students ready for a field visit.

Indigenous economic engagement and inclusion

Economic inclusion has long been an important part of our collaborative engagement with Indigenous groups. Even prior to the implementation of our 2009 Aboriginal and Native American Policy, we worked to create mutual benefits from the projects we engaged on.

Since the 2018 Report, we have further refined our processes to provide more internal awareness and clarity to our projects and operations teams through:

- Utilizing our Socio-Economic Requirement of Contractors process to ensure local Indigenous businesses are engaged in potential contracting and sub-contracting opportunities
- Maintaining an Indigenous business database
- Reaffirming our commitment to our [Supplier Diversity Policy](#)
- Utilizing Business Information Sheets provided by Indigenous groups to understand their businesses and affiliated businesses
- Including qualified Indigenous businesses in master service contracting opportunities directly with Enbridge
- Inviting only Indigenous businesses and Indigenous affiliated businesses to bid on general contracting for the decommissioning portion of the Line 3 Replacement Program in Canada
- Supporting the pre-qualification of Indigenous businesses so they can be ready when opportunities to provide services arise

Since our 2018 Report, we have worked with Indigenous groups and businesses to achieve more than a billion-dollar increase in contracting spend with Indigenous businesses and affiliated businesses and wages paid to Indigenous workers in Canada and the United States. While the bulk of this spending is a result of the Line 3 Replacement Program, the largest capital project in our history to date, we are committed to working with Indigenous groups to maximize inclusion and benefit and will continue to work with Indigenous businesses to offer economic opportunity from future projects and operations.



> Jeta Corporation, an Indigenous woman-owned distribution and supply company who provided contract work for Enbridge. Learn more [here](#).

Plans in action: Gas Distribution and Storage – Indigenous Mentorship Program

Our gas distribution operations has commenced a third year of an Indigenous employee mentorship program in northern Ontario. This program, and associated recruitment efforts, focus on mentorship, skills development, sharing learnings and identifying pathways to full-time employment. In 2021, Enbridge hired four Indigenous mentees (three in the office, one in the field) with a

fifth program participant hired on in a full-time construction laborer position. Enbridge has also partnered with the Métis Nation of Ontario as part of a Métis Youth Internship Program to on-board one additional Indigenous representative to our construction team. In addition, an Indigenous Community Outreach program has been initiated. This program will focus on expanding the mentorship program across Ontario in 2022 to create further internal supports to increase and support partnerships and collaboration with Indigenous businesses.

Environmental management

Enbridge continues to engage with and include Indigenous groups in our environmental management activities. We are learning and adapting our strategies and activities through early and ongoing engagement to refine and improve our practices and provide participation opportunities during projects and operations. In 2018, we committed to seeking the participation of Indigenous monitors from potentially impacted Indigenous groups and we continue to do so in areas where access is granted by the landowner.



➤ Indigenous representatives touring a horizontal directional drilling of a creek in Alberta, Canada.

Plans in action: Line 21 (Norman Wells Pipeline) – Traditional, Cultural, Wildlife and Environmental Knowledge Program

A Traditional, Cultural, Wildlife and Environment Knowledge Program is a land-based cultural learning initiative jointly developed by Indigenous leadership, youth and Enbridge in 2018 in the Northwest Territories. Enbridge continues to provide annual funding through the Enbridge Fueling Futures grant program that supports the connection of Elders and Indigenous youth with the environment. Participants in the program can utilize a journal to record and share knowledge, experiences and reflections from being on the land as they build their understanding of tradition and culture.

Emergency preparedness and response

Since 2018, Enbridge has been establishing release notification protocols to ensure Indigenous groups are aware and engaged in the event of any releases on our pipeline systems. These protocols are in direct response to feedback from Indigenous groups, who have requested information and engagement on our emergency response activities within their traditional territories. These protocols are being

developed and implemented in all of our Liquids Pipelines regions.

Enbridge is also committed to sharing emergency management materials and encouraging participation of Indigenous observers in emergency response exercises, as demonstrated by the 2021 exercise in Wawanesa, Manitoba.

Spotlight: Emergency response exercise in Manitoba

As one component of providing information and education on our operations, in 2021, for the first time, we held a full-scale emergency response exercise with the inclusion of Indigenous perspectives in the planning, and participation as virtual observers (COVID-19 restrictions prevented in-person attendance). In all, 121 individuals representing 56 Indigenous groups throughout Alberta, Saskatchewan and Manitoba were invited to participate in the exercise, which took place along a bend of the Souris River in Wawanesa, Manitoba. Sixty invitees tuned in to their computer screens to observe the exercise. The training commenced with an Indigenous cultural assessment and blessing at the site the day before the exercise.



➤ Indigenous representative on the ground during our full-scale emergency response exercise in Manitoba.

Working together:

An update on the Line 3 Replacement Program

Enbridge's Line 3 Replacement Program (Line 3) is the largest project in Enbridge's history. The replacement pipeline is now fully in service in Canada and the United States. Indigenous businesses and workers on both sides of the border played a significant role in completing this essential maintenance project. With the replacement pipeline now fully operational, our focus has turned to safely removing the existing Line 3 pipeline from service⁴ in accordance with Canadian and United States environmental and other regulatory approvals.

To learn more about Line 3, please visit the project page [here](#).

Highlights of Line 3 (Canada)

With our Indigenous partners in Canada, we:

- Generated more than \$480 million in spend with Indigenous businesses and communities, including \$124 million in wages for Indigenous workers
- Employed over 1,100 Indigenous workers on the construction of Line 3 in Canada, which comprised 20 percent of the overall workforce
- Focused on Indigenous-only requests for proposal processes whereby the decommissioning work will be completed by Indigenous businesses and their affiliated businesses

Highlights of Line 3 (United States)

With our Indigenous partners in the United States, and with the construction of Line 3 in the United States completed in September 2021, we have:

- Generated more than US\$356.8 million in spend with Indigenous businesses and communities, including US\$39.6 million in wages for Indigenous workers, surpassing our commitment of US\$100 million of economic opportunities as of September 30, 2021
- Employed over 850 Indigenous workers on construction of Line 3 in the United States, ultimately comprising more than 7 percent of the overall workforce

The construction of Line 3 could not have been possible without listening to, and working collaboratively with Indigenous groups in Canada and the United States. Working together clearly demonstrates how we can achieve mutual benefits that positively impact both of us today and into the future.



> Line 3 Decommissioning Canada.

⁴For this project, the process is called "decommissioning" in Canada and "deactivation" in the United States.

The journey continues



> Enbridge Tribal engagement advisor and representative from Sac and Fox Nation in Oklahoma.

Our approach to Indigenous engagement and inclusion is continuously evolving. While we have made strides to embed Indigenous inclusion into our business, and we are making progress, we know there is more work to be done. We are committed to this work and to challenging ourselves, our peers, our leaders and our associates to live our values and be innovative and progressive in our approach to collaboration and inclusion.

Our goal is to create and nurture sustainable, respectful and mutually beneficial relationships with Indigenous groups in the areas in which we operate, while ensuring our projects and operations are structured to ensure the land is protected for seven generations and beyond.

As we learn more, as we confront our truths, we create a path that we can walk, together, towards reconciliation.

“While we are proud of our accomplishments and outcomes to date, this is a journey where the destination isn’t an ending but rather an opportunity for continual learning and improvement. A bridge to our energy future has to include continued focus on improved collaboration with and inclusion of Indigenous peoples – and it has to include a commitment to challenge ourselves to cultivate continued discussion, reflection, collaboration, and ultimately, action.”

Kim Brenneis, Director Community and Indigenous Engagement Canada



About Enbridge

Enbridge is a leading North American energy infrastructure company. We safely and reliably deliver the energy people want and need to fuel quality of life. Whether it is crude oil, natural gas or renewable power, Enbridge delivers the energy required to heat homes, feed families, fuel vehicles, power industry and benefit society in thousands of ways. The Company is headquartered on Treaty 7 lands and a portion of the Métis Homeland in Calgary, Canada, with major offices across Turtle Island⁵ in Houston, Edmonton, Toronto, Duluth and Chatham. For more information, visit www.enbridge.com.

Our values

At Enbridge, our core values – Safety, Integrity, Respect and Inclusion – reflect what is truly important to us as a company. These values represent the ‘north star’ for our organization, a constant beacon by which we make our decisions, as a company and as individual employees, every day. We recently added **Inclusion** as a core value. In 2020, we invested time and energy to deeply listen to our employees speak about their experiences, including the lived experiences and barriers faced by Indigenous peoples, and committed to upholding these values as we collectively walk a path to reconciliation.

⁵Turtle Island is the term used by many Indigenous peoples for North America and is rooted in shared creation stories.

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ENBRIDGE GAS DSM PLAN - LOW INCOME PROGRAM

Low Income Sector Strategy

1. Enbridge Gas has a strong history of successful delivery of energy efficiency programs specifically designed to meet the needs of lower income customers. There are two different measures of poverty and housing need, the Low Income Measure, after tax ("LIM-AT") and Core Housing Need ("CHN"), that each suggest about 15% of people in Ontario fall below the threshold for each measure.¹ Enbridge Gas's Low Income program is intended to serve these constituents, including families living in both social and privately owned housing, and in both single and multi-family residential buildings across the province.
2. Of growing concern, Ontario is at risk of losing considerable supply of social and affordable housing stock due to deteriorating conditions and expiring social housing provider agreements. At present, a large portion of affordable housing stock is over 40 years old and large investment is needed to preserve housing suitability.² It is estimated that about a third of available social housing stock could expire and transition to privately owned and operated housing in the next 10 years.³
3. Enbridge Gas is uniquely positioned to support broader investment into the capital upgrades and energy retrofit requirements facing these buildings. Enbridge Gas has the experience and record of success in delivering programming, including financial incentives and technical support, to facilitate upgrades in the energy systems of

¹ Community housing renewal: Ontario's action plan under the National Housing Strategy, Ministry of Municipal Affairs and Housing. <https://www.ontario.ca/document/community-housing-renewal-ontarios-action-plan-under-national-housing-strategy/housing-needs-ontario>

² Ibid.

³ Ibid, sourced from Auditor General of Ontario, Annual Report 2017.

social housing buildings. Enbridge Gas also recognizes that increasing numbers of low income customers are living in privately owned buildings due to the shortage of social housing in the province, and appreciates the need to improve efforts to identify and target these buildings franchise-wide by extending support through the Affordable Housing Multi-Residential offering.

Barriers

4. Low income households can be challenging to find, often because customers are hesitant to self-identify as low income. Once identified, there are several other barriers preventing low income customers from participating in energy efficiency programs, including:
 - Affordability and access to funds to make equipment upgrades and repairs;
 - Awareness or limited understanding of energy and energy use;
 - Competing priorities for necessities such as food, shelter, health and safety;
 - Lack of trust – skepticism that “nothing is free”, or fear of claw backs of financial assistance; and
 - Communication / language barriers.
5. In addition, physical and structural problems within the housing units such as the presence of asbestos, pest infiltration or excessive hoarding, elevates the challenge and safety risk for residents (as well as contractors) in undertaking improvement projects. In these unfortunate instances, units are ineligible for participation until environmental and safety risks are adequately addressed.
6. Enbridge Gas works closely with its network of community-based organizations, local community service providers, social and assisted housing networks, non-profit organizations, and faith-based organizations to gain trust and improve accessibility to programming.

7. In the case of multi-residential low income housing, barriers can include:

- competing priorities and lack of capital;
- a lack of awareness of efficiency upgrade opportunities;
- challenges understanding the complexities of a building's energy management;
- confusion or incorrect assumptions of perceived complicated participation requirements;
- other available funding involves a complex process to navigate which poses a barrier and timelines can be slow causing the housing provider to bear more costs; and
- limited human resources to identify and undertake efficiency projects.

8. The Low Income program has evolved over the last 15 years to meet the changing needs of customers and adapt to evolving market conditions. Enbridge Gas continuously monitors the cost of delivery, evaluates the mix of measures offered and tests modifications to incentive strategies to optimize results. Especially important with this market segment, Enbridge Gas routinely seeks customer feedback, learns from the on-the-ground experience of delivery agents, and solicits the valuable insights provided by key interested stakeholders with expertise in this sector.

9. Enbridge Gas consulted with several familiar stakeholders in preparing this application to revisit discussions for potential improvements. Enbridge Gas's proposals received positive support and stakeholders provided constructive feedback.

Low Income Program Proposal

10. Low income programming encompasses the following important components:

- Strategic outreach specifically tailored to the unique characteristics of hard-to-reach customers;
- Updated, province-wide income eligibility criteria, consistent with CDM criteria;
- Turnkey, fully funded weatherization programming for income qualified residents of single family and low-rise social housing;
- Inclusion of a health and safety budget to improve the safety and well-being of the home and aid in removing barriers to participation;
- Standardized private multi-residential building eligibility screening; and
- Enhanced incentives, low or no cost direct install measures to improve economic feasibility of efficiency projects contributing to the preservation and improvement of the multi-residential social and assisted housing supply and privately-owned multi-residential buildings with high incidence of low income tenants.

11. A high-level description of the Low Income Program offerings as well as their associated are listed below:

<u>Offering Name</u>	<u>High Level Description</u>	<u>Key Offering Elements</u>
Home Winterproofing	A free home energy assessment and weatherization services (i.e. insulation and air sealing) provided where possible at no-cost/low-cost to eligible participants.	<ul style="list-style-type: none"> • Free energy assessment • Full weatherization upgrades and direct install of improvement measures • Customer education and energy literacy

		<ul style="list-style-type: none"> • Health and safety components • Outreach and training to intake agencies • Marketing and Communications
Affordable Housing Multi-Residential	Enhanced prescriptive, custom, and direct install incentives for natural gas savings for multi-residential buildings classified as either social housing or privately owned buildings demonstrating high incidence of low income tenants.	<ul style="list-style-type: none"> • Financial Supports • Energy Assessments • Technical Assistance • Opportunity Identification • Education/Webinars/ • Marketing/ Communications

OEB Objectives and Guiding Principles

12. Enbridge Gas is pleased to continue delivering comprehensive programming for the low income sector through its franchise-wide Home Winterproofing and the Affordable Housing Multi-Residential offerings. In direct response to the OEB's primary objective for DSM, these offerings will continue to focus on supporting natural gas reductions through the installation of energy efficiency upgrades and building envelope improvements to achieve water and space heating savings and

help low income households become “more efficient in order to help better manage their energy bills.”⁴

13. In line with guiding principles (and the OEB’s specific direction in its December 1, 2020 letter), signaling that DSM planning should ensure that “small volume, low income and on-reserve First Nations communities are well served,”⁵ the Low Income Single Family and Affordable Housing Multi-Residential offerings are designed distinctly from the other mass residential and commercial offerings to recognize and address the unique customer needs and barriers to participation faced by this market segment.
14. Similarly, reflecting DSM guiding principles, the Low Income program is “designed to provide opportunities for a broad spectrum of consumer groups and customer needs to encourage widespread customer participation over time and ensure all segments of the market are reached.”⁶ Within the low income customer group, there are several particularly hard-to-reach subgroups that require tailored customer outreach, notably First Nations communities, other visible minorities, recent immigrants and senior citizens.
15. Importantly, and also reflecting guiding principles, Enbridge Gas is engaged with the IESO examining how to appropriately coordinate DSM and electricity CDM efforts geared to low income households across the province. Enbridge Gas has already aligned income eligibility requirements for the Home Winterproofing program (“HWP”) with the electricity income tested CDM program eligibility requirements, consistent with the Energy Affordability Program. Currently, Enbridge Gas and the IESO are in discussions exploring the possibility of a coordinated delivery of the

⁴ EB-2019-0003, OEB Letter Post-2020 Natural Gas Demand Side Management Framework (December 1, 2020), p. 2.

⁵ Ibid, p. 5.

⁶ EB-2021-0002, Application, Proposed Framework, Exhibit C, Tab 1, Schedule 1, p. 6.

single family low income offerings. This would allow for a single point of entry to province-wide programs for income eligible customers.

Home Winterproofing Offering

Background

16. This offering continues to support the province's most vulnerable populations by improving the energy efficiency of their homes and assisting customers in managing their natural gas bills. Low income is commonly described as households spending 30% or more of household income towards shelter costs.⁷ For customers in this position, disposable household income to finance energy efficiency improvements which will result in savings on energy bills, is not typically available. To support these customers, the Home Winterproofing offering provides free energy assessments and no-cost/low-cost, direct install and weatherization upgrades to improve the home. To maximize the value of the free in-home energy assessment, Energy Advisors educate participants on how to manage energy use, and where warranted, implement health and safety measures.

Objective

17. The objective of the Home Winterproofing offering is to reduce energy costs for residents of single family households (typically low-rise housing including but not limited to detached, semi-detached, row/townhouse or mobile home with permanent foundation) by improving the energy efficiency of their homes.

Target Market

18. The target market for the Home Winterproofing offering includes:

⁷ <https://www.cmhc-schl.gc.ca/en/professionals/housing-markets-data-and-research/housing-research/core-housing-need/identifying-core-housing-need>

- All single family social and assisted housing, including co-operative and non-profit housing.
- Residents in private single family (low-rise) dwellings who meet income qualification and eligibility criteria.
- Residents of on-reserve First Nations communities who meet income qualification and eligibility criteria.

Offering Details

19. The Home Winterproofing offering includes a free in-home energy assessment and weatherization services at no cost or low cost to the participant and addresses some health and safety measures as needed.
20. The Home Winterproofing offering provides support to single families on fixed incomes, those who rely on income assistance programs, and those who are generally most vulnerable to increases in energy prices. Enbridge Gas works with community-based organizations to promote and deliver the offering and leverages municipalities and associations active in the community to raise awareness. Enbridge Gas will also continue coordination with the Low-Income Energy Assistance Program (“LEAP”), wherein LEAP administrators are trained to prequalify and guide LEAP recipients to the Home Winterproofing offering.
21. The offering is delivered by third-party Delivery Agents (“DAs”) across the franchise. DAs are responsible for customer intake, income qualification, pre and post energy assessments, and the installation of beneficial upgrades. DAs have access to a health and safety budget to complete minor improvements where barriers may exist to inhibit a customer’s ability to participate in the offering.

Eligibility Criteria

22. To be eligible for Home Winterproofing, a participant must be an Enbridge Gas residential income eligible* customer.

*Income Eligibility

23. Consistent with the direction given by the OEB, Enbridge Gas has revised and aligned Low Income qualification screening criteria with the Tier 1 eligibility income criteria outlined in the IESO Energy Affordability Program as follows:

24. To qualify for low income (Tier 1) support, the participant must be:

- i) A resident of an eligible social or assisted housing property:

Social and Assisted Housing, for the purposes of DSM Low Income programming includes:

- Non-profit providers of social or assisted housing under a federal, provincial or municipally funded program, and includes, without limitation, non-profit corporations governed by the Housing Services Act, 2011 (as amended or any successor legislation);
- Public housing corporations owned by municipalities directly or through local housing corporations;
- Non-profit housing co-operatives as defined in the Co-operative Corporations Act;
- Non-profit housing corporations that manage or own residential (including multi-residential) buildings developed under the “Affordable Housing Program”; and
- Non-profit organizations, or municipal or provincial governments that manage or own residential (including multi-residential) supportive housing, shelters and hostels

OR

- ii) An individual who owns, rents, or leases a residence in Ontario and meets ONE of the following criteria:

- a. Has an annual household income for the previous year that does not exceed 135% of the most recent Statistics Canada before-tax Low Income Measurement ("LIM"). As of May 2021, this would equate to the following limits:

Number of People in Household	Before-tax Household Income
1	\$36,578
2	\$51,729
3	\$63,354
4	\$73,157
5	\$81,791
6	\$89,598
7+	\$96,775

- b. Received one of the following types of assistance in the past 12 months.

- Allowance for Survivors
- Guaranteed Income Supplement
- Allowances for Seniors
- Ontario Works
- Ontario Disability Support Program ("ODSP")
- Healthy Smiles Ontario Child Dental Program

- c. Received a Low-Income Energy Assistance Program ("LEAP") grant or were part of the Ontario Electricity Support Program ("OESP") within the last 12 months.

- d. Qualified to participate in the Tier 1 CDM Energy Assistance Program (“EAP”) formally known as the Home Assistance program (“HAP”) during the past 12 months.

OR

- iii) A resident of an on-reserve First Nation single family home that can demonstrate one of the following:
- A letter from Band Housing confirming that community income thresholds are within income eligibility criteria, OR
 - Confirmation that the community has participated in the CDM Energy Assistance Program Tier 1 during the past 12 months.

Incentives/Enablers

25. The Home Winterproofing offering includes the following financial supports and services for participants:

i) Energy Assessment

All participants receive a free energy assessment (pre-assessment) of the home by a participating Energy Advisor. The Energy Advisor will do a walk-through of the home, identifying energy efficiency opportunities to the customer. The initial energy assessment is an opportunity to educate customers on how to improve the efficiency of the home and reduce gas bills. The Energy Advisor recommends suitable weatherization improvements to be completed in the home. After upgrades have been installed, the Energy Advisor returns to the home to conduct a post-assessment to verify the gas savings from any weatherization improvements completed.

ii) Direct Install Incentives

The home is prequalified for direct install measures at no or low cost to the customer and include showerheads, aerators, adaptive thermostats, and pipe wrap.

iii) Weatherization Services

Based on the findings of the energy assessment and identified deficiencies in the home, air sealing (draft proofing), and insulation upgrades to basements, walls and attics are procured and installed as necessary at no cost to the customer.

iv) Health and Safety Measures

A free carbon monoxide detector is installed in the home if there is none present during the energy assessment. In addition, DA's have access to a Health and Safety budget to address issues or barriers that are posing health and safety risks to residents and delivery agents that may otherwise prohibit participation in the offering.

Metrics

26. The metric for the Home Winterproofing offering is net annual natural gas savings, measured in m³.

Gross Measurement:

27. NRCAN HOT2000 software, used in General Mode, is currently required for estimating natural gas savings achieved from weatherization improvements of participants in the Home Winterproofing offering. Homes will be initially modelled based on the existing state of the home (pre-assessment) and again after upgrades have been installed in the home (post-assessment).

28. In the case of direct install prescriptive measures installed, the offering will reference the TRM as the basis for natural gas savings (m³). Projects must meet requirements as outlined in the version of the TRM applicable to the program year.

Impact Evaluation & Verification

29. Enbridge Gas recommends that verification of project files may be appropriate for this offering. Specifically, verification would ensure that Enbridge Gas's tracking data for the projects are aligned with the information reported by DA's in the field. Furthermore, verification adjustments may be appropriate to account for the installation (or removal) of prescriptive measures.

30. Consistent with historical stakeholder consensus, free ridership is set at zero for all low income program offerings.

Process Evaluation

31. Over the term of the plan, Enbridge Gas will explore process evaluation topics based on the evolving needs of the offering in the pursuit of continuous improvements to program design and delivery. The approach to process evaluation is discussed in Exhibit E, Tab 4, Schedule 5.

Affordable Housing Multi-Residential Offering

Background

32. The AHMR offering was created to provide enhanced economic incentives and technical support to multi-residential buildings that house the province's most vulnerable populations. These buildings are typically government funded or non-profit social housing but increasingly include privately owned multi-residential housing. While similar to the Commercial Program offerings, the AHMR offering

provides incremental economic incentives to assist affordable housing providers overcome often larger capital cost constraints necessary to drive offering participation.

33. One of the biggest challenges in this market is the situation of split incentives whereby the building owner makes a significant financial investment in equipment or building upgrades, with limited or no ability to recoup their costs (i.e. through rental increases to tenants). Tenants, who are the ultimate energy consumers, do not have the same motivation to reduce their consumption. Participating building owners must sign an agreement to forgo Above Guideline Increase as a requirement to participate in the offering. Without the ability to recoup investment costs through rental increases, enhanced economic incentives can strengthen the business case to undertake an energy efficiency project.

34. Affordable housing and privately owned multi-residential building owners and property managers often do not have the staff to understand the technical aspects of their building or what energy improvements are needed in the building. With Enbridge Gas's technical support to assist building owners and property managers to better understand the energy efficiency options available to them, and enhanced incentives to buy-down the project costs, Enbridge Gas can help these customers realize meaningful energy savings while improving the comfort of the building for tenants.

Objective

35. The objective of the Affordable Housing Multi-Residential ("AHMR") offering is to reduce natural gas consumption and improve the energy efficiency of multi-residential buildings in the affordable housing market.

Target Market

36. The AHMR offering will target:

- all social and assisted housing providers including non-profit social housing providers, non-profit housing co-operatives, non-profit housing corporations, supportive housing, and shelters.
- owners/managers of privately owned multi-residential buildings that meet the eligibility criteria supporting high incidence of low income tenants.

Offering Details

37. The AHMR offering includes a mix of prescriptive, custom, and direct install measures depending on the needs of the customer. The offering also funds an energy assessment component for an in-depth evaluation of the building's energy usage to assist building owners and property managers who are unsure of where to start.

38. The AHMR offering will be delivered through:

- i) Enbridge Gas Energy Solutions Advisors ("ESA")
ESAs work directly with social housing providers and eligible private building owners. ESAs maintain on-going relationships with social housing providers and key accounts to develop custom solutions, adopting a holistic, or "building as a system" approach wherever possible. ESAs will also work with municipalities and building associations to build awareness and identify opportunities.
- ii) Third Party Agents
Third party agents are contracted by Enbridge Gas to install the direct install measures for eligible customers.

iii) Business Partners

Business partners are engaged to support identification of opportunities. These include equipment distributors; HVAC contractors; manufacturer representatives; engineering firms and energy consultants.

Incentives/Enablers

39. The AHMR offering includes prescriptive, custom, and direct install incentives, and includes the provision of energy assessments.

Prescriptive Incentives

40. The following prescriptive incentives are detailed in reference to the approved gas saving estimates reflected in the current Technical Resource Manual ("TRM").

Affordable Housing Multi-Residential - Prescriptive Measures	Incentive Levels
Condensing Water Heaters	\$0.80 - \$1.00/annual m ³
Condensing Make-Up Air Unit (MUA)	\$0.60 - \$1.90 per CFM
Energy Recovery Ventilator (ERV)-No existing ERV or not required by code	\$2.75 - \$4.00 per CFM
Energy Recovery Ventilator (ERV)-Improved Effectiveness	\$1.25 - \$1.75 per CFM
Heat Recovery Ventilator (HRV)-No existing HRV or not required by code	\$2.15 - \$3.30 per CFM
Heat Recovery Ventilator (HRV)-Improved Effectiveness	\$0.75 - \$1.50 per CFM
In-Suite Energy Recovery Ventilator (ERV)-No existing ERV or not required by code	\$175 - \$250 per unit
In-Suite Energy Recovery Ventilator (ERV)-Improved Effectiveness	\$60 - \$190 per unit
In-Suite Heat Recovery Ventilator (HRV)-No existing HRV or not required by code	\$150 - \$225 per unit
In-Suite Heat Recovery Ventilator (HRV)-Improved Effectiveness	\$40 - \$150 per unit

Custom Incentives

41. Custom incentives are available to support more complex and/or multi-measure energy improvement projects and are determined using project and site-specific inputs. Measures supported through the custom offering include, but are not limited to:

- Boilers
- Control Systems
- Building Automating Systems (“BAS”)
- Advanced Building Automation Systems (“ABAS”)

42. The proposed standardized incentive rate for gas savings achieved through custom projects is \$1.00 per cubic meter up to 50% of the fully installed project cost to a maximum project incentive of \$200,000.

Direct Install Incentives

43. Direct install measures provide turnkey energy solutions at low or no cost to the customer. Measures can include heat reflector panels and showerheads. Direct install incentives will cover up to 100% of the equipment and installation cost.

Energy Assessment Incentive

44. Social housing providers and privately owned multi-residential building owners that meet eligibility criteria are able to apply for an incentive toward the energy assessment of the building.

45. Enbridge Gas will fund the cost of a building assessment up to \$8,000 per building.

Assessment features may include:

- Examination of all HVAC, controls, and lighting systems and building envelope (windows, insulation, etc.). Identifies all types and costs of energy use, with an emphasis on natural gas.
- Inventory of opportunities and quantification of energy savings including estimated potential and calculated savings for each opportunity providing engineering calculations and/or modelling (RETScreen or equivalent).

- Provision of estimated costs for potential projects including return on investment or simple payback for recommended opportunities.

Metrics

46. The metric for the AHMR offering is net annual natural gas savings, measured in m³.

Gross Measurement:

47. Custom Projects: This offering will employ several customized approaches in the calculation of natural gas savings (m³) including engineering calculations and energy modelling, as determined reasonable by Enbridge Gas's technical experts. In the case of modelling analysis, specific tools may be used such as, eQUEST, EnergyPlus, CANQUEST, Integrated Environmental Solutions ("IES") and Tas Engineering. For commonly implemented measures, standard calculators have been developed such as e-tools to ensure that common baseline assumptions and calculation methodology are applied across similar types of projects.

48. Prescriptive and Direct Install Measures: Natural gas savings claims (m³) will reference the current version of TRM applicable to the program year.

Eligibility Criteria

49. Participants must be an Enbridge Gas low income qualified* multi-unit residential building ("MURB")⁸ customer.

*In order to be eligible for participation in the offering, buildings must fall under one of the following classifications:

⁸ Property used for residential purposes that typically has seven or more self-contained units, though some buildings may deviate from this general description.

Social and Assisted Housing, for the purpose of Enbridge Gas DSM Low Income programming includes:

- a. Non-profit providers of social or assisted housing under a federal, provincial or municipally funded program, and includes, without limitation, non-profit corporations governed by the Housing Services Act, 2011 (as amended or any successor legislation);
- b. Public housing corporations owned by municipalities directly or through local housing corporations;
- c. Non-profit housing co-operatives as defined in the Co-operative Corporations Act;
- d. Non-profit housing corporations that manage or own residential (including multi-residential) buildings developed under the “Affordable Housing Program”; and
- e. Non-profit organizations, or municipal or provincial governments that manage or own residential (including multi-residential) supportive housing, shelters and hostels.

OR

Privately owned multi-residential building that can demonstrate one of the following criteria:

- Privately owned multi-residential building owner or property manager must confirm, based on rent roll review, that at least 30% of the units are rented at less than 80% of the median market rent, as determined by the Canadian Mortgage and Housing Corporation;

OR

- Existence of Rent Geared to Income (“RGI”) or rent supplement contract(s) with the designated service manager office;

OR

- The building has participated in a federal or provincial affordable housing funding program in the last 5 years.

All privately owned building owners or operators must also sign an agreement to forego Above Guideline Increase (“AGI”).

Impact Evaluation & Verification

50. Enbridge Gas recommends that third-party verification studies (also known as Custom Project Savings Verification studies, or “CPSV” studies) are appropriate for this offering since most gross measurement claims are developed by Enbridge Gas. However, since Enbridge Gas has been effectively and reasonably calculating project savings for several years as evidenced by minimal verification adjustments made to the low income results through the course of repeated annual audits, Enbridge Gas submits that less rigorous and multi-year CPSV studies are appropriate in an effort to reduce participant survey fatigue and manage evaluation costs.

51. Consistent with historical stakeholder consensus, free ridership is set at zero for all low income program offerings.⁹

Process Evaluation

52. Over the term of the plan, Enbridge Gas will explore process evaluation topics based on the evolving needs of the offering in the pursuit of continuous improvements to program design and delivery. The approach to process evaluation is discussed in Exhibit E, Tab 4, Schedule 5.

⁹ EB-2021-0002, Application, Proposed Framework, Exhibit C, Tab 1, Schedule 1 , p. 17.

ENBRIDGE GAS INC.

Answer to Interrogatory from
Anwaatin Inc. (Anwaatin)

Interrogatory

Issue 10i

Reference:

Updated Application, Exhibit E, Tab 1, Schedule 3, pages 3 – 13
Updated Application, Exhibit E, Tab 4, Schedule 6, Attachment 1, page 4

Question(s):

Preamble: EGI's Low Income Program includes the Home Winterproofing (HWP) and Affordable Housing Multi-Residential offerings. EGI indicates that one of the target markets for the HWP offering is "[r]esidents of on-reserve First Nations communities who meet income qualification and eligibility criteria." EGI states that it "works with community-based organizations to promote and deliver the offering and leverages municipalities and associations active in the community to raise awareness" and that it consulted with "several familiar stakeholders".

EGI's DSM Stakeholder Update provides that "Indigenous Single Family homes on and off-Reserve" will be eligible for the HWP offer. (emphasis added)

EGI also notes that First Nations communities are "hard to reach" and "require tailored customer outreach".

- a) Please file any and all analysis EGI has performed in connection with the number of on-reserve and off-reserve First Nation residents that have made use of the HWP offering. If EGI has not undertaken any such analysis, please provide estimates and explain why no such analysis was performed.
- b) Please file any and all analysis EGI has performed in deciding to extend eligibility of the HWP to Indigenous single family homes on- and off-reserve.
- c) How does EGI propose to monitor and report on the effectiveness of its Low Income Program for Indigenous customers? Please provide an example or examples.
- d) Please file any and all analysis EGI has performed in connection with Indigenous - owned or -occupied multi-residential housing that is eligible for the Affordable

Housing Multi-Residential offering. If EGI has not undertaken such analysis, please provide estimates and explain why no such analysis was performed.

- e) Please provide details of EGI's "tailored customer outreach" for Indigenous customers as it relates to the Low Income Program and the Indigenous organizations it works with to promote and deliver the offerings.
- f) Please indicate which of the "familiar stakeholders" were Indigenous stakeholders (individuals, First Nations, Indigenous-owned businesses, etc.) that EGI consulted with in preparing the Application as it relates to the Low Income Program. If not, please explain why none of the stakeholders were Indigenous stakeholders.

Response:

- a) Please see response to Exhibit I.10b.EGI.STAFF.41b for on-reserve First Nation residents.

Enbridge Gas does not currently track off-reserve First Nation residents, as these off-reserve individuals would have to self-identify as Indigenous. Accordingly, Enbridge Gas has not identified and tracked Indigenous off-reserve participants to date. Enbridge Gas is currently working on an off-reserve strategy and will review if and how off-reserve participants can be tracked and reported at a high level while adhering to privacy legislation.

- b) No formal analysis was completed as no changes have been made to eligibility in the proposed plan. As discussed in Exhibit I.10.EGI.OSEA.3b, the plan only proposes to serve on-reserve Indigenous customers through its existing Home Winterproofing offering. The current HWP offering can continue to support a customized on-reserve outreach and approach to market while providing flexibility to add new DSM measures with specific eligibility for on-reserve homes, as indicated in Exhibit E, Tab 1, Schedule 3, page 11.

For the current residential eligibility criteria for on-reserve, please see the 2015-2020 DSM Plan proceeding (EB-2015-0029), filed by Union Gas Limited ("Union") on April 1, 2015, in Exhibit A, Tab 3, Appendix A, pages 77 to 80.

For the current eligibility for off-reserve, please see HWP eligibility in the 2015-2020 DSM Plan proceedings:

- EB-2015-0029, Union 2015-2020 DSM Plan (April 1, 2015), Exhibit A, Tab 3, Appendix A, pages. 74-75.
- EB-2015-0049, EGD 2015-2020 DSM Plan (April 1, 2015), Exhibit B, Tab 2, Schedule 1, page. 44.

Historically, on-reserve Indigenous residential support has been a sub-segment of the main HWP offering. Enbridge Gas is able to continue to support on-reserve Indigenous homes within the HWP offering, using unique outreach strategies. Enbridge Gas is also able to adjust the Indigenous HWP focus to off-reserve homes and develop unique strategies to reach this sub-segment of the market. Enbridge Gas will leverage the lessons learned, outreach ideas and marketing material used for Indigenous on-reserve support, and determine the best way to apply to off-reserve homes. Conversations for this off-reserve outreach have only recently been initiated, and Enbridge Gas will continue to tailor the approach, based on the needs of the market.

- c) Enbridge Gas will continue to monitor various information, such as the following for Indigenous on-reserve HWP: the number of on-reserve gas communities, the communities entered, communities outstanding, homes served and lessons learned. As mentioned above, Enbridge Gas does not currently track Indigenous off-reserve progress. Indigenous on-reserve Multi-Residential progress will be monitored as well. Reporting will be provided in the annual report.
- d) Enbridge Gas has not performed any formal analysis in connection with Indigenous - owned or -occupied multi-residential housing. Enbridge Gas will further explore this opportunity, which will include exploring potential collaboration with the IESO CDM Indigenous Commercial offer that has not been released. Please see response to Exhibit I.16.EGI.STAFF.86h.
- e) Please see response to Exhibit I.10b.EGI.STAFF.41b and c.
- f) Please see response to Exhibit I.17.EGI.Anwaatin.5a and d.

ENBRIDGE GAS INC.

Answer to Interrogatory from
Ontario Energy Board (STAFF)

Interrogatory

Issue 10b

Reference:

Exhibit E, Tab 1, Schedule 3, p.8

Question(s):

Enbridge Gas notes that part of its target market are residents of on-reserve First Nations communities who meet income qualification and eligibility criteria.

- a) How many on-reserve First Nations customers does Enbridge Gas currently have?
- b) How many on-reserve First Nations customers have participated in either the legacy EGD or legacy UG low-income programs since 2015?
- c) How is Enbridge Gas planning on making its program known and accessible to customers of on-reserve First Nations communities? In your response, please discuss Enbridge Gas's marketing strategy, education and awareness plan and if an Energy Advisors will be or have been hired from on-reserve First Nations communities to help provide a trusted source for potential participants.

Response

- a) Although there are over 130 Indigenous on-reserve communities within Ontario, there are only 20 Indigenous on-reserve communities in Enbridge Gas's franchise area, 14 of which have residential natural gas service. Therefore, Enbridge Gas currently serves approximately 3,000 residential Indigenous customers on-reserve.

To date, HWP has been offered to all of the Indigenous on-reserve communities served by Enbridge Gas except two. These two communities were delayed due to COVID restrictions and have now been rescheduled. The two remaining HWP communities Enbridge Gas is working with include Aamjiwnaang First Nation in 2021, and Chippewas of Rama planned for 2022.

While there are other on-reserve communities that have access to natural gas, these communities utilize their own natural gas utility (such as Six Nations of the Grand River), therefore, they are not an Enbridge Gas customer and do not have access to Enbridge Gas's DSM programs.

- b) Only Legacy Union Gas had a DSM program dedicated to serving Residential Indigenous customers on-reserve. Legacy Enbridge Gas did not have any Indigenous on-reserve communities in their franchise area.

Though the on-reserve DSM program for Legacy Union Gas was approved in 2015, the first couple years were required for planning, establishing an on-reserve Indigenous Delivery Agent, leveraging Legacy Union Gas' Indigenous Affairs team's existing relationships with Indigenous communities, and further developing knowledge regarding the unique implementation requirement within Indigenous communities.

Over 700 HWP applications have been received from Indigenous on-reserve communities to date. 686 on-reserve homes have received all, or a combination of, Enbridge Gas's basic measures, smoke alarms and carbon monoxide detectors. Only 91 Indigenous homes on-reserve qualified for the HWP insulation measures. Upon review, it was identified that the Indigenous on-reserve housing stock varies significantly across Ontario. Within the Enbridge Gas franchise area, these homes on average, are typically newer (built within the last 30 years) and appear to have insulation levels required by building code. Some of these communities that were built with Insulated Concrete Forms (ICF's), which contained insulation in the middle of the blocks and some homes had insulation upgrades previously either through a private insulation company or as a previously electrically heated home through Hydro One programming.

In order to further learn about the needs of Indigenous on-reserve homes within the Enbridge Gas franchise area, a third-party consultant was hired to learn about the needs of these on-reserve homes and identify potential remaining DSM opportunities. The intention was to visit five of these communities, however, only one community was completed before the COVID-19 Pandemic took effect, and the remaining communities later closed access for this research and temporary participation in HWP. A report was generated, based on the findings of the initial community.

Enbridge Gas is currently working on the internal review of this report, and in discussions with the HWP Indigenous Delivery Agent, to determine any remaining DSM opportunities on-reserve.

The following outlines Enbridge Gas's approach to ensuring program awareness and accessibility to Indigenous on-reserve homes with HWP opportunity.

Obtain endorsement from Chief and Council in accordance with the community's governance structure, which may include a formal process of attending a Chief and Council meeting, to provide a program overview and obtain endorsement (as evidenced by a Band Council Resolution or BCR).

Action items required by the Community, specifically the Chief and Council include:

- Providing a Band Council Resolution endorsing the program
- Appointing a Project Lead and/or beginning any internal hiring processes to find a candidate within the community
- Providing Enbridge Gas with a completed income letter, verifying participating community members meet the income eligibility criteria

After a BCR is obtained, the Indigenous Delivery Agent providing program delivery, First Nations Engineering Services Ltd. (FNESL), launches the program in conjunction with the Project Lead as follows:

- Connecting with community **Project Lead** for training and to setup information sessions.
- Hiring local community members to assist Project Lead as **canvassers**.
- Hosting a **Community Launch Event** to:
 - Educate community members on conservation strategies and program awareness
 - Introducing Project Lead as key contact in the community
 - Intaking of application education and support
- Setting-up scheduling for energy assessment – completing insulation and final assessment within a designated timeframe

- c) Enbridge Gas uses a multi-pronged approach to ensuring Indigenous on-reserve communities served by Enbridge Gas are aware of the HWP program and have opportunities to access it.

To start, an Indigenous Project Lead from each community is appointed. The role of the lead is to host information sessions for community members to learn about this program and its benefits. This is a paid role for a community member and has become pivotal to aid in the success of serving on-reserve Indigenous Communities through HWP. Project Leads further support HWP by promoting these programs and encouraging individual homeowners to participate. The Project Lead is identified and trained by Enbridge Gas's Indigenous HWP Delivery Agent, which is also an Indigenous Owned and Operated on-reserve company.

Additionally, community events have been used and are considered pivotal in gaining awareness and acceptance of HWP with in these communities. These information sessions include the local Enbridge Gas's Indigenous Affairs Community Advisor, to leverage existing relationships within the community and have the support from Chief and Council. Enbridge Gas learned early on about the benefit of hosting an in-person community launch to help support positive outreach and understand the offer and its benefits.

To further support the Indigenous Project Lead and the community outreach, Enbridge Gas has developed customized marketing material for on-reserve communities, to highlight the specific process and benefits for Indigenous communities to utilize throughout the process described above.

In the few cases where DSM overlaps with Indigenous electric CDM programming, Enbridge Gas has also collaborated to visit these communities at the same time as other companies, such as meeting with Hydro One in Long Lake 58 First Nation in 2018, and Constance Lake First Nation in 2019. Enbridge Gas has found that communities appreciate the collaboration, where possible.

ENBRIDGE GAS INC.

Undertaking Response to Anwaatin Inc.

Undertaking

Tr: 29

To file the report referred to in STAFF 41.

Response:

Please see Attachment 1 for the Building Knowledge Canada Inc.'s Report, "Phase 1: Utility DSM Future Scope Developments for Indigenous Communities" and Attachment 2 for Enbridge Gas's Indigenous Existing Homes – Energy Conservation Measures.

Enbridge Gas Preliminary Insight:

The timing of this study was to inform future direction of Indigenous On-Reserve Single Family programming; however, the research was put on hold with impacts of the COVID pandemic. Although the details available in this preliminary report are consistent with Enbridge Gas's findings in this community, Enbridge Gas will continue to monitor for all DSM-related measures.

Now that COVID restrictions are lifting, Enbridge Gas will revisit the original pilot, and use this as an opportunity to evolve the scope, which may include a review of Part 3 buildings. In addition, the impact of recent Federal Greener Homes Indigenous initiative will also be a consideration to better understand what level of support is being offered through this initiative and how Enbridge Gas can best complement those efforts.

Enbridge Gas is committed to explore all DSM opportunities for Indigenous On and Off-Reserve Enbridge Gas Customers.

PHASE 1: UTILITY DSM FUTURE SCOPE DEVELOPMENT FOR INDIGENOUS COMMUNITIES

Project Update Report : December 7, 2020





Project

DATE: Dec 7, 2020

TO: Caroline Knight & Maye Fernandez Perez, Enbridge.

FROM: Andrew Oding, Rob Johnston, Michael Gilizan , Building Knowledge Canada

RE: PHASE 1: UTILITY DSM FUTURE SCOPE DEVELOPMENT: **Project Update December 7, 2020**

Background

Due to the limitations of the current Indigenous Home Weatherization Program offering there is little opportunity to weatherize on-reserve homes. Current Audits are narrow in scope and blower door testing is for the purposes of determining insulation levels and air tightness only. With little opportunity on this front Enbridge undertook a **two-phased** approach to look at alternatives for next generation DSM planning for on-reserve housing stock.

Phase 1

The scope of work outlined the work and deliverables needed to implement and fulfill the first phase of this initiative. The first phase helps to inform evaluation issues that are occurring with the audit results for the Indigenous DSM files. The first phase included a thorough study of housing stock on reserve to determine what the true needs and opportunities are with respect to :

- resource reduction / management (gas, fuel)
- energy-savings (GJ, kW)*
- carbon reduction(ghg tonnes-operational)
- affordability (reducing home operation/ ownership cost)
- Building Science Priorities
 - considerations for occupant health, safety and IEQ
 - asset protection –durability & life span of residence
 - asset protection & climate change Adaptability

** (Future building code requirements e.g. Net Zero Ready NBC 2020-30 (Pan Canadian Framework on Climate Change and Growth)*

Once the on-site audits were complete a iterative energy modelling exercise was undertaken to assess various ECM's(energy conservation measures). Concurrently, a building science review based on holistic outcomes was applied to prioritize the ECM's, to ensure upgrades would result in safe, healthy, durable living environments.



The on-site audits enabled a team of building envelope / IAQ experts to conduct testing and assessments of actual residences . There are many assumptions about on-reserve homes but without a proper study of the unique housing stock a proper pilot could not be launched without the on-site review and insights provided.

There are currently 14 Indigenous communities with residential gas service in the Legacy Union Gas franchise area (there are more if you include commercial). New Indigenous communities are scheduled to come onto gas through community expansion in both LEG and LUG but not enough communities to sustain a continued framework (without new measures) for a new framework. Unfortunately, Phase 1 of this project was completed with limited access to most of the current communities due to the COVID pandemic. Therefore the balance of this report is based on outcomes and observations drawn from the Nipissing community review and on-site testing.

Objectives

1. To develop a comprehensive list of impactful DSM measures and technologies that can be considered for future DSM pilot program delivery
2. To develop and execute a series of exercises (e.g. site testing and observations, energy modeling, environmental scanning and surveys) meant to identify key potential DSM strategies

Deliverables and Schedule: Update

			OCT		NOV					DEC				
Task	Description	Week	21	28	4	11	18	25	2	9	16	23		
1 Develop Key benchmarks and metrics for surveys and community visits														
1.1	develop key metrics that will be used to identify and prioritize strategies													
2 Develop homeowner surveys and benchmarking data collection forms														
2.1	develop questionnaire for homeowners in key communities													
2.2	develop on-site benchmarking data collection form and deliverables													
3 Coordinate and execute community visits and benchmarking														
3.1	planning /scheduling													
3.2	community 1													
3.3	community 2													
3.4	community 3													
3.5	community 4													
3.6	community 5													
5 Coordinate and execute archetype housing iterative modeling analysis														
5.1	collect and coordinate file of housing archetypes: PDF or CAD files													
5.2	develop HOT 2000 iterative modeling base files for each archetype													
5.3	execute iterative model on each house type/archetype													
6 Develop list of proposed and prioritized strategies														
6.1	Develop List of strategies and prioritize.													
7 Develop final report and analysis														
7.1	develop final report DRAFT													
7.2	presentation of report to client-face-to-face meeting													
7.3	deliver final report with clarifications and changes													
8 Deliver supportive training to stakeholders OPTIONAL														
8.1	Presentation, train-the trainer													
8.2	Presentation, train-the trainer													

COMPLETE

COMPLETE

COMPLETE FOR
COMMUNITY 1

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COMMUNITY 1

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COMMUNITY 1

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COMMUNITY 1

Community 1: Nipissing overview



Number of residences: 13 residences

Types of homes: Single Detached,
residential occupancy

Testing / Inspection points:

- In-situ IAQ conditions –temp, RH
- Blower Door-Infiltration test
- Ventilation review
- HVAC review
- Enclosure detailing review: local wetting, staining, drainage detailing
- Occupant lifestyle : Observations and Formal Questionnaire





General Site Observations –Community 1 -Nipissing

1. RANGE HOOD DOES NOT EXHAUST TO EXTERIOR IN MANY HOMES... AND SOME WITH GAS RANGES
2. MANY HOMEOWNERS COMMENTED ON WINDOW CONDENSATION DURING COLD MONTHS
 - ONE OWNER WITH HRV MENTIONED THEY HAD NO ISSUES WITH CONDENSATION AND RH IN THE WINTER
3. AVERAGE RH LEVELS OBSERVED 45-50+%
 - LOTS OF PETS AND HOUSE PLANTS NOTICED IN HOMES
 - 10 of 12 HOMES WITH EXHAUST –ONLY VENTILATION SYSTEMS e.g. BATH FANS
4. AIR TIGHTNESS
 - OVERALL AIR SEALING WAS DONE QUITE WELL : 1.4 ACH50 to 4.6 ACH50 / **Avg = 4.0ACH50**
 - 2 HOMES= VERY LEAKY : 7.6 AND 8.54 ACH50
 - 3-4 HOMES WITH SPRAY FOAMED CRAWL SPACE TENDED TO TEST BETTER
5. ALL HOMES HAD NATURAL GAS CONNECTION
6. MANY HOMES HAD WOOD BURNING APPLIANCES **REMOVED/DISCONNECTED, STATED THIS WAS A REASON IN THE PAST TO NOT INSTALL A RANGE HOOD THAT EXHAUSTS TO THE EXTERIOR**
7. COMMENTS ABOUT DRAFTY WINDOWS .
 - OBSERVED MOST SITTING AREAS/DINING AREAS WERE VERY CLOSE TO LARGE WINDOWS



TASK 5 & 6 : OVERVIEW

- Task 5 Coordinate and execute archetype iterative modeling analysis
- Task 6 Develop list of proposed / prioritized strategies

Building upon the on-site inspections in community 1, BKC developed a modeling strategy to assess potential DSM ECM's (Energy Conservation Measures). Two archetype homes were selected being representational of the existing housing stock in community 1. A 1200sqft single detached, single story residence and a 2200sqft, 2 story, single detached residence. A group of ECM's was applied to each archetype to assess the impact on the following:

1. resource reduction / management (gas, fuel)
2. energy-savings (GJ, kW)
3. carbon reduction(ghg tonnes-operational)
4. affordability (reducing home operation/ ownership cost)
5. Building Science Priorities
 - a. considerations for occupant health, safety and IEQ
 - b. asset protection –durability & life span of residence
 - c. asset protection & climate change Adaptability

In addition to energy modeling, an estimate for completion of each ECM was provided. The estimates were based on **regional quotes from contractors** and from the **NRCan LEEP CBAT Cost Building Assessment Tool**.

See spread sheet file: **ENBRIDGE INDIGENOUS EXISTING HOMES - ECMs**

ECM ENERGY CONSERVATION MEASURES-New Construction -Single detached 1 story Approx. 1200sqft,ORC Zone 2, WWR 9.4%												
Utility Rate Assumptions: Gas - \$0.231133 / Electricity - \$0.139												
Measure or Technology	Total Annual Gas Savings (MJ)	Total Annual Gas Savings (MJ)	Total Annual Electricity Savings (kWh)	Total Annual Electricity Savings (kWh)	Total Annual Energy Savings (MJ)	Estimated GHG Emissions Savings (tonnes/year)	Total Annual Utility Cost Savings	Estimated RENOVATION Upgrade Cost	Estimated CBAT NEW CONSTRUCTION Upgrade Cost	Building Science Priority	Tier 5 - NRCReady applicable	House A System / Building Science Notes
										Low Priority		
Gas to Heat water	45.39	1736.02	0.00	0.00	1781.41	0.03	\$13.38	\$1,400.00	\$1,400.00	3	100%	Unlimited energy savings above R200000. Some opportunity to increase air tightness during renovation/retro work.
Gas to Heat water	15.39	576.02	0.00	0.00	591.41	0.01	\$4.47	\$4,500.00	\$4,500.00	3	100%	
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Gas to Heat water	48.50	1800.02	0.00	0.00	1848.52	0.03	\$13.81	\$1,400.00	\$1,400.00	3	100%	
Gas to Heat water	45.39	1736.02	0.00	0.00	1781.41	0.03	\$13.38	\$1,400.00	\$1,400.00	3	100%	
Gas to Heat water	15.39	576.02	0.00	0.00	591.41	0.01	\$4.47	\$4,500.00	\$4,500.00	3	100%	
Gas to Heat water	48.50	1800.02	0.00	0.00	1848.52	0.03	\$13.81	\$1,400.00	\$1,400.00	3	100%	
Gas to Heat water	45.39	1736.02	0.00	0.00	1781.41	0.03	\$13.38	\$1,400.00	\$1,400.00	3	100%	
Gas to Heat water	15.39	576.02	0.00	0.00	591.41	0.01	\$4.47	\$4,500.00	\$4,500.00	3	100%	
Gas to Heat water	48.50	1800.02	0.00	0.00	1848.52	0.03	\$13.81	\$1,400.00	\$1,400.00	3	100%	
Gas to Heat water	45.39	1736.02	0.00	0.00	1781.41	0.03	\$13.38	\$1,400.00	\$1,400.00	3	10	



Conclusions & Observations

The accompanying document –**spread sheet file “ENBRIDGE INDIGENOUS EXISTING HOMES – ECMs”**” should be referenced while considering these conclusion and observations.

The following recommendations are made within context of the Pan Canadian Efficiency framework which identifies the goal of ALL existing homes and buildings achieving aggressive energy reductions: e.g. net zero ready-like energy performance. More specifically, the proposed 2020 tiered energy code (part 9.36) has been used as a reference (see appendix A).

These recommendations are prioritized based on building science fundamentals. Therefore, prior to aggressive insulation measures, consideration should first be given to ventilation and air tightness. In addition, some mechanical upgrades related to space heating/cooling may be best prioritized AFTER upgrades to the enclosure are complete, thus enabling proper sizing of equipment & systems based on accurate heat loss/heat gain loads.

1. Balanced ventilation with heat recovery HRV/ERV

Based on field observations and feedback, the current ventilation strategies are not adequate to enable further enclosure enhancements (e.g. adding more insulation, improving air tightness). Prior to applying further enclosure upgrades we would suggest the following:

- Prioritize investment in mechanical ventilation systems e.g. HRV or ERV
- Engage key stakeholders , through training, to understand why ventilation is critical to achieving further efficiency measures. This would include ventilation education: fresh air , humidity control, pollutant control, combustion air vs make up air , and more.
- What products and installation techniques are available
- Available control strategies and integration into existing HVAC systems
- Proper use and maintenance of units by contractors and homeowners

Note: Given the current pandemic and concerns related to maintaining healthy indoor environments, the focus on ventilation is far more critical.

2. Air tightness

Air tightness of the enclosure will have a significant and meaningful impact on all existing homes:

- Reduced potential for interstitial condensation inside highly insulated enclosures
- Reduce space heating and space cooling loads
- Enhanced control over interior conditions (always more difficult to control a sieve...)
- Reduced operating costs related to energy use

Making an existing home air tight has become more feasible as the industry becomes more aware of technologies and products that enhance the air barrier. E.g. Air tight window & door products, use of spray foam insulation (an air barrier at manufacturers specifications), proprietary aerosolized air sealing (AeroBarrier™)

3. Domestic Hot Water

Space conditioning loads continue to decrease as energy codes advance and retrofit programs move towards net zero energy. Contextually, the domestic hot water load of a typical home will soon surpass the energy load associated with space heating. There remains significant opportunity to elevate the hot water efficiency of existing homes through

- Condensing type hot water devices
- Drain water heat recovery combined with more efficient DHW devices
- Providing direct vent /sealed vent appliances in existing homes,



4. Windows

New window product with U values of $1.2U >$ and Low E coating options (SHGC .7 - .15) may have a more significant impact on an existing home than would additional attic or wall insulation. In addition, high performance windows also:

- Decrease condensation potential
- Allow for higher RH, healthier levels of RH in the winter- 35% min
- Increase comfort-Less radiant loss to cold surface
- Lower Fuel use/Energy use
- Significant reduction in AC loads (electrical)

5. Below Grade

Basements are frequently used as living spaces. With below –grade heat loss representing 25% of the total structural loss for a typical home, investment in enhancing the below grade enclosure can benefit the home in many ways. Enhancing the performance of below grade living spaces for improved energy efficiency can also provide

- Improved re-sale value of the home
- Additional water and moisture control detailing

6. Above grade walls

To further improve the performance of most existing homes , adding insulation to the above grade opaque assembly will have limited impact on energy reduction , reduced fuel use and better durability* UNLESS the insulation is

- added to the exterior of the home in a continual layer(e.g. EIFS,)
- added carefully to the existing interior wall using high R spray foam insulation or high density insulation materials

7. Space Conditioning- Mechanicals

Replacement of space conditioning systems, primarily heating systems, with condensing –type equipment, does still provide some limited energy savings and reduced fuel consumption. However, due to the adoption of condensing type equipment in the building code during the early 1990's , and the impact of more recent energy efficiency retrofit programs , this ECM may have limited improvement on many existing homes.

Given the significant impact enclosure efficiency, enhancements may have on the homes heating/cooling load, it is important for HVAC equipment upgrade to be consider future load profiles of the home. Over sized systems can lead to

- Reduced efficiency of the system
- Limited durability / life expectancy of equipment due to short cycling
- Significant comfort issues and humidity control concerns due to short cycling

Given the changing load profiles in homes that undergo energy efficiency upgrades, the societal goal of reducing carbon AND recognizing the future potential for standard air conditioning in homes, here are some opportunities to be considered:

- Dual fuel heating and cooling systems –ducted ,air source heat pump combined with back up gas heating system. Includes efficient. High SEER AC capability.
- Dual Fuel “Combo” tankless domestic hot water & space heating system. Combine with air source heat pump(AC)

**exception to this would be older, historical buildings wherein no insulation currently exists with the structure.*



ABOUT BUILDING KNOWLEDGE CANADA INC.

Building Knowledge Canada (BKC) originally began in 1986 as a division of Air Solutions, then incorporated independently in 2009. BKC is the largest residential energy evaluation / home performance company in Canada with over 43,000+ high performance home evaluations/ratings completed across Canada since its creation.

The firm specializes in practical building science for residential buildings/homes including energy modeling, enclosure and HVAC design and forensics, indoor air quality & thermal comfort design, air tightness testing & air barrier design and forensics, HVAC residential commissioning, enclosure water management detailing & forensics; All with the clear goal of achieving energy efficiency, envelope durability and occupant health and comfort.

Building Knowledge Canada is a leader in building performance strategies and an expert on the industry's cutting edge initiatives. BKC's credentials include qualifications in the following areas:

- Recognized Building Science Trainers: Natural Resources Canada
- High Performance Building Science Training for Builders, Trade Contractors, Architects, Sales-Marketing Teams, Real Estate Industry, Building Officials
- Building Science/Building Envelope Diagnostics & Testing
- Energy Software Modeling and Design Analysis including Hot 2000, Remrate, and Retscreen
- Building Code Compliance - NBC and OBC Energy Compliance: Performance/Prescriptive/Comparative
- Air Barrier/Tightness Detailing, Diagnostics and Evaluations
- CMHC Trained Indoor Air Quality Investigators: Training and Audits
- HVAC Design Review, System Diagnostics (HRAI Accredited Staff)
- NET ZERO Home Design Analysis, Modeling and Testing
- LEED
- ENERGY STAR®

BKC contributes its expertise in Building Science Training and Building Code Analysis for several industry partners including both Federal & Provincial public institutions and private manufacturer's of construction material and HVAC equipment. Currently BKC is providing Building Science/Energy Efficiency Training and Consultation for the following clients:

- CMHC Canadian Mortgage & Housing Corp
- CHBA Canadian Home Builders Assoc
- Natural Resources Canada
- NRCan LEEP Division
- ENBRIDGE
- EnerQuality Corporation
- Dupont / Dow
- Owens Corning
- Venmar VenEE
- Jeld-Wen

BKC team members have been instrumental in the development of numerous industry standards (NRC, CSA, etc.) and participate on various building code and advanced housing program committees :

CHBA Net Zero Council and Program Management Committee

R2000 Program Development Committee

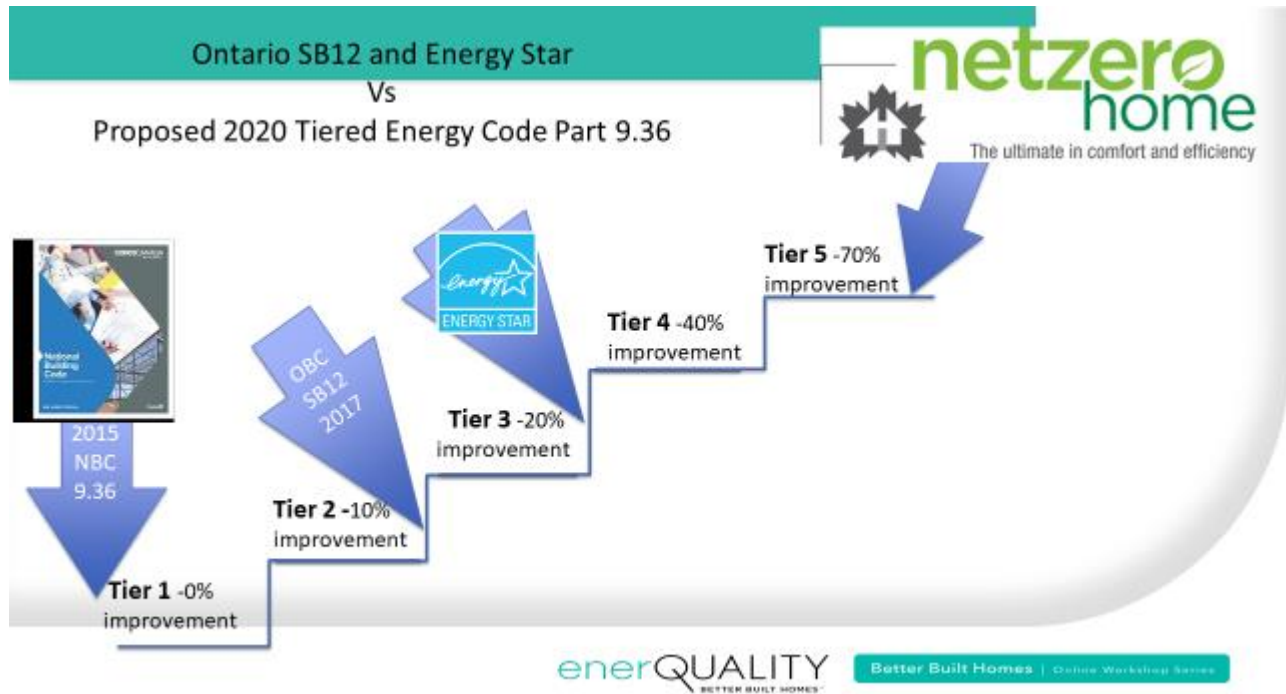
ENERGY STAR® for New Homes Advisory Committee and TAC Committee Chair

CSA F280 -2012 Development and Committee Chair

Ontario Building Code Part 9 2012 Advisory Committee, Part 7, 3 and 12 Review committees

LEED for Homes/Version 4 Technical Review Committee

APPENDIX A



Utility Rate Assumptions: Gas - \$0.231113 / m3 Electricity - \$0.1393/KWh		ECM ENERGY CONSERVATION MEASURES-New Construction - Single detached, Crawlspace, 1 story Approx. 1200sqft,OBC Zone 2, WWR 9.4%											
Arch type details: - Basements R0 / Floors R19 - Attic R50 - AG Walls R19 - Windows 1.8 SHGC 0.6		Total Annual Gas Savings (M3)	Total Annual Gas Savings (MJ)	Total Annual Electricity Savings (KWh)	Total Annual Electricity Savings (MJ)	Total Annual Energy Savings (MJ)	Estimated GHG Emissions Savings (Tonnes/year)	Total Annual Utility Cost savings	Estimated RENOVATION Upgrade Cost	Estimated CBAT NEW CONSTRUCTION Upgrade Cost	Building Science		House As A System / Building Science Notes
											Priority	Tier 5 -NZReady applicable	
											High Priority		
Medium Priority													
Low Priority													
Measure or Technology													
R50 to R60 attic		0.00	0.00	185.90	669.24	670.00	0.01	\$25.90	\$1,300.00	\$ 300.00	3	TIER 5	Limited energy savings above R50(attic). Some opportunity to increase air tightness during renovation/attic work.
R50 to R80 attic		0.00	0.00	360.00	1296.00	1300.00	0.02	\$50.15	\$1,900.00	\$ 2,100.00		TIER 5	
Air tightness 5 ACH50 to 0.6 ACH50		0.00	0.00	875.70	3152.52	3150.00	0.04	\$121.99	\$15,000.00	\$ 7,000.00	1	TIER 5	Significant energy savings. Air tightness is required to limit interstitial condensation in highly insulated enclosures.
Air tightness 5 ACH50 to 1.5 ACH50		0.00	0.00	794.70	2860.92	2860.00	0.04	\$110.70	\$11,000.00	\$ 3,500.00		TIER 5	Significant impact on heating and cooling loads.
Air tightness with AEROBARRIER 5 ACH50 to 1.5 ACH50		0.00	0.00	794.70	2860.92	2860.00	0.04	\$110.70	TBD	\$ 6,400.00		TIER 5	Increasing air tightness MUST be done in tandem with mechanical, balanced ventilation-e.g. HRV,ERV
												TIER 5	Increases occupant comfort-less drafts. Enables good IAQ-Can control interior environment
Above Grade Wall 2x6 16" oc R19 to 2x6 16" oc R22 +10		0.00	0.00	1599.10	5756.76	5760.00	0.07	\$222.75	\$8,500.00	\$ 1,700.00	2	TIER 5	Energy savings. Increases durability of wall by keeping structural cavity warm/dry(limiting dew point). Limits thermal bridging
Above Grade Wall 2x6 16" oc R19 to 2x6 16" oc R22 +5		0.00	0.00	1090.60	3926.16	3930.00	0.05	\$151.92	\$8,200.00	\$ 1,300.00			Increased occupant comfort. Warmer walls/less cold spots result in better comfort e.g. occupant experiences less heat loss through radation to cold surfaces
Below Grade Wall R0 to R20 Blanket		0.00	0.00	2141.60	7709.76	7710.00	0.09	\$298.32	\$1,300.00	\$ 400.00	2		Energy savings. Increases durability of wall by keeping structural cavity warm/dry(limiting dew point). Limits thermal bridging
Below Grade Wall R0 to 2x4 24"oc R22batt + R10ci		0.00	0.00	2149.30	7737.48	7740.00	0.09	\$299.40	\$5,000.00	\$ 3,000.00		TIER 5	Increased occupant comfort. Warmer walls/less cold spots result in better comfort e.g. occupant experiences less heat loss through radation to cold surfaces
No slab insulation to R10 Thermal break and underslab		0.00	0.00	21.00	75.60	80.00	0.00	\$2.93	\$1,500.00	\$ 1,500.00	3	TIER 5	Limited energy savings -dependant on surface area of slab and basemnt vs above grade space ratio
													Significant impact on comfort . E.g. finished basements/living space.Warmer floors/less cold spots result in better comfort e.g. occupant experiences less heat loss through radation to cold surfaces
													Impact on health. Warmer slab surface decreases potential for condensation and "adsorbed" water in porous building materials. Can help with minimizing water vapor transfer and/or air leakage from below slab.
													Some synergies with radon remediation details.
Window 1.8u/.60 SHGC to 1.2u/.45 SHGC		0.00	0.00	391.80	1410.48	1410.00	0.02	\$54.58	\$18,000.00	\$ 3,500.00	2	TIER 5	Potential for significant energy savings depending on WWR window-to-wall ratio. Energy savings/electricity -related to reducing cooling loads(AC power) through lowE coating
Window 1.8u/.60 SHGC to 1.4u/.45 SHGC		0.00	0.00	179.60	646.56	650.00	0.01	\$25.02	\$17,000.00	\$ 3,500.00		TIER 5	Significant health impact. Lower U/better insulated windows reduce condensation potential. Allows occupants to maintain healthy ranges of relative humifity withour condensation issue on windows(35%-45% winter)
Window 1.8u/.60 SHGC to 1.2u/.21 SHGC LOW SOLAR/2 COATS LOWE		0.00	0.00	31.30	112.68	110.00	0.00	\$4.36	\$18,300.00	\$ 3,700.00		TIER 5	Significant comfort impact. Warmer glass-occupant experiences less heat loss through radation to cold surfaces. Reduction in convective "drafts" from cold air on glass.
													LOW SOLAR-2 COATS LOW E Significant energy savings/electricity -related to reducing cooling loads(AC power) by upwards of 40-50%
No DWHR to DWHR 42% 2 showers		0.00	0.00	402.80	1450.08	1450.00	0.02	\$56.11	\$850.00	\$ 850.00	3	TIER 5	Energy savings / Occupant satisfaction-increased recovery rate for HW applaince e.g. more hot water.
No DWHR to DWHR 60% 2 showers		0.00	0.00	544.00	1958.40	1960.00	0.02	\$75.78	\$950.00	\$ 950.00		TIER 5	
100% electric tank to HWT tankless condensing 0.95 UEF)		(334.80)	(12722.40)	3534.30	12723.48	250.00	(0.48)	\$414.95	\$2,800.00	\$ 2,500.00	3	TIER 5	Operational cost savings / Occupant satisfaction- faster recovery rate e.g. more hot water/Health impact is significant-condensing appliance with sealed intake and exhaust.
Exhaust Vent w/bath fans to HRV 75%		0.00	0.00	854.20	3075.12	3070.00	0.04	\$118.99	\$2,000.00	\$ 1,900.00	1	TIER 5	(Note: A modified calculation was use to model the primary bath fan to give a more realiztic represent the energy consumption of the bathfans and the building science that is involved with the exhaust only ventilation.)
Exhaust Vent w/bath fans to ERV 65 %		0.00	0.00	755.50	2719.80	2720.00	0.03	\$105.24	\$2,300.00	\$ 2,300.00		TIER 5	
Exhaust Vent w/bath fans to OEB Base HRV 55%		0.00	0.00	636.70	2292.12	2290.00	0.03	\$88.69	\$2,000.00	na			Energy savings w/ heat recovery addition . Significant health impact: provide ventilation regardless of building pressures(balanced ventilation). Provides some ability to limit high interior relative humidity during winter months.
Exhaust Vent w/bath fans to HRV/ERV 80% with ECM motors		0.00	0.00	966.10	3477.96	3480.00	0.04	\$134.58	\$3,000.00	na		TIER 5	Balanced mechancial ventiliation is a requirment in all new housinge and in renovations wherein air tightness has been increased. e.g. New windows, air sealing, additional insulation, etc
													ECM Motors: Will provide savings in Electricitly in addition to gas use reduction
NO AC to 13.5 seer window-shaker		0.00	0.00	(1330.50)	(4789.80)	(4790.00)	(0.06)	(\$185.34)	\$650.00	\$ 650.00	3		
HTG: Elec baseboard to 98% AFUE NG furnace with ECM motor		(1091.20)	(41465.60)	11293.10	40655.16	0.00	(1.58)	\$1,320.94	\$3,900.00	\$ 1,200.00	2		
HTG: Elec baseboard to 95% NG furnace w/ECM (Dual Fuel) and ASHP HSPF 8.6		(404.70)	(15378.60)	8521.50	30677.40	15600.00	(0.39)	\$1,093.51	\$10,000.00	\$ 12,000.00		TIER 5	
HTG: Elec baseboard to COMBO w/ TPF .90+ ASHP HSPF 8.6		(835.70)	(31756.60)	11935.90	42969.24	11830.00	(1.06)	\$1,469.53	\$18,800.00	\$ 19,000.00		TIER 5	
Standard Operating Conditions to Reduced Operating Conditions		0.00	0.00	752.00	2707.20	2710.00	0.03	\$104.75			3		Energy Star Appliances and ALL CFL or LED lighting in home

Utility Rate Assumptions: Gas - \$0.231113 / m3 Electricity - \$0.1393/KWh		ECM ENERGY CONSERVATION MEASURES-New Construction - Single detached, Crawlspace, 1 story Approx. 1200sqft,OBC Zone 2, WWR 9.4%												
Arch type details: - Attic R50 - AG Walls R20 - Windows 1.8 SHGC 0.45 - Water Heating Electric Tank		Total Annual Gas Savings (M3)	Total Annual Gas Savings (MJ)	Total Annual Electricity Savings (KWh)	Total Annual Electricity Savings (MJ)	Total Annual Energy Savings (MJ)	Estimated GHG Emissions Savings (Tonnes/year)	Total Annual Utility Cost savings	Estimated RENOVATION Upgrade Cost	Estimated CBAT NEW CONSTRUCTION Upgrade Cost	Building Science		Tier 5 -NZReady applicable	House As A System / Building Science Notes
											Priority			
											High Priority			
											Medium Priority			
Measure or Technology											Low Priority			
R50 to R60 attic		18.40	699.20	3.50	12.60	690.00	0.04	\$4.74	\$1,300.00	\$ 300.00			TIER 5	
R50 to R80 attic		35.50	1349.00	6.80	24.48	1340.00	0.07	\$9.15	\$1,900.00	\$ 2,100.00	3		TIER 5	Limited energy savings above R50(attic). Some opportunity to increase air tightness during renovation/attic work.
Air tightness 3. ACH50 to 0.6 ACH50		34.30	1303.40	6.60	23.76	1300.00	0.06	\$8.85	TBD	\$ 6,400.00	1		TIER 5	Significant energy savings. Air tightness is required to limit interstitial condensation in highly insulated enclosures.
Air tightness 3 ACH50 to 1.5 ACH50		26.30	999.40	5.00	18.00	1000.00	0.05	\$6.77	TBD	\$ 1,800.00			TIER 5	Significant impact on heating and cooling loads.
Air tightness with AEROBARRIER 3 ACH50 to 1.5 ACH50		26.30	999.40	5.00	18.00	1000.00	0.05	\$6.77	\$7,000.00	\$ 4,000.00			TIER 5	Increasing air tightness MUST be done in tandem with mechanical, balanced ventilation-e.g. HRV,ERV
													TIER 5	Increases occupant comfort-less drafts. Enables good IAQ-Can control interior environment
Above Grade Wall 2x6 16" oc R20 to 2x6 16" oc R22 +10		162.90	6190.20	31.40	113.04	6180.00	0.31	\$42.02	\$8,500.00	\$ 1,700.00	2		TIER 5	Energy savings. Increases durability of wall by keeping structural cavity warm/dry(limiting dew point). Limits thermal bridging
Above Grade Wall 2x6 16" oc R20 to 2x6 16" oc R22 +5		113.10	4297.80	21.80	78.48	4290.00	0.22	\$29.18	\$8,200.00	\$ 1,300.00				Increased occupant comfort. Warmer walls/less cold spots result in better comfort e.g. occupant experiences less heat loss through radation to cold surfaces
Below Grade Wall R20 to 2x4 24"oc R22batt + R10ci		0.80	30.40	0.10	0.36	30.00	0.00	\$0.20	\$5,000.00	\$ 3,000.00	2		TIER 5	Increased occupant comfort. Warmer walls/less cold spots result in better comfort e.g. occupant experiences less heat loss through radation to cold surfaces
No slab insulation to R10 Thermal break and underslab		3.80	144.40	0.70	2.52	140.00	0.01	\$0.98	\$1,500.00	\$ 1,500.00	3		TIER 5	Limited energy savings - dependant on surface area of slab and basemnt vs above grade space ratio
														Significant impact on comfort . E.g. finished basements/living space.Warmer floors/less cold spots result in better comfort e.g. occupant experiences less heat loss through radation to cold surfaces
														Impact on health. Warmer slab surface decreases potential for condensation and "adsorbed" water in porous building materials. Can help with minimizing water vapor transfer and/or air leakage from below slab.
														Some synergies with radon remediation details.
Window 1.8u/.45 SHGC to 1.2u/.45 SHGC		82.20	3123.60	15.80	56.88	3110.00	0.16	\$21.20	\$18,000.00	\$ 3,500.00	2		TIER 5	Potential for significant energy savings depending on WWR window-to-wall ratio. Energy savings/electricity -related to reducing cooling loads(AC power) through lowE coating
Window 1.8u/.45 SHGC to 1.4u/.45 SHGC		61.80	2348.40	11.90	42.84	2340.00	0.12	\$15.94	\$17,000.00	\$ 3,500.00			TIER 5	Significant health impact. Lower U/better insulated windows reduce condensation potential. Allows occupants to maintain healthy ranges of relative humifity without condensation issue on windows(35%-45% winter)
Window 1.8u/.45 SHGC to 1.2u/.21 SHGC LOW SOLAR/2 COATS LOWE		49.10	1865.80	9.40	33.84	1860.00	0.09	\$12.66	\$18,300.00	\$ 3,700.00			TIER 5	Significant comfort impact. Warmer glass-occupant experiences less heat loss through radation to cold surfaces. Reduction in convective "drafts" from cold air on glass.
														LOW SOLAR-2 COATS LOW E Significant energy savings/electricity -related to reducing cooling loads(AC power) by upwards of 40-50%
No DWHR to DWHR 42% 2 showers		0.00	0.00	402.80	1450.08	1450.00	0.02	\$56.11	\$850.00	\$ 850.00	3		TIER 5	Energy savings / Occupant satisfaction-increased recovery rate for HW appliance e.g. more hot water.
No DWHR to DWHR 60% 2 showers		0.00	0.00	544.00	1958.40	1950.00	0.02	\$75.78	\$950.00	\$ 950.00			TIER 5	
100% electric tank to HWT tankless condensing 0.95 UEF		(359.60)	(13664.80)	3785.70	13628.52	220.00	(0.52)	\$444.24	\$2,800.00	\$ 2,500.00	3		TIER 5	Operational cost savings / Occupant satisfaction- faster recovery rate e.g. more hot water/Health impact is significant-condensing appliance with sealed intake and exhaust.
Exhaust Vent w/bath fans to HRV 75%		83.60	3176.80	16.10	57.96	3170.00	0.16	\$21.56	\$2,000.00	\$ 1,900.00	1		TIER 5	(Note: A modified calculation was use to model the primary bath fan to give a more realistic represent the energy consumption of the bathfans and the building science that is involved with the exhaust only ventilation.)
Exhaust Vent w/bath fans to ERV 65 %		72.00	2736.00	13.90	50.04	2730.00	0.14	\$18.58	\$2,300.00	\$ 2,300.00			TIER 5	
Exhaust Vent w/bath fans to OEB Base HRV 55%		62.40	2371.20	12.00	43.20	2360.00	0.12	\$16.09	\$2,000.00	na				Energy savings w/ heat recovery addition . Significant health impact: provide ventilation regardless of building pressures(balanced ventilation). Provides some ability to limit high interior relative humidity during winter months.
Exhaust Vent w/bath fans to HRV/ERV 80% with ECM motors		86.40	3283.20	91.10	327.96	3540.00	0.17	\$32.66	\$3,000.00	na			TIER 5	Balanced mechancial ventilation is a requirement in all new housing and in renovations wherein air tightness has been increased. e.g. New windows, air sealing, additional insulation, etc
														ECM Motors: Will provide savings in Electriclity in addition to gas use reduction
NO AC to 13.5 seer window-shaker		0.10	3.80	(1279.40)	(4605.84)	(4610.00)	(0.06)	(\$178.20)	\$650.00	\$ 650.00	3			
HTG: 94% AFUE to 98% AFUE NG furnace with ECM motor		22.10	839.80	138.40	498.24	1320.00	0.05	\$24.39	\$3,900.00	\$ 1,200.00	2			
HTG: 94% AFUE to 95% NG furnace w/ECM (Dual Fuel) and ASHP HSPF 8.6		562.70	21382.60	(2052.80)	(7390.08)	13570.00	0.98	(\$155.91)	\$10,000.00	\$ 12,000.00			TIER 5	
HTG: 94% AFUE to COMBO w/ TPF .90+ ASHP HSPF 8.6		114.50	4351.00	1833.80	6601.68	10860.00	0.30	\$281.91	\$18,800.00	\$ 19,000.00			TIER 5	
Standard Operating Conditions to Reduced Operating Conditions		(40.00)	(1520.00)	1156.50	4163.40	2670.00	(0.02)	\$151.86			3			Energy Star Appliances and ALL CFL or LED lighting in home