Enbridge's Feedback on IESO Pathways to Decarbonization Study

ERO # 019-6647
Submitted online

Submission date: May 3, 2023

About Enbridge Inc.

Enbridge Inc. (Enbridge) is a leading North American energy infrastructure company. We safely and reliably deliver the energy people need and want to fuel quality of life. Our core businesses include Liquids Pipelines, which transports approximately 30 percent of the crude oil produced in North America; Gas Transmission and Midstream, which transports approximately 20 percent of the natural gas consumed in the U.S.; Gas Distribution and Storage, which serves approximately 3.9 million retail customers in Ontario and Quebec; and Renewable Power Generation, which owns approximately 1,885 megawatts (net) in renewable power generation capacity in North America and Europe.

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Introduction

Enbridge Inc. and its affiliate companies, including the natural gas utility Enbridge Gas Inc. (Enbridge), appreciate the opportunity to submit feedback on the IESO Pathways to Decarbonization Study. Below are the consultation questions with Enbridge's responses and recommendations.

1. What are your thoughts on the appropriate regulatory requirements to achieve accelerated infrastructure buildout? Do you have specific ideas on how to streamline these processes?

Enbridge agrees that predictable and timely regulatory, approval, and permitting processes will be important to supporting new investments in clean generation, transmission and related energy infrastructure. These processes include interconnection studies and processes, clear environmental permitting frameworks for newer technologies like power storage, generation of hydrogen, and carbon capture, utilization and storage (CCUS), and predictable transmission and pipeline environmental permitting and approvals.

Leave to construct (LTC) thresholds need to be raised. The Government should streamline LTC reviews for smaller pipeline projects so they can be delivered in a more cost-effective and timely manner as the current timelines are not competitive in getting projects to market. Raising the LTC threshold does not remove the need for consultation or for environmental approvals, but it expedites the permitting process. While we support debate on the robust regulatory framework that exists for these projects, streamlining the time it takes to approve projects is key to maintaining Ontario's competitiveness. We urge prompt action to have this addressed in an expedited manner. The current LTC conditions are 20 years old and have not kept pace with the complexities of modern infrastructure projects or inflation. Government should raise the LTC thresholds to $10 million in cost, a 16" pipe size and a corresponding increase in operating pressure for proven operators who have a strong safety record, in order to support timely delivery of government and local priority projects.

Currently, there are no market rules, permitting guidelines, or established approval processes for battery power storage or hydrogen production and underground storage projects. This creates a lot of regulatory and economic uncertainty for developers, for which risk must be priced into contracts. We understand that the Independent Electricity System Operator (IESO) and the Minister of Environment, Conservation and Parks (MECP) are working to address these regulatory gaps and look forward to participating in those regulatory processes, and we recommend that finalizing these regulations in a timely manner within the coming months be considered a priority. As such, Enbridge recommends a date for resolution of 120 days or September 1, 2023, to allow for necessary consultations with a finalized date 30 days from then or September 30, 2023, to maintain Ontario's competitive advantage.

There are likely to be nearly annual procurements at IESO in the next 10 years, therefore the approach to interconnection and transmission capacity assessments taken in the Expedited LT1 RFP cannot be the standard operating procedure. The Deliverability Assessment process was time consuming and provided developers with little usable information, and Hydro One did not interact with developers during the request for proposals (RFP) process. This approach was manageable for one expedited RFP but could significantly hinder development if it continues over an extended period of time. The lack of information on available transmission creates too significant a development risk, which also increases rates bid into procurements. We recommend that IESO and Hydro One (and the LDCs) consider alternative approaches to support more detailed information being available to developers on available transmission, including for example, IESO providing system information that developers can then rely on when considering project locations. This could then be updated after each RFP.

2. What are your expectations for early engagement and public or Indigenous consultations regarding the planning and siting of new generation and storage facilities?

Enbridge fully expects and supports early engagement with indigenous stakeholders in the planning and siting of any new generation and storage facilities. We see this as a duty and live these values in the work we do with our projects. As such, it's imperative that this consultative work begins in earnest immediately to ensure ample time and consideration is given to addressing the concerns that are expected to arise from consultations with the public and indigenous stakeholders. Enbridge offers to leverage its experience, which we consider a continual evolving process in engaging important stakeholders on these important and impactful topics. Our Ontario based Eastern Community and Indigenous Engagement team was created to have meaningful engagement with indigenous communities with whom Enbridge works. This approach has been effective for Enbridge, and we believe a meaningful and inclusive approach is warranted.

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, strengthens our projects and yields constructive outcomes for all Ontarians. Increasing the LTC thresholds referred to above would not deter Enbridge from its commitment to consult Indigenous groups impacted by Enbridge's projects and operations. Enbridge engages local and Indigenous communities potentially affected by our projects. Regardless of whether the duty to consult is triggered, Enbridge will engage with Indigenous groups potentially affected by our projects and operations.

Enbridge's Indigenous Peoples Policy guides our approach to pursuing sustainable relationships with Indigenous Nations and groups in proximity to where Enbridge conducts business. To achieve sustainable relationships with Indigenous Nations and groups, Enbridge governs itself by five principles that include:

- Recognizing legal and constitutional rights possessed by Indigenous Peoples;
- Recognizing the importance of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) within the context of existing Canadian law;
- Engaging in forthright and sincere consultation with Indigenous Peoples about Enbridge's projects and operations through processes that seek to achieve early and meaningful engagement;
- Committing to working with Indigenous Peoples to achieve benefits for them resulting from Enbridge's projects and operations; and
- Fostering an understanding of the history and culture of Indigenous Peoples among Enbridge's employees and contractors.

Enbridge regularly engages with approximately 40 Indigenous groups in Ontario and is committed to fostering long-term meaningful relationships based on our Life Cycle approach to engagement. Life Cycle approach to engagement refers to engaging with potentially affected Indigenous groups from a project's infancy/project planning stage through to decommissioning/abandonment.

Through our commitment to relationship building with Indigenous groups in Ontario, Enbridge has developed a deeper understanding of areas of interest raised by various Indigenous communities, and we work to ensure we meaningfully engage with communities to avoid or mitigate any impacts our projects or operations may have on their rights and interests.

Early public consultation is a key component of the engagement process to help identify and address concerns and potential issues that could arise throughout the duration of a project.

Enbridge expects early public engagement to be inclusive, transparent and accountable, reaching out to all who may be interested, providing access to information – both initially and as the project progresses – and explaining how stakeholder feedback will be incorporated into the decision-making process to determine outcomes.

3. Do you believe additional investment in clean energy resources should be made in the short term to reduce the energy production of natural gas plants, even if this will increase costs to the electricity system and ratepayers? What are your expectations for the total cost of energy to customers (i.e., electricity and other fuels) as a result of electrification and fuel switching?

We believe that a balanced approach to such investments is necessary to maintain resiliency and reliability in our energy system. The recent ice-storm in Quebec on April 5, events in Texas and other Canadian jurisdictions have served to inform energy stewards of the importance of not relying on one form of energy. Enbridge Gas commissioned Guidehouse to complete a study called Pathways to Net-Zero Emissions In Ontario. The report demonstrates that a diversified pathway that includes both pipes and wires, is the best approach to deliver what Ontario families and businesses expect and need from their energy systems as we transition to a net zero future – a reliable and resilient energy system with greater consumer choice and business competitiveness, at a lower cost. We believe a diversified pathway provides the investments needed in clean energy in the short, medium and longer term while minimizing cost to rate payers.

As peak electric demand grows, energy system reliability and resiliency will be key considerations. Significant growth in energy production from intermittent renewable resources, such as wind and solar, requires energy storage and dispatchable electricity generation capabilities to ensure that energy system reliability can be maintained. An American Gas Foundation study published in January 2021 demonstrates that "Utilities, system operators, regulators, and policymakers need to recognize that resilience will be achieved through a diverse set of integrated assets … policies need to focus on optimizing the characteristics of both the gas and electric systems."[1] The IESO examined the possibility of phasing-out natural gas generation by 2030 and concluded that "Diversity in energy supply strengthens the reliability and resilience of Ontario's power system, as different types serve different functions in order to meet needs…. Maintaining a diverse supply mix, where the different forms of supply complement each other, is an effective way to balance supply and demand to maintain the reliability of Ontario's power system."[2]

While electricity supply from natural gas is limited, gas-fired peaking plants currently play, and will continue to play, a critical role in supporting Ontario's electricity system to meet system peaks cost-effectively while maintaining system reliability. The importance of the gas fleet to the electricity system

[1] American Gas Foundation (2021). "Building a Resilient Energy Future: How the Gas System Contributes to US Energy System Resilience" Available at: https://gasfoundation.org/2021/01/13/building-a-resilient-energy-future/

[2] IESO (2021). Decarbonization and Ontario's Electricity System: Assessing the impacts of phasing out natural gas generation by 2030. p.7. Available: https://www.ieso.ca/en/Learn/Ontario-Supply-Mix/Natural-Gas-Phase-Out-Study

was highlighted by a recent IESO study[3], which estimated the costs of decommissioning the natural gas fleet to eliminate GHG emissions from the electricity system by 2030. The report found that, even in an optimistic scenario, eliminating natural gas generation in Ontario by 2030 would require over $27 billion in investments and result in a 60% increase to ratepayers' electricity bills. Phasing out Ontario's 11 GW gas fleet would require adding at least 17 GW of non-emitting generation capacity (e.g., wind, solar, battery storage, demand response, and imports, among others), 1.6 GW of energy efficiency improvements, and significant investment in transmission infrastructure. The IESO study concluded by recognizing the potential that alternative technologies could have in enabling more cost-effective pathways to reducing emissions from the gas fleet; among these, the use of hydrogen-fired peaking plants was discussed.

CCUS will also play a key role in decarbonizing power generation and facilitating production of low-carbon hydrogen. Hydrogen storage in porous (depleted reservoir, aquifers) and non-porous (salt caverns) geological formations will provide the means to ensure a continuous and reliable supply of hydrogen. The International Energy Agency and the Canadian Energy Regulator agree that CCUS is among the most critical decarbonization technologies.[1] The Ontario Ministry of Natural Resources and Forestry has recently published a "Roadmap towards regulating geologic carbon storage"[4] and has indicated its intention to support and enable CCUS for large emitters in Ontario.

Enbridge was surprised to see that the IESO decarbonization study does not include plans for CCUS as a potential pathway to help the gas fleet decarbonize (citing the low load factor expected of gas plants in the future). Once CCUS is up and running for heavy industry and other hard to abate emitters, the gas fired generation assets may be able to attach to the CO2 network to reduce GHG emissions even though they may have a relatively low load factor.

Another pillar of Ontario's electricity supply mix is its 13 GW nuclear fleet. Ontario's nuclear fleet has provided most of its baseload electricity for decades—roughly 60% of total supply in recent years. However, there are plans to retire the Ontario Power Generation Pickering nuclear plant beginning in 2024/2025,[5] leaving a meaningful firm capacity supply gap.

4. Are you concerned with potential cost impacts associated with the investments needed? Do you have any specific ideas on how to reduce costs of new clean electricity infrastructure?

Solving the current identified future need for lower emissions energy by electrification alone as shown will drive unaffordability. We strongly suggest that a diversified approach be taken to reduce the cost burden on energy consumers. Along with electrification, this should include all other viable sources such as hydrogen and its low and renewable variants and other low or almost zero carbon emitting footprint sources. To meet the affordable, reliable and lower emissions energy needs of the future at the lowest cost, while maintaining resiliency in the existing system during that transition, all energy sources must be

[3] IESO (2021). Decarbonization and Ontario's Electricity System. Available: https://www.ieso.ca/en/Learn/Ontario-SupplyMix/Natural-Gas-Phase-Out-Study
[4] See - https://www.ontario.ca/page/geologic-carbon-storage
[5] 0 Ontario Power Generation (2021). The Future of Pickering Generating Station. Available: https://www.opg.com/poweringontario/our-generation/nuclear/pickering-nuclear-generation-station/future-of-pickering/

factored into a holistic plan to demonstrate the complementary roles each energy source can play. We need to continue to do research to identify cost effective solutions and reduce the costs of current low carbon technologies. Any changes proposed to enable a new planning framework must recognize the importance of decarbonizing the province's existing energy infrastructure in the most cost-effective, reliable and resilient manner rather than looking to solve decarbonization through electrification alone, which could have significant implications for consumer and system costs, resiliency and reliability. Moving to an only electric scenario would see an overbuilding of an electric system that must meet peak demands. This is not the optimal scenario for solving the issue. We need to continue to do research in order to identify cost effective solutions and reduce the costs of current low carbon technologies.

As found in both the IESO Pathways to Decarbonization, and Guidehouse's Pathways to Net Zero Emissions for Ontario reports, Ontario moves to a winter peaking electricity system due in part to a significant rise in space and water heating electrification. Hybrid heating provides an opportunity to reduce peak electricity demand today to provide for wider adoption of electrification and greater GHG emission reductions in the near term. In the long term the operation of hybrid heating systems with low and zero carbon gases provides the opportunity to continue to minimize the electrical peak impacts of space heating demand while further reducing GHG emissions. Hybrid heating reduces the electricity requirements for space heating at peak times to similar levels as what are experienced today.

Wide-scale deployment of hybrid heating systems provides an opportunity to reduce energy system costs as a form of behind the meter demand response, which can be leveraged to mitigate electricity peak demands and reduce required investments in new electricity supply resources and transmission infrastructure. Since the expansion of the electricity system supply and transmission are the driver of the electricity unit cost increases described by the IESO in their Pathways to Decarbonization report, hybrid heating could play a role in reducing the forecasted increased in the cost of electricity.

As an integrated behind the meter solution, hybrid heating is also indicative of the integration of the gas and electricity systems to satisfy energy demands. As the energy transition manifests in Ontario, functional integration of the energy systems necessitates more closely aligned planning between electricity and gas system planners. Enbridge believes that collaborative energy system planning is a safe bet required to deliver the most optimal pathway to a net zero future for Ontario.

5. Do you have any comments or concerns regarding the development and adoption of hydrogen or other low-carbon fuels for use in electricity generation? What are your thoughts on balancing the need for investments in these emerging technologies and potential cost increases for electricity consumers?

Hydrogen and electricity are analogous and complementary to each other. It can be used for long duration storage in a smaller footprint to its battery counterpart, which we believe is also complementary to hydrogen. Hydrogen will also act as an enabler to reduce the carbon intensity of peaker gas plants without mothballing them. Low- and zero-carbon gas will be indispensable to get to net zero, both economy-wide and in the electricity generation sector. RNG is available today and is a drop in fuel, meaning electricity producers could begin using RNG today without having to change their equipment. While electrification is a powerful tool that will be required for reducing GHG emissions of many sectors, electrification is not practical for all sectors. Some sectors such as heavy transport or industries with high temperature requirement processes like steel production and chemicals production, which in some cases relies on the molecular interaction to make the process work, have considerable carbon footprints and are challenging or next-to-impossible to decarbonize through electrification. These are some of the industries that will continue to rely on a source of gaseous energy to replace coal and other carbon-based fuels. RNG and hydrogen present an excellent opportunity to minimize Ontario's reliance on energy imports and promote energy independence. We also caution against the inherent risks that exist through the reliance

of any one avenue to decarbonization of the provincial energy system. The northeast blackout of 2003 serves as a reminder of why diversification is important to our provincial energy needs.

Ontario's current gas infrastructure can be repurposed to deliver hydrogen to avoid costly investments in new electricity infrastructure. Ontario has an extensive gas network made up of approximately 150,000 kms of underground pipe, delivering nearly twice as much energy per year as the province's electricity system and four to five times as much in terms of the average peak energy demand. Ontario's pipeline network is ideally suited to be repurposed to a hydrogen network, as the province's newer pipelines, typically made of polyethylene, are already largely hydrogen-ready. Natural gas infrastructure will require engineering assessments before they can be used to transport hydrogen. Enbridge will undertake a full system wide study of its gas grid to determine maximum tolerable blending amounts for the Ontario gas grid; however, a study in Europe has shown that this transitional action can be done for less than a quarter of the cost to build new hydrogen pipelines.[6] Utilizing the existing pipeline infrastructure will also allow stakeholders to continue benefitting from the reliability and resiliency that gas utility systems provide and the competitiveness it offers Ontario's industries. Additionally, the inherent characteristics of pipeline infrastructure (which is mostly underground) support a resilient energy system.

Enbridge has 288 Bcf of natural gas storage in 35 underground storage pools that may be capable of storing hydrogen and hydrogen blends. Research needs to be done to ensure that storage of hydrogen and hydrogen blends in porous reservoirs is feasible. Storage of hydrogen would provide the means to ensure a continuous and reliable supply of hydrogen mimicking the current natural gas system's ability to offer seasonal terawatt hour storage capabilities.

To achieve net zero emissions by 2050, actions are required by all Ontario stakeholders. Policymakers, regulators, and utilities must consider the outlook to 2050 when evaluating different GHG emissions reduction pathways because some options that achieve 2030 goals may not enable cost-effectively achieving net zero emissions by 2050.

The Ministry of Energy should:

- Define medium-term (2030) and long-term (2045) planning targets for hydrogen supply much like the strategic ambitions set by other countries such as the UK (5 GW), France (6.5 GW), Spain (4 GW) and by the European Commission (40 GW). We ask that this be established as soon as possible in conjunction with industry.
- Investigate market measures and incentives that support hydrogen adoption such as low carbon fuel incentives, carbon pricing, targets for fuel cell electric vehicles (FCEV) and hydrogen-fueled appliance deployment, renewable gas mandates and research and development.
- Expand the regulatory oversight of the Ontario Energy Board (OEB) to include hydrogen, hydrogen-derivatives and the associated supply, transport, and storage infrastructure.
- Support the development of hydrogen hubs in the province to establish a robust network for hydrogen supply matched to anticipated and current design
- Enable carbon capture and storage for blue hydrogen production.

[6] Guidehouse (2021). European Hydrogen Backbone: Analysing the future demand, supply and transport of hydrogen. Available: https://gasforclimate2050.eu/wp-content/uploads/2021/06/EHB_Analysing-the-future-demand-supply-and-transportof-hydrogen_June-2021.pdf

- Establish a set hydrogen energy production cost of no more than $35/MWh for hydrogen production in the province. This could also be tied to a contract for difference set up.
- Another potential path is to work with IESO and stakeholders to find a path to addressing the Global Adjustment that would enable Corporate and Virtual Power Purchase Agreements (PPAs). These agreements will be critical to enabling new and existing non-emitting electricity generation to power hydrogen electrolyzers. Virtual PPAs in particular will enable renewable energy projects to locate where the wind, solar, and water resources are most economical and still sell power directly to hydrogen electrolyzers that can be located convenient to retrofitted and new pipelines, while minimizing investments in new electricity transmission and pipeline construction.

The OEB will be a large part in helping hydrogen and should:

- Proactively develop regulatory framework for hydrogen supply, infrastructure and storage in a timely manner to compete with other jurisdictions such as those in the US. Without clarity on how hydrogen supply, storage and infrastructure investments will be regulated, utilities and end users can only rely on the existing natural gas framework as an example. The OEB should gather stakeholder views and investigate how other jurisdictions are approaching the development of a hydrogen regulatory framework.
- Any findings that are deemed to be advantageous to Ontario's hydrogen eco system should be implemented without delay to capitalize on the competitive nature emerging in the hydrogen market development.
- The hydrogen market must be shaped, just like how the natural gas market was, by numerous regulatory and legislative changes, as well as by technological advances and sophistication of the trading markets (physical and financial). Regulatory oversight, in the natural gas market, became increasingly more sophisticated and it has adapted to the condition of the market over the past and this same sophistication can be brought to the hydrogen market.
- Allow utilities to recover the cost of hydrogen at a different cost than natural gas and in line with the market price of hydrogen

Gas and Electric Utilities and System Operators should:

- Assess future hydrogen network needs. Enbridge is in the process of planning a hydrogen grid study which will assess the entire gas grid and has been piloting a hydrogen blending initiative that is serving customers in the city of Markham.
- Develop a hydrogen infrastructure plan. Enbridge should plan how and when natural gas infrastructure can be repurposed for hydrogen and where new infrastructure will be required.
- Perform electricity transmission impact assessment. The IESO and Hydro One should perform a transmission grid impact assessment to identify future network impacts of green hydrogen production on transmission capacity requirements and regional energy flows.
- Provide clear regulations and market rules to enable electricity generators and hydrogen producers a diverse set of economic partnership and agreement options. This will ensure efficient investment and will help ensure new hydrogen development doesn't negatively impact other ratepayers.

While the supply of RNG in Ontario is currently small and more costly than natural gas, the province has significant RNG production potential. Torchlight Bioresources estimated Ontario's RNG potential to be between 40 PJ per year of RNG from wet organic wastes and up to 224 PJ per year if agricultural

residues are included. This RNG potential represents roughly 4%-26% of Ontario's annual gas demand.[7] Most of Ontario's RNG is currently exported and, with other provinces setting ambitious RNG goals, this trend may continue. This may limit Ontario's ability to access the lowest cost local RNG supplies in the near term. The province of Quebec has announced in its Green Economy Plan that it aims to increase its renewable gas (including RNG and hydrogen) supply to 10% of its total gas supply by 2030. The British Columbia government has a 2030 goal for 15% of gas consumption to come from renewable gas, which may include RNG and hydrogen.[8]

The Ministry of Energy should:

- Define binding medium-term (2030) and long-term (2045) RNG blending targets. Adopting binding RNG targets will provide a clear long-term planning horizon and investment certainty for RNG market players, investors, and for regulatory planning.
- Investigate supply and demand market measures that can bolster RNG adoption in Ontario (e.g., guarantees of origin, RNG registers and certificates, low carbon fuel incentives, waste reduction policies).

The Ontario Energy Board should:

- Work with the Ministry of the Environment, Conservation and Parks to ensure existing and future environmental regulations are supportive of RNG production.
- Allow utilities to recover the cost of RNG at a different cost than natural gas and in line with the market price of RNG.

Gas and Electric Utilities and System Operators should:

- Develop tariffs specific to RNG. Having separate rates for RNG and conventional natural gas may incentivize project development by RNG suppliers, as utilities would be able to recover the higher cost associated with RNG

6. Following the end of the current 2021-2024 energy efficiency framework how could energy efficiency programs be enhanced to help meet electricity system needs and how should this programming be targeted to better address changing system needs as Ontario's demand forecast and electrification levels grow?

Energy efficiency will be essential to the success for any pathway to net zero. Enbridge's demand side management (DSM) programs have helped customers save 32.6 billion m^3 of natural gas, representing a cumulative GHG reduction of 61.3 MT between 1995 and 2022.

[7] Torchlight's 22 PJ estimate is based on anaerobic digestion and landfill potential and does not reflect more advanced RNG production technologies like biomass gasification or power-to-gas, which are not yet commercially available. Of the 22 PJ estimate, landfill gas accounts for approximately 21 PJ, equivalent to 9%.

[8] Government of British Columbia (2021). CleanBC Roadmap to 2030. p.60. Available: https://www2.gov.bc.ca/assets/gov/environment/climate-change/action/cleanbc/cleanbc_roadmap_2030.pdf

The province should continue to support increasing cost effective electric and gas conservation in Ontario, balancing bill impacts with the level of savings pursued. It is also essential the government continue to coordinate DSM and CDM offerings with new federal, provincial or municipal government funding for energy efficiency and GHG reduction programming. This must be done to ensure new funding does not displace or duplicate existing programs and that delivery is coordinated where reasonably possible to the benefit of program participants.

Guidehouse's Pathways to Net Zero Emissions for Ontario study concluded that reducing GHG emissions from the gas system will be a less disruptive and more cost-effective option than full electrification. The analysis shows the benefits from a diversified pathway are not only limited to costs savings, but also largely to ease of implementation. A diversified pathway avoids highly disruptive building retrofits and involves less disruptive heating equipment upgrades than would be required in the Electrification scenario. With more than 75% of residential buildings in Ontario already equipped with either gas furnaces or boilers, replacing them with electric heat pumps will require extensive and disruptive renovation to ensure buildings are adequately heated and insulated. Despite these energy efficiency improvements, electricity peak demand will increase significantly. This will lead to major investments in new generation, transmission, and distribution infrastructure. A diversified pathway offers an opportunity to avoid some of this disruption. Heating with low- and zero-carbon gas requires limited building renovation. In the near term, blending RNG and hydrogen into the gas grid does not require new heating systems. Only in the longer term, with a 100% hydrogen gas grid, would hydrogen-ready heating systems be needed.

In addition, the bidirectional electricity grid will become increasingly important during electrification. Distributed energy resources (DER) and power storage will allow Ontario to make efficient use of excess supply from installed generation and to shape load where possible. Clear regulations for interconnection and market rules for participation in the electricity market will help free up investment in non-wires solutions to significantly destress the grid. These should continue to be a priority for IESO in its regulatory and Market Renewal work.

7. What are your thoughts on the potential for development of new hydroelectric generation in Ontario by private-, Indigenous- and government-owned developers?

Hydroelectric generation projects are major undertakings that can have significant impact on the land and the neighbouring communities. Enbridge supports a diversified approach to Ontario's energy sector, but we recommend very early engagement with local communities and especially Indigenous communities impacted by the proposed development. There is also a need given the challenges of large hydro projects that the government should continue to pursue a diversified generation mix.

It is our understanding that Ontario and IESO are hoping to foster a merchant market in the province to help minimize contractual obligations and to enable better price competition and to help ensure prices keep pace with market and technology developments. Single source, major projects such as a 4 GW government-owned hydroelectric project would undermine that objective and could prevent Ontario from establishing a robust merchant market in the electricity sector. We recommend that any such development is considered not just in terms of the power provided but in terms of its impact on the broader electricity market and related competition.

Furthermore, the risk of bilateral government-to-government contracts has and continues to undermine independent power producers (IPP) confidence in opportunities to recover development expenditures, specifically because they are not executed in a predictable or transparent manner. In the event Ontario and IESO decide to engage in such bilateral arrangements, they should provide significant advance notice of such plans, so that developers of new RNG, wind, solar, power storage, etc. projects can make informed choices about continuing to invest in Ontario.

8. What steps should be taken to ensure that transmission corridors can be preserved and lines can be built as quickly and cost effectively as possible?

Within the Parkway Belt West Plan (PBWP), Enbridge has vital natural gas distribution and gas transmission assets, supplying over 95% of Ontario's natural gas needs and serving residents, major commercial and industrial customers, hospitals, schools, government buildings, and power producers in the area and beyond. Enbridge also has massive liquid pipeline assets within the PBWP, delivering nearly 300,000 barrels of crude oil and liquids every day. Therefore, it is imperative that while the Government studies the impacts of the proposed revocation of the PBWP, it considers the safety, environmental, accessibility, permitting, financial, and regulatory implications of the revocation on the public, who would be located in close vicinity to high-pressure pipelines, and Ontario's energy supplies.

Enbridge believes that the existing process for releasing lands from the PBWP is consistent and ensures engagement from all stakeholders that may be impacted and would recommend updating the existing process to a more streamlined and expedited process rather than revoking the PBWP. This would also serve to preserve current and future electricity transmission corridors.

We also reiterate that DERs and power storage offer non-wires alternatives to new transmission in many cases. Batteries do not require specific resource locations and can be located at convenient locations on the existing grid and/or they can be located behind the meter, not requiring any new transmission, which is also true of DERs. Clear regulations for interconnection and market rules for participation in Ontario's electricity market will help free up investment in these non-wires solutions to significantly destress the grid. These should continue to be a priority for IESO in its regulatory and Market Renewal work.

The PBWP provides potential opportunities to site DERs in close proximity to new development growth, and enhance the existing electrical grid, while maintaining suitable separation from existing land uses.

9. Do you have any additional feedback on the IESO's "no-regret" recommendations?

The IESO outlines a number of "no regret" actions in their Pathways to Decarbonization report, many of which are directed at expanding energy efficiency, reducing lead times for new electricity supply and transmission infrastructure development, and adjusting regulatory approaches to adapt to the energy transition.

However, the "no regrets" action of galvanizing collaboration seems to be limited to the electricity sector and government, as there is no mention of collaboration with gas utilities in the energy sector for the planning of future energy needs for Ontarians. It is the view of Enbridge, that collaborative planning must be undertaken to ensure the most cost effective, reliable, and resilient pathway to emissions reductions is developed and that unintended consequences are avoided. Coordinated planning should happen between LDCs, the IESO and Enbridge and should include:

a) Overlaying Enbridge Gas's gas distribution and transmission systems onto both the IESO's regional planning areas and the electric LDCs distribution systems.
b) Modelling the use of both the gas and electric distribution and transmission systems to deliver energy to all sectors, including system and end-user costs, value of resiliency and reliability and stranded assets.
c) This would include coordination on key items such as demand forecasting and planning horizons in order to support alignment of the investments to be brought forward through the energy transition to meet identified energy needs.

Another "no regret" action as noted by the IESO is to track progress and updated plans in an open and transparent process, with the recommendation that the IESO be directed to establish a new process to plan for and track progress on the energy transition in Ontario, and to incorporate that planning into the annual APO, RAF, and AAR. It is the view of Enbridge that this should not be limited to or contained

solely within the IESO publications since the IESO is but one energy system planner in Ontario. Government should formalize Enbridge Gas Inc's role as a partner in energy system planning:

a) Enbridge Gas is a fully integrated utility with planning and accountability equivalent to combining IESO and LDCs. Enbridge Gas must develop its assumptions and own final decisions as the entity responsible for both costs and reliability of service.
b) Achieving the goals of a coordinated energy plan will be difficult, if not impossible, to achieve unless Enbridge Gas has a seat at both the system planning table with IESO and OEB as well as at the distribution table with LDCs.

The tracking of progress toward the emissions reduction goals outlined by Ontario should reside with the Ontario government. There should be regular information gathering or defined updates to the government covering both the gas and electricity sectors, and the progress toward net zero emissions.

Conclusion

Enbridge appreciates the opportunity to provide feedback and recommendations on the IESO Pathways to Decarbonization Study. Enbridge requests consideration of the recommendations identified in this document and welcomes the opportunity to meet with you to discuss the consultation and recommendations in further detail. If you have any questions or require additional information, please do not hesitate to contact Nicole Gruythuyzen, Government Affairs Senior Advisor nicole.gruythuyzen@enbridge.com.