

ONTARIO ENERGY BOARD

EB-2020-0293

IN THE MATTER OF the *Ontario Energy Board Act*, 1998, S. O. 1998, c. 15, Schedule B;

AND IN THE MATTER OF an application by Enbridge Gas Inc. for leave to construct natural gas pipeline and associated facilities in the City of Ottawa

Submissions of Environmental Defence

St. Laurent Pipeline

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Overview

Enbridge Gas is proposing to spend \$134 million to replace a pipeline in downtown Ottawa.¹ The project is driven by pipeline integrity concerns.

Environmental Defence requests that Enbridge be directed to repair the pipeline instead of replacing it. The repair option is safe.² It is also at least \$57 million less expensive than the replacement option, and will likely be even less costly once all the options for robotic inspections have been appropriately considered.³ This alone is sufficient to determine that the repair option is best and should be directed by the OEB, aside from any risks associated with underutilized or stranded assets.

In addition, Enbridge did not consider the possibility of asset underutilization beyond 2050 due to decarbonization, and the impact of that possibility on a comparison of the repair option versus the replace option. The costs for this project will not be fully depreciated until 2077.⁴ By 2050, over \$43 million will remain undepreciated.⁵ There is clearly some risk of underutilization or stranded assets before 2077 in light of Ottawa’s plans to stop using fossil gas and Canada’s legislated 2050 net-zero target.⁶ This factor improves the attractiveness of the repair option versus the replacement option. However, Enbridge’s economic analysis implicitly assumes there

¹ Exhibit D, Tab 1, Schedule 1, Page 10 (including costs for abandonment of the existing pipeline).

² Exhibit I.ED.10 (“the repair option is sufficient to meet the standards set out in CSA Z662”); see also the submissions prepared by Dwayne Quinn, P. Eng., for the Federation of Rental-housing Providers of Ontario, which provide a detailed safety assessment.

³ Exhibit JT1.16.

⁴ Exhibit I.ED.5.

⁵ *Ibid.*

⁶ *Canadian Net-Zero Emissions Accountability Act*, S.C. 2021, c. 22.

is a 0% possibility of underutilized or stranded assets before or after 2050 even though Enbridge has done no actual analysis of these risks.⁷

This is an example of a wider problem where Enbridge does not account for these risks in its planning processes. As a result, its decisions are always biased in favour of replacement options over repair options. The *cumulative* impacts of repeatedly biasing replacement over repair options generate significant risks for ratepayers as rate base continues to grow and grow unabated. The higher the rate base, the worse off customers will be if decarbonization leads to underutilized assets, stranded assets, and/or spiraling distribution costs. While decarbonization pathways are uncertain, it would be much more prudent to pursue repair options wherever they are safe and cost-effective based on a full examination of the risk-weighted costs and benefits.

Repair option is preferable to replacement

The repair option is by far the best option for consumers even if the risks of underutilized assets are disregarded because the repair option is safe and far less expensive based on a simple cost/benefit analysis.

Repair option is safe

Environmental Defence fully agrees with Enbridge that work is required on this pipeline. Doing nothing is not a safe option. That has been repeated over and over in this proceeding and is a given. However, the repair option is clearly safe. This option would involve appropriately increased inspections and repair whenever necessary. Enbridge acknowledges that “the repair option is sufficient to meet the standards set out in CSA Z662.”⁸

In addition, Environmental Defence supports the submissions made by the Federation of Rental-housing Providers of Ontario (“FRPO”) on pipeline integrity issues. FRPO’s submissions were prepared by Dwayne R. Quinn, a professional engineer and former Union Gas facilities planner with over 35 years of experience in the sector. Mr. Quinn’s submissions describe in detail why replacement is not the only safe option.

In addition, Mr. Quinn’s questions at the technical conference put Enbridge’s evidence in the appropriate context. For example, Enbridge acknowledged that photographs showing damaged pipelines were actually due to third-party damage, which can occur to any steel pipe regardless of its vintage.⁹ The photographs look very worrying to a non-expert. The appropriate context shows that the photographs do not justify the replacement option over the repair option.

Enbridge repeatedly highlighted the impacts of a catastrophic failure in this proceeding. However, that is a straw person argument. Nobody is suggesting that Enbridge should do nothing. It should inspect and repair.

⁷ Transcript, March 4, 2022, p. 105, lns. 17-25.

⁸ Exhibit I.ED.10.

⁹ Transcript, March 4, 2022, p. 18 & 19.

Repair option is much less expensive

The repair option is *at least* \$57 million less expensive than the replacement option, and will likely be even less costly once all options for robotic inspections have been appropriately considered.¹⁰

Enbridge's pre-filed evidence contained a table comparing the repair option with the replace option.¹¹ It showed that the repair option is approximately \$41 million less expensive than the replace option. Table 13 from the pre-filed evidence is excerpted below:

Table 13: Comparison of Repair Option & Replace Option (Project) Costs

(\$ millions)	Repair Option	Replace Option
Total Cost	\$33.0	\$73.5
Net Present Value	\$(7.7)	\$(58.9)

Even by Enbridge's own pre-filed evidence, the repair option is much less expensive.

However, the table in the pre-filed evidence was missing the following costs for the repair and replace options:

- The IP PE component, which Enbridge acknowledges will only be required for the replace option, not the repair option;¹²
- The abandonment costs, which will only be required for the replace option, not the repair option; and
- The retrofit and inline inspection costs that will only be required in the repair option, not the replace option.

Environmental Defence asked Enbridge to update table 13 to include all the relevant costs.¹³ The updated table shows that the repair option is \$57 million less expensive:

Table 13: Comparison of Repair Option and Replace Option (Project) Costs Including Abandonment

(\$ millions)	Repair Option	Replace Option
Total Cost	\$63.8	\$111.5
Net Present Value	\$(33.9)	\$(91.2)

Note:

Replace Option includes both the abandonment costs and the IP PE costs, etc.

The NPV impact for the abandonment cost is approx. (\$6.9) million.

Total abandonment cost is approx. 10.3 million.

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Based on Enbridge's pre-filed evidence and its undertaking response, the repair option is much less expensive. Although Enbridge alluded to certain caveats, forecasts and comparisons always

¹⁰ Exhibit JT1.16.

¹¹ Exhibit B, Tab 1, Schedule 1, Page 45.

¹² Transcript, March 4, 2022, p. 95, lns. 7-12.

¹³ Transcript, March 4, 2022, p. 99 ln. 20 to p. 100 ln. 27.

¹⁴ Exhibit JT1.16.

have caveats. Tellingly, there are no tables filed anywhere in the evidence showing that the repair option is more expensive than the replacement option. If that could be supported on the facts, that kind of table would clearly have been provided.

Furthermore, Enbridge's estimate of the repair option is likely too high. A large portion of the repair option involves retrofitting the pipes to allow for use of inline inspection tools. However, robotic inline inspection tools do not require this kind of retrofitting. The pre-filed evidence is silent on the use of those tools. They were only discussed after being raised by Mr. Quinn. Even then, the evidence was woefully incomplete. Enbridge acknowledged that it rejected this option after only looking at one potential robotic inspection provider, Pipetel.¹⁵ It also acknowledged Pipetel could have been used on 1.2 km of the pipeline, but that inspection was cancelled on the assumption that a replacement would take place regardless.¹⁶ There was no report to show that robotic inspection could not be done on the remaining portions of the pipeline and no consideration of other providers, despite some seemingly very promising materials put to Enbridge by Mr. Quinn during the technical conference.¹⁷

The repair option is safe, less expensive, and clearly in the best interests of customers.

Inadequate assessment of options

Possibility of underutilization disregarded

In addition, Enbridge's planning was insufficient because it did not consider the possibility of asset underutilization beyond 2050. In particular, Enbridge did not consider how this risk would impact the weighing of the repair option versus the replace option. Instead, Enbridge implicitly assumed, without any justification, that there is zero risk of underutilization of these assets in relation to decarbonization, even after 2050.

The costs for this project will not be fully depreciated until 2077.¹⁸ By 2050, over \$43 million will remain undepreciated.¹⁹ Canada has committed in legislation to net-zero carbon emissions by 2050.²⁰ It is not certain that this pipeline will be used and useful by that date, let alone utilized to a degree sufficient to continue paying off the remaining cost.

Enbridge was very clear that it did not analyze the risk of underutilization beyond 2050:

MR. MONDROW: [H]as Enbridge done any analysis of the risk of underutilization of this asset beyond 2050?

MR. CLARK: Brad Clark, Enbridge. In our current forecasting period which does not include 2050 we have not. I am not aware of any analysis past beyond 2050.

¹⁵ Transcript, March 4, 2022, p. 88 lns. 20-28.

¹⁶ Exhibit JT1.6.

¹⁷ Exhibit K1.1

¹⁸ Exhibit I.ED.5.

¹⁹ *Ibid.*

²⁰ *Canadian Net-Zero Emissions Accountability Act*, S.C. 2021, c. 22.

MR. MONDROW: Okay. So the answer is no? Is that right? There's been no analysis of the risk of underutilization?

MR. CLARK: None that I am aware of.²¹

Decarbonization is relevant to an analysis of repair alternatives in at least three ways.

First, a repair option can buy time until we have more information on how decarbonization will take place and the extent that it will impact gas demand. This is often described as option value or planning value.

Second, the cost effectiveness of a repair option will improve relative to a replace option as the risk of stranded or underutilized assets due to decarbonization increases.

Third, decarbonization may in some cases allow for a smaller and less expensive pipeline to be used in the future if replacement is ultimately deemed appropriate.

None of these factors were considered by Enbridge even though its pipeline will not be fully depreciated until the late 2070s.

Ottawa may exit Enbridge's pipeline system

The evidence of the City of Ottawa shows that the risk of underutilization is not so remote that it can be fully ignored. Representatives of the City of Ottawa provided evidence regarding its plans to drastically reduce its carbon emissions.²² It has detailed plans to reduce its corporate emissions to zero by 2040 and its community-wide emissions to zero by 2050.²³ Its community housing agency, which owns 15,000 homes, plans to reduce its emissions to zero by 2040 through "deep retrofitting and phasing out of natural gas energy equipment."²⁴

Although no decisions have been made on this topic, decarbonization may mean that the city no longer relies on Enbridge's distribution system.²⁵ But even if Ottawa could still use Enbridge's distribution system for renewable gas, it is far from clear that this level of utilization would be sufficient to fund the system.

Feasibility of electrification

Enbridge suggested that electrification is not feasible. This was done in less than a page of text in its reply evidence stating that electricity generation half the size of Pickering Nuclear Generating Station would have to be built to eliminate the St. Laurent pipeline system.²⁶ This is an incorrect and absurd proposition. Enbridge declined to put forward a witness at the technical conference who could speak to this evidence, despite requests from multiple parties.

²¹ Transcript, March 4, 2022, p. 105.

²² Evidence of the City of Ottawa, January 17, 2020.

²³ *Ibid.* at p. 4.

²⁴ *Ibid.* at p. 8.

²⁵ Sponsor's Interrogatory Responses, 2.1-Staff-2 (b).

²⁶ Enbridge Responding Evidence, January 27, 2022, p. 5.

Enbridge's proposition is based on a conversion of the energetic value of peak gas demand to electricity. This is highly misleading because:

- Gas heating is far less efficient than electric heating. All-electric ground-source heat pumps are particularly efficient, in the range of 500%.²⁷ Ottawa is planning to secure approximately 25% of its heating from this source²⁸. A kilowatt of energy generates more than 5.2 times as much heat in this all-electric equipment versus a typical gas furnace.
- Peak heating demand can be reduced by energy efficiency. Ottawa plans to reduce its heating demand by approximately 65%. This will further reduce the electricity needed to heat homes.²⁹
- Thermal storage can completely shift energy demand from the daytime peak to the nighttime trough by storing heat in bricks or other materials. This can further reduce peak electricity needs.

Enbridge acknowledged that these factors need to be considered to assess electrification supply needs.³⁰ Environmental Defence prepared a calculation showing that these factors reduce the incremental peak demand from electrification to well below Ottawa's planned increase in battery capacity alone, let alone its much larger plans for renewable energy.³¹ Ottawa's witnesses confirmed the calculations and that the measures described were consistent with its plans.³²

Ultimately, Enbridge had to retract the suggestion that electrification is not feasible and acknowledge that its calculations did not incorporate many of the variables necessary to determine the actual feasibility of full electrification.³³

Broader decarbonization may cause underutilization

In addition, broader decarbonization trends show that the risk of underutilization is not so remote that it can be ignored. Electrification is the key recommended strategy for a low-carbon transition for buildings by a number of leading institutions. For instance, the International Energy Agency recommends the phase out of fossil fuel-based heating systems by 2025 to achieve net-zero emissions by mid-century.³⁴ This call for phasing out fossil fuel-based heating is consistent with Ottawa's plans.³⁵

²⁷ Transcript March 7, 2022, p. 39, lns. 22-27.

²⁸ Transcript March 7, 2022, p. 38, lns. 23-27.

²⁹ Transcript March 7, 2022, p. 64, ln. 10; Exhibit JT2.4(a); Exhibit KT2.3.

³⁰ Exhibit JT1.27.

³¹ Exhibit JT2.4(a); Exhibit KT2.3.

³² *Ibid.*

³³ Exhibit JT1.27 (Company wishes to reiterate that its calculations did not incorporate any of the many additional variables necessary (some of which were named by ED within its questions at Exhibit I.M.1.ED.25) to accurately determine the actual feasibility of fully electrifying the City of Ottawa and Gatineau in place of providing natural gas service via the St. Laurent pipeline system. The foregoing qualification would also apply to any conclusion as to the electricity generation, transmission and/or distribution infrastructure that would need to be built and placed into service to eliminate the St. Laurent pipeline system.).

³⁴ *Ibid.*; Transcript, March 4, 2022, p. 32, lns. 4-15; <https://www.iea.org/reports/heating>.

³⁵ *Ibid.*

Enbridge has put forward no evidence to support its implicit assumption that the risk of underutilization by 2050 is zero. In contrast, basic facts show that implicit assumption to be unfounded. For instance, the current gas supply charge is approximately 14.5 cents/m³ in Toronto.³⁶ The 2030 carbon price of \$170/tonne CO₂e amounts to 33.24 cents/m³.³⁷ The combined price of gas and carbon would be 48.74 cents/m³ in 2030, triple the current commodity price, even if there are no commodity price increases in the interim. This will presumably impact customer choices, such as weighing the benefits of zero-emission high-efficiency all-electric heat pumps against fossil gas furnaces. Indeed, that is the entire purpose of a price on carbon.

In the ongoing proceeding in EB-2021-0002, Environmental Defence has submitted evidence of Dr. Heather McDiarmid that all electric heat pumps are near or over a cost-effectiveness tipping point relative to gas.³⁸ We cannot rely on that evidence in this separate proceeding to establish specific assertions about likely decarbonization pathways. But we can note that Enbridge is well-aware of the potential for customers to increasingly leave the gas system for economic reasons but has implicitly assumed there is zero risk of this and has declined to substantiate that assumption with evidence.

As an aside, the potential for hydrogen and renewable natural gas do not justify the implicit assumption of zero risk of underutilization from decarbonization. Enbridge has confirmed that those gaseous alternatives have very low potential due to greatly limited renewable gas feedstocks and safety limits on hydrogen blending.³⁹ But more fundamentally, Enbridge cannot assume that a decarbonization pathway that relies on a zero-carbon gas distribution pipeline network will beat out other pathways that do not, such as pathways with greater electrification. Again, it cannot assume the risk of underutilization in 2050 is zero.

Even if Ottawa had no decarbonization plans of its own, federal carbon legislation and broader trends toward decarbonization cannot be ignored by Enbridge.

Major risks from cumulative impacts of biased planning processes

This project would unnecessarily add \$134 million to rates and cost at least \$57 million more than the repair option. That is bad in and of itself. However, it is an even bigger problem when considered as part of the cumulative impact of Enbridge's implicit decision to disregard the potential impacts of decarbonization.

³⁶ <https://www.enbridgegas.com/-/media/Extranet-Pages/residential/myaccount/rates/rate-1-system-en.ashx?rev=7a36ca722e6743e1aa47b176f5f07003>

³⁷ <https://www.enbridgegas.com/Natural-Gas-and-the-Environment/Enbridge-A-Green-Future/Federal-Carbon-Pricing-Program>

³⁸ See Exhibit L.ED.1.I, p. 16 ([link](#)), addendum ([link](#)), and presentation ([link](#)).

³⁹ Enbridge's evidence and an OEB study found that the potential available renewable gas is less than 2.5% of Ontario's current fossil gas consumption due to limitations on feedstocks. Enbridge's evidence and an OEB study found that the potential available renewable gas is less than 2.5% of Ontario's current fossil gas consumption due to limitations on feedstocks per EB-2020-0066, Exhibit JT1.5 ([link](#)) (Enbridge estimates the potential as 402 million m³/yr by 2025, which is 1.55% of Ontario's gas consumption of 26 billion m³/yr); EB-2016-0359, ICF, *Marginal Abatement Cost Curve*, July 20, 2017, prepared for the OEB, p. 47 ([link](#)) (This report estimates a potential of 627 million m³/yr, which is 2.41% of Ontario's consumption of 26 billion m³/yr.); Enbridge's evidence establishes that hydrogen can only be injected into current pipelines at up to 6% by energetic value, which equates to 20% by volume See EB-2019-0294, Exhibit I.ED.7, [link](#), PDF p. 177 & Exhibit I.ED.12, p 14-15 (h)&(i), [link](#), PDF p. 15-16.

Enbridge has never considered the impacts of various plausible decarbonization pathways on the investments it makes on behalf of consumers in fossil fuel infrastructure. Over time, more and more dollars are being locked into long-lived assets that will not be paid off until the 2070s. Ontario's fossil gas distribution infrastructure liability grew each year from 2011 to 2020, from less than \$10 billion to over \$15 billion.⁴⁰ This trend of continual increases in fossil fuel infrastructure creates significant risks for customers on a cumulative basis. Some of this risk could be mitigated by taking steps to limit increases in rate base, such as repairing pipelines instead of replacing them when that is safe and cost-effective to do so.

The financial risks associated with continued investments in fossil fuels are widely acknowledged by financial leaders. Mark Carney, for example, has warned that global warming could render the assets of many financial companies worthless because they have been too slow to cut investment in fossil fuels.⁴¹ In this case, Enbridge is increasing those risks on behalf of all Ontarians by biasing its planning decisions in favour of more fossil fuel infrastructure.

We do not know what 2050 will hold. But the best way to prepare for all eventualities, and to protect consumers, is to ensure that no unnecessary costs enter into rate base with the goal that rate base begins to shrink. This would minimize overall risks to ratepayers and provide a partial hedge against potential futures.

Conclusion

Environmental Defence respectfully requests that the OEB direct Enbridge to pursue the repair option for this pipeline, including further exploration of robotic inline inspection to lower repair costs. This would be safe, and would save ratepayers at least \$57 million. It would also help to reduce some of the cumulative risks that are accruing to ratepayers through steady increases in fossil fuel infrastructure.

More broadly, we ask that Enbridge be directed to consider the likelihood of underutilized assets when comparing repair and replace alternatives. The least risky option for all ratepayers is to choose the repair option over the replace option wherever it is safe and more cost effective after considering all material factors.

⁴⁰ OEB, Ontario Natural Gas Yearbooks, 2021 & 2015 (Net PP & E).

⁴¹ Financial Post, *Global warming could render the assets of many financial companies worthless, Mark Carney warns*, December 30, 2019, <https://business.financialpost.com/news/fp-street/boes-carney-says-finance-must-act-faster-on-climate-change>.