

ONTARIO ENERGY BOARD

EB-2022-0157

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

AND IN THE MATTER OF an application for leave to construct natural gas pipeline and associated facilities in the Municipality of Chatham Kent, Municipality of Lakeshore, Town of Kingsville and Municipality of Leamington

Submissions of Environmental Defence

Re Enbridge Panhandle Regional Expansion Project

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Overview

Enbridge is proposing to build a \$358 million pipeline expansion in the panhandle region in southwestern Ontario.¹ Even if the 40-year revenue forecast is met, the project will result in a \$150 million loss (i.e. a net present value of negative \$150 million), which will be covered through a cross-subsidy from existing customers.² If a portion of the incremental forecast revenue does not materialize, the subsidy will be many millions higher.

The project fails stage 1 of the EBO 134 test. Therefore, Enbridge attempts to justify the project based on purported savings for new customers who could use gas instead of competing fuels. However, these savings are illusory. Because electric heat pumps are now much more cost-effective than gas systems, there are no stage 2 benefits.

The OEB has never approved a pipeline project on the basis of stage 3 benefits alone and there is no basis to do so in this case. Enbridge's stage 3 analysis is deeply flawed and biased, focusing only on the purported benefits, while disregarding the benefits of the counter-factual and the downsides from building the project. But even the purported benefits (jobs and investment) cannot justify the project as it stands. If the project will result in a boom in greenhouses and fossil fuel power generation demand, those customers should pay for it. This would be fairer,

¹ Exhibit E, Tab 1, Schedule 1, Page 1.

² Exhibit E, Tab 1, Schedule 1, Page 1.

while also giving those customers the appropriate incentives to implement efficiency and electrification where feasible to reduce their incremental peak demand.

The project does not pass the EBO 134 test and is not in the public interest. Environmental Defence asks that the OEB deny leave to construct. If Enbridge is allowed to re-apply, the OEB should direct that it make the following adjustments:

- (a) A revenue horizon limited to 20 years;
- (b) Capital contributions sufficient to eliminate any subsidy;
- (c) A balanced stage 3 analysis that also considers negative impacts of the proposed pipeline and benefits of the counter-factual scenario; and
- (d) An integrated resource planning (“IRP”) analysis that quantifies the potential savings from contract customers and the energy bill reductions that would be achieved by all participating customers.

The project is not in the public interest and fails the EBO 134 test

Public interest test and overview

The governing legal test in this proceeding is whether the expansion is in the public interest under s. 96 of the *Ontario Energy Board Act, 1998*.³ Although the Board should consider the applicable guidance from EBO 134, or from EBO 188 should the OEB decide this to be a distribution project, that cannot fetter its discretion to fulfill its statutory duty to decide what is in the public interest.⁴ Neither EBO 134 or EBO 188 are binding, and neither can override the superseding duty to consider what is in the public interest.⁵ In any event, the public interest test, EBO 134, and EBO 188 all result in the same conclusion that leave should be denied.

At a high level, Enbridge is applying the public interest test and EBO 134 as if nothing has changed since the 1990s. This is inconsistent with the clear guidance in EBO 134, which states that “the concept of public interest is dynamic and it must change according to the circumstances.”⁶ There are two major differences between this case and all of the other gas transmission leave to construct applications that have come before it from a public interest perspective.

- For the first time, gas is no longer the cheapest heating option for buildings. That is critically important because gas expansion *used to* help customers lower their energy bills, which was the primary public interest benefit. But now homeowners don’t need gas to save money and can actually achieve much lower energy bills with heat pumps instead

³ *Ontario Energy Board Act, 1998*, [S.O. 1998, c. 15, Sched. B](#).

⁴ *Pollution Probe Foundation v. Ontario Energy Board*, 2012 ONSC 3206 ([link](#)).

⁵ *Ibid.*

⁶ EBO 134, Report of the Board, June 1, 1987, s. 5.14 ([link](#)).

of gas. As such, the primary public interest benefit in favour of gas expansion is now gone.

- The second major difference is that we are in the midst of an energy transition that puts the future need for pipelines into question. Major projects like this create major risks for existing ratepayers because the project economics are based on a 40-year prediction of strong revenue and strong demand stretching far beyond 2050, which may not come to pass. This risk is a new and important public interest factor against approval.

The energy transition also calls into question the potential upside for existing customers. It was once the case that expansions and customer additions would eventually reduce the costs for all customers after the rates paid by those new customers had covered the incremental upfront connection infrastructure costs. We now know that homes must stop burning fossil-based methane gas long before the end of the 40-year revenue horizon, making it highly unlikely that there would ever be any upside for the existing customer base or payment towards existing rate base.⁷

From this high-level perspective, it is clear that the main public good in gas expansion has disappeared at the same time as major risks have come to the fore. These new realities factor into the specific application of the EBO 134 test, such that this project spectacularly fails that test, as detailed below.

The project fails stage 1

This proposed project fails the stage 1 test, more so than any other transmission project that the OEB has ever approved. Most obviously, the project will result in a \$150 million loss and cross-subsidy from existing customers.⁸ But that is the case if (a) there are no cost overruns and (b) Enbridge brings in \$356 million in incremental revenue over 40 years to cover the capital costs and the ongoing incremental expenses.⁹ Both of those are far from certain.

There is at least a material possibility that the \$356 million 40-year revenue forecast will not materialize. The revenue forecast extends out to 2064 – long after the point at which Canada is legally obligated to achieve net zero and even farther past the interim statutory emissions reduction targets that arise between now and 2050.¹⁰ It is far from certain that there will still be demand for the capacity created by this pipeline in a net zero future. Even if the efforts to achieve net zero cause only modest declines in demand, this will erode the forecast incremental revenue.

Enbridge has failed to follow the guidance under EBO 134 to conduct a risk analysis of the key variables underlying the stage 1 figures, particularly the revenue forecast. EBO 134 states as follows:

⁷ See Environmental Defence Submissions in EB-2022-0200, September 19, 2023 ([link](#)); also, the feasibility of net-zero alternatives that require pipelines is highly suspect at best.

⁸ Exhibit E, Tab 1, Schedule 1, Page 1.

⁹ Exhibit E, Tab 1, Schedule 5, Page 1.

¹⁰ *Canadian Net-Zero Emissions Accountability Act*, S.C. 2021, c. 22 ([link](#)).

6.69 The Board encourages the use of more formal risk measurement in the feasibility test and it would not discourage the use of sensitivity analyses of variables being regularly employed in the test.¹¹

EBO 134 also supported a sensitivity analysis in its support for Union's three-stage test, which included a sensitivity analysis.¹² A sensitivity analysis is far more important today than it would have been when in 1987 when the OEB expressed its support for it because there is an alternative home heating option that is considerably less expensive than gas and the entire future of methane gas for heating is uncertain at best.

Although it is possible that fewer than forecast customers will connect, the much greater financial risk is that existing and new customers reduce their demand and drop off the system over the 40-year horizon. This would erode the incremental revenue underpinning the project economics.¹³ Unfortunately, we have no sensitivity analysis assessing this risk and the potential impacts. Although Enbridge forecasts a \$150 million loss and cross-subsidy, the actual outcome could be far worse if the revenue forecast does not materialize.

The project fails stage 2

Enbridge's stage 2 analysis is fundamentally flawed and inaccurate. EBO 134 describes stage 2 as follows:

The second stage should be designed to quantify other public interest factors not considered at stage one. All quantifiable other public interest information as to costs and benefits should be provided at this stage.¹⁴

Enbridge's analysis clearly does not account for all quantifiable relevant costs and benefits. Instead, Enbridge argues that customers will save money because methane gas is cheaper than other fuel alternatives when comparing the costs per unit of energy. That may have made sense when most heating methods were roughly equally efficient. That is no longer the case because heat pumps are far more efficient than gas equipment on a seasonal basis. A typical gas furnace is in the range of 95% efficient and cannot even theoretically exceed 100% efficiency.¹⁵ Air source and ground source heat pumps are up to 390% and 500% efficient over the winter season,

¹¹ EBO 134, Report of the Board, June 1, 1987, s. 6.69 ([link](#)).

¹² EBO 134, Report of the Board, June 1, 1987, s. 6.61 & 6.72 ([link](#)):
Union's Alternative to the Benefit Test

...
6.61 A sensitivity analyses on the key variables (e.g. social discount rate, gas prices, alternative fuel prices, inflation) is performed to assess the project's risk. ...

...
The Board's Findings on Economic Feasibility Tests

...
6.72 The Board finds that Union's three-stage test has considerable merit.

¹³ Hearing Transcript Vol. 2, p. 132, lns. 1-11 ([link](#)); Exhibit I.ED.8(c) ([link](#)).

¹⁴ EBO 134, Report of the Board, June 1, 1987, s. 6.74 ([link](#)).

¹⁵ Hearing Transcript Vol. 2, p. 137, lns. 15-19 ([link](#)).

respectively, because they move heat instead of converting a fuel into heat.¹⁶ Even a heat pump that is only 200% efficient over the winter season will be cheaper to operate in terms of annual energy costs compared to a gas furnace, as Enbridge acknowledged on cross-examination.¹⁷

Enbridge's analysis is also flawed in that it compares the cost of gas heating to the existing heating fuel mix instead of the cheapest alternative. The purported stage 2 benefits arise almost entirely from new construction homes (between 95 and 99%).¹⁸ Enbridge acknowledges that it is assuming that roughly 24% of new construction homes would be built with oil boilers, which is an absurd proposition in light of the high cost of oil boilers and oil heating.¹⁹ A significant portion of the purported stage 2 benefits arise from a comparison of the cost of gas heating versus oil heating in new construction homes – that is not a real benefit.

Enbridge will argue that its stage 2 calculations have been approved in previous decisions under EBO 134. However, Enbridge's stage 2 methodology is **not** mandated by EBO 134. Indeed, it are contrary to EBO 134 because it does not include all relevant quantifiable information. Furthermore, the fact that the OEB has accepted this approach in the past does not mean it must accept it now in light of drastically changed circumstances. It is only recently that cold climate heat pumps have become both a technically viable option in our climate and highly efficient.²⁰

Dr. Heather McDiarmid's evidence provides a far more robust analysis. Dr. McDiarmid approached the issue from two perspectives. First, she adjusted Enbridge's own energy cost comparison spreadsheet to correct key omissions, including the different efficiency levels of gas furnaces versus heat pumps. Second, she conducted a full lifetime comparison. In both cases, she found that general service customers would be far worse off with gas compared to a heat pump in the range of tens of millions of dollars.²¹

Enbridge critiques Dr. McDiarmid's report in a number of ways, none of which have any merit, as outlined below:

- First, Enbridge argues that one cannot have *negative* stage 2 results. This disregards the reality that new construction homes are built primarily by subdivision developers, who are not the ones that ultimately pay the heating bills. If those developers install gas instead of heat pumps, due to the availability of pipeline capacity and the split incentive problem, customers will be worse off.
- Second, Enbridge argues that Dr. McDiarmid should not have included distribution costs in stage 2 because distribution revenues are included as a benefit in stage 1. But Dr. McDiarmid still found an NPV of negative \$24 million even excluding gas distribution

¹⁶ Dr. McDarmid Report, October 18, 2023 p. 2 ([link](#)); Natural Resources Canada, *Heating and Cooling with a Heat Pump* (Exhibit K2.3, p. 23 & 41 – [link](#)); Hearing Transcript Vol. 2, p. 137, Ins. 20-28 ([link](#)).

¹⁷ Hearing Transcript Vol. 2, p. 138, Ins. 17-23 ([link](#)).

¹⁸ Hearing Transcript Vol. 2, p. 133, Ins. 7-12 ([link](#)).

¹⁹ Hearing Transcript Vol. 2, p. 135, Ins. 16-21 ([link](#)).

²⁰ Dr. McDarmid Report, October 18, 2023 ([link](#)); Natural Resources Canada, *Heating and Cooling with a Heat Pump* (Exhibit K2.3, [link](#)); Hearing Transcript Vol. 2, p. 137, Ins. 20-28 ([link](#)).

²¹ Dr. McDarmid Report, October 18, 2023 p. 2 ([link](#)).

costs.²²

Furthermore, it is methodologically accurate to include distribution costs when examining the costs and benefits to potential new customers. A new customer that connects to the gas system must pay gas distribution costs, and so those need to be accounted for to determine whether and how much money that customer is actually saving in comparison to the alternative.

Stage 1 and stage 2 have different purposes. Stage 1 determines if there is a cross-subsidy.²³ Stage 2 examines net costs and benefits.²⁴ Distribution charges are relevant to both and need to be accounted for in both. Although Enbridge sums the stage 1 and 2 benefits together, that is illogical and contrary to EBO 134.²⁵ Although the OEB has not criticized that practice in past cases, that does not represent an explicit approval or require this OEB Panel to follow suit.

- Third, Enbridge argues against a comparison of gas heating to the cheapest alternative. Enbridge seems to suggest that the cost of methane gas heating should be compared to a forecast of what would be installed in lieu of methane gas were it not to be available. But that is difficult to predict, and Enbridge has not even attempted to do so (see above re the assumption of 24% oil heating penetration in new construction homes). Furthermore, the choices that consumers might make could be the consequence of a lack of information or false marketing. The simplest and best assumption that can be made on this record, if an assumption is required, is that customers would install the best and cheapest alternative if gas was not available.

Furthermore, it is incorrect to say that new construction customers benefit from lower energy bills unless you compare to the cheapest alternatives. Take this analogy: If the same new car is on sale at different dealerships for \$35,000, \$40,000, and \$45,000, I cannot say that I have “saved” \$5,000 by buying the \$40,000 car. Similarly, if the second dealership with the \$40,000 car opens, one cannot say that there is a \$5,000 benefit for every person who buys from them not knowing that the exact same car is available for \$5,000 less down the road. Calculating the “benefit” of gas expansion requires a comparison with the best alternative heating fuel source.

- Fourth, Enbridge argues that gas could become cost effective again if certain major assumptions are changed and the carbon price is removed. But if gas simply becomes cost-competitive again, that will not result in significant stage 2 benefits. Furthermore, this ignores Dr. McDiarmid’s own sensitivity analysis²⁶ and the ways in which her overall analysis was conservative, including the following:

²² Dr. McDiarmid Presentation, November 10 2023, p. 4 ([link](#)).

²³ EBO 134, Report of the Board, June 1, 1987, s. 6.67 ([link](#)).

²⁴ EBO 134, Report of the Board, June 1, 1987, s. 6.74 ([link](#)).

²⁵ EBO 134, Report of the Board, June 1, 1987, s. 6.62 ([link](#)).

²⁶ Dr. McDarmid Report, October 18, 2023 p. 4 ([link](#)).

- The panhandle region is relatively warmer, which will result in greater heat pump efficiency than modelled;
 - New construction homes likely have lower up-front installation costs;
 - Ground source heat pumps are even more efficient and cost-effective than the air-source heat pumps that were modelled;
 - Federal grants were not accounted for; and
 - No carbon price increases were assumed after 2030.²⁷
- Fifth, it was suggested that heat pumps may not be appropriate or cost-effective for larger and/or poorly insulated homes with a higher heating load. That is false. There is no question that a heat pump can effectively heat these homes.²⁸ In fact, the savings for these homes are even greater than for homes with a smaller heating load. For example, a home with double the average heating load could save an *additional* \$5,000 in energy bill savings over the lifetime of the equipment.²⁹
 - Sixth, it was suggested that Dr. McDiarmid should have accounted for potential upstream incremental upstream electrical transmission and distribution costs that would be required with electrified heating. This is misguided. The stage 2 analysis based on Dr. McDiarmid’s report is symmetrical in that it excludes both incremental electricity *and* gas distribution and transmission (“T&D”) costs. If one included incremental electricity T&D costs, one would need to include incremental gas T&D costs as well. Doing so would make electrified heating even more cost-effective than gas heating, for two reasons:
 - Incremental gas T&D costs would include costs of this transmission project *plus* all of the entirely new distribution costs to connect all those new developments. In contrast, electricity T&D costs would include *incremental* costs to upsize wires and transformers to handle the winter peak load, which are likely to be modest seeing as new construction homes are already built with 200-amp services. In other words, new homes already need wires and transformers, and electrified heating will at most require somewhat bigger equipment (if any). In contrast, the gas T&D would require many kilometers of pipe that could otherwise be avoided. Accounting for this difference would just make electrified heating even more cost-effective in comparison to gas. Excluding the T&D costs actually makes Dr. McDiarmid’s analysis very conservative, as it excludes one of the key benefits of electrification in new construction (i.e. the avoidance of new gas lines).
 - Also, there is at least a significant possibility that these homes will need to electrify their heating in the future because of the high cost of low-carbon gaseous fuels, limited renewable gas feedstocks, and lack of a feasible 100% hydrogen

²⁷ Dr. McDiarmid Presentation, November 10 2023, p. 6 ([link](#)).

²⁸ Exhibit J1.3, p. 2 ([link](#)).

²⁹ Exhibit J1.3, p. 2 ([link](#)).

option.³⁰ The electrified option becomes even more cost-effective when one considers the future costs to convert to heat pumps. If there are any incremental electricity T&D costs associated with electrified heating, it will be much more cost-effective to build out the infrastructure properly now and avoid replacement before end-of-life down the road. Again, the exclusion of this consideration is another way in which Dr. McDiarmid’s analysis is conservative.

Finally, we note that Enbridge has the burden to justify its project. It cannot do so based on its fundamentally flawed stage 2 analysis. Dr. McDiarmid’s analysis is far more robust and shows that the availability of gas to subdivision developers would result in significantly higher gas bills for new home owners compared to the best alternative.

Stage 3 analysis is fundamentally flawed and biased

Enbridge has not conducted a stage 3 analysis looking at the costs and benefits of pursuing the project versus alternatives. Instead, it has produced a highly biased assessment that only looks at the purported benefits and disregards the negative impacts. Those negative impacts are as follows:

- **Energy transition risk exposure and rate base:** Enbridge customers are highly exposed to risks associated with the energy transition. Rate base is high and set to increase by another \$2 billion over the next five years at a time when the future viability of pipelines in a decarbonized future is uncertain.³¹ This project is large and would materially add to that risk, particularly if the benefiting large industrial customers do not cover the cost and the risk.
- **Fossil fuel subsidy:** As proposed, this project would amount to a \$150 million subsidy for fossil fuel infrastructure. It would also subsidize a particularly unsustainable and carbon-intensive form of agriculture – gas-powered greenhouses. Produce grown in gas-powered greenhouses result in far higher carbon emissions than those grown in fields and trucked to Ontario. One comparison found that greenhouse-grown tomatoes had 10 times the emissions as those trucked from Mexico.³² The project would also subsidize fossil-fuel power generation.
- **Skewed behavior and sub-optimal outcomes.** This subsidy will blunt the natural incentive for customers to invest in energy efficiency and electrification. Like other subsidies, this will result in a sub-optimal outcome (i.e. a non-Pareto-optimal outcome) by interfering with market prices, resulting in higher societal costs. Also, as a subsidy for fossil fuel infrastructure, it will result in higher emissions.

³⁰ Environmental Defence Submissions in EB-2022-0200, September 19, 2023 ([link](#)).

³¹ See Environmental Defence Submissions in EB-2022-0200, September 19, 2023 ([link](#)).

³² Dr. McDarmid Report, October 18, 2023 p. 4 ([link](#)).

- **Carbon emissions:** The incremental volumes of gas underlying the revenue forecast will result in massive quantities of greenhouse gases (GHG) in combustion emissions alone - 36 MT CO_{2e}.³³
- **Economic and employment losses:** To the extent that this project promotes the use of gas at the expense of energy efficiency and electrification, it will result in economic and employment losses. Spending on gas flows out of the province and is lost to our economy. Spending on efficiency and electrification mostly stays in Ontario, creating good jobs, economic growth, and government revenue.

Enbridge emphasized the investments and jobs that would be created. But how long-term would those jobs be when they are in highly carbon-intensive industries like fossil fuel power generation and fossil fuel heated greenhouses? Enbridge also notes that the spending on the pipeline itself would result in jobs and growth. By that logic, the more that is spent on pipelines the better – an absurd conclusion.

Furthermore, Enbridge does not compare the benefits to a counterfactual. You cannot say that this \$150 million subsidy will bring about the purported jobs and growth benefits without looking at how else you could spend \$150 million of ratepayer dollars and the jobs and growth benefits that would flow from the best alternative. For instance, is it better to subsidize gas plants and gas-powered greenhouses, or to allocate those dollars to help all customers lower their energy bills through incentivized energy efficiency, which would result in lower energy bills while also creating jobs and economic growth? This is a rhetorical question, but it highlights how the OEB should not be assume the position of doling out industrial subsidies with the aim of creating jobs and growth. That is not the OEB's role, and if it were the OEB's role, that exercise would need to be based on a detailed analysis of alternative uses for those funds, which is not present here.

This project cannot be approved based on such a highly flawed stage 3 analysis. If the leave to construct is denied without prejudice to re-applying, Enbridge should be required to conduct a proper stage 3 analysis.

Capital contributions

There is absolutely no justification for the \$150 million subsidy. If Enbridge is allowed to re-apply, it should be directed to ensure that it secures capital contributions sufficient to eliminate the subsidy. This is justified on multiple grounds:

- **Public interest:** As noted above, the OEB has never granted leave to a transmission pipeline where there are no stage 2 benefits or where there has been evidence that the pipeline is not required to achieve lower energy bills. Without these public interest benefits, there is no public interest justification for existing customers to subsidize the project.

³³ Exhibit I.ED.13.

- **Beneficiary pays:** Requiring capital contributions from the industrial customers causing the need for the pipeline and benefiting from the project is required by the beneficiary pays principle.
- **Fairness versus recently-connected customers:** Enbridge argues against capital contributions on the basis that it would be unfair vis-à-vis customers who recently connected and did not need to pay a capital contribution. By that argument, it would never be fair to change rates. In any event, there is no unfairness here – there are simply different circumstances that warrant different regulatory treatment. Even if there were unfairness, it would be far outweighed by the unfairness to existing customers of a \$150 million subsidy.
- **Predictability:** Enbridge argues against capital contributions on the basis of predictability, noting that capital contributions have not been required in the past. This is overly rigid and contrary to EBO 134, which calls for the public interest test to be applied in a way that is “dynamic” and that “must change according to the circumstances.”³⁴
- **Capital contribution methodology:** Enbridge argued against capital contributions on the basis that they will result in over- or under collection of revenue. That is because the amount of available capacity will vary depending on where customers connect to the system. However, Enbridge is clear that it is entirely possible to develop a methodology and the only question is how to limit over and under collection.³⁵ Although it may not be possible to achieve perfect fairness, that is no different from the lack of perfect fairness inherent in postage stamp rates that result in the same rates for customers that actually cost different amounts to serve. Furthermore, steps can be taken to limit over and under collection:
 - Over collection can be eliminated by capping the capital contributions that Enbridge will collect. If there is additional capacity available after the requisite funds have been collected, Enbridge could either (a) stop collecting contributions or (b) collect contributions but disburse them pro-rata to those who connected previously. With respect to (b), this is not difficult to achieve seeing as electricity distributors are required to implement a similar approach.³⁶
 - Under collection can be eliminated by setting the capital contributions high enough so that they it is unlikely that under collection will occur. Over-collected

³⁴ EBO 134, Report of the Board, June 1, 1987, s. 5.14 ([link](#)).

³⁵ Hearing Transcript Vol. 2, p. 160, lns. 15-25 ([link](#)).

³⁶ Distribution System Code, s. 3.2.27 ([link](#)) (“Unforecasted customers that connect to the distribution system during the five-year customer connection horizon will benefit from the earlier expansion and should contribute their share. In such an event, the initial contributors shall be entitled to a rebate from the distributor. A distributor shall collect from the unforecasted customers an amount equal to the rebate the distributor shall pay to the initial contributors. The amount of the rebate shall be determined as follows: (a) for a period of up to five years, the initial contributor shall be entitled to a rebate without interest, based on apportioned benefit for the remaining period; and (b) the apportioned benefit shall be determined by considering such factors as the relative name-plate rated capacity of the generator customers, the relative noncoincident peak demand of the load customers and the relative line length in proportion to the line length being shared by the customers , as applicable.”).

amounts can then be returned to customers who connected previously through the process discussed above.

- Alternatively, under collection could simply be tolerated. It would be better to have some degree of under collection in lieu of Enbridge’s proposal of a \$150 million subsidy.
- **Regulatory jurisdiction:** Enbridge seems to imply that capital contributions should not (or cannot) be made because they are not provided for under EBO 134. We will not address that in detail and instead rely on the submissions what we understand other intervenors will be making. In any event, neither EBO 134 or EBO 188 are binding, and neither can override the superseding duty to consider what is in the public interest.³⁷
- **Race-to-the-bottom:** Enbridge justifies the subsidy as a way to attract greenhouses to Ontario instead of other jurisdictions. This is a perfect example of the “race-to-the-bottom” where jurisdictions are pressured to make bad policy in an attempt to attract business. The OEB should not be subsidizing fossil fuel infrastructure for this carbon-intensive industry in order to outcompete other jurisdictions.
- **Blunting efficiency and electrification incentives:** As Dr. Petro acknowledged, there are multiple ways in which greenhouses can reduce their consumption of gas, including energy efficiency and biomass.³⁸ A pipeline subsidy will blunt their incentive to do so. In contrast, if they need to pay upfront for pipeline capacity, they may decide to reallocate some of those funds to improve their building envelope instead.

Risk mitigation: 20-year revenue horizon

Capital contributions alone would not be sufficient to achieve fairness and avoid cross-subsidies. That is because existing customers would still bear the risk that some of the \$356 million in revenue from the 40-year forecast will not materialize.³⁹ This assumption of risk without a corresponding benefit is another form of subsidy. It has a value now and could end up resulting in additional major losses for existing customers.

If Enbridge is allowed to re-apply for this project, it should be directed to recalculate the project economics that underlie any capital contributions based on a 20-year revenue forecast. This would be consistent with the 20-year revenue horizon under the EBO 188 for large volume customers. Although the risk of disconnections is arguably less in the context of a large transmission project because of the number and diversity of customers, that is outweighed by the fact that almost all the incremental demand is from only two sectors, both of which are highly carbon intensive.

The gas plant and greenhouse sectors are highly vulnerable to the energy transition. Gas plants are subject to the federal policy to achieve net-zero electricity generation in 2035 and the federal

³⁷ *Pollution Probe Foundation v. Ontario Energy Board*, 2012 ONSC 3206 ([link](#)).

³⁸ Hearing Transcript Vol. 3, p. 152, lns. 21-23; p. 154 ln. 2-28 ([link](#)).

³⁹ Exhibit E, Tab 1, Schedule 5, Page 1.

clean energy regulations. Greenhouses apparently have no clear pathway to fully decarbonize and are therefore at risk of being supplanted by field-grown produce, especially as transportation is decarbonized. Of course, we do not know how these sectors might adapt. But that is the point. It is unreasonable for Enbridge to be relying on strong revenue from continued strong demand until 2064, particularly when existing customers – not Enbridge shareholders – bear all the risk.

Greenhouse demand

Enbridge criticized Dr. McDiarmid’s evidence on greenhouses in great detail. But these critiques were mere strawman arguments, with Enbridge refuting points that Environmental Defence is not actually making (as clear from our Opening Statement Outline). Environmental Defence has been clear from the beginning that it is not putting forward Dr. McDiarmid as an expert on greenhouses. Nor has Environmental Defence ever suggested that it intends to rely on this evidence as part of an attack on the project need (as Enbridge suggests).

In the end, Dr. Petro’s evidence on greenhouses was consistent with Dr. McDiarmid’s. Both speak of the use of CO₂ as a by-product of gas consumption in greenhouses, among other challenges of decarbonizing greenhouses.⁴⁰ Both discuss a number of methods of reducing demand and emissions from greenhouses, including energy efficiency and substitution of biomass.⁴¹ The evidence of both supports Environmental Defence’s contention that:

- There are opportunities to reduce demand and emissions from greenhouses; and
- Cost is an important consideration, such that subsidies for fossil gas infrastructure could skew decisions to implement energy efficiency or other demand-side reduction alternatives.

Integrated resource planning

Environmental Defence requests that the OEB direct Enbridge to improve its integrated resource planning analysis when it refiles for approval of this case (with capital contributions) and in future cases, based on lessons learned from this project. In particular, Enbridge’s analysis should:

- Include potential reductions from contract customers;
- Account for the energy cost savings achieved by customers through DSM; and
- Complete the analysis much farther in advance of the proposed pipeline project.

Although it would likely be very difficult to avoid capacity shortfalls using demand-side management (“DSM”) at this time, this case provides helpful insight into how integrated resource planning could be improved in the future.

⁴⁰ Dr. McDarmid Report, October 18, 2023 p. 6-7 ([link](#)).

⁴¹ Hearing Transcript Vol. 3, p. 152, lns. 21-23; p. 154 ln. 2-28 ([link](#)).

Include contract customers

The analysis prepared by Posterity for Enbridge found that enhanced targeted energy efficiency could achieve 57 TJ/d in peak hour load reduction by 2029/2030.⁴² Although that is a very large reduction in peak demand, Enbridge found that it was insufficient because “the required capacity is 66 TJ/d by Winter 2024/2025 and increases to 112 TJ/d by Winter 2025/2026.”⁴³

However, Enbridge’s assessment excluded potential peak reductions from the contract customers that make up approximately 55% of the demand in this area. This was not justified and undermines Enbridge’s IRP analysis. Enbridge argues that contract customers should be ignored because they are sufficiently motivated, sufficiently sophisticated, and deeply aware of their own energy businesses and consumption to achieve all cost-effective energy efficiency on their own. However, they provided no studies to support that conclusion.⁴⁴ Furthermore, it is contrary to the OEB’s 2015-2020 DSM plan decision.

In the 2015-2020 Natural Gas DSM Framework, the OEB decided to cancel the required DSM programming for large volume customers on the basis that “these customers are sophisticated and typically competitively motivated to ensure their systems are efficient.”⁴⁵ However, the OEB later reinstated large volume programming in the 2015-2020 DSM plan proceeding, stating that it “benefitted from the fuller evidentiary record produced in this proceeding.”⁴⁶ The OEB was convinced by the evidence of expert witnesses that large volume customers would not initiate all cost-effective energy efficiency on their own despite being competitively motivated to do so.⁴⁷ It is beyond the scope of this hearing to go into detail as to *why* programming is required to achieve all cost-effective energy efficiency, but the following answers from Brian Goulden of Union Gas provide some insight:

MR. ELSON: I'd like to propose to you some reasons why large industrial users may not be able to implement all cost-effective DSM. The first potential reason may be that the user would have limited capital, and therefore need an incentive to put their scarce resources towards energy efficiency measures. Would you agree with that potential reason?

MR. GOULDEN: Yes.

MR. ELSON: And another reason for some customers might be that they do not have perfect or complete information about what energy efficiency measures are available and their relative benefits. Would you agree with that, at least for some customers?

MR. GOULDEN: Yes.

MR. ELSON: And another reason might be that their managers have limited time and other priorities to deal with. Is that a possibility as well?

⁴² Exhibit C, Tab 1, Schedule 1, p. 20.

⁴³ *Ibid.* p. 21.

⁴⁴ Hearing Transcript Vol. 2, p. 146, lns. 10-14 ([link](#)).

⁴⁵ EB-2014-0134, *Report of the Board, Demand Side Management Framework for Natural Gas Distributors (2015-2020)*, December 22, 2014, p. 27 ([link](#)).

⁴⁶ EB-2015-0029/0049, Decision and Order, January 20, 2016, p. 50 ([link](#)).

⁴⁷ *Ibid.*

MR. GOULDEN: Yes. To say it another way, it is not an organizational priority, I think as you're referring to.

MR. ELSON: Thank you. And another might be the corporate managers have incentives to focus on initiatives with a shorter payback period?

MR. GOULDEN: Yes.

Following the hearing, Enbridge estimated that it could achieve additional peak hour savings of 21 TJ/day by 2029 from contract customers by extrapolation from its estimates for general service customers.⁴⁸ Unfortunately, this number was provided after the hearing and there was no opportunity to test it properly through questions to the Posterity witnesses. Enbridge had previously refused to provide a figure at the technical conference.⁴⁹ It makes little sense that the potential savings from contract customers would be less than half those from general service customers in light of the following:

- The DSM potential study prepared for the OEB found that the “industrial sector is the greatest contributor to the provincial potential”,⁵⁰
- Greenhouse envelope improvements are one of the top 10 measures (i.e., the top 10 highest potential of all of those found in the DSM potential study);⁵¹ and
- Greenhouse envelope improvements would result in significant *peak* savings because weather sensitive measures such as building envelope measures tend to provide a greater proportion of their savings at the time of system peak compared to non-weather sensitive measures.⁵²

A simple extrapolation of 57 TJ/d savings for general service customers would result in 126 TJ/d savings including all customers.⁵³ This alone would address a great deal of the forecast demand before even considering any supply-side solution or any potential electrification measures. That would seem to be an underestimate in light of the greater DSM potential from industrial customers in general and the “peakiness” of greenhouse demand and potential greenhouse savings. Although we cannot explain why the Enbridge extrapolation is so different, this is even more reason to ensure that Enbridge includes estimates for savings from industrial customers in its initial evidence filings so that it can be properly tested by intervenors.

⁴⁸ Exhibit J2.10 ([link](#)).

⁴⁹ Technical Conference Transcript Vol. 1, p. 173, ln. 19 to 174, ln. 26 ([link](#)).

⁵⁰ *2019 Integrated Ontario Electricity and Natural Gas Achievable Potential Study*, Prepared for the OEB and IESO, September 13, 2019, p. xiv ([link](#)) (Note: This is for the unconstrained scenario B, which is the scenario used by Posterity to calculate the potential for the Panhandle area. Also, this result is proportional to the industrial sector’s contribution to forecast natural gas consumption as the industrial sector is forecast to account for approximately 42% of provincial natural gas consumption in 2038.).

⁵¹ Hearing Transcript Vol. 2, p. 146, lns. 11-14 ([link](#)).

⁵² Hearing Transcript Vol. 2, p. 147, lns. 6-13 ([link](#)).

⁵³ Extrapolated from the 45:55 ratio of general service to contract demand, which results in approximately 70 TJ/d for contract customers.

DSM savings

Enbridge also concludes that enhanced targeted energy efficiency is not economically feasible based on a simple comparison of the cost of the pipeline versus the cost of the energy efficiency programming. However, this disregards the major benefit of energy efficiency – it helps homes and businesses meet their heating needs with less energy, and thus reduces energy bills.

All of the energy efficiency measures considered by Posterity were cost-effective as they were based on the cost-effective potential study.⁵⁴ As a result, the investments (\$8.3 million per TJ/d) would be more than outweighed by energy savings accruing to Enbridge customers.⁵⁵ However, those savings were completely disregarded. This is an extremely attractive aspect of DSM that has simply been ignored in coming to the conclusion that DSM is not economically feasible.

Timely analysis

As in previous cases, Enbridge’s analysis of DSM was too little too late. Enbridge first identified this potential project approximately six years ago in the Union Gas 2018-2027 Asset Management Plan.⁵⁶ Unfortunately, Enbridge did not develop an analysis of the potential energy efficiency savings in the full project area until the June 5, 2023 report by Posterity.⁵⁷ Its analysis from 2022 was restricted only to the Leamington area and identified only one-tenth of the actual potential.⁵⁸ As noted above, even the 2023 report is unduly limited by excluding 55% of the demand in the area. The lateness of this analysis makes it extremely difficult to change course and explore solutions that would achieve energy bills savings while also meeting system needs.

This is part of a larger pattern of Enbridge not meeting OEB expectations regarding IRP analysis. A summary of previous OEB findings and directions is attached as schedule B.

Electrification

In the Enbridge rebasing case, Environmental Defence has asked that the OEB clarify that Enbridge can now seek approval for IRP alternatives that involve electrification. As this is being considered in the rebasing case, it is not necessary to seek the same relief here. However, we excerpt below our submissions on that point as this could be relevant to whether IRP could avoid a future build in this area or a reduced build upon re-filing by Enbridge:

Environmental Defense requests that the OEB allow Enbridge to consider electricity-based non-pipeline solutions in its integrated resource planning. Although the first-generation integrated resource planning framework ruled out electricity-based alternatives, it also explicitly made this an interim determination and noted that this could “evolve as energy planning evolves, and as experience is gained with the IRP Framework.”⁵⁹ There has been a

⁵⁴ Hearing Transcript Vol. 2, p. 150, ln. 13 to p. 151, ln. 13 ([link](#)).

⁵⁵ *Ibid.*

⁵⁶ Exhibit I.ED.5 (a).

⁵⁷ Exhibit C, Tab 1, Schedule 1, p. 20.

⁵⁸ *Ibid.*

⁵⁹ OEB Decision and Order, July 22, 2021, EB-2020-091, p. 35 ([link](#)).

sufficient passage of time and a sufficient evaluation of energy planning to revisit this, including the following:

- **Government policy:** Since the integrated resource planning decision was issued, the Minister of Energy has directed the OEB to pursue lower energy bills whether that be through more efficient gas *or electric equipment*.⁶⁰ Although the direction was made in the context of demand-side management, it is analogous to IRP in that the direction condones spending on electric equipment where that would lower energy bills.
- **Improved cost-effectiveness:** The cost-effectiveness of electricity-based integrated resource planning has improved drastically since the integrated resource planning decision was issued. The federal government now provides \$5,000 rebates for electric heat pumps and Enbridge's demand-side management program provides an additional \$1,500 while also expanding eligibility and increasing the measure-wide incentive limit to \$10,000. This will lower the incremental cost of a non-pipeline alternative relying on heat pumps. Enbridge can leverage this pre-existing funding, plus modest spending on marketing and incremental incentives, to pursue a geographically-targeted program far more cost-effectively.
- **Insufficient non-pipeline solutions:** Over two years has passed since the integrated resource planning framework was put into place, which followed direction after direction from the OEB to pursue integrated resource planning (see Appendix 1 on page **Error! Bookmark not defined.** below). However, Enbridge's rebasing application still proposes \$7 billion on pipeline solutions and \$0 for non-pipeline solutions. All we have thus far is pilots that have just been applied for. The experience of the past two years suggests that Enbridge would benefit from additional tools.

Finally, any electricity-based non-pipeline solution would be presented to the OEB for approval in an integrated resource planning application. Therefore, the OEB would have the opportunity to scrutinize any electricity-based proposals that Enbridge may put forward.

IRP on re-applying

As noted above, we believe this application will need to be re-filed by Enbridge as it fails the EBO 134 test. If Enbridge seeks capital contributions, that may impact the demand for the pipeline. Refiling would be an opportunity for Enbridge to redo its IRP analysis and explore more cost-effective means of meeting customers' needs.

Relief sought and conclusion

For the reasons outlined above, the OEB should not grant leave to construct based on the existing application. If Enbridge is provided an opportunity to re-apply, that should be subject to the following directions:

- (a) A revenue horizon limited to 20 years;

⁶⁰ Mandate Letter to the OEB, November 15, 2021, p. 3 ([link](#)) ("It is also important that the DSM Framework be implemented in a way that enables customers to lower energy bills in the most cost-effective way possible, and help customers make the right choices regardless of whether that is through more efficient gas or electric equipment.").

- (b) Capital contributions sufficient to eliminate any subsidy;
- (c) A balanced stage 3 analysis that also considers negative impacts of the proposed pipeline and benefits of the counter-factual scenario; and
- (d) An IRP analysis that quantifies the potential savings from contract customers and the energy bill reductions that would be achieved by all participating customers.

There are so many outstanding issues and details that conditional approval of this project would not be appropriate. In particular, Enbridge does not know whether the requirement to pay capital contributions may impact the forecast demand. This could result in a major change to the project economics and to the tradeoffs between pipe and non-pipe solutions. Enbridge had an opportunity to properly assess the viability of this project with capital contributions but declined to do so. Without that information, it appears that the only option is to deny leave to construct.

Enbridge's overall defence of how it has applied EBO 134 is that this is how it has always done do in the past. However, that does not justify undertaking the exact same analysis today. What may have been appropriate in the 1990s is not appropriate now. Again, EBO 134 explicitly states that the public interest test must be applied in a "dynamic" way and "must change according to the circumstances."⁶¹ If anything, past OEB decisions would strongly suggest that leave to construct should *not* be granted. The OEB has never approved a project with such a high loss/subsidy, particularly where there are no stage 2 benefits, and certainly not in the current context of at least a material possibility that demand reductions will erode the forecast revenue.

In some ways, this case can be summed up in one question: How can it possibly be in the public interest to approve a project that will violate the beneficiary pays principle; create at least a \$150 million cross-subsidy; enable massive greenhouse gas emissions; subsidize fossil fuel consumption over alternatives; subsidize particularly carbon-intense uses such as gas plants and gas-powered greenhouses; blunt incentives to implement demand reductions and efficiency; and provide a home heating option that is far inferior in both cost and environmental impact to cold climate heat pumps?

⁶¹ EBO 134, Report of the Board, June 1, 1987, s. 5.14 ([link](#)).

Appendix 1: Summary of OEB directives re IRP

The Board has directed Enbridge to practice Integrated Resource Planning many times over the past 30 years.⁶² These directions date back to the OEB’s IRP proceeding in the early 1990s.⁶³ This summary will focus on the directions provided by the OEB over the last decade. Through these directions, the OEB has repeatedly highlighted the importance of IRP, expressed concerns about the lack of progress by Enbridge in this area, and directed Enbridge to do IRP better and sooner.

In the decision in the GTA pipeline case (EB-2012-0451), the OEB directed Enbridge “to provide a more rigorous examination of demand side alternatives, including rate options, in all gas leave to construct applications.”⁶⁴ The decision also directed Enbridge to incorporate IRP in its planning in a more systematic way:

Environmental Defence urged the Board to send a signal to the companies that new supply-side investments will not be approved unless all lower cost DSM and/or interruptible service options have been explored and documented. Other parties agreed and argued that both Enbridge and Union should be required to do a better job...

In light of the evidence presented, the Board concludes that further examination of integrated resource planning for gas utilities is warranted. The evidence in this proceeding demonstrates that the following issues should be examined:

- The potential for targeted DSM and alternative rate designs to reduce peak demand
- The role of interruptible loads in system planning
- Risk assessment in system planning, including project prioritization and option comparison
- Shareholder incentives.⁶⁵

In the 2014 DSM Framework decision, the Board again directed Enbridge to conduct IRP and develop a consistent IRP methodology:

As part of all applications for leave to construct future infrastructure projects, the gas utilities must provide evidence of how DSM has been considered as an alternative at the preliminary stage of project development.

In order for the gas utilities to fully assess future distribution and transmission system needs, and to appropriately serve their customers in the most reliable and

⁶² E.g. EBO 169-III, *Report of the Board on the Demand-Side Management Aspects of Gas Integrated Resource Planning*, July 23, 1993, pp. 1-4; Ontario Energy Board, *Decision in EB-2012-0451/0433, January 30, 2014*, p. 46-47 (GTA Pipeline) ([link](#)); Ontario Energy Board, *DSM Framework*, December 22, 2014, p. 35-36 ([link](#)); EB-2018-0097, *Decision and Order*, January 3, 2019, pp. 6-7 (Bathurst Reinforcement) ([link](#)); EB-2020-0192 (London Lines), OEB Decision and Order, January 28, 2021, p. 20 ([link](#)).

⁶³ EBO 169-III, *Report of the Board on the Demand-Side Management Aspects of Gas Integrated Resource Planning*, July 23, 1993 ([link](#)).

⁶⁴ Ontario Energy Board, *Decision in EB-2012-0451/0433, January 30, 2014*, p. 46-47 (GTA Pipeline) ([link](#)).

⁶⁵ *Ibid.*

cost-effective manner, the Board is of the view that DSM should be considered when developing both regional and local infrastructure plans. ...The Board expects the gas utilities to consider the role of DSM in reducing and/or deferring future infrastructure investments far enough in advance of the infrastructure replacement or upgrade so that DSM can reasonably be considered as a possible alternative. If a gas utility identifies DSM as a practical alternative to a future infrastructure investment project, it may apply to the Board for incremental funds to administer a specific DSM program in that area where a system constraint has been identified.

The Board is also of the view that the gas utilities should each conduct a study, completed as soon as possible and no later than in time to inform the mid-term review of the DSM framework. The studies should be based on a consistent methodology to determine the appropriate role that DSM may serve in future system planning efforts. As part of the multi-year DSM plan applications, the gas utilities should include a preliminary scope of the study it plans to conduct and propose a preliminary transition plan that outlines how the gas utility plans to begin to include DSM as part of its future infrastructure planning efforts.⁶⁶

In the 2016 DSM Plan decision, the OEB found that Enbridge's proposed next steps would cause "delay" and directed them to develop an IRP transition plan:

The OEB agrees that a case study, as proposed by Enbridge, would assist in assessing the merits of a transition plan. However, the OEB is concerned that the time required to complete a case study would delay the utilities' infrastructure planning activities proposal and the transition plan would not be available in time for the mid-term review.

The OEB directs Enbridge and Union to work jointly on the preparation of a proposed transition plan that outlines how to include DSM as part of future infrastructure planning activities. The utilities are to follow the outline prepared by Enbridge, and should consider the enhancements suggested by the intervenors and expert witnesses. The transition plan should be filed as part of the mid-term review.⁶⁷

In the 2018 DSM Mid-Term Review decision, the OEB expressed concerns about the lack of progress on IRP and directed Enbridge to do better.

Stakeholders indicated reservations in the usefulness of the transition plan provided by the natural gas utilities. The OEB agrees that although the progress made is at an early stage, the transition plan does not advance the understanding of the role and impact that energy conservation can play in deferring or avoiding capital projects. Currently, leave to construct applications do not include a description of the DSM alternatives considered to help avoid and/or defer the proposed capital project. The natural gas utilities should continue to develop rigorous protocols to include DSM as part of their internal capital planning

⁶⁶ Ontario Energy Board, *DSM Framework*, December 22, 2014, p. 35-36 ([link](#)).

⁶⁷ EB-2015-0029/0049, *Decision and Order*, January 20, 2016 (2015-2020 DSM Plans), p. 84 ([link](#)).

process. This should include a comprehensive evaluation of conservation and energy efficiency considered as an alternative to reduce or defer infrastructure investments as part of all leave to construct applications.⁶⁸

In the 2019 Bathurst Reinforcement decision, the OEB again directed Enbridge “to provide sufficient and timely evidence of how DSM has been considered as an alternative at the preliminary stage of project development.”⁶⁹ It also warned Enbridge that it “faces the risk that future application will be deemed incomplete.”⁷⁰

In the 2021 London Lines decision, the OEB directed Enbridge to do better once again and to conduct an “in-depth quantitative and qualitative analyses of alternatives”.⁷¹ In particular, the OEB said:

However, despite the OEB approval of the application for leave to construct this Project, the OEB agrees with Environmental Defence that Enbridge Gas has an obligation to conduct a more rigorous Integrated Resource Planning assessment at the preliminary stage of projects development in future cases. As OEB staff also notes the failure to present detailed analyses makes it unlikely that Enbridge Gas would select an alternative including DSM or other non-build project option. The OEB acknowledges that more direction is likely to be provided to Enbridge Gas in future leave to construct projects as part of the ongoing IRP proceeding. In the interim, however, the OEB believes that all parties would be assisted if Enbridge Gas would, in the future, undertake in-depth quantitative and qualitative analyses of alternatives that specifically include the impacts of DSM programs on the need for, or project design of facilities for which Enbridge Gas has applied for leave to construct.⁷²

⁶⁸ EB-2017-0127/0128, *Report of the Ontario Energy Board, Mid-Term Review of the Demand Side Management (DSM) Framework for Natural Gas Distributors (2015-2020)*, November 29, 2018, p. 20-21 ([link](#)).

⁶⁹ EB-2018-0097, Decision and Order, January 3, 2019, pp. 6-7 ([link](#)).

⁷⁰ *Ibid.*

⁷¹ EB-2020-0192 (London Lines), OEB Decision and Order, January 28, 2021, p. 20 ([link](#)).

⁷² EB-2020-0192 (London Lines), OEB Decision and Order, January 28, 2021, p. 20 ([link](#)).