

Elson Advocacy

March 9, 2023

BY RESS

Nancy Marconi

Registrar

Ontario Energy Board

2300 Yonge Street, Suite 2700, P.O. Box 2319

Toronto, Ontario M4P 1E4

Dear Ms. Marconi:

Re: EB-2022-0156 – Enbridge Gas Inc. – Selwyn Pipeline Project
EB-2022-0248 – Enbridge Gas Inc. – Mohawks of the Bay of Quinte First
Nation Pipeline Project
EB-2022-0249 – Enbridge Gas Inc. – Hidden Valley Pipeline Project

I am writing to proactively provide a description of the evidence that Environmental Defence proposes to submit in the above proceedings and a cost estimate. The proposed evidence would relate to each of the above three proceedings, and we therefore provide a single proposal covering all three proceedings. As detailed below, this evidence would assist the OEB in its mandate to protect the interests of gas customers.

Nature of the Evidence

Environmental Defence proposes to retain Dr. Heather McDiarmid to compare the costs for an average customer in each of the relevant three communities to convert their heating to electric cold climate heat pumps instead of converting to gas. The evidence would compare the upfront costs, annual energy costs, and the lifetime costs. The evidence is relevant to the customer addition forecast that drives the revenue forecast and is determinative of the financial risks to existing customers. The proposed evidence is also relevant to a critique of Enbridge's evidence on the costs of heating with various fuel types and Enbridge's communications with potential future customers regarding the purported "savings" they can achieve by switching to gas.

The financial risks to existing customers if the customer addition and revenue forecasts are missed are not trivial. To break even, these projects must generate over \$19 million in revenue from customers according to the discounted cash flow tables for each project.¹ Although Enbridge must maintain a 10-year rate stability period, those years account for less than 16% of the overall revenue forecast. That is because over \$16 million of the revenue required to break even is forecast to be collected over years 11 to 40 – the period when existing ratepayers bear all

¹ EB-2022-0156, Exhibit E, Tab 1, Schedule 1, Attachment 2; EB-2022-0248, Exhibit E, Tab 1, Schedule 1, Attachment 2; EB-2022-0249, Exhibit E, Tab 1, Schedule 1, Attachment 2. The revenue figures are summarized in Appendix 1.

of the financial risks. That amounts to existing ratepayers bearing over 84% of the overall revenue forecast risk. This is separate and incremental to the subsidy provided to these projects from existing customers.

The revenue forecast depends on the customer addition forecast, which in turn depends in part on the relative cost of gas heating versus the best alternative available to customers – cold climate heat pumps. There have been a number of important developments since this project was first conceived that impact the relative cost-effectiveness of gas furnaces versus electric heat pumps, including the following:

- The federal government is now providing \$5,000 incentives for customers to switch to high-efficiency electric heat pumps as part of its Greener Homes Grant;²
- The federal government is now providing an *additional* \$5,000 in incentives for customers to switch from oil to high-efficiency electric heat pumps if they earn a median income or lower (e.g. \$122,000 after-tax income for a family of 4 in Ontario) through the Oil to Heat Pump Affordability Program;³
- The federal government is now providing up to \$40,000 in interest free loans, which can be put towards conversions to electric heat pumps, and not gas equipment, through the Greener Homes Loan;⁴
- Gas prices have increased precipitously;
- Carbon prices are increasing and are set to reach \$170/tonne CO₂e by 2030; and
- The federal government has published a formal plan under section 9 of the *Canadian Net-Zero Emissions Accountability Act* to reduce carbon emissions from buildings by 41% by 2030 from 2019 levels.⁵

These changes decrease the likelihood of customers investing in conversions to gas equipment over the lifetime of this project and will likely impact revenues. This warrants further exploration.

Dr. Heather McDiarmid

Dr. McDiarmid is very well-placed to provide the proposed evidence. Dr. McDiarmid has provided evidence relating to heat pumps in two OEB proceedings.⁶ The OEB specifically

² <https://natural-resources.canada.ca/energy-efficiency/homes/canada-greener-homes-initiative/canada-greener-homes-grant/canada-greener-homes-grant/23441>

³ <https://natural-resources.canada.ca/energy-efficiency/homes/canada-greener-homes-initiative/oil-heat-pump-affordability-program-part-the-canada-greener-homes-initiative/24775>.

⁴ <https://natural-resources.canada.ca/energy-efficiency/homes/canada-greener-homes-initiative/canada-greener-homes-loan/24286>

⁵ <https://www.canada.ca/en/environment-climate-change/news/2022/03/2030-emissions-reduction-plan--canadas-next-steps-for-clean-air-and-a-strong-economy.html>

⁶ EB-2021-0002 and EB-2022-0157.

acknowledged the value of Dr. McDiarmid's evidence in the decision on the cost awards in EB-2021-0002, stating as follows:

“Among the intervenors, the OEB found Environmental Defence's expert witness supported intervention particularly efficient and responsive to the objective of the proceeding.”⁷

Dr. McDiarmid is a consultant based in the Kitchener area. She has researched the cost-effectiveness of heat pumps extensively and has prepared reports on this topic for the housing stock in the Waterloo area and for Ontario as a whole. She is currently involved in a number of ongoing research projects relating to heat pumps and has published on the subject in a peer-reviewed journal. Dr. McDiarmid has a PhD in biochemistry and a Master of Climate Change degree. Dr. McDiarmid will be able to leverage her past work on heat pump cost-effectiveness in Ontario to prepare evidence for this proceeding in an efficient and effective manner. Dr. McDiarmid's *curriculum vitae* is attached.

Dr. McDiarmid would be able to leverage the work she has completed in previous OEB proceedings. But she would go beyond that work by:

- Preparing cost comparisons based on customer-facing prices (versus the societal avoided cost calculations used in the DSM proceeding);
- Preparing cost comparisons that are specific to the each of the three separate proceedings, such as the locally-applicable energy and distribution prices;
- Incorporating the system expansion surcharge; and
- Reviewing and updating the model inputs with the latest information.

Budget

Environmental Defence would seek a cost award for Dr. McDiarmid's work. Dr. McDiarmid estimates that her report will cost between \$3,000 and \$5,000 per proceeding, which would bring the total to \$9,000 to \$15,000 (plus HST). This low cost is possible because Dr. McDiarmid can build on previous work she has completed. The cost for interrogatory responses and a technical conference, if one occurs, are impossible to predict with certainty because they depend on factors outside of Dr. McDiarmid's control. The steps beyond the preparation of evidence may add an additional 40% to the costs, subject to the caveats noted above.

I estimate the incremental counsel costs required in relation to the preparation of Dr. McDiarmid's evidence will be between \$1,000 and \$2,000 per proceeding.

⁷ EB-2021-0002, *Decision and Order on Cost Awards*, January 31, 2023, p. 3.

Timing

Dr. McDiarmid estimates that she could complete a report in three weeks, with the proviso that an additional week would be required if the timing of the report conflicts with a two-week period at the end of May during which Dr. McDiarmid anticipates being away from her office.

Although it is not strictly necessary, it would be ideal to set the date of Dr. McDiarmid's evidence to fall two or three weeks after the interrogatory responses from Enbridge are due. This would allow Dr. McDiarmid to use Enbridge's own assumptions in her report as much as possible, such as assumptions regarding future commodity prices and equipment costs. Doing so may reduce the number of disputed issues and allow for a better comparison of Enbridge's and Dr. McDiarmid's evidence. In addition, it would be helpful if Dr. McDiarmid would have access to data on the heating systems used in the existing housing stock for the purpose of calculating relative cost-effectiveness, which could be obtained through interrogatory responses.

Conclusion

Existing ratepayers will bear the large majority of the risk of shortfalls in the revenue needed to fund these projects. In addition, new customers may convert to gas based on promised savings, only to learn later that electric heat pumps would have been far cheaper. Dr. McDiarmid's evidence would help shed some light on those risks and assist the OEB in its mandate to protect both existing customers and potential new customers.

Yours truly,

A handwritten signature in blue ink, appearing to read 'K. Elson', written in a cursive style.

Kent Elson

cc: Applicant and Parties Requesting Intervenor Status

Appendix 1: Required Revenue per Project Discounted Cash Flow Tables⁸
(\$,000)

	Selwyn	Mohawks of the Bay of Quinte First Nation	Hidden Valley	Total
SES Revenue	\$4,477	\$4,252	\$2,188	\$10,917
Distribution Revenue	\$2,418	\$3,672	\$2,099	\$8,189
Total Revenue	\$6,895	\$7,924	\$4,287	\$19,106
Years 11-40				
SES Revenue	\$2,970	\$3,354	\$1,800	\$8,124
Years 11-40 Distribution Revenue	\$3,349	\$2,953	\$1,710	\$8,012
Years 11-40 Revenue	\$6,319	\$6,307	\$3,510	\$16,136
Percent of revenue in years 11-40	91.6%	79.6%	81.9%	84.5%

⁸ EB-2022-0156, Exhibit E, Tab 1, Schedule 1, Attachment 2; EB-2022-0248, Exhibit E, Tab 1, Schedule 1, Attachment 2; EB-2022-0249, Exhibit E, Tab 1, Schedule 1, Attachment 2.

Heather McDiarmid, MCC, PhD

heatheratp2@gmail.com

Experience

Independent Consultant, McDiarmid Climate Consulting

Sept 2018 to present

- Clients have included the Environmental Defense, Ontario Clean Air Alliance, ClimateActionWR, Reep Green Solutions, GreenUP Peterborough, Waterloo Region Community Energy, Conestoga College.
- Prepared evidence for Ontario Energy Board hearings as an expert in residential heating options modelling.
- Developed curriculum materials for an internationally-recognized climate literacy certification program.
- Analyzed the financial and climate mitigation impacts of electrifying Ontario homes using heat pumps for space and water heating.
- Explored a housing archetype-based approach to decarbonizing residential homes in Waterloo Region.
- Conducted a residential retrofit financing program feasibility study to meet FCM requirements.
- Prepared a research-based study of the potential for active transportation hubs and programs to encourage transportation mode shifts in the tri-cities.
- Unearthed and detailed residential carbon mitigation programs and strategies from across North America to inform Toronto's climate action plan.
- Prepared a climate impact analysis and developed an evaluation framework for a non-profit.
- Performed primary and secondary market research on the feasibility of retrofit management.

Sustainability Living Lab Coordinator, University of Waterloo

Oct 2021 to July 2022

- Facilitated opportunities for students to apply their skills and knowledge to campus sustainability challenges
- Documented campus work related to the UN Sustainable Development Goals
- Developed resources to support integration of sustainability content in courses and programs

Research Associate and Lecturer, University of Waterloo

Jun 2020 to present

- Taught a blended (in person and online) graduate course in Climate Change Mitigation in Fall 2021.
- Worked with local non-profit organizations to provide experiential learning opportunities.
- Invited as a guest lecturer on Climate Change Communications and on Climate Change and Housing.
- Analyzed a database of over 44,000 home energy audit results to explore the emissions impacts of different retrofit and electrification approaches for the residential sector.
- Presented research findings at the International Green Energy Conference, Jul 15-18, 2021.

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Research Assistant and Writer, University of Waterloo and David Miller

Mar 2019 to Apr 2020

- Investigated municipal programs from around the world that have been successful in cutting carbon emissions, highlighting the most relevant and universally applicable details for a book.
- Advised on structuring the book and collaborated in choosing programs to profile.
- Wrote early drafts of many chapters.
- David Miller, Director of International Diplomacy at C40 Cities, is the author of the book titled Solved: how the world's great cities are fixing the climate crisis.

Researcher, Clean Air Partnership

Apr to Aug 2019

- Prepared a [toolkit](#) on municipal financing options for residential retrofit programs.
- Completed a 16-week research project in 10 weeks.
- Prepared and presented webinars to municipal representatives.

Academic Instructor, Wilfrid Laurier University and University of Guelph

2002 to 2011

- Shared a passion for biochemistry with 6-200 students at the 2nd, 3rd and 4th year levels.
- Researched and developed new course content.
- Explored innovative ways of engaging students.

Education

- Master of Climate Change, University of Waterloo
- PhD in Biochemistry, University of Guelph

Leadership in Sustainability

- **Project Lead**, Homeowner's guide to heat pumps for WR *Jan to Jun 2021*
- **Committee Member and Co-Chair**, ClimateAction WR Residential Sector *Dec 2018 - present*
- **Committee Member**, UW CAP Climate and Energy Working Group *2019*

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heatheratp2@gmail.com

Writing and Publications

- An analysis of the financial and climate benefits of using ground-source heat pumps to electrify Ontario's gas-heated homes, prepared for Ontario Clean Air Alliance
- Carbon Literacy Training, an 8-hour micro-credential prepared for Conestoga College
- [An analysis of the financial and climate benefits of electrifying Ontario's gas-heated homes by installing air-source heat pumps](#), prepared for Ontario Clean Air Alliance
- [Accelerating the 1.5°C energy transition for Canadian residential buildings through selective direct electrification with heat pumps](#). Peer-reviewed article published in Canadian Geographer, July 4, 2022.
- [Analysis of Enbridge Gas' proposed low carbon transition program for cost-effectiveness and climate alignment](#), prepared for Environmental Defense for use in OEB hearings
- [An analysis of the potential for air source heat pumps to reduce energy costs and greenhouse gas pollution](#), prepared for Ontario Clean Air Alliance
- Deep energy efficiency retrofits vs direct electrification for urgent emissions reduction: a case study using 33,780 residential energy profiles in Waterloo, Canada. Presented to the 13th International Green Energy Conference Jul 2021.
- [Active Transportation Hubs in Waterloo Region: a research pilot project](#) prepared for ClimateActionWR
- [Aerial thermal imaging and building energy efficiency upgrades in WR: a sustainable buildings pilot](#), prepared for ClimateActionWR
- [Analysis of the Residential Electrification Potential for the Waterloo Region](#)
- [Residential heat pump water heaters as a climate action for the Waterloo Region](#)
- Deep Energy Residential Retrofit: financing feasibility study for Waterloo Region, prepared for WR Community Energy
- [Accelerating Home Energy Efficiency Retrofits through LIC Programs: a toolkit for municipalities](#) , prepared for Clean Air Partnership
- [Climate Change and the Tree Canopy of Waterloo Region](#)
- [Climate Change and Housing Affordability in Canada](#)