

Elson Advocacy

October 4, 2021

Ms. Christine Long

Registrar

Ontario Energy Board

2300 Yonge Street, 27th Floor

Toronto, Ontario

M4P 1E4

Dear Ms. Long:

**Re: Enbridge 2022 to 2027 Demand Side Management (“DSM”) Plan
EB-2021-0002**

I am writing pursuant to Procedural Order #3 to describe the evidence that Environmental Defence proposes to commission from Dr. Heather McDiarmid. A description of this proposed evidence and a cost estimate is detailed below.

Description of Evidence

Environmental Defence proposes to retain Dr. McDiarmid to analyze Enbridge’s proposed heat pump programming, including gas, electric, and hybrid heat pumps. Enbridge’s proposed Low Carbon Transition Program consists of a variety of heat pump programming. It is important that this programming be analyzed because it is entirely new. In addition, Enbridge proposes to invest more than more than \$12 million in ratepayer funds over 2023 and 2024 in this area. This new program would also be the fastest growing budget item (see below).¹ It would benefit the OEB and stakeholders to have independent evidence regarding the measures included in this new and quickly expanding program.

Table 2: 2023-2027 Five-Year DSM Plan Budget

DSM Budget Category	2023 Base Year	2024	2025	2026	2027
Residential Program	\$40,804,802	\$41,762,686	\$42,597,940	\$43,449,899	\$44,318,896
Low Income Program	\$22,987,685	\$23,447,439	\$23,916,388	\$24,394,716	\$24,882,610
Commercial Program	\$25,262,775	\$25,626,242	\$26,138,767	\$26,661,542	\$27,194,773
Industrial Program	\$17,828,114	\$18,184,676	\$18,548,370	\$18,919,337	\$19,297,724
Large Volume Industrial Program	\$2,766,624	\$2,821,957	\$2,878,396	\$2,935,964	\$2,994,683
Energy Performance Program	\$1,221,656	\$1,222,739	\$1,247,194	\$1,272,138	\$1,297,580
Building Beyond Code Program ¹	\$8,437,503	\$9,546,354	\$21,272,696 to be reassessed	\$25,796,143 to be reassessed	\$30,614,958 to be reassessed
Low Carbon Transition Program ¹	\$4,590,841	\$7,482,907			
Program Subtotal	\$123,900,000	\$130,095,000	\$136,599,750	\$143,429,738	\$150,601,225

¹ EB-2021-0002, Exhibit D, Tab 1, Schedule 1, Page 9

Dr. McDiarmid's evidence would focus on three areas:

1. The cost-effectiveness of heat pump measures, including gas, electric, and hybrid heat pumps; and
2. An assessment of the forward-looking prospects for the elements included in the proposed Low Carbon Transition Program based on a review of existing literature.

Dr. McDiarmid's evidence will focus primarily on heat pumps in the residential sector. This will include cost-effectiveness assessments specific to the Ontario context. Dr. McDiarmid's evidence will also discuss heat pumps in the commercial context, but only through a review of existing literature on the topic. Dr. McDiarmid will endeavour where possible to prepare her analysis using assumptions that are consistent with those used by Enbridge so as to facilitate evidence comparability and decrease disputes.

Dr. McDiarmid's evidence will not duplicate the evidence of the OEB Staff's expert or Mr. Neme. I have specifically conferred with OEB Staff to confirm that there will be no overlap with its expert evidence. For example, Dr. McDiarmid will not be critiquing the scorecards or delivery details for Enbridge's Low Carbon Transition Program. Instead, she will be providing evidence on the cost-effectiveness of the underlying measures. This will complement the other evidence being proposed and provide a distinct and important contribution to the assessment of this programming.

Expertise and Qualifications

Dr. McDiarmid is very well-placed to provide evidence on the cost-effectiveness of heat pumps in the Ontario context. 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. She is currently involved in a number of ongoing research projects relating to heat pumps and has presented on the subject. Dr. McDiarmid has a PhD in biochemistry and a Master of Climate Change. 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.

Budget

Dr. McDiarmid estimates that her report will cost \$17,000 to prepare. The cost for interrogatory responses, a technical conference, and hearing are impossible to predict with certainty because they depend primarily on the actions of other parties. The steps beyond the preparation of evidence may add an additional 30% 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 \$2,000 and \$4,000.

Conclusion

Enbridge is proposing to roll out brand new programming focused on heat pumps and to devote the majority of new DSM funding to this area. The OEB and intervenors would greatly benefit from an assessment of these measures from Dr. McDiarmid.

Yours truly,

A handwritten signature in blue ink, appearing to read 'K. Elson', with a stylized, cursive script.

Kent Elson

cc: Parties in the above proceeding

Heather McDiarmid, MCC, PhD

heatheratp2@gmail.com

Experience

Independent Consultant

Dec 2017 to present

- Clients have included the University of Waterloo, Ontario Clean Air Alliance, ClimateActionWR, Reep Green Solutions, GreenUP Peterborough, Waterloo Region Community Energy.
- Analyzed the cost effectiveness and climate mitigation impacts of electrifying homes in the Waterloo region 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.

Research Associate and Lecturer, University of Waterloo

Jun 2020 to present

- 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.
- Engaged to teach a graduate course in Climate Change Mitigation in Fall 2021.
- Presented research findings at the International Green Energy Conference, Jul 15-18, 2021.
- Invited as a guest lecturer on Climate Change Communications and on Climate Change and Housing.

Research Assistant and Writer, University of Waterloo and David Miller

Mar 2019-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- 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.

Heather McDiarmid, MCC, PhD

heatheratp2@gmail.com

Academic Instructor, Wilfrid Laurier University and University of Guelph

2002 - 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.

Leadership in Sustainability

- **Blog Writer, [McDiarmid Climate Consulting](#)**
- **Project Lead, Homeowner's guide to heat pumps for WR** *Jan. 2021-present*
- **Guest Lecturer, Climate Change Communication, Climate Change and Housing Affordability**
- **Committee Member and Chair, ClimateAction WR Residential Sector** *Dec. 2018 - present*
- **Committee Member, UW CAP Climate and Energy Working Group** *2019*

Writing and Publications

- Should electrification, not retrofits, be the focus for decarbonisation of most residential buildings?
Submitted to Climate Policy May 2021.
- 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](#)
- Aerial thermal imaging and building energy efficiency updates in WR: a sustainable buildings pilot
- [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
- [How to cut emissions from the residential sector in Waterloo Region](#)
- [Accelerating Home Energy Efficiency Retrofits through LIC Programs: a toolkit for municipalities](#)
- [Climate Change and the Tree Canopy of Waterloo Region](#)
- [Climate Change and Housing Affordability in Canada](#)