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Ontario

BY E-MAIL

January 26, 2022

Nancy Marconi
Acting Registrar
Ontario Energy Board
2300 Yonge Street, 27th Floor
Toronto, ON M4P 1E4

Dear Ms. Marconi:

Re: Enbridge Gas Inc. – EB-2021-0002
Application for new DSM Framework and 2022-2027 DSM Plan

Please find attached responses to interrogatories from Enbridge Gas Inc. in relation to OEB Staff's expert evidence produced by Optimal Energy Inc. (Exhibit L.OEB Staff.2). These responses are in addition to those filed by OEB Staff on January 19, 2022.

The interrogatory responses have been sorted by the Final Issues List. Optimal Energy Inc. has provided the responses to all interrogatories.

Yours truly,

Josh Wasylyk
Digitally signed by Josh Wasylyk
Date: 2022.01.26 16:14:55 -05'00'

Josh Wasylyk
Senior Advisor – Application Policy & Conservation

cc: All parties in EB-2021-0002

Interrogatory Responses on OEB Staff's Expert Evidence (Exhibit L.OEB Staff.2)
2022-2027 Demand Side Management Framework and Plan Application

Enbridge Gas Inc.
EB-2021-0002

January 26, 2022

Issue 1

Interrogatory from Enbridge Gas Inc.

1-EGI-1-OEB.STAFF.2

Reference:

Exhibit L.OEB STAFF.2, page i)

Preamble:

Optimal Energy recommends the full elimination of furnaces and boilers as offered measures in the Residential Program stating that any promotion through the program creates a lost opportunity for electrification.

Question:

a) Please confirm the primary and secondary objectives of ratepayer funded natural gas DSM as outlined by the OEB in its December 1, 2020 Letter (page 2 and 3).

b) Please identify any direction provided by the OEB that avoiding lost opportunities for electrification is an objective of the gas utility's ratepayer funded natural gas demand side management in Ontario.

Response

a) The primary objective is to assist customers in making their homes and business more efficient, in order to help better manage their energy bills. The secondary objectives are to help lower overall natural gas usage, play a role in meeting Ontario's greenhouse gas goals, and create opportunities to defer and/or avoid natural gas infrastructure.

b) Space heating electrification aligns with all three secondary goals in the letter. In general, the points in our report are our own recommendations, and do not necessarily reflect previous OEB mandates.

Issue 3

Interrogatory from Enbridge Gas Inc.

3-EGI-2-OEB.STAFF.2

Reference:

Exhibit L.OEB STAFF.2

Preamble:

Jurisdictional Analysis Due Diligence

Question:

As part of its evidence Optimal Energy compares Enbridge Gas's program designs and performance to those from other jurisdictions.

a) Would Optimal Energy agree that in order for a fair, objective and non-partisan comparison between different jurisdictions, both generally and specifically with respect to savings as a percent of sales, that several factors need to be taken into consideration, including but not limited to:

- weather normalization of sales data
- new building codes and standards,
- cost effectiveness test leveraged to screen in measures, offerings, programs (i.e. MTRC used by Fortis BC)
- relative cost of gas / electricity to consumers
- customer makeup (ie. number of customers by sector, average consumption)
- equipment and measure baselines, for example, looking most recently updated TRMs of some utilities on residential furnace replacement end of life baselines - Ameren, Illinois - 80% AFUE, Centerpoint, Minnesota - 80% AFUE, National Grid, Rhode Island - 85% AFUE.
- approach to and manner of EM&V NTG calculations and the respective inputs that are considered (i.e. free ridership, spill over etc)
- regulatory policies in support of specific programs and goals, (i.e. mandated statewide savings targets)
- maturity and historic impact of DSM programs
- market saturation of specific measures
- jurisdictional industry standard practice

If not, please explain why not in detail.

b) As it relates to the comparisons made in this report, could Optimal Energy indicate what efforts/adjustments, if any, were made for the above mentioned factors when conducting the analysis and presenting comparisons?

c) Specifically for Table 6: Summary of Performance Incentives compares a number of Jurisdictions, were any adjustments for any of the above factors made?

d) Please provide all reference material used, all internal calculations and notes, and any research reviewed and organized by Jurisdiction (State/Utility) which demonstrates the jurisdictional analysis and comparison undertaken.

Response

a) We agree that all of these items can have some influence on the cost effective achievable efficiency potential, and can therefore also impact savings as a percentage of sales when pursuing savings targets approaching all cost-effective achievable potential. In addition, we agree that baseline assumptions in TRM's can directly influence the amount of savings a utility can claim, and therefore impact the savings as a percentage of sales being achieved.

b) The quantitative comparisons in the report were given as a high-level benchmarking exercise, and not intended to prescribe precise levels. The report does qualitatively discuss many of these specific differences.

c) Assuming this refers to Table 6 in Exhibit L.OEB STAFF 1, it is unclear why any of these considerations would apply to the performance incentive design. It is also unclear why the considerations would apply to Table 6 in Exhibit L.OEB STAFF 2, Massachusetts Net-to-Gross Ratios. If this refers to the sectoral comparison tables, then see response to (b).

d) See Attachment 18 for the supporting analysis for the jurisdictional analysis. See Attachment 19 for the research used in developing the report.

Interrogatory from Enbridge Gas Inc.

3-EGI-3-OEB.STAFF.2

Reference:

Exhibit L.OEB STAFF.2, page ii

Preamble:

Consider adding a behavioral program.

Question:

a) Is Optimal Energy aware of Enbridge Gas and Union's previous Behavioural Program proposal and the OEB's ultimate decision to not approve these proposals in the 2015-2020 DSM Plan proceeding and the concerns the OEB expressed in rendering this decision?

Response

a) Yes, we are aware of this decision and share some of the similar concerns expressed in the 2016 decision. That said, there has been additional third-party evaluation results since that time that consistently find savings from these programs, including a persistence in savings once reports are stopped. This recommendation is contingent on Enbridge getting attractive cost and savings estimates from a behavioral provider and is another area where an integrated offering with IESO would likely significantly increase cost-effectiveness.

Interrogatory from Enbridge Gas Inc.

3-EGI-4-OEB.STAFF.2

Reference:

Exhibit L.OEB STAFF.2, page ii

Preamble:

Expand the Energy Performance (Whole Building P4P) program to include all large C&I customers.

Question:

a) Could Optimal Energy please indicate which leading jurisdictions currently have undertaken this approach?

b) For those jurisdictions listed please provide, broken out by utility/program administrator the following items; savings achieved in comparison to the respective prescriptive and custom offerings, total costs compared to the respective prescriptive and custom offerings, indicate the cost effectiveness of the offering both from a TRC perspective and from a $/m3 perspective in relation to both custom and prescriptive offerings. Please provide all references from where the information was sourced.

c) Please convert all USD values to CAD using an assumed $0.80 CAD/USD rate.

Response

a) Optimal has not performed this analysis, but jurisdictions offering similar programs include Massachusetts, Rhode Island, and Vermont.

b) Optimal has not performed this analysis

c) See Attachment 20 for updated tables.

Interrogatory from Enbridge Gas Inc.

3-EGI-5-OEB.STAFF.2

Reference:

Exhibit L.OEB STAFF.2, pages iii & 28

Preamble:

On page iii Optimal Energy states, "Ensure that the Small Business Direct Install Program effectively integrates with the electric side, and ***focus the gas program on envelope measures, as is done in the residential sector***." (emphasis added)

On page 28, the report notes, "While in theory, there are ***small business direct install measures that do custom measures including those related to envelope and ventilation, in practice there is rarely significant penetration for these measures***." (emphasis added)

Question:

Please clarify what Optimal Energy is recommending for Enbridge Gas' DSM Plan.

Response

We recommend the small business program comprehensively address all of a customer's needs, and pursue all cost-effective efficiency opportunities with each participant, to the extent that participant chooses to adopt the measures.

Interrogatory from Enbridge Gas Inc.

3-EGI-6-OEB.STAFF.2

Reference:

Exhibit L.OEB STAFF.2, page 1

Preamble:

Table 1 Reference - We estimated savings as a percent of sales by dividing the target 2023 residential savings by the estimated 2020 residential sector forecast consumption data taken from the OEB's 2019 Achievable Potential Study, Appendix_x1_Forecast_Potential_Consumption_20191218, tab 07a.

Question:

Is Optimal Energy Aware that the forecast consumption data that is in the referenced file used, included consumption from the multi-residential sector which has resulted in the savings for the Enbridge Gas DSM residential program being compared against sales volumes that includes more than just Residential sales.

Response

We used only the 2020 forecasts labeled "residential," under the assumption that the residential forecast used in the potential study reflects the energy use addressed via residential efficiency programs. According to page 13 of the 2019 potential study, multi-family usage is about 17% of total residential. If this is removed from the calculation cited above, savings as a percent of sales would increase from 0.154% to 0.186%.

Interrogatory from Enbridge Gas Inc.

3-EGI-7-OEB.STAFF.2

Reference:

Exhibit L.OEB STAFF.2, Page 2 and 3

Preamble:

Table 2: Natural Gas Utility Residential Conservation Program Details

Further, Rhode Island's lower costs are largely driven by very high behavioral savings, while low costs in Illinois and Minnesota are partly driven by thermostats, savings "kits" including low-flow showerheads and faucet aerators, and furnaces/boilers (in Minnesota), which we would not recommend for Enbridge Gas. In Illinois, the costs to achieve are particularly driven by 33,000 smart thermostats rebated in 2020 – the retail products program is about 90% of total residential savings and almost entirely from thermostats (although note that this reflects a year where Covid made home energy visits difficult).

Question:

a) In the table on page 2 please convert all USD values to CAD using an assumed $0.80 CAD/USD rate. Please add two columns, one that shows the % of total budget for each item and one that shows the % of total first year savings for each item.

b) Please re-cast the table in a) adjusting for the commentary above by removing behavioural programs or other program elements that are not recommended. Lower the thermostat savings in Illinois to a recommended level and state the rationale for the appropriate level. Make assumptions and state them as required.

Response

a) See Attachment 20 for updated tables.

b) We did not perform this analysis as we did recommend considering a behavioral program, did not state that Illinois rebates too many thermostats, and this report was not meant to get into the level of detail where it's prescribing specific adoption rates of specific technologies. In general, we would recommend pursuing all cost-effective thermostats and other low-cost technologies.

Interrogatory from Enbridge Gas Inc.

3-EGI-8-OEB.STAFF.2

Reference:

Exhibit L.OEB STAFF.2, Page 2-3

Preamble:

Table 2: Natural Gas Utility Residential Conservation Program Details

Further, Rhode Island's lower costs are largely driven by very high behavioral savings, while low costs in Illinois and Minnesota are partly driven by thermostats, savings "kits" including low-flow showerheads and faucet aerators, and furnaces/boilers (in Minnesota), which we would not recommend for Enbridge Gas. In Illinois, the costs to achieve are particularly driven by 33,000 smart thermostats rebated in 2020 – the retail products program is about 90% of total residential savings and almost entirely from thermostats (although note that this reflects a year where Covid made home energy visits difficult).

Question:

a) In the table on page 2 please convert all USD values to CAD using an assumed $0.80 CAD/USD rate. Please add two columns, one that shows the % of total budget for each item and one that shows the % of total first year savings for each item.

b) Please re-cast the table in a) adjusting for the commentary above by removing behavioural programs or other program elements that are not recommended. Lower the thermostat savings in Illinois to a recommended level and state the rationale for the appropriate level. Make assumptions and state them as required. "

Response

This question appears to be a duplicate of the previous question.

Interrogatory from Enbridge Gas Inc.

3-EGI-9-OEB.STAFF.2

Reference:

Exhibit L.OEB STAFF.2, Page 6

Preamble:

Massachusetts program has been successful at driving significant participation and deep savings – Eversource in MA saved 48,182 lifetime m3 per participant in its program in 2020, compared to 12,404 m3 for Enbridge Gas.

Question:

Enbridge Gas assumed Optimal Energy was specifically referring to Eversource Gas' Residential Coordinated Delivery Program when making this comparison. Enbridge Gas examined the 2022-2024 Statewide Data Tables - Gas at https://ma-eeac.org/plans-updates/ to seek to understand the comparison in more detail. Filtering the year to "2020", the reporting period to "Evaluated", and the initiative to "Residential Coordinated Delivery". In order to make the calculation Enbridge Gas used a conversion factor of therms to m3 at a rate of 2.776 m3/therm. Respectively, Eversouce Gas (NSTAR), and Eversource Gas (EGMA) had 9,029 and 8,983 participants in their program, with a Net Lifetime Natural Gas Savings of 20,771,614 and 23,268,103 therms which equated to 2,301 and 2,590 lifetime therms per participant. Converted to m3 that would be 6,386 and 7,190 lifetime m3 per customer.

a) Could Optimal Energy confirm if these values are correct, otherwise, please provide the reference and all calculations used in generating the comparison including the lifetime savings in m3, conversion factors, the estimated useful life and annual first year savings.

Response

a) The text in the report should say “National Grid in MA saved 48,182 m3 per participant in its 2019 program…” If, when using the data source referenced above, filter the year to “2019”, the Program Administrator to “National Grid,” the reporting period to “Evaluated”, and the initiative to “Residential Coordinated Delivery. In this line, you can see that the program served 4,810 participants, for total net lifetime savings of 81,289,880 therms. Converted to m3 using a 2.851 m3/therm conversion, this is 231,757,448 m3, or 48,182 m3 per participant. We used 2019 results as a better specific comparison in this case, due to significant disruptions in the 2020 coordinated delivery program caused by Covid-19. The numbers cited above for 2020 are correct, with a caveat that we used a conversion rate of 2.851 m3 per therm.

Interrogatory from Enbridge Gas Inc.

3-EGI-10-OEB.STAFF.2

Reference:

Exhibit L.OEB STAFF.2, page 26

Question:

For Table 6: Summary of Performance Incentives by Jurisdiction, please provide the source for the information provided.

Please confirm that this source data is the most up to date information that was available prior to starting the report. If not, please provide the most up to date source of information and provide an updated table using that information.

Response

We presume this question refers to Table 6: Massachusetts Net-To-Gross Ratios from Exhibit L.OEB STAFF.2. These ratios are based on the most up-to-date evaluation reports from MA. See here for a full list of evaluations in MA:

https://ma-eeac.org/studies/

Issue 10a

Interrogatory from Enbridge Gas Inc.

10a-EGI-11-OEB.STAFF.2

Reference:

Exhibit L.OEB STAFF.2, page 3

Preamble:

While we would not encourage Enbridge Gas to shift the focus away from a whole home approach, the comparison does indicate that Enbridge Gas would likely be able to bring costs down somewhat by increasing the number of thermostats rebated, adding a behavioral program, jointly running the program with the Independent Electricity System Operator.....

Question:

Please confirm if Optimal Energy is aware of the following:

a) At the current time, IESO does not have funding for Residential energy conservation programs.

b) Residential Behavioral programming was been disallowed in the OEB decisions for the 2015-2020 with specific concerns expressed for this type of programming

Response

a) Our recommendation would be that electric efficiency for the residential sector be funded and run jointly with residential gas efficiency, regardless of the current state of funding.

b) See our response to 3-EGI-3-OEB.STAFF.2

Interrogatory from Enbridge Gas Inc.

10a-EGI-12-OEB.STAFF.2

Reference:

Exhibit L.OEB STAFF.2, page 11

Preamble:

Perform direct installation of low-cost measures such as aerators, showerheads, and pipe insulation during the initial energy assessment.

Question:

a) The proposed Whole Home offering would be delivered using NRCan certified Energy Auditors and Service Organizations; who are not permitted to perform direct installations as per their NRCan licenses. Please confirm if this recommendation was based on utilization of the NRcan certified Energy Auditors or if it was suggesting Enbridge Gas add an additional delivery mechanism and cost to the proposed Whole Home offering?

Response

a) We are not familiar with the issue regarding NRCan certified auditors not being permitted to perform direct installations. Our first reaction would be that it seems that there should be potential workarounds to the issue, especially since direct installation plays a large role in the low-income and multi-family programs.

Issue 10g

Interrogatory from Enbridge Gas Inc.

10g-EGI-13-OEB.STAFF.2

Reference:

Exhibit L.OEB STAFF.2, page 32-33

Preamble:

In order for a builder to be eligible, Enbridge Gas requires any new construction building to commit to using natural gas as a fuel source for space and/or water heating. As a first step, the OEB should consider whether this makes sense from a policy perspective, given provincial and national GHG emission reductions goals. New construction is increasingly using heat pumps for space and water heating – Massachusetts program data, for example, indicates that all-electric new construction is the norm in above code construction. Further, there is increasing evidence that all-electric new construction results in lower costs in addition to a significant GHG reduction. A recent study from Rocky Mountain Institute, for example, finds lower initial costs for all-electric homes in most cities examined and lower lifecycle costs for all cities, in addition to GHG savings of between 50% and 93% depending on fuel mix of electricity. In this light, it is unclear if ratepayer funds should be encouraging natural gas in new construction at all. However, if the programs do go forward, Enbridge Gas should consider expanding the comprehensiveness and incentive structure to encourage additional above code savings.

Question:

a) Please identify where in the existing Ontario Building Code it prohibits the use of natural gas in buildings/housing?

b) Please identify where in the National Step Code, which outlines code progression to step 4/5 (NZER), it prohibits the use of natural gas in buildings/housing?

c) Please identify the cities used to generate the findings that led to the conclusion that all-electric new construction houses result in lower initial costs and lower lifecycle costs.

d) How does the climate associated with these cities compare to that of Ontario?

e) How does the price of electricity and natural gas compare to that of Ontario?

f) How does the electric load profile compare to that of Ontario?

g) The study references a comparison to a standard heat pump, is it assumed that the standard heat pump could fulfill all heating requirements, or is a back-up system required? Can you make the same costing comparison applying cold-climate heat pumps or hybrid heating systems, which would be required to accommodate the Ontario climate.

Response

a) We are not aware of anywhere in the existing Ontario Building Code that prohibits natural gas in buildings or homes.

b) We are not aware of anywhere in the National Step Code that prohibits natural gas in buildings or homes.

c) See here for the study referenced in the preamble. New Construction costs were lower for all-electric construction compared to natural gas and AC in all cities looked at – Oakland, Houston, Providence, and Chicago.

https://rmi.org/insight/the-economics-of-electrifying-buildings/

d) Ontario had 3,340 heating degree days in 2021 (https://toronto.weatherstats.ca/charts/hdd-yearly.html). According to the US National Weather Service, Chicago has had annual average heating degree days of 3,319 (5,974, converted to Celsius using 5/9. See https://www.weather.gov/lot/ord_rfd_monthly_yearly_normals). Providence, RI, also included in the report, has 3,002 average heating degree days (https://www.weather.gov/wrh/Climate?wfo=box). By this measure, the study has included several US jurisdictions with similar climates to Ontario.

e) We did not do a detailed analysis of this question.

f) We did not do a detailed analysis of this question.

g) The report assumes no additional back-up and uses assumptions for cold climate heat pumps for the climates (Providence and Chicago) where they are necessary to heat the home with no backup sources.

Interrogatory from Enbridge Gas Inc.

10g-EGI-14-OEB.STAFF.2

Reference:

Exhibit L.OEB STAFF.2, page 38

Preamble:

Revamp the incentive structure on Energy Star Homes to motivate additional participation, reduce free ridership, and encouraging additional savings beyond the minimum to achieve Energy Star certification.

Question:

Enbridge Gas's Building Beyond Code offering includes financial incentives to assist builders in building to Energy Star levels and evaluating these homes to the Energy Star level.

a) Please discuss the specific details of what a 'revamped incentive structure' would mean?

   Please include details on what incentive levels are required to drive additional participation, the total cost of such a recommendation, what specific actions would reduce free ridership and detail from what level this comparison is being made. Provide all references and assumptions.

Response

a) As stated in the report (Exhibit L.OEB STAFF.2), p. 33:

   "The incentive of $1,500 for the residential new construction program does not seem like it would be sufficient to motivate additional Energy Star Homes. Further, the flat incentive rate does not encourage additional savings beyond the minimum to get Energy Star Certified, and it is unclear why builders should be limited on receiving incentives to only one home per year. Consider revamping the incentive structure to something more like the Massachusetts program, which pays based on the energy savings over an average home, with bonus incentives for certain certifications. This would include significantly increasing the per home incentive cap and eliminating the requirement that a builder can only receive incentives on one home per year. This requirement undermines any market transformation goals the program may have."

   While the scope of the report did not include suggesting precise incentive levels and design for Enbridge or modeling how these changes would impact program costs and savings, see below for more information on how incentives in MA's programs are

determined. Incentive is determined by giving $0.50 per kWh saved, plus $50 per mmbtu saved (~1.75 per m3), plus $4,000 multiplied by the percent savings of the new building over the baseline model. Our strongest recommendation for this would be to eliminate the restriction that a builder can only receive incentives on one home per year, or increase that cap.

https://www.masssave.com/-/media/Files/PDFs/Save/Residential/Pay-for-Savings.pdf?la=en&hash=67420BCA38A8BC3BBDB8B9DE41949DE58D22C964

Interrogatory from Enbridge Gas Inc.

10g-EGI-15-OEB.STAFF.2

Reference:

Exhibit L.OEB STAFF.2, Page 32

Preamble:

New construction is increasingly using heat pumps for space and water heating

Question:

a) Could Optimal Energy provide references to the Ontario specific evidence that New Construction in Ontario is increasingly using heat pumps for space and water heating. Include data for both any heat pumps and for non-heat pumps along with % of total market.

Response

a) According to US data, the amount of new homes using heat pumps as a primary heating source went from 23% in 2000 to 40% in 2019 (https://eyeonhousing.org/2020/11/air-conditioning-and-heating-systems-in-new-homes-5/).

   In cold climates specifically, see for example this baseline study done in Maine, concludes that "Homes that used only heat pumps or heat pumps with supplemental electrical resistance (ER) heat accounted for 19% of homes. This was a large change from previous Maine housing studies where heat pumps were rare and where present, provided supplemental heating." (https://www.efficiencymaine.com/docs/Maine-New-Construction-Baseline-Assessment-08262021.pdf).

   Further, an increasing amount of cities, including Ithaca, NY (https://www.cityofithaca.org/642/Green-New-Deal) and New York City (https://legistar.council.nyc.gov/LegislationDetail.aspx?ID=4966519&GUID=714F1B3D-876F-4C4F-A1BC-A2849D60D55A&Options=ID%7CText%7C&Search=combustion) have passed all-electric mandates for new construction.

   Finally, the world's leading installers of heat pumps are all countries with extremely cold winters – Norway, where ~60% of households have heat pumps, and Sweden and Finland, where around 40% of households have heat pumps. While this doesn't address the question of current building practices in Ontario, it does speak

to the technical feasibility of using heat pumps in cold climates. See: https://reasonstobecheerful.world/heat-pumps-norway-efficiency-emissions/

Issue 16

Interrogatory from Enbridge Gas Inc.

16-EGI-16-OEB.STAFF.2

Reference:

Exhibit L.OEB STAFF.2, page 14

Preamble:

Use a coordinated, jurisdiction-wide approach. This means not only between electric and gas utilities, but also between any other government programs or nonprofits offering relevant services.

Question:

Enbridge Gas is working with IESO to establish a coordinated, province wide joint delivery model for the EGI Home Winter Proofing program and IESO's Energy Assistance Program in 2022 (see Staff 30). Please confirm if there are other specific programs in addition to these being referred to and provide references.

Response

We would encourage this approach for all applicable programs.