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Enbridge Gas Distribution
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April 8, 2016

Ms. Kirsten Walli
Board Secretary
Ontario Energy Board
2300 Yonge Street, 27th floor
Toronto, Ontario
M4P 1E4

Dear Ms. Walli:

Re: Ontario Energy Board Generic Proceeding
Natural Gas Community Expansion
Board File No.: EB-2016-0004

Pursuant to the Board's Procedural Order No. 2 dated March 9, 2016, attached please find Enbridge Gas Distribution's Interrogatories in this proceeding.

This submission was filed through the Board's Regulatory Electronic Submission System (RESS). Confirmation of filing is attached to this letter.

Please contact the undersigned if you have any questions.

Yours truly,

[original signed]

Joel Denomy
Manager, Regulatory Applications

Cc: All Parties to EB-2016-0004 (via email only)

Ontario Energy Board – Generic Community Expansion Proceeding
EB-2016-0004

INTERROGATORIES OF
ENBRIDGE GAS DISTRIBUTION INC.

April 8, 2016

Canadian Propane Association (the "CPA")

Q1:

Reference

CPA (page 9) "Union's application and evidence overstates the benefit to consumers of converting from propane to natural gas. This is described in detail in the Expert Report of Gerry Goobie dated 8 March 3, 2016."

Preamble

The CPA takes the position Union's EB-2015-0179 application and evidence overstates the benefit to consumers of converting from propane to natural gas.

Request

a) Please provide all data and detailed analysis supporting the relative energy costs for space and water heating used to support the evidence of the CPA in this proceeding.
b) Please provide retail residential propane prices that were offered to CPA member customers by CPA members for each month in 2014.

Q2:

Reference

Section 2: "Natural gas subsidization violates rate-making principles"

Preamble

The CPA takes the position that subsidization across utility customers is outside of the ratemaking authority of the OEB and that such subsidization can only be justified on non-financial grounds such as the provision of general societal benefits or improving the provincial economy.

Request

a) Please confirm that CPA member companies each achieve exactly the same degree of profitability for every customer which they serve.
b) Please confirm that it is the CPA's understanding that the current EBO 188 Guidelines do provide for a degree of cross subsidy across gas utility system expansion projects.
c) Please confirm that is the CPA's understanding that Stage 2 and Stage 3 Benefits as defined in EBO 134 cannot be considered in the evaluation of gas utility system expansion projects under the EBO 188 Guidelines.

Epcor

Q1:

Reference

Section: C.3 Sharing the Costs of Expansion and Regulatory Treatment

Preamble

(page 16, line 1) “Given the high and divergent costs of available energy sources in comparison to natural gas prices, customers in new franchise areas stand to benefit. They could contribute via time-limited surcharges but these may create a free-rider problem as some may delay conversion until surcharges expire. Regulated rates that differ from those elsewhere, and are higher on a sustained basis because of the greater delivery costs, are an alternative option.”

Request

a) Can Epcor please provide examples of where sustained higher rates have been utilized to avoid a free- rider problem?
b) In the examples provided in the response to a) above, please provide evidence which substantiates that the free- rider problem was avoided?
c) Please provide all analysis completed by Epcor of the impacts of having sustained higher rates rather than a time-limited surcharge and the associated impacts on customer conversion rates, project economics and all other impacts examined by Epcor.

Q2:

Reference

Section: C.1 Expansion Reserve Proposal

Preamble

(page 12, line 8) EPCOR proposed that the Board should establish and administer an Expansion Reserve which would be funded by a small volumetric levy on Province-wide sales of natural gas to current customers.

Request

a) How would the proposed Expansion Reserve Levy be determined?
b) What would the annual cost of administering the Expansion Reserve be?

c) How would community expansion projects be evaluated for the purpose of Expansion Reserve Funding?
d) Under the Epcor Expansion Reserve Proposal how would the administrator of the Reserve ensure consistency across all community expansion proposals evaluated?
e) What legislation provides the OEB with the legal authority to mandate, establish and administer the proposed Expansion Reserve?

Q3:

Reference

Section: C.1 Expansion Reserve Proposal

Preamble

VECC EB-2016-0004 Evidence (page 11, line 20), "In other words, a marginal project attaching residential customers would not reach a PI of 0.8 until the end of the fortieth year. In the first part of the forty year period, the revenues collected from new customers would be lower than the costs of serving them. This would produce an annual revenue deficiency which would put an upward pressure on rates. Assuming that the OEB approved annual or periodic rate increases, existing customers would subsidize new customers through higher rates during this period. Some time, before halfway through the 40 years a crossover would be reached and the revenues from the new customers would exceed the costs, creating an annual revenue sufficiency putting a downward pressure on rates. From then on the new customers would subsidize existing customers."

Request

a) Does Epcor agree with this statement? If not, why not?
b) Given the statement above, how could Epcor's Expansion Reserve Proposal be administered equitably for all Ontario gas ratepayers without project specific tracking for extended periods of time (decades), or without establishing standardized province-wide gas distribution rates?
c) As an alternative to Epcor's Expansion Reserve Proposal please explain why it would not be appropriate for Epcor's existing customers to subsidize its development of gas distribution systems in Ontario?

The Municipality of Kincardine; The Municipality of Arran-Elderslie; and The Township of Huron-Kinloss. (Collectively the "Municipalities")

Q1

Reference

Report prepared by the Municipality of Kincardine, the Municipality of Arran-Elderslie, the Township of Huron-Kinloss & Henley International Inc. ("the Municipalities") "The approach & competitive solicitation process undertaken by the Municipalities to facilitate the expansion of Natural Gas services to Southern Bruce County (the "RFI Report").

Preamble

(RFI Report, page 8) It is stated that "Among other things, the RFI obtained information from interested parties about their direct experience with respect to:

- system design and technical due diligence;
- financing;
- constructing;
- obtaining regulatory approvals and compliance;
- distribution rate design;
- natural gas storage; and
- owning and/or operating a regulated natural gas distribution utility."

Request

a) Please provide a copy of the Request for Information and all related documentation that was issued by the Municipalities to potential respondents on March 27th 2015.
b) Please provide copies of all of the proposals from the six (6) different respondents to the Municipalities Request for Information noted in the RFI Report along with all documentation (emails, reports, written reports) associated with the evaluation of these proposals.
c) Please explain why the Municipalities have a preference for one potential gas distribution services provider over any others absent of any reliable information on the cost of providing this service to the Municipalities, their constituents, the Province of Ontario or any other entity?
d) Please provide detailed references confirming Epcor's experience in the design, ownership and operation, financing, construction of natural gas distribution and storage facilities.

Ontario Geothermal Association (the "OGA")

Q1:

Reference

Evidence of the OGA, Section 3

Preamble

Beginning at Section 3.2 the OGA provides a history of the gothermal industry. Enbridge wishes to better understand the structure of the industry and its participants.

Request

a) Is the OGA aware of the Canadian GeoExchange Coalition? If so, what does the OGA understand to be the membership represented by the Coalition?
b) Has the OGA consulted with the Canadian GeoExchange Coalition about the OGA's intervention in this proceeding and does the OGA's intervention have the support of the GeoExchange Coalition?
c) If the OGA has not consulted with the Coalition about the intervention in this proceeding, why has it not done so?
d) If the OGA has consulted with the Coalition about the OGA's intervention, please describe the discussions between the two organizations in this regard?

Q2:

Reference

Evidence of the OGA, page 4

Preamble

Enbridge wishes to better understand the process for setting standards for the Ontario geothermal industry and the certification of personnel involved in the installation and servicing of geothermal space heating and water heating systems as well as how the actual performance of installed geothermal heating and water heating systems is certified.

Request

a) Is a geological study of the site conducted before installation to estimate technical and financial feasibility of geothermal projects?

b) Is an Engineering certification of the actual geology at the site required to confirm conditions?
c) Is a thermal capacity field test of the bore holes, or horizontal loop geo exchange, provided upon completion of a geothermal heating and water heating installation?
d) Is there a performance test of the entire geothermal system provided at the site for approval or certification purposes?

Q3

Reference

Evidence of the OGA, page 4

Preamble

In its evidence the OGA has identified a geothermal system heating efficiency (or COP) of 4 (or 400%), no reference was provided to support this value and all of the OGA's evaluations provided in their evidence rely on this value.

Request

a) Please provide references to support or COP value 4 (or 400%).
b) Please indicate if this value is the maximum, minimum, or average performance?
c) Is this the efficiency that geothermal system installers state their system will operate at, and do they guarantee this value to the end customer?
d) The OGA have stated that several thousand residential geothermal retrofits and new construction have been installed in Ontario. Please provide documentation confirming an average seasonal COP of 4 based on the results of these actual installations.
e) Is the electricity consumed by the Geo-exchange glycol pump included in the calculation of the system COP? If not, what would the average COP be if this addition energy consumption was included?
f) Are certificates, or proof of COP performance or thermal capacity provided for installed geothermal system for municipality records, electric utility records, and for the customer? If so, what authority issues and stands behind such certificates?
g) What assurances are provided to the homeowner that the geothermal system will run at the capacity and performance as outlined in this evidence? Is there a performance guarantee, and if so who pays for and tests the system and the correction of system performance deficiencies?
h) When were these certification processes put in place and how are they enforced?

Q4

Reference

Evidence of the OGA, “Head to Head Comparisons” (page 5)

Preamble

Enbridge seeks to better understand the data, data sources, assumptions, qualifications and sensitivity of the analyses that support the conclusions of this part of the OGA’s evidence. The evidence of the OGA states that the thermal energy from the ground is “endlessly renewable”.

Request

a) Please provide the limit to the heating capacity of a defined geo-exchange vertical hole of a standard defined depth, or if the capacity is limitless for a standard defined depth?
b) Please identify any subsoil conditions that alter the capacity of heat extraction from a standard defined depth?
c) For a standard Canadian home where the geo-exchange system would provide space heating and domestic hot water year round and have no need for air conditioning would the geothermal exchange system be able to provide heat if heat was being extracted year round? To what extent would the COP be impacted on a seasonal basis in this scenario? Would additional geoexchange depth have to be considered, and how would this impact the installation cost?

Q5

Reference

Evidence of the OGA, Section 8 Appendix B (page 33)

Preamble

The OGA evidence states that geothermal heat pump systems can be installed for all residential customers and have identified a cost to install ranging from $2000 to $3000 per Refrigerant Tonne (RT). Enbridge seeks to better understand the data, data sources, assumptions, qualifications and sensitivity of the analyses that support the conclusions of this part of the OGA’s evidence. The evidence of the OGA states that the thermal energy from the ground is “endlessly renewable”.

Request

a) Does the installed cost of a geothermal heat pump system quoted of $2,000 to $3,000 per RT include all costs associated with drilling and installing the required thermal loop?
b) Please identify geological conditions in Ontario that would increase the noted estimated installation costs, impact the overall system performance, or potential negative environmental issues? To what extent are these conditions prevalent in the community expansion areas identified in the evidence of Enbridge Gas Distribution?
c) Please identify any costs or environmental implications that can arise due to different geological conditions, such as Aquifer drinking water strata, methane in Shale layers, dry porous or fractured stone layers?
d) Please confirm it is standard practice to install a peaking or redundant heating source for an electric geothermal heat pump heated home in Ontario? If not why not?
e) If auxiliary electric heat is installed as part of the geothermal heating system how much additional cost is involved?
f) What would be the impact on the OGA's quoted geothermal heat pump system COP of 4, and the lifecycle cost of a geothermal heat pump system be if it assumed that the auxiliary electric heating system is engaged for twenty days per year, including the incremental CO2 allowance costs associated with the incremental emissions from the natural gas fired peaking plants required to meet this additional electricity demand?
g) In Appendix B of the OGA's evidence a conversion comparison was provided between a natural gas heating system and an electric geothermal heat pump system. The analysis reviews a 1500 sq ft house and assumes that a 36,000 btu/hr geothermal heat pump system would be adequate for peak space heating and water heating. Please identify the characteristics of the house used in this analysis and identify the data that supports that this represents 80% of the residential opportunities in potential community expansion projects, in terms of age of home, insulation level, and glassing characteristics.
h) Please restate the OGA's cost comparison assuming that a 60,000 btu/hr geothermal heat pump system is required.
i) Please restate the OGA's cost comparison assuming that a 80,000 btu/hr geothermal heat pump system is required.
j) Please provide a reference to support the OGA's assumption that the average design peak winter heating load for all the homes in the community expansion projects is 21,325 Btu/hr.

k) Please explain the rational so support the assumption that a thermal profile of 21,325 Btu/hr is representative of the average of all housing stock in the identified community expansion projects?
l) Please restate the OGA analysis assuming efficient geothermal system COP of and a 60,000 btu/hr heating capacity requirement. Please provide the capital cost, operating costs, and electricity demand associated with this scenario?
m) Please provide an explanation of the basis of the eQuest energy calculation result as shown in Figure #1 by providing details, of the assumed average home and weather data used for the analysis?

Q6:
Reference

Evidence of the OGA, Section 5.2 (page 24)

Preamble

The OGA evidence concludes that the lifecycle cost of geothermal systems are competitive with natural gas in the proposed communities, particularly when carbon costs are considered. Enbridge seeks to better understand the data, data sources, assumptions, qualifications and sensitivity of the analyses that support the conclusions of this part of the OGA's evidence.

Request

a) Please confirm that the OGA has used the average Carbon emissions for the entire Ontario electric generation portfolio to estimate the carbon emissions for the electric technologies?
b) Please restate the OGA's lifecycle cost analysis assuming that the analysis is based on natural gas being the only marginal fuel used for new electric generation load (including assumed CO_2 emissions costing).
c) Please confirm that all the electricity consumed for the assumed geothermal heat pump systems will represent incremental electrical load on the Province's electricity generating transmission and distribution systems. If not, why not?
d) How does the OGA assume that the additional cost associated with the incremental CO_2 created by the additional use of natural gas power plants required to satisfy the incremental electric loads imposed by additional geothermal heat pump systems be recovered? And, recovered from whom?

e) In its evidence the OGA have stated that the natural gas community expansion proposed programs proposed by Union Gas and Enbridge would produce 4 MT of carbon production by 2050 and that these same communities all converted to geothermal heat pump systems would yield only 0.2 MT. Assuming that all new marginal electricity was to be generated by natural gas fired power plants (assumed to be 45% efficient) please provide an estimate of the CO_2 produced by these power plants to support the new electric load from the OGA's proposed geothermal heat pumps assumed in the OGA's analysis.
f) The OGA states that the aggregate average peak electricity load for HVAC in winter is 2.2 kW based on the fuel usage distribution information stated in table #2. Please confirm that; -1) homes presently heated with fossil fuels would not require substantial upgrades to their electrical services, and -2) the electric LDCs serving these homes would not require significant upgrades to their distribution systems. If this is not the case, who would bear the cost of upgrading these systems?
g) Please provide the average cost of site restoration associated with the drilling of the required bore holes and installation of the thermal loops and confirm whether or not this cost was included in the OGA's "Head to Head Comparisons".

Q7:
Reference

Evidence of the OGA, Section 5.2 (page 24)

Preamble

Geothermal natural gas heat pump technology is available in Ontario.

Request

a) Has the OGA examined and evaluated the use of natural gas heat pumps in geothermal systems for Ontario applications?
b) Is the OGA aware of the distributor of this technology in Ontario?
c) Is OGA aware of the gas fired heat pump applications presently operating in Ontario?