EB-2024-0111
Enbridge Gas Rebasing – Phase II

Interrogatories of Green Energy Coalition

System Pruning

Interrogatory # 1-GEC-1

Reference: Exhibit 1, Tab 17, Schedule 1, Page 22, Paragraph 57

Preamble: Enbridge states that the Board's Phase 1 Decision "notes that a comprehensive IRP approach to system pruning would include comparing the cost of the system renewal project (i.e., maintenance or replacement of the pipeline) against the cost of the system pruning alternative (i.e., replacing gas equipment with electric equipment)" and that "If the system pruning alternative is economically feasible, it would be implemented to defer or eliminate the need for the system renewal project."

Question:

(a) What is Enbridge's understanding of how economic feasibility would be determined? It is based on Phase 1 of the DCF+ test, or some other mechanism?

Interrogatory # 1-GEC-2

Reference: Exhibit 1, Tab 17, Schedule 1, Pages 22-23, Paragraph 59

Preamble: Enbridge suggests that ideal candidates for system pruning "are likely to include segments to the system that require maintenance or replacement, are one-way fed, and have a relatively small number of services attached that feed residential or small commercial customers."

Questions:

(a) Please explain what is meant by "small number of services attached that feed residential or small commercial customers". Does Enbridge mean that pipe that serves only residential and small commercial customers, but only a small number of them? Or does it mean pipe that could serve load from larger commercial or industrial customers, with only a small number of residential and commercial customers that require addressing? Or something else? Please explain.
(b) Does Enbridge believe that a system pruning project could be even just one larger customer, such as a university? If not, why not?

Interrogatory # 1-GEC-3

Reference: Exhibit 1, Tab 17, Schedule 1, Page 23, Paragraph 62

Preamble: Enbridge states that "The development of an IRP system pruning pilot will require time."

Questions:

(a) Does Enbridge believe that it would be able to begin work in the field on a pruning pilot – i.e., work with customers to change out gas-consuming equipment – within 24 months of a Board order in this proceeding? If not, why not?
(b) What is Enbridge's best estimate of the amount of time that will be necessary to develop and begin work in the field on a system pruning pilot? What is the basis for that estimate?
(c) Has Enbridge assessed how long it took other gas utilities to launch their first system pruning projects? If so, which utilities were assessed? Please provide documentation of what Enbridge found in its assessments.

Interrogatory # 1-GEC-4

Reference: Exhibit 1, Tab 17, Schedule 1, Page 23-24, Paragraph 64

Preamble: Enbridge provides a bulleted list of factors that could affect the technical feasibility of a pruning project.

Questions:

(d) The first factor is number of connected services. What is meant by connected services? If a university currently used gas for many different buildings and operations, is each such building and operation a different connected service? Please explain why the number of connected services is a potential technical barrier.
(e) The second factor is types of attached customers. What types of attached customers would render a potential pruning project technically infeasible? Why?
(f) The third factor is the planned in-service date of the project. Would Enbridge agree that injection of compressed natural gas could be used to put off the in-service date of a standard distribution system upgrade? If so, why is in-service date a technical barrier rather than just (potentially) an economic one?

Interrogatory # 1-GEC-5

Reference: Exhibit 1, Tab 17, Schedule 1, Pages 25-26, Paragraph 68

Preamble: Enbridge suggests that gas system pruning will "require a framework that allows for consistent comparison of the economic feasibility of gas and electric energy solutions." Enbridge further notes that the current cost-benefit tests used by

Enbridge for non-pipe solutions and by LDCs for non-wires solutions are different.

Question:

(a) Why does that matter since the pruning of Enbridge's gas system has nothing to do with consideration of non-wires alternatives?

Interrogatory # 1-GEC-6

Reference: Exhibit 1, Tab 17, Schedule 1, Pages 27, Paragraph 71

Preamble: Enbridge states that it will complete a scan of other jurisdictions that have begun or are planning to undertake system pruning projects.

Questions:

(a) Has Enbridge already analyzed the experience of any other North American gas utilities that have completed or planned system pruning? Please identify all other such gas utilities and provide copies of all reports, regulatory orders and other documents related to system pruning from or related to such utilities that Enbridge has collected.
(b) Has Enbridge already commissioned a comprehensive jurisdictional scan? If not, why not? If so, when is a draft and final report on the results expected?

Fuel Cost Comparisons

Interrogatory # 1-GEC-7

Reference: Exhibit 1, Tab 16, Schedule 1, Page 2, Figure 1

Questions:

(a) Please provide an Excel spreadsheet with all of the assumptions and calculations used to compute the values presented in Figure 1.
(b) Enbridge later notes that its comparison to electricity is only for electric resistance heat and not to heat pumps. Given that, why does Enbridge use the label "electricity" rather than "electric resistance heat"?

Interrogatory # 1-GEC-8

Reference: Exhibit 1, Tab 16, Schedule 1, Page 5, Paragraph 11a

Preamble: Enbridge states that one reason it does not compare gas to an electric ccASHP is because such comparisons require consideration of upfront costs and that the analysis of such upfront costs is more complex than that of the upfront costs of converting to a natural gas furnace because it can sometimes include things like

"electric panel upgrades, exterior upgrades from the electric utility, internal wiring upgrades, duct work improvements, etc."

Questions:

(a) Enbridge compares gas to electric resistance heat, which will most often be homes with electric resistance baseboards. Many such homes will lack ductwork (if they don't have central air conditioning). Wouldn't this be an equally significant even concern in terms of variation in cost of conversions to gas as the potential duct work improvements to enable use of ccASHPs are?
(b) Why are exterior upgrades from the electric utility relevant to customer costs?
(c) It is our understanding that when Enbridge connects a new residential gas customer the first 20 meters of the connection is provided at no cost with the remainder paid by the customer. Is that correct? If not, please explain what is paid by the customer.
(d) In calendar year 2023, what fraction of the residential customers who converted to gas from another fuel paid any connection cost?
(e) In calendar year 2023, of the residential customers who converted to gas from another fuel and paid a gas connection cost, what was the average connection cost?
(f) In calendar year 2023, what was the largest connect cost paid by a residential customer?
(g) Please confirm that any gas connection costs are not included in Enbridge's comparison of heating bills by fuel.

Interrogatory # 1-GEC-9

Reference: Exhibit 1, Tab 16, Schedule 1, Page 6, Paragraph 11b

Preamble: Enbridge states that it does not compare the cost of customer conversions to ccASHPs because such conversions might require electric utility distribution system upgrades.

Question:

(a) Is Enbridge contending that individual customers who convert from propane or fuel oil to ccASHPs would be required to pay for any such electric distribution system upgrade costs? If so, what is the basis for that contention? If not, why are potential costs borne by distribution utilities relevant to a comparison of end-use customer costs?

Interrogatory # 1-GEC-10

Reference: Exhibit 1, Tab 16, Schedule 1, Page 8, Table 2

Question:

(a) Please provide all of the conversion factors referenced, including sources.

Interrogatory # 1-GEC-11

Reference: Exhibit 1, Tab 10, Schedule 7, Paragraph 15

Preamble: Enbridge makes reference to RNG as a low-carbon fuel. It further states that the supply of RNG is currently "mainly from biogas generated through anaerobic digestion of farm and food waste and landfill gas" and that the "ETTF can be used to support further development of alternative technologies such as gasification to enable access to a variety of feedstocks (e.g., agricultural waste, forestry residues, municipal solid waste), thus increasing supply and over time, lowering cost."

Questions:

(a) When considering different RNG options, does Enbridge plan to consider differences in lifecycle GHG emissions (i.e., including emissions associated with production and transportation of biogas to customers' homes and businesses) or will it treat all RNG as zero-emitting (and therefore all the same from a climate perspective). Please explain the rationale for the response.
(b) What is Enbridge's current best estimate of the potential fraction of its current gas sales that could be converted to RNG? What is that estimate based on?
(c) What is Enbridge's best estimate of the delivered cost of RNG from gasification? What is that estimate based on?
(d) By how much does Enbridge believe that costs of gasification can be reduced over time through investment via the ETTF? What is that estimate based on?

Interrogatory # 1-GEC-12

Reference: Exhibit 1, Tab 10, Schedule 7, Pages 5-6, Paragraphs 15-16

Preamble: Enbridge states that low-carbon hydrogen "will play an important role in the energy mix."

Questions:

(a) What types of hydrogen, other than green hydrogen, would Enbridge consider to be "low-carbon"? Please explain the basis for the response, including whether Enbridge believes that lifecycle accounting of GHG emissions should be part of the determination.
(b) Which of the following three types of applications of low-carbon hydrogen would Enbridge consider to be potentially viable ETTF investments: (1) hydrogen blending with methane for delivery through existing Enbridge pipes to all customers; (2) dedicated delivery of 100% hydrogen to individual industrial customers with high heat process needs; and/or (3) delivery of 100% hydrogen to residential and commercial customers through either new or repurposed existing Enbridge pipes? Please explain the rationale for the response, including why Enbridge believes that the application could play a significant role in future decarbonization of the gas system.

Interrogatory # 1-GEC-13

Reference: Exhibit 1, Tab 10, Schedule 7, Page 6, Paragraph 16

Preamble: Enbridge states that methane pyrolysis could "offer a unique opportunity to produce hydrogen by using natural gas as a low-cost feedstock…"

Questions:

(a) Why has Enbridge focused specifically on industrial use of methane pyrolysis rather than other forms of hydrogen generation, such as green hydrogen?
(b) What is Enbridge's current estimate of the cost of delivered heat through methane pyrolysis? What is the basis for that estimate?
(c) What is Enbridge's current estimate of the lifecycle GHG emissions associated with hydrogen generated through methane pyrolysis? What is the basis for that estimate?
(d) What is Enbridge's current estimate of the cost of green hydrogen? What is the basis for that estimate?
(e) What is Enbridge's current estimate of the lifecycle GHG emissions from green hydrogen? What is the basis for that estimate?

Interrogatory # 1-GEC-14

Reference: Exhibit 1, Tab 10, Schedule 7, Page 6, Paragraph 17

Preamble: Enbridge states that "hydrogen is emerging as an attractive, low-carbon alternative fuel for a variety of end-use applications" and that "The ETTF will support innovation initiatives to develop end-use equipment working with a low-carbon carbon fuel mix."

Questions:

(a) To what end-use applications is Enbridge referring?
(b) For each end-use listed in response to (a) of this question, what is the basis for the statement that "hydrogen is emerging as an attractive, low-carbon alternative"?

Interrogatory # 1-GEC-15

Reference: Exhibit 1, Tab 10, Schedule 7, Page 6, Paragraph 17

Preamble: Enbridge states that "The ETTF will support innovation initiatives to develop end-use equipment working with a low-carbon carbon fuel mix."

Questions:

(a) Please list the specific kinds of end-use equipment the ETTF will support and why.
(b) How will the ETTF support such end-use equipment?

Interrogatory # 1-GEC-16

Reference: Exhibit 1, Tab 10, Schedule 7

Questions:

(a) Is Enbridge proposing that it alone will make decisions on the technology or products in which ETTF funds will be invested? If not, how will input from other parties be solicited and what role will input from other parties play in final investment decisions?
(b) Would Enbridge agree that its shareholders have a vested interest in decisions regarding which decarbonization technologies or products would merit the most investment? If not, why not?
(c) Enbridge did not list networked geothermal as a potential focus of ETTF investment. Why not?
(d) Enbridge did not list full electrification of residential or commercial or industrial heating, water heating, process heating or other end uses as a potential ETTF investment. Why not?

Low-Carbon Energy in the Gas Supply Commodity Portfolio

Interrogatory # 4-GEC-17

Reference: Exhibit 4, Tab 2, Schedule 7, Page 17, Paragraph 46

Preamble: Enbridge indicates procurement of 1,000GJ of RNG in March 2022, 2,300 GJ of RNG in February 2023, and an additional 2,300 GJ of RNG in February 2024 through the voluntary RNG Pilot Program.

Questions:

(a) Are these values cumulative, so that the total procured for voluntary participation now totals 5,600 GJ?
(b) What year(s) do these procurements of RNG for the voluntary program expire?
(c) What is the cost per GJ for each of these procurements?
(d) What percent of the planned gas commodity procurement for 2024 do these RNG procurements provide? Note: Paragraph 32 indicates total planned gas commodity procurement of 527 PJ.
(e) If the proposed LCVP and RNG in the commodity portfolio as proposed are successful in meeting their 4% target, by 2029, how many total PJ of RNG will be provided in the Enbridge Gas Commodity portfolio?
(f) By what factors (in percent terms) will the volumes of RNG procurement need to increase above the voluntary RNG pilot procurements listed above to meet the Low Carbon Voluntary (LCVP) targets of up to 1% in 2026 and 4% in 2029?

Interrogatory # 4-GEC-18

Reference: Exhibit 4, Tab 2, Schedule 7, Page 1, Paragraph 3

Preamble: Enbridge states: "It is clear the energy transition is underway and RNG will play an important role. As outlined in Canada's Energy Future 2023 published by the Canada Energy Regulator (CER), low-carbon fuels will enable the energy system's path to net zero."

Questions:

(a) What level of RNG in PJ and as a share of supply is implied by the term "important role"?
(b) How do the values in response to 4-GEC-17(e) (above) compare to the levels associated with an "important role"?

Interrogatory # 4-GEC-19

Reference: Exhibit 4, Tab 2, Schedule 7

Questions:

(a) For calendar years 2027, 2028 and 2029 please indicate the projected levels of participation in the LCVP for large volume sales service customers, and the projected remaining levels to be included in the cost of gas supply commodity purchases.
(b) What is the estimated cost range of RNG per GJ for each of the four calendar years (2026-2029) for RNG procurement through the LCEP?
(c) How does the estimated cost range compare to the spot market prices from Platts Gas Daily referenced in paragraph 68 on page 27?

Interrogatory # 4-GEC-20

Reference: Exhibit 4, Tab 2, Schedule 7, Page 3, Paragraph 9

Questions:

(a) Please provide a workbook with values and formulas intact, that demonstrates the anticipated energy content and volumes of RNG and the procurement cost per PJ that is equivalent to reaching the 1%, 2%, 3%, and 4% targets within the maximum impact levels per residential customer of $2/month, $4/month, $6/month and $8/month.
(b) Paragraph 33 on page 13 indicates the maximum bill impact estimates assume no LCVP participation. Please provide a workbook with formulas and values intact indicating the estimated average residential bill impact with LCVP participation rates based on the answer to question 4-GEC-19 (a) above.

Interrogatory # 4-GEC-21

Reference: Exhibit 4, Tab 2, Schedule 7, Page 15, Paragraph 41

Preamble: The application states that Enbridge's low-carbon energy proposal would contribute roughly 6% of the provincial emissions reduction targets for 2030 (assuming 4% of the commodity gas portfolio is RNG).

Questions:

(a) Assuming the 4% of commodity gas portfolio is RNG, please estimate the emissions from the remaining fossil gas in 2030 (including combustion and non-combustion emissions).
(b) What is the total emissions level required for Ontario to reduce emissions by 30% below 2005 levels by 2030?
(c) What share of the total emissions (b) are associated with the projected remaining fossil gas system emissions (a)?

Interrogatory # 4-GEC-22

Reference: Exhibit 4, Tab 2, Schedule 7, Page 31, Paragraph 76

Preamble: Enbridge states the carbon intensity score of RNG will not be the primary consideration when procuring RNG. However, the costs and carbon intensity of RNG varies significantly by feedstock source and therefore are important factors for consideration in the planning and review for the LCEP.

Questions:

(a) What citations and data does the Company have for the carbon intensity for RNG from the following feedstocks? Note a range for carbon intensities as appropriate.
    i. Landfill gas (accounting for baseline levels of required methane capture and onsite energy production).
    ii. Agricultural manure.
    iii. Food waste
    iv. Wastewater treatment
(b) What citations and data does the Company have for the supply costs for RNG from the following feedstocks? Note a range for cost per GJ as appropriate.
    i. Landfill gas
    ii. Agricultural manure
    iii. Food waste
    iv. Wastewater treatment
(c) To reach the 4% LCEP target by 2029 what are the Company's best estimate of the share of RNG supply that will come from each of these four feedstocks?
    i. Landfill gas
    ii. Agricultural manure

iii. Food waste
iv. Wastewater treatment

Interrogatory # 4-GEC-23

Reference: Exhibit 4, Tab 2, Schedule 7, Attachment 2 – Anew North American Renewable Natural Gas Market Evaluation, September 2022

Preamble: The Executive Summary under Supply sub-heading on p. iv indicates RNG produced across the inventory of U.S. project sites could decarbonize as much as 48% of current North American natural gas demand.

Questions:

(a) Please provide a workbook with formulas and values intact that documents this finding.
(b) Please provide a citation and value for the current North American natural gas demand.
(c) What level of decarbonization is implied? For example, is the finding that 48% of the current natural gas demand becomes carbon neutral, or that it is decarbonized by a percent? If the latter, by how much?
(d) The section claims that forecasters expect RNG supply, led by carbon negative RNG, could substantially decarbonize gas consumption. What feedstock streams are carbon negative? What are the range of carbon intensities for these feedstock streams? What is the projected supply that supports the statement "led by carbon negative RNG"?

Interrogatory # 4-GEC-24

Reference: Exhibit 4, Tab 2, Schedule 7, Attachment 2 – Anew North American Renewable Natural Gas Market Evaluation, September 2022

Preamble: Under the demand sub-heading the statement is made that some forecasters expect RNG to fully supplant geologic gas use.

Questions:

(a) Please provide citations to such forecasts.
(b) What levels (or range) of RNG supply and pipeline gas demand are associated with these forecasts?

Interrogatory # 4-GEC-25

Reference: Exhibit 4, Tab 2, Schedule 7, Attachment 2 – Anew North American Renewable Natural Gas Market Evaluation, September 2022

Preamble: On page 12, the Anew study indicates several utilities use a combination of RNG and carbon offsets in their program offerings.

Questions:

(a) Is Enbridge proposing to use carbon offsets in any of the low-carbon energy gas supply?
(b) If so, please provide details on the share, anticipated cost, and source for carbon offsets.

Interrogatory # 4-GEC-25

Reference: Exhibit 4, Tab 2, Schedule 7, Attachment 2 – Anew North American Renewable Natural Gas Market Evaluation, September 2022

Preamble: On page 20 of the Anew study, the last full paragraph states "Currently, the growing RNG producer network can deliver just a fraction of overall natural gas volumes being consumed in North America."

Question:

(a) Please provide the fraction that is currently provided and relate this to the claim that as much as 48% of the current North American natural gas demand can be decarbonized by RNG.

Interrogatory # 4-GEC-25

Reference: Exhibit 4, Tab 2, Schedule 7, Attachment 2 – Anew North American Renewable Natural Gas Market Evaluation, September 2022

Preamble: On page 24, Table 5.1.2 of the Anew study indicates smart targets for up to 5,000 operating projects by 2040, and increase from the current tally of 508.

Questions:

(a) What is the current annual RNG production from the 508 existing sites?
(b) What is the estimated annual production (range) from the 5,000 sites, if they are operational by 2040?
(c) How does the answer to (b) relate to the values cited by the report in the Executive Summary of 48% of current natural gas demand, and the answers to questions 4-GEC-23?