Elson Advocacy

July 26, 2020

BY EMAIL AND RESS

Ms. Christine Long
Board Secretary
Ontario Energy Board
2300 Yonge Street, Suite 2700, P.O. Box 2319
Toronto, Ontario M4P 1E4

Dear Ms. Long:

Re: EB-2019-0294 – Enbridge Gas Inc. – Low Carbon Energy Project

I am writing to submit the attached supplementary interrogatory request to Enbridge.

We ask that this interrogatory be answered despite being submitted beyond the applicable deadline. We believe this is warranted for two reasons. First, answering this interrogatory will not delay the proceeding in any way because Enbridge can answer the interrogatory while it is waiting for answers to the interrogatories to the TSSA. Second, the interrogatory pertains to an important study regarding hydrogen use in heating buildings which was released on July 14, 2020 and only came to our attention two days ago, on Friday, July 24, 2020.[1] The interrogatory could not have been submitted within the applicable deadline because of the release date. Furthermore, we have acted as quickly as possible by submitting this interrogatory on a Sunday after only becoming aware of the study on Friday afternoon.

Yours truly,

Kent Elson

[1] FIEE, *Green hydrogen or green electricity for building heating?*, July 14, 2020 (link).

Elson Advocacy Professional Corporation | Kent@ElsonAdvocacy.ca | 1062 College St., Toronto, ON M6H 1A9 | tel: 416 906-7305 | fax: 416 763-5435

EB-2019-0294 – Enbridge Gas Inc. – Low Carbon Energy Project

Environmental Defence Supplementary Interrogatory

Interrogatory #12

Reference: Exhibit A, Tab 2, Schedule 1, p. 1

Preamble: Enbridge states that:

> "The LCEP is a pilot project that will allow the Company to green a portion of the natural gas grid in Ontario. The experience gained through the implementation of the LCEP will position Enbridge Gas to then expand hydrogen injection into other parts of its gas distribution system, further enhancing reductions to GHG emissions across the province."

A study recently released by the Fraunhofer Institute for Energy Economics and Energy System Technology contains the following conclusions:

1. "[H]ydrogen is not a viable option when it comes to heating buildings. The amount of green electricity needed to produce green hydrogen for this purpose is 500 to 600 percent greater than the amount needed to power an equivalent number of heat pumps.

   'The differences in efficiency are so large that it is unreasonable to propose the wide-spread use of hydrogen for heat in buildings,' Prof. Dr. Clemens Hoffmann, the Executive Director of Fraunhofer IEE, says."[2]

2. "The authors do recommend the priority use of hydrogen when there are no good alternatives to fossil fuels. The most relevant hydrogen applications include synthetic fuels for airplanes and ships; the production of ammonia, methanol, and steel; and the supply of power plants with and without CHP."[3]

3. "The blending of hydrogen into natural gas grids is currently limited to 10%, and an increase to 20% is under discussion. However, this only corresponds to an energetic share of 7–8%, meaning that little would be obtained in the way of climate protection."[4]

4. "In order to exceed a 20% hydrogen blending threshold, it would be necessary to completely and abruptly switching distribution grids to 100%

[2] FIEE, *Green hydrogen or green electricity for building heating?*, July 14, 2020 (link); FIEE, *Hydrogen in the Energy System of the Future: Focus on Heat in Buildings*, May 2020, p. 5 (link).
[3] FIEE, *Green hydrogen or green electricity for building heating?*, July 14, 2020 (link); FIEE, Hydrogen in the Energy System of the Future: Focus on Heat in Buildings, May 2020, p. 4 (link).
[4] FIEE, *Hydrogen in the Energy System of the Future: Focus on Heat in Buildings*, May 2020, p. 5 (link).

hydrogen supply. This would require the premature replacement of all existing natural gas boilers, a cost factor that would considerably exceed that of converting the gas grids."[5]

5. "When blue hydrogen is produced from fossil natural gas, at best 85–95% of the emissions can be captured and injected underground. In addition, depending on the country of origin and application, 0.5–4.1% leakage occurs during pipeline transport. Therefore, blue hydrogen can at best be a bridge technology to enable early structural change by industry."[6]

Questions:

(a) Please confirm that part of the purpose of this project is that the experience gained through the implementation of the LCEP will position Enbridge Gas to then expand hydrogen injection into other parts of its gas distribution system.

(b) If the conclusions listed in the study above are true, does Enbridge still believe its project and the associated expenditures are reasonable and prudent?

(c) Does Enbridge agree that the amount of green electricity needed to produce green hydrogen for building heating is 500 to 600 percent greater than the amount needed to power an equivalent number of heat pumps? If not, please provide Enbridge's estimate of the percentage difference on a best efforts basis. Please also comment on whether Enbridge still believes its project is reasonable and prudent in light of this, and why.

(d) Please confirm that (i) there is approximately a 20% energetic loss when converting electricity to hydrogen through power to gas; (ii) gas furnaces currently available on the market in Ontario cannot reach efficiencies above 100%, (iii) currently available cold climate electric heat pumps reach "efficiencies" above 200% as an annual average. Please also comment on whether Enbridge still believes its project is reasonable and prudent in light of this, and why.

(e) Does Enbridge agree that hydrogen use should be prioritized for use where no good alternatives to fossil fuels exist, such as synthetic fuels for airplanes and ships? Please also comment on whether Enbridge still believes its project is reasonable and prudent in light of this, and why.

(f) Does Enbridge agree that low-cost hydrogen produced from surplus power is finite?

(g) Does Enbridge agree that low-cost hydrogen produced from surplus power should be prioritized for use where no good alternatives to fossil fuels exist?

(h) Please confirm whether a 20% blending of hydrogen corresponds to a 7-8% energetic share. If not, please provide the accurate value.

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[5] FIEE, *Hydrogen in the Energy System of the Future: Focus on Heat in Buildings*, May 2020, p. 6 (link).
[6] FIEE, *Hydrogen in the Energy System of the Future: Focus on Heat in Buildings*, May 2020, p. 5 (link).

(i) Enbridge is proposing a 2% hydrogen blend. What does this correspond to in terms of an energetic share?

(j) Does Enbridge agree that, in order to exceed a 20% hydrogen blending threshold, it would be necessary to completely and abruptly switching distribution grids to 100% hydrogen supply, which would require the premature replacement of all existing natural gas boilers at a high cost? Please also comment on whether Enbridge still believes its project is reasonable and prudent in light of this, and why.

(k) In light of all the technical and financial challenges, please describe a potential pathway whereby hydrogen can decarbonize heating in buildings. Please list all the existing barriers and how they could potentially be overcome. Please also comment on whether Enbridge still believes its project is reasonable and prudent in light of this, and why.

(l) To ensure a complete record, please file the FIEE study and the associated FIEE article discussed above as an attachment to Enbridge's interrogatory response.[7]

[7] FIEE, *Green hydrogen or green electricity for building heating?*, July 14, 2020 (link); FIEE, *Hydrogen in the Energy System of the Future: Focus on Heat in Buildings*, May 2020 (link).