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May 27, 2020

**VIA RESS**

Christine Long
Registrar and Board Secretary
Ontario Energy Board
P.O. Box 2319, 27th Floor
2300 Yonge Street
Toronto, ON M4P 1E4

Dear Ms. Long:

**Re: Enbridge Gas Inc. (EGI)**
**Low Carbon Energy Project – Application for leave to construct and related approvals**
**EB-2019-0294**

We are counsel to H2GO Canada (**H2GO**). Please find enclosed H2GO's interrogatories to EGI in the above-noted proceeding, filed further to Procedural Order No. 1.

Sincerely,

Lisa (Elisabeth) DeMarco

c. Bob Oliver, H2GO Canada
Janet Howard, Fasken
Regulatory Affairs, Enbridge Gas Inc.
David Stevens, Aird & Berlis LLP

Encl.

**ONTARIO ENERGY BOARD**

**IN THE MATTER OF** the *Ontario Energy Board Act, 1998*, S.O. 1998, c. 15, Sched. B, as amended (the **Act**);

**AND IN THE MATTER OF** an application by Enbridge Gas Inc. (**EGI**) under section 90 of the Act for an order or orders granting leave to construct natural gas distribution pipelines and ancillary facilities to enable its Low Carbon Energy Project (**LCEP**) in the City of Markham;

**AND IN THE MATTER OF** an application under section 36 of the Act for an order or orders approving a rate rider to be applied to customer impacted by the Low Carbon Energy Project.

**EB-2019-0294**

# INTERROGATORIES

**OF**

**H2GO CANADA**

**May 27, 2020**

**Question:** **B-H2GO-1**

Reference:
- Exhibit B, Tab 1, Schedule 1, Attachment 1, paras 1, 10-13, 18, 20-21
- Exhibit B, Tab 1, Schedule 1, para 4

Preamble: EGI states that it has conducted a detailed review of the feasibility and recommendations for blending hydrogen into natural gas supply for distribution using existing infrastructure (para 1).

EGI further states that it engaged several consultants in order to complete the analysis and investigation work for hydrogen blending, including a consultant experienced with town-gas applications and a global consulting firm specializing in risk management (para 18).

EGI has concluded that blending hydrogen in a concentration of up to 2% hydrogen is safe and reliable for the LCEP. To define the appropriate hydrogen blending concentration (2%), EGI followed an assessment methodology that included a research and development (R&D) work stream (i.e., literature review) to leverage existing industry knowledge and recommendations from the Canadian Gas Association (**CGA**) / American Gas Association (**AGA**) Task Force on Hydrogen Blending, the HYREADY Consortium, the multi-year European-led NATURALHY technical study and other technical literature (paras 20-21).

EGI's assessment methodology also included a work stream focused on gas distribution network hydrogen tolerance. EGI's investigation into the Blended Gas Closed Loops concluded that 5% hydrogen by volume can be injected (para 24).

a) Please file copies of any reports, working papers, presentations, datasets, or other materials related to the work performed by the consultant experienced with town-gas applications.

b) Please file copies of any reports, working papers, presentations, datasets, or other materials related to the work performed by the global consulting firm specializing in risk management.

c) Please file copies of any reports, working papers, presentations, datasets, or other materials that EGI reviewed in connection with its literature review, including any such materials related to the CGA/AGA Task Force on Hydrogen Blending, the HYREADY Consortium, and the multi-year European-led NATURALHY technical study.

d) Given that EGI's investigation concluded that up to 5% hydrogen by volume can be injected (para 24), please provide an outline of the reasons why EGI limited both the study and the LCEP to injection of 2% hydrogen by volume. Please file copies of all related reports, working papers, presentations, datasets, or other materials.

e) Please file a copy of the 2-year engineering assessment recommending 2% hydrogen by volume (Exhibit F, Tab 1, Schedule 1, Attachment 5, p. 3).

f) Please provide (preferably in table format) EGI's assessments of the potential greenhouse gas (**GHG**) emissions reductions, additional power and gas efficiencies, and costs that may result under each of the following scenarios:

(i) 4% hydrogen by volume and:
   a. 15% enhanced used of natural gas blend as a transportation fuel; and
   b. status quo usage of natural gas and 15% enhanced use of electricity as a transportation fuel.

(ii) 2% hydrogen by volume and:
   a. 15% enhanced used of natural gas blend as a transportation fuel; and
   b. status quo usage of natural gas and 15% enhanced use of electricity as a transportation fuel.

**Question:** **A-H2GO-2**

Reference:
- Exhibit A, Tab 2, Schedule 1, paras 6, 13
- Exhibit B, Tab 1, Schedule 1, paras 6-7, 26-27

Preamble: With leave of the Board, EGI expects to commence construction of the LCEP in the second quarter of 2021. EGI says this timing is required in order to gain experience with the blending of hydrogen into the natural gas distribution system in advance of pending carbon abatement regulations (including the Clean Fuel Standard (**CFS**)).

EGI states that the CFS will seek to reduce the carbon footprint of carbonaceous fuels by setting "lifecycle carbon intensity requirements for liquid, gaseous and solid fuels used in transportation, industry and buildings" and will become more stringent over time.

EGI indicates that hydrogen is expected to be a means of compliance and a pathway for the generation of CFS credits and that the LCEP will prepare the natural gas grid for implementation of the CFS.

EGI also believes that successful implementation of this pilot project will support it in pursuing additional and larger scale hydrogen blending activities in other parts of its distribution system.

a) Please provide an outline of the steps EGI proposes to take in order to gain the necessary experience with the blending of hydrogen into the natural gas distribution system over the period prior to the second quarter of 2021.

b) Please provide an outline of how EGI proposes to learn from the LCEP in order to prepare the natural gas grid for implementation of the CFS.

c) Does EGI anticipate that it will retain ownership of any environmental attributes generated through the LCEP? If so, please explain how it will account for such environmental attributes. If not, please explain why not.

d) Please provide an explanation of how EGI envisions that pathway for the generation of CFS credits under projects similar to the LCEP.

e) Please file any and all analysis EGI has performed in connection with the use of hydrogen in the natural gas grid as a means of compliance with the CFS.

f) Please outline EGI's plans to pursue "additional and larger scale hydrogen blending activities in other parts of its distribution system."

g) The CFS for gaseous and solid fuel regulations will come into force January 1, 2023. Please complete the following chart:

| Year | Estimated Volume of Hydrogen Blending by EGI ($m^3$) | Estimated GHG Emissions Reductions from Hydrogen Blending by EGI (tCO2e) | Anticipated Number of CFS Credits Generated by EGI through Hydrogen Blending Activities |
|---|---|---|---|
| **2023** | | | |
| **2024** | | | |
| **2025** | | | |
| **2026** | | | |
| **2027** | | | |
| **2028** | | | |
| **2029** | | | |
| **2030** | | | |
| **2031** | | | |

| | | | |
|---|---|---|---|
| **2032** | | | |
| **2033** | | | |

h) Please provide any and all assumptions that EGI has made regarding the design and implementation of the CFS system in Canada, its inter-operability with the US, the fungibility of the CFS, and US and California LCFS related credits/units.

i) Please comment on how hydrogen blending may currently and over the next five years impact:

(i) gas storage;
(ii) security of natural gas supply; and
(iii) natural gas commodity and transportation pricing.

**Question:** **B-H2GO-3**

Reference:
- Exhibit B, Tab 1, Schedule 1, paras 7, 16
- Exhibit F, Tab 1, Schedule 1, Attachment 5, p. 2

Preamble: EGI estimates that, for the blended gas area (**BGA**) of the LCEP, GHG emissions reductions can range from approximately 97 tons carbon dioxide equivalent (tCO2e) to 120 tCO2e per year (para 7).

EGI states that hydrogen has a positive effect on GHG emissions when blended into the natural gas distribution system by serving to reduce the overall carbon content of natural gas. The result is a reduction in GHG emissions associated with the combustion of natural gas (para 16).

In a response to a question asked by Mississaugas of the Credit First Nation, EGI stated that, for blend of 2% by volume hydrogen, 0.663% of emissions due to natural gas are reduced. EGI further indicated that it anticipates approximately 625 tCO2e could be offset annually (based on 2018 natural gas volumes used in the area), equal to the amount of GHG emissions of approximately 139 homes in a year (based on average yearly gas usage).

a) Please provide a detailed explanation of the formula EGI used to calculate the estimate of emissions reductions of 97 to 120 tCO2e per year for the BGA.

b) Please explain what factors are likely to contribute to variability within the range of estimated GHG emissions reductions in the BGA.

c) Please file copies of any reports, working papers, presentations, datasets, or other materials related to EGI's determination that blending 2% hydrogen by volume results in a 0.663% reduction of emissions due to natural gas.

d) Has EGI performed any analysis of how the LCEP — and hydrogen blending generally — will affect the imposition of federal carbon charges on customers in the BGA.

If so, please provide the analysis.

If not, please explain why no such analysis has been performed.

e) Please confirm that the estimate of emissions reductions of 97 to 120 tCO2e per year for the BGA is specific to Phase 1 of the LCEP.

Please provide details of EGI's forecast, if any, of the GHG emissions reductions in Phase 2 of the LCEP.

**Question:** **B-H2GO-4**

Reference:
- Exhibit B, Tab 1, Schedule 1, paras 14-15

Preamble: EGI states that a Power to Gas (**PtG**) plant owned by an affiliate will provide electricity regulation service under contract with the Independent Electricity System Operator (**IESO**).

EGI further states that, in the future, blending of hydrogen into the natural gas stream will provide a solution to the challenge of storing the province's surplus electrical energy. In doing so, hydrogen blending can establish an intertie between the electrical grid and the natural gas distribution system, and improve energy utilization, by using existing pipeline infrastructure to effectively store electrical energy.

Enbridge also states that, in addition to storing electrical energy as hydrogen, the PtG process provides a valuable dispatchable ancillary service to the province's IESO, delivering benefits not only to natural gas rate payers, but also to the province's electrical ratepayers. The ability to more effectively balance the electricity system is important in order to balance the electricity production of the province's renewable generation fleet. It will become more important if the renewable generation fleet in the province expands.

a) Please complete the following chart:

| **PtG Plant Electricity Consumption (annual average) (kWh)** | **PtG Plant Hydrogen Production (annual average) ($m^3$)** | **Quantity of Hydrogen Blended into BGA (m3)** |
|---|---|---|
| | | |

b) Does EGI expect that 100% of the hydrogen produced by the PtG plant will be used for hydrogen blending in the BGA? If so, please explain how EGI will ensure that hydrogen is not over-produced. If not, please explain what

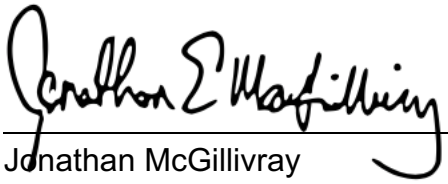
other applications EGI anticipates for the hydrogen produced by the PtG plant.

c) Please explain how EGI proposes to store hydrogen produced by the PtG plant. Please further explain whether EGI anticipates using its existing pipeline infrastructure to store hydrogen and provide details.

ALL OF WHICH IS RESPECTFULLY SUBMITTED THIS

27th day of May, 2020

Lisa (Elisabeth) DeMarco
DeMarco Allan LLP
Counsel for H2GO Canada



Jonathan McGillivray
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