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May 16, 2022

Movement of United Professionals
c/o Allevato Quail & Roy, Barristers and Solicitors
405-510 West Hastings St.
Vancouver, BC
V6B 1L8

Attention: Mr. Jim Quail

Dear Mr. Quail

Re: FortisBC Energy Inc. (FEI)

Revised Renewable Gas Program Application – Stage 2 (Application)

Response to Canadian Office and Professional Employees Union, Local 378 (known as Movement of United Professionals or MoveUP) Information Request (IR) No. 1

On December 17, 2021, FEI filed the Application referenced above. In accordance with the amended regulatory timetable established in British Columbia Utilities Commission Order G-103-22, FEI respectfully submits the attached response to MoveUP IR No. 1.

For convenience and efficiency, FEI has occasionally provided an internet address for referenced reports instead of attaching lengthy documents to its IR responses. FEI intends for the referenced documents to form part of its IR responses and the evidentiary record in this proceeding.

If further information is required, please contact the undersigned.

Sincerely,

FORTISBC ENERGY INC.

Original signed:

Diane Roy

Attachments

cc (email only): Commission Secretary
Registered Parties

1.0 Effective date for RS 7B

Reference: Exhibit B-11 page 4:

FEI's proposed RS 7B is included as Appendix D-1 and aligns with the Renewable Gas Program as currently approved. FEI proposes to begin offering service under the proposed RS 7B commencing on February 1, 2022.

1.1 Has FEI begun offering the proposed RS 7B rate?

Response:

Yes, FEI RS 7B is available to customers.

1.2 Please describe the perceived level of customer interest in obtaining service under this proposed rate.

Response:

There are RS 7 customers that are actively seeking or are mandated to reduce their emissions and would view RS 7B as a potential solution. However, the absence of an RS 7B rate had prevented FEI from having in-depth and site-specific discussions with RS 7 customers as it relates to RNG, and interest in RS 7B is exploratory for most customers at this stage. Energy costs for customers in RS 7, and potentially RS 7B, can make up a significant portion of the operating costs for organizations under these rate schedules. Therefore, the decision to choose RS 7B is generally a longer process that may require additional budget requests or prolonged analyses comparing design options relative to energy source costs.

1.3 What is the extent of actual or pending take-up as of March 31, 2022?

Response:

As of April 30, 2022, there has been no customer uptake on RS 7B.

1.4 What is the extent of anticipated take-up prior to October 30, 2022 (the anticipated date when the Commission may decide whether to decide the Application)?

Response:

Given the preliminary status of discussions with organizations to date, and the length of time associated with a customer's decision, FEI expects limited uptake by October 30, 2022.

1.5 What would be the consequences in relation to customers taking service under this rate prior to the decision-date, if the Commission were to deny approval of the rate, or alternatively approve it only on a going-forward basis?

Response:

RS 7B was approved on a permanent basis by Order G-3-22, filed as Exhibit A-9 in this proceeding.

FEI does not add rates to its billing system until after receiving BCUC approval. Therefore, it is not possible to add a rate to a customer's account for them to begin taking service until after BCUC approval.

2.0 Value of FEI's Gas Delivery

Reference: Exhibit B-11 page 44:

4.3 THE BENEFITS OF THE GAS DELIVERY SYSTEM ARE SIGNIFICANT AND VALUABLE

Gas infrastructure in the province is a multi-billion dollar asset, resulting from over 70 years of sustained development, which provides reliable, safe, affordable and high- quality energy services to British Columbians. Building a gas system today to replace the existing system would be cost prohibitive, making the existing system even more valuable to British Columbians. FEI operates over 50,000 kilometres of energy delivery infrastructure and has invested in significant energy storage capacity. Over three million British Columbians currently rely on natural gas service, with over 58 per cent of households in the province using natural gas as their primary heating source.

And Reference: Exhibit B-11 page 48:

Currently energy in BC is delivered via three main streams:

1. **Electricity**: Electricity makes up approximately 20 percent of the energy delivered in BC;
2. **Natural and Renewable Gas:** The gas system delivers approximately 23 percent of the energy delivered in BC;
3. **Liquid and Solid Fossil Fuels:** These fuels make up the remaining 55 percent of the energy delivered in the province.

2.1 To approximately what degree would BC Hydro and FBC need to increase their combined energy supply to British Columbia in order to replace the energy provided by FEI's gas delivery system with electricity, in GWh per annum and as a proportion of their combined present scale?

Response:

Please refer to the responses to CEC IR1 15.3, 17.2 and 17.3.

3.0 Hydrogen

3.1 Please discuss the relative scalability of hydrogen for the purposes of ramping up the renewable content of its delivered gas commodity.

Response:

While FEI expects that hydrogen will comprise a relatively small share of its Renewable Gas portfolio over the next decade, hydrogen is a scalable technology that is likely to play an important role in the Province's energy system. If the market demand for hydrogen can be established and adequately supported by policy and government, the scale of hydrogen production projects and the availability of end-use technologies for building heat, industrial heat and feedstock, and onshore and marine transport refueling is likely to drive rapid hydrogen deployment and establish hydrogen as a mass market low-carbon fuel.

3.2 What strategies are potentially available to ensure that hydrogen is blended into FEI's gas commodity in a sufficiently uniform proportion throughout its distribution system?

Response:

As FEI begins to blend hydrogen into the gas supply, FEI's Gas Control department will manage the injection and blending of hydrogen to ensure a uniform hydrogen blend is achieved downstream of the injection point, which will disperse evenly throughout the system.

3.3 What if any role does FEI envisage for third-party processors to provide a blended natural gas-hydrogen product?

Response:

In the long term, FEI envisions that third party processors operating large centralized upstream facilities could provide a blended natural gas-hydrogen product. However, in the near term, FEI expects that third party producers will supply hydrogen and the utility will manage the blended natural gas-hydrogen supply on the system.

3.4 To what extent are neighbouring jurisdictions pursuing blending hydrogen with natural gas for delivery by distribution utilities?

Response:

Many jurisdictions recognize hydrogen to be a potentially viable pathway to decarbonize their gas supply and are supporting blending hydrogen for utility supply through new directed policies, including through programs similar to FEI's Renewable Gas Program.

There are several projects in neighbouring Canadian provinces and in the United States, including California,[1] that are demonstrating blends with hydrogen concentrations from 1 to 20 percent[2] and are in the advanced stages of development. A major goal of these projects is to enhance industry knowledge and understanding regarding the long-term impact of hydrogen on materials and equipment to overcome any challenges associated with hydrogen blending at a large scale.

3.5 What if any discussions are underway or planned for the establishment of regional standards and co-ordination for blending hydrogen into natural gas in the Pacific Northwest?

3.5.1 To what extent would such standards and co-ordination facilitate the provision of a blended gas product to FEI customers?

Response:

The Canadian Standards Association (CSA) group, under the remit of an NRCan working group, is advancing a coordinated effort to upgrade codes and standards to support hydrogen adoption and uptake in the gas system.

For example, a draft of the next revision of the Canadian Oil and gas Pipeline Standard (CSA Z662) is out for public review and includes a new section dedicated to blending hydrogen in the gas system, repurposing segments of the gas system for 100 percent hydrogen service, and designing new gas infrastructure to be hydrogen ready.

The CSA group also has similar work underway to adapt the codes and standards that govern gas equipment performance and safety certification to include hydrogen. These efforts will be important in supporting FEI's planned deployment of hydrogen in the gas system in BC.

3.6 What would be the approximate volumetric impact on FEI's delivered gas of blending in a plausible proportion of hydrogen, in order to provide the same amount of energy resource to customers?

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1 https://www.prnewswire.com/news-releases/socalgas-and-sdge-announce-groundbreaking-hydrogen-blending-demonstration-program-to-help-reduce-carbon-emissions-301178982.html.

2 https://www.nrel.gov/news/program/2020/hyblend-project-to-accelerate-potential-for-blending-hydrogen-in-natural-gas-pipelines.html.

3.6.1 To what extent would a projected decline in total accounts and in use per account compensate for any gas volume increase necessitated by the introduction of hydrogen?

Response:

Hydrogen has an energy density on a volumetric basis of approximately one third that of methane. When hydrogen is blended into natural gas, FEI can adjust the gas system to deliver the same amount of end use energy by flowing more gas per unit of time. At low percentage blend levels, this would require minimal to no system upgrades. Therefore, based on FEI's current understanding, no decline in demand would be needed to compensate for the introduction of hydrogen. However, based on current knowledge and technology, at high blend percentages beyond approximately 20 percent hydrogen concentration by volume, system components and end-use equipment would need to be assessed and potentially upgraded.

Reference: Exhibit B-11 p 77:

> Currently, natural gas is the primary resource used globally for hydrogen production and, in conjunction with technologies such as carbon capture, the resulting hydrogen is considered a low carbon energy source. Further, when using renewable primary energy resources such as clean electricity or biomass, the resulting hydrogen is considered carbon-free. Therefore, hydrogen represents the largest potential source of carbon-free Renewable Gas.

3.7 Does this extract imply that FEI expects that most of the hydrogen that would be blended into its gas would be "blue hydrogen" (i.e., refined from natural gas)?

Response:

No. This extract implies that FEI considers green and blue hydrogen collectively represent a significant opportunity to further expand Renewable Gas supply in furtherance of GHG reduction targets.

3.8 Where, geographically, does FEI expect that its acquired blue hydrogen would be produced and how does FEI anticipate that it would be delivered?

Response:

Both blue hydrogen (derived from natural gas feedstock with carbon capture and storage) and green hydrogen could be produced in British Columbia. This hydrogen can be delivered to customers as a blend in the existing gas system and also in dedicated hydrogen infrastructure

that will connect production facilities located in proximity to gas customers that can use the hydrogen to directly displace natural gas use.

Blue and green hydrogen may also be sourced from outside BC, which would initially be delivered through displacement using the same delivery model that FEI uses today to import biomethane from outside BC. Over time, as hydrogen hubs and large production centres emerge in Alberta and other neighboring jurisdictions, FEI expects the existing long distance gas pipelines will be adapted to physically move hydrogen from production to emerging large demand centres.

3.9 To what extent does FEI expect that it would acquire "green hydrogen" (i.e., electrolyzed from water) for blending into its RNG?

Response:

FEI is currently progressing early-stage development work on the technical and economic feasibility of large-scale electrolytic ("green") hydrogen production in BC. FEI is also evaluating potential opportunities in BC to acquire green hydrogen from producers, and opportunities to acquire green hydrogen from producers outside BC which FEI could import to BC (subject to the GGRR being amended to allow green hydrogen from outside BC). The acquisition of green hydrogen will complement FEI's RNG (biomethane) acquisition from 2024 onwards, further supporting Renewable Gas supply growth to meet provincial targets. FEI anticipates that green hydrogen will play a significant role in developing hydrogen production capacity within and outside BC.

3.10 Where does FEI expect that its acquired green hydrogen would be produced and how does FEI anticipate that it would be delivered?

Response:

Please refer to the response to MoveUP IR1 3.9.

3.11 What electrical energy resources does FEI expect would be available for the purposes of producing green hydrogen?

Response:

FEI expects to purchase green hydrogen from renewable or clean electrical energy resources. The *BC Renewable and Low-Carbon Gas Potential Study* provides detailed insight into the share

of future potential hydrogen production in BC that could be green hydrogen produced using renewable electricity generated from a range of resources including water, wind and solar.[3]

[3] https://www.cdn.fortisbc.com/libraries/docs/default-source/news-events/bc-renewable-and-low-carbon-gas-supply-potential-study-2022-03-119b1624d693c7435ebcd416b13869f7a8.pdf?sfvrsn=1ed16720_0.

4.0 Delivery Systems

Ref Ex B-11 page 72:

> 6.2.1 Growth in Supply Has Been Substantial Since Program Inception
>
> The number of operating facilities supplying FEI with RNG has increased from one in 2011 to ten in 2021, and FEI has increased annual purchases of RNG each year over this time period. Much of the growth in new supply projects has occurred over the last three years, and has included innovations such as the first RNG supply from out-of- province, and the first RNG supply delivered via virtual pipeline.

4.1 Please define "virtual pipeline".

Response:

A "virtual pipeline" is when an RNG project uses pressurized tube trailers to link the project to an FEI station facility where the RNG can be injected into the gas network. This contrasts with a pipeline that supplies RNG from the RNG production facility to the injection point into the gas system.

A virtual pipeline generally involves using two mobile fueling trailers alternating between filling at the RNG facility and unloading at one or more of FEI's interconnection facilities. This process is beneficial as it is usually a more economically feasible solution, as compared to constructing a permanent pipeline. In particular, it enables FEI to acquire RNG from projects within BC that: (1) are small in scale and not located near natural gas infrastructure; or (2) where pipeline infrastructure capacity is constrained and thus does not allow for RNG injection.

4.2 What kinds of virtual pipeline does this extract refer to?

Response:

Section 6.2.2 of the Application refers to the Quadrogen Biomethane Purchase Agreement which utilized a virtual pipeline, as described in the response to MoveUP IR1 4.1.

4.3 Please discuss the advantages and disadvantages of virtual pipelines relative to pipelines for these purposes.

Response:

Please refer to the response to MoveUP IR1 4.1.

4.4 Please discuss the potential scalability of virtual pipelines in relation to the quantities of RNG that FEI will require by 2030 and beyond.

Response:

Virtual pipelines can be scaled in anticipation of, or in response to, RNG supply. While direct pipeline injection is a preferred approach as it is generally more economical, it is not always possible for a project to be located near a pipeline with sufficient capacity due to feedstock availability in areas. For example, areas that typically produce a large amount of agriculture waste (e.g., the Fraser Valley) generally have a lower ability to inject RNG into local pipelines due to lower natural gas consumption in the area. FEI considers virtual pipelines to be a critical tool, thus enabling increased RNG production within BC.

5.0 RNG Supply

Reference: Exhibit B-11 page 73 Table 6-1 Contracted RNG Supply Projects

5.1 Please provide Table 6-1 in electronic Excel format.

Response:

Please refer to Attachment 5.1 for a copy of Table 6-1 in electronic Excel format.

Attachment 5.1

REFER TO LIVE SPREADSHEET MODEL

Provided in electronic format only

(accessible by opening the Attachments Tab in Adobe)