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December 22, 2022

GNAR Sustainable Home Design
206-1420 Alpha Lake Rd,
Whister, B.C.
V8E 0R8

Attention: Mr. Edgar Dearden

Dear Mr. Deardon:

Re: FortisBC Energy Inc. (FEI)

2022 Long Term Gas Resource Plan (LTGRP) – Project No. 1599324

Response to the GNAR Sustainable Home Design (GNAR) Information Request (IR) No. 1

On May 9, 2022, FEI filed the LTGRP referenced above. In accordance with the amended regulatory timetable established in British Columbia Utilities Commission Order G-287-22 for the review of the LTGRP, FEI respectfully submits the attached response to GNAR IR No. 1.

FEI notes that, in some instances, the manner in which GNAR has framed its information requests (IRs) appears to be an attempt to provide intervener evidence through the preambles to its IRs. In other proceedings, the BCUC has set out its expectations regarding the appropriate style and substance of IRs under Rules 13.01-13.02 of the Rules and Practice and Procedure. In particular, the BCUC stated: [1]

> The BCUC reminds all interveners that the purpose of IRs is not to enable the author of the IR to introduce evidence. The purpose of IRs is to elicit relevant information on the evidentiary record or to clarify or test existing evidence to contribute to a better understanding by the BCUC of the relevant issues in the proceeding. Any statements that are included in the preamble to an IR should be restricted to providing context for a question relevant to the proceeding submitted by the party to whom the IR is directed.
>
> Finally, whereas letters of comment are intended to provide for any member of the public to contribute views, opinions, and impact or potential impact, with respect to a matter before the BCUC, IRs must not be letters of comment.

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[1] In the matter of the *FEI Application for a CPCN for the Advanced Metering Infrastructure Project*, in its letter dated September 28, 2021 (Ex. A-15).

FEI has responded to the information requests by focusing on the questions themselves, rather than parsing and rebutting each preamble. However, FEI wishes to be clear that the preambles contain inaccuracies and characterizations that FEI does not accept. As such, FEI's silence regarding any part of the content of a preamble should not be interpreted as agreement. FEI will object to any attempt by GNAR to rely on the content of preambles to its information requests in final argument.

For convenience and efficiency, if FEI has provided an internet address for referenced reports instead of attaching the 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 Hydrogen as a 'low carbon' gas

On page 3-13 of the Application, FEI states:

> FEI's vision for a hydrogen economy is built around evolving policy and technology developments in BC, Canada and internationally. Hydrogen is a versatile energy source and carbon-free at the point of use.

Hydrogen itself isn't a GHG, but rather it interferes with the atmospheric degradation of methane by reacting with hydroxyl radicals. The effect is the same though: more warming because very bad GHG gasses remain in the atmosphere for longer. And because hydrogen leaks easily, mitigating that leakage will be very important- not just for safety reasons, but to avoid warming the planet.

According to research by Hamburg and Ocko, hydrogen has a warming potential of up to 200x that of carbon dioxide due to indirect heating, because it extends the life of methane in the atmosphere. "Because hydrogen is a light gas, 5-30kg of hydrogen would have the same climate impact as 1-6 tons of CO2-equivalent, according to the 200x greenhouse effect potency put forward by Hamburg and Ocko."

1.0 FEI note that they are monitoring international developments in hydrogen. Is FEI monitoring international research into the global warming impact of hydrogen?

Response:

To FEI's knowledge, there has been no guidance provided to date on any potential indirect global warming potential of hydrogen, including by the world authority, the Intergovernmental Panel on Climate Change,[1], or from the British Columbia or federal governments. Moreover, the Province of British Columbia and the Government of Canada have both published hydrogen strategies, and a number of leading organizations evaluating global climate action have indicated that hydrogen will be an important part of the overall global decarbonization transition. The International Energy Agency, for example, notes that:

> Hydrogen will need to play an important role in the transition to a net-zero energy system, as shown in IEA's Net-Zero Emissions by 2050 Roadmap. Hydrogen demand should grow six-fold by 2050 and its use should expand to new sectors, including long distance transport, shipping, aviation, new uses in heavy industry or power generation.[2]

FEI expects that hydrogen policy will consider the contribution of hydrogen leakage to scope 1 emissions and compare it to the reduction of customer emissions from the use of hydrogen.

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[1] The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body for assessing science related to climate change. IPCC's website may be found at: https://www.ipcc.ch/.

[2] International Energy Agency, "IEA at COP26: The role of hydrogen in the transition to net zero" (3 November 2021) online at: https://www.iea.org/events/iea-at-cop26-the-role-of-hydrogen-in-the-transition-to-net-zero.

FEI also notes that the quantification of greenhouse gas potential of any emission is based upon provincial and federal government requirements, to which FEI is adhering. FEI has been and will continue to monitor the related global and federal developments.

1.1 Please discuss how it will impact FEI's planning if research confirms that the warming potential of hydrogen is on the high end of estimates (200x the warming impact of CO2)?

Response:

As noted in the response to GNAR IR1 1.0, there has been no guidance provided on the indirect global warming potential of hydrogen, including by the world authority, the Intergovernmental Panel on Climate Change, or from the British Columbia or federal governments.

1.2 Would such a finding impact hydrogen's status as a 'low carbon gas'?

Response:

Please refer to the responses to GNAR IR1 1.0 and 1.1.

1.3 How does FEI plan to monitor and prevent leaks of hydrogen from their systems and equipment?

Response:

FEI has an Integrity Management Program (IMP) which provides documentation and direction for the programs, plans and practices that anticipate, manage and mitigate conditions that could adversely affect safety, reliability, or the environment with respect to the asset's complete life cycle. The IMP includes activities intended to manage both hazards and consequences by predicting and preventing failure incidents and reducing the probability of the hazard and the severity of the consequences of failure. Leak management is an activity within the IMP that covers surveying for leaks, the classification of identified leaks, and their associated repair.

FEI has an existing policy that defines and describes gas leak conditions on the gas systems (upstream and downstream of customer meters) that are identified by customers, the public,

employees, or contractors, and describes the response requirements to these gas leak conditions. FEI carries out frequent leak surveys on buried high-pressure transmission and low-pressure distribution pipeline assets and associated above ground pipeline facility infrastructure up to and including the customer gas meter. FEI also responds to and investigates all gas odours or leaks reported by customers or the public downstream of the gas meter including outside and inside customers' premises. All reports of leaking gas will be classified, and the method of response determined based on the following:

- Impact to the safety of public or property;
- Impact to reliability of delivery of gas;
- Impact to the integrity of the gas delivery system;
- Impact to customer or public relations; and
- Impact to the environment.

FEI has established guiding principles that provide the basis for leak classification and response and that minimize potential leak impacts including impact to the environment. In addition, FEI has an ongoing program to proactively replace aging distribution mains based on their condition. Each year, numerous main renewals are completed across the province as part of FEI's sustainment capital program. FEI will continue to monitor and prevent leaks from the gas system as the share of renewable and low-carbon gas increases over time. FEI is investigating and piloting alternative leak survey methodologies such as satellite leak detection to more rapidly detect leaks on the distribution system.

FEI recognizes that hydrogen is a smaller molecule compared to methane and therefore FEI may need to adjust aspects of its leak management policy to ensure leakage is minimized. Examples of enhancements to leak management include adopting more extensive leak management practices, refurbishment or replacement of leak detection equipment, representative testing of affected customer appliances and equipment, prioritized inspection and testing of select gas piping, and refined risk assessment and impact management models. FEI also expects codes, standards, and regulatory requirements will also advance with market development and ensure safety and environmental considerations are adequately addressed as the adoption of hydrogen and hydrogen blends progresses, including leak monitoring and prevention processes.

1.4 How are leaks monitored or detected from buried hydrogen transportation pipes?

Response:

Please refer to the response to GNAR IR1 1.3.

1.5 Please explain any other pertinent information relating to steps FEI is taking to understand the global warming impact of hydrogen, and how it will mitigate the risks of leaks, and otherwise assure the public that the proposed use of hydrogen will not end up causing further damage to the climate?

Response:

FEI will continue to monitor the changing state of climate science as well as engage on the importance of a proper regulatory approach to minimize indirect global warming potential associated with all greenhouse gases.

2 Biomethane as a 'low carbon' gas

On page 1-7 of the application FEI notes that the lifecycle emission factor for biomethane* is 0.0100tCO2e/GJ

(*GNAR Inc will not be using the term 'renewable natural gas' as 100% of the biomethane sold to customers is processed and refined. 'Processed' and 'refined' are both antonyms of the word 'natural', therefore the term 'renewable natural gas' to refer to the biomethane sold to consumers is an oxymoron; a combination of contradictory or incongruous words)

In multiple peer reviewed research papers released in 2021 by the Imperial College of London, it notes that methane leakage to the atmosphere from biomethane production facilities can be considerable, as high as 9% of total methane produced leaking to the atmosphere. This would significantly contradict the idea that biomethane is 'low carbon', as a 9% leakage of methane means that the CO2e of biomethane could be higher than some fossil fuels.

2.0 Has FEI been monitoring the literature such as the Imperial College of London studies that shows biomethane facilities leak large amounts of methane?

Response:

FEI is not aware of the methodologies nor the conclusions and recommendations of the referenced studies and cautions that each gas system is unique based on its vintage, gas supply mix, operational practices and technologies, and maintenance and sustainment regime. FEI monitors its own facilities and, through its off-take contracts, is able to audit its counterparties to ensure that biomethane in FEI's system meets provincial regulations where relevant and provides GHG emission reductions (i.e., meets the carbon intensity as stated in the Application).

2.1 Please discuss the steps FEI has taken to ensure that methane is not leaking from methane production facilities?

Response:

For its own facilities, FEI employs methods to mitigate methane leakage with flares, thermal oxidizers and preventive maintenance. For instance, seals are tested on a regular basis as they are a common cause of methane leakage from production facilities. From a process perspective, the majority of methane leakage is from the exhaust gas losses. Therefore, at FEI-operated facilities, exhaust gas is combusted in either a flare or thermal oxidizer to destroy methane in the exhaust gas. Methane losses from process vessels and equipment are

controlled through regular maintenance activities. FEI also applies the same standards for biomethane plants as it does other facilities to detect and minimize leaks as discussed in the response to GNAR IR1 1.3.

FEI-operated facilities also undergo audits completed by third-party consultants. FEI tracks the inlet methane and outlet methane quantities, which provides real-time measurement of methane loss. FEI follows the provincial standard to measure the life cycle analysis of biomethane which involves lifecycle emissions modeling using GHGenius.

Methane leakage is also considered when determining a facility's carbon intensity. Therefore, through production audit and reporting requirements, FEI has the capability to quantify and verify the carbon intensity of the biomethane produced at any third-party production facilities that have a Biomethane Purchase Agreement with FEI. Both carbon intensity limits and the right to audit facilities are written into FEI's Biomethane Purchase Agreements, which give FEI the ability to have better control of methane leakage for third-party facilities. In the unlikely event of exceedance of such carbon intensity requirements, termination of the contract may be required.

There is a strong incentive for FEI and its RNG suppliers to reduce methane leakage from biomethane production facilities, as methane leakage is considered in the carbon intensity evaluation, and all RNG projects undergo a carbon intensity evaluation once a full year of operating data is available. Carbon intensities are reviewed and published by the BC Low Carbon Fuel Standard for RNG suppliers that sell into the transportation market as CNG (these values also include the carbon intensity of compression and loading CNG vehicles).

2.2 What testing has FEI done to ensure that methane is not leaking from biomethane production facilities? Please provide details of what testing has been undertaken.

Response:

Please refer to the responses to GNAR IR1 2.1.

2.3 Are biomethane production facilities monitored on a continuous basis to ensure that large short term methane leaks do not occur? If so, what technology is used to conduct such monitoring?

Response:

Please refer to the responses to GNAR IR1 2.1.

2.4 Please provide details of all measures taken to reduce methane leaks at biomethane production facilities? What procedures and quality assurance processes are followed to ensure that these measures are successfully implemented, along with any third party verification.

Response:

Please refer to the response to GNAR IR1 2.1.

2.5 When calculating carbon intensity of gas, does FEI include leakage of methane from its pipeline distribution and include post meter leakage such as is frequently detected by gas meters from gas appliances and valves within customers homes? What leakage rates are used for these calculations?

Response:

As part of regulatory compliance requirements, FEI reports on leakage of methane from its pipeline distribution network. Emissions from where FEI receives gas (the natural gas custody transfer station) all the way to customer meters are accounted for in FEI's inventory (i.e., all natural gas transmission and distribution assets). FEI does not account for or measure fugitive-related GHG emissions within customers' residences and facilities.

2.6 If methane leakage rates from FEI biomethane suppliers are discovered to be at similarly high rates as per the Imperial College of London, how will that impact FEI's long term gas planning?

Response:

FEI does not envision the scenario described in this information request will materialize. Methane leakage, as suggested above, would represent lost revenue and a degradation of product value for biomethane producers who are seeking to maximize profits and the value of their product via its associated carbon intensity. Biomethane producers, therefore, ensure as much biogenic methane as possible makes it to the natural gas system. Please refer to the response to GNAR IR1 2.1.

3 Liquefied Fossil Gas as a pillar of FEI's 'Clean Growth Pathway'**

(**as per the aforementioned explanation, 100% of the fossil gas sold to consumers is processed and refined, GNAR Inc will not be using the oxymoron 'natural gas' to describe this substance)

On page 3-21 of the application, FEI states:

The fourth pillar of the Clean Growth Pathway is investing in [Liquefied Fossil Gas] to lower GHG emissions in marine fueling and global markets

In their report entitled "Wasted capital and Stranded Assets", Carbon Tracker and the Grantham Research Institute on Climate Change and the Environment at LSE calls for regulators, governments and investors to re-evaluate energy business models against carbon budgets, to prevent a $6 trillion carbon bubble in the next decade.

Their analysis on the carbon budget deficit shows that between 60-80% of fossil coal, fossil oil and fossil gas reserves of publicly listed companies are 'unburnable' if the world is to have a chance of not exceeding global warming of 2°C. They note in their research that the cost of failing to anticipate an Inevitable Policy Response to climate change will result in large fossil fuel investments becoming stranded assets. Their research finds that due to the large capital investments required for Liquefied Fossil Gas (LFG) facilities, that 100% of LFG facilities will have a negative net present value when accounting for future climate action

3.0 Present Provincial Legislation notwithstanding, what types of financial modeling has FEI undertaken to determine how future actions to address climate change could impact the future financial performance of LFG facilities?

Response:

FEI has not undertaken any detailed financial modeling to address unknown future actions to address climate change related to its natural gas facilities. FEI continues to model its natural gas facilities within the current provincial and federal policy environment and believes that they can play an important part in reducing global greenhouse gas emissions and supporting the global transition away from higher carbon fuels.

3.1 Discuss the risks associated with LFG facilities becoming stranded assets to BC ratepayers?

Response:

As discussed in Sections 3.6.1 and 3.6.2 of the Application, there are significant GHG emission reduction opportunities associated with marine fueling as well as exports using LNG to displace higher carbon fuels. There are also very significant air contaminant reductions as described in the response to CEC IR 1.26.1. As such, the stranded asset risk associated with FEI's LNG facilities is low. FEI also notes that as sales through marine fueling and LNG exports grow, the revenue will ultimately help to reduce increases in customers' rates. Please also refer to the response to BCUC IR1 16.1 for a general discussion on stranded asset risk and BCUC IR1 16.1.2 for a discussion on actions that FEI is taking to mitigate the risk of stranded assets.

3.2 Discuss if the currently slow pace of climate action, relative to the rapid climate action required to avert the climate crisis may be contributing to regulators being insufficiently active in preventing the build-up of unsustainable asset investments in fossil fuel infrastructure?

Response:

FEI disagrees with the premise of the question. FEI believes that British Columbia and the BCUC are leading in the evaluation, approval and advancement of regulation and regulatory practices that enable low carbon investment by regulated utilities. FEI agrees that the pace of low carbon investment will continue to increase and be driven by provincial policies that seek to reduce emissions while preserving the affordability, reliability and resiliency of provincial gas and electric energy systems.

3.3 Discuss the possibility that FEI's current reporting on strategy does not address the risk to business models of future emissions constraints.

Response:

FEI is unclear what specific reporting on strategy this question is referring to. FEI has discussed in the Application that in order to achieve the DEP Scenario or the Deep Electrification Scenario, a significant energy transition must occur in BC in the coming decades. This transition would see a new mix of energy assets being utilized within the BC energy system to meet the emissions constraints being established by the provincial government.

3.4 Has FEI developed any alternative indicators which stress-test valuations against the potential that future performance will not replicate the past?

Response:

While FEI has not developed such "alternative indicators", FEI has conducted broad-based assessments of risks facing the utility.

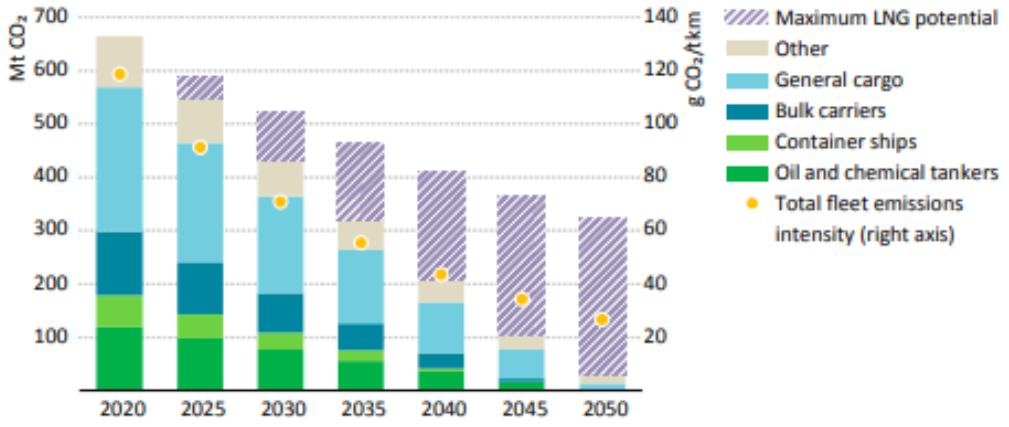
3.5 From the perspective of BC ratepayers, explain how it makes sense over the long term for FEI to use ratepayer funds to develop high cost fossil fuel projects, which will require continued investment in exploring for and developing more fossil fuels, when aligned with global carbon budget caps required for climate stability?

Response:

Immediate and steep reductions in global GHG emissions must occur to align with climate-stabilizing emissions trajectories. The International Marine Organization's (IMO) strategy for GHG emissions reductions provides a policy imperative to develop solutions to reach a 50 percent reduction in global shipping GHG emissions by 2050. There are a limited number of solutions to do so, with LNG being one of them. Analysis conducted by the International Energy Association (IEA) in the World Energy Outlook suggests that, in their Sustainable Development Scenario, uptake of LNG as a fuel could be a key short-term action to reduce emissions and create time for lower- or zero-carbon fuels to develop and scale to achieve the overall target.[3]

[3] IEA (2019). World Energy Outlook. OECD/Paris. P. 207-209.

Figure 4.17 ▷ Locked-in emissions from international shipping and the maximum potential remaining emissions from LNG



Notes: Mt CO_2 = million tonnes of carbon dioxide; g CO_2/tkm = grammes of carbon dioxide per tonne kilometre.

As shown in Figure 4.17 above, which is reproduced from the referenced IEA analysis, LNG under the IEA's Stated Policies Scenario offers a proven option to reducing sulphur and nitrogen emissions. LNG under the IEA's Sustainable Development Scenario for marine bunkering, depending on the adoption of other low-carbon options, could have an allowable upwards limit of 300 Mt CO2 as put forth by the IMO (Figure 4.17). Furthermore, LNG offers the ability to make CO2 emissions reductions from heavy oil fuels in the short term. LNG for export to countries with carbon intensive energy systems would make immediate and large global GHG emissions reductions to which there are currently no other commercial alternatives to reduce emissions. LNG combustion results in around 40 percent fewer CO2 emissions relative to coal and 20 percent fewer than oil for each unit of energy output.**Error! Bookmark not defined.** FEI recognizes that the composition of a global net-zero energy system is subject to considerable uncertainty and that there will be different perspectives and analyses that point to smaller or larger roles for commodities like natural gas and LNG in the future net-zero energy system.

Abated emissions happening now are more important for the global climate system than prospective emissions reductions in the future. Importantly, these projects benefit FEI's customers here in British Columbia, providing the potential for a significant new revenue stream to mitigate customer rate impacts arising from a clean energy transition.

4 Pipeline distribution systems

On page ES-2 of the application, FEI notes that the length of its distribution pipelines has increased from 45,741km to 47,523km since the previous long term gas plan. Elsewhere in the application, FEI notes its future plans to expand pipelines in British Columbia.

In other countries such as Switzerland, the gas utilities have been decreasing their length of distribution pipeline, amongst other reasons because the piping itself leaks the greenhouse gas methane. The gas utility in Zurich, Energie 360°, notes that most residents of Zurich now support the switch, mainly because of concerns about the effects of greenhouse emissions from burning fossil fuels.

4.0 Is FEI monitoring international developments in gas pipelines?

Response:

FEI confirms that it follows developments in the gas utility sector around the world and the initiatives being undertaken in different regions to reduce GHG emissions.

With respect to the preamble to this information request, Energie 360° is a municipally-owned utility that serves customers within the City of Zurich.[4] There are multiple factors informing the city's decision to reduce reliance on the natural gas system in Zurich. While residential concern for GHG emissions was one motivating factor, other factors include:[5]

1) It was more economical for the City of Zurich to expand a district heating system that used excess heat from a waste incinerator built on the edge of the city.
2) Zurich's move to shift away from gas was driven in part by the economics of the waste incinerator for the city. The incinerator, supplemented by facilities that burn wood or gas, heats water and that heated water will circulate through underground pipes to heat homes and businesses as a district heating system. According to Zurich's energy minister, it made little economic sense for the city to maintain two sets of pipelines.
3) The City of Zurich's district heating system will be expanded incrementally.
4) In 2011, city officials announced that gas service to the middle area of Zurich would be shut down within five years. The area in the middle of the city where the district heating system would operate hosts close to 93 thousand people. The start of the gas shut down was delayed until 2021. Year by year, Zurich plans to expand its district heating system and shut down gas service in additional neighbourhoods, with the system planned to be complete within 20 years.
5) There was significant pushback to the plan by local residents.

[4] https://www.energie360.ch/de/energie-360/portrait/organisation/.
[5] "To fight climate change, and now Russia, too, Zurich turns off natural gas": https://www.npr.org/2022/04/20/1092429073/to-fight-climate-change-and-now-russia-too-zurich-turns-off-natural-gas.

6) After the 2011 announcement, protests erupted as many residents argued they had little or no notice and were being forced to buy costly replacements for their gas appliances without financial support from the government, support which Zurich promised would come. Zurich delayed the start of the gas shut down to 2021. More recently, some businesses have complained that it still costs them significant amounts of money (e.g. $40 thousand to replace gas stoves at a restaurant that are not close to the end of their useful lives) to replace equipment and the city is not helping as it promised to do so.

7) Zurich energy minister, Silvia Banfi Frost, confirmed that gas pipelines may remain in the city center.

8) According to the Swiss energy minister, the gas pipeline may remain in the city center to carry renewable gases provided by biogas supplied from animal manure or other similar sources.

9) A member of Zurich city parliament, Ernst Danner, mentioned that impacts from the war in Ukraine support finding a source of energy other than natural gas purchased from Russia.

10) Switzerland receives approximately 47 percent[6] of its direct gas imports from Russia, making Russia by far the largest supplier of natural gas to the country. This overreliance on Russia as a key source of energy is another factor supporting the transition away from natural gas.

As such, while FEI is monitoring international developments in gas pipelines, developments, such as the district heating system in Zurich, are location- and utility-specific and unique to that municipal planning context.

4.1 To what extent has FEI explored alternative methods of increasing the resilience of local energy systems that don't require continued investments in fossil fuel infrastructure and prolong the use of fossil fuels?

Response:

FEI is adopting methods that will provide more resilient infrastructure, meet carbon reduction goals, and reduce the reliance on fossil fuels. These methods include FEI's exploration and development of local and regional renewable and low carbon gas supply produced by larger-scale plants within the FEI operating area, and injection of that supply into FEI's system. FEI also invests in pipelines and facilities that will continue to be useful in delivering gaseous energy

[6] "Gas supplier Russia – Switzerland is so dependent on Putin's gas – News", https://gettotext.com/gas-supplier-russia-switzerland-is-so-dependent-on-putins-gas-news/.

beyond conventional natural gas. With a move to renewable and low carbon gas supply, FEI's infrastructure will remain an integral, essential, and resilient contributor to enabling net-zero energy delivery within British Columbia.

4.2 Has FEI done any analysis, or explored any pathways that decrease the amount of gas pipelines in British Columbia?

Response:

FEI has completed analysis examining optimal pathways for BC to meet GHG emissions reduction targets as established by the provincial government. The Pathways for British Columbia to Achieve its GHG Reduction Goals Report[7] (Pathways Report) characterizes BC as a unique jurisdiction with unique considerations to account for when planning a reliable and cost-effective energy system. In other words, what works in another jurisdiction would not necessarily work in BC. For instance, the Pathways Report found that an electrification-only pathway with decreased utilization of BC's gas infrastructure would be approximately $100 billion more expensive than a diversified pathway. This difference in cost accounts for the expense of maintaining gas infrastructure that has significant excess capacity. FEI has not conducted in-depth evaluations of the costs of decommissioning gas infrastructure owned by FEI but would expect that the costs would be considerable and would add to the $100 billion cost difference identified in the Pathways Report.

4.3 Notwithstanding the lack of any current plans by FEI to begin shutting down and decommission the gas distribution piping within the province, discuss what costs and steps that could be reasonably anticipated in response to a future government mandate to begin phasing out the use of methane gas within the province?

Response:

FEI's DEP Scenario assumes a rapid and expansive transition to renewable and low-carbon gas from conventional natural gas such that the gas system continues to be used and useful. Currently, FEI is waiting for more detail from the Province on the main policy in the CleanBC Roadmap to 2030 impacting natural gas utilities, the GHG Reduction Standard (GHGRS), to better understand potential compliance pathways.

[7] Exhibit B1-1, 2022 LTGRP Application, Appendix A-2.

4.4 Discuss how the strategy of proactively winding down investments in the gas distribution system and related infrastructure could benefit ratepayers by reducing the risk of wasted investments and stranded assets.

Response:

FEI believes that winding down investments in the gas distribution system would not benefit ratepayers. In fact, it would lead to increased costs for ratepayers given the amount of new infrastructure that would have to be built in order to supply energy through new pathways. As discussed in the Pathways Report winding down the gas system has the following implications:

- Higher costs of decarbonization including increased costs associated with accelerated depreciation which may overlap with emissions reduction compliance costs, putting additional burden on BC ratepayers;
- Reduced capacity to invest in emissions reductions, safety and reliability; and
- Decreased resiliency of BC's overall energy system.

5 Potential future changes in fossil gas policy within both the Province of BC or Canada

On page 2-26 FEI states that:

> Gas market analysts currently predict that North America could produce over 100 years of economically recoverable supply, based on current consumption levels.

Whether governments of the future will allow the continued production of fossil gas from shale or any other source is far from sure. Major international developments just this year have shown that governments can make rapid and drastic policy changes in order to address the climate crisis. On the 13th of June, 2022, the government of Austria announced its decision to ban the installation of any new fossil gas appliances with a start date of January 1st, 2023. With less than 7 months notice, the Government of Austria has effectively shut down the future of the fossil gas industry in the country.

Closer to home, one of the two current candidates to be the leader of the BC NDP party, and hence the Premier of BC, Anjali Appadurai, has stated that her policy platform would "immediately stop all new oil and gas production, exploration and infrastructure, including in new buildings, and rapidly phase out all fossil fuel production, export and use by 2033"

5.0 Discuss why FEI has not at least considered the highly likely pathway where fossil gas production, exploration and infrastructure is immediately banned by the present or future government within the space of years to months?

Response:

The LTGRP is a process in which FEI develops multiple scenarios in consultation with stakeholders on the Resource Planning Advisory Group (RPAG) to understand potential futures and their impacts. The hypothetical scenario where gas production, exploration and infrastructure is immediately banned and phased out by 2033 was not suggested by the provincial government nor other stakeholders. Further, both provincial and federal climate policy frameworks have not incorporated immediate bans as mentioned in the question.

5.1 Discuss what the impact would be on FEI's planning if, for example, an Austrian style policy of 'no new gas appliances' was implemented by the current or future provincial or federal government?

Response:

This circumstance is discussed in the Application's Deep Electrification Scenario, which FEI considers not to be feasible, is discussed in the response to BCUC IR1 30.3.

In developing their future scenarios, the most radical shift away from fossil gas 'Deep Electrification' assumes that the government will still support Liquefied Fossil Gas. On page 4-25 of the application FEI notes that in the Deep Electrification scenario "the BC government supports LNG exports to other countries Jurisdictions"

5.2 Is it possible that FEI suffers from a lack of imagination in its planning of just how strong future climate legislation will be?

Response:

No. FEI has followed a rigorous process involving the RPAG in informing its approach in developing different planning scenarios and has modelled a broad range of possible futures.

5.3 Why were no scenarios considered in which all fossil gas was completely phased out by some date in the future? Even just as a reference case to determine what that looks like for ratepayers?

Response:

Please refer to the response to GNAR IR1 5.0.

5.4 Does FEI's planning team allow diverse opinions on possibilities to tackle the climate emergency to be heard? Or are these voices suppressed?

Response:

FEI welcomes all voices and opinions presented through its various avenues of engagement in energy planning activities and considers all practical ideas for addressing the many complex issues in energy resource planning. FEI encounters a wide range of opinions on many of these issues and finds that one of the many challenges is the extent to which the various participants in engagement activities are fully informed about all issues, costs, factual information and trade-offs that must be considered in planning for future energy requirements in BC. FEI must balance all of the opinions that are offered through its engagement activities within the context of the extensive analyses it undertakes and consideration of the many complexities that are part of integrated resource planning.

Please refer to Section 8 of the Application for a full discussion of FEI's LTGRP related engagement activities and feedback received as well as the following website pages for a discussion of FEI's resource plan stakeholder engagement and notes from all engagement events:https://www.fortisbc.com/about-us/projects-planning/natural-gas-projects-planning/natural-gas-planning-stakeholder-engagement.

6 Public engagement sessions

GNAR Inc was fortunate enough to attend one of the community engagement sessions held by FEI in November 2021. It does not appear that FEI have reported some of the themes discussed at the session, such as that FEI's climate reduction targets, which are based on the provincial targets of a 30% reduction in GHGs, are insufficient to meet the goal of maintaining global warming to less than 1.5°C 2.0°C. Another theme that was noted at the session, was that a FEI employee who was joining virtually from Mission, BC at the time, commented about how he was overlooking the giant puddle where Abbotsford used to be, due to the record atmospheric river, and subsequent record flooding. The employee expressed fear at the future of climate catastrophes, and the company's role in contributing to the climate crisis by taking insufficient action.

6.0 Discuss FEI's position on whether provincial GHG reduction targets, or those of FEI, should aim higher than the current target of a 30% reduction in GHGs by 2030?

Response:

The statement in the question is incorrect. BC has legislated targets for reducing GHG emissions by 40 percent below 2007 levels by 2030. FEI will follow all mandates and policies as implemented by the Government of BC. The 40 percent target applicable to the 2030 milestone year is just one of many milestone targets that will need to be met on the way to a net zero future within BC.

6.1 Discuss what attempts FEI has made to gauge the fear amongst the community, or within FEI's own employees, that FEI's actions are not in line with the actions required to avert catastrophic climate change?

Response:

From the multiple stakeholder sessions and other engagement in the community, FEI did not observe any "fear amongst the community or within FEI's own employees" as suggested in the information request. This may be in part due to the focus FEI has placed in its LTGRP on achieving rapid reductions in GHG emissions for customers.

FEI held six workshops between 2021 and 2022 to review the key steps in the LTGRP process. Through those workshops, stakeholders and a small number of FEI's own employees were able to provide useful input on many areas of concern including:

- Scenario development;
- System planning;

- Gas supply and DSM; and
- Transition to a low carbon future.

Some stakeholders expressed their desire for urgent climate action and advocated for more intense electrification and allocation of renewable energy to "hard to decarbonize sectors". Other stakeholders highlighted the benefits of maintaining the gas system in providing an affordable, reliable, and resilient complementary energy system that optimizes the use of both the gas and electric systems to deliver energy in BC. In general, there were robust conversations about what the ideal pathway forward was to reduce emissions and there was support for developing local or BC clean energy projects.

FEI shares the urgency around addressing climate change through concrete action. Notably, FEI has committed significant resources toward expanding its supply of renewable and low carbon gases as well as investing in energy efficiency. The urgency is further supported by FEI's recent releases of the Clean Growth Pathway and Pathways Report, as well as the suggested DEP Scenario in the Application which has been designed to meet the CleanBC Roadmap to 2030 targets.

7 Potential health effects of fossil gas itself, as well as it combustion indoors, lead to reduced demand or the possibility of health related mandates to reduce its use

Reference: nowhere in the application.

Notably missing from FEI's long term gas plan was any discussion of recent North American research into the deleterious effects of fossil gas combustion indoors, or the toxic and carcinogenic compounds that have been recently detected in the fossil gas itself.

7.0 Has FEI been monitoring the literature such as the recent Harvard or Stanford studies showing the risks associated with hydrocarbon gas and its combustion indoors?

Response:

FEI is aware of the two studies listed and FEI's initial review has uncovered methodological concerns regarding the sampling. FEI is not aware of any other studies. FEI notes that the regulatory oversight of the use and combustion of natural gas and indoors in residential space is provided by both provincial and federal agencies. FEI continues to monitor and follow guidance from federal sources such as Health Canada.

7.1 Does the detection of toxic and carcinogenic substances such as benzene, toluene, hexane and cyclo-hexane in samples of fossil gas supplied from Western Canada portend any potential health related measures which could impact FEI's ability to market gas from fossil sources?

Response:

FEI is unaware of any peer-reviewed studies that measure concentrations of volatile organic compounds (VOCs), nor health-related measures from western Canada supplied pipeline grade natural gas. As such, FEI has not considered the potential health-related measures that could impact FEI's ability to market gas from conventional natural gas sources as part of this Application.

7.2 Does the research showing that fossil gas combustion indoors portend any potential health related measures which could impact FEI's ability to market gas from fossil sources?

Response:

Please refer to the responses to GNAR IR1 7.0 and 7.1.

7.3 Does FEI plan to conduct any of its own research, or conduct outreach to consumers to make them aware of the health risks that have been identified, or take any other actions related to this research that may impact FEI's long term gas planning?

Response:

FEI does not have plans to conduct its own research on this topic and relies on the research and information from entities such as the federal government, including Health Canada.