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British Columbia Utilities Commission

Inquiry into the Acquisition of Renewable Natural Gas by Public Utilities in British Columbia

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Phase 1 Report

July 28, 2022

Before:
D. M. Morton, Panel Chair
R. I. Mason, Commissioner
A. Pape-Salmon, Commissioner

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Executive summary

The British Columbia Utilities Commission (BCUC) initiated this Inquiry into the Acquisition of Renewable Natural Gas by Public Utilities in British Columbia (Inquiry) in response to a recommendation made by the BCUC in Order E-14-21 and accompanying Reasons for Decision with respect to FortisBC Energy Inc (FEI). Filing of a Biomethane Purchase Agreement (BPA) between FEI and Shell North America (Canada) Inc. (Shell). This Final Phase 1 Report or Report, reflects the findings and recommendations resulting from the first phase of this Inquiry.

Very broadly speaking, the initial scope of this Inquiry is to determine:

- What is the definition of Renewable Natural Gas (RNG) for the purposes of the Greenhouse Gas (GHG) (Clean Energy) Reduction Regulation (GGRR)[1]?
- How should the "maximum volume" test of the GGRR be interpreted?
- Any other related issue that may be raised by the parties.

In the course of reviewing the submissions of parties and further considering the issues, this Panel:

- Makes findings and determinations on the questions posed.
- Provides discussion and/or definitions of the following:
    - Natural Gas;
    - Conventional Natural Gas;
    - Biomethane;
    - Environmental Attributes of Biomethane;
    - Acquisition of Environmental Attributes;
    - Delivery of Conventional Natural Gas to BC consumers;
    - RNG; and
    - Notional Delivery of RNG to BC consumers.
- Considers that many of the issues raised in this Inquiry, in particular, concerning the treatment of Environmental Attributes generally, should be further considered in a context beyond the scope of the GGRR.

Our findings are summarized below:

- Biomethane cannot, for all practical purposes, be physically delivered to customers due to the mixing with Natural Gas from other sources once injected into the gas pipeline system, regardless of where, and the method by which, the Natural Gas is generated.
- Gas utilities and much of the Intervener community have accepted and agree with the concept of 'notional' delivery of gas. The BCUC has made determinations on the suitability and applicability of this approach in BC.

[1] https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/102_2012

- The essence of the notional delivery of biomethane to the end-use customer is the delivery of a physical unit of Natural Gas along with Environmental Attributes associated with the production of a unit of physical biomethane, produced anaerobically, which are contractually acquired by the BC public utility.
- The definition of RNG includes biomethane and also the acquisition of natural gas combined with separately acquired Environmental Attributes that arise from the production of biomethane.

We note that enabling the acquisition of Environmental Attributes derived from the production of biomethane independent of the physical gas may provide more flexibility for acquiring public utilities. This may also result in reducing the price the utility, and ultimately, the end-use customer pays for RNG, although there is no specific evidence that this will be the case. Further, it may also facilitate end-use customers and gas marketers to obtain their own RNG directly from a supplier.

We further consider whether Environmental Attributes that are not derived from the production of a unit of biomethane can similarly be coupled with natural gas to create gas that has a reduced GHG emission profile. We seek submissions on this matter as set out in this report.

We also note that the GGRR sets out that an acquiring utility can contract for more than the 15 percent annual limit set out in the GGRR, as long as it prices and sells any excess to individual customers at full cost and does not assign the cost to ratepayers for more than the 15 percent annual limit on a net annual basis.

This Report was initially issued as a draft (Draft Phase 1 Report) with the findings in provisional form. In addition, the Draft Phase 1 Report proposed a Phase 2 for this Inquiry. Parties were invited to comment on whether it is appropriate to set out minimum terms or how the BCUC should evaluate the terms of any such Environmental Attribute as part of the review of an Energy Supply Contract pursuant to section 71 of the *UCA*. The Panel seeks specific submissions on the following:

1. Given the GGRR does not specify a Carbon Intensity (CI) requirement for RNG, nor is the CI of RNG provided in BC's Low Carbon Fuel Standard (LCFS), should any maximum CI be established for acquired Environmental Attributes arising from the production of biomethane?
2. Should the BCUC consider any fugitive methane emissions that may be associated with the production of biomethane and/or the delivery of RNG?

Given the potential scope and availability of Environmental Attributes, the Panel also expressed interest in considering further the role these Environmental Attributes could play in Natural Gas delivery in BC. For Phase 2, the Panel invites further submissions on the following:

1. Are there certain Environmental Attributes other than those derived from the production of biomethane, that when combined with what is Conventional Natural Gas, produce RNG? (Scenario 1)
2. Do Environmental Attributes arising from a "Clean or Renewable Resource", as that term is defined in the CEA, when combined with Conventional Natural Gas, give rise to RNG? (Scenario 2)
3. If those Environmental Attributes described in scenarios 1 and 2 above do not give rise to RNG, do they reduce the GHG emission profile of the associated Conventional Natural Gas?
4. If Natural Gas is combined with Environmental Attributes that are associated with a process or method that reduces atmospheric CO_2, but does not result in RNG, for example carbon capture and storage, what is the GHG emission profile of that resultant gas?
5. How can the integrity of Environmental Attributes purchased by BC public utilities be assured and what is the BCUC's role, if any, with respect to double-counting, compliance and enforcement?

Parties were provided an opportunity to comment on the Draft Phase 1 Report.[2] The Panel considered these comments and responded in Order G-212-22 and accompanying Reasons for Decision.

The Panel hereby confirms that it will continue with Phase 2 of this Inquiry. As a result of various comments and submissions raised by BSCEA, CEC, CBA and MoveUp in the review of the Draft Phase 1 Report, in Phase 2, in addition to the questions set out above, we also invite parties' submissions as set out in section 7 of this Report.

We also invite submissions on whether recommendations should be made to the Provincial Government to prohibit unbundling of Environmental Attributes – or the notional delivery of Renewable Natural Gas – under certain circumstances. Such circumstances may include:

- Biomethane injected in the distribution system of an applicant upstream of all potential customers of Renewable Natural Gas
- Biomethane injected in the distribution system of an applicant downstream of all potential customers of Renewable Natural Gas
- Biomethane injected in the pipeline system of a third party upstream of an applicant's distribution system
- Biomethane injected in the distribution system of a third party that is downstream of the applicant's distribution system
- Biomethane injected in a transmission or distribution system of a third party that is not connected in any way to the applicant's distribution system.

Further, what relevance, if any, does the province, state or country in which the biomethane is manufactured have? We invite submissions, and evidence where warranted, from parties on this topic.

Additionally, Section 10 of the GGRR may suggest that lignin, synthesis gas and hydrogen are not considered by the GGRR to be Renewable Natural Gas. We therefore seek submissions on this matter, including the following:

1. Does the definition of RNG include synthesis gas, lignin and hydrogen?
2. Can gas derived from synthesis gas, lignin and hydrogen be notionally delivered or unbundled?

[2] G-144-22

1.0 Introduction and Background

The British Columbia Utilities Commission (BCUC) is an independent regulatory agency of the BC Government, charged with the administration of the *Utilities Commission Act* (UCA). The BCUC is responsible for ensuring safe and reliable energy supply at fair rates for energy consumers across the province. The BCUC balances this responsibility with the need to ensure public utilities[3] under its jurisdiction are afforded a reasonable opportunity to earn a fair return on their investments.

By Order E-14-21 and accompanying Reasons for Decision dated May 28, 2021[4], the BCUC determined that the FortisBC Energy Inc. (FEI) Filing of a Biomethane Purchase Agreement (BPA) between FEI and Shell North America (Canada) Inc. (Shell) (FEI-Shell BPA) qualified as a prescribed undertaking pursuant to section 18 of the *Clean Energy Act* (CEA) and sections 2(3.7) to 2(3.9) of the Greenhouse Gas Reduction Regulation (GGRR) and accepted the FEI-Shell BPA for filing pursuant to section 71 of the UCA.

In section 7.4 of the Reasons for Decision, the BCUC noted that the FEI-Shell BPA proceeding had "raised a number of novel issues regarding public utilities' acquisition of RNG". [5] In particular, the BCUC noted that "there are no definitions of RNG in the GGRR or in the CEA"[6] and "there are no definitions of environmental attributes in the GGRR or in the CEA. Further, it is not clear whether natural gas which is not otherwise biomethane and was extracted from the earth's crust and subsequently associated with environmental attribute is RNG."[7]

Therefore, the BCUC considered it "valuable to have definitions of RNG, biogas, biomass, and environmental attributes for the BCUC to use in future proceedings considering RNG contracts".[8]

In addition, the BCUC stated that it "considers that there is merit in the BCUC evaluating the different approaches to assessing compliance with the GGRR's annual volume test".[9]

The BCUC therefore recommended that "the BCUC inquire further into the acquisition of RNG by public utilities in BC to bring clarity to the issues".[10]

[3] In the UCA, a "public utility" is defined as a person, or the person's lessee, trustee, receiver or liquidator, who owns or operates in BC, equipment or facilities for the production, generation, storage, transmission, sale, delivery or provision of electricity, natural gas, steam or any other agent for the production of light, heat, cold or power to or for the public or a corporation for compensation. There are a number of exclusions from the definition of a public utility, including municipalities or regional districts that provide services within their own boundaries, and a person that provides services to employees or tenants.

[4] FortisBC Energy Inc. Filing of a Biomethane Purchase Agreement between FEI and Shell North America (Canada) Inc. pursuant to Section 71 of the Utilities Commission Act and BCUC Rules for Natural Gas Energy Supply Contracts

[5] Reasons for Decision, Section 7.4, p. 22.

[6] BCUC Order E-14-21, Section 7.4, p. 24.

[7] Ibid.

[8] Ibid.

[9] Ibid., p.25

[10] Ibid.

2.0 Regulatory Process

The BCUC established this Inquiry[11] to further examine these issues and invited stakeholders, including the BC Government, to provide submissions on the issues and questions identified in the FEI-Shell BPA Decision.

Upon establishment of this Inquiry, the BCUC also sought submissions on whether purchasing Environmental Attributes and pairing these with physical natural gas in BC satisfies the definition of RNG.

The BCUC received submissions from the following parties:

- Movement of United Professionals (MoveUP);
- Commercial Energy Consumers Association of British Columbia (CEC);
- Pacific Northern Gas Ltd. (PNG);
- B.C. Sustainable Energy Association (BCSEA);
- Canadian Biogas Association (CBA);
- FEI; and
- Residential Consumer Intervenor Association (RCIA).

By letter dated February 11, 2022, the BCUC invited parties to file reply submissions, which were received from MoveUp, CEC, PNG, BSCEA, FEI and RCIA.

On May 20, 2022, the BCUC issued a draft report with its preliminary findings in the Inquiry into the Acquisition of Renewable Natural Gas (RNG) by Public Utilities in British Columbia (Draft Report, Draft Phase 1 Report).

By Order G-142-22, the BCUC sought written submissions on the following:

(i) The contents of the Draft Report; and

(ii)The specific questions and submissions sought by the BCUC contained within the Draft Report.

By June 6, 2022, the following parties filed their submissions:

- Movement of United Professionals (MoveUP);
- Pacific Northern Gas LTD. (PNG);
- B.C. Sustainable Energy Association (BCSEA);
- FortisBC Energy Inc. (FEI); and
- Residential Consumer Intervenor Association (RCIA).

On June 20, 2022, BCSEA filed its reply submission.

The Inquiry was then adjourned for 30 days by Order G-173-22.

[11] Exhibit A-1, dated December 22, 2021.

3.0 Legislative and Policy Background

3.1 Clean Energy Act

On April 18, 2010, the BC Government enacted the CEA. The CEA provides, in part, that the Lieutenant Governor in Council (LGIC) may make regulations to define "prescribed undertakings" that are intended to encourage "the use of electricity, or energy directly from a clean or renewable resource instead of the use of other energy sources that produce higher greenhouse gas emissions."[12]

Specifically, section 35(n) of the CEA allows the LGIC to "make regulations...for the purposes of the definition of "prescribed undertaking" in section 18..." of the CEA.

The CEA defines "clean or renewable resource" to mean "biomass, biogas, geothermal heat, hydro, solar, ocean, wind or any other prescribed resource."[13]

Section 18(1) of the CEA defines a prescribed undertaking as "...a project, program, contract or expenditure that is in a class of projects, programs, contracts or expenditures prescribed for the purpose of reducing greenhouse gas emissions in British Columbia." Further, sections 18(2) and 18(3) of the CEA establish the BCUC's role in the setting of rates related to prescribed undertakings:

> (2) In setting rates under the *Utilities Commission Act* for a public utility carrying out a prescribed undertaking, the commission must set rates that allow the public utility to collect sufficient revenue in each fiscal year to enable it to recover its costs incurred with respect to the prescribed undertaking.
>
> (3) The commission must not exercise a power under the *Utilities Commission Act* in a way that would directly or indirectly prevent a public utility referred to in section (2) from carrying out a prescribed undertaking.[14]

3.2 Greenhouse Gas Reduction Regulation – Prescribed Undertaking

By Order in Council (OIC) No. 295/2012 [15] the LGIC ordered the GGRR, which describes classes of prescribed undertakings pursuant to section 18 of the CEA. Section 2(3.8) of the GGRR established the acquisition of RNG as a prescribed undertaking:

> (3.8) The public utility acquires renewable natural gas
>
> (a) for which the public utility pays no more than $30 per GJ, and
>
> (b) that, subject to subsection (3.9), in a calendar year, does not exceed 5% of the total volume of natural gas provided by the public utility to its non-bypass customers in 2015.

[12] *Clean Energy Act*, SBC 2010, c. 22, s. 35(n).
[13] *Clean Energy Act*, SBC 2010, c. 22, s. 1.
[14] *Clean Energy Act*, SBC 2010, c. 22, s. 18.
[15] https://www.bclaws.gov.bc.ca/civix/document/id/oic/arc_oic/0295_2012

On May 25, 2021, the LGIC ordered OIC No. 306/2021[16], which amended the GGRR and added the following definitions to section 1:

> "annual percentage change" means the annual percentage change in the annual average All-items Consumer Price Index for British Columbia, as published by Statistics Canada under the authority of the *Statistics Act* (Canada);
>
> "fiscal year" means the period from April 1 in one year to March 31 in the next year;

OIC No. 306/2021 added the following subsection to the GGRR:

(3.71) For the purpose of subsection (3.8) "acquires renewable natural gas" includes producing renewable natural gas by producing or purchasing biogas and upgrading it to renewable natural gas, and

OIC No. 306/2021 repealed subsection 3.8 of the GGRR and substituted the following:

(3.8) The public utility acquires renewable natural gas

(a) at costs that meet the following criteria, as applicable:

(iii) if the public utility acquires renewable natural gas by purchasing it, the price of the renewable natural gas does not exceed the maximum amount, determined in accordance with section 9, in effect in the fiscal year in which the contract for purchase is signed;

(iv) if the public utility acquires renewable natural gas by producing it, the levelized cost of production reasonably expected by the public utility does not exceed the maximum amount, determined in accordance with section 9, in effect in the fiscal year in which the public utility decides to construct or purchase the production facility, and

(b) that, in a calendar year, does not exceed 15% of the total amount, in GJ, of natural gas provided by the public utility to its non-bypass customers in 2019, subject to subsection (3.9) and section 10;

OIC No. 306/2021 added the following sections to the GGRR:

9 For the purpose of sections 2 (3.8) (a), 6 (c), 7 (2)(b) and 8 (1) (b),

(a) The maximum amount in effect in the 2021/2022 fiscal year is $31 per GJ; and

(b) For fiscal years subsequent to the 2021/2022 fiscal year, the maximum amount is calculated on April 1 of each year by multiplying

(i) The maximum amount in effect in the immediately preceding fiscal year, and

(ii) The sum of

(A) 1, and

(B) The annual percentage change for the previous calendar year.

[16] https://www.bclaws.gov.bc.ca/civix/document/id/oic/oic_cur/0306_2021

10 If a public utility does 2 or more of the following:

(a) acquires renewable natural gas in accordance with section 2 (3.8);

(b) produces or purchases hydrogen in accordance with section 6;

(c) purchases synthesis gas in accordance with section 7;

(d) purchases lignin in accordance with subsection 8,

the aggregate amount of all products must not exceed 15% of the total amount of natural gas, in GJ, provided by the public utility to its non-bypass customers in 2019.

3.3 Utilities Commission Act

Public utilities are required to file Energy Supply Contracts (ESC), including those for biomethane, with the BCUC pursuant to section 71 of the UCA. The BCUC may hold a hearing to determine if an ESC is not in the public interest. In determining whether an ESC is or is not in the public interest, the BCUC must consider the criteria set out in section 71(2.1) of the UCA.

By Order G-130-06, dated October 27, 2006, the BCUC established the Gas Supply Rules to facilitate the review of natural gas energy supply contracts pursuant to section 71 of the UCA.

Section 82 of the UCA provides the BCUC with powers to inquire on its own initiative:

82(1) The commission

(a) may, on its own motion, and

(b) must, on the request of the Lieutenant Governor in Council,
inquire into, hear and determine a matter that under this Act it may inquire into, hear or determine on application or complaint.

(2) For the purpose of subsection (1), the commission has the same powers as are vested in it by this Act in respect of an application or complaint.

3.4 CleanBC Roadmap to 2030

3.4.1 Low Carbon Energy

The CleanBC Roadmap to 2030 (CleanBC) identifies that BC's existing gas-pipeline infrastructure can reduce GHG emissions by "transitioning away from fossil natural gas to delivering renewable gas" and to help drive this transition, an annual GHG emissions cap of 6MT CO_2e will be implemented. This cap represents an emissions reduction of approximately 47 percent relative to 2007 levels. Further, CleanBC identifies that gas utilities can meet this target through the use of renewables, such as synthetic gas, biomethane, green and waste hydrogen and lignin.[17]

[17] https://www2.gov.bc.ca/assets/gov/environment/climate-change/action/cleanbc/cleanbc_roadmap_2030.pdf, p.29

3.4.2 Construction

CleanBC acknowledges current new construction requirements focus on energy efficiency, but do not directly address GHG emissions. A carbon pollution standard is to be added to the BC Building Code to support a transition to zero-carbon new buildings by 2030. The standard will be performance based, and allow for a variety of options, including low carbon fuels such as renewable natural gas. A review will be undertaken in 2023, with provincial regulations being phased in over time, in 2024, 2027 and 2030.[18]

4.0 Natural Gas, Biogas, Biomethane and RNG

In this section, we consider the meaning of the terms Natural Gas, biogas, biomethane and RNG, how Natural Gas, biomethane and RNG are acquired and delivered and their Environmental Attributes.

4.1 Natural Gas

Definitions of Natural Gas in BC Legislation

For the purpose of ESCs and gas marketing under Part 5 of the UCA, "natural gas" is defined in Section 68 of the UCA as:

> any methane, propane or butane that is sold for consumption as a domestic, commercial or industrial fuel or as an industrial raw material

The *BC Petroleum and Natural Gas Act* (BCPNGA) defines natural gas as:

> *all fluid hydrocarbons, before and after processing, that are not defined as petroleum, and includes hydrogen sulphide, carbon dioxide and helium produced from a well*.[19]

The *Carbon Tax Act* (CTA) defines natural gas as:

> *"natural gas" means natural gas, whether or not the natural gas*
>
> > *(a) occurs naturally or results from processing, or*
> >
> > *(b) contains gas liquids,*
>
> *but does not include refinery gas*;[20]

Natural gas is not defined in the GGRR or the CEA.

[18] Ibid, p.40
[19] https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/96361_01#section1
[20] https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/08040_01

Other Definitions of Natural Gas

The Cambridge Dictionary defines natural gas as "gas, found underground, that is used as fuel".[21]

The Oxford Dictionary defines natural gas as:

> Gaseous hydrocarbons, chiefly methane (CH_4), ethane (C_2H_6), propane (C_3H_8), and butane (C_4H_{10}), trapped in pore spaces in rocks with or without liquid petroleum. It has a high heat value and burns without smoke or soot; it provides raw material for the chemical industry for making plastics, detergents, fertilizers, etc. Gas of this composition is also termed 'natural gas' if it occurs as a gas chimney or after production."[22]

The Canadian Energy Regulator (CER) energy information program glossary describes natural gas as:

> A naturally occurring gas comprised primarily of methane and other hydrocarbons. It is used as a source of energy for heating, cooking, and used in the production electricity. [23]

The US Energy Information Agency (EIA) describes natural gas as:

> a fossil energy source that formed deep beneath the earth's surface. Natural gas contains many different compounds. The largest component of natural gas is methane, a compound with one carbon atom and four hydrogen atoms (CH_4). Natural gas also contains smaller amounts of natural gas liquids (NGLs, which are also hydrocarbon gas liquids), and nonhydrocarbon gases, such as carbon dioxide and water vapor. [24]

Panel Determination

We note that the term 'natural gas' has numerous definitions, but most ascribe natural gas with similar characteristics: notably, its source and its composition.

We adopt the definition of Natural Gas found in section 68 of the UCA. However, that definition of Natural Gas does not reflect its source, thereby potentially capturing different types of gas in ESCs and provided by gas marketers i.e., both fossil fuel derived and non-fossil fuel derived.

In order to distinguish different sources of Natural Gas, for the purpose of this Report the Panel therefore will use the term **Conventional Natural Gas for that Natural Gas which is formed from fossils and extracted from and below rocks within the earth's surface**. We will discuss other sources of Natural Gas in section 4.2 of this Report.

4.1.1 Delivery of Conventional Natural Gas in British Columbia

As with many other commodities, molecules of Conventional Natural Gas are fungible.

Accordingly, shippers and buyers of Conventional Natural Gas have typically contracted for "notional delivery", meaning, in essence, that the buyer extracts the contracted quantity of Conventional Natural Gas from the gas pipeline system downstream of where the producer, or shipper, injected that equal quantity of Conventional Natural Gas, without regard for the actual molecules either injected or extracted.

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[21] https://dictionary.cambridge.org/dictionary/english/natural-gas
[22] https://www.oxfordreference.com/view/10.1093/oi/authority.20110803100225247
[23] https://www.cer-rec.gc.ca/en/data-analysis/glossary/
[24] https://www.eia.gov/energyexplained/natural-gas/

It is generally accepted in the delivery of Conventional Natural Gas that as long as the customers receive the same quantity of Conventional Natural Gas they purchased, the precise source of the Conventional Natural Gas or the route it took to arrive is unknown, unquestioned, and immaterial. Conventional Natural Gas is arbitrarily blended in gas transmission and distribution pipelines such that individual molecules are not identifiable or traceable. This method of delivery is referred to as "notional physical delivery" or just "notional delivery".

Panel Discussion

In the Panel's view, notional delivery of Conventional Natural Gas has worked well, and is indeed possible, because all of the gas injected into and extracted from the gas pipeline system is fungible, and all of the molecules injected into the pipeline system and delivered to customers are physically indistinguishable. Further, notional delivery is the only practical way to manage purchase and delivery contracts among the many users of a gas pipeline.

4.2 Biogas and Biomethane

As discussed above, traditionally, Natural Gas has been obtained from fossil-fuel sources; that is, methane-rich gas that is extracted from rocks beneath the earth's crust. However, in addition to fossil-fuel derived sources, Natural Gas can also be produced from the raw gas generated at facilities where naturally occurring processes break down, or digest, organic matter, or biomass, in the absence of oxygen (Anaerobic Digestion). [25]

This raw 'biogas' is a key component of biomethane, which is further discussed in the sections below. Upgrading this biogas, which would otherwise be released into the atmosphere, to be injected into a gas pipeline, offsets an equal amount of Conventional Natural Gas that would have otherwise been extracted from a fossil-fuel source.[26]

4.2.1 Biogas

The term biogas is not defined in the GGRR, CEA, UCA, BCPNGA or the CTA. Therefore, we turn to other sources for examples of biogas definitions, which are provided below.

The BCUC has previously defined biogas, at least for the purposes of the "Inquiry into an Exemption for Biogas and Biomethane Suppliers" as: [27]

> raw gas from any organic source that is capable of being purified or upgraded to pipeline quality gas, such as raw gas substantially composed of methane that is produced by the organic breakdown of matter in the absence of oxygen.

The CER energy information program glossary describes biogas as:[28]

> The gaseous emissions from anaerobic degradation of organic matter (from plants or animals) by a consortium of bacteria. It is composed primarily of methane.

[25] https://www.iea.org/reports/outlook-for-biogas-and-biomethane-prospects-for-organic-growth/an-introduction-to-biogas-and-biomethane
[26] https://www.europeanbiogas.eu/about-biogas-and-biomethane/
[27] G-126-13
[28] https://www.cer-rec.gc.ca/en/data-analysis/glossary/#B

The US EIA describes biogas as:[29]

> an energy-rich gas produced by anaerobic decomposition or thermochemical conversion of biomass. Biogas is composed mostly of methane (CH_4), the same compound in natural gas, and carbon dioxide (CO_2).

In its report "An Introduction to Biogas and Biomethane", the International Energy Agency (IEA) defines biogas as:

> [A] mixture of methane, CO_2 and small quantities of other gases produced by anaerobic digestion of organic matter in an oxygen-free environment.[30]

Biogas Sources

The composition of biogas depends on the type of organic matter, or biomass. According to the EIA, "biomass contains stored chemical energy from the sun. Plants produce biomass through photosynthesis. Biomass can be burned directly for heat or converted to renewable liquid and gaseous fuels through various processes." [31]

Sources of biomass include:

- Wood and wood processing wastes—firewood, wood pellets, and wood chips, lumber and furniture mill sawdust and waste, and black liquor from pulp and paper mills
- Agricultural crops and waste materials—corn, soybeans, sugar cane, switchgrass, woody plants, and algae, and crop and food processing residues
- Biogenic materials in municipal solid waste—paper, cotton, and wool products, and food, yard, and wood wastes
- Animal manure and human sewage[32]

Biogas Production

Biogas composition is also dependent on the method of production, which includes the following main technologies:

- Biodigesters: These are airtight systems (e.g. containers or tanks) in which organic material, diluted in water, is broken down by naturally occurring micro-organisms. Contaminants and moisture are usually removed prior to use of the biogas.
- Landfill gas recovery systems: The decomposition of municipal solid waste (MSW) under anaerobic conditions at landfill sites produces biogas. This can be captured using pipes and extraction wells along with compressors to induce flow to a central collection point.
- Wastewater treatment plants: These plants can be equipped to recover organic matter, solids, and nutrients such as nitrogen and phosphorus from sewage sludge. With further treatment, the sewage sludge can be used as an input to produce biogas in an anaerobic digester.[33]

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[29] https://www.eia.gov/energyexplained/biomass/landfill-gas-and-biogas.php
[30] https://www.iea.org/reports/outlook-for-biogas-and-biomethane-prospects-for-organic-growth/an-introduction-to-biogas-and-biomethane
[31] https://www.eia.gov/energyexplained/biomass/
[32] Ibid.
[33] https://www.iea.org/reports/outlook-for-biogas-and-biomethane-prospects-for-organic-growth/an-introduction-to-biogas-and-biomethane

Through the process of anaerobic digestion, microorganisms break down, or digest, this organic matter which creates two products: biogas and the residual solid and liquid portion, called digestate.[34]

Raw biogas must be processed and upgraded to remove moisture, CO_2 and contaminants, including hydrogen sulfide and to reduce nitrogen and oxygen content before it can be injected into a gas pipeline.[35]

Panel Discussion and Findings

Biogas, in its raw state, is not a pipeline quality gas. Therefore, it is not indistinguishable or fungible, from Conventional Natural Gas. Instead, biogas requires further processing and upgrading before it can be injected into a gas pipeline.

While biogas is not defined in BC legislation, section 2(3.71) of the GGRR contemplates "*producing or purchasing biogas and upgrading it"*. The Panel notes that the GGRR is explicit in that it differentiates biogas from Conventional Natural Gas, or some other form of gas, and recognizes the generally accepted concept that biogas is an input, or ingredient, which requires further processing and upgrading.

The GGRR is silent on the source, or feedstock of biogas. However, section 7(1) of the GGRR provides a definition of "biomass" for the purposes of a prescribed undertaking with respect to the purchase and distribution of synthesis gas as:

> non-fossilized plants or parts of plants, animal waste or any product made of either of these, other than a fuel product, and includes wood and wood products, agricultural residues and wastes, biologically derived organic matter found in municipal and industrial wastes, black liquor and kraft pulp fibres.

As discussed above, biogas can be created from the anaerobic digestion of organic matter, or biomass. We note that both organic matter and biomass are terms used synonymously to describe the organic material that is anaerobically digested, and as such, we will not distinguish between the two terms.

The Panel, therefore, determines that **biogas is the raw gas physically produced through the anaerobic digestion of biomass that is capable of being processed and upgraded to biomethane.**

4.2.2 Biomethane

We note that biomethane is not defined in the CEA, GGRR, UCA or the BCPNGA. In BC legislation, the only reference to biomethane is found in the CTA:

> "biomethane" means methane produced from biomass;

The CTA does not provide a definition of biomass.

The BCUC has previously defined biomethane, again, at least for the purposes of the "Inquiry into an Exemption for Biogas and Biomethane Suppliers" as:

> biogas that is purified or upgraded to meet the public utility's specifications for injection into its natural gas pipeline. [36]

[34] https://www.epa.gov/agstar/how-does-anaerobic-digestion-work
[35] https://www.epa.gov/sites/default/files/2020-07/documents/lmop_rng_document.pdf
[36] G-126-13

Turning to the FEI-Shell BPA, biomethane is therein defined as:

> pipeline quality Gas derived from the decomposition of organic matter. Pipeline Quality means meeting the gas quality requirements of the receiving pipeline at the delivery point. [37]

The IEA defines biomethane as:

> a near-pure source of methane produced either by "upgrading" biogas (a process that removes any CO_2 and other contaminants present in the biogas) or through the gasification of solid biomass followed by methanation. [38]

Once upgraded, biomethane is physically indistinguishable from Conventional Natural Gas. The only difference is an intangible property; that is, the biomethane is sourced from biogas or biomass rather than fossil fuel deposits.[39]

Panel Discussion and Findings

Biomethane requires a raw input of biogas that is subsequently upgraded to "pipeline quality".

It is only after the biogas has been upgraded – a process that increases the proportion of methane and therefore the energy content - can the resultant gas be considered biomethane. This biomethane, like Conventional Natural Gas, can be injected into the gas transmission and distribution system and once injected and comingled, or blended, the biomethane is indistinguishable from, and fungible with, Conventional Natural Gas.

Therefore, the Panel determines that **biomethane is pipeline quality gas derived from upgrading and processing biogas or biomass. Biomethane is indistinguishable from Conventional Natural Gas and can be injected into a gas pipeline system.**

There may be other gases present in biogas and other combustible products may be derived from biogas. For example, synthesis gas, which section7(1) of the GGRR requires to be derived from biomass and is hydrogen rich as opposed to methane rich.

4.3 Environmental Attributes of Biomethane

We now turn our attention to the idea of Environmental Attributes. As previously discussed, biomethane is considered chemically identical to Conventional Natural Gas. However, certain attributes of biomethane production do distinguish it from Conventional Natural Gas.

Because of the renewable aspects of the process to produce and consume biomethane, the combustion of biomethane is not considered to result in the net emission of GHGs, and these source attributes are often referred to as "environmental attributes". These attributes are similar to some attributes associated with other commodities such as "fair trade"[40] coffee and Forest Stewardship Council (FSC)[41] certified lumber. Using these examples, while the coffee or lumber commodity is identical whether it is certified or not, it is the fair trade or FSC attribute that differentiates them.

As noted in the FEI-Shell Decision, there is no formal definition of Environmental Attributes in any BC legislation.

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[37] FEI-Shell BPA, Exhibit B-1, pdf p. 21
[38] Ibid.
[39] https://www.epa.gov/agstar/renewable-natural-gas-agricultural-based-adbiogas-systems
[40] https://fairtrade.ca/what-is-fairtrade/#what
[41] https://fsc.org/en

The FEI-Shell BPA, however, does provide that FEI contractually acquires "all environmental attributes, namely GHG emissions reduction benefits" [emphasis added] resulting from methane being produced and acquired from a biogenic source. In the FEI-Shell BPA, Environmental Attributes are defined as:[42]

> **"Environmental Attribute"** means:
>
> (i) all attributes associated with, or that may be derived from the actual or assumed reduction, displacement or offset of emissions associated with the Facilities;
>
> (ii) the right to quantify and register the interests and rights associated with such attributes or characteristics with competent authorities;
>
> (iii) any existing or future instrument, including any Offset, environmental emission allowances and reduction credits, reduction right, allowance, certificate or other unit of any kind whatsoever, whether or not tradable and any other proprietary or contractual right, whether or not tradable, and any resulting from, or otherwise related to the actual or assumed reduction, displacement or offset of emissions associated with, or that may be derived from the actual or assumed reduction, displacement or offset of emissions associated with the Facilities and related activities; and
>
> (iv) all revenues, entitlement, benefits and other proceeds arising from or related to the foregoing other than revenues received by the Seller from the Buyer and the revenues received by the Upstream Seller from the Seller's Affiliate for Biomethane purchased under this Agreement.

The contract further provided that:[43]

> - **Environmental attributes and Carbon Intensity.** All environmental attributes, namely GHG emissions reduction benefits, of the biomethane purchased under the SHELL BPA will be transferred to FEI. This ensures the full value of the RNG will be received by FEI and its customers and is the same as FEI's agreements to purchase RNG from projects located within BC. The environmental attributes, namely GHG reductions, associated with RNG are an essential element of the RNG program for customers. SHELL will ensure that the carbon intensity of the biomethane will not exceed [redacted] grams of CO_2 equivalent per megajoule. In the SHELL BPA, the avoided methane emissions arise from capturing and processing methane from the wastewater treatment process along with the digestion of organics. The biogas from the wastewater treatment process would have otherwise been flared and the organics would have otherwise been landfilled.

Submissions of the parties

The CEC

The CEC submits that the Environmental Attributes were generally defined in the FEI-Shell BPA as "GHG emissions reduction benefits" and the CEC finds the definition reasonable. The CEC submits the "physical displacement of natural gas with RNG, using a clear physical connection, has been a reasonable assessment for the BCUC to use when determining whether the purchase of RNG attributes can be considered a Prescribed Undertaking under the GGRR." [44]

In addition, the CEC states that given GHG emission reductions are a global issue, reductions anywhere in the world should be allowed by the BCUC on the condition that GHG reductions benefits are received by the utility and not double counted.[45]

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[42] FEI-Shell BPA Application, Exhibit B-1, pdf p. 22.
[43] FEI-Shell BPA Application, Exhibit B-1, p. 8.
[44] CEC Submission, p.4.
[45] Ibid.

MoveUp

MoveUp states that Environmental Attributes are contractually defined and explained in the FEI-Shell BPA and the definition is broad and "captures all manner of financial benefits arising from the production of the RNG apparently without reference to where they arise, or under the laws of which jurisdiction."[46]

MoveUp further notes that "this is not a broader discussion about the use of generic "carbon offsets" which are diverse and widely-marketed and have no necessary connection with the production of RNG."[47]

Panel Discussion and Findings

In the absence of a statutory definition of Environmental Attributes, Environmental Attributes can instead be defined by specific contractual terms. These terms may include the Carbon Intensity (CI) of the biomethane acquired and the resultant GHG emission reductions.

Notwithstanding, we find that the creation of biomethane gives rise to specific Environmental Attributes and that these attributes may be contractually transferred between parties.

We further consider in section 4.4 below these Environmental Attributes when we consider how biomethane is delivered.

4.4 Delivery of Biomethane in British Columbia

In this section, the Panel discusses various scenarios with respect to how biomethane may be delivered to the acquiring public utility in BC and/or its end-use customers.

Perhaps the most conceptually straightforward delivery method – and therefore a good place to start – is the scenario where a purchaser pulls up to a biomethane facility with a truck and takes delivery of the molecules of biomethane.

In this example, call it scenario 1, the purchaser has taken physical delivery of biomethane molecules and is able to drive the truck back to its plant, where, for example, the biomethane is consumed as a fuel for heat.

In an alternative scenario, which we will call scenario 2, the purchaser is a public utility, and it drives the truck full of biomethane to a customer of that public utility where that customer consumes the biomethane as a fuel for heat.

In a third scenario, the public utility drives the truck full of biomethane to a receipt point on its pipeline system and the biomethane is injected for eventual delivery to a customer who has contracted for the delivery, through the pipeline system which also supplies Natural Gas, of an amount of biomethane equal to the amount in the truck.

In scenario 4, the biomethane is injected into the public utility's distribution pipeline system directly by the biomethane facility. The public utility then sells the biomethane to its customers and delivers the biomethane to them through its pipeline system that also supplies Natural Gas.

In scenario 5, a biomethane supplier outside of BC enters into an agreement to sell biomethane to a BC public utility, including full and explicit transfer and ownership of rights to the Environmental Attributes associated with the biomethane. Therefore, the biomethane produced outside of BC is injected into a pipeline system outside of BC and consumed with no Environmental Attributes attached. The biomethane supplier agrees to inject an equivalent

[46] MoveUp Submission, p.4
[47] Ibid, p.5

amount of Conventional Natural Gas into the BC public utility's distribution pipeline system with the Environmental Attributes "notionally" attached.

This enables the BC public utility to attach the acquired Environmental Attributes to Natural Gas that it sells to a BC customer.

Some questions that arise from these examples are:

1. In Scenarios 1 and 2, did the customer take delivery of the Environmental Attributes when it took delivery of the biomethane?
2. In Scenario 2, how did the Environmental Attributes transfer from the utility to the customer?
3. In Scenarios 3, 4 and 5, did the utility take notional delivery of the biomethane, despite being mixed with Natural Gas in the natural gas pipeline? Did the end customer take notional delivery of biomethane?
4. Is there a difference between Scenarios 4 and 5 with respect to Environmental Attributes from a BC perspective?

In the first three scenarios, the physical molecules of biomethane received into the truck are the same physical molecules of biomethane that left the plant. It is biomethane, produced from biogas, and it is physically indistinguishable from Conventional Natural Gas. A key question is whether the purchaser has also acquired the "Environmental Attributes", as described in section 5.1 of this Report.

In the case of acquisitions of biomethane by FEI previously approved by the BCUC (i.e., scenarios 4 and 5), the acquisition of biomethane includes the explicit transfer of ownership of the Environmental Attributes which is made explicit in the contract of sale.

Scenarios 3 and 4 pose the question that if the contract or conditions of sale do not contain any provisions for the Environmental Attributes, do these Environmental Attributes naturally follow the physical molecules of gas (i.e., are they attached to the molecule of biomethane)?

In Scenarios 1 and 2, the molecules of biomethane consumed by the end user are the same molecules of biomethane that come out of the plant. There is no ambiguity in that regard. If the molecules of biomethane came out of the plant and the Environmental Attributes have not otherwise been separated and/or sold to another party, the end user can be said to have consumed biomethane. The end user therefore receives both molecules of biomethane and the intangible Environmental Attributes.

Now consider scenarios 3 and 4, where the biomethane is injected into the BC natural gas pipeline system. At that point, these biomethane molecules are no longer distinguishable from other molecules of Natural Gas in the pipeline. If the Environmental Attributes follow the physical molecules, the only customers that can receive the Environmental Attributes are those that receive the actual molecules, and it is not possible to determine which molecules have attached to them Environmental Attributes, and to which set of customers these attributes belong.

Panel Discussion and Findings

In light of these considerations, the Panel finds that it is not practical to consider Environmental Attributes to be intrinsically associated with a specific Natural Gas molecule. Although these attributes arise by virtue of the way the gas molecules are produced and at the same time they are produced, the attributes must be tracked separately to be of any reporting and monetary value to users of the gas system.

In order to deliver biomethane to a specific customer, the customer takes delivery of whatever molecules of Natural Gas happen to flow to that customer's premises. This is acknowledged in the FEI-Shell BPA Transaction Confirmation:

> The Parties acknowledge and agree that because Gas molecules are indistinguishable, interchangeable and comingled in the pipeline system, purchasers of conventional Gas or Biomethane generally do not physically receive or consume the same Gas molecules that they purchase from a specified source of production, this replacement of the Gas molecules purchased with other molecules being referred to as displacement.[48]

The gas utility and the customer must then agree that the Environmental Attributes that were acquired by the gas utility, through contractual or other lawful manner, are transferred to the customer, again through some contractual or other appropriate legal means, along with whatever molecules of Natural Gas are delivered. Currently in BC, Environmental Attributes are transferred to the customer in some cases by contract and in other cases by the terms of the tariff.

This is acknowledged in section 7 of the FEI-Shell Transaction Confirmation, where:

> delivery of the product purchased and sold hereunder will be by displacement… of the Biomethane produced from the Facilities with Gas produced elsewhere that upon delivery includes the Environmental Attributes associated with the Biomethane produced from the Facilities and, as a result, the product delivered by Seller hereunder constitutes Biomethane as defined herein."[49]

Further, absent a contractual or other lawful means for providing for the ownership of any or all of the Environmental Attributes, it is unclear whether those attributes follow the delivery of any biomethane or remain with the owner/operator of the biomethane facility.

4.5 What is RNG?

In this section we consider an appropriate definition of RNG.

The Panel is not aware of any statutory definition of RNG in BC. However, as discussed above, section 2(3.71) of the GGRR states:

> For the purposes of subsection (3.8), **"acquires renewable natural gas"** includes producing renewable natural gas by producing or purchasing biogas and upgrading it to renewable natural gas. [Emphasis Original]

While the term renewable natural gas is used in the GGRR to prescribe the amount of RNG that can be acquired and at what maximum price, the term is not defined there.

Also, the term biomethane does not appear in the GGRR or the CEA; however, the CEA does define the following:

> "clean or renewable resource" means biomass, biogas, geothermal heat, hydro, solar, ocean, wind or any other prescribed resource

In 2010, the BCUC approved a "Biomethane Application" from FEI (then Terasen Gas Inc.) which requested approval of:

- A Biomethane Service Offering and Supporting Business Model;
- The Salmon Arm Biomethane Project; and
- The Catalyst Biomethane Project as a "Biomethane Pilot Project".

[48] FEI-Shell BPA, Exhibit B-1, pdf p.25
[49] Ibid.

The term renewable natural gas appeared only once in that application - in the statement: "On March 4, 2008, PG&E and BioEnergy Solutions announced that their Biogas-to-pipeline injection project in Fresno County has begun production of renewable natural gas derived from animal waste."[50] The acronym RNG did not appear.

Since that time, FEI has filed an application for renewal of the pilot and approximately 30 applications pursuant to section 71 of the UCA for acceptance of BPAs for the purchase of biomethane – and none for renewable natural gas or RNG. The terms renewable natural gas, RNG, and biomethane appear to have often been used interchangeably in those applications and proceedings.

In approving the FEI-Shell BPA, the BCUC noted "The contract specifies that the RNG is sourced from a specific anaerobic digestion facility in Iowa, with notional delivery to FEI at the Huntingdon interconnection point."[51] The BCUC commented that it was "satisfied that what FEI is acquiring in the Shell BPA is RNG, because the gas is methane sourced from an anerobic digestion facility and comes with the associated environmental attributes".[52]

In its report "An Introduction to Biogas and Biomethane", the IEA states that biomethane is "also known as renewable natural gas".[53]

The CER describes RNG as:[54]

> Carbon neutral methane that is produced from the decay of organic matter in farms and landfills.

The US Environmental Protection Agency defines RNG as:[55]

> a term used to describe biogas that has been upgraded for use in place of fossil natural gas. The biogas used to produce RNG comes from a variety of sources, including municipal solid waste landfills, digesters at water resource recovery facilities (wastewater treatment plants), livestock farms, food production facilities and organic waste management operations.

Submissions of the parties

FEI

FEI submits that while the term RNG is not defined in the GGRR, many terms are not specifically defined in legislation and the meaning of a term that is not defined in legislation is constrained by its grammatical and ordinary sense, the context, the objective of legislation and the intention of parliament.[56]

FEI contends that RNG has a specific meaning; that is, natural gas produced from organic waste.[57] RNG, also called biomethane, is methane that is not extracted from the earth's crust and is natural gas produced from biogenic feedstocks through the process of anaerobic decomposition or anaerobic digestion. The raw biogas generated from the breakdown of these biogenic feedstocks must then be upgraded and cleaned so that the resulting gas is RNG high in methane content.[58]

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[50] Terasen Gas Inc. Biomethane Application, Exhibit B-1, p. 32.
[51] Order E-14-21, Reasons for Decision, May 28, 2021, p.7
[52] Ibid, p.12
[53] https://www.iea.org/reports/outlook-for-biogas-and-biomethane-prospects-for-organic-growth/an-introduction-to-biogas-and-biomethane
[54] https://www.cer-rec.gc.ca/en/data-analysis/glossary/#R
[55] https://www.epa.gov/lmop/renewable-natural-gas
[56] FEI Submission, p.3
[57] Ibid, p.2
[58] FEI Submission, p.3 - FEI include the examples of decomposition of biomass waste from landfill and anaerobic digestion of organic waste such as manure.

Further, FEI submits "the nature of RNG is consistent with the broader legislative context. The definition of "biomethane" in section 1 of the Carbon Tax Act, [SBC 2008] Chapter 40, states that "biomethane" means methane produced from biomass." In accordance with this definition, carbon tax in BC is not exigible on RNG. Conventional natural gas paired with environmental attributes would not satisfy the definition of "biomethane" and would therefore be subject to the carbon tax."[59]

In its reply submission, FEI reaffirms its position that "[t]here is no doubt as to the nature of RNG: RNG is not a set of environmental attributes, but methane made in a particular way, i.e., from biomass."[60]

MoveUP

MoveUp states that the GGRR does not provide an exhaustive definition of RNG and does not address the purchase of processed RNG from a third-party producer, whether injected on or off system.[61]

PNG

PNG states that once introduced into a gas distribution system, RNG is physically indistinguishable from natural gas extracted from the earth. PNG submits that a transaction of RNG is identical to a transaction of natural gas with the inclusion of Environmental Attributes unique to RNG. [62]

PNG further states it uses the terms "biomethane" and "renewable natural gas" (RNG) synonymously and except when citing or referencing the GGRR, uses the term biomethane rather than RNG.[63]

RCIA

RCIA submits the BCUC has already established the principle that it is not physical delivery of RNG molecules to the point of combustion [which] is necessary to meet the definition of RNG, but the principle that carbon reductions have been achieved from a global emissions perspective. RCIA further submits that purchasing Environmental Attributes and pairing these attributes with physical Natural Gas in BC satisfies the definition of RNG.[64]

CBA

CBA states that it and its members are not in favour of a definition where RNG relates to natural gas which is not otherwise biomethane and was extracted from the earth's crust and subsequently associated with Environmental Attributes.[65]

BSCEA

BSCEA go on to state some RNG acquired by FEI under the CEA/GGRR is physically delivered to a receipt point on FEI's distribution system and some RNG is delivered notionally by injection into a gas pipeline connected to, but not part of FEI's system. The important point is that RNG delivered notionally is still RNG even though it is not delivered physically.[66]

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[59] FEI Submission, p.4
[60] Ibid, p.2
[61] MoveUp Submission, p.4
[62] PNG Submission, pp. 3-4
[63] Ibid, Footnote 1, p.2
[64] RCIA Submission, p.2
[65] CBA Submission, p.1
[66] Ibid, p.3

The CEC

CEC notes there is no definition of RNG in the GGRR and the BCUC has accepted that RNG can be notional, acquired from distant sources and delivered by displacement and is supportive of the concept that physical delivery of RNG molecules is not required for an acquisition of RNG to be a prescribed undertaking. [67]

In its reply submission, the CEC states that the provincial government's objectives to reduce greenhouse gases reasonably and cost-effectively would suggest the BCUC adopt a broad approach to its RNG regulation.[68]

Panel Discussion and Findings

As discussed above, once injected into the pipeline system, Conventional Natural Gas molecules, derived from fossil fuels, are indistinguishable from biomethane molecules derived from the upgrading of biogas. This ability to be mutually interchangeable allows for the delivery of Conventional Natural Gas and/or biomethane, at least in the notional sense, and is the basis upon which almost all Natural Gas is injected, transported and delivered to the consumer.

Put simply, the gas pipeline system can be viewed as injection of Natural Gas from suppliers, from fossil fuel or biomethane sources, who have agreed to sell to a purchaser an agreed upon amount of Natural Gas. A purchaser is delivered, or in other words, consumes, that same amount of Natural Gas from the system. The gas system is, in aggregate, balanced by the injected volumes of Natural Gas being equal to the delivered volumes of Natural Gas. The system and consumer are agnostic with respect to the source of the Natural Gas injected, transported, and withdrawn.

In the alternative, should one wish to guarantee that a customer who purchased biomethane is *only* delivered biomethane, for example, one would in essence require a system where the only source of Natural Gas is biomethane, injected into a dedicated biomethane pipeline and delivered to the biomethane customer. This is neither realistic nor reasonable.

Given that once blended in the system, each molecule of Natural Gas is indistinguishable from the next, there is no realistic way to trace a Natural Gas molecule to its source, or attribute the individual Natural Gas molecule to a specific source. This is clearly problematic for the delivery of biomethane.

Instead, and as discussed above, the only practical way to deliver biomethane is to contractually purchase, or acquire, the Environmental Attributes that are in essence the proof that an amount of biomethane purchased, injected, delivered and sold is from an organic source. It is this Environmental Attribute that differentiates Conventional Natural Gas from biomethane, and it is this Environmental Attribute, when paired with a unit of Natural Gas that enables a gas utility to deliver a product considered to be Renewable Natural Gas. **Therefore, the Panel determines that a unit of Natural Gas plus the Environmental Attributes associated with the production of an equivalent unit of biomethane is an example of Renewable Natural Gas.**

We note that Renewable Natural Gas can be delivered to the customer and is the sum of two parts: the *physical delivery* of Natural Gas and the *contractual delivery* of the associated Environmental Attributes.

We agree with FEI, that this form of Renewable Natural Gas might not be consistent with the definition of biomethane in the CTA as "methane produced from biomass". However, as discussed in section 4.4 above, it is all but impossible to reliably deliver "methane produced from biomass" to a customer via a gas pipeline. In fact, it is unlikely a customer purchasing biomethane from a public utility is physically delivered any molecules of biomethane, given the concept of notional delivery discussed above.

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[67] CEC Submission, p. 3
[68] CEC Reply Submission, p.3

Further, this approach is consistent with the practice of acquiring a certain volume of biomethane outside the province of BC, with defined Environmental Attributes, and taking delivery of an equal volume of Natural Gas in BC.

5.0 Combining Natural Gas and Environmental Attributes

A question posed in this Inquiry is whether purchasing Environmental Attributes and pairing these attributes with Natural Gas in BC satisfies the definition of RNG. As discussed above, RNG is delivered in BC as a product which is the sum of a physical volume of Natural Gas paired with an Environmental Attribute that is created/associated with the production of an equivalent volume of biomethane. However, Natural Gas could potentially also be paired with attributes other than those that are "biomethane-derived".

This broader category of Environmental Attributes could include what are currently called "carbon offsets". The effect of these Environmental Attributes could reduce the deemed amount of GHG emissions from Natural Gas combustion to facilitate "net-zero" or "carbon-neutral" natural gas; that is, where CO_2 that is emitted into the atmosphere is balanced by an equivalent amount of CO_2 being removed.

According to the IEA, there are three main categories under which CO_2 can be removed from the atmosphere:

- Nature-based solutions include afforestation and reforestation. These involve the repurposing of land use by growing forests where there was none before (afforestation) or re-establishing a forest where there was one in the past (reforestation).
- Enhanced natural processes include land management approaches to increase the carbon content in soil through modern farming methods. This can incorporate the addition of biochar (charcoal produced from biomass) to soils, where the carbon can remain stored for hundreds or thousands of years.
- Technology solutions include bioenergy with carbon capture and storage (BECCS) and direct air capture, which – as the name suggests – involves the capture of CO2 directly from the atmosphere. Both of these solutions rely on geological storage of CO_2 for large-scale carbon removal.[69]

Specific examples include:

- Capturing carbon dioxide at the point of combustion of the Natural Gas here in BC (e.g., carbon capture and storage).
- Capturing atmospheric carbon dioxide anywhere (e.g., negative emission technologies).
- Renewable Electricity Certificates (RECs) associated with the generation of electricity from renewable sources that displace fossil fuel electricity resources.
- Planting and maintaining trees as carbon sinks, accounting for any natural leakage of emissions.

5.1 Current Treatment of Environmental Attributes in BC

In the FEI-Shell BPA Application, FEI stated:

> The carbon intensity of any source of RNG can be determined through a life cycle assessment. There is no particular carbon intensity required for RNG; however, the lower the carbon intensity, the greater the value of the RNG, as it will count more towards GHG reduction targets.[70]

[69] https://www.iea.org/commentaries/going-carbon-negative-what-are-the-technology-options
[70] FEI-Shell BPA, Exhibit B-3, p.2.

FEI also explained that it "has adopted the BC LCFS [Low Carbon Fuel Standard] standard for calculating the carbon intensity of renewable gas primarily as a means of ensuring that RNG can be sold under the BC LCFS which recognizes RNG as a low carbon fuel".[71]

FEI stated that ownership of Environmental Attributes "enables the owner to claim the benefit of those attributes under legislative schemes of GHG reduction targets set up by governments or other entities".[72]

FEI went on to explain that "[w]hether the environmental attributes remain tied to the RNG volume purchased from the SHELL BPA would depend on what legislative scheme" is in place. FEI also confirmed that "[c]urrently, only customers that purchase RNG as a registered fuel under the BC Low Carbon Fuel Standard can monetize the environmental attributes. In the case of FEI's customers, today this is limited to those customers who purchase RNG in the natural gas for transportation market".[73]

The terms of the FEI-Shell BPA also include the provision for calculating the market value of the contract, which, in the event of a seller default is:

> (i) in the case of default by Seller, at the Buyer's option, either as
> (a) a transaction consisting of Biomethane; or,
>
> (b) a transaction consisting of conventional Gas plus Carbon Offsets equal to the greenhouse gas reduction that would have been achieved by the Biomethane supply for the remainder of the Transaction; the number of Carbon Offsets to be equivalent to the product of (1) the difference between 0.05 metric tonnes of CO_2e/GJ (being the CO_2 equivalency of conventional Gas) and the carbon intensity of the Biomethane set out in Section 11 multiplied by (2) the Minimum Annual Quantity for each Contract Year (or part of a Contract Year prorated) remaining under the Transaction, provided such carbon Offsets with the required quality are readily available in the market, and

Where an "Offset" is defined as:

> "**Offset**" means any credits, emission offsets or other tradable or recognized instruments issued or granted by a government or program authority or recognized under a regulation, in recognition of emission reductions or sequestration that may be applied to achieving compliance with any emissions related obligations or commitments whether voluntary or mandatory.

Ministry Letter

In the FEI Application for Acceptance of the BPAs between FEI and Tidal Energy Marketing Inc. proceeding, the Ministry of Energy, Mines and Low Carbon Initiatives filed a letter with the following comment:[74]

> The Province understands that in order to achieve the GHG reduction targets of the Province and other entities (e.g., municipalities and transit agencies), natural gas utilities require innovative approaches and significant flexibility. As such, we are supportive of the ability of the utilities to undertake a broad range of activities, actions and investments to reduce the GHG emissions resulting from the natural gas sector in British Columbia.

[71] FEI-Shell BPA, Exhibit B-4, Response to BCUC IR 7.6.
[72] FEI-Shell BPA, Exhibit B-4, Response to BCUC IR 7.4.1
[73] FEI-Shell BPA, Exhibit B-4, Response to BCUC IR 7.5
[74] https://docs.bcuc.com/Documents/Proceedings/2020/DOC_57023_E-1-MEMPR-Letter-of-Comment.pdf

Submissions of the parties

FEI

FEI submits that based on legislation, purchasing Environmental Attributes and pairing these attributes with conventional natural gas in BC would not satisfy the definition of RNG in the GGRR and any conventional natural gas paired with Environmental Attribute would be "abated gas or other similar terms, but not RNG."[75]

FEI is, however, supportive of a regime where it could purchase Environmental Attributes alone which would be recognized as abating GHGs from conventional natural gas. FEI further argue that the purchase of Environmental Attributes alone would remove commodity and transportation costs and make costs of Environmental Attributes more transparent. [76]

Under this scenario, FEI states it would purchase conventional natural gas, secure transportation from a trading hub to its interconnection point and claim the Environmental Attributes as GHG reductions in BC. FEI contend that while changes to legislation would be required, "purchasing the environmental attributes and pairing them with conventional natural gas would achieve the same GHG emission reductions as acquiring RNG and transporting it to FEI's system." [77]

FEI submits that GHG reductions are the result of the biogenic process by which RNG is produced, which has a lower lifecycle GHG emission profile than the production and use of Natural Gas. GHG reductions occur when RNG displaces the use of higher GHG energy. It is the acquisition of the Environmental Attributes associated with the production of RNG that "conveys the environmental credit, including associated GHG reductions" and "would give FEI or its customers the right to claim any credits for the GHG reduction from the production and use of the RNG. This could be done without purchasing the actual molecules". [78]

FEI contends that while acquiring Environmental Attributes this way could be used to meet BC's GHG reduction targets, and could be at lower cost to ratepayers, supporting amendments to the CTA and GGRR would be required.[79] Further, given the definition of biomethane in the CTA, carbon tax is not levied on RNG. Conventional natural gas paired with Environmental Attribute would not satisfy this definition and would therefore be subject to the CTA. [80]

In its reply, FEI submits that the GGRR prohibits the unbundling of a transaction because of the word "renewable natural gas" and the lack of any provision that refers to the purchase of Environmental Attributes; the GGRR contemplates the acquisition of RNG, not the acquisition of Environmental Attributes.[81]

FEI argues the BCUC has identified that a component of the test for an acquisition to be a prescribed undertaking is that FEI must be acquiring RNG and the BCUC has accepted BPAs on this basis.[82] Further, FEI states in all BPAs to date, it has acquired actual RNG; that it, actual RNG molecules produced by the supplier.

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[75] FEI Submission, p.4
[76] Ibid, p.2
[77] Ibid, p.2
[78] Ibid, p.3
[79] Ibid, p.3
[80] Ibid, p.4
[81] Ibid.
[82] FEI Reply Submission, p.3

RCIA

RCIA states that as the BCUC has accepted extra-jurisdictional RNG sources, it has accepted the principle that physical delivery of RNG molecules is not necessary to meet the definition of RNG, but rather the principle that carbon reductions have been achieved from a global emissions perspective.[83]

With respect to carbon neutral gas, that is, physical natural gas paired with Environmental Attributes, RCIA asserts that "ratepayers would see an economic benefit with no change in total global carbon emissions if carbon neutral gas were recognized to satisfy the definition of RNG."[84] RCIA, therefore, adopts the position that purchasing Environmental Attributes and pairing these with physical natural gas in BC satisfy the definition of RNG.[85]

RCIA does identify, however, that there is regulatory uncertainty on whether physical natural gas combined with Environmental Attributes such as carbon offsets would be recognized by the federal or provincial governments, because there is no regulated carbon offset program in place.[86]

BSCEA

BSCEA submits "there is no lack of clarity in the law. Fossil natural gas coupled with unbundled environmental attributes is not Renewable Natural Gas within the prescribed undertaking regime" [Emphasis Original] and the GGRR applies to RNG and not unbundled Environmental Attributes.[87]

BSCEA argues that nothing in the CEA or GGRR "establishes, or indicates an intention to establish, a mechanism involving unbundled environmental attributes"[88] and that the prescribed undertaking regime does not involve credits, offsets, or any other form of unbundled Environmental Attributes. Therefore, in BC there is "no such thing as purchasable "environmental attributes" of RNG separate from the RNG itself".[89] Further, BSCEA submits establishing such a regime goes beyond the cost of acquisition and is not within the BCUC's jurisdiction.[90]

In reply to BSCEA, FEI agrees with BCSEA's statement that there is no lack of clarity in the law; fossil natural gas coupled with unbundled Environmental Attributes is not RNG.[91]

CBA

CBA submit that decoupling Environmental Attributes from RNG to be sold without tracking the physical fuel is a key approach for RNG to reach full potential and is commonly used in Canada and the United States. Further, for pairing Environmental Attributes with natural gas to meet the definition of RNG, those Environmental Attributes must come from RNG.[92]

CBA state that by using book-and-claim accounting, the decoupled attributes represent the ownership and transportation of RNG without physically tracing it. Once the Environmental Attribute is decoupled and purchased, the physical gas is considered Conventional Natural Gas and can no longer be claimed as RNG which prevents double counting.[93]

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[83] RCIA Submission, p.1
[84] Ibid.
[85] Ibid, p.2
[86] Ibid, p.1
[87] BCSEA Submission, p.2
[88] Ibid, p.1
[89] Ibid.
[90] Ibid, p.3
[91] Ibid, p.2
[92] CBA Submission pp. 1-2
[93] Ibid, p.2

PNG

PNG submits separating the Environmental Attributes from the energy carrier is an important mechanism in the development of an efficient RNG market and is similar to characteristics in the renewable power markets where renewable energy is the sum of two components – (i) physical energy and (ii) unbundled Environmental Attributes.

In addition, the PNG submits BPAs accepted by the BCUC are structured to allow for the separability of the Environmental Attribute from the energy carrier and consist of three parts; (i) the GasEDI Base Contract for the sale purchase of natural gas; (ii) Special provisions which set out the terms and conditions, and (iii) the Transaction Confirmation, which defines the Environmental Attributes.[94] PNG contend that in being structured this way, a transaction of RNG is identical to a transaction of natural gas, with the inclusion of Environmental Attributes unique to RNG.[95]

PNG submits there is no language in the GGRR that prohibits unbundling of a transaction of biomethane into a transaction for natural gas plus a transaction for Environmental Attributes associated with biomethane; the GGRR defines the production and purchase of RNG, but the CEA is silent on the transportation and delivery of RNG.[96]

PNG states it is very supportive of any means that can reduce the cost of RNG transactions and the ability to acquire the Environmental Attributes associated with RNG as a separate transaction could result in such cost reductions.[97]

The CEC

CEC submits that Environmental Attributes were generally defined as GHG emissions reduction benefits and that because GHG emissions reductions are a global issue, the BCUC should allow reductions anywhere around the world, as long as the utility receives the GHG reduction benefits such that they are not double counted.[98]

MoveUp

MoveUP states that the purchase of Environmental Attributes and pairing them with physical natural gas in BC should be a "device to help maintain the stability of the sector and smooth out points of turbulence between the vagaries of incremental RNG supply and the attainment of regulatory and statutory objectives".[99]

However, MoveUp states that the BCUC "should not consider that the government intended for mechanisms to subvert the real-world objective, attaining the province's climate goals" and maintains that while this serves the purposes of the GGRR if used as a bridge, it is not a substitute for ensuring that the methane molecules delivered to FEI's customers are increasingly from biogenic instead of fossil-fuel sources.[100]

Panel Discussion and Findings

The Panel considers the following two scenarios:

1. Environmental Attributes derived from the production of biomethane
2. Other Environmental Attributes

[94] PNG Submission, p.3
[95] Ibid.
[96] Ibid.
[97] PNG Submission, p.5
[98] CEC Submission, p.2
[99] MoveUP Submission, p.8
[100] Ibid.

Environmental Attributes derived from Biomethane

For the reasons set out below, the Panel finds that when Environmental Attributes associated with the production of biomethane are acquired by a BC public utility and then combined with an equivalent amount of Natural Gas *acquired separately*, this results in Renewable Natural Gas for the purpose of the GGRR.

As discussed in section 4.4 of this Report, the BCUC has already accepted that the delivery of biomethane (and consequently RNG) requires the delivery of a physical molecule of Natural Gas and a transferable Environmental Attribute. This approach has been advocated by FEI and supported by many Interveners, including the CEC, RCIA and MoveUp. To date, in all of the circumstances where the acquisition of RNG has been approved by the BCUC, the utility has contractually acquired both Natural Gas and an associated Environmental Attribute together, and both have come from the same source.

Although the Environmental Attributes are *associated* with the Natural Gas purchased transported and delivered, they are not necessarily *attached* to the specific molecules of Natural Gas. Beyond the injection/delivery point at which it acquired the RNG, FEI has subsequently separated the physical gas and the Environmental Attributes again in order to deliver an RNG 'product' to its customers. FEI has been acquiring RNG and delivering it to its customers in this manner for more than 10 years.

With regards to BSCEA's assertion that nothing in the CEA or GGRR "establishes, or indicates an intention to establish, a mechanism involving unbundled environmental attributes", the Panel is not persuaded. The CEA and the GGRR are silent on both the definition of RNG and the mechanism for delivery of RNG. Indeed, the CEA does not explicitly preclude the acquisition of RNG being the sum of an acquisition of a molecule of Natural Gas and an unbundled Environmental Attribute that arose from the production of biomethane, nor does it explicitly preclude the notional delivery of biomethane, with the separate delivery of a physical methane molecule and the associated Environmental Attributes.

In its review of a BPA, the BCUC has never explicitly considered whether the acquisition of RNG requires the applicant to acquire both the Conventional Natural Gas and the EA in the same transaction. The BPAs to date that have been approved by the BCUC involved the applicant acquiring the EAs and the physical gas at the same time and from the same seller – although the seller may not necessarily be the producer of the biomethane or the party that delivers the gas to the applicant utility. The BCUC has accepted that these BPAs are acquisitions of RNG pursuant to the GGRR.

The BCUC has previously stated:[101]

> The [BCUC] does not disagree that the accepted principles of statutory interpretation require that "acquire" be given a fair, large and liberal interpretation to accomplish the purpose of the GGRR and the CEA.

Further, the BCUC has previously determined:[102]

> Given the accepted principles of statutory interpretation and these broad definitions, the [BCUC] is satisfied that, when considered together, the process of purchasing and taking possession of raw landfill gas from the COV and upgrading it to RNG satisfies the meaning of "acquires renewable natural gas" in section 2(3.8) of the GGRR.

In this case, FEI did not acquire RNG in from another party. It created, or manufactured, it.

[101] Decision and Order G-122-19, p. 10.
[102] Decision and Order G-122-19, p. 10.

As illustrated above, the BCUC has accepted that an applicant utility can produce its own RNG instead of purchasing it – it can "assemble" the RNG itself. Producing, or assembling, RNG from an EA and conventional natural gas, each acquired separately, similarly satisfies the requirement to acquire RNG. RNG can be "assembled" from EAs acquired separately from the conventional gas it is ultimately bundled with. It may be further unbundled and re-bundled when it is delivered to the end-use customer.

Finally, the legislative purpose of the GGRR is for reducing greenhouse gas emissions in British Columbia[103], and we note that the unbundling of Environmental Attributes for voluntary carbon reduction markets has been commonplace since the 1990s, including under the BC government led Greenhouse Gas Emission Reduction Trading Pilot.[104]

As has been the case with the acquisition of biomethane which has been "notionally delivered" as RNG (for example the FEI-Shell BPA), the onus is on the applicant to demonstrate to the satisfaction of the BCUC that there is no double-counting of the acquired Environmental Attributes and that sufficient safeguards are in place to prevent double-counting.

Therefore, given the nature of the delivery of RNG, for the purposes of interpreting the GGRR the Panel finds that Renewable Natural Gas is acquired in each of these scenarios:

- **biomethane is acquired with its associated Environmental Attributes – as, for example, in the case of FEI's biomethane purchase agreements; and**
- **Conventional Natural Gas is acquired and an appropriate quantum of Environmental Attributes that are associated with the production of biomethane are acquired separately.**

In either case, the acquired product is Renewable Natural Gas for the purpose of the GGRR.

That said, in the case of an acquisition as described in the second bullet above, clarification is required regarding the specific attributes of the acquired Environmental Attribute. In Phase 2, the Panel invites parties to provide submissions on what specific attributes or criteria those alternate Environmental Attributes must have, how those Environmental Attributes can be verified and how customers can be assured of their integrity.

For example, the contract between FEI and Shell provides for the following:[105]

> Environmental attributes and Carbon Intensity. All environmental attributes, namely GHG emissions reduction benefits, of the biomethane purchased under the SHELL BPA will be transferred to FEI. This ensures the full value of the RNG will be received by FEI and its customers and is the same as FEI's agreements to purchase RNG from projects located within BC. The environmental attributes, namely GHG reductions, associated with RNG are an essential element of the RNG program for customers. SHELL will ensure that the carbon intensity of the biomethane will not exceed [XXX] grams of CO2 equivalent per megajoule. In the SHELL BPA, the avoided methane emissions arise from capturing and processing methane from the wastewater treatment process along with the digestion of organics. The biogas from the wastewater treatment process would have otherwise been flared and the organics would have otherwise been landfilled.

6.0 The Annual Volume Test in the GGRR

In this section, we discuss an appropriate calculation when performing the annual volume test in section 2(3.8)(b) of the GGRR, as copied below:

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[103] https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/10022_01#section18
[104] https://archive.news.gov.bc.ca/releases/archive/pre2001/1998/june/bg024-gh.asp
[105] FEI – Shell BPA, Exhibit B-1, pdf. p.8 of 47

(b) that, in a calendar year, does not exceed 15% of the total amount, in GJ, of natural gas provided by the public utility to its non-bypass customers in 2019, subject to subsection (3.9) and section 10;

Submissions of the parties

FEI states that the annual volume test must be based on actual annual volumes acquired by FEI in any given year; section 2(3.8) of the GGRR does not refer to the maximum amount of RNG a public utility could or has a right to acquire in a calendar year, but instead refers to the RNG that a public utility acquires in a calendar year.[106]

FEI states the contractual maximum RNG volume is the maximum RNG volume FEI can be obligated to purchase under a BPA. This volume is often based on the theoretical maximum output of the facility and it is unlikely that a project will produce at its maximum output year over year. FEI states that none of its RNG projects have ever supplied actual RNG volumes that have matched the contracted maximum.[107]

Based on experience, FEI submits that its RNG projects have instead produced on average approximately 70 percent of the total maximum supply. FEI is expecting, on average, 75 percent of contracted maximum volumes going forward, based on lessons learned and actual data from operating projects.[108]

FEI also states that the BCUC has previously explored the RNG supply cap, when it approved FEI's initial RNG supply cap at 1.5 PJ annually. At the time, FEI observed that actual RNG supply was consistently below contracted maximum volumes, which was noted by the BCUC:

> The Panel notes FEI's submission regarding lower-than-expected volumes from existing supply contracts. Accordingly, when calculating the maximum amount that can be contracted for the purpose of determining if the Supply Cap has been reached, the Panel directs that the total contracted maximum amount must not exceed 2 PJ. [109] [Emphasis Added]

FEI suggests this decision implies the BCUC understand actual volumes will not match the maximum contracted volumes and that a variance of approximately 25 percent could be considered reasonable. FEI further states it expects the contractual maximum of its entire RNG portfolio to be 25 percent higher than the GGRR maximum volume in order to support achieving the GGRR maximum volume each year[110]. However, FEI affirms that should it exceed the GGRR maximum volume in any given year, it would sell the amount of RNG at full cost as provided by section 2(3.9) of the GGRR. [111]

FEI states it would also consider applying for BCUC approval of acquisitions over the maximum RNG volume specified in the GGRR, where FEI would manage annual volumes so that they stayed within the maximum volumes when considered over a number of years. FEI argues this levelized approach would recognise the difficulty in managing RNG volumes on a yearly basis, given the variability of RNG production.[112]

FEI confirms it reports the actual and forecast volume of RNG acquisitions in: (i) the Annual Biomethane Variance Account (BVA) Report filed with the BCUC each April; (ii) through the BVA rate rider through each Annual Review;

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[106] FEI Submission, p.6
[107] Ibid.
[108] Ibid, p.7
[109] Order G-210-13 Biomethane Services Offering: Post Implementation Report and Application for the Approval of the Continuation and Modification of the Biomethane Program on a Permanent Basis
[110] FEI Submission, p.8
[111] Ibid
[112] Ibid, p.9

and (iii) in the Fourth Quarter Gas Cost Report each November. FEI proposes to continue similar reporting in the future to provide the BCUC the opportunity to review FEI's annual RNG volumes on a regular basis each year.[113]

FEI concludes that in filing a BPA for BCUC acceptance, the BPA is part of a portfolio of ESCs that supports FEI in achieving the maximum volume of RNG in accordance with the GGRR on an actual basis each year. As FEI's actual annual RNG volumes approach the maximum specified volume in the GGRR, FEI states it will provide a more detailed analysis to show that each BPA is a reasonable addition to its portfolio that supports acquisitions up to the GGRR maximum volume. [114]

BCSEA

BCSEA submits that the annual volume test in section 2(3.8)(b) of the GGRR should be calculated based on delivered volumes of RNG, not the BPA contracted volumes, as exact delivered quantities of RNG cannot always be determined in advance.[115]

PNG

PNG states that it takes no stance on the appropriate calculation to apply when performing the annual volume test in section 2(3.8)(b) of the GGRR. However, PNG argues using contractual rather than forecast deliveries results in a more stable and predictable target against which to plan and execute an RNG procurement strategy and expects to continue to use this method. [116]

PNG concludes that it is aware this method increases the risk that target RNG blending ratios are not achieved if the contracted RNG supply does not materialize; however, PNG manages such risk by entering into BPAs with counterparties having a reasonably high likelihood of successfully delivering the contracted RNG supply.[117]

The CEC

The CEC submits that meeting the annual test in section 2(3.8)(b) of the GGRR means that the BCUC should ensure that the GHG emissions reductions (Environmental Attributes) claimed by the utility for any calendar year do not exceed the level of GHGs that would be generated by up to 15 percent of the natural gas used in BC by the public utility. [118]

CEC submits the following calculation is the total amount of GHG reductions which is not to be exceeded:

> (Total GJ of natural gas used by the public utility annually x CO_2 equivalent tonnes of GHG/GJ of natural gas x 15%)

RCIA

RCIA states that they "wish to see utilities purchase the maximum quantity of RNG that is mandated by law, but not excess RNG quantities" given RNG is more expensive than Natural Gas and therefore represents an economic burden. [119]

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[113] Ibid
[114] Ibid
[115] BSCEA Submission, p.3
[116] PNG Submission, p.5
[117] Ibid p.6
[118] CEC Submission, p.4
[119] RCIA Submission, p.2

RCIA asserts that applying the annual volume test to contracted RNG volumes will not meet the intent of the GGRR of RNG volumes up to 15 percent of the total natural gas delivered because delivered volumes are less than contracted and delivered RNG volumes reduce BC's carbon emissions.[120]

RCIA submits the calculation should be based on delivered RNG volumes and proposes that excess RNG volumes should be used for FEI's voluntary RNG program, whereby the costs of excess delivered RNG are fully recovered from the voluntary ratepayers and/or FEI without recourse to ratepayers.[121]

MoveUp

MoveUp states that should the acquisition of Natural Gas with Environmental Attributes attached be accepted by the BCUC as a prescribed undertaking, the entire volume of relevant gas should be treated identically with any other "real" or notional RNG for all purposes, with the notional RNG counting towards the 15 precent limit as set out in in section 2(3.8)(b) of the GGRR.[122]

BCSEA

BCSEA submits that the calculation of RNG volumes in applying the annual volume test in section 2(3.8)(b) of the GGRR should be calculated based on delivered volumes of RNG, not contracted volumes in a BPA as exact delivered quantities of RNG cannot always be determined in advance.[123]

Panel Discussion and Findings

The Panel is persuaded that the actual delivered volume of RNG in a calendar year is the appropriate quantity on which to base the calculation for the annual volume test as set out in section 2(3.8)(b) of the GGRR.

The Panel acknowledges that forecast volumes have, by definition, an inherent uncertainty, and the actual volumes of delivered RNG are only known at the time of delivery. In the case of the FEI-Shell BPA, and other BPAs entered into, FEI have contractual assurances that the delivered volume of biomethane will be within a certain minimum and maximum range which mitigates this volume risk. Further, as evidenced by FEI, BPAs are unlikely to deliver actual volumes that match their contractual, theoretical maximums, given the variability of the biomethane feedstock. Therefore, we find that basing the annual volume calculation on this measure to be somewhat restrictive.

We note that using actual delivered volumes of RNG to calculate the annual volume test will enable utilities to maximize the actual amount of RNG that is delivered to their customers, thereby providing the largest GHG reduction benefit and contribution in achieving the legislative purpose of the GGRR.

As noted above, using actual delivered RNG volumes will only be known at the time of delivery, and therefore reporting actual delivered volumes and the calculation of the annual volume test will only be known retrospectively. The Panel notes FEI's existing reporting requirements and finds these sufficient to ensure compliance with the volume limit as set out in s. 2(3.8)(b) of the GGRR.

The Panel notes that s.2(3.9) of the GGRR contemplates a scenario where a public utility acquires renewable natural gas in excess of the volume limit and provides ratepayer protection, where, in the event volumes of RNG exceed the GGRR maximum volume in any calendar year, the utility may sell the excess amount of RNG at full cost to the customer.

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[120] RCIA Submission, p.3
[121] RCIA Submission, p.4
[122] MoveUp Submission, p. 10
[123] BCSEA Submission, p.3

7.0 The Draft Phase 1 Report and Phase 2 Submissions

This Report was initially published as the Draft Phase 1 Report with the findings in provisional form. In addition, the Draft Phase 1 Report proposed a Phase 2 that would consider the following questions:

1. Given the GGRR does not specify a Carbon Intensity (CI) requirement for RNG, nor is the CI of RNG provided in BC's Low Carbon Fuel Standard (LCFS), should any maximum CI be established for acquired Environmental Attributes arising from the production of biomethane?
2. Should the BCUC consider any fugitive methane emissions that may be associated with the production of biomethane and/or the delivery of RNG?

Given the potential scope and availability of Environmental Attributes, the Panel also expressed interest in considering further the role these Environmental Attributes could play in Natural Gas delivery in BC. For Phase 2, the Panel invites further submissions on the following:

1. Are there certain Environmental Attributes other than those derived from the production of biomethane, that when combined with what is Conventional Natural Gas, produce RNG? (Scenario 1)
2. Do Environmental Attributes arising from a "Clean or Renewable Resource", as that term is defined in the CEA, when combined with Conventional Natural Gas, give rise to RNG? (Scenario 2)
3. If those Environmental Attributes described in scenarios 1 and 2 above do not give rise to RNG, do they reduce the GHG emission profile of the associated Conventional Natural Gas?
4. If Natural Gas is combined with Environmental Attributes that are associated with a process or method that reduces atmospheric CO_2, but does not result in RNG, for example carbon capture and storage, what is the GHG emission profile of that resultant gas?
5. How can the integrity of Environmental Attributes purchased by BC public utilities be assured and what is the BCUC's role, if any, with respect to double-counting, compliance and enforcement?

Parties were provided an opportunity to comment on the Draft Phase 1 Report. The Panel considered these comments and responded in Order G-212-22 and accompanying Reasons for Decision.

The Panel hereby confirms that it will continue with Phase 2 of this Inquiry. As a result of various comments and submissions raised by the BCSEA, CEC, CBA and MoveUp in the review of the Draft Phase 1Report, in Phase 2, in addition to the questions set out above, we also invite parties' submissions on the following:

BCSEA states: [124]

1. In BCSEA's view, biomethane is a gas mixture that can be readily distinguished (including chemically) from the conventional natural gas mixture.

We invite further submissions on how biomethane is physically distinguished from Conventional Natural Gas and the significance and consequences of this difference, particularly as it relates to the acquisition of RNG.

The CEC submits that: [125]

> A related issue is whether or not a public utility can or should acquire GHG Environmental Attributes outside of the Prescribed Undertakings described in the GGRR. For instance, a question for the Commission could be to what extent should a public utility acquire Environmental Attributes as an asset, and could the

[124] BCSEA Submission dated June 6, 2022, p.6.
[125] CEC Submission dated January 31, 2022, p.5.

> utility acquire this asset and keep the costs for achieving this greater level of GHG environmental attributes (i.e. GHG reductions) in a deferral account for use in future years. Acquiring GHG reductions earlier, rather than later, creates additional environmental benefits.

We invite submissions on CEC's comments.

CBA submits: [126]

> For example, this decoupling of environmental attributes is an approach that is used in the California Low-Carbon Fuel Standard. RNG projects can use book-and-claim accounting to keep track of the ownership and transfer of RNG without tracking the physical fuel. The decoupled environmental attributes represent the ownership and transportation of RNG without physically tracing it. RNG injected into a pipeline must maintain evidence of chain-of-custody by California Air Resources Board accredited LCFS third parties. Once the environmental attribute is decoupled and purchased, the physical gas is considered conventional natural has [sic] and can no longer be claimed as RNG by the producer. This prevents double counting.

We invite submissions on CBA's comments and welcome intervener evidence, if warranted, on the approach taken by California and other jurisdictions including whether, or how, it is inconsistent with the treatment of Renewable Natural Gas under the GGRR.

MoveUp submits that:[127]

> The utility workforce represented by the union has a vital interest in ensuring that FEI achieves a soft landing through the period of transition that is now underway in earnest. Their careers and livelihoods depend on it. FEI's ability to source sufficient non-fossil gas to meet evolving standards is critical to that soft landing, and it must be given the tools to accomplish it.
>
> The GGRR is similarly aimed at guiding gas utilities through these transitions and should be interpreted and applied to enable success. It should be seen as a tool to serve societal purposes, including providing a pathway to mitigate economic dislocation as we pursue our collective climate goals.

MoveUp also submits that: [128]

> One objective of energy utility regulators at this juncture should be to enable the survival of the natural gas distribution sector, and its transition to a sustainable future.

We invite submissions on these MoveUp comments.

We also invite submissions on whether recommendations should be made to the Provincial Government to prohibit unbundling of Environmental Attributes – or the notional delivery of Renewable Natural Gas – under certain circumstances. Such circumstances may include:

- Biomethane injected in the distribution system of an applicant upstream of all potential customers of Renewable Natural Gas
- Biomethane injected in the distribution system of an applicant downstream of all potential customers of Renewable Natural Gas

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[126] CBA Submission dated January 31, 2022, pp. 1-2.

[127] MoveUp Submission dated January 31, 2022, p.11.

[128] Ibid., p.1.

- Biomethane injected in the pipeline system of a third party upstream of an applicant's distribution system
- Biomethane injected in the distribution system of a third party that is downstream of the applicant's distribution system
- Biomethane injected in a transmission or distribution system of a third party that is not connected in any way to the applicant's distribution system.

Further, what relevance, if any, does the province, state or country in which the biomethane is manufactured have? We invite submissions, and evidence where warranted, from parties on this topic.

Additionally, Section 10 of the GGRR may suggest that lignin, synthesis gas and hydrogen are not considered by the GGRR to be RNG. We therefore seek submissions on this matter, including the following:

1. Does the definition of RNG include synthesis gas, lignin and hydrogen?
2. Can gas derived from synthesis gas, lignin and hydrogen be notionally delivered or unbundled?

8.0 Summary of Findings and Recommendations

	Finding/Recommendation	**Page(s)**
1.	In order to distinguish different sources of Natural Gas, for the purpose of this report the Panel therefore will use the term **Conventional Natural Gas for that Natural Gas which is formed from fossils and extracted from and below rocks within the earth's surface**.	p.7
2.	Therefore, the Panel determines that **biomethane is pipeline quality gas derived from upgrading and processing biogas or biomass. Biomethane is indistinguishable from Conventional Natural Gas and can be injected into a gas pipeline system.**	p.11
3.	**Notwithstanding, we find that the creation of biomethane gives rise to specific Environmental Attributes and that these attributes may be contractually transferred between parties.**	p.13
4.	**[T]he Panel finds that it is not practical to consider Environmental Attributes to be intrinsically associated with a specific Natural Gas molecule.**	p.14
5.	**Therefore, the Panel determines that a unit of Natural Gas plus the Environmental Attributes associated with the production of an equivalent unit of biomethane is an example of Renewable Natural Gas.**	p.18
6.	**[T]he Panel finds that when Environmental Attributes associated with the production of biomethane are acquired by a BC public utility and then combined with an equivalent amount of Natural Gas *acquired separately*, this results in Renewable Natural Gas for the purpose of the GGRR.**	p.24

	Finding/Recommendation	Page(s)
7.	**Therefore, given the nature of the delivery of RNG, for the purposes of interpreting the GGRR the Panel finds that Renewable Natural Gas is acquired in each of these scenarios:** • **biomethane is acquired with its associated Environmental Attributes – as, for example, in the case of FEI's biomethane purchase agreements; and** • **Conventional Natural Gas is acquired and an appropriate quantum of Environmental Attributes that are associated with the production of biomethane are acquired separately.** In either case, the acquired product is Renewable Natural Gas for the purpose of the GGRR.	p.25

9.0 Summary of Submissions Sought

	Submission	Page(s)
1.	• **Conventional Natural Gas is acquired and an appropriate quantum of Environmental Attributes that are associated with the production of biomethane are acquired separately.** [I]n the case of an acquisition as described in the bullet above, clarification is required regarding the specific attributes of the acquired Environmental Attribute. In Phase 2, the Panel invites parties to provide submissions on what specific attributes or criteria those alternate Environmental Attributes must have, how those Environmental Attributes can be verified and how customers can be assured of their integrity.	p.25
2.	Given the GGRR does not specify a Carbon Intensity (CI) requirement for RNG, nor is the CI of RNG provided in BC's Low Carbon Fuel Standard (LCFS), should any maximum CI be established for acquired Environmental Attributes arising from the production of biomethane?	p.29
3.	Should the BCUC consider any fugitive methane emissions that may be associated with the production of biomethane and/or the delivery of RNG?	
4.	Are there certain Environmental Attributes other than those derived from the production of biomethane, that when combined with what is Conventional Natural Gas, produce RNG? (Scenario 1)	
5.	Do Environmental Attributes arising from a "Clean or Renewable Resource", as that term is defined in the CEA, when combined with Conventional Natural Gas, give rise to RNG? (Scenario 2)	
6.	If those Environmental Attributes described in scenarios 1 and 2 above do not give rise to RNG, do they reduce the GHG emission profile of the associated Conventional Natural Gas?	
7.	If Natural Gas is combined with Environmental Attributes that are associated with a process or method that reduces atmospheric CO_2, but does not result in RNG, for example carbon capture and storage, what is the GHG emission profile of that resultant gas?	

	Submission	Page(s)
8.	How can the integrity of Environmental Attributes purchased by BC public utilities be assured and what is the BCUC's role, if any, with respect to double-counting, compliance and enforcement?	
9.	BCSEA states: [129] > In BCSEA's view, biomethane is a gas mixture that can be readily distinguished (including chemically) from the conventional natural gas mixture. We invite further submissions on how biomethane is physically distinguished from Conventional Natural Gas and the significance and consequences of this difference, particularly as it relates to the acquisition of RNG.	p.29
10.	The CEC submits that:[130] > A related issue is whether or not a public utility can or should acquire GHG Environmental Attributes outside of the Prescribed Undertakings described in the GGRR. For instance, a question for the Commission could be to what extent should a public utility acquire Environmental Attributes as an asset, and could the utility acquire this asset and keep the costs for achieving this greater level of GHG environmental attributes (i.e. GHG reductions) in a deferral account for use in future years. Acquiring GHG reductions earlier, rather than later, creates additional environmental benefits. We invite submissions on CEC's comments.	p.29
11.	CBA submits: [131] > For example, this decoupling of environmental attributes is an approach that is used in the California Low-Carbon Fuel Standard. RNG projects can use book-and-claim accounting to keep track of the ownership and transfer of RNG without tracking the physical fuel. The decoupled environmental attributes represent the ownership and transportation of RNG without physically tracing it. RNG injected into a pipeline must maintain evidence of chain-of-custody by California Air Resources Board accredited LCFS third parties. Once the environmental attribute is decoupled and purchased, the physical gas is considered conventional natural has [sic] and can no longer be claimed as RNG by the producer. This prevents double counting. We invite submissions on CBA's comments and welcome intervener evidence, if warranted, on the approach taken by California and other jurisdictions including whether, or how, it is inconsistent with the treatment of Renewable Natural Gas under the GGRR.	p.30

[129] BCSEA Submission dated June 6, 2022, p.6.
[130] CEC Submission dated January 31, 2022, p.5.
[131] CBA Submission dated January 31, 2022, pp. 1-2.

	Submission	Page(s)
12.	MoveUp submits that:[132] > The utility workforce represented by the union has a vital interest in ensuring that FEI achieves a soft landing through the period of transition that is now underway in earnest. Their careers and livelihoods depend on it. FEI's ability to source sufficient non-fossil gas to meet evolving standards is critical to that soft landing, and it must be given the tools to accomplish it. > We submit that the GGRR is similarly aimed at guiding gas utilities through these transitions and should be interpreted and applied to enable success. It should be seen as a tool to serve societal purposes, including providing a pathway to mitigate economic dislocation as we pursue our collective climate goals. MoveUp also submits that:[133] > One objective of energy utility regulators at this juncture should be to enable the survival of the natural gas distribution sector, and its transition to a sustainable future. We invite submissions on these MoveUp comments.	p.30
13.	We also invite submissions on whether recommendations should be made to the Provincial Government to prohibit unbundling of Environmental Attributes – or the notional delivery of Renewable Natural Gas – under certain circumstances. Such circumstances may include: • Biomethane injected in the distribution system of an applicant upstream of all potential customers of Renewable Natural Gas • Biomethane injected in the distribution system of an applicant downstream of all potential customers of Renewable Natural Gas • Biomethane injected in the pipeline system of a third party upstream of an applicant's distribution system • Biomethane injected in the distribution system of a third party that is downstream of the applicant's distribution system • Biomethane injected in a transmission or distribution system of a third party that is not connected in any way to the applicant's distribution system. Further, what relevance, if any, does the province, state or country in which the biomethane is manufactured have? We invite submissions, and evidence where warranted, from parties on this topic.	pp.30-31

[132] MoveUp Submission dated January 31, 2022, p.11.
[133] Ibid., p.1.

	Submission	Page(s)
14.	Section 10 of the GGRR may suggest that lignin, synthesis gas and hydrogen are not considered by the GGRR to be Renewable Natural Gas. We therefore seek submissions on this matter, including the following: 1. Does the definition of Renewable Natural Gas include synthesis gas, lignin and hydrogen? 2. Can gas derived from synthesis gas, lignin and hydrogen be notionally delivered or unbundled?	p.31
15.	The Panel invites submissions, and evidence if warranted, from parties on any other matter they consider relevant to this Inquiry.	