Renewable Natural Gas supplier guide
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FortisBC—Leading energy solutions in B.C.

Canadian owned utility

serving
1.1 million customers

49,000 km of pipeline in BC

4 hydroelectric generating plants

3 natural gas fuelling solutions for transportation

operating in
135 communities

5 RNG supply facilities

2 LNG facilities
Our natural gas system

Natural gas service area
FortisBC pipeline
Spectra Energy pipeline

British Columbia

Aitken Creek
Hudson's Hope
Mackenzie
Prince George
Williams Lake

Fort Nelson

Salmon Arm Landfill
Glenmore Landfill
Surrey Biofuel Facility
Seabreeze Dairy Farm
Fraser Valley Biogas

A few Renewable Natural Gas (RNG) milestones:

• **2010**: RNG was first accepted into our system from Fraser Valley Biogas
• **2011**: FortisBC established our customer program as a two-year pilot
• **2012**: Salmon Arm landfill came online
• **2013**: permanent program was established
• **2016**: regulatory approval for revised RNG rate
• **2017**: BC Climate Policy now allows up to five per cent RNG in natural gas distribution system
FortisBC Renewable Natural Gas customers help support the program.

Yard waste, commercial waste, and residential food scraps are collected at processing facilities.

1. Yard waste, commercial waste, and residential food scraps are collected at processing facilities.

2. Suppliers use organic waste to produce biogas, and then upgrade it into Renewable Natural Gas.

3. Renewable Natural Gas is injected into FortisBC’s existing natural gas pipeline system.

4. FortisBC Renewable Natural Gas customers help support the program.

What is Renewable Natural Gas?

Farms, landfills and municipalities have teamed up with us to capture biogas from decomposing organic waste. This biogas would otherwise escape into the atmosphere, and it contains methane, which is a greenhouse gas. We purify the biogas to create biomethane, or RNG.

RNG is interchangeable with conventional natural gas. It’s injected into our natural gas system, displacing conventional natural gas. Commercial and residential customers can volunteer to support the program by signing up for RNG.

Environmental benefits for B.C.

Greenhouse gas (GHG) emissions

• RNG helps reduce GHG emissions by reducing the amount of conventional natural gas needed.

• Additionally, emissions are reduced when methane (CH₄) is captured and repurposed as RNG, rather than being released directly into the atmosphere.

Carbon neutrality

• RNG is a carbon neutral energy source, because it does not contribute any net carbon dioxide into the atmosphere.¹

• The combustion of RNG releases biogenic carbon dioxide, which does not add to the natural carbon cycle.²

Independent verification

Offsetters, Canada’s leading carbon management solutions provider, independently reviewed FortisBC’s RNG. Offsetters assessed the expected lifecycle emissions savings of Renewable Natural Gas and confirmed that RNG meets the requirements to be granted Offsetters’ Carbon Neutral Product status in B.C.

For more information, read Offsetters’ Biomethane Greenhouse Gas Emissions Review for FortisBC.

Additionally, the B.C. government considers biomethane from organic waste (including agriculture, landfill or wastewater sources) to be a carbon neutral fuel source.³
We’re looking for RNG suppliers

We’ve had great success with our existing suppliers, and are looking to increase our RNG supply. Currently, the B.C. government allows our natural gas system to include up to five per cent RNG, with the remainder coming from conventional natural gas sources.

Our natural gas system currently includes less than one per cent RNG, which means there’s a big opportunity to expand our RNG portfolio and add new projects. We’re interested in working with farmers, municipalities and other organizations that could benefit from RNG production.

Working with FortisBC

FortisBC is uniquely positioned to purchase RNG from B.C. suppliers, and distribute it through our existing natural gas infrastructure to commercial and residential customers across the province.

With several years of real-world RNG experience, we offer many benefits to RNG suppliers, including:

- **Partner stability** – we’ve owned and operated natural gas infrastructure in B.C. for more than 60 years and have invested approximately $15 million dollars in RNG infrastructure to date. RNG purchase agreements with our suppliers are typically between 10-20 years in length. We operate with transparency, receiving oversight from the BC Utilities Commission (BCUC).

- **Proven RNG expertise** – we currently work with five RNG supply projects, including two of our own RNG upgrading facilities. Having worked with RNG suppliers for several years, our team has considerable experience and expertise in RNG processing and delivery.

- **Established market** – FortisBC has a growing RNG customer base wanting a carbon neutral energy source to help them meet their long-term sustainability goals. As of January 2018, our RNG program has more than 9,000 customers.

Benefits for agricultural RNG suppliers

Aside from selling RNG to FortisBC, farms may charge tipping fees to commercial companies, which benefit from providing their organic waste for the farm’s biogas production.

According to the Canadian Biogas Association, additional socio-economic and environmental advantages for farms producing biogas may include:

- improved water quality due to near elimination of pathogen load of manure
- reduced risk of nitrogen and phosphorous leaching
- reduced greenhouse gas (GHG) emissions from livestock
- enhanced fertilizer for crops by recovering nutrients in organic materials
- reduced GHG emissions by replacing fossil fuel consumption with renewable energy consumption
- greater on-farm innovation and job creation
- reduced odour and pathogens


Benefits for municipal RNG suppliers

Municipalities can become RNG suppliers in multiple ways. For example, the City of Surrey has built a biogas production facility that will turn residential organic waste into RNG. Richmond’s Lulu Island wastewater treatment plant is currently producing biogas, and is set to become a FortisBC RNG supplier in 2019. Salmon Arm and Kelowna are each using landfill waste to produce biogas for FortisBC.

Some of the benefits for these municipalities include:

- demonstrating leadership in sustainability by helping residents turn their waste into renewable energy
- reducing GHG emissions by replacing fossil fuel consumption with renewable energy consumption
- further reducing GHG emissions by capturing methane gas that would have otherwise escaped into the atmosphere
- producing RNG that can be used as fuel for municipal vehicles, in the case of Surrey’s Biofuel Facility, and/or
- producing energy for space and water heating, as in the case of the Lulu Island wastewater treatment facility
Connecting suppliers to FortisBC’s system

FortisBC has two models for connecting suppliers to our natural gas system.

**Ownership model 1: FortisBC purchases raw biogas**

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<thead>
<tr>
<th>Supplier owned</th>
<th>FortisBC owned</th>
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<tbody>
<tr>
<td><img src="image1" alt="" /></td>
<td><img src="image2" alt="" /></td>
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Waste source → Landfill

Gas upgrading → Interconnection facility and pipeline

**Ownership model 2: FortisBC purchases Renewable Natural Gas**

<table>
<thead>
<tr>
<th>Supplier owned</th>
<th>FortisBC owned</th>
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<tr>
<td><img src="image3" alt="" /></td>
<td><img src="image4" alt="" /></td>
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Waste source → Anaerobic digestion and raw gas generation

Gas upgrading → Interconnection facility and pipeline

FortisBC can pay up to $30 per gigajoule (GJ) for pipeline quality, purified biomethane. Raw biogas will be purchased from suppliers at a lower price.
Interested in becoming a supplier? Here’s the basic process you can expect to go through, from initial evaluation to construction and production.

1 Preliminary analysis

The primary purpose of this stage is to determine whether a project can meet the minimum requirements. The potential supplier will outline the proposed project to FortisBC, including the ownership model and the following details:

- project synopsis describing the project
- proposed location
- projected volume of RNG and/or volume of raw biogas

At this stage FortisBC may require the supplier to demonstrate a basic level of financial stability. FortisBC will perform a preliminary cost estimate for an interconnection station and pipeline. If the supplier is considering ownership model one, FortisBC will do an initial cost estimate that includes the purification facility.

Minimum requirements met?

- location is suitable
- total volume of RNG/biogas is within FortisBC program limits
- cost threshold is met

Proceed to next step

2 Feasibility study

Both the supplier and FortisBC will further determine the viability of the project. This includes:

- refining the cost estimate
- reviewing the technical feasibility of the project
- defining the capital contribution required by the supplier
- estimating the total cost per gigajoule

The result of this study will either be a project assessment (if FortisBC will own the biogas upgrader) or...
a cost and feasibility report for the potential supplier. The final cost per GJ will be communicated to the supplier based on the following:

- FortisBC facility and pipeline costs
- proposed site and pipe routing
- identification of any costs required by FortisBC from the supplier

FortisBC will confirm with the supplier whether or not the total price per GJ meets the criteria.

**Is the project feasible for both parties?**

- FortisBC confirms the total cost for the project
- FortisBC confirms the anticipated biogas/biomethane volumes will result in a final price within the price cap
- Supplier confirms total project price meets their criteria
- Supplier obtains its internal approvals and confirms the project will meet their requirements

**Proceed to next step**

**Purchase agreement**

At this stage it’s time to formalize a contract. FortisBC will provide a contract based on a standard form for either biogas (ownership model 1) or biomethane (ownership model 2). This standard form of agreement is used to expedite the required approval with the BCUC. The terms of the agreement will include but may not be limited to the following:

- commodity supplied (biogas or biomethane)
- contract term (in years)
- price paid by FortisBC per GJ
- allowable maximum gas volume, including seasonal capacity limitations (if any)
- supplier commitment to minimum volume
- gas quality specification
- ownership of environmental attributes
- land access and use
- description of each party’s facilities (or equipment)

**Has the agreement been negotiated and signed by both parties?**

**Proceed to next step**

**Regulatory approvals**

Once signed by FortisBC and the supplier, the purchase agreement will be filed with the BCUC for final approval.

At this stage, the supplier may also be securing financing and getting permit approvals as required.
Project execution

With approvals, permits and financing in place, FortisBC will work with the supplier to coordinate project design, construction, and commissioning. From this step forward, if the supplier does not follow through with its commitments, they may be liable for any costs incurred by FortisBC. Prior to incurring any costs, FortisBC may require the supplier to demonstrate that it has secured financing and can complete the work.

Execution phases

1. **Project design**
   FortisBC and the supplier will complete a detailed project design, including technical details for interface. At this point, FortisBC will coordinate the construction and commissioning schedule with the supplier.

2. **Construction**
   Following approval by the BCUC, the supplier will have a fixed time to finish installation and commissioning of its facilities. FortisBC and the supplier will coordinate the procurement of the components needed to construct the facilities. This may include a digester or gas collection equipment, upgrading equipment and the interconnection facility.

3. **Commissioning**
   All facilities and components will be rigorously tested to ensure systems are fully operational. FortisBC will coincide commissioning of its facilities with the supplier's whenever possible. Note:
   - this step will require gas flow from the supplier
   - FortisBC will be on site to ensure gas quality requirements are met

4. **Ongoing operations**
   After successful commissioning and demonstration that the supplier can meet operational requirements, FortisBC will begin paying the supplier.
   At any time, FortisBC may require the supplier to demonstrate its facilities continue to meet environmental standards and gas quality specifications.
Case studies

Seabreeze Farm

Seabreeze Dairy farm in Delta, B.C., has been operating for more than 30 years. Becoming a Renewable Natural Gas supplier was a natural fit, because it gave them a unique way to manage their nutrients while generating an additional revenue stream to keep the farm viable for future generations. Their biogas plant commenced operations in 2015.

Inputs
- dairy cattle manure
- off-farm organic wastes

Overall facility description
- anaerobic digestion for biogas production
- water wash upgrading technology
- approximate footprint:
  - 6,000 sq. ft. for digester
  - 1,500 sq. ft. for upgrader
- upgrading equipment owned by Seabreeze (ownership model two)

Outputs
- Renewable Natural Gas projected at 45,000 GJ/year
- digestate/fertilizer and cow bedding

"We host tours and find that consumers really like the RNG program. We’re proud to be part of it... FortisBC has been really cooperative; it’s a real team effort to make it work. And as a farmer, we’re ready to face the future better now than if we’d just continued business as usual."

Jerry Keulen, Owner, Seabreeze Dairy Farm

City of Kelowna

Owned and operated by the City of Kelowna, the Glenmore Landfill serves as the only active landfill for the Central Okanagan. They collaborated with FortisBC to make use of their biogas as a sustainable energy source. FortisBC built, owns and operates the biogas plant on site that commenced operations in 2015.

Inputs
- landfill waste from residential, commercial, and industrial customers

Overall facility description
- landfill gas generation and capture
- pressure swing adsorption upgrading technology
- approximate footprint:
  - 14,000 sq. ft. for upgrader compound
- upgrading equipment owned by FortisBC (ownership model one)

Outputs
- Renewable Natural Gas projected at 45,000 GJ/year

"FortisBC has top notch people... and taking part in the RNG program has allowed us to make progress towards achieving the requirements of the BC Landfill Gas Regulations. We also get financial benefits from selling landfill gas, and we’re able to show municipal support for sustainability."

Scott Hoekstra, City of Kelowna
City of Surrey

The City of Surrey is working to become a North American leader in sustainable practices. One of their biggest sustainability achievements to date is the Surrey Biofuel Facility, which commenced operations in 2018.

Inputs
• source-separated organic waste from municipal and commercial customers

Overall facility description
• two-step process:
  - anaerobic digestion for biogas production
  - aerobic compost production
• water wash upgrading technology
• approximate footprint:
  - 140,000 sq. ft. for waste receiving and processing, dry batch anaerobic digestion and compost bays, education centre and administration
  - 14,000 sq. ft. for upgrader
• upgrading equipment owned by City of Surrey (ownership model two)

Outputs
• Renewable Natural Gas projected at 100,000 GJ/year
• compost

“By working with FortisBC, we can add Renewable Natural Gas from the new biofuel facility to the distribution system already in place, and then draw it out where we need to fuel. It gives us great flexibility and efficiency while reducing our carbon footprint.”

Rob Costanzo, General Manager, Corporate Services, City of Surrey
Additional resources

Please visit fortisbc.com/renewable for more information about how our RNG program works.

The Canadian Biogas Association is the collective voice of the biogas industry and it provides valuable resources for the exploration of new developments and new markets for RNG. Please visit their website at biogasassociation.ca and select from the “Resources” menu:

- for the agricultural sector, please read “Developers’ Guides”
- for municipalities, please read “Closing the Loop” and "Municipal Guide to Biogas"

Getting started

Interested in becoming an RNG supplier for FortisBC?

After you’ve reviewed this guide and additional resources, please contact the FortisBC Renewable Natural Gas team to ask any questions you may have, or to initiate the project evaluation process:

biogasprogram@fortisbc.com
604-592-7659