RNG at FortisBC: The Gas is Greener on the Other Side

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FortisBC's Renewable Natural Gas Program

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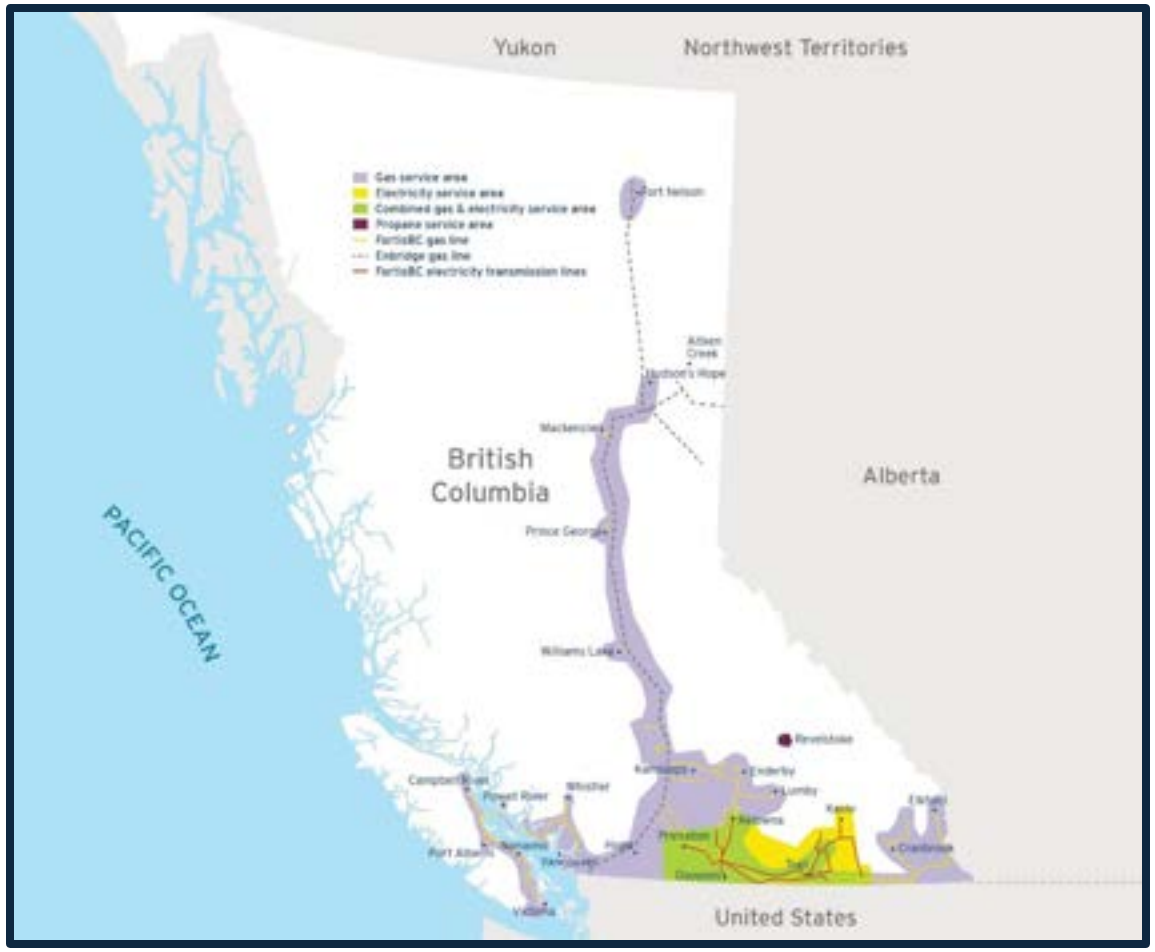
28 October 2025

Agenda

1. FortisBC's RNG Program
2. RNG 101 - Biogas and Upgrading
3. Agricultural RNG Site: Dicklands Farms
4. Snapshot of FortisBC Operating Facilities

FortisBC – Energy for a Better BC

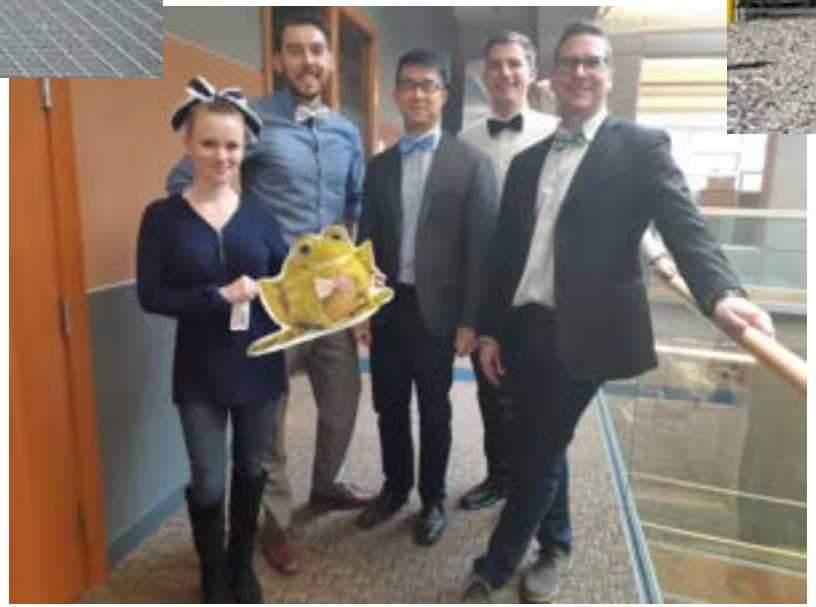


We're a Canadian-owned, B.C.-based regulated utility with more than 2,700 employees across the province.

We proudly deliver Renewable Natural Gas[1], natural gas and electricity to almost 1.3 million customers in 135 B.C. communities, and 58 First Nations communities across 150 Traditional Territories.

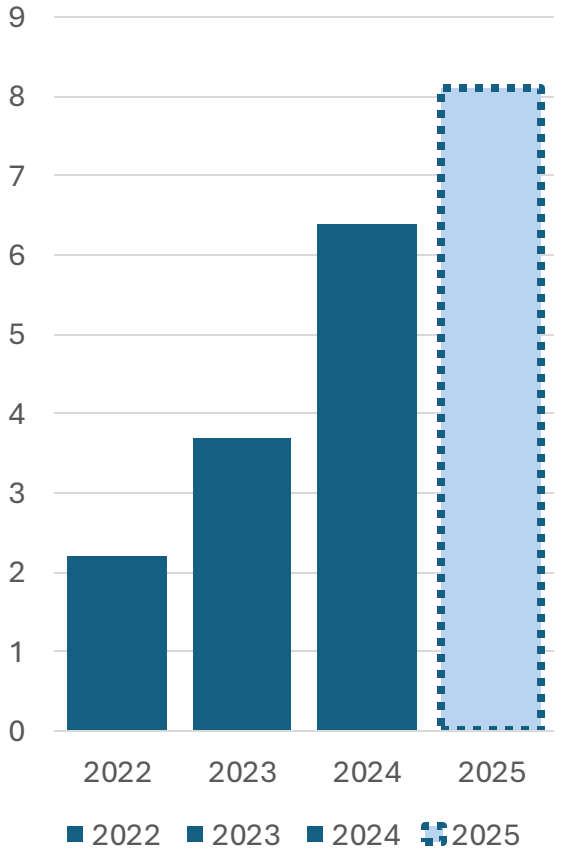
[1]Renewable Natural Gas (also called RNG or biomethane) is produced in a different manner than conventional natural gas. It is derived from biogas, which is produced from decomposing organic waste from landfills, agricultural waste and wastewater from treatment facilities. The biogas is captured and cleaned to create RNG. When RNG is added to North America's natural gas system, it mixes with conventional natural gas. This means we're unable to direct RNG to a specific customer. But the more RNG is added to the gas system, the less conventional natural gas is needed, thereby reducing the use of fossil fuels and overall greenhouse gas emissions.

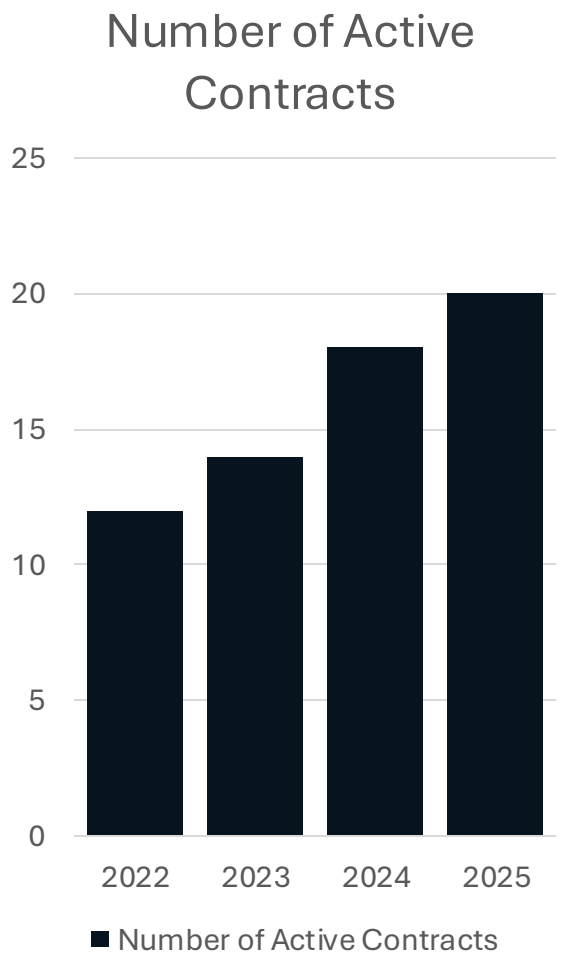
What does our RNG Department do?



- Full project lifecycle support, from bowties to coveralls
- Technical oversight of plants and stations
- Commercial account management, RNG supply contracts

RNG Program Growth





- 33x growth in annual supply of RNG over 5 years
- Reached 1 million GJ of production from BC projects in 2025
- 10 RNG facilities connected to the FortisBC network

Renewable Natural Gas 101

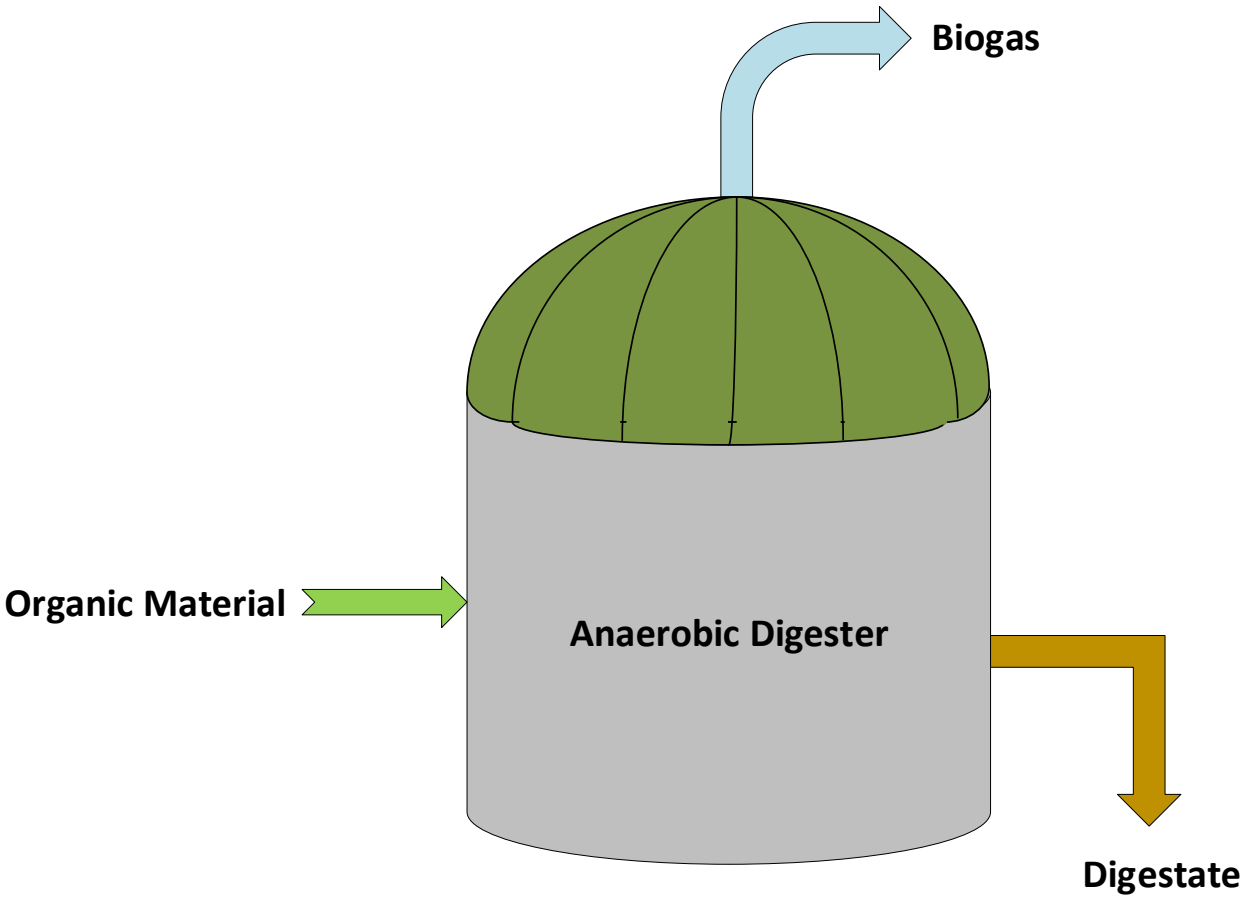
Surrey Biofuel – Surrey, BC

What is biogas?

Fraser Valley Biogas – Abbotsford, BC

- Biogas is a gaseous mixture formed from the decay of organic material by microorganisms in the absence of oxygen.
- The main gas constituents are methane (40-60%) and carbon dioxide (30-50%).
- Trace contaminants like hydrogen sulfide, siloxanes, and volatile organic compounds may be present.

Biogas Generation via Anaerobic Digestion

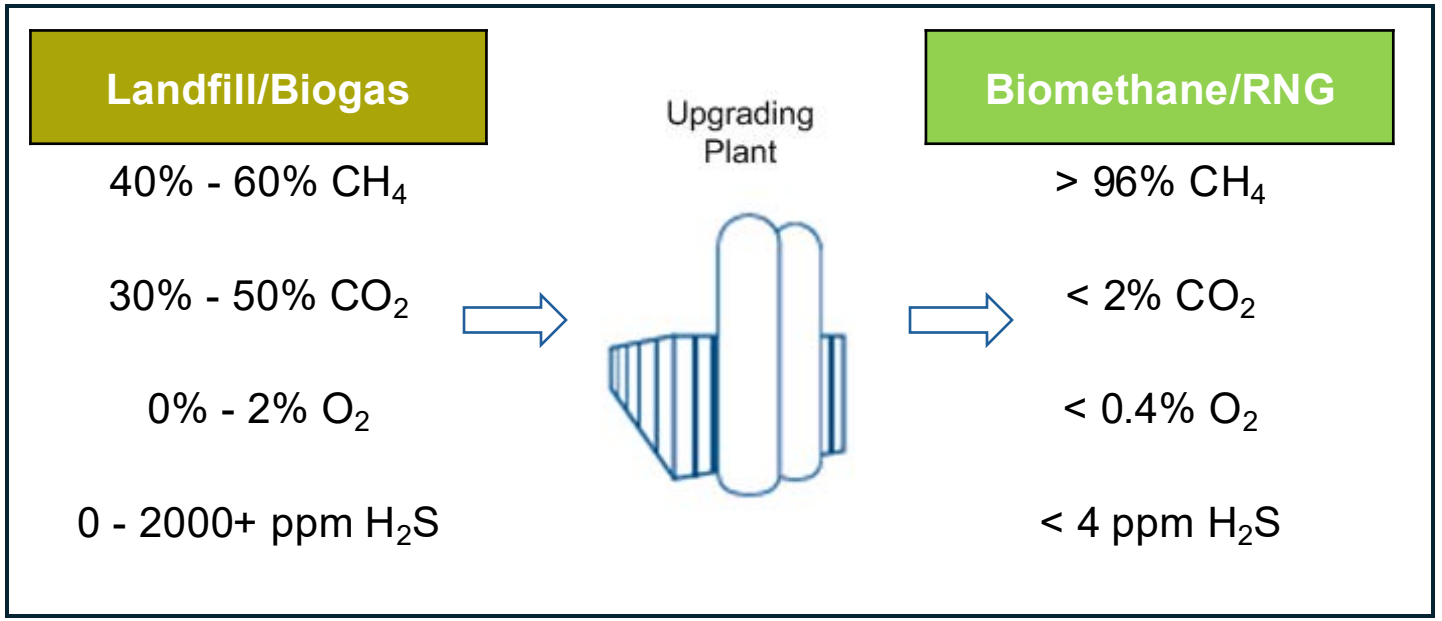


Digestate

Digestate

- Digestate is the liquid remainder after anaerobic digestion. It is essentially an organic fertilizer.
- It can be land-applied in areas that are not nutrient overloaded.
- Otherwise, it is often further processed into a solid form.

What is upgrading?



Upgrading is the process of removing contaminants and concentrating methane to pipeline quality.

Technology options include water wash, pressure swing adsorption, membranes, and cryogenic separation.

The FortisBC pipeline specification was developed based on CGA's published guidance

Biogas Upgrading Process

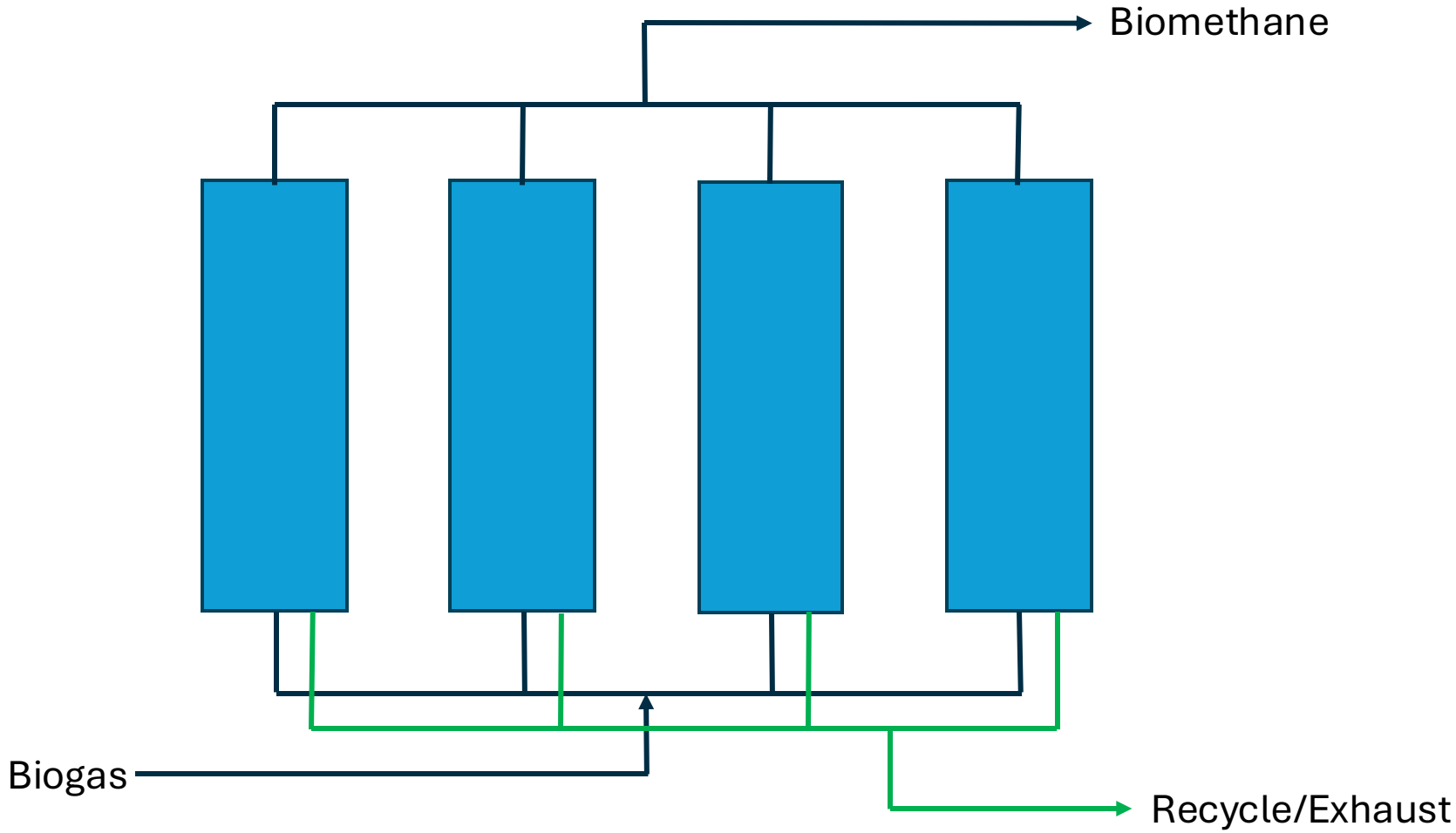
Salmon Arm Biogas Plant (2019)

Contaminant Removal

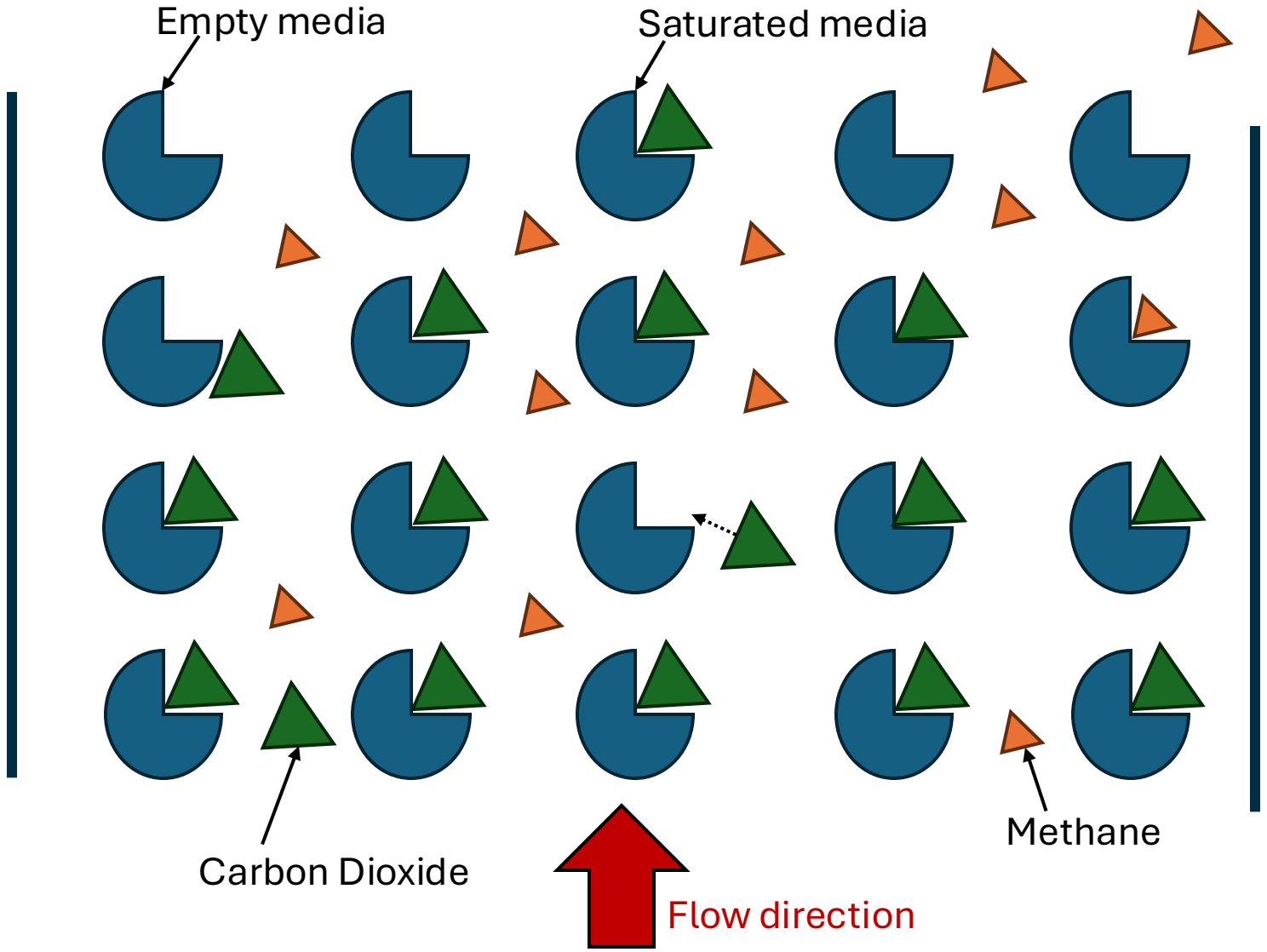
Hydrogen sulfide removal vessel at the Kelowna Biogas Plant (2021)

- Biogas contains constituents like hydrogen sulfide, siloxanes, and VOCs in small quantities.
- These contaminants are typically removed through adsorption onto media.
- Removal of contaminants is vital as these constituents can have harmful effects on the rest of the process.

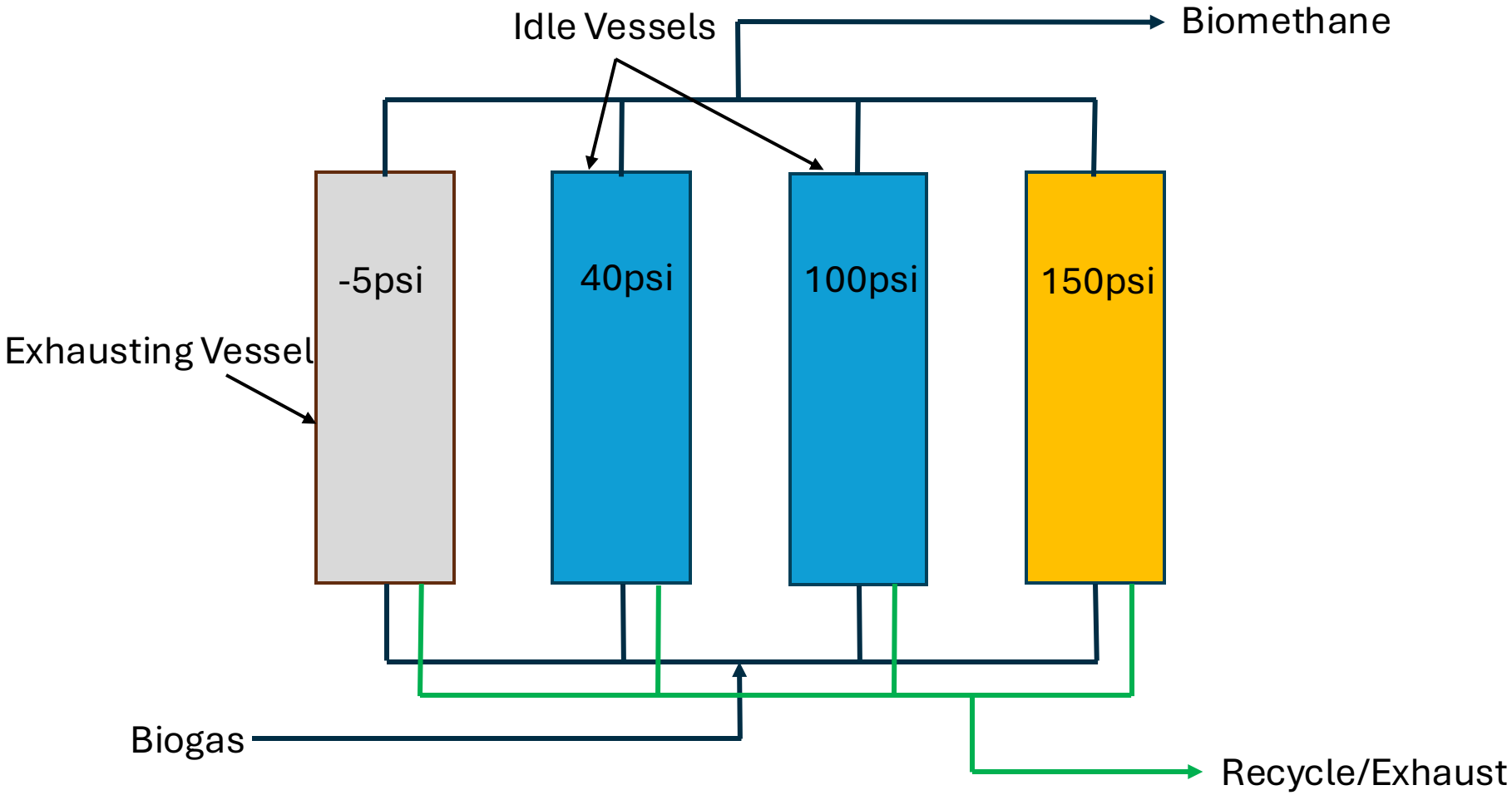
Gas Separation - PSA



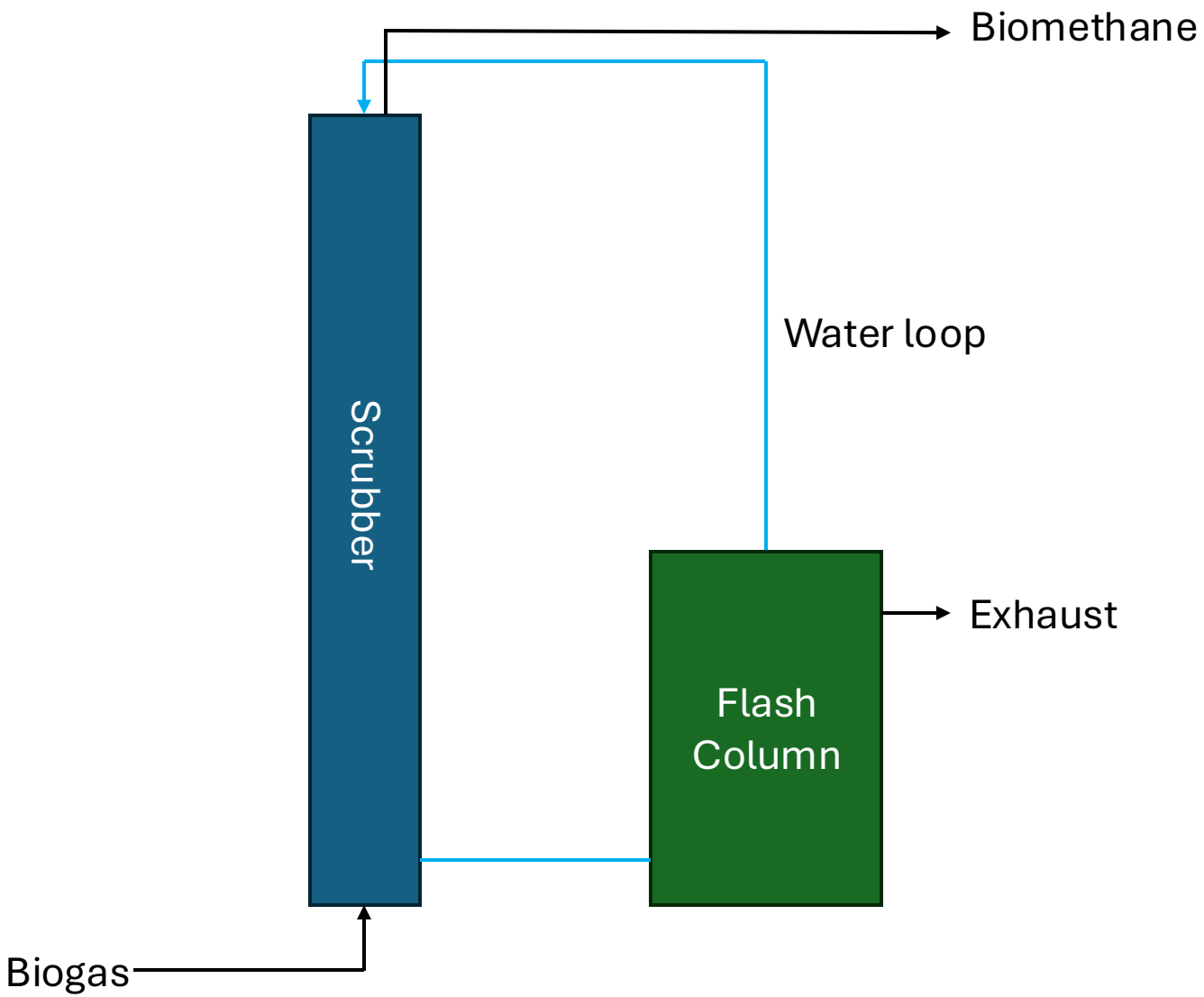
Gas Separation – Inside a PSA Vessel



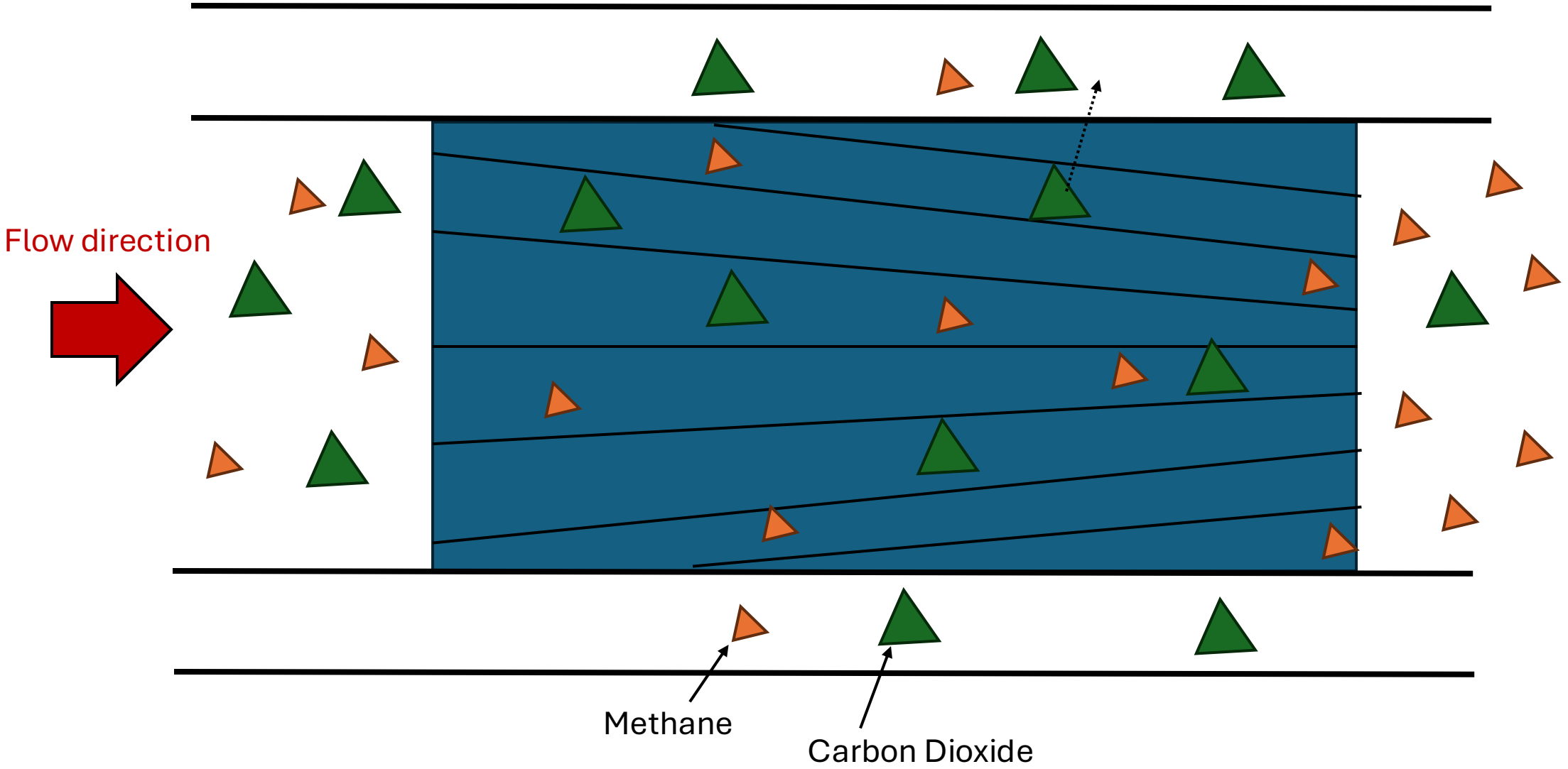
Gas Separation - PSA



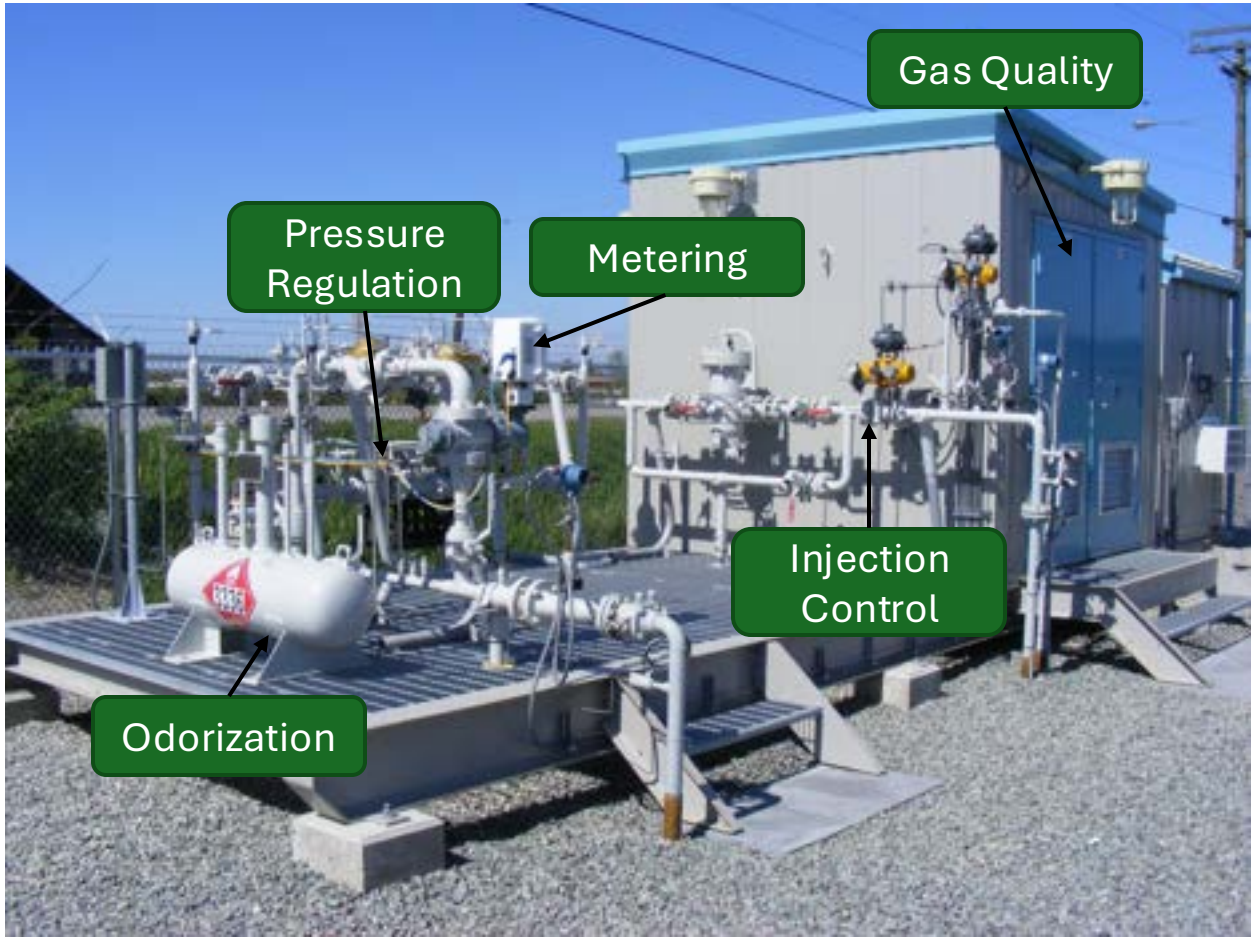
Gas Separation – Water Wash



Gas Separation - Membrane



FortisBC Interconnection Station



Interconnection station at Seabreeze Farms – Delta, BC

Dicklands Farms

Family-run dairy farm in Chilliwack, BC

Occupies 400 acres and has 300+ cows

Dicklands Biogas Timeline

2012: Original contract signed

2013 - 2019: Revised the site design several times due to changing permitting requirements and incorporating learnings from similar projects in the region

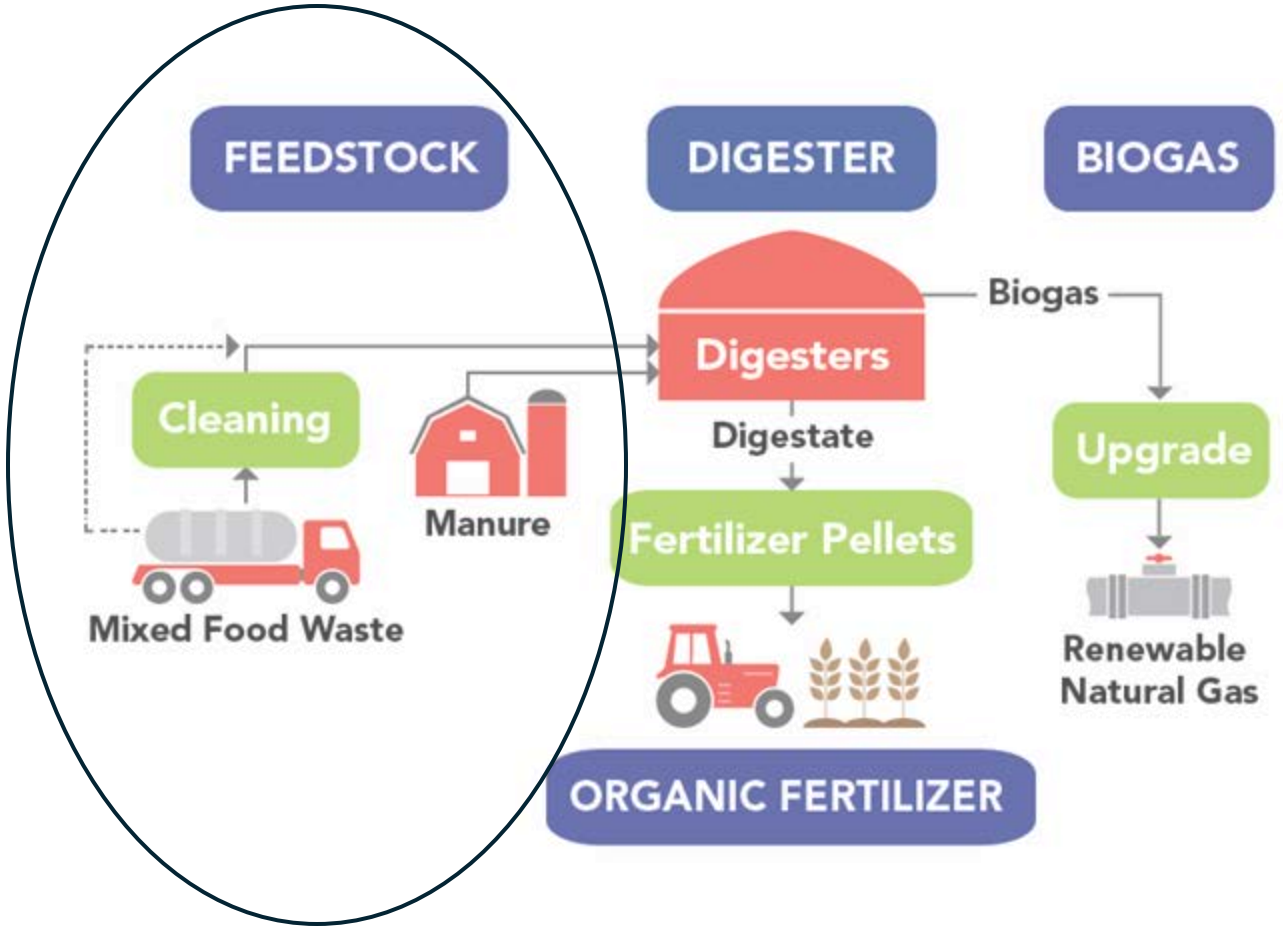
2020: Final design & contract re-negotiation complete

2021: Construction started

2023: Startup & first gas to grid

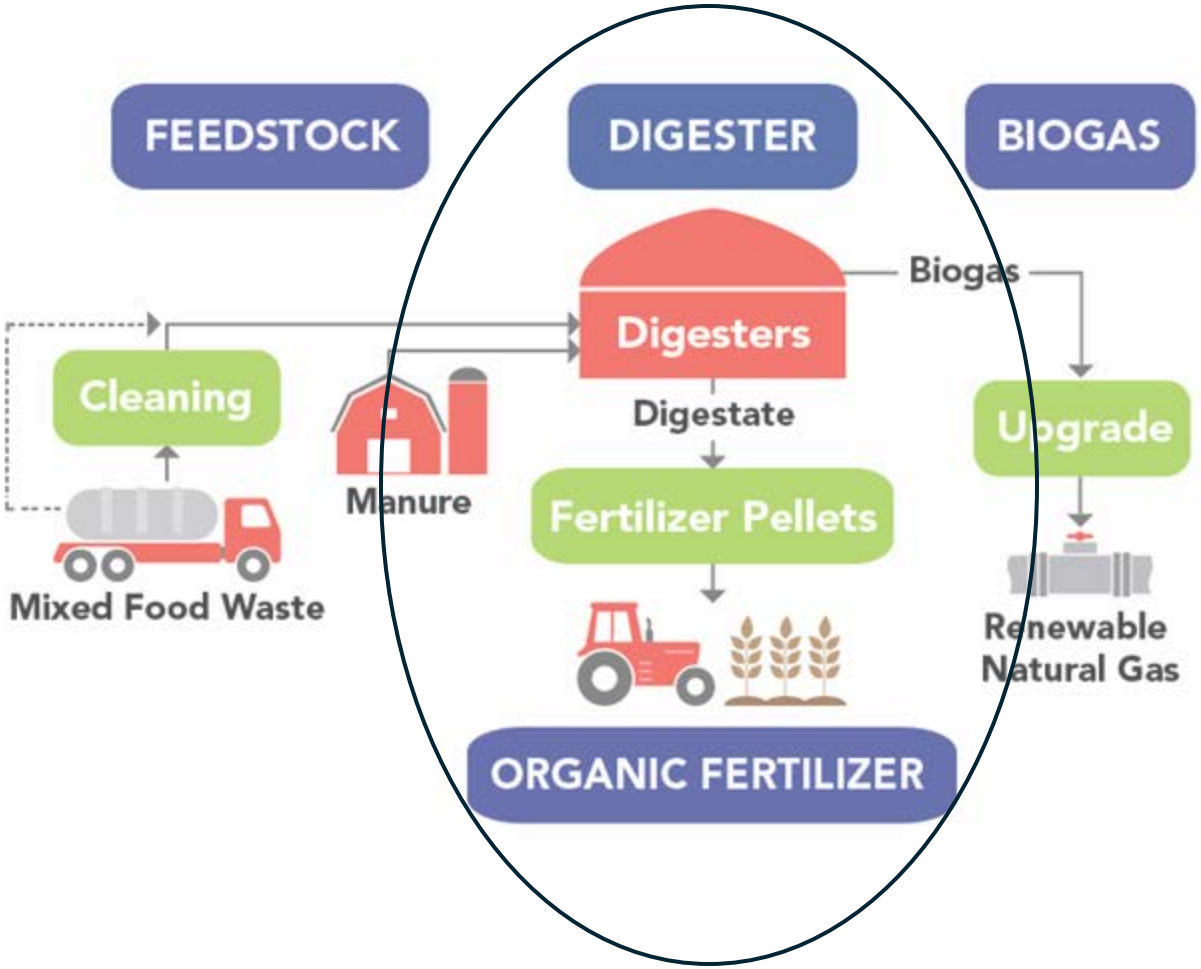
Dicklands Biogas - Feedstock

- Processes manure from on-site sources and local dairy and poultry farms
- Accepts liquid and solid food waste from a variety of sources:
  - Food processing waste
  - Supermarket & restaurant waste
  - Spoiled food, green bin & residential waste
  - Fats, oils, and greases
- Capable of receiving both clean waste and waste with non-organic contaminants through the use of de-packing equipment. This separates out plastic, cartons, tin, paper, etc.



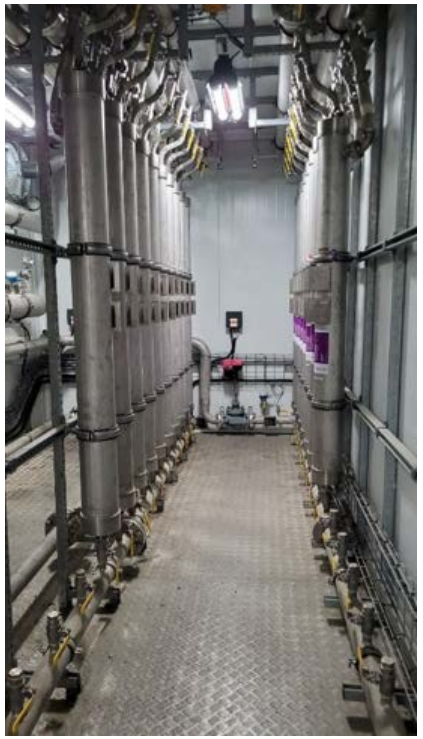
Dicklands Biogas - Digester

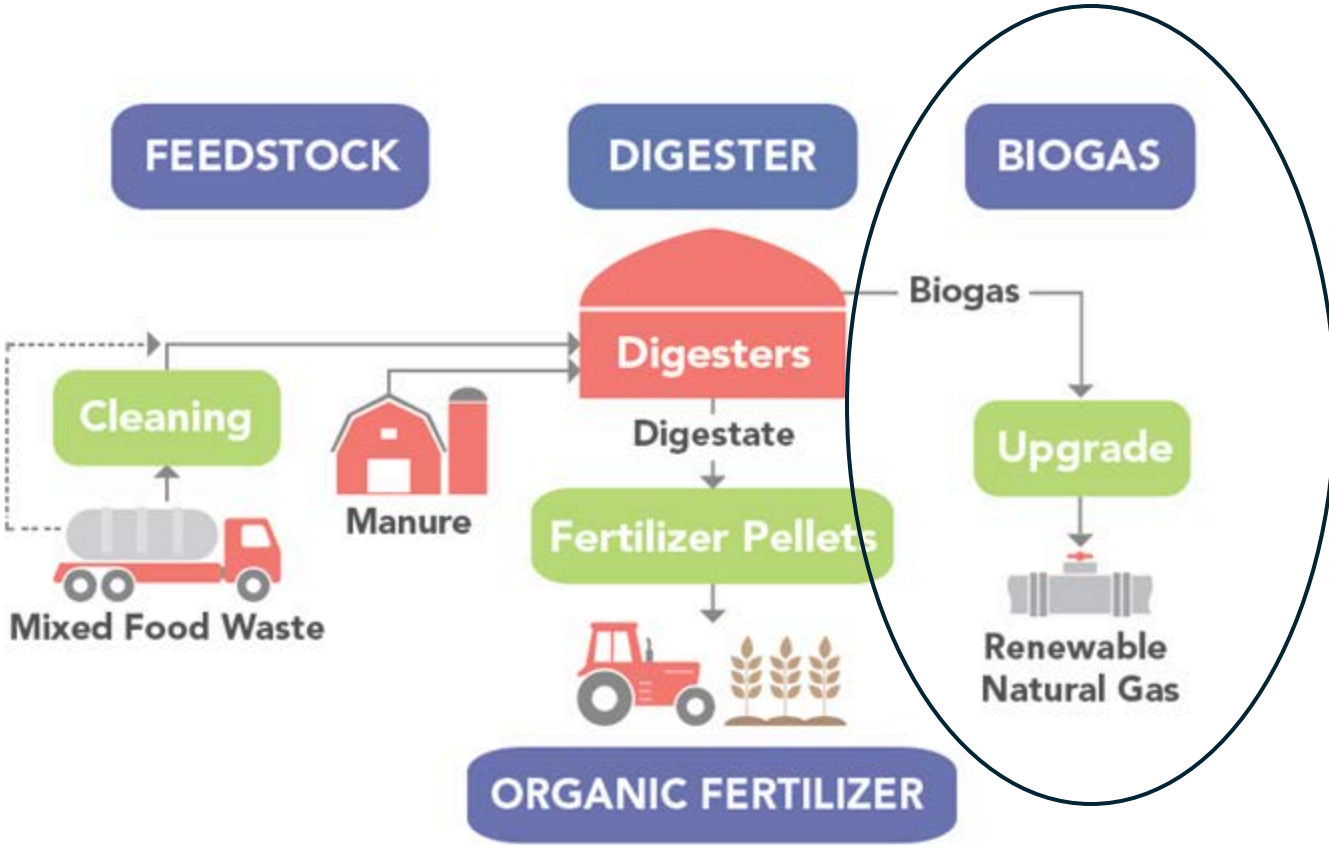
- Capable of processing 80,000 tonnes of organic waste / year
- Digestate is further dried and turned into fertilizer pellets (>85% dry product)
- Pellets contain 4% nitrogen, 3% phosphorus, 4% potassium



Dicklands Biogas

- 3-stage membrane separation system (typically capable of >99% efficiency) operating at up to 230 psi
- Produces up to 110,000 GJ/yr





Salmon Arm Landfill

Salmon Arm, BC
2013: First landfill project in BC
15,000 GJ/Year

City of Kelowna – Glenmore Landfill

Kelowna, BC
2014
65,000 GJ/Year

City of Surrey Biofuel

Surrey, BC
2018
80,000 GJ/Year

Lulu Island Wastewater

Richmond, BC
2020
60,000 GJ/Year

Delta RNG

Delta, BC
2024
700,000 GJ/Year

Hartland Landfill

Making a difference...together

WAGA ENERGY

Victoria, BC
2025
375,000 GJ/Year

City of Vancouver Landfill

Delta, BC
Startup in 2025
265,000 GJ/Year

Thank you!

Mason Lau

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