

Value of Biogas West - Vancouver

Powerco Renewable Gas Team

David Hendry and Elizabeth Smart | Nov 2024



Gas & electricity Network

28,441

Kilometres of lines and cables covered by our network

345,000

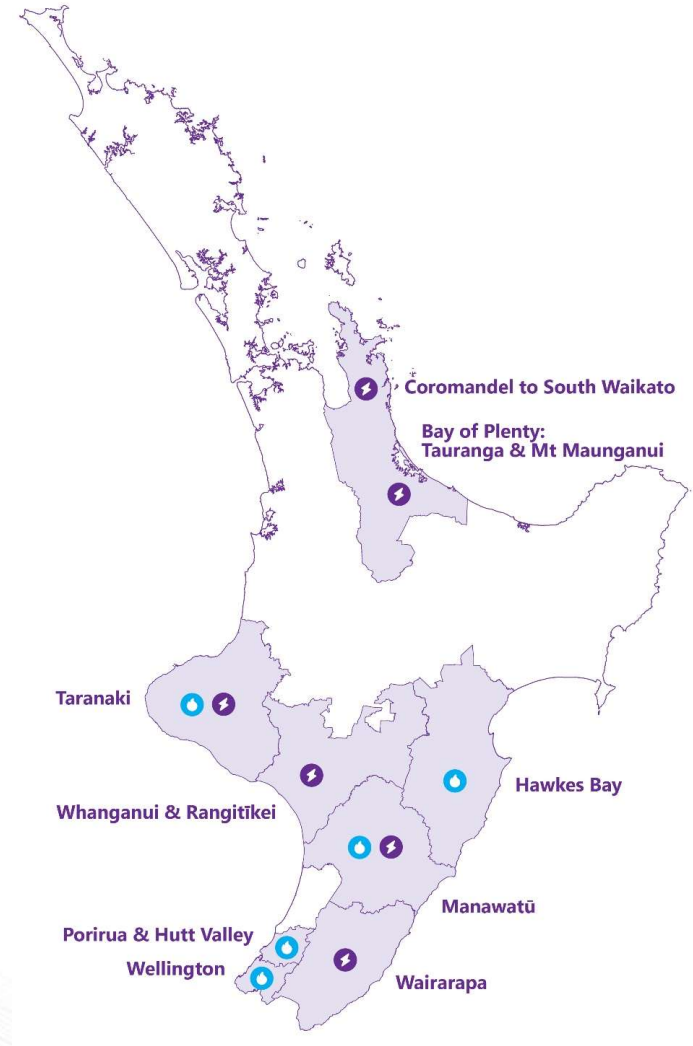
Homes, businesses and industries connected to us

6,100

Kilometres of pipes make up our network

112,000

Homes, businesses and industries connected to us



Why Canada?



OUR FOCUS

Net Zero Climate Goals

- Carbon markets (carbon tax, cap & trade, OBPS)
- Clean fuels regulation (LCFS, CFS)
- Offset systems (TIER, GHG)
- Clean energy investments

Clean Fuels & Renewable Energy

- Electricity
- RNG
- Vehicle fuel
- Power to gas
- Hydrogen

Organic Materials & Digestate Management

- Circular economy
- Diversion policy
- Soil health
- Green procurement
- Approvals
- Standards, plastics
- Compostables



Dicklands Biogas Site Visit



Dicklands Biogas - Feedstocks



Dicklands Biogas - AD



Dicklands Biogas – Biogas Upgrading



Dicklands Biogas Digestate and Biomethane

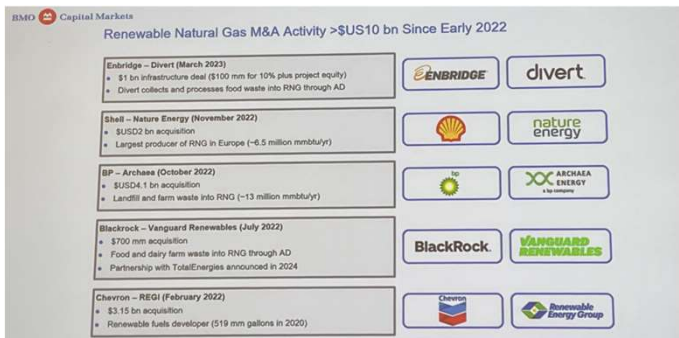


Value of Biogas West Conference

- Run by Canadian Biogas Association
- Attended by 300+ delegates from Europe and the Americas (+2 from Oceania!)
- 42 exhibitors
- Held over 2 days and covered a huge range of topics, particularly relevant for RNG operators and developers



Value of Biogas West Conference – Debt, Equity & Risk



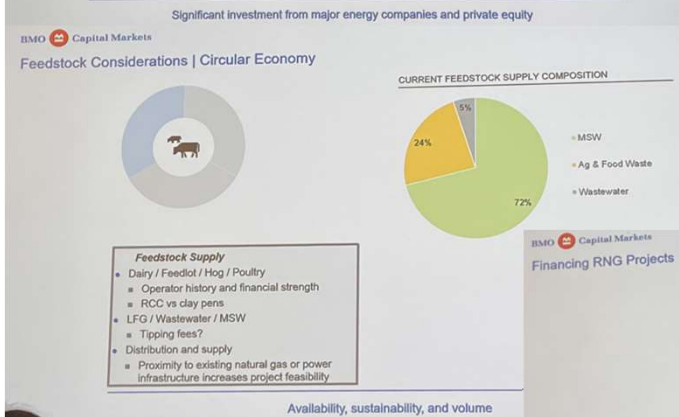
BMO

- M&A activity
- Debt funding DD

Risk Management Contractual Interface

	What to look out for	Why?
Review	<ul style="list-style-type: none"> All relevant project agreements Including the loan agreement 	<ul style="list-style-type: none"> Early insurance input to negotiations but Risk allocation first, then insurance strategy
Make sure to Comment on	<ul style="list-style-type: none"> Risk allocation from an insurability perspective Risk Transfer for Works Force Majeure and Liquidated Damages Warranties Indemnities Insurance requirements Consistency of drafting with insurance strategy 	<ul style="list-style-type: none"> Benchmark against industry standards Risk allocation ties-in with insurability Optimized contractual position where insurable and transfer where uninsurable Identify unusual risks and potential gaps Avoid overlapping insurance purchase and reduce costs Access to contractor's insurances
Remain Engaged on	<ul style="list-style-type: none"> Drafting of clauses Insurance requirements Negotiations with stakeholders 	<ul style="list-style-type: none"> Complement legal counsel's work Informed commercial decisions with insurance understanding
Make sure to audit:	<ul style="list-style-type: none"> Contractors insurances 	<ul style="list-style-type: none"> Ensure ability to comply and reduce non-compliance Ensure contractor's compliance
Look for Support on:	<ul style="list-style-type: none"> Placement process Policy wording development 	<ul style="list-style-type: none"> Educate insurers of your risks Pursue cover for identified risks Reduce costs caused by uncertainty

- ↓ Reduced risks for Owner's and Developers
- ↑ Widest insurance protection
- ↓ Optimum insurance spend for owner's and developers
- ↑ Compliant insurance program

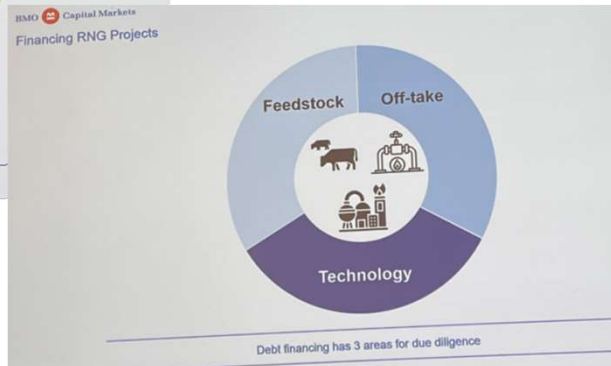


Marsh

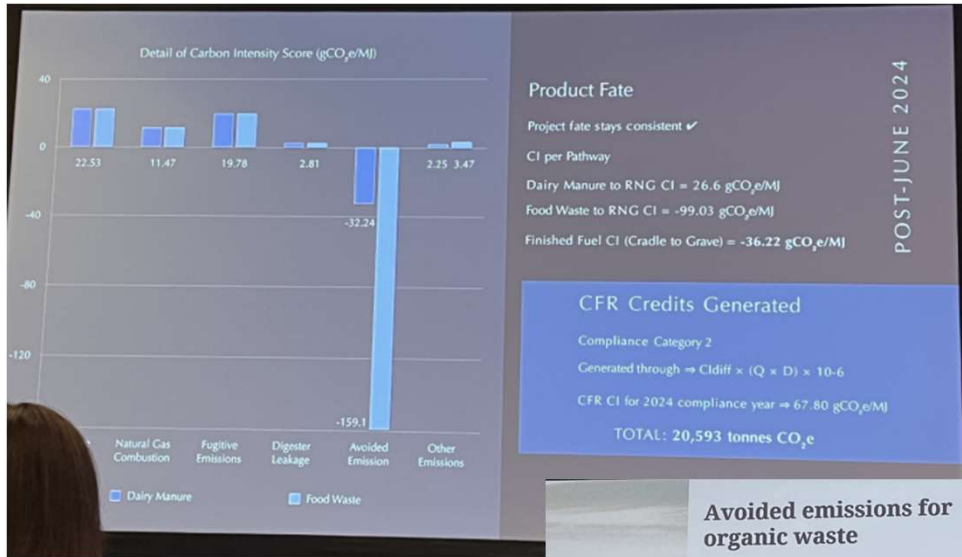
- Optimising project for insurance outcomes
- Innovative RNG insurance products

Key Developments in the Alternative Risk Financing Marketplace

- Technology Risk/Efficacy Risk or Performance Guarantee.
- Tax insurance for ITC's.
- Credit Insurance.
- Supply Chain Risk Transfer.



Value of Biogas West Conference – Carbon Intensity



Modelling Results

g CO ₂ e/MJ	Dairy Manure	Food Waste
NG combustion	11.5	11.5
Fugitive emissions	9.7	9.7
Electricity	3.9	3.9
Fuel distribution	0.76	0.76
Fuel combustion	0.41	0.41
Avoided emissions	-34.9	N/A
TOTAL	-8.7	26.2
CREDITS*	4,372	5,943

*calculated in accordance with Section 95 of the CFR

Avoided emissions for organic waste

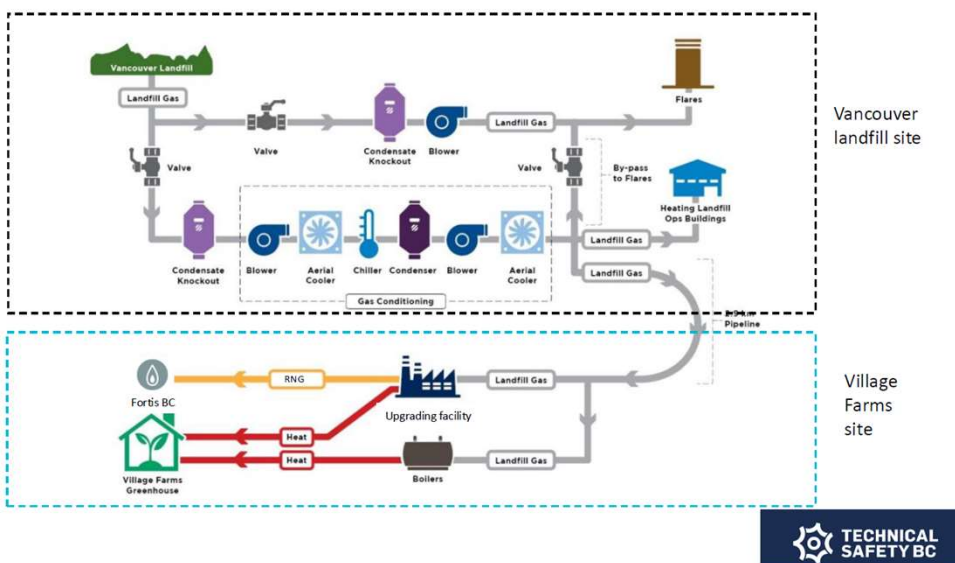
- Food Waste (FW)**
 Avoided landfill and compost emissions
 • Only waste from preparation and consumption of food
3.154 kg CO₂e avoided / dry kg FW
- Yard and Garden (YG)**
 Avoided landfill and compost emissions
 • Organic waste from landscaping activities (grass, leaves, etc.)
4.003 kg CO₂e avoided / dry kg YG
- Source-Separated Organics (SSO)**
 Avoided landfill and compost emissions
 • Separately collected (green bin) mix of FW and YG
3.689 kg CO₂e avoided / dry kg SSO
- Other Solid Organic Waste (OSOW)**
 Avoided landfill emissions only
 • Solid waste that does not fall into above categories
10.772 kg CO₂e avoided / dry kg OSOW

Confidential and Proprietary | www.anewclimate.com | 4

LCA, CI and Carbon Credits

- CFR
- Optimising avoided emissions for carbon credits
- Make or break – project economics

Value of Biogas West Conference - Projects



Vancouver landfill

St.Sophie: Vital Stats

TOTAL BIOGAS: 13,273 Nm³/day
 AVERAGE CH₄: 52%
 ENERGY: 275 GJ/D
 LOWEST BMP FEEDSTOCK:
 DAIRY MANURE-45m³/T
 HIGHEST BMP FEEDSTOCK:
 CORN STOVER-296m³/T
 CRANBERRY WASTE: 160m³/T
 FITEC DIG: 200 kW thermal
 AG DIG: 180 kW thermal
 CONNECTED LOAD: 420kW

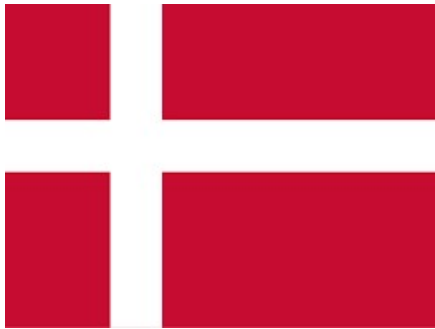
FITEC

St. Sophie, Quebec

Digestion Process Flow Calculation				
Organic Waste Type	Mass	TS delivered	Contaminants	Clean material TS
	tonne/day	%	%TS	t TS
Liquid bovine manure	110.06	12.00%	1.00%	13.08
Dry bovine manure	23.02	27.00%	1.00%	6.15
Cranberry silage	7.67	30.00%	1.00%	2.28
Soya silage	7.67	30.00%	1.00%	2.28
Corn stalks	15.34	45.00%	0.00%	6.90
Total input	163.76	18.89%	1.00%	30.69

oTS	oTSv	Gas yield (lab results)	Biogas Yield	Methane content
%TS	%oTS	Nm ³ /toTS	Nm ³ /t	%
77.60%	87.64%	483.36	44.56	50.20%
65.00%	46.00%		57.00	51.80%
90.00%	80.00%		160.00	55.30%
90.00%	83.00%		164.00	51.80%
90.00%	90.00%		296.00	53.10%
79.70%	80.40%		81.05	51.97%

Value of Biogas West Conference – Other Policy Drivers



Denmark

Decarbonizing our Customers



Blends of 5, 10, 25, 50 or 100% as Renewable Gas.
Pay a premium for incremental RG amount.

All sales customers to be designated a portion of
Renewable Gas beginning July 1, 2024.
Percentage to increase over time to meet.

Fortis BC

- RNG target
- RNG purchase price

Regulatory Landscape for Renewable Gases

Energy at work FORTIS BC

- BC's *Clean Energy Act* authorizes the *Greenhouse Gas Reduction Regulation (GGRR)* which sets out "Prescribed Undertakings"
- The GGRR is intended to reduce GHG emissions by:
 - incenting domestic production of low-carbon and renewable fuels
 - enabling the use of low-carbon fuels for transportation
 - enabling decarbonization opportunities for remote communities
- As of 2023, the GGRR has enabled over 30 RNG projects, utilizing agricultural waste, landfill gas, and wastewater.
- Eight RNG facilities in BC are operational and producing RNG.

EC Engineers



Value of Biogas West Conference – Key takeaways

- Co-digestion is the in thing, and feedstock is key.
- The future is positive, and momentum is building fast in the North American RNG sector. Largely driven from policy, financial incentives, scale.
- Lessons have been learned already in the North American RNG market – we can leverage this.

Fraser Valley Biogas Site Visit



Catalyst Greenlane® Rimu – Fully Installed



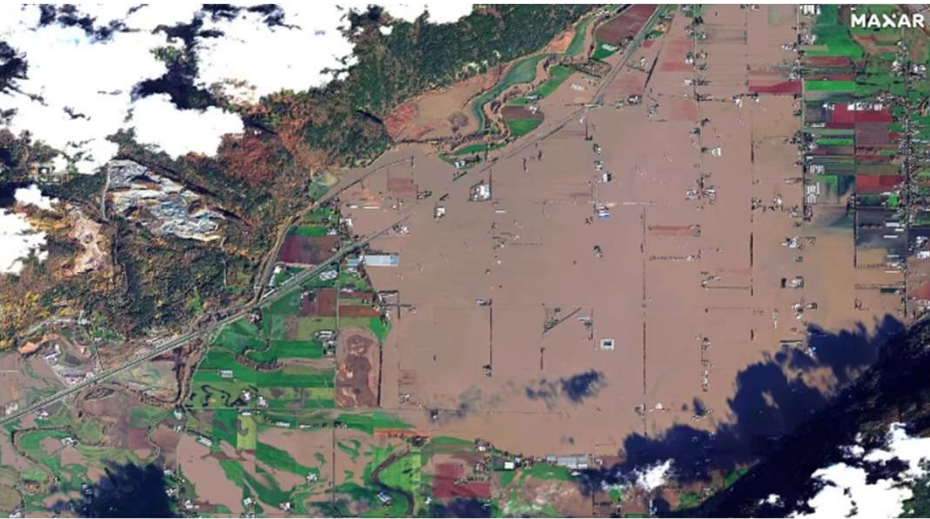
Catalyst Site – August 2010

- First biomethane project in Canada, commissioned in 2010
- Sufficient gas to supply 10,000 homes
- Feedstock of dairy, pig, poultry and food waste
- Original set up was a Greenlane Rimu water wash upgrade system – built in Mangere Bridge



Fraser Valley Biogas

June 2021 – Sumas Prairie Floods



Fraser Valley Biogas – Upgraded Facility



- Plant purchased by Evergen in 2021, expansion project planned
- Two new digesters and new upgrading technology installed through 2022/2023, increased capacity to 190 TJs



Fraser Valley Biogas Site Visit



TerraVest Upgrading System installed with PSA modules

99.2% uptime and record outputs



EverGen Infrastructure Corp. + Follow ...
EVERGEN 2,171 followers
4mo • 🌐

EverGen Announces Record RNG Production at Fraser Valley Biogas in June 2024

EverGen is pleased to announce it has achieved new record single-day and monthly production of RNG at Fraser Valley Biogas for June of 2024. New production records are as follows:

Daily Production Record: 530 GJs

Monthly Production Record: 10,758 GJs

🔥 Click below for the news release.

<https://lnkd.in/gHwvCfbQ>

TSX: #EVGN | OTCQX: #EVGIF

#RenewableEnergy #RNG #NewsRelease

NEWS RELEASE EverGen Infrastructure Announces Record RNG Production at Fraser Valley Biogas in June 2024
businesswire.com

🌱 39 2 comments · 3 reposts

