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Clearing the Path:
Natural Gas and the Biogas Opportunity

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uniongas
A Spectra Energy Company

Union Gas Limited

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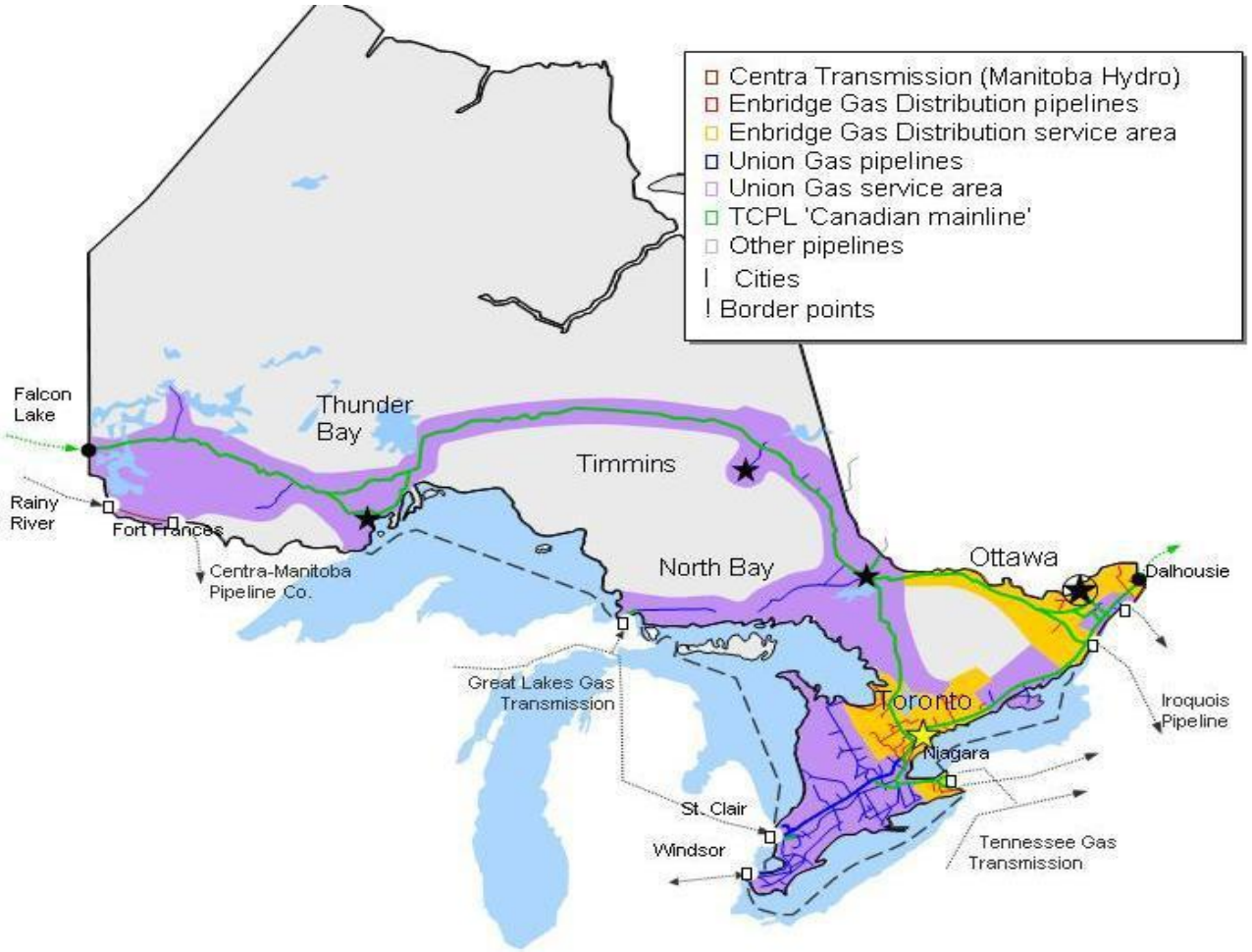
- Delivers natural gas to homes and businesses in northern, southwestern and eastern Ontario.
- Approximately 1.3 million residential, commercial and industrial customers.
- Over 400 communities served.
- Storage and transportation services link natural gas from western Canadian and U.S. supply basins to central Canadian and northeast U.S. markets.
- Employs about 2,200 people.
- A Spectra Energy Company.



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Biogas Description

- Gas produced as a result of anaerobic digestion. Typical untreated gas produced is 50-60% methane with the remainder primarily CO2.

- Biogas can be produced from a number of sources including agricultural waste, crops, food industry waste, sewage treatment, landfill

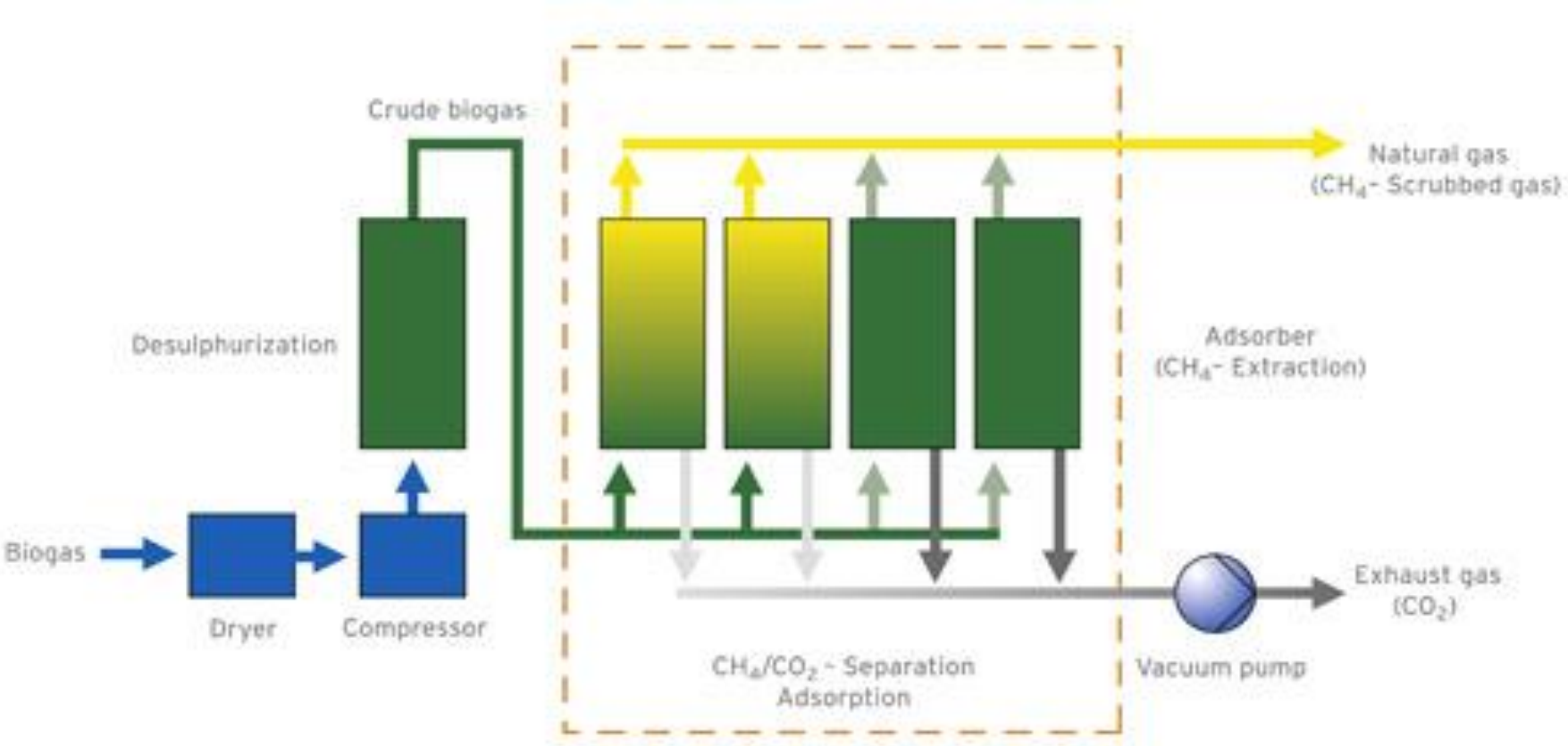
Biogas Output

Power Generation: generate electric power by utilizing biogas produced in a combined cycle power plant. Electricity is the primary energy produced with waste heat also produced.

Biomethane: Clean and separate biogas and inject it into the natural gas distribution system (>95% methane). This can substitute for natural gas in end use applications.

Biogas Process Diagram

Source http://us.mt-energie.com/gas-conditioning/physical-methods.htm



Biogas Impact Comparison

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Electricity System

- Feed in Tariff (FIT) available to encourage development
- Rural supply, urban demand
- Regional transmission system constraints
- Renewable, environmentally positive energy

Natural Gas System

- Current supply pricing is commodity based
- Rural supply, urban demand
- Local distribution market constraints
- Renewable, environmentally positive energy

Biomethane Opportunities

- Replaces a non-renewable energy
- Burns as cleanly as natural gas
- "Full environmental value" of biomethane is high (although currently uncertain)
- Delivery infrastructure may already be in place
- Can be produced effectively with existing technologies (i.e. others are doing this)

Biomethane Challenges

- Market based natural gas commodity pricing is cyclical with no “feed in tariff” to recognize biomethane’s environmental value.
- Separation technology to upgrade biogas to biomethane is currently expensive
- Rural natural gas distribution system may be constrained since gas produced feeds the local market only
- Due diligence required to ensure gas quality

Energy Policy Considerations

- Provide funding assistance for industry to determine the environmental "value" of biomethane
- Funding assistance for first pilot/ demonstration sites
- Incremental utility infrastructure – who pays?
- Consideration of a natural gas "feed-in tariff" to reflect the full cycle environmental value