
MEMORANDUM

TO: OFA Policy Advisory Committee
FROM: Ian Nokes, Farm Policy Research Department
DATE: July 11, 2022
RE: Natural Gas and Renewable Natural Gas for the Agriculture Sector

For Ontario farms, direct fuel costs average 5 to 10% of crop budgets, about \$11,800 per farm, or \$318 million from 27,000 surveyed farms annually¹. Access to reliable sources of energy is crucial to farming. Most farm communities have limited access to natural gas and rely on propane for gaseous fuel needs. OFA supports efforts to bring natural gas to these communities.

Ontario Natural Gas Expansion Program

Under Ontario's Natural Gas Expansion Program, \$360 million has been allocated for NG access in 59 communities. This will save 17,000 newly connected customers up to \$1,500/year, and in many cases, the transition from higher carbon fuels will reduce their carbon footprint.

Phase 1 potentially creates up to 1,400 jobs in the greenhouse industry in Chatham-Kent. Phase 2 estimates 5,000 new jobs in two expansion projects; the Grimsby-Lincoln project and the Hamilton Airport Regional Expansion project. Due to oversubscription, Ontario will begin consulting in the fall of 2022 on delivering a Phase 3. OFA continues to stress to the province the importance of connecting farm communities and to help bring farm cluster RNG production to fruition, as part of a longer term strategic plan.

As Canada moves to cleaner energy options, the viability of pipeline RNG and hydrogen has dispelled most concerns that continuing to expand NG infrastructure will strand assets.

Farming: Access to Natural Gas Pipelines and Renewable Natural Gas (RNG) Production

OFA, working with the Canadian Biogas Association (CBA) and Enbridge, has developed two processes to bring NG and RNG opportunities to farm businesses and communities.

Using OMAFRA GIS data we have found areas where small clusters ~ 5 to 15 farm operations near to existing pipelines, may be able to connect to NG pipelines under affordable conditions. We have analysed about 20 such scenarios so far and presented eight to Enbridge to perform desk top feasibility analysis. We have engaged with farm operations in two areas so far help them move to next stage of utility assessment for their sub-community level access projects.

Also using GIS data, we have developed a calculator to identify some farm clusters, groups of three to five farms, to work together to profitably produce and upgrade biogas to RNG, and inject RNG into the nearest existing pipelines (1 to 5 km distances).

¹ Statistics Canada Survey of Farming 2016.

RNG Production in Canada and the U.S.

In Canadian and the US, there are 250 RNG production facilities in operation, 112 under construction, and 125 in development. Of these 487 projects, about 10% are in Canada.

RNG is part of global efforts to build a path to net-zero carbon emissions. Canadian and American NG truck transportation networks are a significant target for RNG, although to a lesser degree in Canada. For example, US trucking companies commonly switch highway tractors before entering Canada. Still, but for Ontario RNG production opportunities, transportation is a key demand area.

In 2021, U.S. and Canadian NG vehicles (NGV) supplanted 2.5 billion litres of gasoline and 64% of the NG was Renewable. RNGV technology, using biogas from landfills, wastewater treatment and food waste facilities, and agricultural, can yield carbon-negative lifecycle emissions².

For perspective, 2021 North American RNGV truck transportation supplanted 15 billion km worth of car emissions, the work of 5 million acres of forests sequestering carbon³.



Lowered GHG emissions equivalent to **15.2 billion kilometres**
Avoided car travel



Reduced CO₂ emissions equal to **1.6 billion litres of gasoline** or **1.4 b litres of diesel**



Sequestered CO₂e equal to growing **62.8 million** tree seedlings for ten years



or **4,494,013** acres of forests for one year

In Canada for example, Waste Management will spend over \$800m over the next 4 years to add another 17 projects, Waste Connections CDA and Enbridge are spending \$50m in Chatham, and Storm Fisher has a new contract to sell biogas to Modern Niagara for injection as RNG into pipelines. These projects are mostly municipal and landfill gas projects but there are industrial agricultural projects, with mostly in U.S. taking the stage.

Agricultural RNG Projects

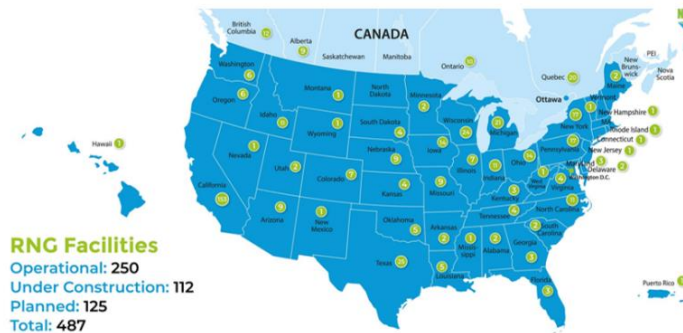
In the U.S., utilities, private investors and state and federal governments support farm-based RNG production and research, including the following examples in Florida, New York, and Vermont:

- 6,000 cow dairy farm in NY, manure to RNG project. LF Bioenergy leases five acres, finances and operates AD to RNG to pipeline injection. Funding is from a private investment firm.
- 6,500 cow dairy in Fla., biogas to electricity. Farm partners with gas utility to build a biogas to RNG conditioning facility, to inject into interstate pipeline.

² California Air Resources Board, Pathway Certified C Intensities 2021 bio-CNG vehicle fuel portfolio was – 44.41 gCO₂e/MJ

³ GHG equivalency: U.S. EPA calculator. 3.8 m MT of CO₂e offset: CARB's LCFS carbon intensity numbers.

- U of Vermont \$200,000 U.S. EPA grant, to study food waste AD, visit 15 farm ADs, study food waste capacity, and address concerns of accepting food waste and biogas analysis.



RNG Market Growth

For 2024-25 RNG supplies, there is a shortage of landfill gas – only about 5 billion litres per year (bl/y). For demand, even though CNG as a transportation fuel is still a niche market in Canada, the demand is about 5.3 bl/y.

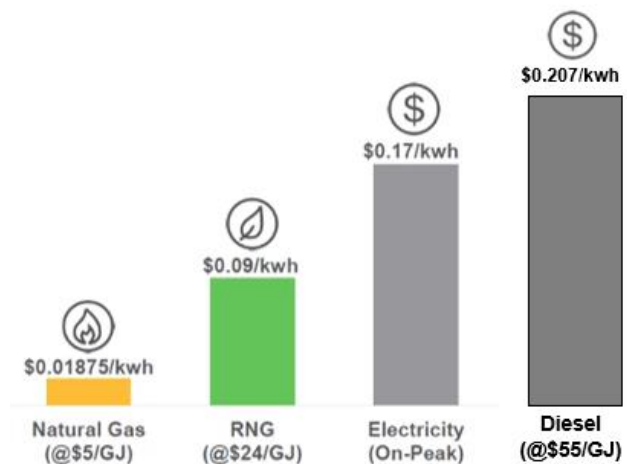
Looking forward, RNG supplies and markets will diversify. The potential remains for increasing supplies by 30% as the demand for biogas increases, but most biogas supply is beyond the reach of gas grids, and there is potentially 500 bl/y supply in Ag residues.

RNGV markets could be 10 times the market of RNG to higher value utility stock and 100 times the market of RNG in Gas to Liquid technologies (converting NG to high-quality liquid products otherwise made from crude oil). This means RNG production sufficient to supply fueling stations could be a very lucrative business model. Policies such as Canada's Clean Fuel Standard regulation will further enable investment capital for volume growth and market stability.

Renewable Energy demand and investment are growing focus on low carbon initiatives. Under Enbridge's NG Utility OptUp Voluntary RNG Program customers to pay \$2 per month for RNG blended into natural gas system, with all proceeds directly used to purchase RNG.

An RNG Blend Directive

Recent global events have constrained supplies of pipeline fuels. NG is still less expensive than onpeak electricity, gasoline and diesel fuel. As the actual cost of CO₂e emissions comes into price alignment, RNG will be a viable choice to supplant fossil fuels. Until then, a consortium of distributors and stakeholders are lobbying federal and provincial governments to mandate an RNG blend. It will be a challenge to secure a mandate considering we just exited period of higher spending on COVID than anticipated.



Considering these factors, OFA continues to recommend advocating the provincial government to increase farm community access to NG, leveraged by establishing farm cluster RNG production opportunities.