



Canadian Biogas & RNG Market Summary Report

October 2023



Canadian Biogas
Association
canadienne de biogaz

Section 1

Over the years, reports and studies put out by the Canadian Biogas Association (CBA) have helped shape public discourse and regulatory policy across the country. The 2020 Market Report was no exception, and this year's edition provides a well-rounded snapshot of the current market as **the industry's renewable natural gas (RNG) production is projected to quadruple** in the coming years.

The data analyzed in this report shows how the industry has adapted and grown through the pandemic to prove itself as a solid base for reaching energy and climate goals. As with the last report, the information on the following pages can be used to encourage policy, program, and regulatory developments. The data also supports the continued advocacy and educational work undertaken by the CBA to help biogas & RNG reach its full potential.

As the voice of the industry in Canada, it is the CBA's mission to increase integration and adoption of biogas & RNG. This report shows that while change is taking place, more could be done to help create a cleaner, greener climate for the future.



Section 2

Biogas offers important environmental benefits, the most significant of which is reducing greenhouse gas (GHG) emissions. Emissions reductions were estimated at 8.2 Mt CO₂e in 2020, and these can increase to 23.6 Mt CO₂e by 2050 with favourable policies. Note these reductions account for both avoided methane emissions and displaced fossil fuel use.

2.2 Environmental Benefits

Biogas projects offer several other important environmental benefits, including:

- Waste management
- Stabilization of nutrients
- Reduction of commercial fertilizers
- Protection of water quality
- Odour reduction
- Improved air quality
- Preservation of valuable landfill space

2.3 Economic Benefits

Additionally, economic benefits of developing and expanding biogas & RNG projects in Canada include:

- Wider economic benefits, including job creation
- High-quality digestate for improved land management
- Cost savings and/or revenues for municipalities or waste management companies that own biogas facilities
- Bedding savings for farms
- Potential carbon emissions credits

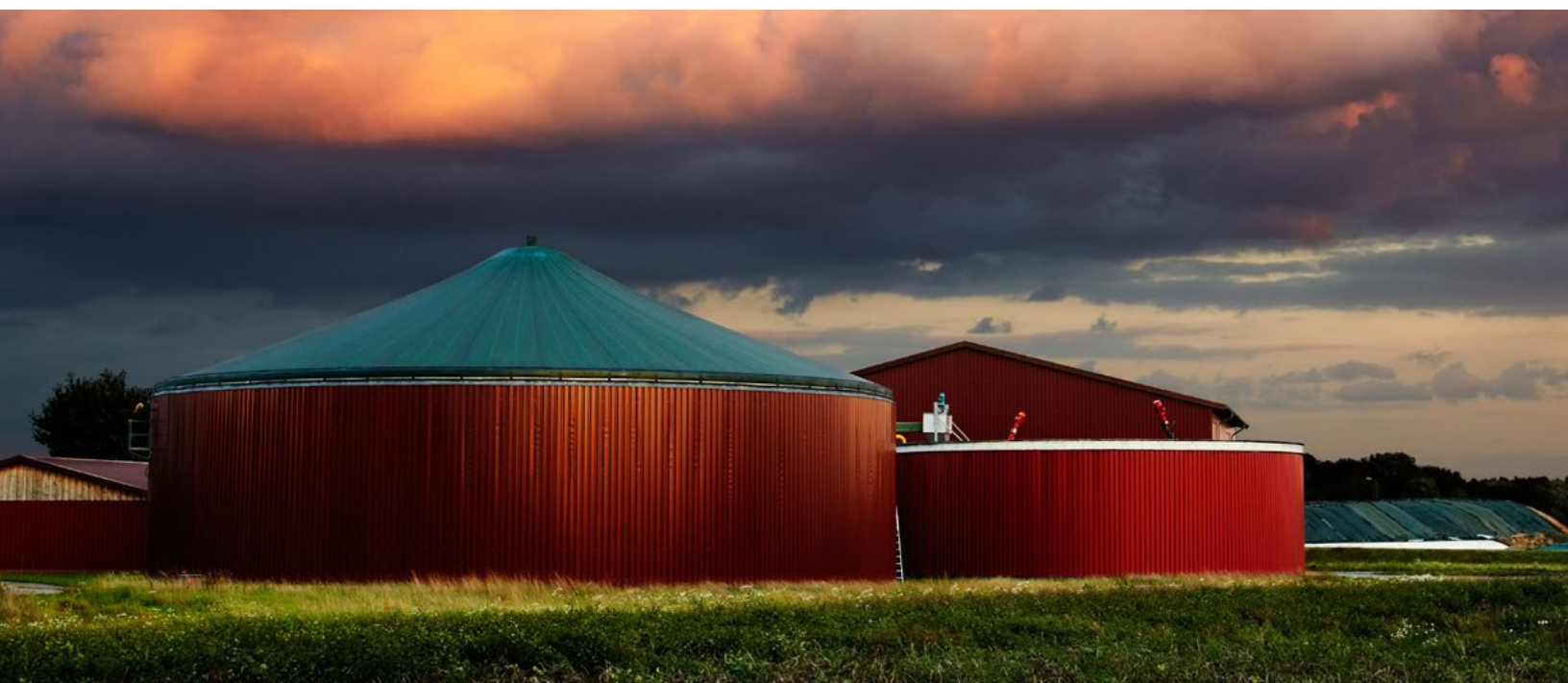


Section 3

Thanks to a growing global awareness of climate change, an urgency to reduce GHG emissions, and the demand for more sustainable waste management practices and energy systems, biogas production is a growing industry in Canada. Biogas & RNG facilities are increasingly being identified as immediate solutions to the issues impacting our local communities and businesses. Biogas development is primarily provincially driven and happening at higher rates in provinces with favourable regulations, programs, and funding (see Table 1).

Table 1 – Activity Supporting RNG Generation in Key Provinces

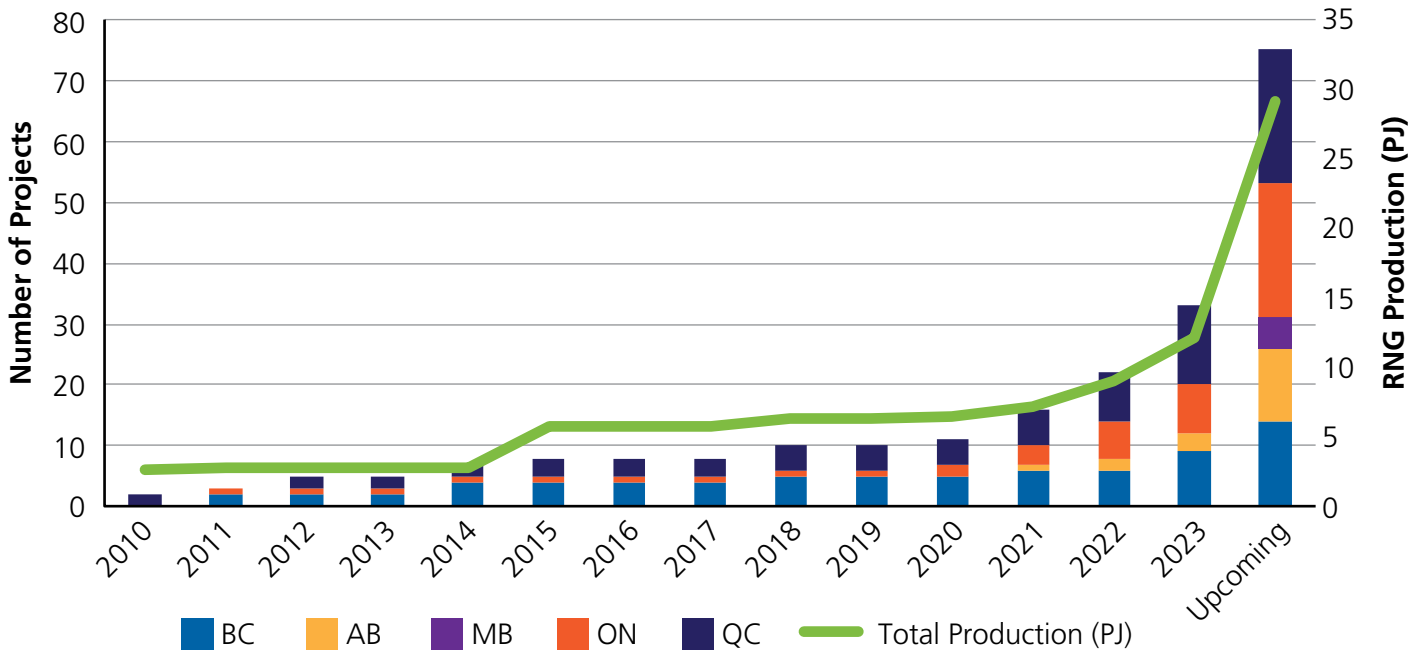
Province	Key Regulations	RNG Programs	RNG Funding Opportunities
Alberta	Technology Innovation and Emissions Reduction (TIER) Regulatory System pathways for creating credits through biogas	None	Emissions Reductions Alberta
British Columbia	GHG Reduction Regulation (GGRR) includes a renewable portfolio allowance of up to 15 percent renewable gas in the total gas supply by 2030; BC Low Carbon Fuels Standard	Utilities FortisBC and Pacific Northern Gas (PNG) purchase RNG	None
Ontario	None	Enbridge Gas voluntary OptUp program	None
Québec	Provincial Biomethane Regulation	Énergir purchases RNG	Renewable Natural Gas Production Support Programme (PSPGMR), Programme of Organic Waste Treatment via Anaerobic Digestion and Composting (PTMOBC)



3.2 Industry Trends

As noted in the 2020 Biogas Market Report, the early adoption of biogas in Canada was focused on its use for generating electricity due to favourable feed-in tariff programs. However, with the rise of RNG markets and few to no opportunities for electricity markets for biogas, biogas utilization has shifted to RNG and nearly all new developments are focused on producing RNG. The Industry’s RNG production is projected to quadruple in the coming years compared to 2021.

Figure 1 – RNG Projects Across Canada



In recent years, book and claim has enabled the growing RNG market by connecting RNG suppliers and end-users. The system does not require direct connection and ensures the environmental benefits of RNG. In both provinces with regulations for RNG content, British Columbia and Québec, the injection of RNG into the natural gas grid is enabled by a book and claim system.

The advantages of the book and claim system include:

- Reducing costs and logistical challenges associated with RNG storage and transportation
- Enables industries to reduce their GHG emissions with RNG without the requirement of being co-located with an RNG production site
- Easier tracking and verification of RNG origin and associated emission reductions

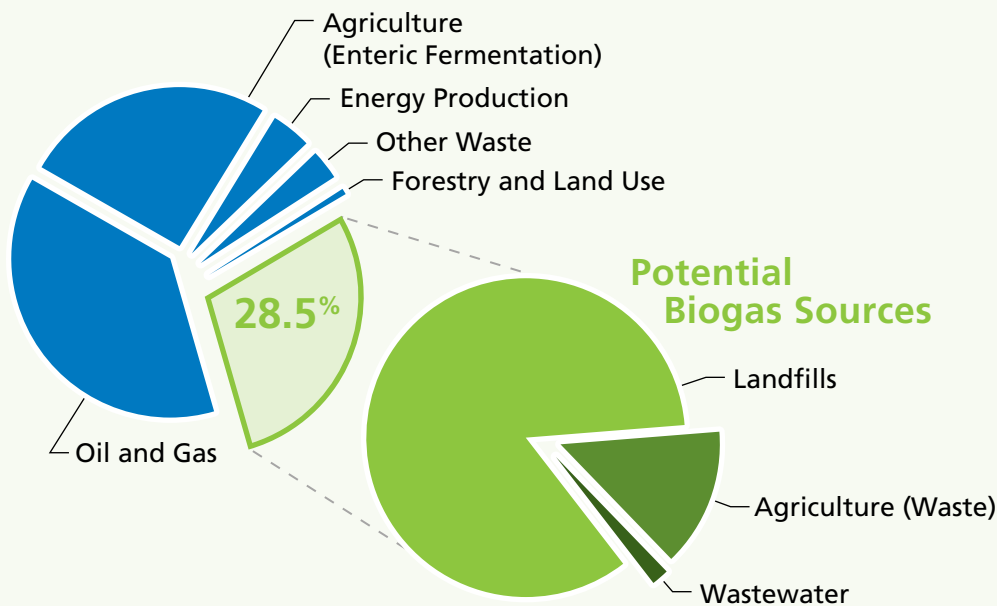
3.2.1 Sources and Current Status

There are four key sources of feedstock for biogas in Canada and most are being significantly underutilized. The CBA has been active in trying to increase utilization of feedstocks for biogas. Specifically, the CBA has engaged the agriculture sector by providing resources, tools and creating connections with the biogas industry. The CBA is also beginning work to engage municipalities who control significant portions of the other three feedstock sources: organic materials, landfill gas and wastewater.

These feedstocks are sustainable since they will always be generated in our society, however they are also sources of methane emissions in Canada (Figure 2). By capturing and utilizing this methane for energy production, the biogas sector can make a significant contribution towards meeting Canada’s methane targets.



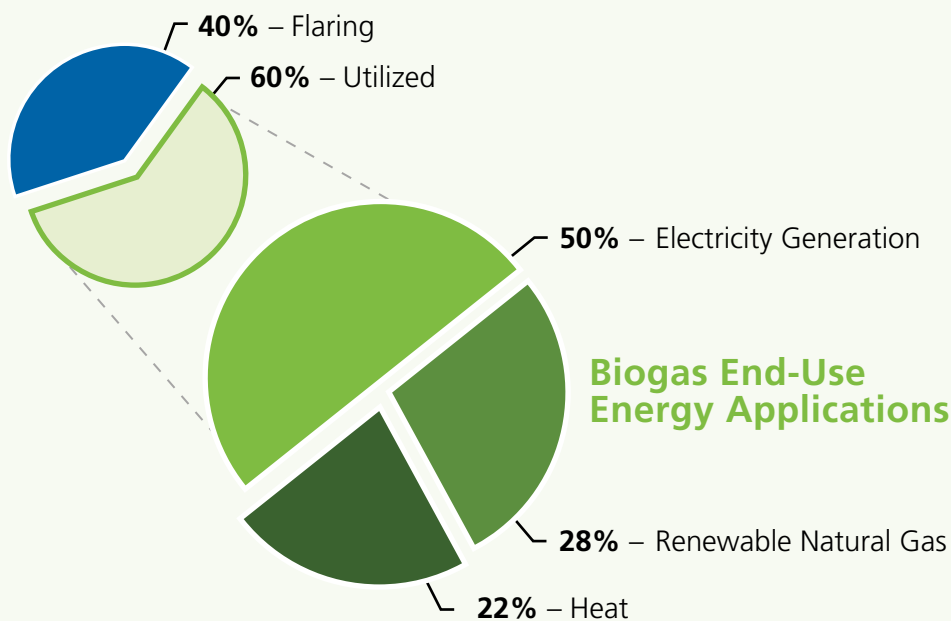
Figure 2 – Canada’s Methane Sources



3.2.2 Biogas End-Use Trends

As of this report, the biogas that is generated by agricultural and industrial AD systems, WWTFs, and landfill gas systems is used to generate electricity or heat, upgraded to RNG, or flared.

Figure 3 – Biogas End-Use



Transportation is also a potential end-use for RNG with numerous reference cases across Canada. More details can be found in the full report.

3.3 Federal Policies and Programs Supporting Growth

While provincial-level regulations and programs have driven the bulk of biogas & RNG development, there are some federal regulations that pose opportunities for the sector such as the Federal Clean Fuel Regulations and Federal Carbon Pricing. These opportunities that can contribute to meeting Canada's climate goals include:

- Reducing GHG emissions 40-45 percent by 2030
- Reducing methane emissions 30 percent by 2030
- Achieving net zero emissions by 2050



Section 4

In 2021, Canada has nearly 300 biogas & RNG projects already reducing 8 Mt of greenhouse gas emissions, processing two million tonnes of manure, crop residues and off-farm organics annually and generating over 20 PJ of energy from agricultural AD, industrial AD, municipal and industrial WWTFs and landfills.

Figure 4 – Biogas & RNG in Canada

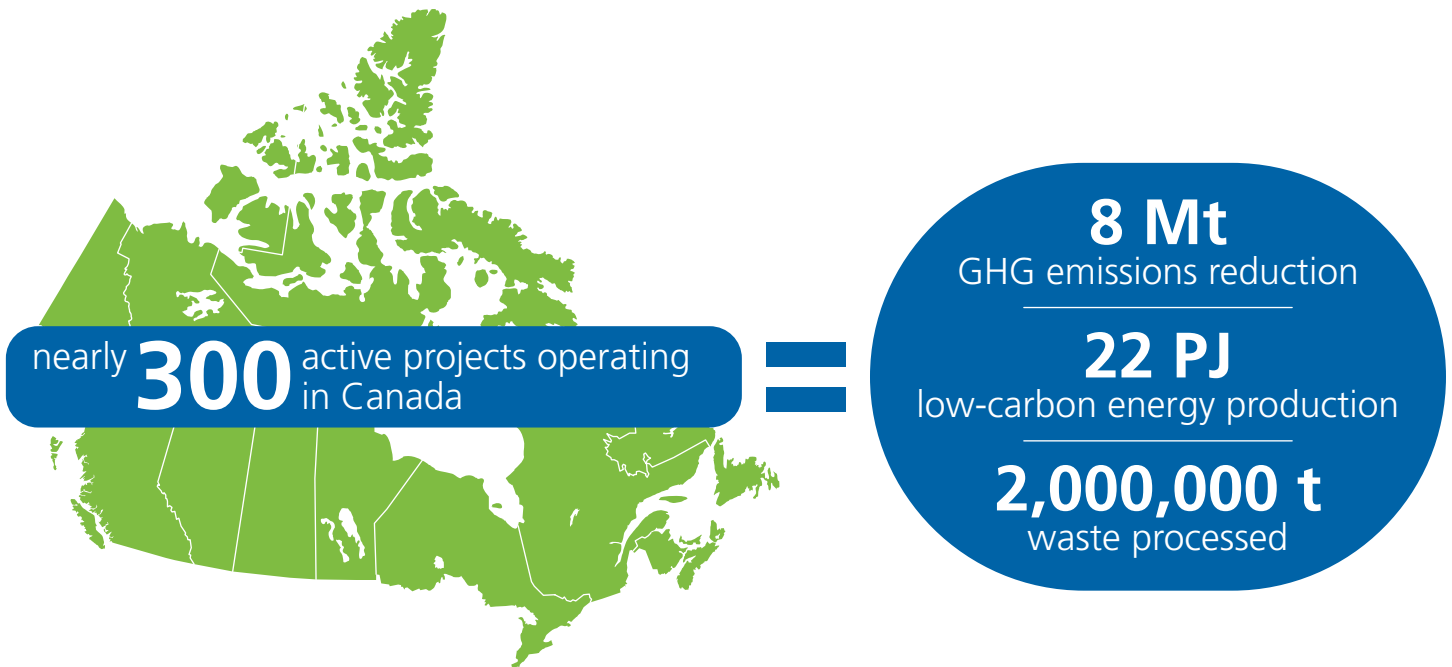
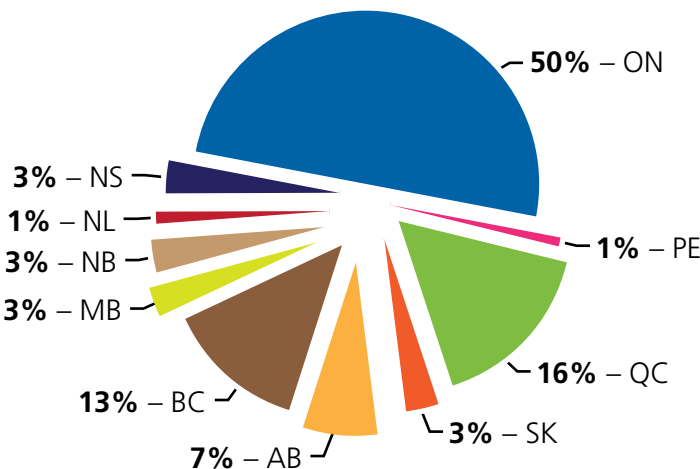


Figure 5 – Distribution of Operational Biogas Facilities in Canada by Province



The majority (50 percent) of Canada’s operational biogas facilities are in Ontario, which has a total of 140 facilities (57 of which are municipal WWTFs).

AD facilities include smaller scale agricultural facilities and large-scale industrial facilities. In comparison with the 2020 Market Report, agricultural AD jumped up 14 percent in organic material processed. Industrial AD showed a 104 percent increase, for a combined 50 percent increase over 2020.

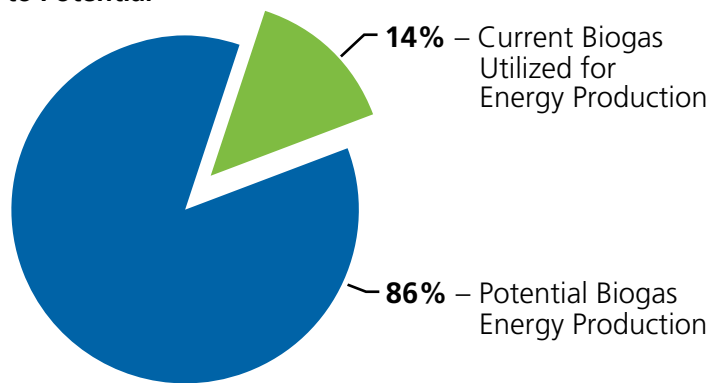
Canada had a total of 123 wastewater treatment facilities (WWTFs), both municipal and industrial that employ AD.

As of November 2020, the number of landfill gas (LFG) capture systems that were operational in Canada was 99. As is the case with AD facilities and WWTFs, most LFG facilities are located in Ontario (40.4%), followed by Québec (22.2%) and British Columbia (18.2%).

Section 5

With existing biogas projects currently producing 6 PJ of RNG, 130 Mm³ of biogas for heat and direct use, and 198 MW of additional clean electricity capacity, Canada is currently tapping only about 14 percent of its easily-available biogas energy potential. This means the sector has the opportunity to bring more than eight times more biogas energy online.

Figure 6 – Canada’s Biogas Production Compared to Potential



While there is a need for immediate policy and support for the biogas & RNG sector to achieve its full potential, there are numerous projects under development which demonstrates this technology’s value to business and communities. There are currently 43 RNG projects under development which account for an additional 16.85 PJ of RNG.

The RNG market continues to grow in Canada and with the projects that are planned it is projected to increase four-fold in the next few years compared to 2021 numbers.



Section 6

Despite its myriad of benefits, there are a number of barriers to realizing the full potential of biogas & RNG energy in Canada. The primary barrier to growth and development of the biogas sector is weak or undefined policy and support measures.

For example, with significant investment tax credits (ITC) for clean tech and hydrogen announced in Budget 2023 and the Fall Economic Statement in response to the U.S.'s Inflation Reduction Act (IRA), there were no provisions included for biogas & RNG. This poses an existential threat to Canadian producers of this viable pathway to net-zero, as the American IRA has expanded existing investment tax credits to include biogas operations that begin construction before 2025.

- Securing financing and project economics
- Lack of government support and recognition of environmental benefits of biogas
- Challenges connecting to the natural gas and electricity grid
- Lack of technology understanding and awareness

More detail can be found in the *2023 Canadian Biogas Market Report*, available exclusively to members of the Canadian Biogas Association.

