

Enhance Business Innovation, Support Existing Infrastructure, Achieve Emission Reduction Targets, and Grow the Canadian Economy

Introduction

Biogas is a renewable fuel derived from the breakdown of organic material and can be upgraded to produce renewable natural gas (RNG). Biogas is a proven technology that offers Canadians:

- new and expanded economic opportunities in local communities;
- engagement of youth and long-term employment;
- advancement in clean technologies and support for existing infrastructure;
- reliable, cost-effective, renewable energy; and,
- a solution to protecting our environment by capturing methane, helping achieve national greenhouse gas (GHG) emission targets, and supporting a circular economy and resource recovery.

As the collective voice of Canada's biogas sector, the Canadian Biogas Association is developing the biogas industry to its fullest potential through capturing and processing organic materials to maximize the utility and value inherent within that material. Our members span the entire value chain of the sector and consist of farmers, municipalities, and private sector owners and operators of biogas systems, technology suppliers and consultants, financial and learning institutions, utilities, and waste industry and organic residual generators.

Overview

Biogas is a renewable source of methane, the main ingredient of natural gas. Biogas can be used for heating and cooling or to generate electricity that can be used on-site or fed into the grid. It can be refined into renewable natural gas that can be injected into gas pipelines or compressed and used as a vehicle fuel. The entire system, including the energy generating components, is referred to as a biogas facility.

Biogas is produced when organic material, which ranges from crop residue to animal manure to municipal wastes and food processing by-products breaks down in an oxygen-free environment. The process is called anaerobic digestion (AD) and usually occurs in a specialized tank or vessel – the anaerobic digester. AD is also the process that generates biogas or landfill gas within landfills.

The capturing and utilization of biogas is a powerful tool for reducing GHGs that are the principle cause of human-induced climate change. GHGs are reduced in two ways: first, the biogas produced is a source of renewable energy that can replace fossil fuels. Second, the capturing of biogas reduces methane, a very potent greenhouse gas that would otherwise be free to escape into the atmosphere.

Biogas offers important environmental benefits. As materials such as animal manures or food wastes are processed in biogas systems, the pathogens are significantly reduced, and nutrients like nitrogen and

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phosphorous are made more available to plants. These biogas systems reduce and provide greater control of our air and water pollution sources.

All of these critical functions - generating renewable energy, reducing solid wastes, managing nutrients, reducing GHGs and mitigating pollution risks - can be realized from a biogas facility in an economically sound and sustainable manner. The required components and services are available across Canada. Biogas production generates diverse revenue streams for farms, industries and municipalities, creates new jobs in the green economy and offers attractive investment opportunities.

Recommendations

Biogas brings forth tremendous economic, social and environmental benefits that are realized when industry and government work together. The following recommendations are offered for consideration in the 2017 pre-budget consultation:

1. Clean Technology, Innovation and Jobs: Allocate funding to advance the development of biogas and RNG technologies to stimulate the growth and transition of clean-tech, innovation and green jobs across Canada.

Biogas is a clean-tech solution that continues to offer innovation to the agricultural, municipal and waste management sectors. Biogas technologies can develop in a small footprint, and function compatibly with existing operations. Biogas offers economic and social stimulus to Canadians and plays important roles in local communities, including investment in innovation, advancement in clean technologies, engagement of youth, and job creation.

Realizing the full potential of biogas development can lead to 1,800 separate construction projects with a capital investment of \$7 billion and economic spin-off of \$21 billion to the Canadian economy; close to 17,000 construction jobs for a period of one year, and 2,650 on-going long term operational jobs; and, 100 new and expanded Canadian companies, including biogas system designers and developers, equipment suppliers, and laboratories.

2. Clean Energy Infrastructure: Allocate \$250 million into new and existing clean energy infrastructure to support the deployment and advancement of biogas and RNG technologies.

Biogas delivers energy when Canadians need it. Biogas is flexible, renewable power that can interface uniquely with a diverse energy mix. Biogas generates energy independent of weather and can produce renewable electricity or be stored in existing natural gas infrastructure, for generation at combined heat and power hosts. RNG can be produced to meet all of the technical standards and requirements of conventional natural gas, and therefore offers the same degree of versatility, at the same time as using existing infrastructure and avoiding stranded assets within Canadian communities. These investments can leverage existing infrastructure and storage capabilities and create lower-carbon, resilient energy systems.

3. Renewable Energy Pathways: Amend Canada’s Renewable Fuel Regulations to include RNG as a compliance option for transportation fuels, or implement a Renewable Fuel Standard similar to that offered in the U.S.

Biogas is a growing industry in Canada with well over 100 operating biogas projects generating renewable electricity and heat and close to a dozen RNG facilities. Biogas and RNG are on the verge of major expansion with the potential to produce 800MW of power (enough to meet 1.3% of Canada’s electricity demand) or generate 2,430 million cubic metres of RNG annually (about 3% of its natural gas demand). Biogas in the form of RNG is an important addition to the portfolio of energy options available to biogas producers, including the transportation sector and in particular, return-to-base fleets. The U.S. has implemented several programs that have driven RNG development including:

- Renewable Fuel Standards for vehicles
- Low Carbon Fuel Standards for vehicles
- Renewable Portfolio Standards for electricity

The US could benefit from Canadian projects, but at the expense of Canada’s ability to meet its carbon reduction goals cost effectively. Canada’s call to action to embrace biogas and RNG is now.

4. Low-Carbon Solution: Assign and recognize the value of environmental attributes resulting from biogas and RNG technologies.

Biogas reduces two critically important greenhouse gases — carbon dioxide (CO₂) and methane (CH₄). Biogas and RNG are unique from other renewable fuels in that they displace fossil based fuels as well as abate methane emissions. Carbon dioxide emissions are reduced when biogas replaces fossil fuel use (i.e. coal, diesel or natural gas). Methane is captured in the biogas process and is converted to energy. There are multiple ways in which biogas can reduce methane emissions or displace other higher carbon intensive fuels with a lower-carbon solution. Biogas can play a role in reducing carbon when compared to baseline conditions and current practices. In some cases, biogas reduces GHG emissions by greater than 100% from fossil fuel baseline. This distinguishing factor needs two-fold recognition: 1) the ability for capped sectors to reduce their emission liability in a cap and trade system (such as natural gas distributors offering RNG in their supply), and 2), the potential for carbon offset credits by non-regulated sectors like agriculture or small landfills.

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Biogas Delivers More to Canadians

Biogas provides multiple forms of renewable energy, offers financial security to developers, reduces the environmental footprint of agricultural and municipal communities, and creates economic and environmental benefits.

Multiple Energy Applications of Biogas

- Fuel combustion engines to turn a generator, producing electricity and heat
- Provide multiple point sources of distributed energy generation on Ontario's hydro grid, reducing line losses and increasing service stability
- Fuel a boiler or a chiller reducing fossil fuel consumption and emissions
- Upgrade to Renewable Natural Gas (RNG) for injection into the natural gas grid, delivering renewable energy through existing infrastructure
- Renewable sources of pipeline natural gas requiring no drilling and associated ground water source threats
- Biogas-sourced RNG can be compressed for use as a transportation fuel, or as a direct replacement of fossil-sourced natural gas in household heating, or industrial, commercial and institutional processes.

Biogas Added Value and Environmental Benefits

- Biogas secures the Agriculture/Food and Municipal sectors by:
 - financial diversification and risk mitigation through energy sales
 - addressing societal concerns about pathogens and odours
 - supporting local processing organic materials
 - providing a sustainable, cost effective solution which addresses the increasing waste disposal burden confronted by food processors and municipalities
 - reducing commercial fertilizer requirements and costs
- Biogas reduces Agriculture's Environmental Footprint by:
 - facilitating recovery of the crop nutrient potential in the organic residuals generated by food processing, wholesale and retail activities
 - protecting ground water sources by processing manure into a pathogen-reduced, more effective fertilizer, reducing the risk of nitrogen, phosphorous and pathogen leaching
 - providing green, renewable heat energy sources for green houses, grain drying and farm heating
 - mitigating livestock greenhouse gas emissions impact
- Biogas reduces the Municipal Sector's Environmental Footprint by:
 - diverting organic waste from landfills to ADs captures higher energy yields and valuable nutrients
 - capturing GHG emissions from organics decomposing in landfills
 - recovering the inherent energy of the biosolids generated during waste water treatment residuals
 - improving the quality of waste water treatment effluent discharged to ground water
 - reducing ratepayer costs for infrastructure and collection logistics of source separated organic waste

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- enhanced recovery of troublesome fat, oil and grease (“FOG”) from sewer networks saves ratepayers significant sewer repair and cleaning costs
- Biogas supports a Green Economy by:
 - creating local job in technical, manufacturing and construction/trades
 - generating economic development and billions of dollars of investment in rural communities
 - developing a domestic biofuel and related service industries
 - creating useful by-products from wastes, acting as a significant economic multiplier
 - offering an emerging technology that allows for research, innovation and engagement of youth