

BioAlberta's Position Paper on Bioenergy Development in Alberta



Introduction

BioAlberta is a member driven not-for-profit industry organization with a mission to facilitate the market development of the bioenergy ecosystem by providing a common voice for bioenergy companies in Alberta.

BioAlberta is pleased to provide this position paper in response to the Government of Alberta's Emissions Reduction and Energy Development Plan¹ and initiatives in support of advancing bioenergy development in the province.

BioAlberta commends the Emissions Reduction and Energy Development Plan in acknowledging opportunities that were also raised by industry stakeholders at BioAlberta's Bioenergy Roundtable Event and follow-up Working Group session. It is through this collaborative process that BioAlberta was able to frame discussions, identify challenges and highlight opportunities to craft this Position Paper. We hope it will inform a critical path for developing all aspects of the value chain including advancing and commercializing bioenergy processing in the province. BioAlberta plans to continue its stakeholder engagement and issues awareness sharing initiatives by hosting further Working Group sessions.

Engagement topics include:

- Blending Renewable Natural Gas (RNG) into the natural gas utility distribution systems
- Enhancing the Renewable Fuel Standard Regulation
- Reviewing Technology Innovation and Emissions Reduction Regulations (TIER) protocols
- Reducing red tape and streamlining development approval process.

Context

Bioenergy, also known as biomass energy, is one of many diverse resources available with the potential to reduce greenhouse gas (GHG) emissions to meet net-zero ambitions from abundantly available biomass feedstocks. These feedstocks include organic waste from agriculture, forestry, municipal wastewater treatment and landfill facilities.

The Alberta bioenergy industry is expanding as companies respond to opportunities to supply domestic and export markets with low carbon fuels and sustainable products like organically derived fertilizers. The resulting boost to Alberta's cleantech strategy will accelerate the reduction of GHG emissions, utilize and monetize waste streams, diversify and strengthen value chains, and improve the strength and resilience of Alberta's economy with particular focus on:

- Encouraging economic development and job creation, particularly in rural communities
- Supporting the development of a circular economy by converting waste into energy and fertilizer
- Improved management of organic wastes
- Attracting investment.

¹ [Emissions and Energy Development Plan](#)



By leveraging Alberta's abundant feedstock supply chain resources, existing infrastructure and technical innovation will enhance economic diversification and create added economic value streams through the production of RNG, liquid biofuels and byproducts. Bioenergy becomes a key technology that supports decarbonization of electricity, natural gas, transportation fuels, and fertilizers, and when combined with carbon capture and storage (BECCS), reduces emissions in hydrogen production. Bioenergy processes, including anaerobic digestion and gasification, are well established technologies in the production of biogas. Biofuels can be produced by modifying existing petroleum refining facilities and applying newer technologies like pyrolysis to generate advanced biofuels like synthetic aviation fuel.

The following sections provide an overview of priorities raised by industry participants and identified in the Alberta Emissions and Energy Development Plan where BioAlberta can provide agency in the consultation and implementation processes.

RNG Blending

Blending renewable natural gas (RNG) with conventional natural gas has proven successful in lowering the carbon intensity of delivered energy, as well as de-risking and stimulating the greater RNG production industry in many jurisdictions. RNG blending into natural gas distribution networks is a growing practice throughout North America. Technologies used to produce RNG are mature and have been used for over 30 years. Depending on the processes and feedstocks, produced RNG may have low to negative carbon intensities, the attributes of which may be used to meet various decarbonization goals. Moreover, the existing natural gas network found in Alberta can be readily used for gathering and distributing RNG since it is chemically indistinguishable from conventional natural gas and meets existing pipeline quality requirements. RNG blending is a relatively quick method to achieve immediate and sustainable decarbonization impacts and demonstrates the long-term potential for natural gas to play an ongoing role in meeting consumer energy needs and environmental, sustainable and governance (ESG) ambitions.

The Alberta Emissions and Energy Development Plan correctly points out that most all the RNG produced in Alberta (except for on-farm heating or electricity generation) is used in other jurisdictions. **Producing low carbon environmental attributes for other jurisdictions does not benefit Alberta's decarbonization ambitions when they are used elsewhere.**

Several jurisdictions in Canada currently regulate RNG blending. British Columbia enacted regulation in 2013 that requires Fortis BC to blend 5% RNG into their gas distribution system by 2025. The RNG ratio is further increased to a minimum of 15% by 2030. Québec has similar blending regulations that began in 2020 where RNG content is at a minimum of 1% and increasing to 10% starting in 2030. New Brunswick is also exploring a minimum portion of RNG in their provincial natural gas supply. Provincial government support has been instrumental in getting these types of programs off the ground.

A hydrogen and RNG blending engagement session held by Alberta Energy, in partnership with Alberta Environment and Protected Areas on September 29, 2022, is an encouraging indication that the Government of Alberta is considering this direction. In 2015 a Biogas Market Study² was conducted on behalf of the present Emission Reductions Alberta to understand the anaerobic digestion landscape in Alberta.

² [Biogas Market Study](#)



BioAlberta is encouraged by the direction the Government of Alberta is taking on RNG blending and emphasises the importance of working with industry to establish mandates, targets, and timelines competitive with other jurisdictions.

Enhancing the Renewable Fuel Standard

Alberta's Renewable Fuels Standard (RFS)³, legislated by the Emissions Management and Climate Resilience Act, has been in place since April 1, 2011. The RFS requires liquid fuel producers to include renewable fuels as part of the retail gasoline and diesel sold to consumers. It currently mandates the minimum annual volumetric renewable fuel content average of 5% for gasoline and 2% for diesel. Alberta RFS regulations also require a lifecycle carbon intensity (CI) of the renewable fuels to demonstrate a 25% equivalent reduction in greenhouse gas (GHG) emissions compared to fossil fuels.

Renewable blending levels in Saskatchewan (7.5% = gasoline, 2% = diesel) and Manitoba (10% = gasoline, 5% = diesel) are comparatively more stringent on a volumetric basis than what is required in Alberta, although these two provinces don't have the GHG reduction equivalency targets that apply in Alberta, British Columbia, Ontario, and Quebec:

- British Columbia's low carbon fuel regulations comprise a minimum volumetric content requirement plus a CI adjusted component. The volumetric content is currently 5% for gasoline and 4% for diesel. The CI fuel component in BC is prescribed by the Low Carbon Fuel Standard (LCFS) that declines each year by mandating additional biofuel blending requirements.
- Ontario uses a weighted average CI adjusted content mechanism where the volumetric component can be lowered depending on the bio-based fuel CI score differential. The CI adjusted volumetric content equivalency is 5% until 2024 increasing to 11% until 2027, 13% in 2029 and 15% after 2030.
- Quebec uses a similar approach as Ontario where a volumetric blend rate is a function of the CI score of the bio-based fuels. Quebec's 2023 RFS mandates a CI adjusted volumetric content for gasoline at 10% for 2023 increasing to 15% by 2030 while diesel CI adjusted volumetric content is 3% in 2023 increasing to 5% in 2025 and 10% by 2030. Quebec also allows for the trading and banking credits generated by overcompliance between regulated providers.

Compared to other provinces with an RFS, the Alberta RFS is no longer competitive with other provinces and should be updated. Expected increased demand in advanced biofuels production like sustainable aviation fuels (SAF) and biochar is introducing competition in other jurisdictions which the current policy does not adequately address.

Although Alberta's RFS meets the new federal Clean Fuels Regulation (CFR) volumetric content obligations (5% gasoline and 2% diesel), the CFR uses a decreasing CI standard approach. This is like BC's Low Carbon Fuel Standard (LCFS), where each fuel is assigned a baseline CI score that suppliers must reach, or surpass (below baseline), to meet compliance. Biofuels that exceed the baseline benchmark, and are not used for the compliance year, are eligible as credits that can be banked or traded with other CFR regulated entities. The CFR allows for gaseous low carbon fuels (RNG and hydrogen) to generate gaseous credits on a voluntary basis. As with RNG, biofuels produced in the province tend to be exported to other jurisdictions where they are valued higher.

³ [Alberta Renewable Fuels Standards](#)



BioAlberta emphasizes the immediate need to commence the Government of Alberta's commitment to engage with stakeholders and review increasing minimum RFS requirements as well as including new low carbon fuels like sustainable aviation fuel. **The Alberta RFS should be updated to match or exceed other provinces' minimum blending thresholds on a volumetric basis and better align with CFR verification standards.**

Biogas TIER Protocol Revision

Alberta's regulations for reducing GHG emissions from large emitters are regulated by the Technology Innovation and Emissions Reduction Regulations (TIER) and are administered by Alberta Environment and Protected Areas. The regulation uses a facility-specific benchmark mechanism whereby certain facilities are subject to compliance and must reduce their emissions intensity by 10%, relative to the facility's historical average. An additional 1% reduction is required in addition to the 10% for each subsequent requirement year. Lower emission facilities may opt into the program including power, agriculture, forestry, chemical and fertilizer facilities. Facilities subject to TIER can comply with emission reduction requirements by reducing emissions, paying into the TIER fund, countering emissions with performance improvements, and or purchasing emission offset credits.

Offset credits are created and approved as quantifiable protocols. Several TIER offset credits protocols include the use of biogas in some form to create offset credits. These approved protocol standards⁴ are:

- Biofuel Production and Usage
- Energy Generation from the Combustion of Biomass Waste
- Biogas Production and Combustion
- Landfill Gas Capture and Combustion

The protocols most used to generate biogas-based TIER offset credits are the Biogas Production and Combustion and the Landfill Gas Capture and Combustion protocols. The Energy Generation from the Combustion of Biomass protocol has been used by the forestry industry although it is restrictive because of intensive water use and emissions produced from biomass combustion are included in regulated emissions.

The Biogas Production and Combustion protocol is useful for anaerobic digestion developers as a revenue source when biogas is used to generate electricity. Because this protocol applies to electricity generation only, the protocol disregards biogas produced for thermal (heating) purposes. For example, blending processed biogas (RNG) into the natural gas distribution system does not qualify as an offset credit under the protocol. **The Biogas Production and Combustion protocol does not recognize the environmental benefits of using biogas production in RNG blending the same as biogas produced for electricity generation.** Furthermore, this protocol is inconsistent with the Landfill Gas and Capture and Combustion protocol where biogas produced by displacing fossil fuel methane can generate offset credits.

BioAlberta will submit a revision to the quantification protocol request to Alberta's emission offset system as part of the Government of Alberta's continuous improvement efforts and TIER review by 2026.

Digestate

Anaerobic digestion (AD) generates additional environmental value other than producing biogas. AD produces a left-over material rich in nutrients and nitrogen known as digestate. Digestate is an excellent fertilizer compared to non-processed raw organic waste because it recycles waste nutrients, reduces pathogens, improves soil quality and is an ideal alternative to energy-intensive mineral fertilizers. The quality of digestate used as fertilizer depends on the feedstock used in the AD process. Liquid digestate from manure can be applied to crop land

⁴ [Alberta Emission Offset System Approved Protocols](#)



while dry digestate can be used as livestock bedding or further processed into pellets for commercial and distribution purposes.

AD plants can be distinguished between industrial waste management facilities or agriculture farm operations. In Alberta, the Agricultural Operations Practices Act⁵ includes regulations for meeting allowable nutrient loading levels for on-farm applications while industrial digestate must check with Alberta Environment and Parks and the Natural Resource Conservation Board for permission and guidance for land application.

In addition to replacing commercial fertilizer use, on-farm digestate can be distributed to neighboring farms and generate extra revenue when following nutrient management and land application regulations. Industrial AD facilities can obtain certification for their digestate to be used as fertilizer under the Canadian Fertilizers Act and Regulations with the Canadian Food Inspection Agency. Generating additional value from digestate by decarbonizing fertilizer pathways are worth pursuing.

Digestate is not currently recognized as a decarbonization pathway in any TIER credit offset protocols. BioAlberta will be providing input to the Government of Alberta's request for assessing the opportunity of including digestate in the Nitrous Oxide Emission Reduction protocol.

Red Tape Reduction

Siting and permitting of bioenergy projects are challenging due to long lead times and multiple agency approval requirement processes. Project and infrastructure investment are foundational in developing the bioenergy ecosystem in the province. Meeting low-carbon fuel project development, financing and compliance obligations require reliable and timely regulatory approval and permitting processes. Separate departments and levels of government have their own regulations and policies for bioenergy facilities. For example, a typical anaerobic digester project will seek independent approvals from several departments and agencies independently that may include duplication efforts and additional time and resources that impact project planning and costs. In Alberta, this includes seeking approval from:

- Municipality/County
- Alberta Agriculture and Forestry
- Alberta Environment and Parks
- Alberta Transportation
- Natural Resource and Conservation Board

It is estimated that a project may take between three to seven years to receive the required approvals. At the Provincial level, the reasons for such lengthy permitting timelines can be attributed to the lack of interdepartmental coordination and standardized processes. **Streamlined procedures and regulatory processes will help de-risk and preserve project developments in the province.**

BioAlberta is listening to stakeholder concerns and plans to monitor approval process timelines closely. BioAlberta will continue to work with project developers, regulators, and departments to explore expediting approval challenges.

Summary

Realizing the bioenergy industry's fullest potential requires stakeholders to engage in dialogue, identify challenges and collaborate on solutions. BioAlberta is taking this opportunity to highlight the feedback received

⁵ [Alberta Operations and Practise Act](#)



by stakeholders and provide agency in proactively engaging with policy makers in support of developing and improving bioenergy strategies.

A summary of BioAlberta ambitions include:

1. Facilitate RNG blending initiatives by assisting in establishing targets, setting timelines, and reporting on progress.
2. Participate on behalf of industry in a provincial RFS review.
3. Work with Alberta Environment and Parks to improve TIER protocols.
4. Raise awareness and legitimize the environmental benefits of using digestate as fertilizer.
5. Consult with industry and the Government of Alberta to develop streamlined permitting processes.

