



Technology Collaboration Programme
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Newsletter IEA Bioenergy Task 37: 07/2022

Biogas in the Americas

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SoCal's first power to gas reactor will be built in Maine

SoCalGas' bio-methanation reactor system will be used to help produce renewable energy as part of a power-to-gas demonstration. This system will be installed at an anaerobic digester facility in Clinton, Maine in early 2023. The power-to-gas process converts renewable electricity into hydrogen. The bio-methanation reactor converts the hydrogen and biogenic carbon dioxide into methane that can be used onsite or injected into the natural gas grid. SoCalGas, Plug Power, Electrochaesa, and the U.S. Department of Energy's National Renewable Energy Laboratory (NREL) worked together to develop the reactor in Golden, Colorado. The bio-methanation reactor will be transferred from Colorado to Maine as a key component of this Department of Energy (DOE)-funded project. Summit Natural Gas of Maine was recently awarded nearly \$5 million from the DOE to demonstrate power-to-gas with bio-methanation process at a dairy digester in Clinton.

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Proposal of new settings of biofuel volumes for 2020 to 2022

By the end of last year the U.S. Environmental Protection Agency (EPA) proposed a package of actions setting biofuel volumes for the Renewable Fuel Standard (RFS) program for years 2020, 2021, and 2022. Under the RFS, the biogas industry produces gaseous and liquified renewable natural gas, renewable electricity, renewable hydrogen, and can help decarbonize other fuels. The proposal includes a 20-25% annual growth in the D3/cellulosic category, 95% of which is renewable natural gas made from biogas which runs short on the actual development according to the American Biogas Council. The actual industry growth in 2021 was two times higher. In addition, EPA has failed to recognize renewable

electricity from biogas in its volumes for now the seventh year in a row.

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PG&E helps advance accessibility to RNG sources for California customers

Under a partnership between Pacific Gas and Electric Company (PG&E), Maas Energy Works and California Energy Exchange (CEE), manure produced from thousands of cows within Merced County will be converted to renewable natural gas (RNG), further advancing California's greenhouse gas reduction goals. Marking a first for PG&E, RNG from Maas Energy's facilities in Merced began flowing into PG&E's gas transmission system in mid-December 2021 through a "mid-market" third-party pipeline. This project produces RNG by capturing methane at the source from 15 dairy farm partners. The Maas Energy project, which includes gas production and cleaning equipment, as well as the interconnection facilities to move RNG from farms into the CEE and PG&E transmission pipelines, was funded in part by incentives from the CPUC under Senate Bill 1383 (Lara, 2016). The private pipeline operated by CEE enables remote dairies with the infrastructure to connect an economically viable source of renewable energy to the PG&E pipeline system. Historically, access and a lack of cost-effective alternatives to transport RNG to PG&E's pipeline system hindered otherwise viable partnerships with dairies. Mid-market pipelines, such as the CEE pipeline transporting RNG from the Maas Energy project, provide a necessary solution to make methane capture a cost-effective source of RNG for California.

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New Assessment Documents Expansion of US Renewable Natural Gas Industry

The sustainable energy NGO Energy Vision released its 2021 annual assessment of the US renewable natural gas (RNG) industry, conducted for the U.S. Department of Energy's Argonne National Laboratory. It documents rapid growth in RNG production nationwide. The number of RNG production facilities grew 33.5% (from 313 in December 2020 to 418 by the close of 2021), including 230 RNG facilities now operating (up 46% from 2020), 108 under construction (up 42%), and at least 80 new projects in planning. This growth has increased production capacity 24% since 2020. The US can now produce enough RNG fuel to displace nearly 574 million gallons of diesel annually. That can power 63,800 refuse trucks (35% of the US total). Robust capacity growth should continue in the years ahead. Realizing full domestic RNG resource potential (up to 30 times greater than current production) would generate enough fuel to displace over 25% of current on-road diesel demand (>10 billion gallons/yr), cutting GHG emissions by an estimated 300 million metric tons annually on a lifecycle basis. As a basis, Argonne National Lab developed the Renewable Natural Gas (RNG) database to provide a comprehensive list of biogas projects that are upgrading gas for pipeline injection or use as vehicle fuel (whether locally or at the end of a pipeline). The database is an Excel format spreadsheet and is compatible with any version of Microsoft Excel. Although a handful of Canadian projects deliver RNG into the US, all projects listed in the database are in the United States.

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Air Liquide to open RNG hydrogen plant

Air Liquide will open a steam methane reformation plant fed by renewable natural gas (RNG) in Las Vegas, Nevada, by the end of March. The hydrogen plant, powered by methane captured from biological wastes, will produce 30 tons per day of hydrogen at full capacity. This will be enough to fuel 42,000 hydrogen fuel cell electric vehicles, said Katie Ellet, president of Hydrogen Energy and Mobility for Air Liquide north America. The \$250mn plant will be the first world-scale liquid hydrogen production unit dedicated to serving the US West Coast. The facility is targeted at California's current market of 10,000 fuel cell vehicles, but it will also have the capacity to power other industrial markets

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EPA selects 11 organizations to receive \$2 million to expand AD capacity

The U.S. Environmental Protection Agency (EPA) announces the selection of 11 organizations expected to receive a total of approximately \$2 million in funding to divert food waste from landfills by expanding anaerobic digester capacity nationwide. By decreasing the amount of wasted food in landfills, AD reduces landfill methane emissions, in turn reducing impacts of climate change. AD is a strategy included in EPA's food recovery hierarchy that is preferable to landfilling and incineration because it reclaims valuable resources, contributing to a circular economy. Keeping food waste out of landfills by transforming it into fuel or fertilizer can save money and reduce environmental impacts. Each selected organization will receive a range of approximately \$150,000 – \$200,000 over a two-year period.

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BC to invest in renewable gas capture at Vancouver landfill

British Columbia (BC) is investing \$4.28 million (€2.98 million) to expand the Vancouver landfill gas capture system through the CleanBC Industry Fund, with matching funds from the City of Vancouver. Vancouver landfill is a 320-hectare site owned by the City of Vancouver. Approximately 73% of the gas emitted by the landfill was captured in 2020. The CleanBC project will expand the current landfill gas collection system by installing a system of wells, collectors and piping to capture methane and CO₂ that would otherwise be vented to the atmosphere. Landfill gases will be transported for refining into usable RNG that will be sold to FortisBC and incorporated into the company's natural gas distribution system for residents, businesses and the city's buildings, vehicles and neighbourhood energy utility. The Vancouver landfill project is part of a larger round of CleanBC Industry Fund investment in 22 projects throughout the province that will reduce emissions in sectors such as mining, pulp and paper, and oil and gas.

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Archaea Energy Announces New 20-year RNG Agreement with FortisBC

Under the agreement, which is subject to regulatory approval by the British Columbia Utilities Commission, FortisBC expects to purchase up to eight million gigajoules (approximately 7.6 million MMBtu) of RNG generated by Archaea annually from its portfolio of RNG production facilities for a fixed fee for a period of 20 years. The agreement is expected to commence in 2022 upon regulatory approval, with the full annual quantity beginning in 2025. The RNG produced by Archaea for this long-term partnership is expected to help FortisBC meet its stated goal of having 15 per cent of its natural gas supply be renewable by 2030. FortisBC's RNG program, which began in 2011, was the first utility program in North America to offer RNG to customers. FortisBC is working towards having around 75 per cent of the natural gas in its system derived from renewable sources by 2050.

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New projects boost FortisBC's RNG supply

Roughly 8,800 more homes in Canadian British Columbia (BC) can become carbon neutral following the addition of three new renewable natural gas (RNG) suppliers in partnership with FortisBC Energy Inc, over the last three months. Approximately 800,000 gigajoules of RNG will be added to FortisBC's gas system from three diverse sources – food waste from EverGen's Net Zero Waste (NZWA) Project in Abbotsford, agricultural waste from Faromor CNG Corp. (Faromor) in Ontario and wastewater operations collected from Shell Energy North America (Canada) Inc. in Iowa. To date, FortisBC is receiving RNG from both Faromor and Shell with EverGen's NZWA Project coming online in the next year. Increasing RNG supply is a key part of FortisBC's Clean Growth Pathway to 2050 towards a lower carbon future for British Columbia.

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FortisBC proposes to provide 100 per cent renewable gas to all new homes

Under a new proposal put forward by FortisBC Energy Inc. (FortisBC) to the British Columbia Utilities Commission (BCUC), every newly constructed home connecting to the gas system would automatically

receive 100 per cent renewable gas for the lifespan of the building. The approval of this proposal would mark a new era in the evolution of the company's renewable energy programs. Renewable gas includes Renewable Natural Gas (RNG) available in the gas system today and hydrogen, syngas and lignin. The proposal was part of the second phase of an ongoing regulatory proceeding regarding RNG customer rates and a comprehensive review of FortisBC's RNG program. FortisBC has committed to increasing the amount of renewable gas in its system and reducing the amount of conventional natural gas used by its customers. The company is currently on pace to exceed its target of having 15 per cent of its gas supply being renewable by 2030 and is working towards having about 75 per cent of its supply be renewable by 2050

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British Columbia Shown to Hold a Wealth of Renewable and Low Carbon Gas Potential

By 2050, the province's gas system could be completely supplied by made-in-B.C. renewable and low carbon sources. A study released early March showed that, by 2050, the potential of renewable and low carbon gases could be as high as 440 petajoules (PJ) per year—roughly double what currently flows through FortisBC's gas infrastructure to British Columbians. The joint study commissioned by the Government of British Columbia, FortisBC Energy Inc.(FortisBC's) and BC Bioenergy Network (BCBN) examined the potential production of renewable and low carbon gases using solely B.C. resources by 2030 and 2050, as well as examining overall potential production in Canada and the United States. If the renewable and low carbon gas industry continues to grow, in both capacity and technological innovation, the province has the potential to produce up to 50 PJ of renewable and low carbon gases annually by 2030 and up to 440 PJ by 2050. In 2018, both the Government of British Columbia and FortisBC set a target of 15 per cent of the gas supply being renewable or low carbon by 2030. With the desire for faster and deeper decarbonization, it's expected that target may grow and the most recent projections from FortisBC show that the company should exceed that number, as the momentum of bringing on new sources of RNG is steadily growing. The company tripled its supply of RNG through 2021 and expects to, at minimum, triple its supply again in 2022. FortisBC's vision for renewable and low carbon gas is to have roughly 75 per cent of its total gas supply be renewable or low carbon by 2050 to meet the province's 80 per cent GHG reduction target.

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More biogas and renewable natural gas would help Canada hit climate targets

With the right government policies, Canada could reduce five times more greenhouse gas emissions through biogas and Renewable Natural Gas (RNG). That's according to a new study released in March by the Canadian Biogas Association. Biogas & RNG projects currently reduce 8 megatonnes of greenhouse gas pollution by making clean energy out of methane collected from landfills, agriculture and other organic waste. According to the study, that number will grow only 2.5 megatonnes by 2030 with existing policies. Meanwhile, a combination of new policies could deliver 26.7 megatonnes of emission reductions in 2030, meaning biogas & RNG could be instrumental for hitting Canada's 2030 climate targets. The study also shows a potential 40 megatonne greenhouse gas reduction through biogas & RNG by 2050. To achieve these bigger greenhouse gas reductions, the study says the Government of Canada needs to scale up two policies proving successful at the provincial level. The first is a countrywide renewable gas mandate, similar to what Québec and British Columbia have in place. A federal renewable gas mandate would require all suppliers of conventional natural gas to add renewably-sourced gases to their mix. The second policy is a carbon offsets system that rewards landfills and farms for voluntarily collecting and utilizing methane. Alberta and Québec have similar policies in place that the federal government could look to.

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Brazil launches incentives for biomethane production

President Jair Bolsonaro participated in the launch of incentive measures for the production and sustainable use of biomethane. This renewable fuel is obtained through the purification of biogas and

can replace natural gas, diesel and gasoline. Bolsonaro drove a biomethane-powered tractor to the Planalto Palace, the seat of government. It took him about ten minutes to make the four-kilometer route between the buildings. The Minister of the Environment, Joaquim Leite, signed the decree that creates the National Program for the Reduction of Methane Emissions, called “Methane Zero”, which will mean advances in the generation and use of biomethane from urban and rural waste. The Minister of Mines and Energy, Bento Albuquerque, signed a decree that includes investments in biomethane in the Special Regime of Incentives for Infrastructure Development (Reidi) and exempts new projects from taxes that levy the acquisition of machinery, construction materials and equipment. The insertion of biomethane, according to the federal government, will make it possible to build new production plants to increase supply and install green corridors to fill heavy vehicles, which will help reduce greenhouse gas emissions. Total investments of US\$ 7,000 million and the generation of at least 6,500 jobs in the construction and operation of the new units are expected. It is planned to build 25 new plants in six states.

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B.C.'s renewable and low carbon gas supply could be double current gas use by 2050

By 2050, the province's gas system could be completely supplied by made-in-B.C. renewable and low carbon sources according to a new study released in May. The study showed that, by 2050, the potential of renewable and low carbon gases could be as high as 440 petajoules (PJ) per year—roughly double what currently flows through FortisBC's gas infrastructure to British Columbians. The joint study commissioned by the Government of British Columbia, FortisBC Energy Inc.(FortisBC's) and BC Bioenergy Network (BCBN) examined the potential production of renewable and low carbon gases using solely B.C. resources by 2030 and 2050, as well as examining overall potential production in Canada and the United States. If the renewable and low carbon gas industry continues to grow, in both capacity and technological innovation, the province has the potential to produce up to 50 PJ of renewable and low carbon gases annually by 2030 and up to 440 PJ by 2050.

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