



## Newsletter IEA Bioenergy Task 37: 12/2020

### Biogas & Biomethane in the USA

#### **RNG for transport fuel continues to grow in the USA**

NGV America and Coalition for Renewable Natural Gas (RNG Coalition) announced that 39 percent of all on-road fuel used in natural gas vehicles in calendar year 2019 was renewable natural gas (RNG). Over the last five years, RNG use as a transportation fuel has increased 291 percent, displacing close to 7.5 million tons of carbon dioxide equivalent (CO<sub>2</sub>e). In 2019 a total of 717 million gallons (GGE) of natural gas were used as motor fuel. Of that, 277 million gallons (GGE) were renewable produced by 110 RNG production facilities transforming waste into fuel. Another 100 facilities were on the way.

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#### **Clean Energy Fuels' RNG to fuel New York transit buses**

Clean Energy Fuels will supply its Redeem™ renewable natural gas (RNG) to 800 New York transit buses. The firm was contracted by the New York Metropolitan Transportation Authority (MTA) to provide its organic waste-derived fuel to power the fleet. The multi-year agreement for an estimated 25 million gallons of Clean Energy's Redeem RNG will reduce greenhouse gas (GHG) emissions by 25,351 tonnes annually – equivalent to removing 5,477 petrol cars from the road. Redeem is the first commercially available RNG vehicle fuel, derived from capturing biogenic methane produced from the decomposition of organic waste from dairies, landfills and wastewater treatment plants.

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#### **Update of AgSTAR's AD project development handbook**

Early summer the U.S. EPA has released the third edition of AgSTAR's Anaerobic Digester Project Development Handbook, which includes a compilation of the latest knowledge in the industry on best practices for anaerobic digestion and biogas systems. According to the USDA, the handbook aims to ensure long-term project success for anaerobic digestion and biogas systems by providing background and a framework for project development. It is intended for agriculture and livestock producers, farm owners, developers, financiers, policymakers, implementers, and others. The handbook is designed to help these stakeholders make informed decisions to maximize profits and environmental performance while reducing implementation risks. The third edition spans more than 130 pages.

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#### **U.S. Gain becomes largest RNG supplier in Oregon, US**

U.S. Gain has become the largest renewable natural gas (RNG) supplier in Oregon, US, through its latest supply agreements with Salem Area Mass Transit District, Gresham Sanitary, Heiberg Garbage and Recycling and Pride Disposal. The news follows U.S. Gain's announcement of an RNG supply agreement with the Port of Seattle for use at Seattle Tacoma International Airport. Gresham Sanitary Service was

the first company in Oregon to introduce natural gas refuse trucks in its fleet. Today, 100% of its primary fleet is now powered by RNG. Heiberg Garbage and Recycling has a fleet of 11 natural gas refuse trucks powered by RNG that displace over 60,000 gallons of diesel annually. Pride Disposal has been creating cleaner and safer neighborhoods for over 34 years through its fleet of 25 natural gas refuse trucks in Sherwood, Tigard, King City, Beaverton, Durham, Hillsboro and Washington County communities. Moving to RNG produces even stronger environmental benefits for its customers. Salem Area Mass Transit District seeks to enhance community livability through innovative, sustainable regional transportation options. Integrating natural gas transit buses was the first step in its quest to become more sustainable. Using RNG in place of natural gas cements its commitment to emission reductions.

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### **RNG development in the USA**

ABLC Digital 2020 provides a very nice video presentation from Brain Foody, CEO of IOGEN with lots of figures and graphs on the actual status of biogas in the US and the development of renewable natural gas. It is an excellent promotion tool for biomethane.

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### **Anheuser-Busch transitioning dedicated fleet to RNG**

Anheuser-Busch is transitioning more than 180 trucks – representing approximately 30% of its dedicated fleet – to renewable natural gas (RNG). In 2014 and 2015, Anheuser-Busch converted 160 diesel-fueled trucks in Houston and St. Louis to fleets powered by compressed natural gas (CNG) engines. As the next step to achieve its 2025 sustainability goal of reducing carbon emissions across its value chain by 25% by 2025, the brewer will be expanding this fleet and investing in technology to transition to cleaner-burning renewable natural gas. As part of the transition, Anheuser-Busch has placed an order from Agility Fuel Solutions – a leading global provider of clean fuel solutions for medium- and heavy-duty commercial vehicles – to expand its existing CNG fleet by equipping over 180 new class-8 trucks

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### **SoCalGas is dispensing California produced RNG**

Southern California Gas Co. (SoCalGas) is for the first time dispensing California-produced renewable natural gas (RNG) at many of the natural gas fueling stations it operates across the U.S. state. The utility recently began purchasing RNG from Calgren Dairy Fuels, which captures biogas from manure of dairy farms and turns it into RNG, a renewable fuel. SoCalGas has dispensed 100% RNG from out-of-state sources at its fueling stations for a year. Calgren's facility is part of a rapidly growing biomethane industry in California and is currently the largest dairy biogas operation in the U.S. Production of the fuel has accelerated quickly in California, supported by state incentive programs seeking to reduce greenhouse gas emissions from trucking and dairy farms. In just the next three and a half years, at least 160 RNG production facilities will be online in California to serve the transportation fuel sector, producing more than 15.8 million therms of carbon-negative RNG every year and replacing about 119 million gallons of diesel fuel. That's enough to reduce greenhouse gas emissions by over 3.4 million tons every year.

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### **SoCalGas, PG&E, Opus 12 develop technology to convert CO2 into RNG**

Southern California Gas Co (SoCalGas), Pacific Gas and Electric Company (PG&E) and Opus 12, a clean energy start-up, have developed a new electrochemical technology that converts the carbon dioxide (CO<sub>2</sub>) content in raw biogas into pipeline-quality renewable natural gas (RNG). The single-step process was designed to use renewable electricity and therefore also provides a way for the long-term storage

of excess wind and solar power. The 12-month research and development effort was funded by SoCalGas and PG&E and builds on the success of an initial feasibility study in 2018. The new demonstration shows that improved catalyst activity could speed reactions by five times and nearly double conversion efficiency, making the technology commercially competitive with other new biogas upgrading methods, according to the companies. The core technology was scaled up and tested using commercially available electrolyser hardware. The next step will be to test the technology for longer periods at an existing biogas facility.

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### **California's natural gas vehicles achieve first carbon-negative milestone**

The energy weighted carbon intensity (CI) value of California's natural gas vehicle portfolio in the Low Carbon Fuel Standard (LCFS) programme achieved carbon-negative status for the first time. Data from the California Air Resources Board (CARB) for the second quarter of 2020 shows the CI value was below zero at 0.85 gCO<sub>2</sub>e/MJ – the first time in the history of the LCFS programme that any low-carbon fuel portfolio has achieved carbon-negative status. The CI of any given fuel measures all greenhouse gas (GHG) emissions associated with the entire life-cycle of a transport fuel, including production and consumption. Many forms of RNG, such as that produced from food and green waste, have a carbon-neutral and even carbon-negative rating. Other forms of RNG, such as that produced from dairy waste, can have CI ratings that are 200-300% lower than even a battery electric vehicle powered by renewable energy such as solar or wind. The Q2 2020 data from CARB's LCFS programme confirms another significant milestone – RNG made up nearly 90% of all natural gas vehicle fuel in the programme and consumed in California in the first half of the year.

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### **Solving the Climate Crisis in the USA**

The House Select Committee on the Climate Crisis unveiled a climate crisis action plan that aims to serve as a congressional roadmap to help the U.S. reach net-zero emissions by 2050. Biomass, biogas and biofuels will help meeting that goal, according to the committee. Within the plan, the committee recommends that Congress invests in research on the potential of bioenergy with carbon capture and storage (BECCS). The staff report notes that renewable thermal technologies, including solar thermal, certain biomass, geothermal energy, and renewable natural gas (RNG) can lower greenhouse gas (GHG) emissions by replacing fossil energy sources. Transportation fuels are also addressed. The staff report also recognizes the need to develop cost-effective, scalable methods to measure and quantify carbon sequestration and greenhouse gas reduction on farms and ranches, and study the feasibility of developing a federal tax credit to incentivize carbon sequestration and abatement on farms. A full copy of the report can be downloaded from the House Select Committee on the Climate Crisis.

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### **An assessment: California's in-state supply for transportation 2020 -2024**

The goal of this study is to provide stakeholders and policy makers with an accurate, data-driven estimate for the total volume of RNG that will be produced in-state and made available for transportation use by California fleet operators in the near term. The inventory assesses the actual RNG production of existing and developing projects. It provides a reasonably reliable estimate of the actual supply of in-state RNG that was being produced on January 1, 2020, the growth in production that will take place over the next four years, and the total supply of California-produced RNG that will be flowing to end users in California on January 1, 2024. This research determines that currently 160 California-based RNG production facilities are supplying more than 15.8 million MMBTU, or nearly 119 million diesel gallon equivalents (DGE), to transportation end users by the beginning of 2024. As a significant proportion of the growth in "domestic" production will come from California dairies, the energy

weighted Carbon Intensity (CI) value of the instate supply of RNG will be approximately -101.74 gCO<sub>2</sub>e/MJ.

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### **Incentives spur dairy digester projects in California**

A report issued by CoBank's Knowledge Exchange explains how California's Low Carbon Fuel Standard (LCFS) and Cap-and-Trade programs have helped successfully spur the development of dairy digester projects within the state. According to the report, California's 1.4 million dairy cows are the state's largest source of methane. In 2017, the state set a goal to reduce dairy manure methane emissions by 40 percent below 2013 levels by 2030. The report shows that California's Dairy Digester Research and Development Program has already awarded more than \$183 million in grants for 108 dairy digester projects. In comparison, EPA data that shows only 255 digesters were operating on U.S. livestock farms as of March 2020. In California, like anywhere else, the LCFS is a key component of revenue for dairy digester projects, according to CoBank, noting the average monthly credit price for this year has been around \$200 per ton of carbon dioxide equivalent. CoBank also noted that the high value of LCFS credits reduces the incentive for California to put money into grants for dairy digester projects. CoBank points out that the decision to invest in a digester is not purely an economic one for California dairies. Since the state will have the authority to mandate manure methane emissions reductions starting in 2024, CoBank said using incentive funding now to install a digester that merely breaks even is a wise choice for dairies that could face future penalties for emissions.

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### **An overview of renewable natural gas from biogas**

The U.S. EPA's Landfill Methane Outreach Program in July published a report on renewable natural gas (RNG) that aims to provide biogas stakeholders and other interested parties with a resource to promote and potentially assist in the development of RNG projects. The 55-page report addresses RNG feedstocks and sources, options for delivering and using the fuel, the benefits of RNG projects, an estimate of current operational and potential RNG projects, and the processes and technologies used to upgrade biogas to RNG. The report also addresses policies and incentives to boost RNG development and use as well as barriers to RNG project development. In the report, the EPA estimates that more than 100 RNG projects are currently operational across 34 states. About 40 additional projects were under development as of February 2020. The report also provides interesting figures on emission reduction with RNG vehicles as compared to fossil fuel and gives data on carbon intensity.

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