

Renewable Natural Gas: Same Ol' Climate Polluting Methane, Cleaner-Sounding Name

As corporations seize more control of our food and energy systems, our planet gets increasingly saturated with their toxic byproducts. Increasingly worried about their image as people demand meaningful climate action, corporations have tried to assuage the public with technological Band-Aid fixes like “renewable” natural gas. In reality, this is just a greenwashed, cleaner-sounding name for biomethane, or processed biogas that can be delivered in pipelines.¹ In this way, “renewable” natural gas is a symptom of the systems that are forcing climate change.

Biomethane is being misleadingly touted as a clean source of energy, and its supporters market it as renewable. By relying on symptoms for climate change to be the cure, we simply perpetuate the underlying problem. For one, biogas is primarily comprised of methane (the same greenhouse gas that makes up fracked natural gas). It includes waste methane from landfills, sewage treatment plants and factory farm livestock manure.²

Biomethane proponents include natural gas companies, investor-owned utilities, industry trade groups like the American Gas Association, and Big Ag.³ These champions have an incentive to invest in and support biomethane because it can utilize existing fossil-fueled gas infrastructure while propping up factory farms.⁴ This is a win-win for energy companies because biomethane could either diversify their portfolios or keep their assets from becoming stranded. Concerningly, biomethane encourages the continued buildout of leaky gas infrastructure that locks in climate chaos.

Debunking “Pro-Climate” Claims

Supporters claim that the primary benefit of biomethane is that it reduces fossil fuel consumption and helps allay climate change.⁵ But for biomethane to provide meaningful change, it relies on the improbable condition that no methane will be emitted to the atmosphere during the conversion of biogas to biomethane.⁶ And a 2020 study determined that “renewable” natural gas systems are prone to leakage.⁷

Studies have shown that methane can be released at biogas facilities through the process of “upgrading” it to biomethane, pressure relief valves, ventilation processes, leaky infrastructure, and more.⁸ A 2019 study looked at 23 manure-based agricultural biogas plants in Denmark — eight of which manufactured biomethane — and found that 0.4 to 14.9 percent of the production total (methane) leaked from their systems. The average plant lost 4.6 percent.⁹

A 2018 Food & Water Watch report found that although biogas is literally comprised of methane, every state with a Renewable Portfolio Standard considers waste gas from landfills and sewage treatment plants to be renewable energy; 25 states classify biogas from factory farms as renewable.¹⁰ Biomethane simply replaces one form of the climate pollutant for another.

“Renewable” Natural Gas is Way Too Expensive

The cumulative costs associated with treating biogas, bringing it to market and all the necessary interconnected facilities pose challenges to the economic viability of these projects.¹¹ Research has indicated that replacing fossil fuels with biomethane is “not likely to be commercially feasible without large subsidies.”¹² Likewise, anaerobic digestors (the infrastructure that converts waste into biogas) cost millions. These expensive facilities are dependent upon significant public funding and incentives.¹³ Some costs are offset by taxpayer-subsidized handouts; others are simply passed down to utility ratepayers.¹⁴ In 2018, California invested over \$70 million toward 42 new dairy biogas digester projects.¹⁵ These grants, coupled with other incentives,¹⁶ encouraged the construction of dairy digesters across the state.

Digestors produce neither clean nor safe energy because of methane combustion emissions, leaks, accidental manure spills and explosions.¹⁷ It would make more sense to actually decarbonize the grid by moving to wind and solar. For one, biomethane is significantly more expensive to fuel homes and businesses than traditional fossil fuel gas.¹⁸ Secondly, technology exists to support a transition to 100 percent clean, renewable energy, backed up by storage and transmission, at prices lower than current energy costs.¹⁹

The Factory Farm Nexus

Biomethane from anaerobic digesters props up factory farms that produce a colossal amount of manure due to the large concentrations of animals. The technology converts gas from factory farm manure (and other wastes like sewage sludge or food waste) into biogas, which is promoted for onsite electricity generation or for being sold to the grid.²⁰ Some leaders are championing for anaerobic digesters as a remedy for managing factory farm waste.²¹ But digesters do not solve animal waste problems, and they do not reduce phosphorus or nitrogen levels in manure. Manure still needs to be managed through practices such as field application.²²

Smaller, pasture-based dairies can manage manure onsite by applying it as fertilizer on their cropland at sustainable rates. However, factory farms typically produce more manure than can be used onsite. Overapplication of dairy manure can cause runoff, polluting waterways with nutrients like nitrogen and phosphorus.²³

Increasingly, Big Ag is partnering with energy companies, locking us into two polluting business models. For example, in August 2018 SoCalGas began accepting biomethane that originated from an anaerobic digestion facility (which was already used to fuel roughly 400 waste hauling trucks). And in February 2019, SoCalGas announced that it had begun to inject biomethane from a dairy digester into its natural gas system.²⁴



PHOTO CC-BY © SOMENERGIA COOPERTIVA / FLICKR.COM

Anaerobic digestion facilities support factory farms that produce a colossal amount of manure due to large concentrations of animals.

Oregon's first anaerobic digester began operating in 2019; it is one of the largest in the nation, and feeds gas into the grid.²⁵ That same year Dominion entered into a \$500 million joint venture with pork producer conglomerate Smithfield to turn manure into biomethane; (Dominion's natural gas transmission and storage assets have since been acquired by a Warren Buffet company in a nearly \$10 billion deal.)²⁶ Dominion also partnered with Vanguard Renewables in a \$200 million nationwide effort to convert dairy manure into biomethane. Projects have also been planned for New Mexico, Colorado, Nevada, Utah and Georgia.²⁷

In Delaware, Biogas Dev Co (BDC) entered into a 20-year contract with Perdue Farms to construct a \$7 million anaerobic digestion system for biomethane.²⁸ BDC, a global company backed by private equity, also teamed up with Chesapeake Utilities to flood its natural gas system with "renewable" natural gas.²⁹ This is the first time Chesapeake Utilities has looked to add biomethane to their network.³⁰ The plan also includes pouring millions of dollars into gas tanker trucks to carry the biomethane to the 500-mile Eastern Shore Natural Gas pipeline network in Maryland.³¹

Other Sources of So-Called "Renewable" Natural Gas

Waste methane from landfills is another primary source of "renewable" natural gas. Like dairy biogas, landfill gas can be used onsite (or close by) for direct heating, or it can be processed and upgraded into biomethane to be used in transportation or injected directly into the pipeline network.³² Landfills are the leading source of biomethane in the U.S., and about 560 operational landfill gas projects are spread throughout the country.³³

At landfills, natural anaerobic decomposition happens as waste breaks down, which releases methane. Its reuse is being promoted because any infrastructure that uses fossil fuel natural gas, can also use landfill gas. To tap it, punctured pipe wells are drilled into the garbage every acre or so. The wells connect to a header pipe that has a vacuum that sucks gas out. Unused landfill gas is burned off (flared).³⁴

While landfills pose the problem of fugitive methane emitted into the atmosphere during trash decomposition, repurposing it into pipeline-grade combustible gas isn't the solution. In fact, it further entrenches us into more dirty infrastructure and continued fossil fuel reliance.

For example, in California, the proposed Glendale Biogas Renewable Generation Project is a biogas generation project that Glendale Water & Power (GWP) has been plotting



PHOTO CC-BY © SOMENERGIA COOPERTIVA / FLICKR.COM

The Scholl Canyon Landfill near Eagle Rock — a Los Angeles community beset by a history of poor air quality and pollution-related health problems and casualties — is the target site of the Glendale Biogas Renewable Generation Project. As part of a larger plan to repower and upgrade the city's Grayson Power Plant, the Glendale Project would help lock Angelenos into climate-destroying infrastructure.

to build at the city-owned Scholl Canyon Landfill near Eagle Rock — a Los Angeles community beset by a history of poor air quality and pollution-related health problems and casualties.³⁵ The Glendale Project is part of a larger plan to repower and upgrade the city's Grayson Power Plant,³⁶ locking Angelenos into climate-destroying infrastructure.

“Renewable” natural gas can likewise originate from municipal solid waste, sludge from wastewater treatment plants, food waste³⁷ or be manmade. Power-to-gas and artificial photosynthesis processes can create biomethane. These processes involve transforming water into hydrogen, then combining hydrogen with carbon dioxide. Absurdly, these technologies rely on renewables.³⁸ (Though, when power-to-gas doesn't use real renewable energy — like wind and solar — it typically utilizes dirty energy sources under the guise of “renewable.”)

Conclusion: We Need Real Solutions and Real Renewables

Biomethane is indistinguishable from fossil methane and fracked gas. States must strengthen and eliminate dirty energy sources like biomethane from their renewable portfolios. Counting waste methane from factory farms, landfills, sewage treatment plants and more as “renewable” simply bolsters the natural gas industry and maintains the nation's leaky gas infrastructure — a major emitter of methane. Expensive “renewable” natural gas will simply help prolong fossil fuel dependence and delay the shift to genuinely clean, renewable energy needed to reduce greenhouse gas emissions, while propping up polluting factory farms.

A real solution would be transitioning to 100 percent clean, renewable energy by 2030 through an investment in a New Deal-scale green energy public works program that fosters a rapid transition to real zero-emission clean energy (like solar and wind) accompanied by widescale deployment of energy efficiency. Technology for a large-scale transition to renewables has existed for over 20 years and is cheaply available now³⁹ — we just need the political will to see it through.

Endnotes

- 1 Haines, Deanna. SoCalGas/SDG&E. "Getting the facts on renewable natural gas." Presented at 2nd Annual AGA-EPA Natural Gas STAR/Methane Challenge Renewable Natural Gas Workshop & Exhibit. Fort Worth, Texas. October 23, 2018 at 13.
- 2 Tanigawa, Sara. Environmental and Energy Study Institute (EESI). "Biogas: Converting Waste to Energy." October 2017 at 1; U.S. Environmental Protection Agency (EPA). "How does AD work?" Available at <https://www.epa.gov/anaerobic-digestion/basic-information-about-anaerobic-digestion-ad>. Accessed April 2019.
- 3 SoCalGas. "Biogas and renewable natural gas." Available at <https://www.socalgas.com/smart-energy/renewable-gas/biogas-and-renewablenatural-gas>. Accessed December 2017; American Gas Association. "Securing a Role for Renewable Gas." August 31, 2010 at 1 to 4; Bates, Michael. "Bioenergy, Chesapeake Utilities partner to supply RNG." *NGT News*. June 5, 2020; Goldstein, Nora. "Smithfield Foods goes big on biogas." *BioCycle*. January 4, 2019.
- 4 Grubert, Emily. "At scale, renewable natural gas systems could be climate intensive: The influence of methane feedstock and leakage rates." *Environmental Research Letters*. Vol. 15, No. 8. August 2020 at 1; Russell, Pye et al. MJB & A. "Renewable Natural Gas. The RNG Opportunity for Natural Gas." April 2017 at 1; Food & Water Watch (FWW). "Biogas From Factory Farm Waste Has No Place in a Clean Energy Future." July 2019.
- 5 Paolini, Valerio et al. "Environmental impact of biogas: A short review of current knowledge." *Journal of Environmental Science and Health, Part A*. Vol. 53, No. 10. 2018 at 899.
- 6 Grubert (2020) at 1, 5 and 10.
- 7 *Ibid.* at 5 and 10.
- 8 Scheutz, Charlotte and Anders M. Fredenslund. "Total methane emission rates and losses from 23 biogas plants." *Waste Management*. Vol. 97. September 2019 at 38.
- 9 *Ibid.* at 42.
- 10 FWW. "Cleanwashing. How States Count Polluting Energy Sources as Renewable." July 2018 at 8.
- 11 Russell (2017) at iii, 7 and 8.
- 12 Jaffe, Amy Myers et al. UC Davis, Institute of Transportation Studies. "The Feasibility of Renewable Natural Gas as a Large-Scale, Low Carbon Substitute." June 2016 at 11.
- 13 EPA AgStar. "Funding On-farm Anaerobic Digestion." September 2012 at 1.
- 14 Lucas, Jim. Southern California Gas. Sempra Energy. "Renewable natural gas and interconnecting to the SoCalGas pipeline." PR1118.1 Working Group Meeting. October 24, 2017 at 6, 9, 11 and 14.
- 15 California Department of Food and Agriculture (CDFA). Dairy Digester Research and Development Program. "Report of Funded Projects (2015-18)." January 2019 at 3.
- 16 Ashton, Adam and Andrew Sheeler. "Turning poop into power: California dairies appeal for more state climate change money." *Sacramento Bee*. May 29, 2019.
- 17 Flesch, Thomas K. et al. "Fugitive methane emission from an agricultural biodigester." *Biomass and Bioenergy*. 2011 at 3927; Verburg, Steve. "Blast destroys roof of troubled biodigester near Waunakee." *Wisconsin State Journal*. August 6, 2014.
- 18 Cagle, Susie. "US gas utility funds 'front' consumer group to fight natural gas bans." *Guardian*. July 26, 2019.
- 19 FWW. "Cracked: The Case For Green Jobs Over Petrochemicals In Pennsylvania." September 2020 at 6.
- 20 Tanigawa (2017) at 1; EPA. (April 2019); Michigan Department of Agriculture et al. "Frequently asked questions about anaerobic digesters (ADs): Operation advantages and funding opportunities." ND at 3.
- 21 Michigan Department of Agriculture et al. (ND) at 2 to 3.
- 22 *Ibid.* at 6; Liebrand, Carolyn Betts and K. Charles Link. USDA Rural Development. "Cooperative Approaches for Implementation of Dairy Manure Digesters." Research Report 217. April 2009 at 4; Informa Economics. "National Market Value of Anaerobic Digester Products." Prepared for the Innovation Center for U.S. Dairy. February 2013 at 51; Carreira, R. I. "How far can poultry litter go? A new technology for litter transport." *Journal of Agricultural and Applied Economics*. December 2007.
- 23 Long, Colleen M. et al. "Use of manure nutrients from concentrated animal feeding operations." *Journal of Great Lakes Research*. Vol. 44, Iss. 2. April 2018 at introduction.
- 24 SoCalGas. [Press release]. "Renewable natural gas now flowing into SoCalGas pipelines from Calgren dairy digester pipeline cluster." February 14, 2019
- 25 Iogen Corporation. [Press release]. "Iogen: Dairy manure RNG project begins operations in Oregon." December 4, 2019.
- 26 "\$500M Dominion-Smithfield venture taking manure and making it into renewable gas." *PowerEngineering*. October 25, 2019; Walton, Rod. "Berkshire Hathaway strikes \$10bn deal with Dominion Energy for natural gas assets." *Power Engineering International*. July 8, 2020.
- 27 Dominion Energy. "Dominion Energy, Vanguard Renewables partner on dairy RNG." *Biomass Magazine*. December 11, 2019.
- 28 Tabeling, Katie. "Chesapeake Utilities, Bioenergy DevCo reach renewable energy deal." *Delaware Business Times*. June 4, 2020; "Chesapeake, new operator of Perdue plant launch program to convert chicken droppings into natural gas," *Delaware Business Times*. June 4, 2020.
- 29 Delaware Business Times (2020); Tabeling (2020); "Bioenergy DevCo secures US \$106 million to grow North American AD market." *Bioenergy International*. August 13, 2019.
- 30 Tabeling (2020).
- 31 *Ibid.*
- 32 Russell (2017) at 2.
- 33 *Ibid.*; EPA "Project and landfill data by state." Available at <https://www.epa.gov/lmop/project-and-landfill-data-state>. Accessed June 2020.
- 34 LeFevers, Daniel. Waste Management. "Landfill Gas to Renewable Energy." Presented at EESI Hill Briefing. April 26, 2013 at 4.
- 35 Hendrickson, Bill. "Burning of methane at Scholl Canyon raises questions anew." *Boulevard Sentinel*. November 30, 2018; Scauzillo, Steve. "Methane burn-off at Scholl Canyon Landfill angers Pasadena, Glendale and La Cañada Flintridge residents." *Pasadena Star-News*. April 11, 2019; Brown, Deb et al. American Lung Association. "State of the Air 2019." 2019 at 4, 6 to 7 and 19 to 20; Dannelski, David. "Los Angeles area's air quality the deadliest in the nation, researchers say." *Press-Enterprise*. August 11, 2016.
- 36 Stantec Consulting Services Inc. Prepared for City of Glendale Water and Power. "Final Environmental Impact Report, Grayson Repowering Project." March 1, 2018 at 3.1.
- 37 Tomich, Matthew and Marianne Mintz. Energy Vision. Argonne National Laboratory. "Waste-to-Fuel: A Case Study of Converting Food Waste to Renewable Natural Gas as a Transportation Fuel." ANL/ESD-17/9. August 2017 at v.
- 38 Russell (2017) at 2.
- 39 FWW. "Fracking's Bridge to Climate Chaos." January 2020 at 12.