

Renewable natural gas may benefit climate, but unlikely to solve declining demand for gas utilities

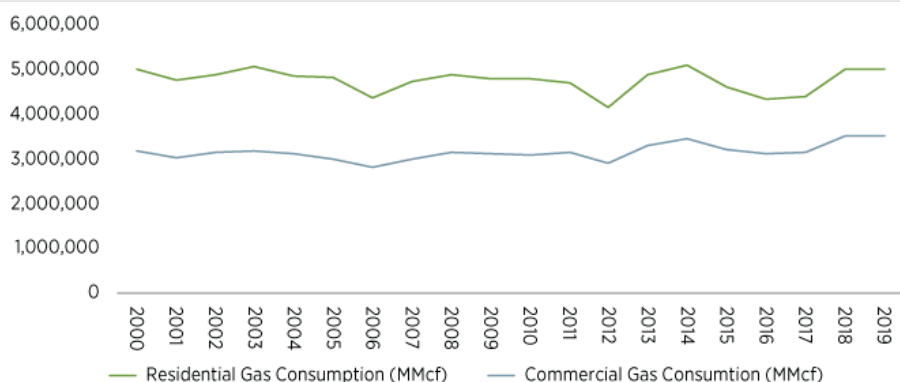
By: John Miller | & Leah Moehlig, CFA | October 6, 2020

Washington - As U.S. gas utilities consider the growing demand risk for their core product in a decarbonizing world, investment and joint venture announcements in animal-waste-to-biogas, or renewable natural gas (RNG), have grown. While RNG offers a comparatively lower total greenhouse gas (GHG) footprint when benchmarked against traditional natural gas (gas), reliance on RNG is a risky proposition. Rather, a prudent energy transition strategy would include consideration of RNG as one of multiple measures in preparing for a reduced gas demand future, while simultaneously compelling upstream suppliers to cut operational emissions, and investing in upgrades to existing infrastructure and technology - not expanding networks.

Premium valuation at risk?

Historically, sales volumes of gas to US residential and commercial customers has been consistent and predictable. This predictability, and the expectation that future results will be equally consistent, has encouraged investors to assign higher asset valuations to the gas utility sector compared to electric peers.

20-year US residential and commercial gas consumption trends in MMcf



Source: US EIA. Natural Gas Consumption by End Use. https://www.eia.gov/dnav/ng/ng_cons_sum_dcu_nus_a.htm

However, as the full GHG footprint of the gas value chain becomes evident, risks to this historical predictability have emerged. In 2018, fossil fuel consumption by residential and commercial end users -primarily gas - resulted in the production of 583.3 million metric tons (MMT) of carbon dioxide (CO2) equivalent emissions, or 8% of all US GHG emissions. Emissions from gas systems themselves adds a further 175 MMT CO2 equivalent.¹

Simultaneous to this growing gas sustainability risk, the efficiency and cost effectiveness of electric alternatives - primarily heat pumps - has increased. When powered by renewable generation, these electrical alternatives can offer a lower cost, lower carbon intensity product, than that offered via traditional gas.

Animal waste to pipeline gas

The implementation of RNG projects have the potential to both reduce GHG emissions and minimize overall environmental impacts related to livestock waste. In the US, anaerobic digesters using animal manure have seen the most investment attention. In anaerobic digestion, microorganisms' breakdown the organic material feedstock in an oxygen deprived environment. The process generates methane and waste CO2. Once upgraded, the methane can be injected into a utility's gas pipeline.

RNG value chain

1. Capturing Methane from the Farm

Methane from hog and cow manure is captured from covered digesters outside the barns and transported to a central conditioning facility.



2. Converting it to RNG

The methane is cleaned at the conditioning facility to 99% pure methane, the same as traditional natural gas.



3. Delivering to Home and Business

The RNG is then put into existing distribution systems to serve local homes and businesses.



Adapted from Dominion Energy, "Renewable Natural Gas: Turning Waste Into Clean Energy."

The climate argument for RNG rests on its conversion of animal waste -- which would otherwise emit methane from the farm -- to CO₂ when the RNG is consumed. Over a 100-year horizon, methane carries 25 times the global warming potential of CO₂.²

While ample feedstock exists to scale RNG, cost remains a major hurdle. At a time when traditional gas costs are hitting 20-year lows below \$2.00/MMBtu, regional cost projections for animal waste RNG ranges from \$18.4/MMBtu to \$32.6/MMBtu.³ Federal programs, such as the Renewable Fuel Standard, and state-level initiatives, including California's Low Carbon Fuel Standard which carries a ~\$70/MMBtu incentive for animal waste RNG are critical in incentivizing production and consumption.⁴

Preparing for lower gas demand

Prudent energy transition strategic planning for gas utilities calls for the real consideration of a lower gas demand future. While the timeline will vary, the relative economic advantages of electric alternatives make an eventual transition likely.

Animal waste derived RNG can certainly play a meaningful role in this future decarbonized state, but utility projections indicating growing, or even flat, long-term demand trends increase the risk of stranded investments in underutilized infrastructure. In addition to exploring RNG and other low carbon gasses, best-in-class energy transition planning should include pressure on gas suppliers to cut their operational emissions, while focusing capital allocation towards existing infrastructure upgrades and the deployment of technology and meter systems to boost efficiency.

Bottom line: Through Calvert's ESG investment research framework, centered on financial materiality, we have identified a series of best practices that leading gas utilities are taking to strategically plan for a lower demand, decarbonized future. These practices include exploring low and zero carbon alternative fuels, applying pressure on upstream suppliers, and capital spending on existing infrastructure upgrades and efficiency related technologies.

1. US EPA. *Inventory of US Greenhouse Gas Emissions and Sinks*.

2. US EPA. *Inventory of US Greenhouse Gas Emissions and Sinks*

3. ICF. *Renewable Sources of Natural Gas: Supply and Emissions Reduction Assessment*. December 2019. Prepared by ICF for the American Gas Foundation.

4. *Financial Times*, "Methane from manure offers green fuel revenue for US farmers," June 24, 2020.

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