DECARBONIZATION

Decarbonization Of Fuel Source Through Energy Innovation

A priority for Hawaiʻi Gas will be a focus on renewable natural gas (RNG) and hydrogen, both of which already exist in our energy portfolio yet has room for continued growth through exploration and innovation. On Oahu, both fuels allow Hawaiʻi Gas to make use of our vast infrastructure; primarily our 1,100 miles of pipeline network and production plant. The existing pipeline network currently accommodates a mix of synthetic natural gas (SNG), renewable natural gas (RNG) and up to 15% hydrogen. That is more utility hydrogen than any other utility company in the nation.

Hawaiʻi Gas is also evaluating projects and new technology that could further diversify our fuel mix to reduce the overall use of SNG. As we better understand the capability of delivering a modified mix of fuel, Hawaiʻi Gas will continue to invest in adapting the existing infrastructure as needed.

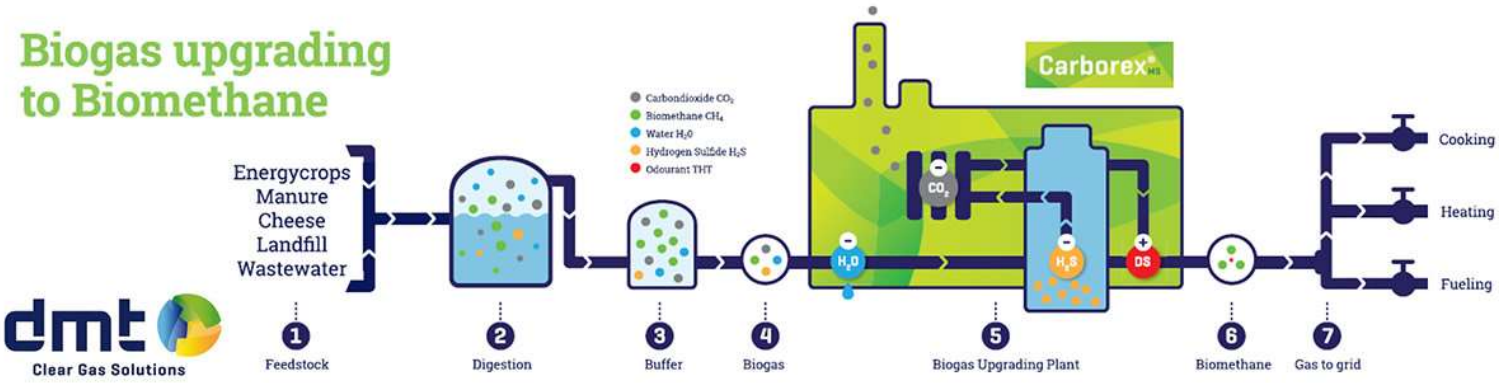
Renewable Natural Gas

The Honouliuli RNG Facility equipment, painted an eye-catching bright green, takes the gases that are a by-product of wastewater treatment and turns them into clean-burning biomethane.

Renewable natural gas (RNG) is natural gas or methane that is created using the biogas generated by organic matter as it decomposes. RNG is an ultra-clean fuel and can be considered carbon-negative depending on the source because it potentially converts more greenhouse gases than it emits.

Hawai‘i Gas was the first in the state to capture and process biogas from the City and County of Honolulu’s Honouliuli Wastewater Treatment Plant on O‘ahu. This facility produces about 800,000 therms of energy per year, enough gas for more than 6,000 homes[1]. At the same time, this RNG project reduces the need for approximately 15,000 barrels of oil and reduces greenhouse gas emissions by the amount produced by 400 cars annually. Additionally, since 2018, the City and County of Honolulu generated approximately $1.85 million of revenue by selling the biogas to Hawaiʻi Gas.

[1]Based on average household use of 11 therms/month by Hawai‘i Gas customers.



The wastewater feedstock is upgraded through a multi-step process to create renewable natural gas in the form of biomethane.

The City and County of Honolulu and Hawai'i Gas held a blessing and dedication ceremony for the Honouliuli RNG Facility in December 2018. Pictured from left to right: Kirsten Turner, representing U.S. Rep. Tulsi Gabbard; Honolulu City Councilmember Kymberly Pine; Macquarie Infrastructure Corporation CEO Christopher Frost; Hawai'i Gas President & CEO Alicia Moy; City and County of Honolulu Mayor Kirk Caldwell; and City and County of Honolulu Director of Environmental Services Lori Kahikina.

"Ensuring that all families have access to affordable and reliable energy, our RNG project is an important step toward achieving Hawaii's clean energy goals. RNG leverages existing infrastructure to deliver cleaner fuels to our customers while providing jobs and revenue source to the City."

– *Alicia Moy,* *President & CEO, Hawai'i Gas*

"The ability to capture biogas from our sewage (and transform it into RNG) is the type of innovative project that will help us reach our renewable energy goals sooner rather than later."

– *Mayor Kirk Caldwell,* *City & County of Honolulu*

Other RNG Projects

Hawaii Gas is also actively pursuing new RNG projects in the near future with a priority on locally produced RNG and increasing the percentage of carbon-negative natural gas sources in our fuel mix. The Hawaii Natural Energy Institute of the University of Hawaii recently issued a study exploring local production resources for RNG, which is a first step in cataloging the potential opportunities in the state. While there is still more work that needs to be done to bring into focus the many factors that impact RNG production. Benefits include:

- Economic growth: capital investments, new income source for counties, new jobs in the green energy industry
- Environmentally friendly: eliminates/reduces the state's dependency on oil; RNG is carbon negative thus can play a significant role in reducing greenhouse gas emissions
- Positive consumer impact: gas appliances could save customers an average of 30% on utility bills

Hydrogen

There is worldwide recognition that hydrogen—a clean, zero-emissions fuel—will be the clean energy source of the future. Hawaiʻi Gas has been using hydrogen in our utility fuel mix for many years and we are excited to explore new opportunities to improve clean energy options for the state. Our vision is to be an industry leader in transitioning to zero-emissions fuel sources, like hydrogen, safely, affordably and reliably.

Hydrogen has the potential to go beyond gas replacement to be a clean alternative fuel for transportation, to power electric generators, and provide long-lasting energy storage for the electric grid. Recently, Hawaiʻi Gas has embarked on several hydrogen research and development projects to try and overcome the technological challenges of increasing renewable natural gas and hydrogen into our supply mix.

SNG And Propane

Synthetic Natural Gas

We will continue to use SNG to satisfy consumer demand and stabilize our energy portfolio until such time that newer technologies can make replacement fuels, like RNG and hydrogen, more viable. Since our state has no naturally occurring source of natural gas, Hawaiʻi Gas produces SNG from a petroleum by-product called naphtha. While SNG is created artificially, its properties are like that of natural gas and has considerably less impact on the environment than other energy sources like oil and coal.

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Propane

The use of propane (LPG) is a part of everyday living for many homeowners and business. Moreover, it is critical to the stability of essential functions during emergencies and severe weather as it is used to operate emergency command centers, fire stations, hospitals, shelters and other

essential services statewide. When the electrical grid is damaged or not functioning properly, gas energy is readily available and easy to set up to cook, heat water for showers or sanitation, and backup power.

Propane is used all over Hawaii:

- For residential water heaters, air conditioners, furnaces, outdoor grills, fireplaces and appliances
- On farms to control pests, dry crops and power irrigation pumps
- To power forklifts and industrial vehicles
- For heating, cooking and much more at thousands of businesses - including restaurants and hotels

Propane is not regarded as a greenhouse gas and is even listed as an approved clean energy source by the 1990 Clean Air Act and Energy Policy Act of 1992. Like any natural gas, propane has some level of emissions, but it is fairly low compared to other fuels. Technology, science and research continues to evolve, however, to date there is no feasible alternative to propane that can offer comparable affordability and resiliency. While propane will continue to be a part of our energy portfolio, we are committed lowering our carbon footprint by investing in initiatives that offset the impact of propane use.

Frequently Asked Questions

- What is SNG? (/web/20210925091007/https://hawaiigas.com/customer-service/faq/clean-energy/#1252)
- How is SNG made? (/web/20210925091007/https://hawaiigas.com/customer-service/faq/clean-energy/#1342)
- What is LNG? (/web/20210925091007/https://hawaiigas.com/customer-service/faq/clean-energy/#1401)
- Is LNG toxic? Does it have an odor? Is it corrosive? (/web/20210925091007/https://hawaiigas.com/customer-service/faq/clean-energy/#1219)
- Is propane safe to use in my home? (/web/20210925091007/https://hawaiigas.com/customer-service/faq/clean-energy/#1378)

VIEW ALL FAQS (/WEB/20210925091007/HTTPS://HAWAIIGAS.COM/CUSTOMER-SERVICE/FAQ/)

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SMELL GAS?

If you smell gas or suspect an emergency situation, leave the area immediately, call **9-1-1** and then Hawaii Gas (/web/20210925091007/https://hawaiigas.com/customer-service#emergency-numbers).