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PUBLIC UTILITIES
COMMISSION

March 31, 2015

HAND DELIVER

The Honorable Chair and Members of
the Hawaii Public Utilities Commission
465 South King Street
Kekuanoa Building, Room 103
Honolulu, Hawaii 96813

Re: Hawaii Revised Statutes (HRS) § 269-45, Gas Utility Companies Renewable
Energy Report

To the Honorable Public Utilities Commission of the State of Hawaii:

In accordance with HRS § 269-45, The Gas Company, LLC doing business as Hawaii
Gas, hereby files its Annual Renewable Energy Report for 2014. Portions of the
report have been redacted in accordance with HRS § 269-45(a).¹

Sincerely,

Lori Y. Sun
Associate General Counsel
Hawaii Gas

¹ HRS § 269-45(a) states in part, "Due to the proprietary nature of the information required by paragraphs (3) and (4), that information shall be held in confidence by the commission; provided that any information obtained by the commission under this section, including confidential information, shall be made available to the department of business, economic development, and tourism or its authorized representative, which shall safeguard the confidentiality of that information."

Hawaii Gas

2014 Renewable Energy Report

The Gas Company, LLC, doing business as Hawaii Gas (Hawaii Gas), has prepared this Annual Renewable Energy Report for the Hawaii Public Utilities Commission pursuant to Hawaii Revised Statutes (HRS) § 269-45.

Hawaii Gas manufactures synthetic natural gas (SNG) for its utility customers on Oahu, and distributes propane through utility and nonutility systems throughout the State's six main islands. SNG and propane are clean-burning fuels that produce lower levels of carbon emissions than other hydrocarbon fuels such as coal and oil. SNG and propane provide a safe, reliable, and economical source of energy to approximately 70,000 residential and commercial customers throughout the State, with almost half of those customers served by the SNG utility system. SNG is made using naphtha, a byproduct of oil produced at a local refinery. Therefore, production of SNG does not require any additional oil to be imported to Hawaii. By using SNG, Hawaii avoided importing 817,255 barrels of oil in 2014.¹ This amounts to a savings of \$100,407,897, based on \$122.86 per barrel of low sulfur fuel oil.²

Renewable Energy Data and Information

Hawaii Gas produces SNG using a blend of naphtha and hydrogen, along with other feedstocks. Since 2000, approximately 50% of the hydrogen used to produce SNG has been from recycled water from the Honouliuli Wastewater Treatment Plant (WWTP). Recycled water from the WWTP is combined with methane and other gases to produce hydrogen and additional methane in Hawaii Gas' SNG production processes. This renewable hydrogen accounted for 2.6% of the total feedstock used to produce SNG in 2014.³

Renewable Natural Gas (RNG)

Hawaii Gas is committed to increasing the use of renewable natural gas (RNG) in Hawaii. In 2009, Hawaii Gas conducted laboratory studies which showed it was possible to convert animal fats and plant oils into a feedstock to produce RNG and displace a portion of Hawaii Gas' SNG production. In 2011, Hawaii Gas constructed a Renewable Natural Gas Pilot Plant to test whether the results from the laboratory studies could be duplicated on a larger scale, while still remaining economically and operationally feasible.⁴ Through the pilot project, it was determined that while it was possible to use fats and oils to produce RNG, the process

¹ See Attachment 1.

² *Id.*

³ *Id.*

⁴ See Docket No 2010-0334, Decision and Order No. 30096, issued on January 9, 2012.

could not meet the efficiency, reliability, and quality standards needed to sustain large scale production. Some of the obstacles faced by the pilot project included low feedstock conversion rates (conversion rates turned out to be lower than laboratory results); the presence of byproducts that could not be effectively separated from the feedstock stream; and additional capital investments and chemical treatments necessary to feasibly continue. Hawaii Gas learned valuable lessons about RNG production from fats and oils as a feedstock source. However, due to the challenges detailed above, Hawaii Gas is considering alternative uses for the Pilot Plant equipment.

Currently, Hawaii Gas is working to secure and develop local sources of biogas from WWTPs, landfills, special purpose energy crops, and other anaerobic digestion systems. Biogas, which is made primarily of methane and carbon dioxide, can be used to produce RNG (also called bio-methane). Hawaii Gas has entered into discussions with the City and County of Honolulu to acquire rights to biogas emitted from Oahu's WWTPs and landfills. Hawaii Gas is awaiting the formal procurement process that the City would need to conduct to procure biogas from its facilities, which has not yet started. In 2015, Hawaii Gas plans to conduct pilot projects with local companies to evaluate the use of special purpose energy crops, and to pursue other anaerobic digestion systems. If Hawaii Gas were to secure all of the biogas currently produced on Oahu, it would result in a displacement of approximately 10-14% of Hawaii Gas' utility system output.

Summary

Hawaii Gas plays a vital role in Hawaii's energy portfolio by providing efficient and cost-effective energy for Hawaii consumers. Hawaii Gas is committed to Hawaii's clean energy goals, and will continue to look toward new, innovative, and economical ways to generate renewable energy, while also reducing greenhouse gas emissions and aiding in waste diversion.

Attachment 1: Renewable Energy Report Summary
Confidential - Pursuant to HRS § 269-45(a)

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| Annual Report to the Hawaii Public Utilities Commission | | |
| Date: | March 3, 2015 | |
| Submitted by: | The Gas Company, LLC dba Hawaii Gas 745 Fort Street, Suite 1800 Honolulu, Hawaii 96813 | |
| Requested Information | | Value Barrel of Oil Equivalent (BOE) |
| Percentage of total feedstock comprised of petroleum feedstock | | 97.4% |
| Percentage of total feedstock comprised of non-petroleum feedstock ¹ | | 2.6% |
| The energy quantity in therms produced from petroleum feedstock (therms/ year) | | |
| The energy quantity in therms produced from non-petroleum feedstock (therms/ year) ² | | |
| Total (therms/ year) | | |
| Savings to Hawaii from the use of Synthetic Natural Gas (SNG) ³ | | |
| Number of barrels of imported oil saved by using SNG instead of electricity (barrels/ year) ⁴ | | 817,255 |
| Dollars saved on imported oil for the Hawaiian economy ⁵ | | \$/ barrel |
| - For every one (1) barrel of therm equivalent of SNG it would require 2.8125 barrels of oil for generator fuel ⁶ | | \$122.86 |
| - As an example for heating water, if electrical cost would be \$100, the SNG cost would be \$35.54 (higher conversion efficiency) | | |
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| Footnote | | |
| ¹ Plant stoichiometric basis (HHV) - R-hydrogen therm/ Plant Feedstock therm - use of recycled water from Honolulu Wastewater Treatment Plant. | | |
| ² Hydrogen produced in the reformer and water shift reactor from reclaimed wastewater - therm quantity based on feedstock flow. | | |
| ³ SNG is made using naphtha, a by-product produced at a neighboring refinery, and does not require any additional oil to be imported to Hawaii. | | |
| ⁴ Calculated from plant conversion efficiencies with hot water production. | | |
| ⁵ Average \$122.86/ LSFO barrel from HECO Monthly reports July thru Dec 2014. | | |
| ⁶ For every Barrel Therm Equivalent of SNG produced there is a savings of 1.728 barrels of oil saved [54.4614 therms/ barrel]. | | |