



# HAWAII GAS

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## THE CLEAN ENERGY COMPANY

### BALANCING SUSTAINABILITY, AFFORDABILITY AND RELIABILITY/RESILIENCY

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H2O Removal



H2S Removal

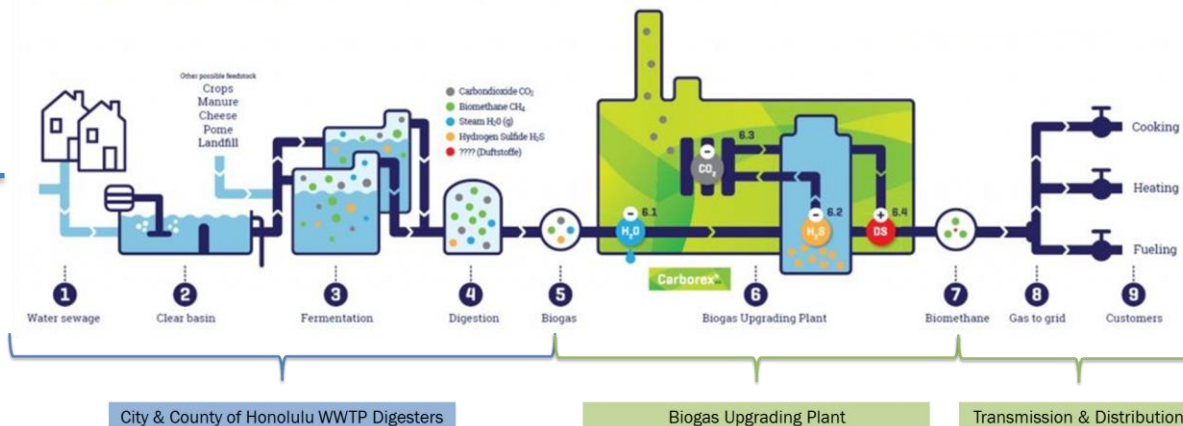


CO2 Removal



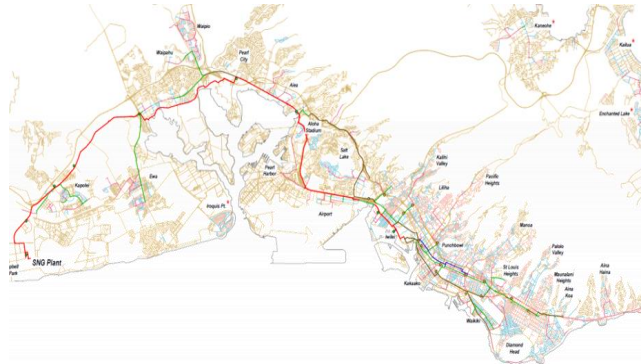
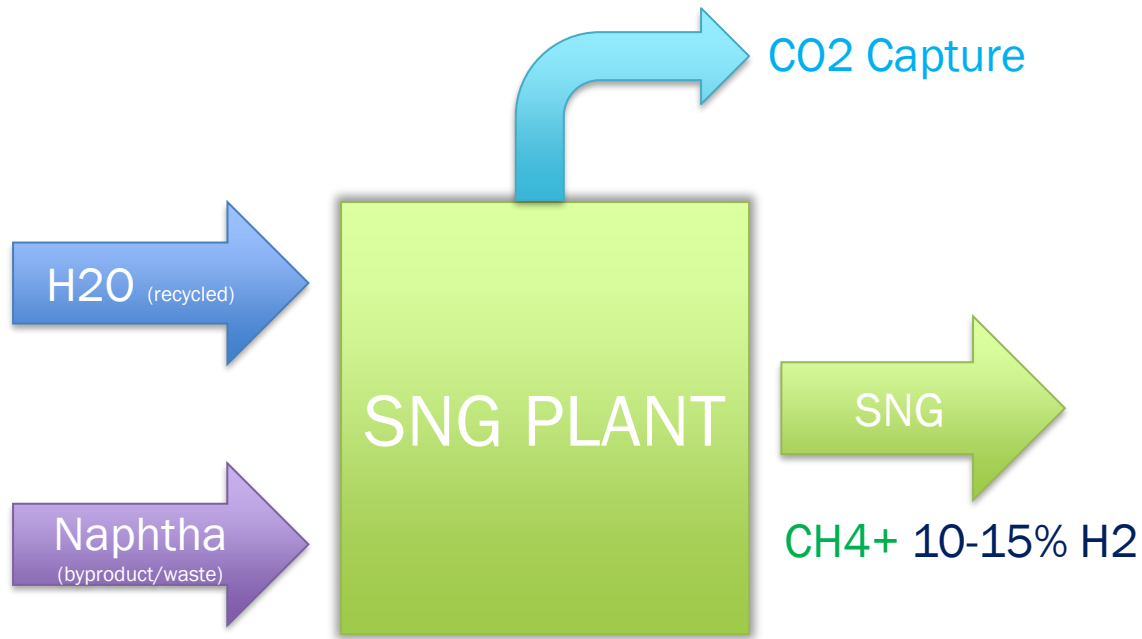
RNG T&D

## Biogas upgrading to Renewable Natural Gas



- **Collaboration**
  - Partnership with City & County of Honolulu
  - Support Hawai'i's carbon neutrality law
  - Provide renewables to Hawai'i customers
- **Affordability**
  - Payment to City & County of Honolulu for otherwise flared biogas.
  - HG utility equipment & operation
  - Affordable RNG to utility customers
- **Sustainability**
  - Up to 800,000 th/yr of renewable
  - 4,280 metric tons of CO2 eliminated annually
  - Capture flared gas, use waste to generate renewable energy, displace GHG from fossil fuel sources
  - Use recycled wastewater at SNG
- **Reliability / Resiliency**
  - Utility gas back-up
  - Underground distribution
  - Local supply & consumption

## II – SYNTHETIC NATURAL GAS PLANT



- **Collaboration**
  - Partnerships to study long term effect of Hydrogen blends
  - Partnership to study new hydrogen technology
  - Partnership to develop more renewable hydrogen supply
- **Affordability**
  - Provide affordable SNG (including H2) to utility customers
  - Allows integration of RNG/H2 to supply
- **Sustainability**
  - Up to 15% mol hydrogen produced (since 1970's)
  - CO2 captured
  - Very low GHG footprint
  - Use recycled wastewater (steam) and Refinery by-product or waste (Naphtha)
- **Reliability / Resiliency**
  - Utility gas flexibility and back-up
  - Underground distribution
  - Local supply & generation



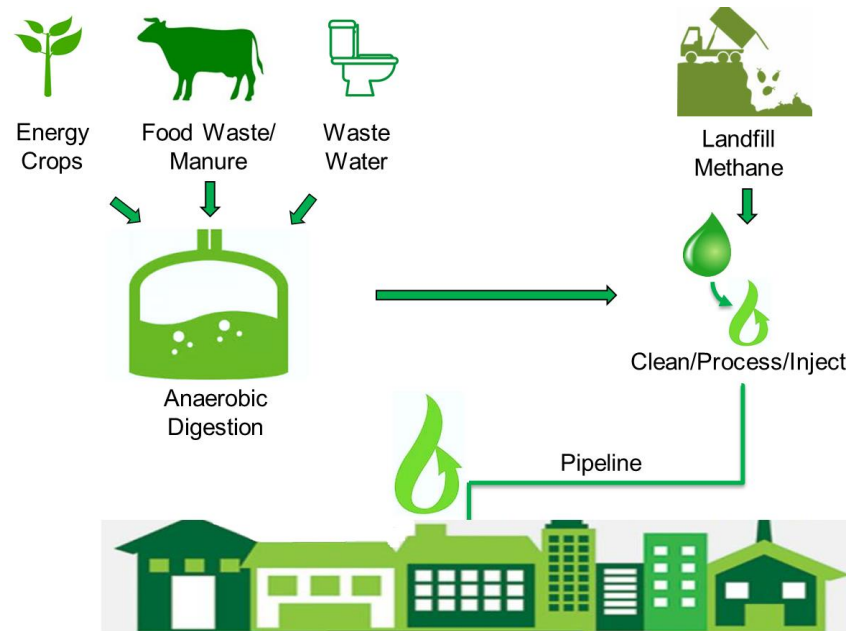
# OUR CLEAN ENERGY PLAN



## Renewable Natural Gas

- ✓ Continue current partnership
- ✓ Develop more waste to energy
- ✓ Diversify local RNG supply

Phased integration of more RNG



## Liquid Natural Gas / Propane- Air

- ✓ Complete limited LNG project
- ✓ Provide affordable resilient clean energy statewide
- ✓ Support renewable integration

Protect Hawaii reliability, resiliency and affordability



## Transmission & Distribution

- ✓ Reach underserved community
- ✓ Provide affordable resilient clean energy
- ✓ Protect & create jobs

Develop Hawai'i's utility infrastructure & resiliency



## Synthetic Natural Gas & Hydrogen

- ✓ Continue current partnership (by-product waste used to produce up to 15% H<sub>2</sub>)
- ✓ Develop more H<sub>2</sub> supply (project feasibility)
- ✓ Study distribution and end-use (though national/international collaborations)

Phased integration of more Hydrogen

# DOING MORE: WHERE ARE WE?



## Hydrogen & Hydrogen Blend



### Key H2 blending Partnership Agreements

- ✓ National partnership with major US labs and utilities (T&D impact, GHG, economics, some end user application)
- ✓ International partnership with other utilities (Hydrogen blend impact on T&D joints)
- ✓ International Partnership with UK utility (transition strategy, end-user and safety focus)

### Key Utility Scale H2 Supply Projects

- ✓ H2 blend technology and energy conversion via SNG plant (feasibility)
- ✓ Renewable H2 supply project via SNG plant (feasibility)



## Renewable Natural Gas



### Key Supply Projects & Leads

- ✓ Waste to Renewable Energy projects (pre-feasibility & feasibility)
- ✓ Plant based Renewable Energy projects (feasibility & front-end engineering)
- ✓ Carbon Capture Agreement (feasibility)
- ✓ GHG Program – LCA & Inventory (completed)

Continuous assessment of RNG leads focusing on waste to Renewable Energy, Plant based Renewable Energy & Carbon Capture



# Mahalo

**“The best time to plant a tree was 20 years ago. The second-best time is now.”**

- Chinese Proverb

