



HAWAII GAS

THE CLEAN ENERGY COMPANY

ROLE OF CLEAN ENERGY UTILITY PROJECTS IN SUPPORTING HAWAI'I PANDEMIC RECOVERY

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Who we are and what we do



- Founded in 1904
- Hawaii's only gas utility
- ~340 employees
- ~70,000 customers
- Supply clean energy to all islands

We aim to safely provide Hawai'i with clean energy that is sustainable, affordable, & resilient!

Produce synthetic natural gas (SNG) locally, a mixture with up to 15% mol utility Hydrogen, from recycled water and what some may consider refinery byproduct or waste



<https://youtu.be/gYqJfsUpROA>



Produce renewable natural gas (RNG) locally, such as Honouliuli, in partnership with City & County of Honolulu, from wastewater

Largest propane supply in Hawaii, with storage on all islands, ensuring statewide resiliency



Further utilize small-scale LNG in limited quantities to provide Affordability and Flexibility for RNG integration



Distribute affordable clean energy through 1,100-mile underground utility pipeline system



Ongoing Pandemic Impact – Hawai'i is our home



- Ongoing Economic Impact
 - Loss of jobs
 - Loss of income
 - Some sectors deeply affected
 - Renewed focus on local, affordable & reliable clean energy
- Ongoing Social Impact
 - Feeling remote/isolated
 - Some areas are underserved/less resilient
 - Staying at home
 - Positive community response (together/supporting one another)
- Areas of focus / change
 - Maintain and create “good” jobs
 - Reach underserved communities
 - Focus on local, affordable & reliable clean energy
 - Revitalize local economy
 - Improve Hawaii resiliency
 - Continue the “fight” against climate change (decrease GHG)



Ongoing Pandemic Impact – Serving Hawai'i with Aloha



- Commercial and industrial volumes decreased significantly (~40-60%). Besides this, HG Ohana was able to:
 - Maintain statewide operations
 - Maintain employment
 - Continue to support our customers
 - Provide the same clean, affordable, resilient energy to Hawai'i
- Can this pandemic become a catalyst for change? We believe our Clean Energy Plan can support Hawai'i recovery and:
 - Maintain and create jobs
 - Connect underserved communities
 - Help revitalize key sectors in Hawaii
 - Continue transformation to more utility RNG and Hydrogen
 - Continue to provide clean energy that is sustainable and affordable
 - Improve Hawai'i resiliency



Current and potential local jobs are "well-paying" jobs, above the minimum wages, supporting employees, their families and communities statewide!



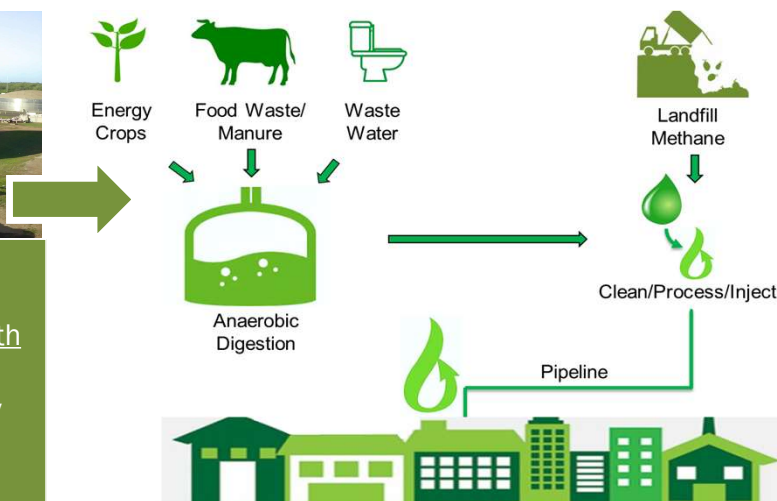
Clean Energy Plan - Support Recovery & "Well-paying" Local Jobs



1 Renewable Natural Gas

- ✓ Extend existing partnership with City and County of Honolulu
- ✓ Develop more Waste to Energy
- ✓ Diversify (local) RNG supply

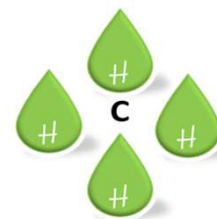
RNG Phased Integration



3 Natural Gas / Propane- Air

- ✓ Efficiently utilize existing fuels in order to enable:
- ✓ Affordable resilient clean energy statewide
- ✓ Renewable integration flexibility

State Reliability/Affordability, Flexibility for Renewables



4 Transmission & Distribution

- ✓ Reach underserved community & RNG sources
- ✓ provide affordable resilient clean energy
- ✓ Protect & create jobs

Connect Local Communities & Renewables , Create Local Jobs & Increase Resiliency

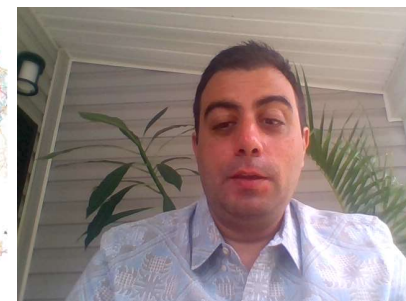
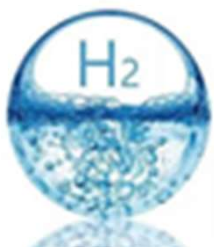
5 Green House Gas Program Clean Energy Assets Energy Efficiency/Back-up



2 Synthetic Natural Gas & Utility Hydrogen

- ✓ Extend existing utility partnership
- ✓ Develop & diversify utility hydrogen supply
- ✓ Utility hydrogen Integration feasibility

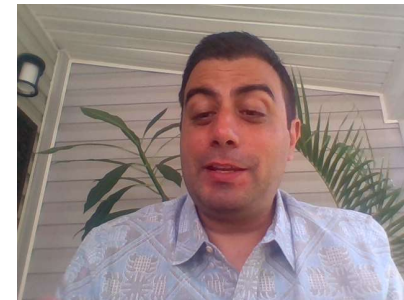
Utility Hydrogen Phased Integration



Example: City & County Of Honolulu Honouliuli WWTP

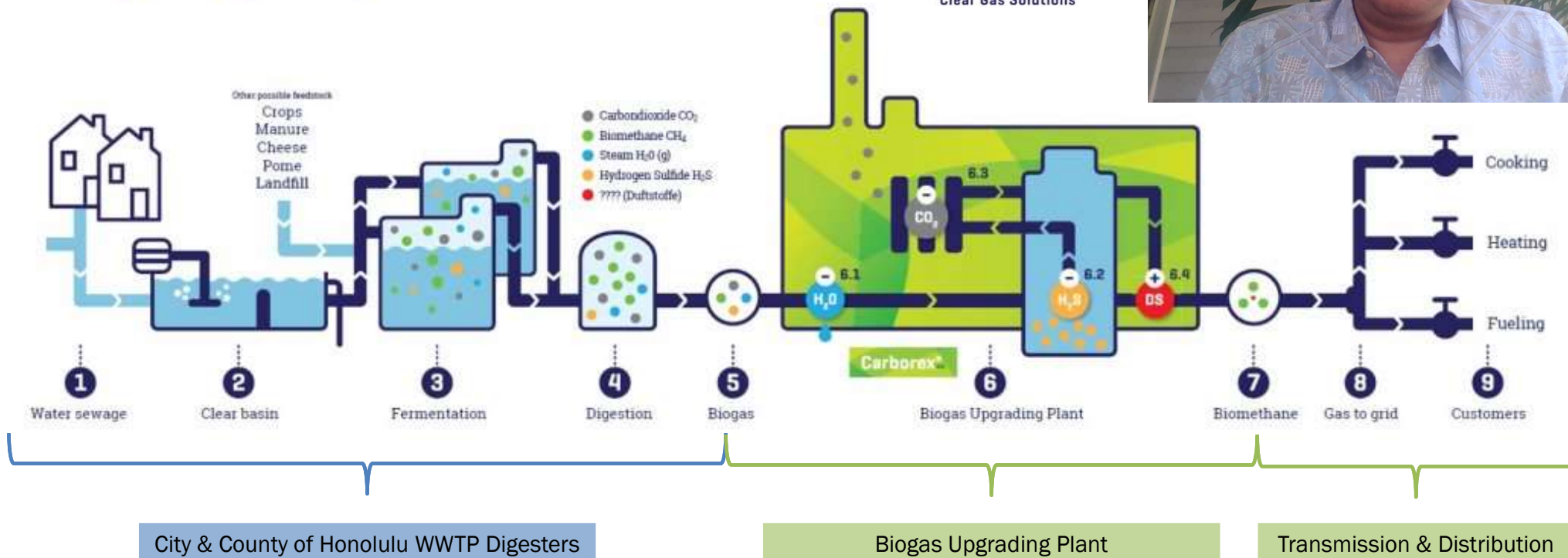


- **Collaboration**
 - Award winning partnership with City & County of Honolulu
 - Support Hawai'i carbon neutrality by providing renewable energy to our customers
- **Affordability**
 - Payment to City & County of Honolulu for otherwise flared (no revenue) biogas. Provided equipment & operations of the facility
 - Provides affordable RNG to utility customers
- **Sustainability**
 - Up to 800,000 therms per year of renewable energy
 - ~4,280 metric tons of CO2 eliminated annually (the equivalent of removing 915 from the road or 10,500,000 miles driven by an average car every year)
 - Capture flared gas, use local waste to generate clean energy (Less CO2 from fossil fuel sources)
 - Use recycled wastewater at SNG
- **Resiliency**
 - Utility gas back-up (underground distribution)
 - Local supply (consistent & reliable)



Example: Honouliuli WWTP Process

Biogas upgrading to Renewable Natural Gas



Example: Honouliuli Biogas Upgrading Virtual Tour



1 Water Removal System



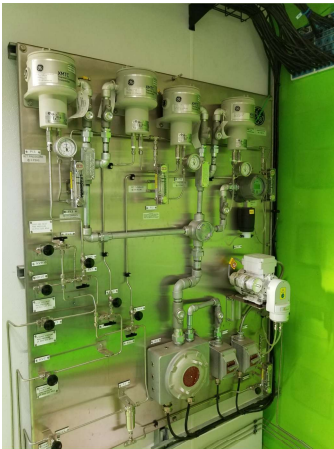
2 Activated Carbon Vessel



3 Compressor



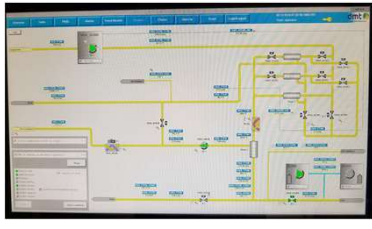
4 2-stage membranes



5 Gas analyzers



6 RNG to T&D



HMI



Doing More: Carbon Negative Utility RNG Local Projects that Support Recovery & "Well-paying" Local Jobs



Waste Water



- ✓ Predictable & consistent
- ✓ Honouliuli success
- ✓ Recycle local waste, capture flare

Limitations

- Limited local resources
- 3rd party owned & Controlled



Landfill Waste



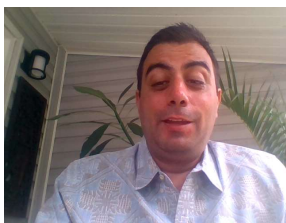
- ✓ Some waste "in place"
- ✓ Different technology available
- ✓ Honouliuli success
- ✓ Recycle local waste, capture flare

Limitations

- Limited local resources
- 3rd party owned & Controlled
- Contaminants (complex/expensive)



Agricultural Crops



- ✓ Scalable & Sizeable
- ✓ Technology available
- ✓ Revitalize Hawaii Agriculture
- ✓ Use local green crops, capture CO2

Limitations

- Limited land available
- Requires irrigation
- Requires farmers (crop type)

Utility Infrastructure Projects that Support Recovery & "Well-paying" Local Jobs



Underground Pipe extension



- ✓ Retain and create well-paying local jobs
- ✓ Prepare for transition to renewables
- ✓ Connect communities
- ✓ Improve Hawai'i resiliency
- ✓ Leverage existing T&D (Oahu)
- ✓ Provide storage for reliability

Limitations

- Need support - Potential upfront cost
- Limited outside Oahu



Energy back-up & Efficiency



- ✓ Retain and create well-paying local jobs
- ✓ Energy efficient (recycled heat)
- ✓ Improved resiliency
- ✓ Support sectors devastated by pandemic & critical facilities

Limitations

- Need support - Potential upfront cost
- Minimum system size may be needed



Utility Hydrogen



- ✓ Retain and create well-paying local jobs
- ✓ Zero-Carbon/ Carbon-offset
- ✓ Leverage utility system
- ✓ Cost-effective long-term utility clean energy storage and distribution
- ✓ Lead nation (H2 in utility)

Limitations

- Study increased utility hydrogen concentration
- Develop utility hydrogen supply technologies
- Need access to resources

Time for change is Now



"The best time to plant a tree was 20 years ago. The second best time is now."

- Chinese Proverb



Mahalo

