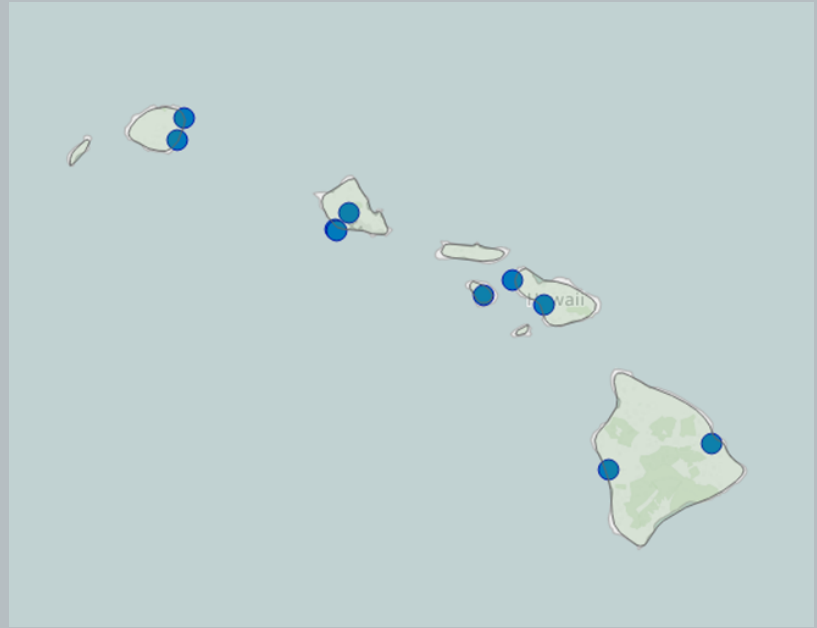


The State of CHP: Hawaii



Combined heat and power (CHP) – also referred to as cogeneration – is an efficient and clean approach to generating on-site electric power and useful thermal energy from a single fuel source. The information in this document provides a general overview of the state of CHP in Hawaii, with data on current installations, technical potential, and economics for CHP.



Map of current CHP installations in Hawaii. Illustration from ICF.

Hawaii: Installed CHP

U.S. DOE Combined Heat and Power Installation Database

The DOE CHP Installation Database is a data collection effort sponsored by the U.S. Department of Energy. The database contains a comprehensive listing of combined heat and power installations throughout the country, including those in California, and can be accessed by visiting <https://doe.icfwebservices.com/chp>.

CHP Project Profiles

The Western CHP TAP has compiled information on certain illustrative CHP projects in Hawaii. You can access these by visiting the Department of Energy’s CHP Project Profiles Database at <https://betterbuildingsolutioncenter.energy.gov/chp/chp-project-profiles-database>.

Western CHP Technical Assistance Partnership

For assistance with questions about specific CHP opportunities in Hawaii, please consult with the Western CHP TAP by visiting wchptap.org or contacting the CHP TAP director.

Hawaii Existing CHP

Sector	Sites	Capacity (MW)
Industrial	5	432
Commercial/Institutional	5	6
Other	0	0
Total	10	439

Western CHP TAP Director

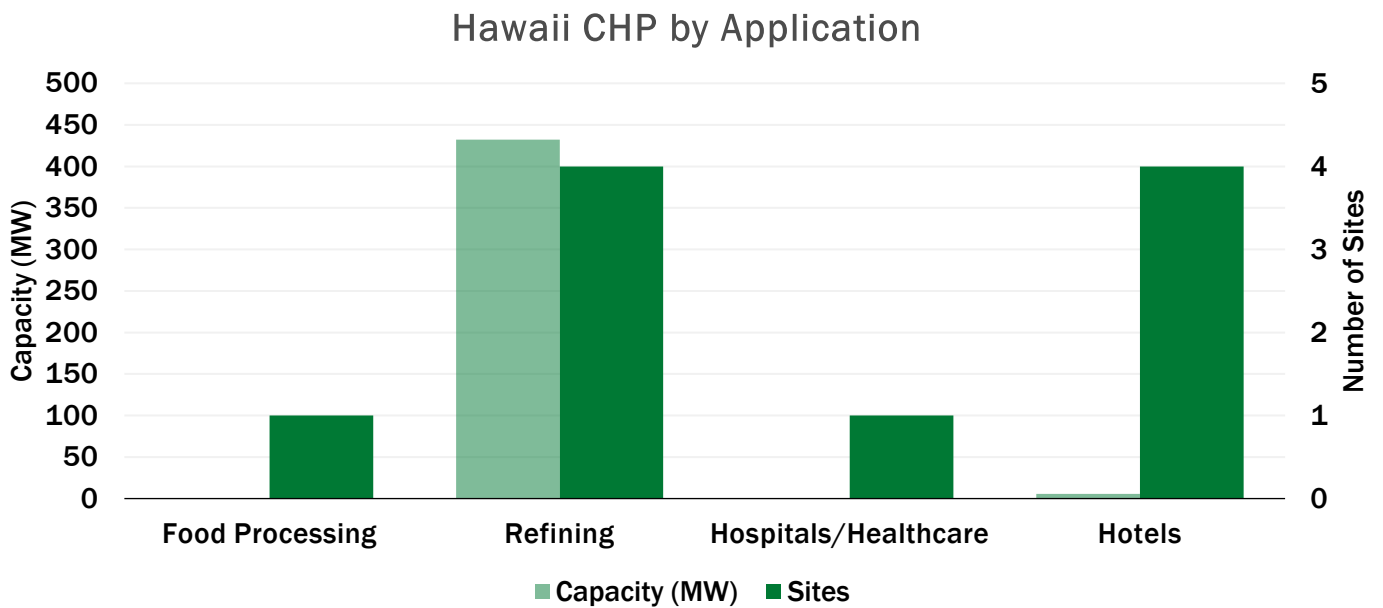
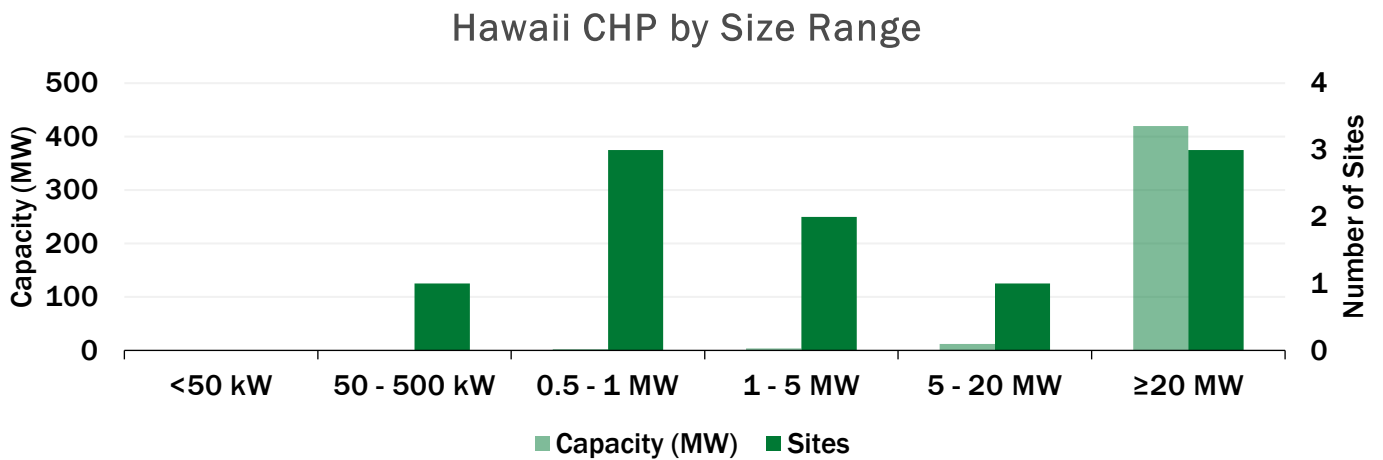
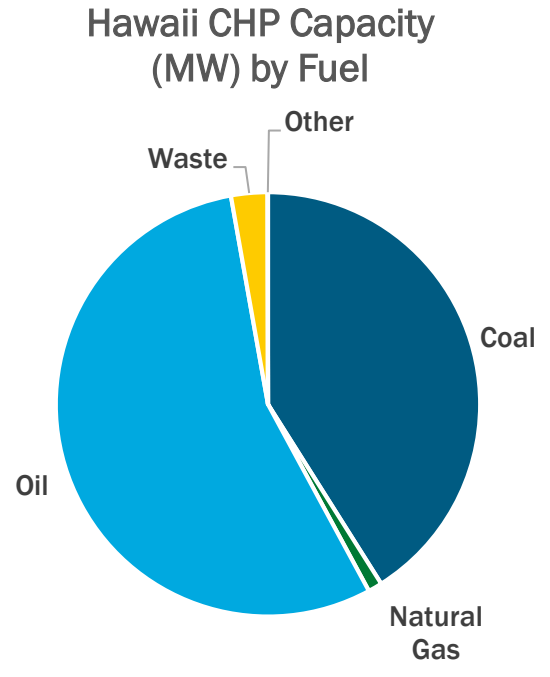
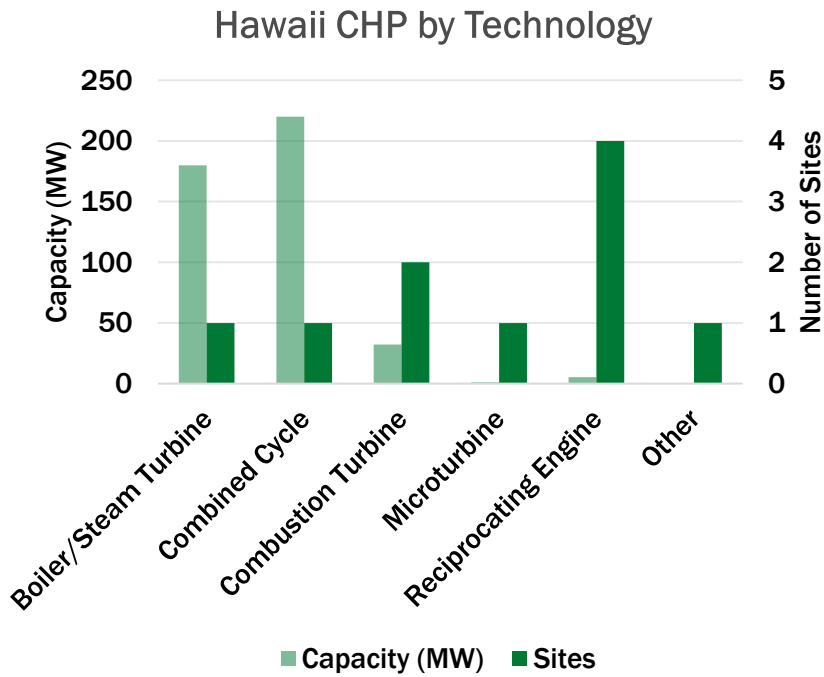
Carol Denning

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WESTERN



CHP
TECHNICAL ASSISTANCE
PARTNERSHIPS



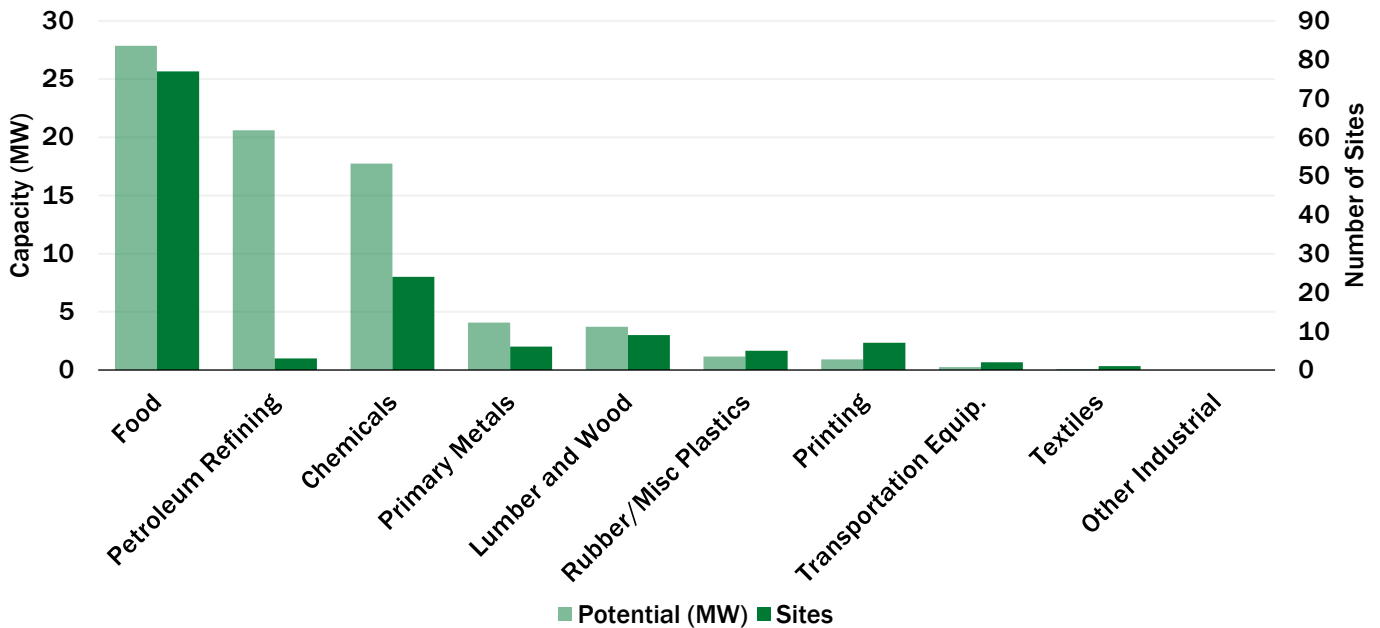
Hawaii: Technical Potential for New CHP Installations

The “Combined Heat and Power (CHP) Technical Potential in the United States” market analysis report provides data on the technical potential in industrial facilities and commercial buildings for “topping cycle” CHP, waste heat to power (WHP) CHP, and district energy CHP in the U.S. Read the report [here](#).

Hawaii CHP Technical Potential

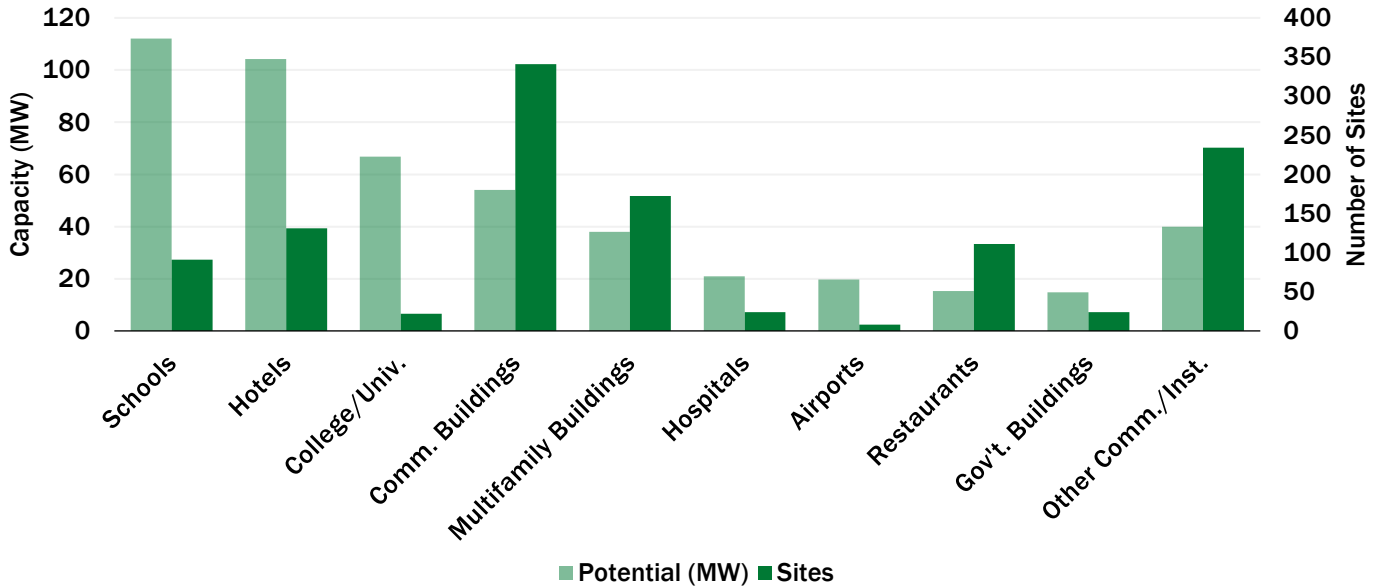
Sector	Potential Sites	Potential MW
Industrial	134	76
Commercial/Institutional	1,158	486
Total	1,292	563

Hawaii Technical Potential (MW) for Industrial CHP Applications



Application	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		>20 MW		Total	
	Sites	MW	Sites	MW	Sites	MW	Sites	MW	Sites	MW	Total Sites	Total MW
Food	60	10	10	7	7	11	0	0	0	0	77	28
Chemicals	17	2	3	2	3	7	1	7	0	0	24	18
Petroleum Refining	0	0	0	0	2	7	1	13	0	0	3	21
Primary Metals	5	1	0	0	1	3	0	0	0	0	6	4
Lumber and Wood	7	1	0	0	2	2	0	0	0	0	9	4
Other Industrial	15	2	0	0	0	0	0	0	0	0	15	2
Total	104	17	13	9	15	30	2	20	0	0	134	76

Hawaii Technical Potential (MW) for Commercial/Institutional CHP Applications



Application	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		>20 MW		Total	
	Sites	MW	Sites	MW	Sites	MW	Sites	MW	Sites	MW	Total Sites	Total MW
Schools	0	0	46	40	45	72	0	0	0	0	91	112
Hotels	77	12	23	15	29	62	2	15	0	0	131	104
College/Univ.	8	1	2	2	9	25	2	15	1	25	22	67
Commercial Buildings	246	12	76	30	19	11	0	0	0	0	341	54
Multifamily Buildings	122	9	44	22	7	7	0	0	0	0	172	38
Other Comm./Inst.	358	48	17	11	25	41	1	10	0	0	401	111
Total	811	83	208	120	134	219	5	40	1	25	1,158	486

Department of Energy CHP Accelerators

Packaged CHP Accelerator

Standardized packaged CHP systems can reduce risk for both CHP users and suppliers by reducing design errors, limiting uncertainty about performance, shortening project development time, and reducing overall costs. Accelerator partners will validate the installation, performance, and economic and resiliency benefits of packaged CHP systems, evaluate the integration of new technologies and packaged CHP, and identify R&D challenges. For more information, visit <https://betterbuildingssolutioncenter.energy.gov/accelerators/packaged-chp>

CHP for Resiliency Accelerator

The U.S. DOE collaborated with cities, states, utilities, and other stakeholders who are actively pursuing CHP as a consideration in resiliency planning for critical infrastructure in their jurisdictions. This included defining resiliency, identifying critical infrastructure, and assessing CHP opportunities. This process was documented in the DG for Resilience Planning Guide and the CHP for Resilience Screening Tool. For more information, visit <https://betterbuildingssolutioncenter.energy.gov/accelerators/combined-heat-and-power-resiliency>

Hawaii: CHP Economics

The most important indicators for CHP economics are electricity and gas prices. For most potential CHP installations, natural gas and electricity rates for host facilities will fall within the range of average commercial and industrial prices. Lower energy prices may be possible for large CHP applications.

Hawaii Natural Gas Prices

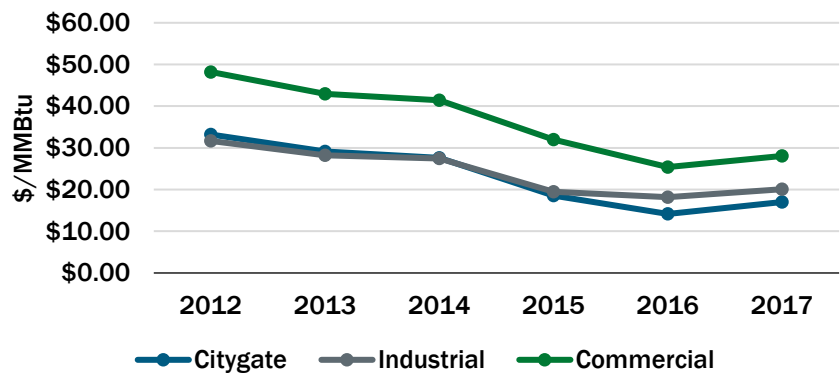
The EIA industrial natural gas price is a full tariff rate, and most large consumers are purchasing gas commodities from marketers at a lower rate.

Hawaii Average Gas Prices (\$/MMBtu) - 2017

Sector	HI Price	U.S. Price
Citygate*	17.04	4.26
Industrial	20.11	4.20
Commercial	28.10	8.08

*Citygate is a point or measuring station at which a distributing gas utility receives gas from a NG pipeline company or transmission system.

Hawaii Average Natural Gas Prices



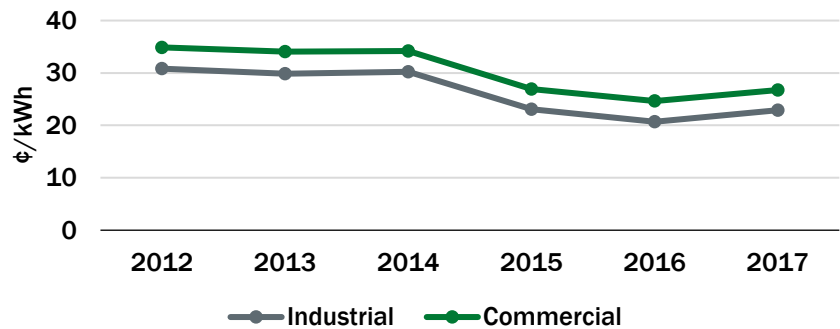
Hawaii Electricity Prices

Electricity rates can vary greatly by utility and facility size range. The rates below from EIA represent general averages; individual facility rates may vary.

Hawaii Average Electricity Prices (¢/kWh) - 2017

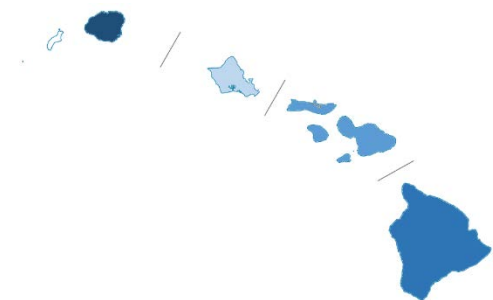
Sector	HI Price	U.S. Price
Industrial	22.92	6.88
Commercial	26.77	10.66

Hawaii Average Electricity Prices



Hawaii Average Delivered Electricity Prices by Utility

Utility	Industrial Price (¢/kWh)	Commercial Price (¢/kWh)	Average Price (¢/kWh)
Kauai Island Utility Coop	30.62	34.55	32.59
Hawaii Electric Light Co	26.76	32.30	29.53
Maui Electric	27.11	30.79	28.95
Hawaiian Electric Co	21.59	25.01	23.30



- Hawaiian Electric Co
- Maui Electric Co
- Hawaii Electric Light Co
- Kauai Island Utility Coop