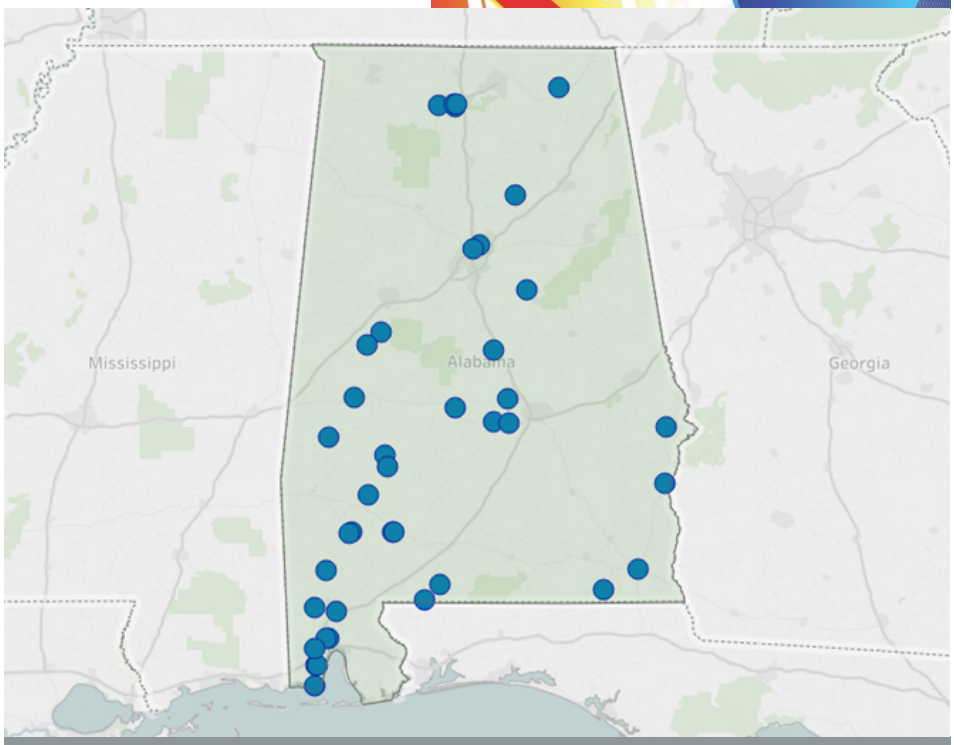
U.S. DEPARTMENT OF ENERGY

Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

The State of CHP: Alabama



Map of current CHP installations in Alabama. *Illustration from ICF.*

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 Alabama, with data on current installations, technical potential, and economics for CHP.

Alabama: 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 Alabama, and can be accessed by visiting https://doe.icfwebservices.com/chp.

CHP Project Profiles

The Southeast CHP TAP has compiled information on certain illustrative CHP projects in Alabama. You can access these by visiting the Department of Energy's CHP Project Profiles Database at https://betterbuildingssolutioncenter.energy.gov/chp/chp-project-profiles-database.

Southeast CHP Technical Assistance Partnership

For assistance with questions about specific CHP opportunities in Alabama, please consult with the Southeast CHP TAP by visiting sechptap.org or contacting the CHP TAP director.

Alabama Existing CHP

Sector	Sites	Capacity (MW)
Industrial	30	3,381
Commercial/Institutional	5	117
Other	5	22
Total	40	3,520

Southeast CHP TAP Director

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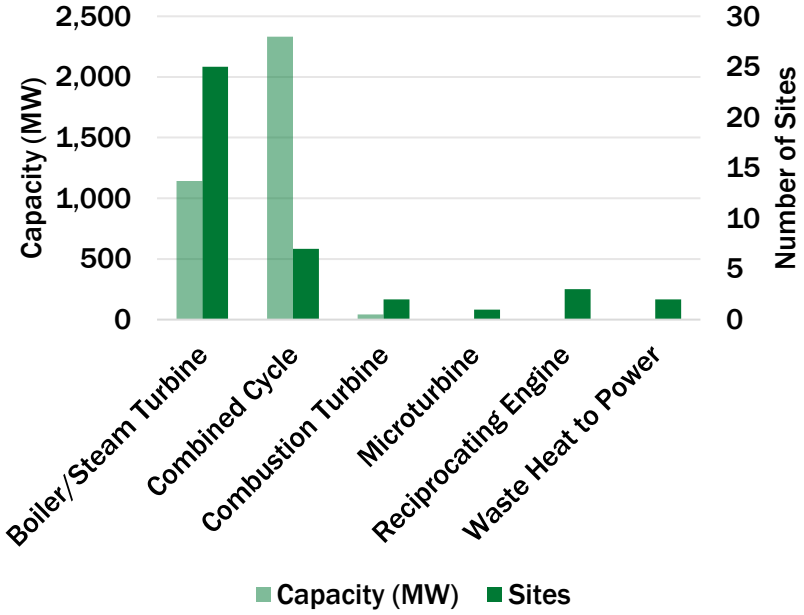
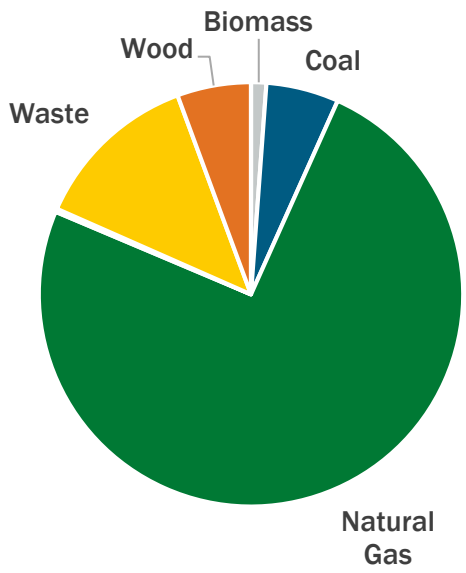
SOUTHEAST CHP Technical Assistance Partnerships

DOE CHP Installation Database (U.S. installations as of Dec. 31, 2017)

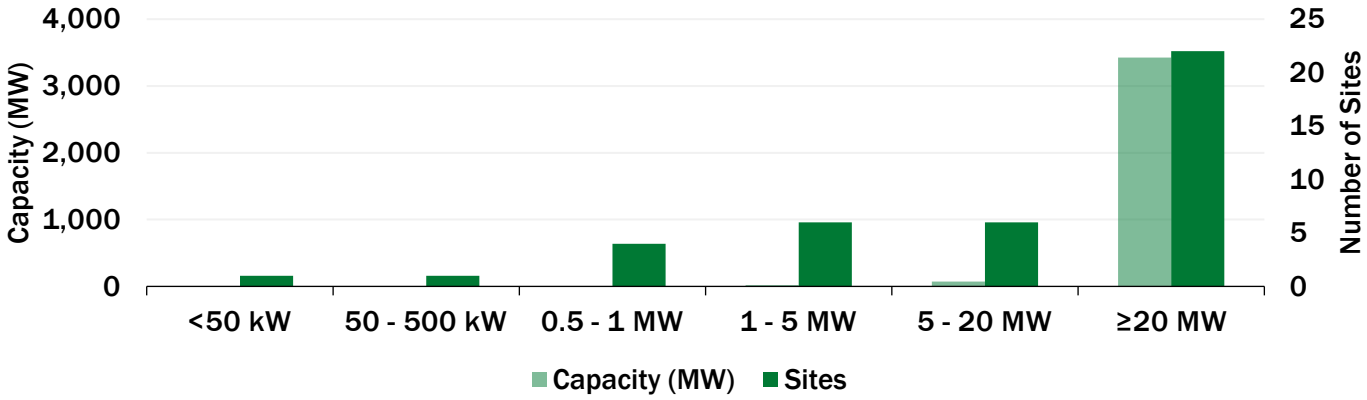
Alabama CHP by Technology



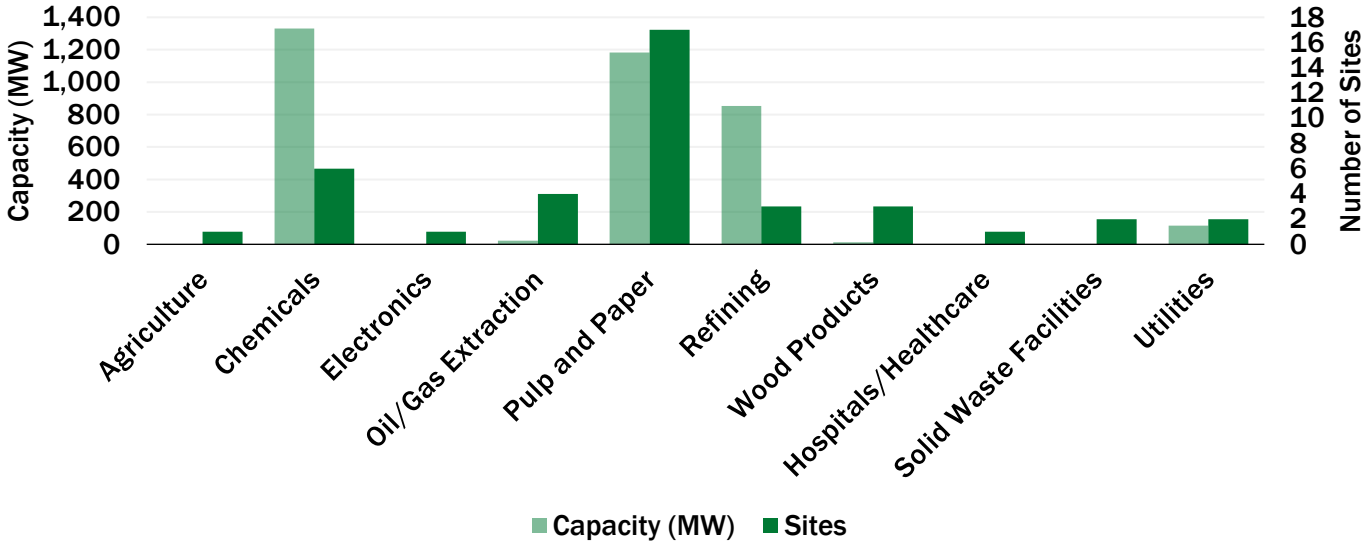
Alabama CHP Capacity (MW) by Fuel



Alabama CHP by Size Range



Alabama CHP by Application

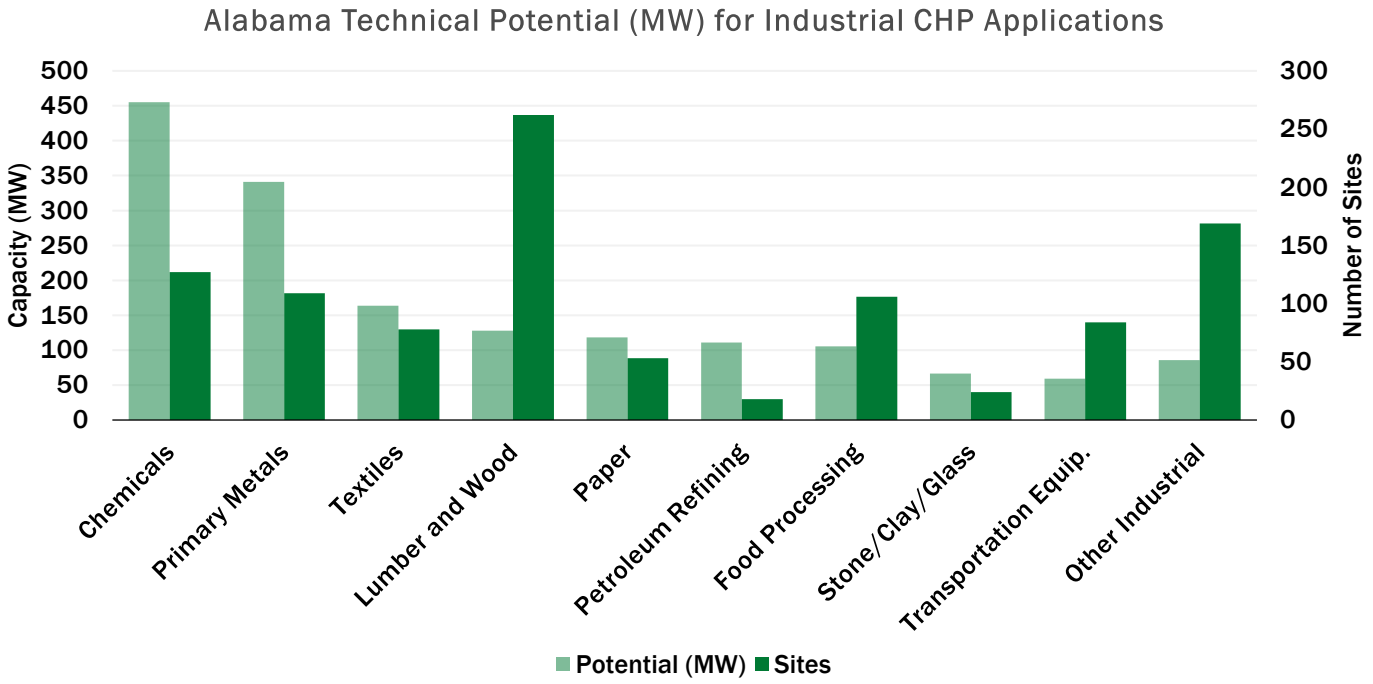


Alabama: Technical Potential for New CHP Installations

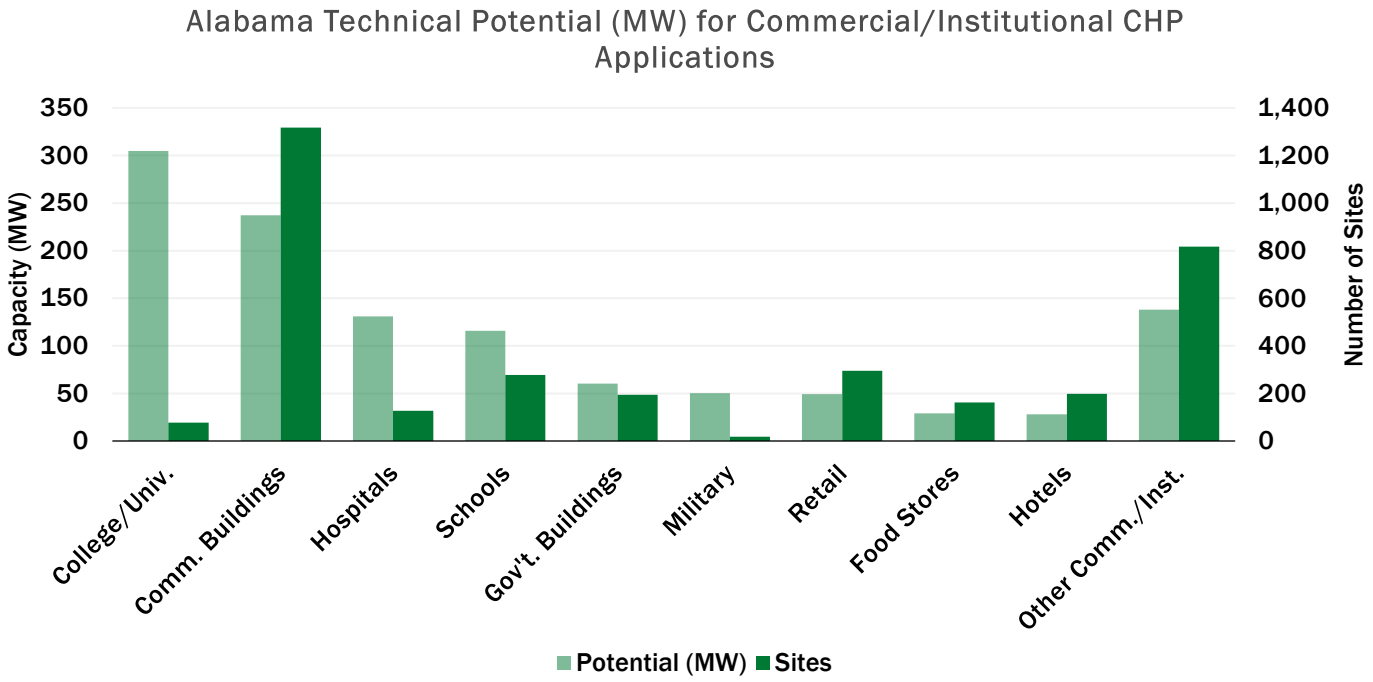
The "Combined Heat and Power (CHP) Technical Potential in the United States" market analysis report provides data on the technical potential in industrial facilities and commercial buildings for "topping cycle" CHP, waste heat to power (WHP) CHP, and district energy CHP in the U.S. Read the report **here**.

Alabama CHP Technical Potential

Sector	Potential Sites	Potential MW
Industrial	1,030	1,634
Commercial/Institutional	3,482	1,143
Total	4,512	2,777



	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		>20 MW		Total	
Application	Sites	MW	Sites	MW	Sites	MW	Sites	MW	Sites	MW	Total Sites	Total MW
Chemicals	56	10	18	13	35	74	13	113	5	245	127	455
Primary Metals	54	11	19	13	21	45	11	134	4	138	109	341
Textiles	34	6	12	10	25	50	5	45	2	53	78	164
Lumber and Wood	191	38	45	31	24	48	2	11	0	0	262	128
Paper	31	8	7	5	11	24	2	19	2	63	53	118
Other Industrial	274	47	51	35	61	142	13	125	2	78	401	428
Total	640	119	152	107	177	384	46	448	15	575	1,030	1,634



	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		>20 MW		Total	
Application	Sites	MW	Sites	MW	Sites	MW	Sites	MW	Sites	MW	Total Sites	Total MW
College/Univ.	33	8	8	5	21	48	10	93	5	151	77	305
Commercial Buildings	878	44	351	140	88	53	0	0	0	0	1,317	237
Hospitals	58	16	28	19	38	76	3	19	0	0	127	131
Schools	226	80	47	31	4	4	0	0	0	0	277	116
Government Buildings	176	23	6	4	9	13	3	20	0	0	194	60
Other Comm./Inst.	1,411	176	55	32	18	27	6	60	0	0	1,490	294
Total	2,782	347	495	231	178	221	22	192	5	151	3,482	1,143

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

Alabama: 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.

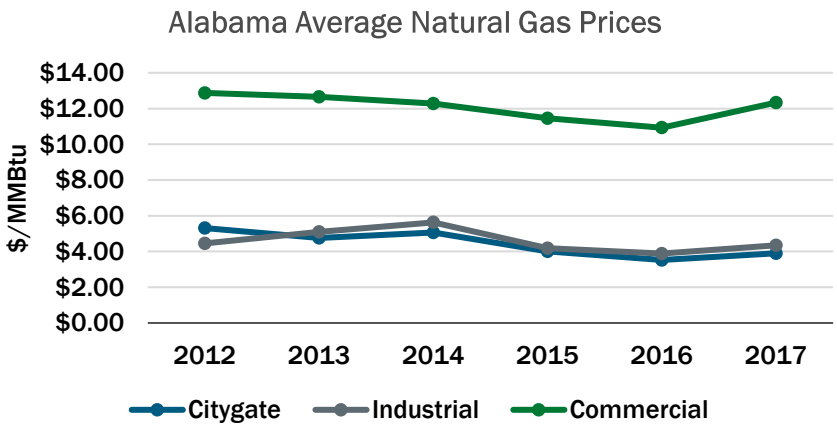
Alabama Natural Gas Prices

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.

Alabama Average Gas Prices ($/MMBtu) - 2017

Sector	AL Price	U.S. Price
Citygate*	3.90	4.26
Industrial	4.35	4.20
Commercial	12.33	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.

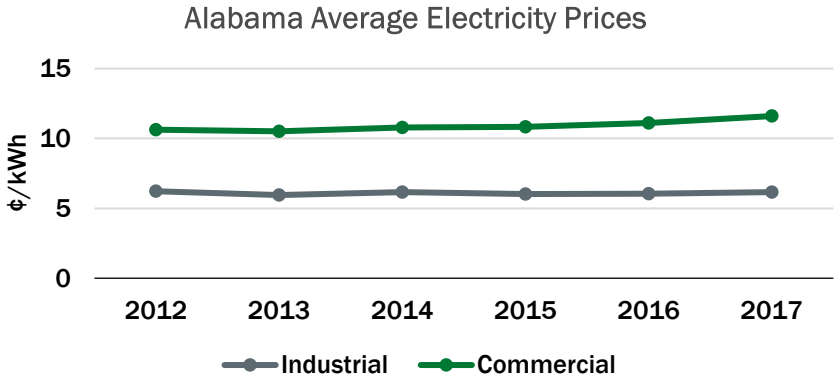


Alabama Electricity Prices

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

Alabama Average Electricity Prices (¢/kWh) - 2017

Sector	AL Price	U.S. Price
Industrial	6.16	6.88
Commercial	11.60	10.66



Alabama Average Delivered Electricity Prices by Utility

Utility	Industrial Price (¢/kWh)	Commercial Price (¢/kWh)	Average Price (¢/kWh)
Franklin Elec Coop	6.80	12.96	9.88
Sand Mountain Elec Coop	7.37	12.12	9.74
North Alabama Elec Coop	5.91	13.02	9.46
Alabama Power	6.51	12.16	9.33
City of Florence	7.38	10.81	9.09
Joe Wheeler Elec Coop	5.43	12.26	8.85
City of Athens	5.93	10.58	8.26
City of Huntsville	6.47	9.80	8.13