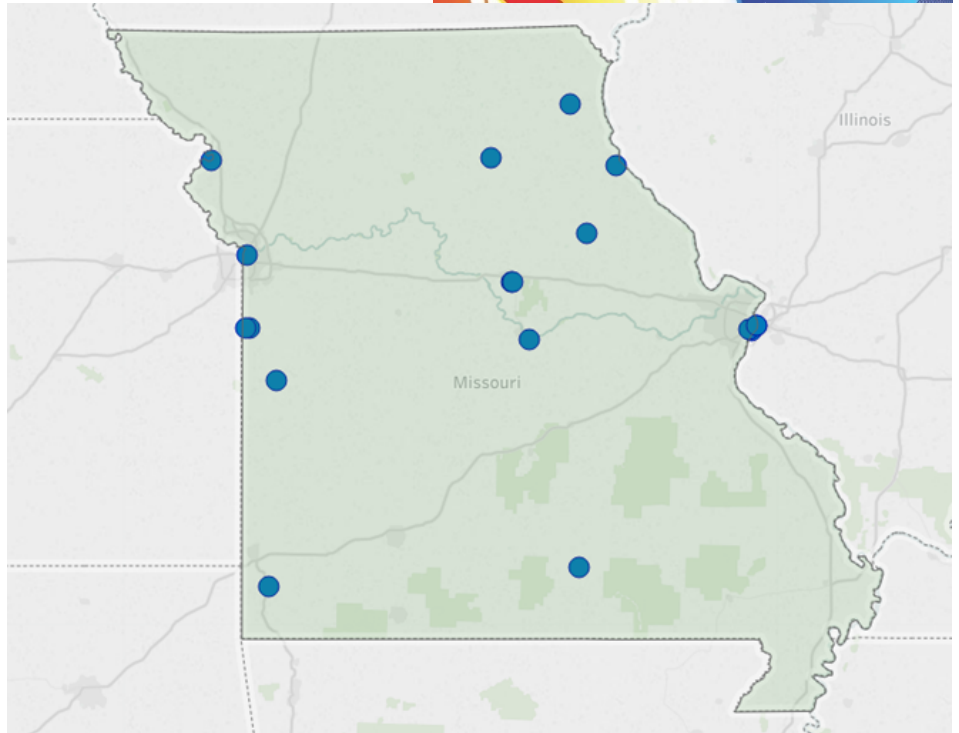


The State of CHP: Missouri



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



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

Missouri: 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 Missouri, and can be accessed by visiting

<https://doe.icfwebservices.com/chp>

CHP Project Profiles

The Central CHP TAP has compiled information on certain illustrative CHP projects in Missouri. 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>.

Central CHP Technical Assistance Partnership

For assistance with questions about specific CHP opportunities in Missouri, please consult with the Central CHP TAP by visiting chptap.org or contacting the CHP TAP director.

Missouri Existing CHP

Sector	Sites	Capacity (MW)
Industrial	5	52
Commercial/Institutional	13	182
Other	1	0.8
Total	19	236

Central CHP TAP Director

Cliff Haefke

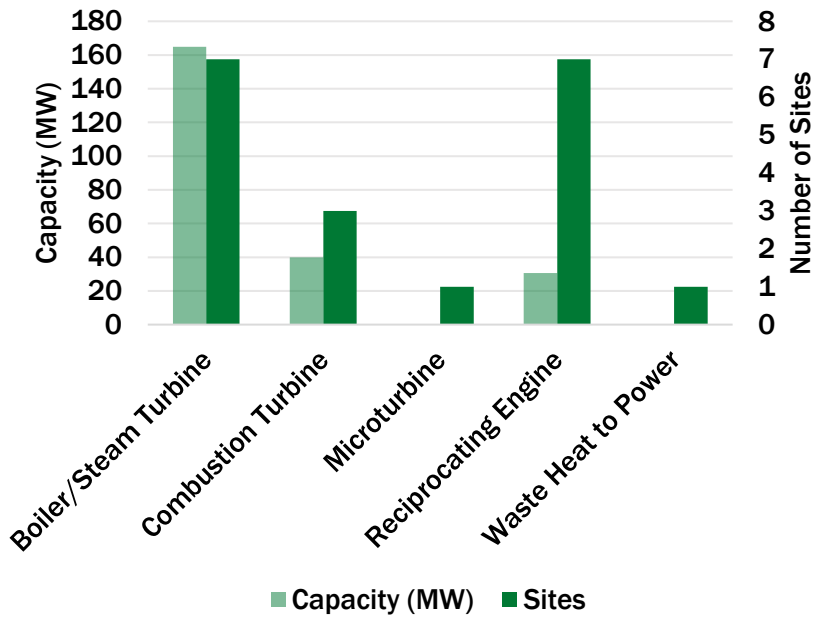
- University of Illinois at Chicago
- chaefk1@uic.edu
- 312-355-3476

CENTRAL

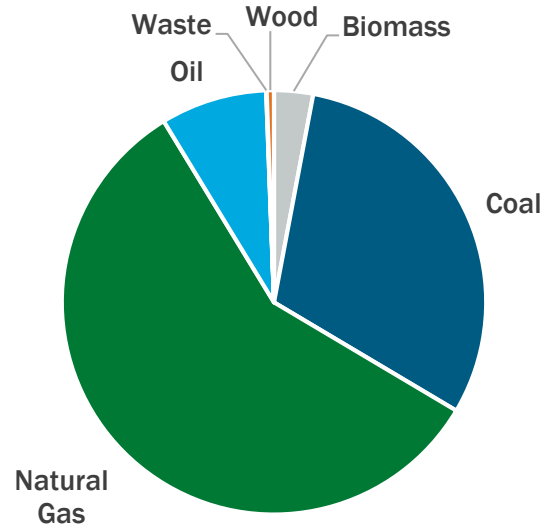


CHP
TECHNICAL ASSISTANCE
PARTNERSHIPS

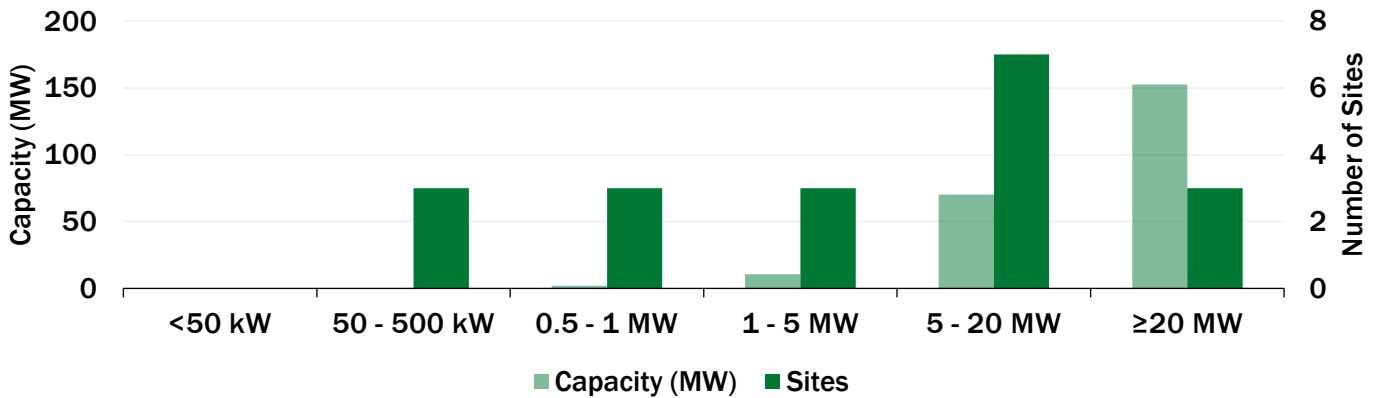
Missouri CHP by Technology



Missouri CHP Capacity (MW) by Fuel



Missouri CHP by Size Range



Missouri CHP by Application



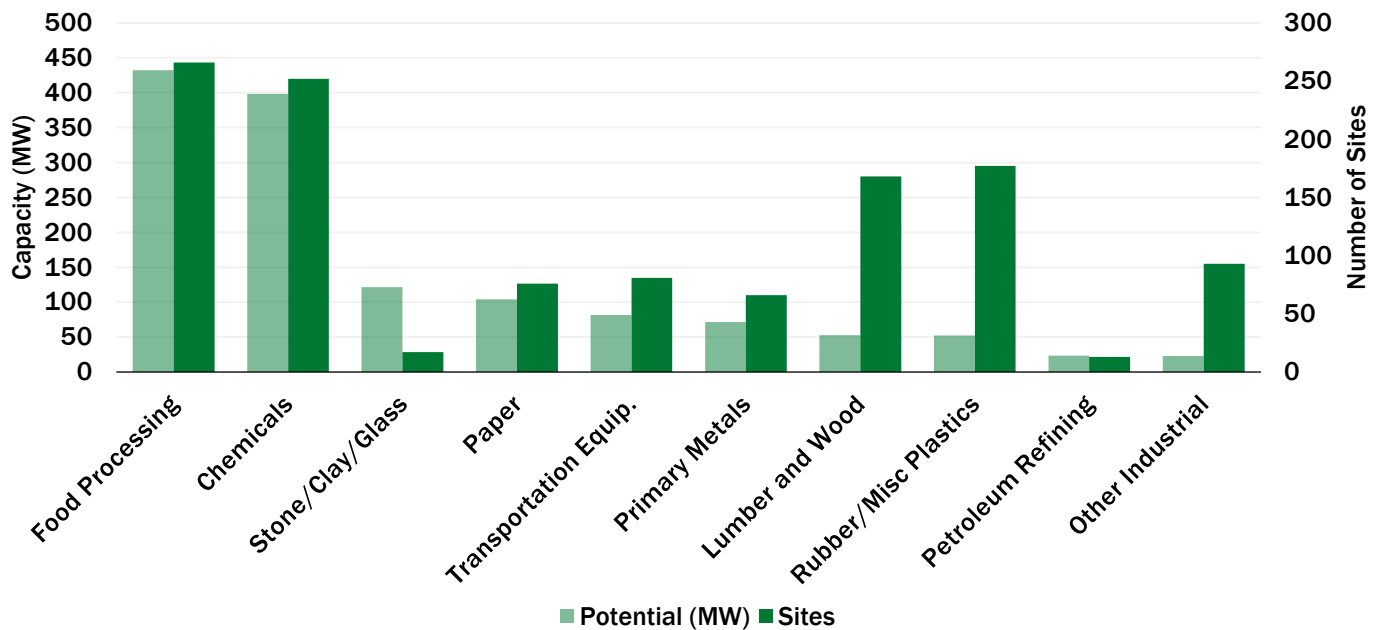
Missouri: Technical Potential for New CHP Installations

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](#).

Missouri CHP Technical Potential

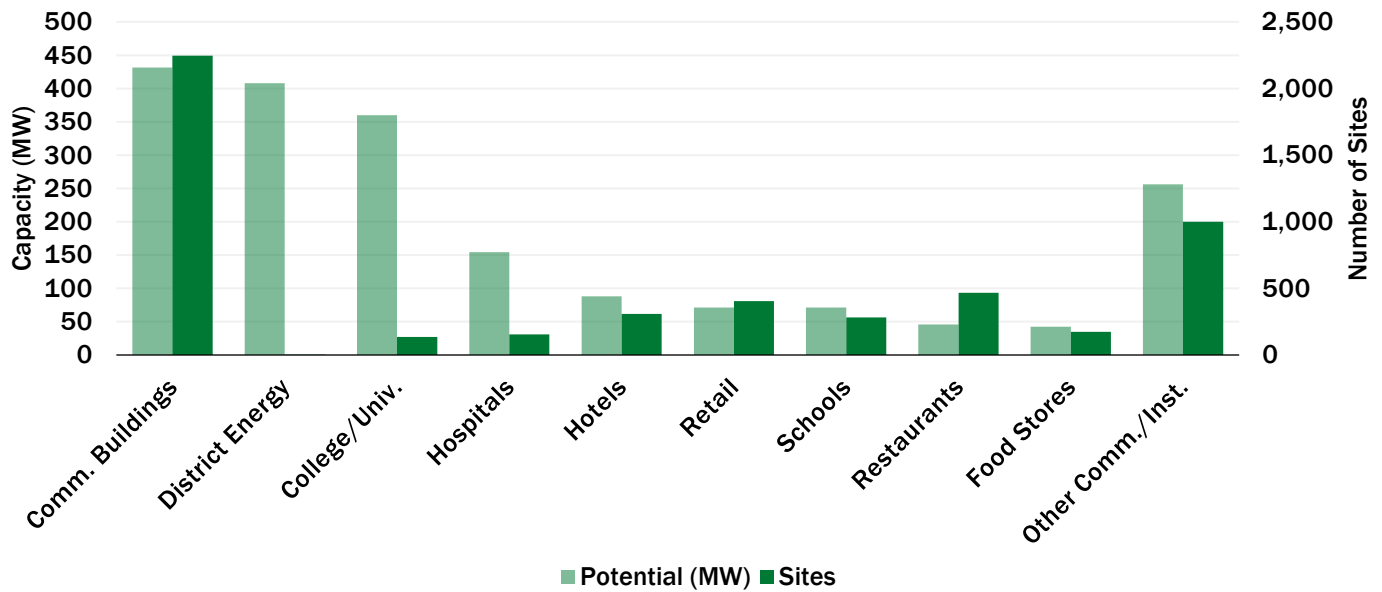
Sector	Potential Sites	Potential MW
Industrial	1,209	1,361
Commercial/Institutional	5,175	1,929
Total	6,384	3,290

Missouri 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 Processing	174	36	24	17	51	98	14	135	3	147	266	432
Chemicals	155	27	25	18	52	110	16	140	4	103	252	398
Stone/Clay/Glass	3	0	1	1	3	8	9	89	1	23	17	122
Paper	46	12	12	9	16	30	1	10	1	43	76	104
Transportation Equip.	57	9	13	9	8	17	2	24	1	23	81	82
Other Industrial	419	72	54	39	41	86	3	28	0	0	517	223
Total	854	155	129	92	171	349	45	426	10	339	1,209	1,361

Missouri 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
Commercial Buildings	1,437	72	629	252	180	108	0	0	0	0	2,246	431
College/Univ.	81	15	3	2	33	77	13	128	6	138	136	360
Hospitals	80	20	30	22	43	96	2	16	0	0	155	155
Hotels	273	31	17	10	16	27	3	19	0	0	309	88
Retail	381	56	23	14	1	2	0	0	0	0	405	71
Other Comm./Inst.	1,765	231	114	66	37	66	6	54	2	408	1,924	824
Total	4,017	424	816	365	310	376	24	217	8	546	5,175	1,929

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>

Missouri: 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.

Missouri Natural Gas Prices

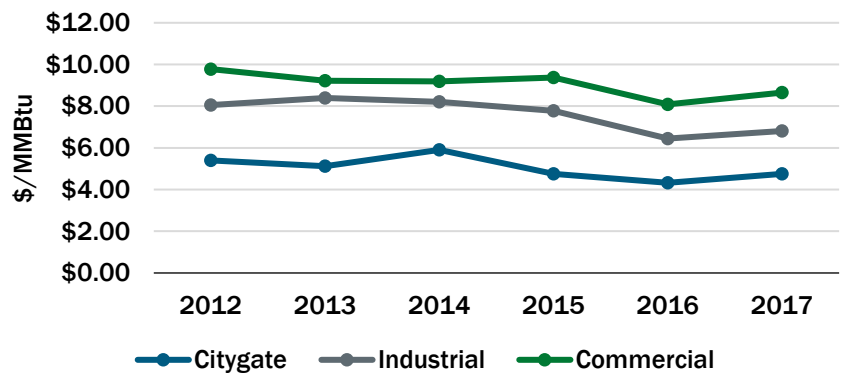
The EIA industrial natural gas price is a full tariff rate, and most large consumers are purchasing gas commodities from marketers at a lower rate.

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

Sector	MO Price	U.S. Price
Citygate*	4.75	4.26
Industrial	6.81	4.20
Commercial	8.65	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.

Missouri Average Natural Gas Prices



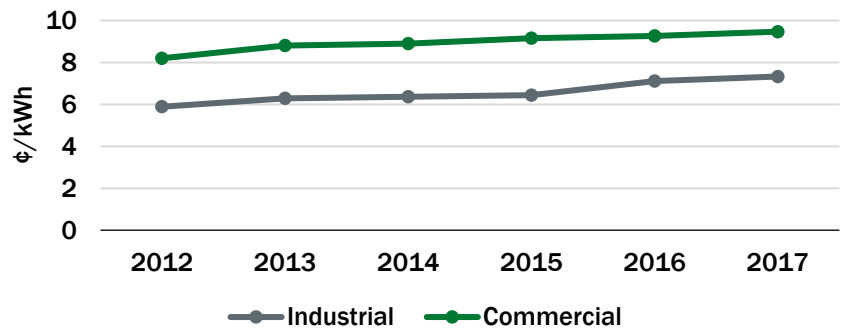
Missouri Electricity Prices

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

Missouri Average Electricity Prices (¢/kWh) - 2017

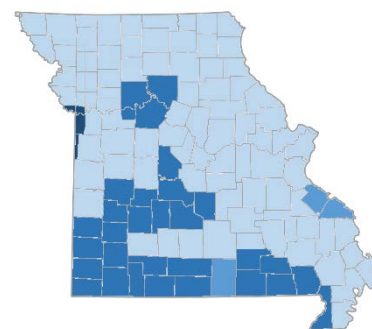
Sector	MO Price	U.S. Price
Industrial	7.33	6.88
Commercial	9.47	10.66

Missouri Average Electricity Prices



Missouri Average Delivered Electricity Prices by Utility

Utility	Industrial Price (¢/kWh)	Commercial Price (¢/kWh)	Average Price (¢/kWh)
Kansas City Power & Light	8.67	11.81	10.24
Empire District Electric	8.38	11.42	9.90
State municipal average	8.84	9.92	9.38
State coop average	7.78	10.41	9.10
Citizens Electric Corp.	5.76	12.01	8.89
Howell-Oregon Elec Coop	7.89	9.03	8.46
City Utilities of Springfield	7.49	8.52	8.01
KCP&L Greater Missouri	6.74	9.09	7.92
Ameren Missouri	6.84	8.46	7.65



- Ameren / KCP&L Greater MO / Springfield
- Citizens Elec Corp / Howell-Oregon Elec Coop
- Empire District Electric
- Kansas City Power & Light