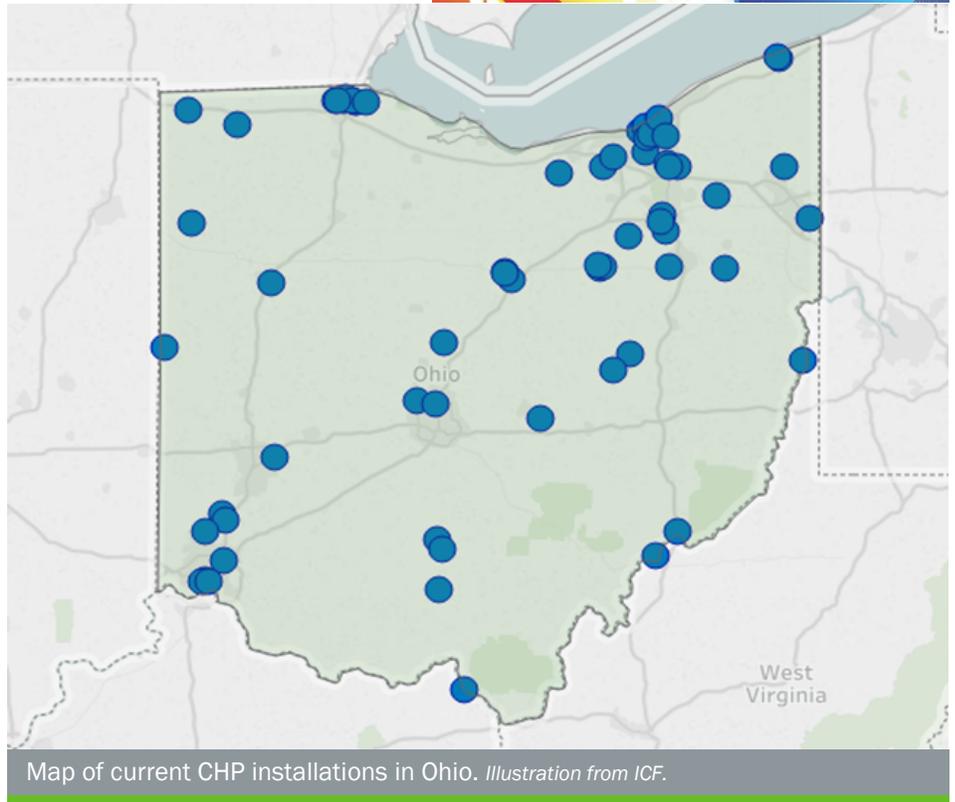


The State of CHP: Ohio



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



Ohio: 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 Ohio, and can be accessed by visiting energy.gov/chp-installs.

CHP Project Profiles

The Midwest CHP TAP has compiled information on certain illustrative CHP projects in Ohio. You can access these by visiting the Department of Energy’s CHP Project Profiles Database at energy.gov/chp-projects.

Midwest CHP Technical Assistance Partnership

For assistance with questions about specific CHP opportunities in Ohio, please consult with the Midwest CHP TAP by visiting mwchptap.org or contacting the CHP TAP director.

Ohio Existing CHP

Sector	Sites	Capacity (MW)
Industrial	26	430
Commercial/Institutional	33	104
Other	6	4
Total	65	538

Midwest CHP TAP Director

Cliff Haefke

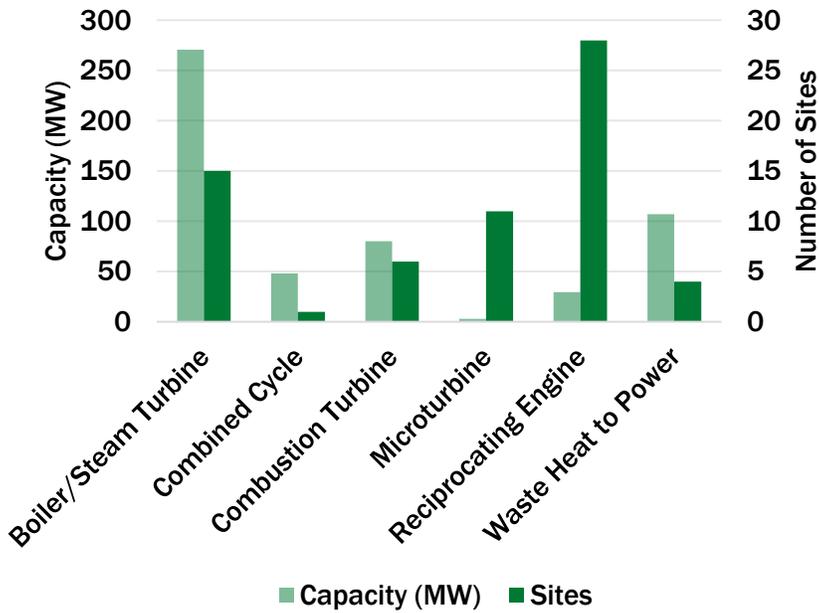
- University of Illinois at Chicago
- chaefk1@uic.edu
- 312-355-3476

MIDWEST

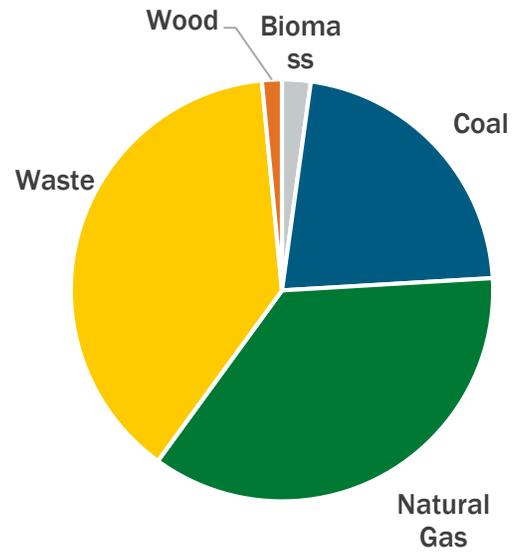


CHP
TECHNICAL ASSISTANCE
PARTNERSHIPS

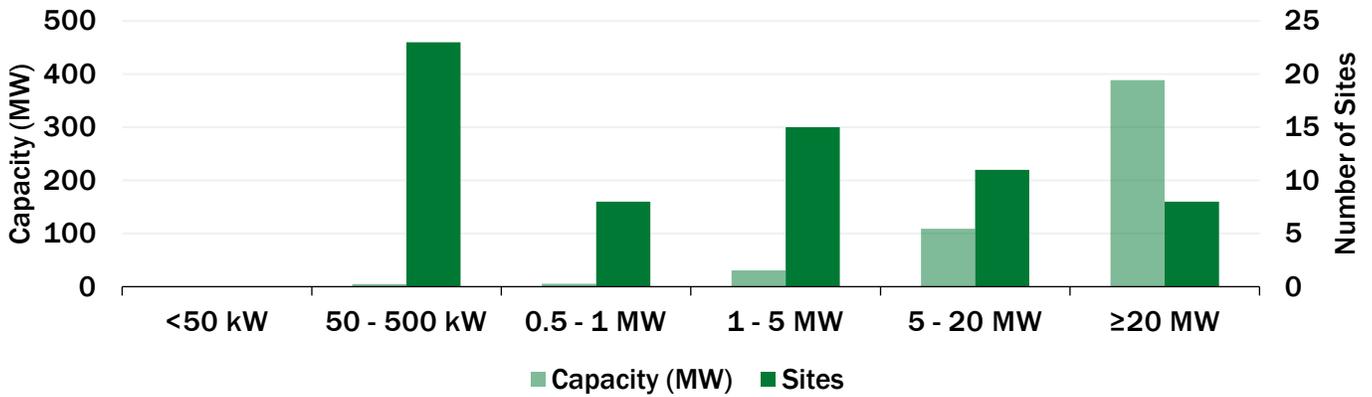
Ohio CHP by Technology



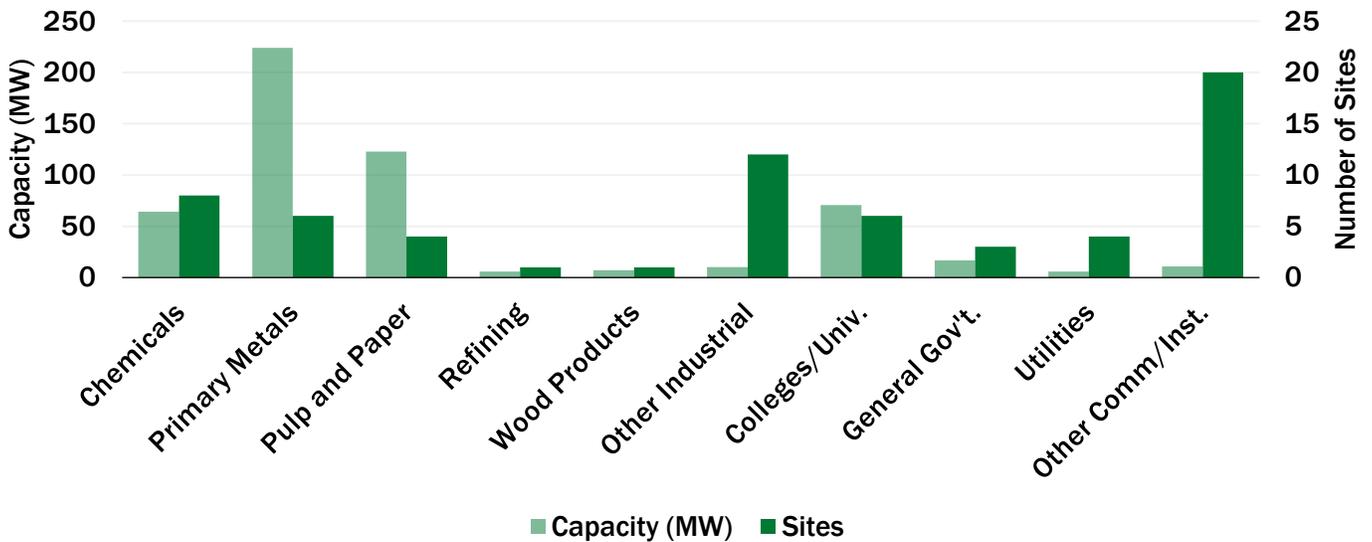
Ohio CHP Capacity (MW) by Fuel



Ohio CHP by Size Range



Ohio CHP by Application



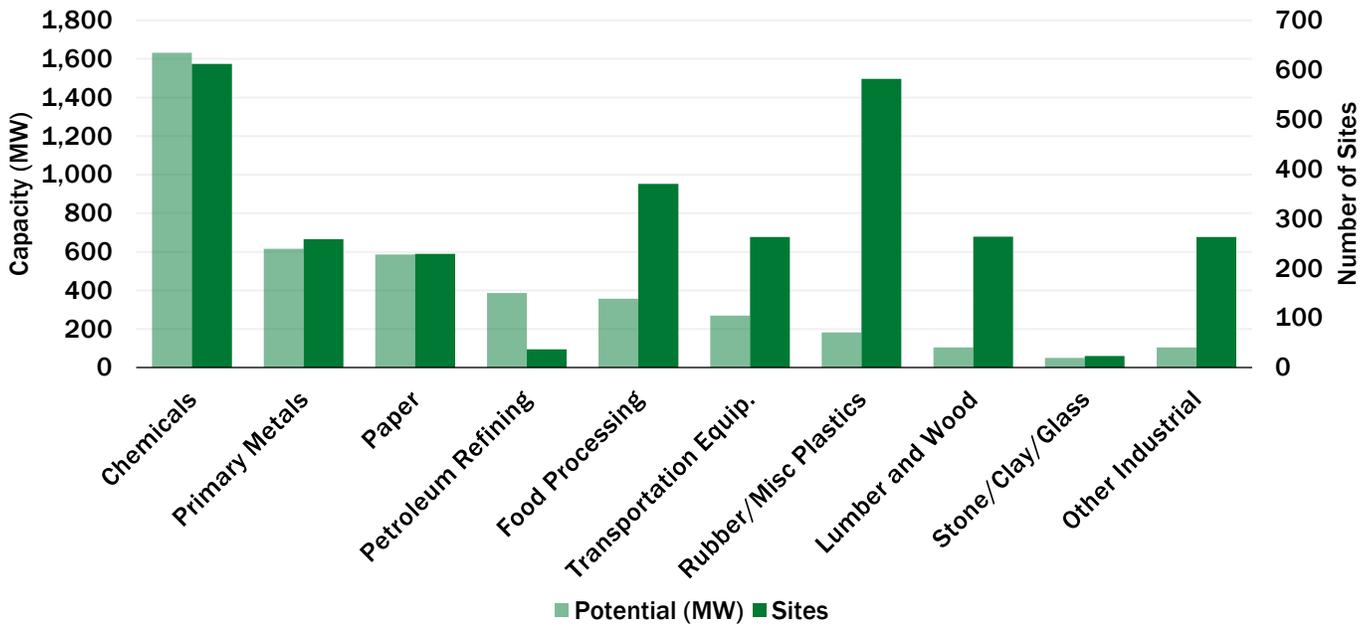
Ohio: Technical Potential for New CHP Installations

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. This report can be accessed at energy.gov/chp-potential.

Ohio CHP Technical Potential

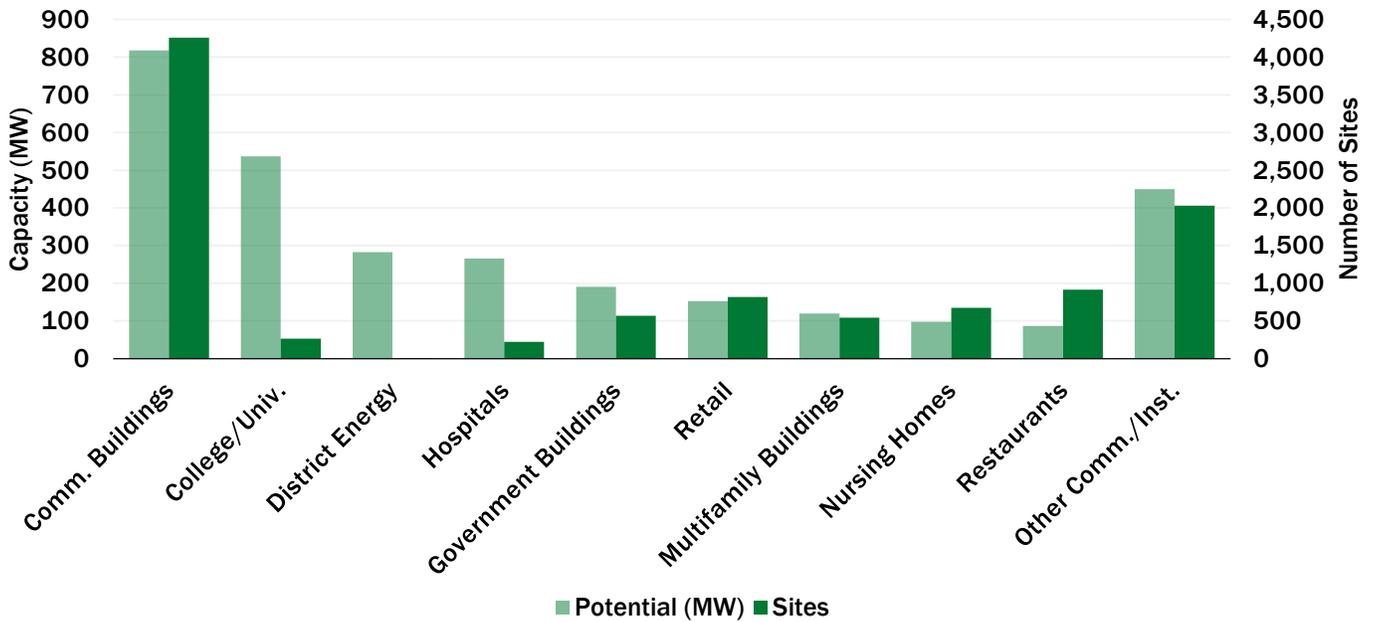
Sector	Potential Sites	Potential MW
Industrial	2,902	4,288
Commercial/Institutional	10,292	3,000
Total	13,194	7,288

Ohio 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
Chemicals	272	51	106	78	153	362	68	625	13	516	612	1,633
Primary Metals	123	29	55	40	53	124	21	199	7	224	259	615
Paper	121	32	41	29	44	94	17	173	6	258	229	586
Petroleum Refining	2	0	15	10	12	25	2	29	6	322	37	387
Food Processing	252	47	38	29	70	136	8	67	2	78	370	356
Other Industrial	1,122	183	135	93	113	208	25	227	0	0	1,395	711
Total	1,892	343	390	277	445	950	141	1,320	34	1,398	2,902	4,288

Ohio 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	2,726	136	1,192	477	341	205	0	0	0	0	4,259	818
College/Univ.	167	28	9	6	66	176	18	157	6	170	266	537
Hospitals	99	25	30	21	87	175	7	44	0	0	223	266
Government Buildings	484	70	34	23	49	83	2	14	0	0	569	191
Retail	756	108	47	28	13	16	0	0	0	0	816	152
Other Comm./Inst.	3,862	469	206	113	82	139	4	33	4	283	4,159	1,036
Total	8,094	836	1,518	668	638	794	31	248	10	453	10,292	3,000

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://betterbuildingsinitiative.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 Resiliency Planning Guide and the CHP for Resiliency Screening Tool. For more information, visit <https://betterbuildingsinitiative.energy.gov/accelerators/combined-heat-and-power-resiliency>

Ohio: 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.

Ohio Natural Gas Prices

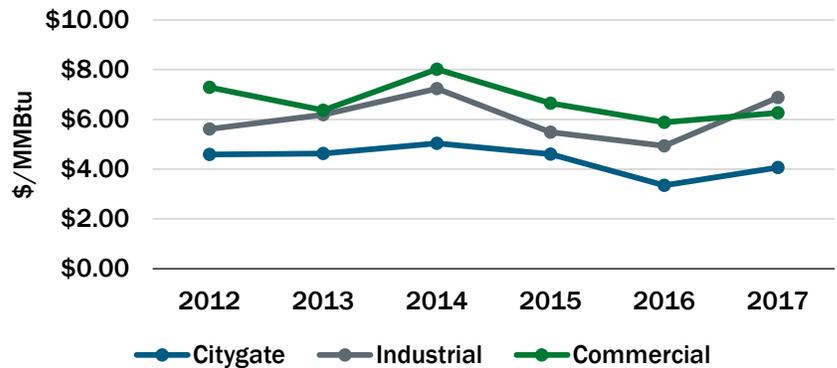
The EIA industrial natural gas price is a full tariff rate, and most large consumers are purchasing gas commodities from marketers at a lower rate.

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

Sector	OH Price	U.S. Price
Citygate*	4.06	4.26
Industrial	6.88	4.20
Commercial	6.26	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.

Ohio Average Natural Gas Prices



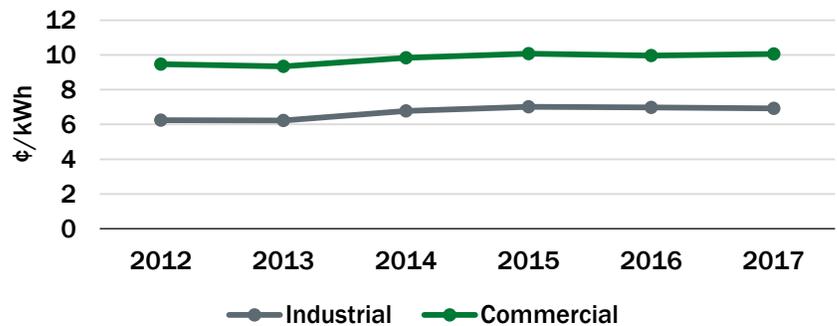
Ohio Electricity Prices

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

Ohio Average Electricity Prices (\$/kWh) - 2017

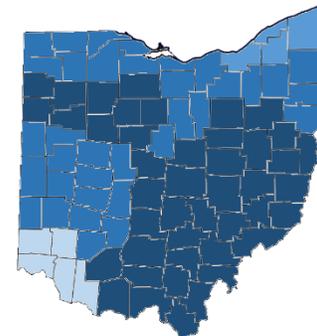
Sector	OH Price	U.S. Price
Industrial	6.92	6.88
Commercial	10.05	10.66

Ohio Average Electricity Prices



Ohio Average Delivered Electricity Prices by Utility

Utility	Industrial Price (\$/kWh)	Commercial Price (\$/kWh)	Average Price (\$/kWh)
AEP Ohio	12.28	11.53	11.91
FirstEnergy (Toledo Edison)	8.82	12.51	10.66
FirstEnergy (Ohio Edison)	9.15	11.68	10.42
Dayton Power & Light	12.19	8.52	10.35
FirstEnergy (Illuminating Co)	6.33	12.73	9.53
Duke Energy Ohio	8.45	9.50	8.97



- Duke Energy Ohio
- The Illuminating Co
- DP&L / Ohio Edison / Toledo Edison
- AEP Ohio