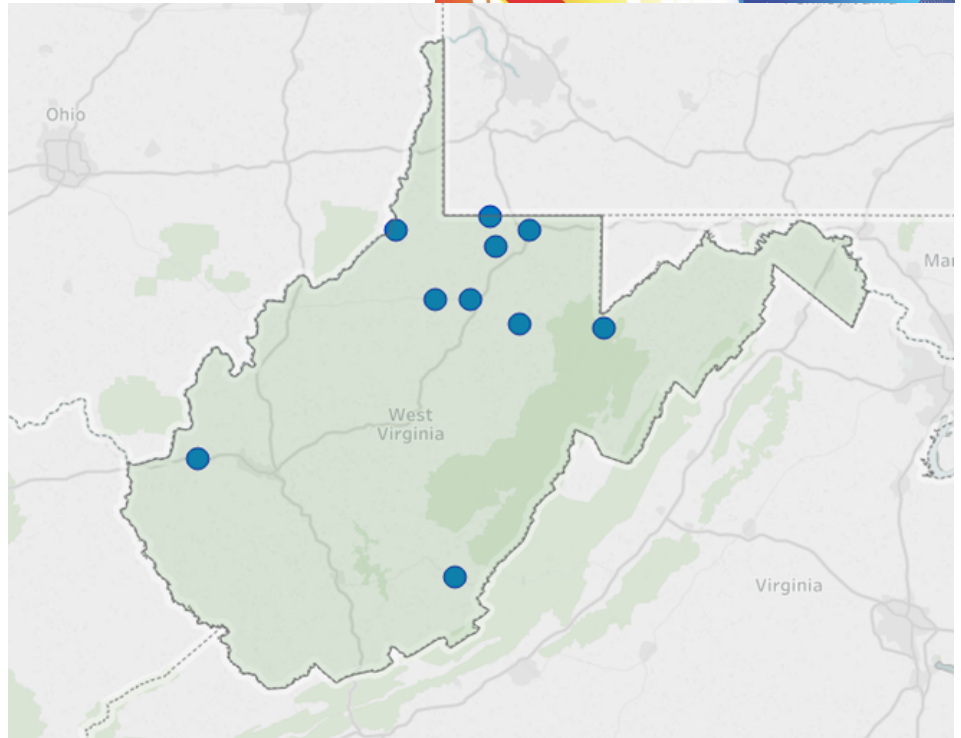


The State of CHP: West Virginia



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



Map of current CHP installations in West Virginia. *Illustration from ICF.*

West Virginia: 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 West Virginia, and can be accessed by visiting <https://doe.icfwebservices.com/chp>.

CHP Project Profiles

The Mid-Atlantic CHP TAP has compiled information on certain illustrative CHP projects in West Virginia. 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>.

Mid-Atlantic CHP Technical Assistance Partnership

For assistance with questions about specific CHP opportunities in West Virginia, please consult with the Mid-Atlantic CHP TAP by visiting machptap.org or contacting the CHP TAP director.

West Virginia Existing CHP

Sector	Sites	Capacity (MW)
Industrial	2	124
Commercial/Institutional	8	153
Other	0	0
Total	10	277

Mid-Atlantic CHP TAP Director

Jim Freihaut, Ph.D.

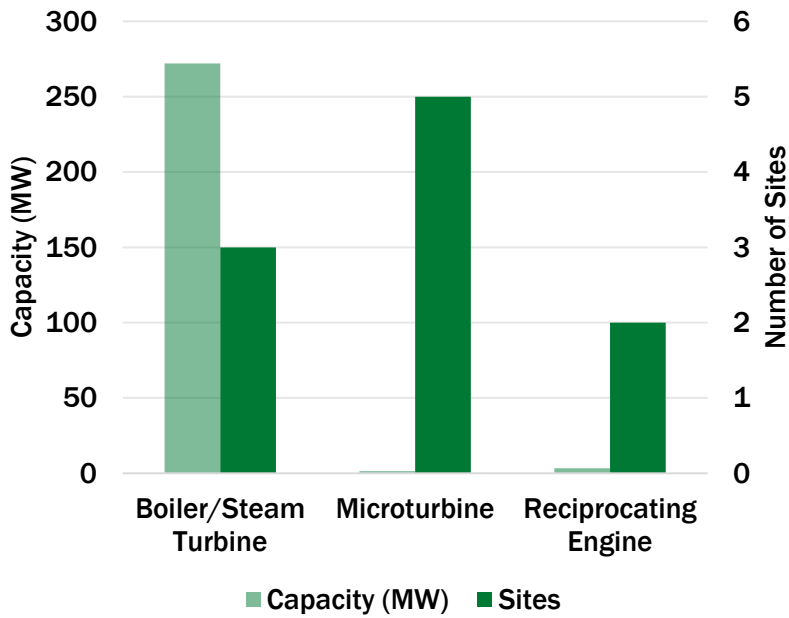
- Pennsylvania State University
- jdf11@psu.edu
- 814-863-0083

MID-ATLANTIC

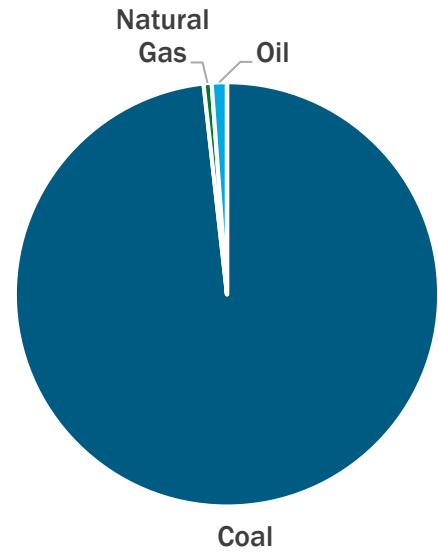


CHP
TECHNICAL ASSISTANCE
PARTNERSHIPS

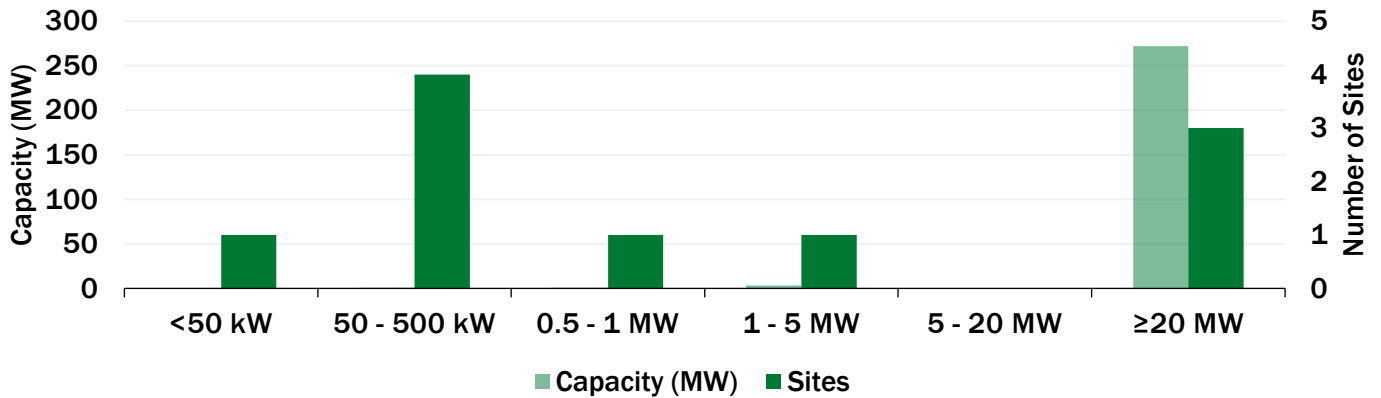
West Virginia CHP by Technology



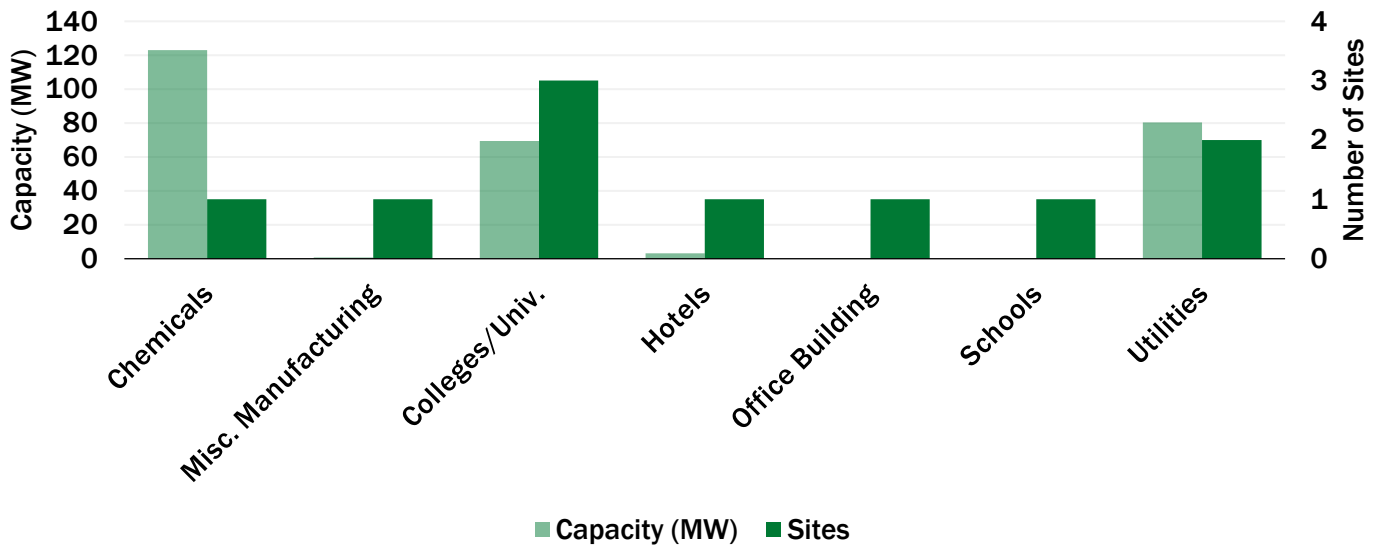
West Virginia CHP Capacity (MW) by Fuel



West Virginia CHP by Size Range



West Virginia CHP by Application



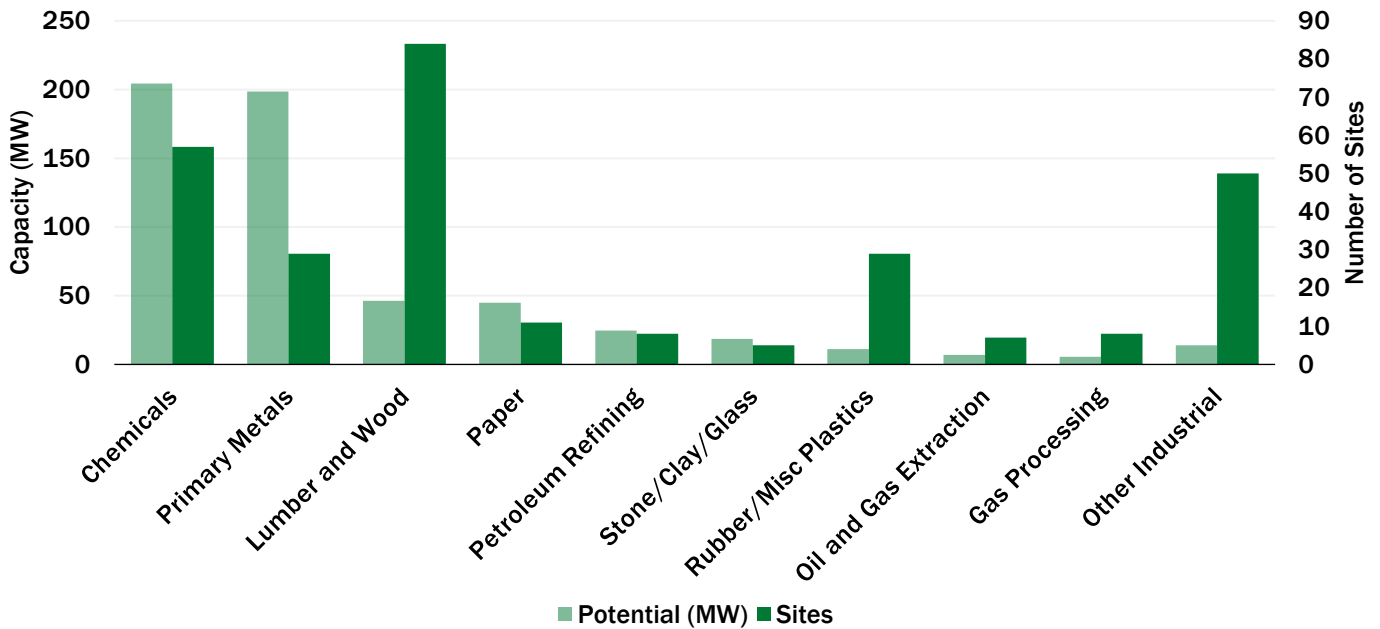
West Virginia: Technical Potential for New CHP Installations

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](#).

West Virginia CHP Technical Potential

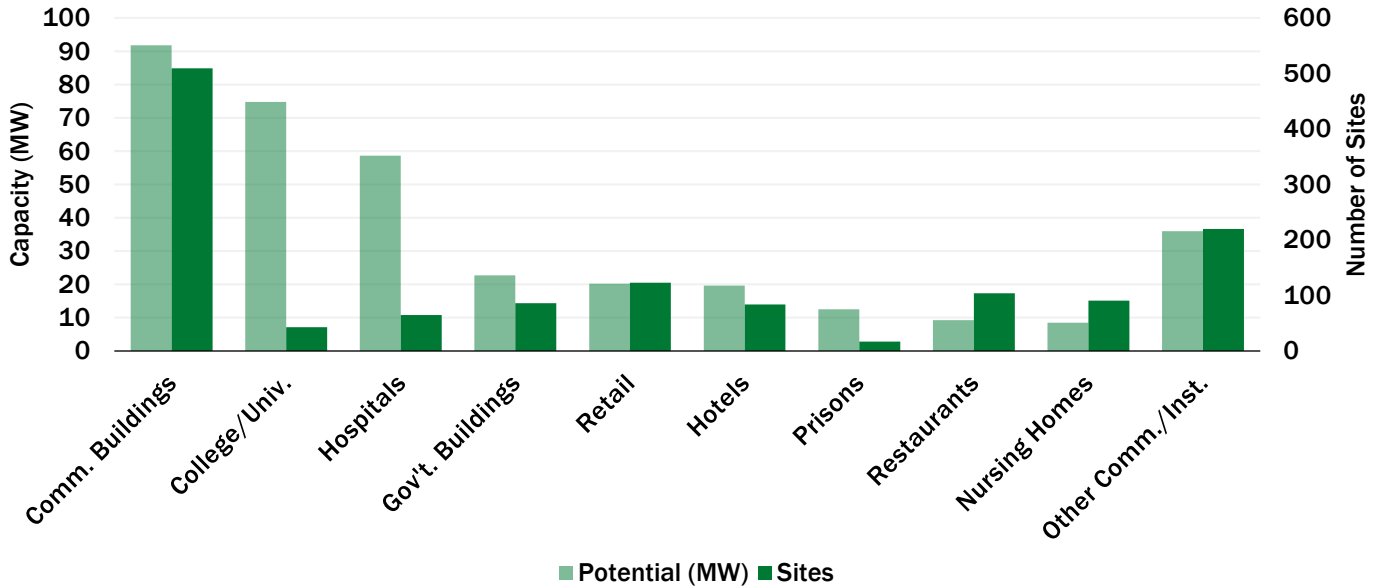
Sector	Potential Sites	Potential MW
Industrial	288	575
Commercial/Institutional	1,342	354
Total	1,630	929

West Virginia 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	20	4	7	6	17	43	11	100	2	51	57	204
Primary Metals	14	4	5	3	4	10	4	42	2	139	29	198
Lumber and Wood	63	14	15	11	4	9	2	13	0	0	84	46
Paper	3	1	1	1	4	9	3	34	0	0	11	45
Petroleum Refining	0	0	3	2	4	11	1	11	0	0	8	25
Other Industrial	76	14	12	9	10	18	1	15	0	0	99	56
Total	176	37	43	32	43	100	22	216	4	190	288	575

West Virginia 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	339	17	136	54	34	20	0	0	0	0	509	92
College/Univ.	23	4	4	3	10	21	6	47	0	0	43	75
Hospitals	31	9	12	8	21	36	1	6	0	0	65	59
Government Buildings	80	10	2	1	3	5	1	6	0	0	86	23
Hotels	79	9	2	1	2	4	1	5	0	0	84	20
Other Comm./Inst.	490	55	13	8	11	18	1	5	0	0	516	85
Total	1,083	114	170	76	79	100	9	64	0	0	1,342	354

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>

West Virginia: 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.

West Virginia Natural Gas Prices

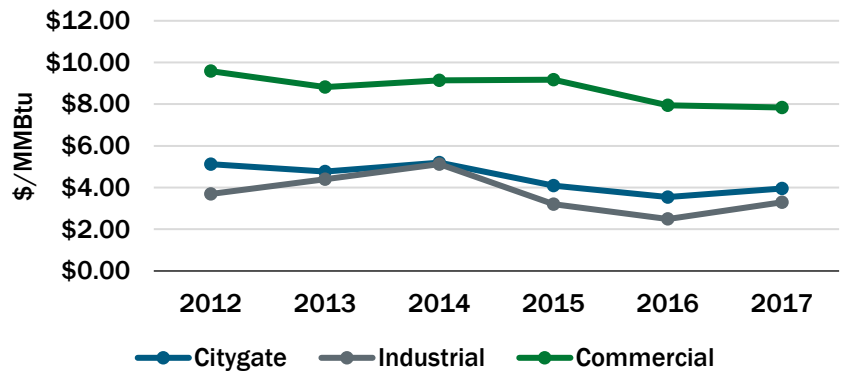
The EIA industrial natural gas price is a full tariff rate, and most large consumers are purchasing gas commodities from marketers at a lower rate.

West Virginia Average Gas Prices (\$/MMBtu) - 2017

Sector	WV Price	U.S. Price
Citygate*	3.96	4.26
Industrial	3.29	4.20
Commercial	7.84	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.

West Virginia Average Natural Gas Prices



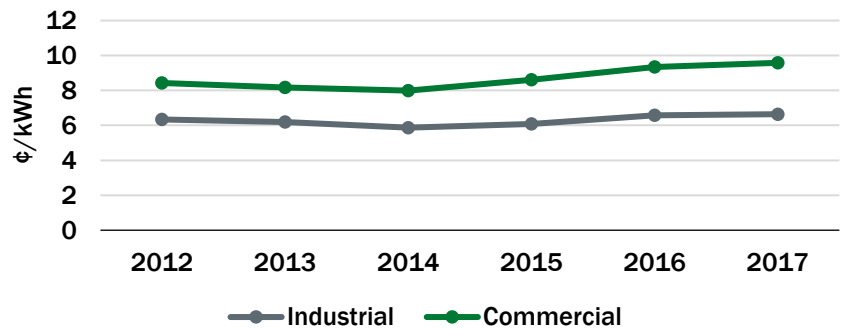
West Virginia Electricity Prices

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

West Virginia Average Electricity Prices (¢/kWh) - 2017

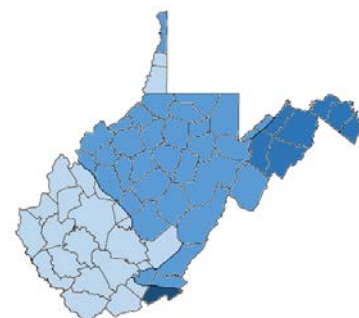
Sector	WV Price	U.S. Price
Industrial	6.64	6.88
Commercial	9.58	10.66

West Virginia Average Electricity Prices



West Virginia Average Delivered Electricity Prices by Utility

Utility	Industrial Price (¢/kWh)	Commercial Price (¢/kWh)	Average Price (¢/kWh)
Craig-Botetourt Elec Coop	-	13.63	13.63
FirstEnergy (Potomac Edison)	9.43	11.25	10.34
FirstEnergy (Mon Power)	6.93	9.82	8.37
Appalachian Power	6.72	9.08	7.90
Appalachian Power (Wheeling)	5.88	9.24	7.56



- Appalachian Power
- Mon Power
- Potomac Edison
- Craig-Botetourt Elec Coop