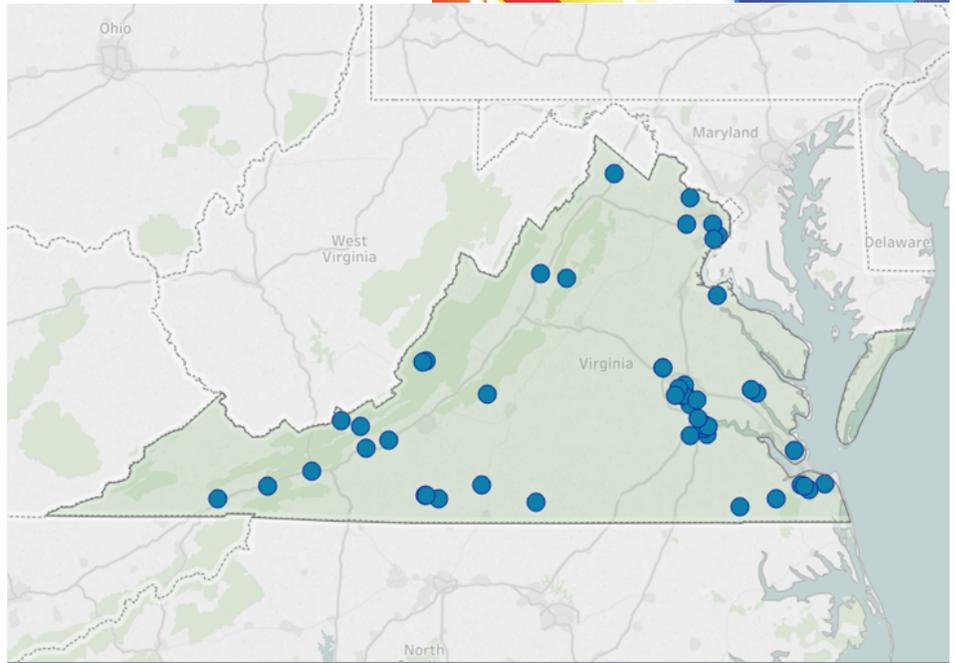


## The State of CHP: Virginia



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



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

### 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 Virginia, and can be accessed by visiting [energy.gov/chp-installs](http://energy.gov/chp-installs).

#### CHP Project Profiles

The Mid-Atlantic CHP TAP has compiled information on certain illustrative CHP projects in Virginia. You can access these by visiting the Department of Energy’s CHP Project Profiles Database at [energy.gov/chp-projects](http://energy.gov/chp-projects).

#### Mid-Atlantic CHP Technical Assistance Partnership

For assistance with questions about specific CHP opportunities in Virginia, please consult with the Mid-Atlantic CHP TAP by visiting [machptap.org](http://machptap.org) or contacting the CHP TAP director.

#### Virginia Existing CHP

Sector	Sites	Capacity (MW)
Industrial	27	1,252
Commercial/Institutional	22	117
Other	2	241
<b>Total</b>	<b>51</b>	<b>1,610</b>

#### Mid-Atlantic CHP TAP Director

Jim Freihaut, Ph.D.

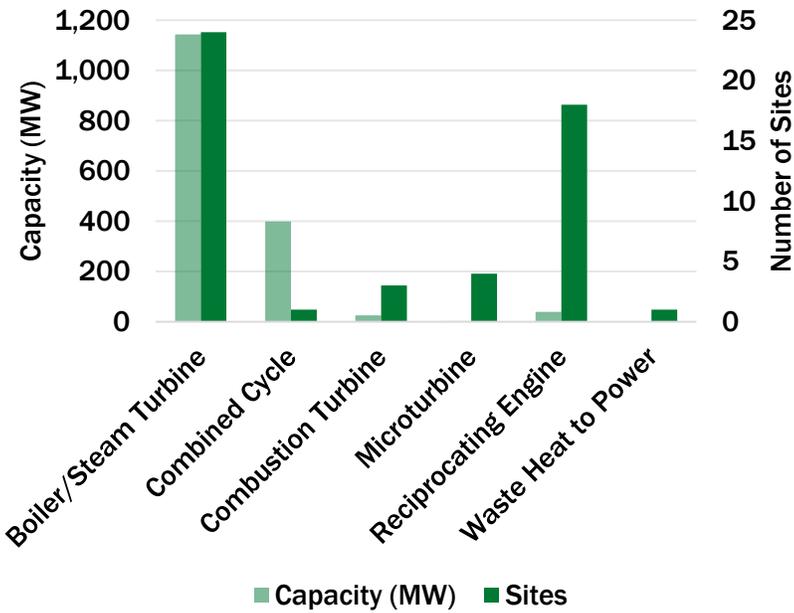
- Pennsylvania State University
- [jdf11@psu.edu](mailto:jdf11@psu.edu)
- 814-863-0083

MID-ATLANTIC

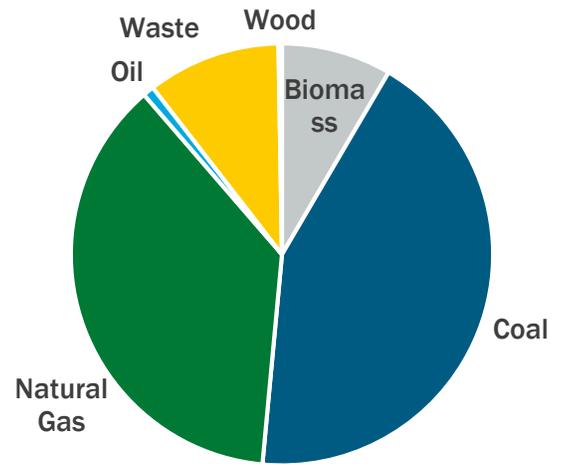


CHP  
TECHNICAL ASSISTANCE  
PARTNERSHIPS

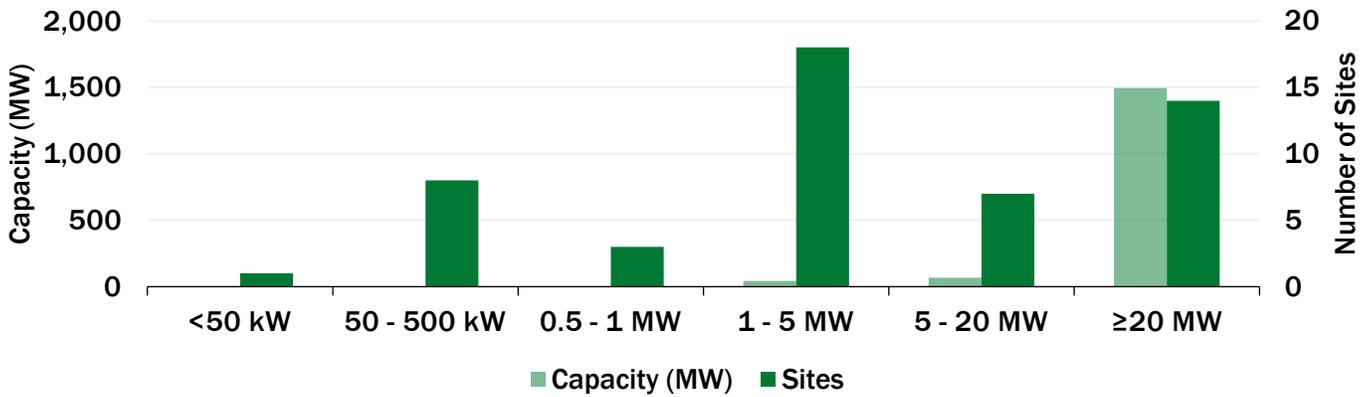
Virginia CHP by Technology



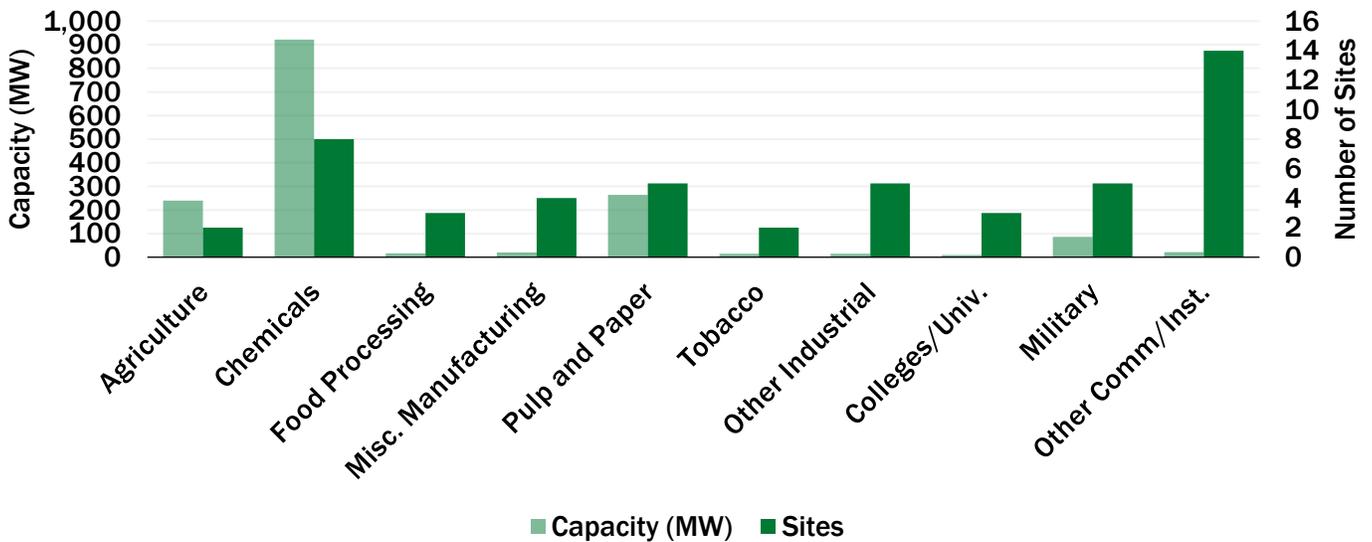
Virginia CHP Capacity (MW) by Fuel



Virginia CHP by Size Range



Virginia CHP by Application



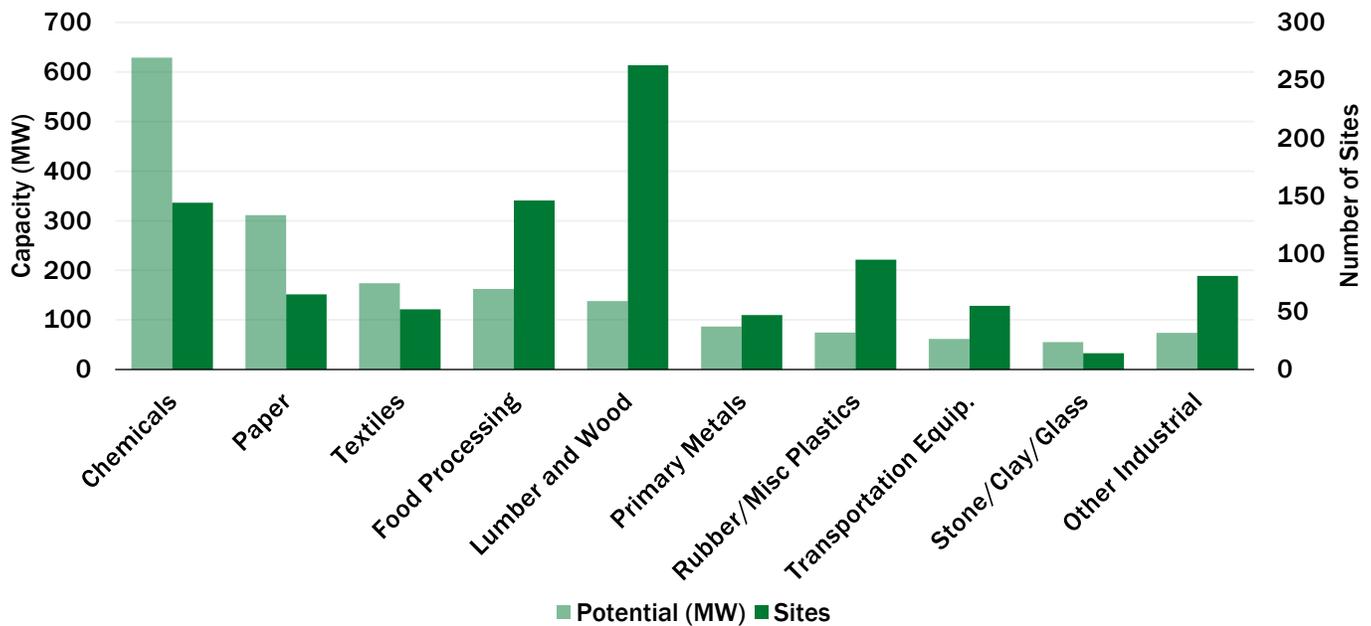
## Virginia: Technical Potential for New CHP Installations

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. This report can be accessed at [energy.gov/chp-potential](http://energy.gov/chp-potential).

## Virginia CHP Technical Potential

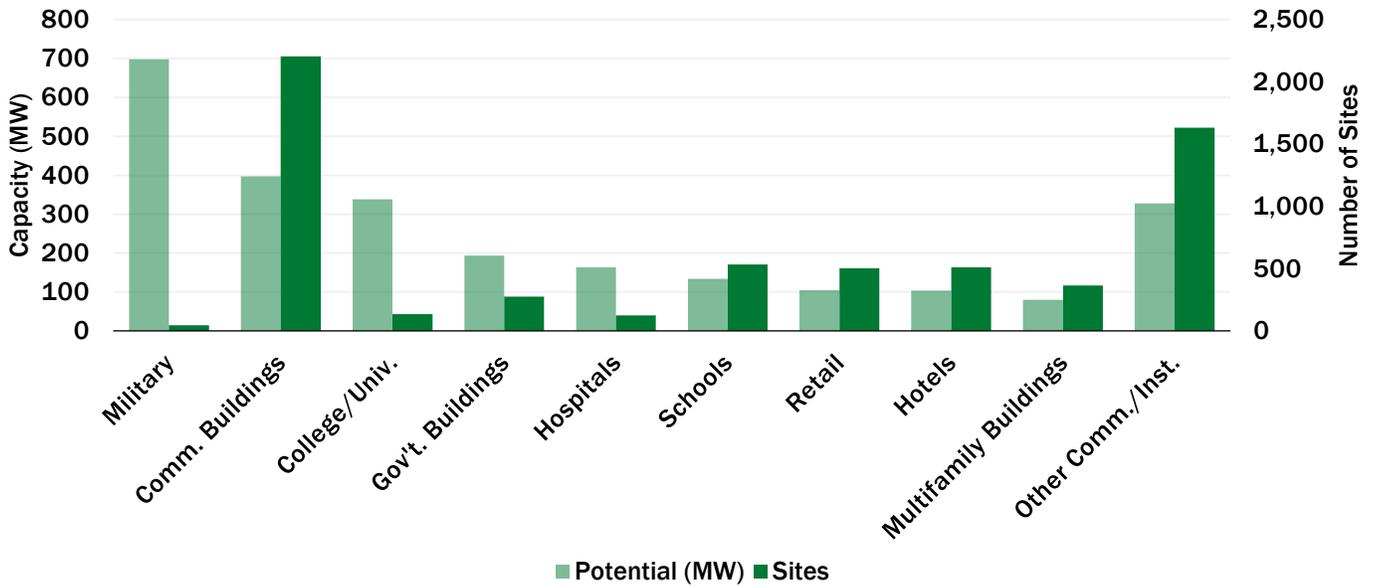
Sector	Potential Sites	Potential MW
Industrial	962	1,768
Commercial/Institutional	6,329	2,540
<b>Total</b>	<b>7,291</b>	<b>4,308</b>

## 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	76	13	17	12	27	46	16	148	8	411	144	629
Paper	25	7	10	6	19	54	6	59	5	186	65	312
Textiles	14	3	9	7	19	40	8	55	2	68	52	174
Food Processing	95	15	19	15	28	46	3	30	1	57	146	163
Lumber and Wood	190	38	43	29	25	43	5	29	0	0	263	138
Other Industrial	195	34	46	32	39	80	8	93	4	113	292	352
<b>Total</b>	<b>595</b>	<b>110</b>	<b>144</b>	<b>100</b>	<b>157</b>	<b>309</b>	<b>46</b>	<b>414</b>	<b>20</b>	<b>834</b>	<b>962</b>	<b>1,768</b>

## 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
Military	16	3	5	4	10	31	13	111	2	550	46	698
Commercial Buildings	1,470	74	588	235	147	88	0	0	0	0	2,205	397
College/Univ.	77	15	7	5	33	78	14	114	4	126	135	338
Government Buildings	212	31	24	17	30	52	10	93	0	0	276	194
Hospitals	41	11	27	19	50	101	5	33	0	0	123	163
Other Comm./Inst.	3,219	448	235	139	87	124	3	40	0	0	3,544	750
<b>Total</b>	<b>5,035</b>	<b>581</b>	<b>886</b>	<b>418</b>	<b>357</b>	<b>474</b>	<b>45</b>	<b>391</b>	<b>6</b>	<b>676</b>	<b>6,329</b>	<b>2,540</b>

## 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>

## 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.

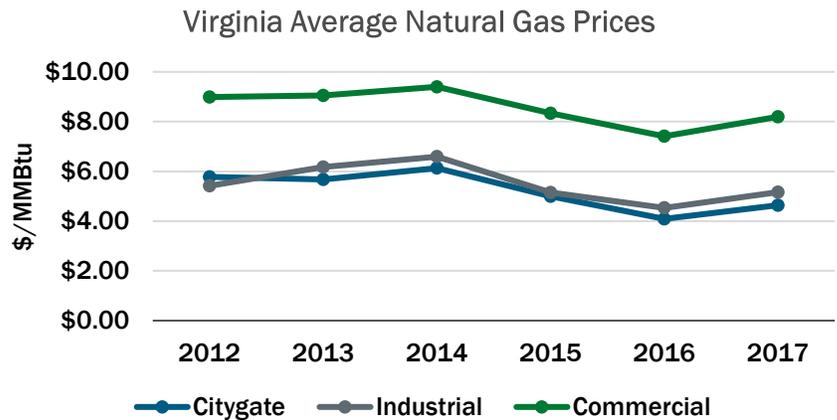
### Virginia Natural Gas Prices

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.

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

Sector	VA Price	U.S. Price
Citygate*	4.64	4.26
Industrial	5.17	4.20
Commercial	8.19	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.

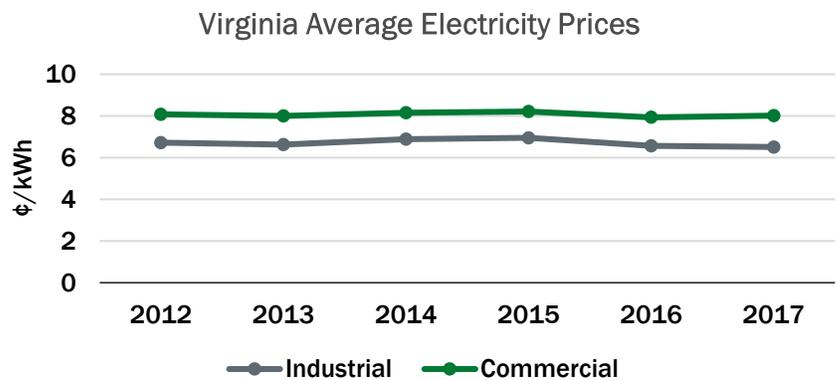


### Virginia Electricity Prices

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

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

Sector	VA Price	U.S. Price
Industrial	6.51	6.88
Commercial	8.01	10.66



#### Virginia Average Delivered Electricity Prices by Utility

Utility	Industrial Price (¢/kWh)	Commercial Price (¢/kWh)	Average Price (¢/kWh)
A&N Elec Coop	8.24	11.56	9.90
Rappahannock Elec Coop	7.70	10.94	9.32
Shenandoah Elec Coop	7.20	10.14	8.67
Northern Virginia Elec Coop	5.93	11.37	8.65
Kentucky Utilities	6.27	9.76	8.01
Appalachian Power	6.72	9.08	7.90
Dominion Energy	5.59	9.09	7.34

