The State of CHP: Washington

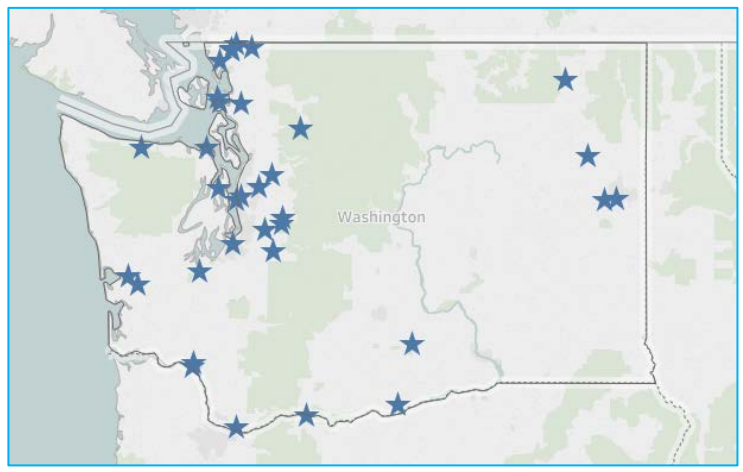
The information in this document provides a general overview of the state of CHP in Washington, with data on current installations, technical potential, and economics for CHP. For help with questions about specific CHP opportunities in Washington, please consult with the Northwest CHP Technical Assistance Partnership.

Washington Installed Base of CHP

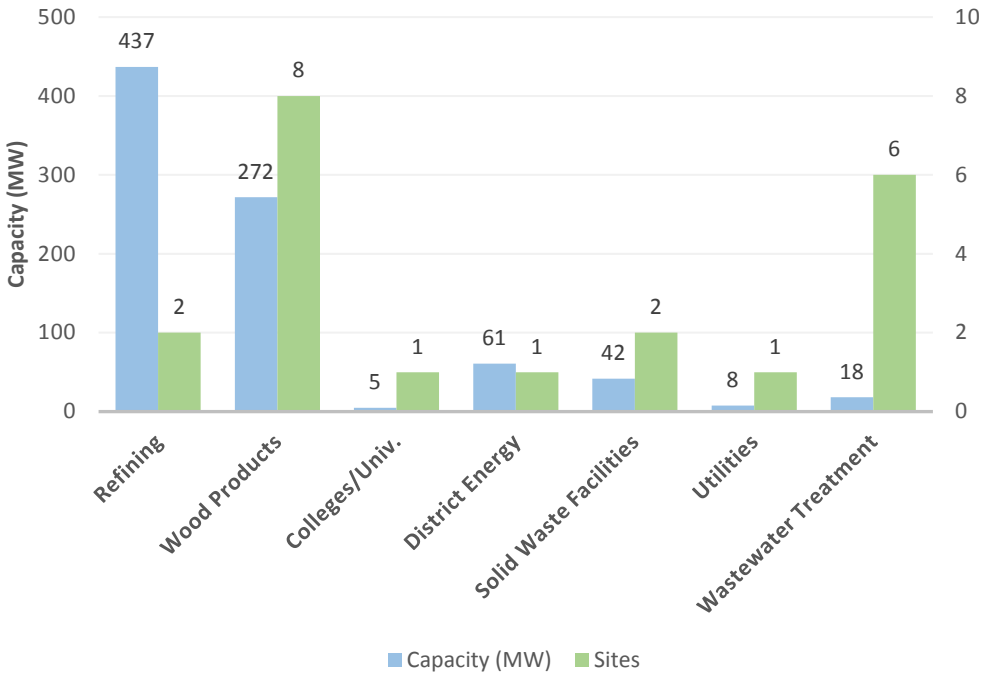
U.S. DOE Combined Heat and Power Installation Database

Sector	*Installations*	*Capacity (MW)*
Industrial	16	912
Commercial/Institutional	11	134
Other	8	6
Total	**35**	**1,052**

The Northwest CHP Technical Assistance Partnership has compiled information on certain illustrative CHP projects in Washington. You can access these by visiting the Department of Energy's CHP Project Profiles Database.

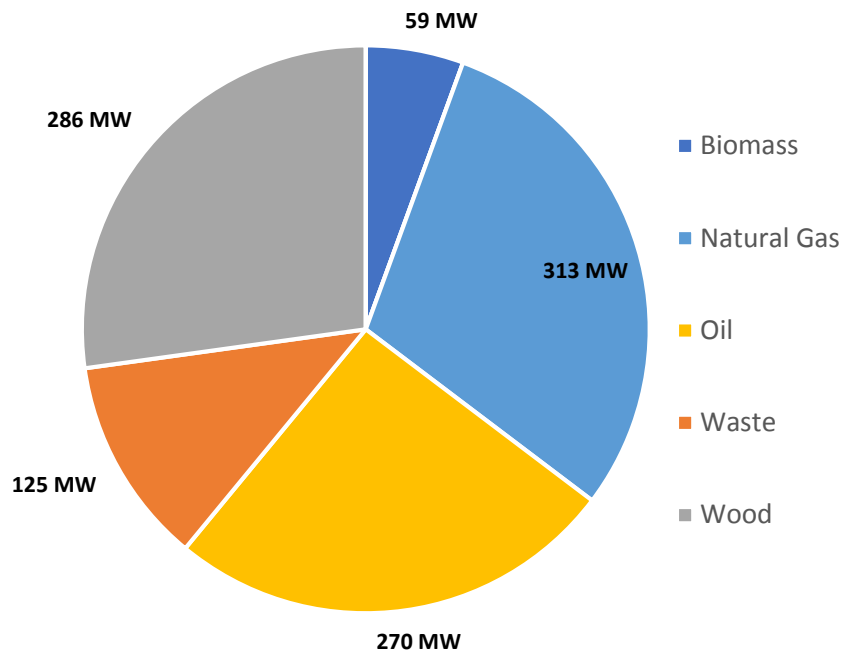


Washington CHP by Application



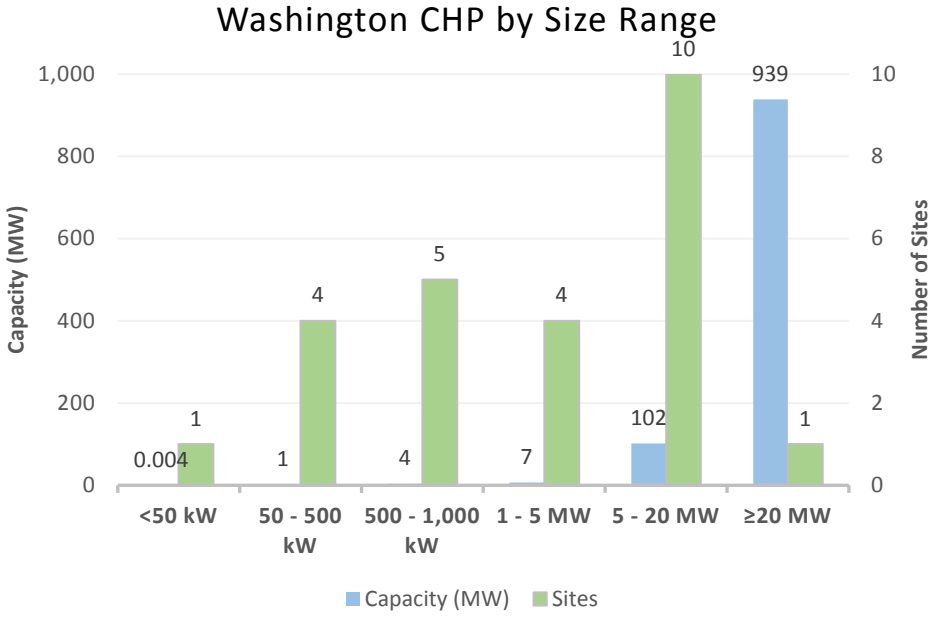
Source: DOE CHP Installation Database (U.S. installations as of Dec. 31, 2016)

Washington CHP Capacity (MW) by Fuel Type



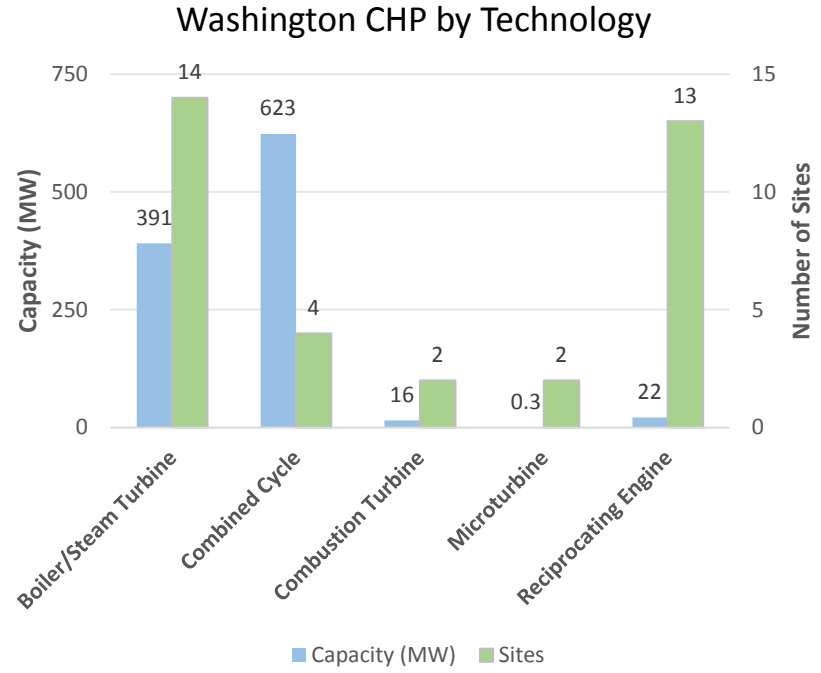
Source: DOE CHP Installation Database (U.S. installations as of Dec. 31, 2016)

Washington CHP by Size Range



Source: DOE CHP Installation Database (U.S. installations as of Dec. 31, 2016)

Washington CHP by Technology



Source: DOE CHP Installation Database (U.S. installations as of Dec. 31, 2016)

Combined Heat and Power (CHP) – sometimes 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.

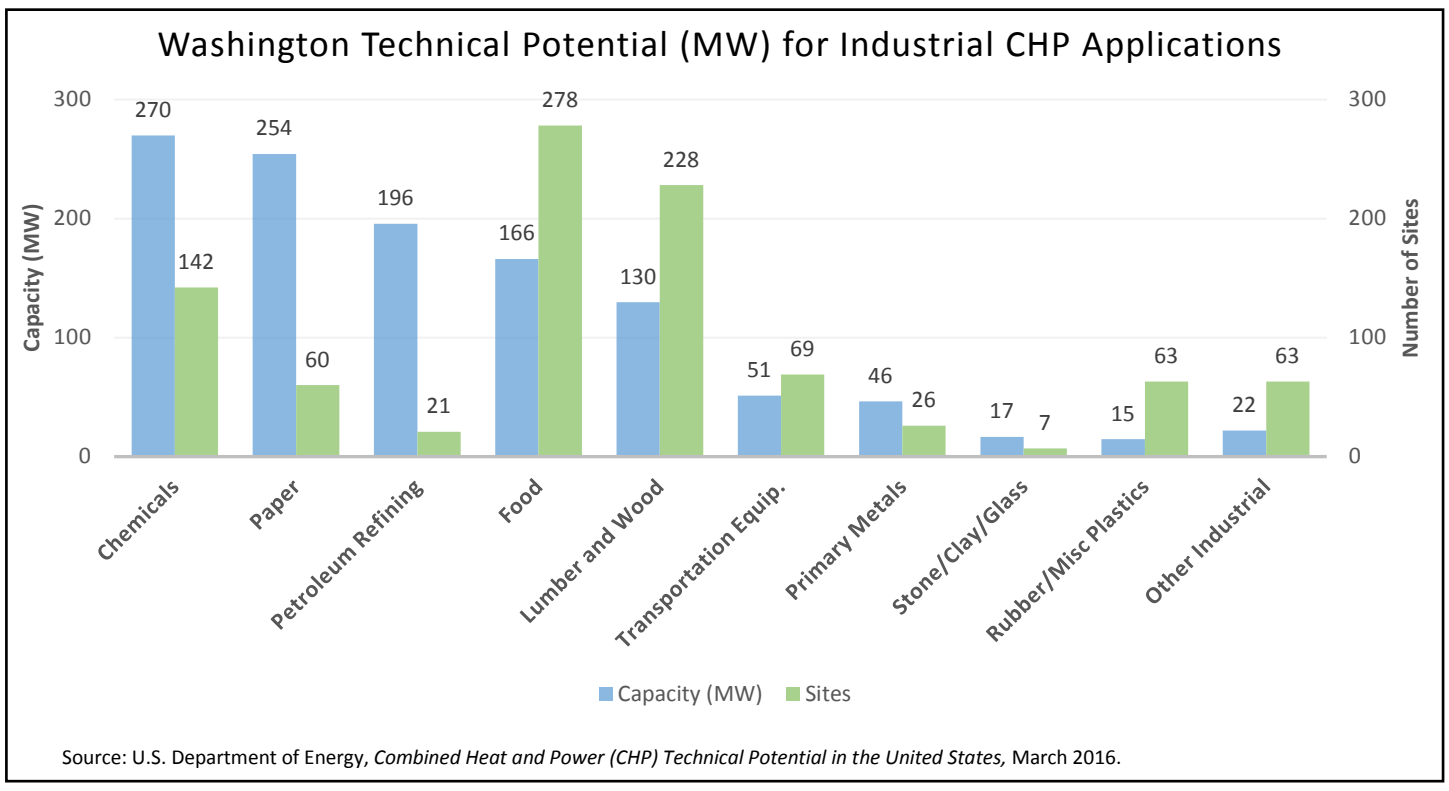
The State of CHP: Washington

The information in this document provides a general overview of the state of CHP in Washington, with data on current installations, technical potential, and economics for CHP. For help with questions about specific CHP opportunities in Washington, please consult with the Northwest CHP Technical Assistance Partnership.

Washington Technical Potential for New CHP Installations

U.S. DOE Analysis: Combined Heat and Power (CHP) Technical Potential in the United States

Sector	*Potential Sites*	*Potential Capacity (MW)*
Industrial	957	1,167
Commercial/Institutional	4,613	1,378
Total	**5,570**	**2,545**

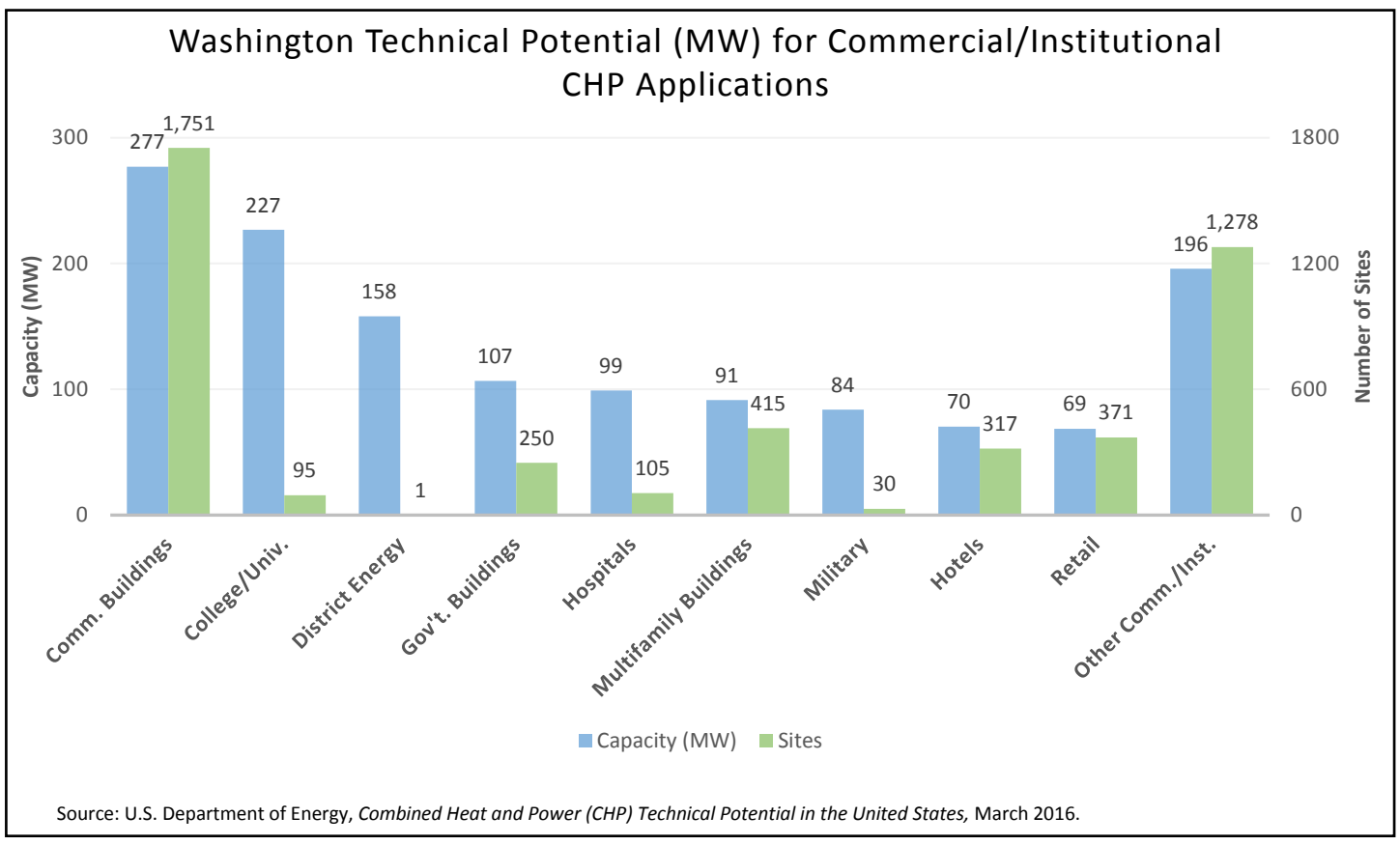


Source: U.S. Department of Energy, *Combined Heat and Power (CHP) Technical Potential in the United States,* March 2016.

Technical Potential by CHP Size Range for Top Five Industrial Sectors

	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	95	17	14	10	21	47	8	65	4	131	142	270
Paper	32	9	11	7	7	12	6	67	4	159	60	254
Petroleum Refining	2	0	8	6	4	7	3	32	4	151	21	196
Food	214	44	25	17	34	62	5	43	0	0	278	166
Lumber and Wood	162	31	31	21	34	66	1	12	0	0	228	130
Other Industrial	184	32	24	16	16	36	2	12	2	55	228	151
Total	689	133	113	77	116	230	25	231	14	495	957	1,167

Source: U.S. Department of Energy, *Combined Heat and Power (CHP) Technical Potential in the United States,* March 2016.



Source: U.S. Department of Energy, *Combined Heat and Power (CHP) Technical Potential in the United States,* March 2016.

Technical Potential by CHP Size Range for Top Five Commercial/Institutional Sectors

	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**
Commercial Buildings	1,265	63	389	156	97	58	0	0	0	0	1,751	277
College/Univ.	40	7	3	2	45	117	6	74	0	26	94	227
Government Buildings	200	31	25	17	23	43	2	15	0	0	250	107
Hospitals	57	13	15	10	32	70	1	6	0	0	105	99
Multifamily Buildings	293	22	106	53	16	16	0	0	0	0	415	91
Other Comm./Inst.	1,904	242	43	27	44	79	4	31	2	198	1,997	577
Total	3,759	379	581	265	257	384	13	126	3	224	4,613	1,378

Source: U.S. Department of Energy, *Combined Heat and Power (CHP) Technical Potential in the United States,* March 2016.

Combined Heat and Power (CHP) – sometimes 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 State of CHP: Washington

The information in this document provides a general overview of the state of CHP in Washington, with data on current installations, technical potential, and economics for CHP. For help with questions about specific CHP opportunities in Washington, please consult with the Northwest CHP Technical Assistance Partnership.

Washington 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.

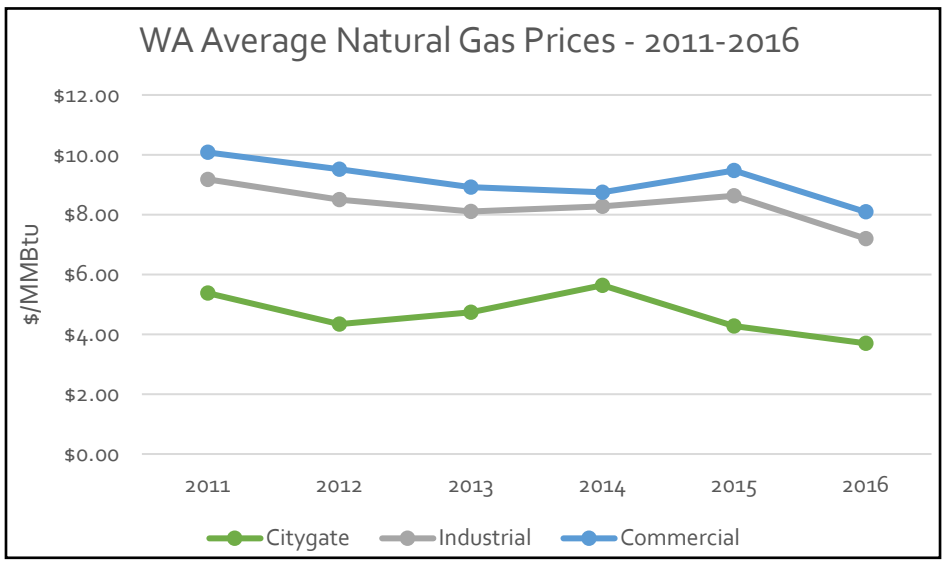
Washington Natural Gas Prices

Washington Average Gas Prices - 2016

Sector	*WA Price ($/MMBtu)*	*U.S. Price ($/MMBtu)*
Citygate*	3.70	3.75
Industrial	7.20	3.39
Commercial	8.09	7.22

Source: U.S. Energy Information Administration, "Natural Gas Prices", https://www.eia.gov/dnav/ng/ng_pri_sum_dcu_SWA_a.htm

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.



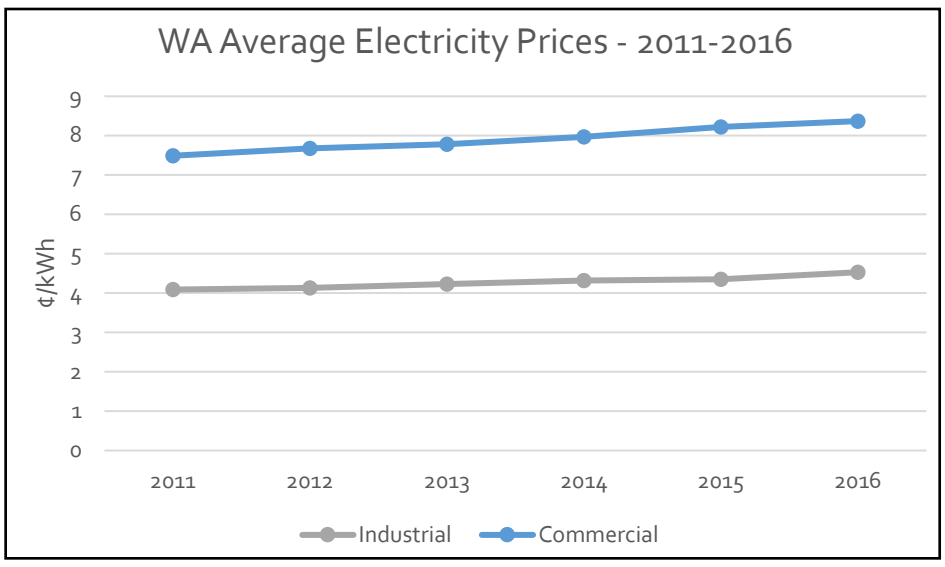
Washington Electricity Prices

Washington Average Electricity Prices - 2016

Sector	*WA Price (¢/kWh)*	*U.S. Price (¢/kWh)*
Industrial	4.35	6.75
Commercial	8.37	10.37

Source: U.S. Energy Information Administration, "Electricity Data Browser", https://www.eia.gov/electricity/data.cfm

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

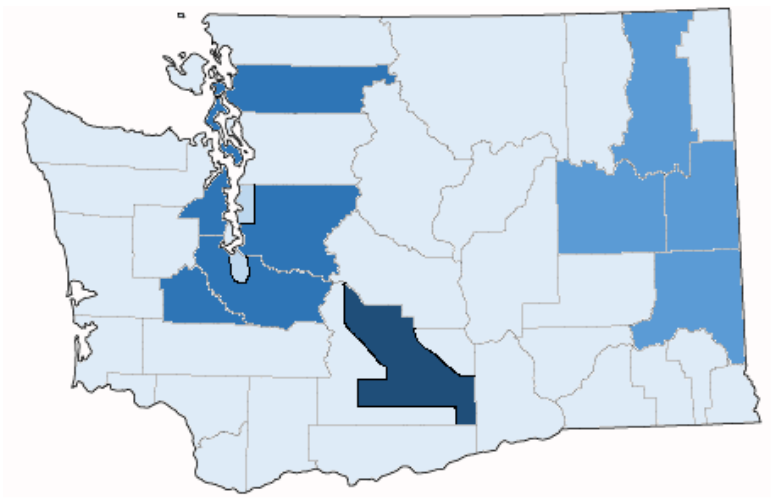


Washington Average Delivered Electricity Prices by Utility

Utility	*Industrial Price (¢/kWh)*	*Commercial Price (¢/kWh)*	*Average Price** (¢/kWh)*
PacifiCorp	14.00	8.23	11.12
Puget Sound Energy	9.08	9.77	9.42
Avista Corp	5.90	10.14	8.02
City of Seattle	6.64	7.75	7.20
City of Tacoma	5.54	8.31	6.93
Big Bend Electric Coop	5.31	6.91	6.11
Benton Rural Electric Assn	5.86	6.35	6.10
Public Utility Districts	4.96	7.06	6.01

Source: U.S. Energy Information Administration, "Annual retail price of electricity by utility", https://www.eia.gov/electricity/data.cfm

Washington Electricity Prices – Heat Map



*Citygate is a point or measuring station at which a distributing gas utility receives gas from a NG pipeline company or transmission system.

**Average of commercial and industrial electricity prices as reported by EIA.

Combined Heat and Power (CHP) – sometimes 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 State of CHP: Washington

The information in this document provides a general overview of the state of CHP in Washington, with data on current installations, technical potential, and economics for CHP. For help with questions about specific CHP opportunities in Washington, please consult with the Northwest CHP Technical Assistance Partnership.

Installed CHP | CHP Technical Potential | CHP Economics | CHP Partners

Department of Energy CHP Partnerships

Northwest CHP Technical Assistance Partnership

U.S. Department of Energy
CHP Technical Assistance Partnerships
NORTHWEST

Northwest CHP TAP Director: David Van Holde
Phone: 360-956-2071
Email: vanholded@energy.wsu.edu

CHP for Resiliency Accelerator

The U.S. DOE is collaborating with a group of cities, states, and utilities who are actively pursuing CHP as a consideration in resiliency planning for critical infrastructure in their jurisdictions. This has included defining resiliency, identifying critical infrastructure, and assessing CHP opportunities. This process is being documented in a Resiliency Planning Tool. For more information: CHP for Resiliency Accelerator Website.

- Currently, there are no CHP for Resiliency Accelerator partners in Washington.

Combined Heat and Power (CHP) – sometimes 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.