The State of CHP: Delaware

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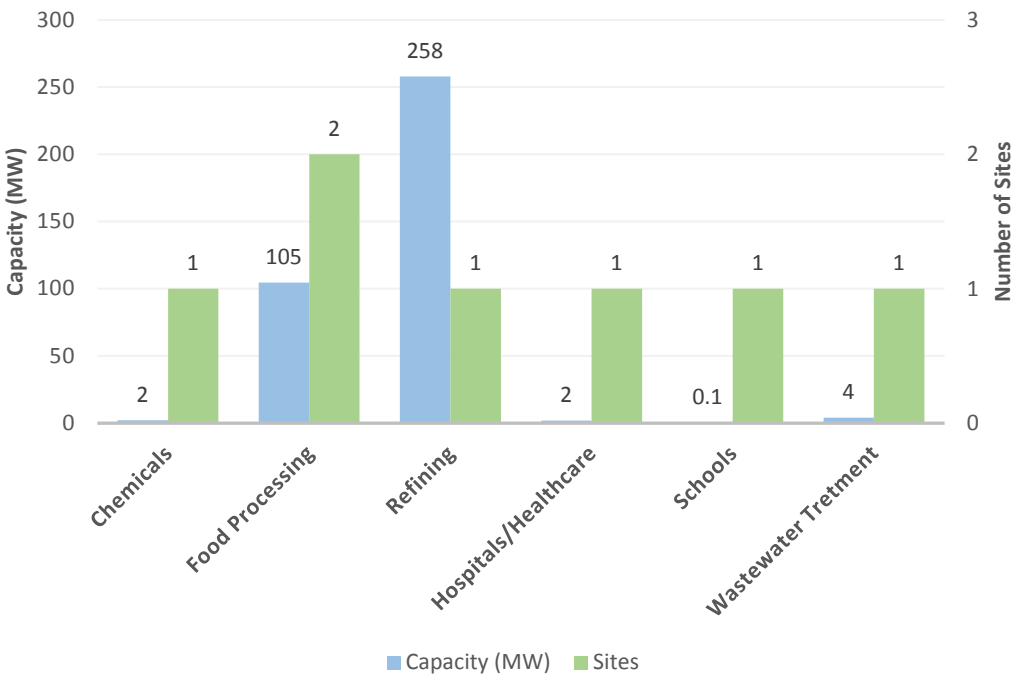
Delaware Installed Base of CHP

U.S. DOE Combined Heat and Power Installation Database

Sector	*Installations*	*Capacity (MW)*
Industrial	4	365
Commercial/Institutional	3	6
Other	0	0
Total	**7**	**371**

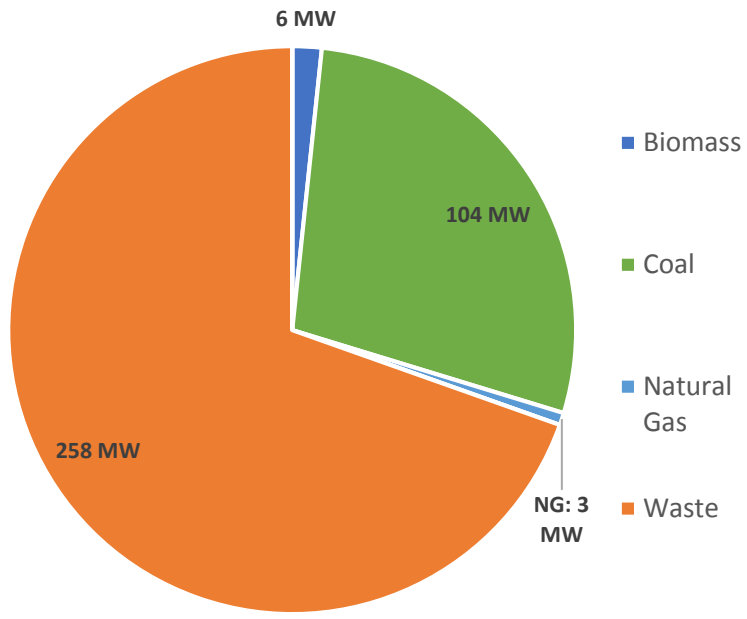
The Mid-Atlantic CHP Technical Assistance Partnership has compiled information on certain illustrative CHP projects in Delaware. You can access these by visiting the Department of Energy's CHP Project Profiles Database.

Delaware CHP by Application



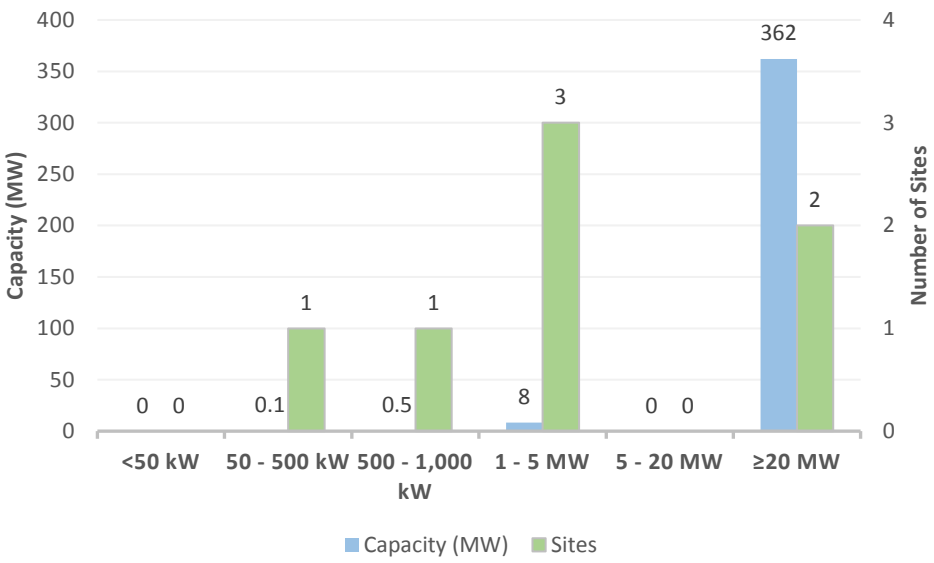
Source: DOE CHP Installation Database (U.S. installations as of Dec. 31, 2016)

Delaware CHP Capacity (MW) by Fuel Type



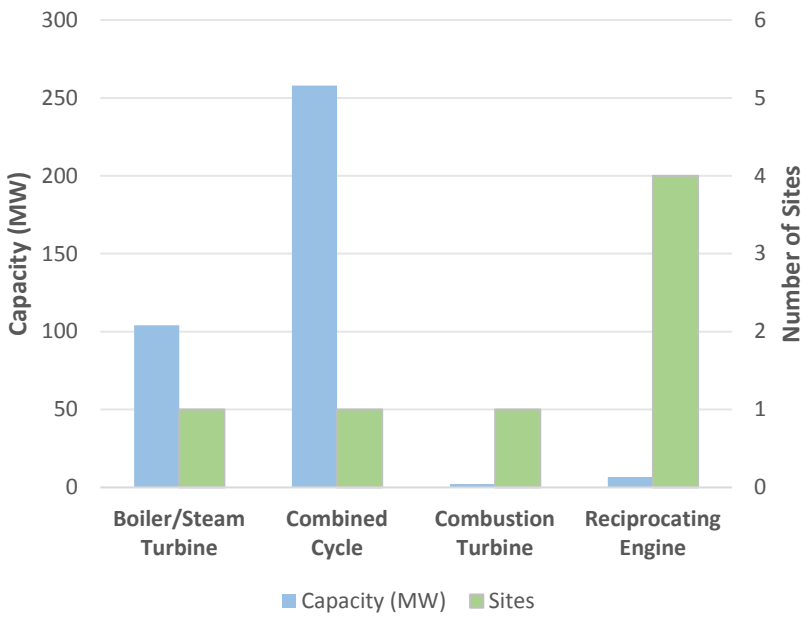
Source: DOE CHP Installation Database (U.S. installations as of Dec. 31, 2016)

Delaware CHP by Size Range



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

Delaware 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.

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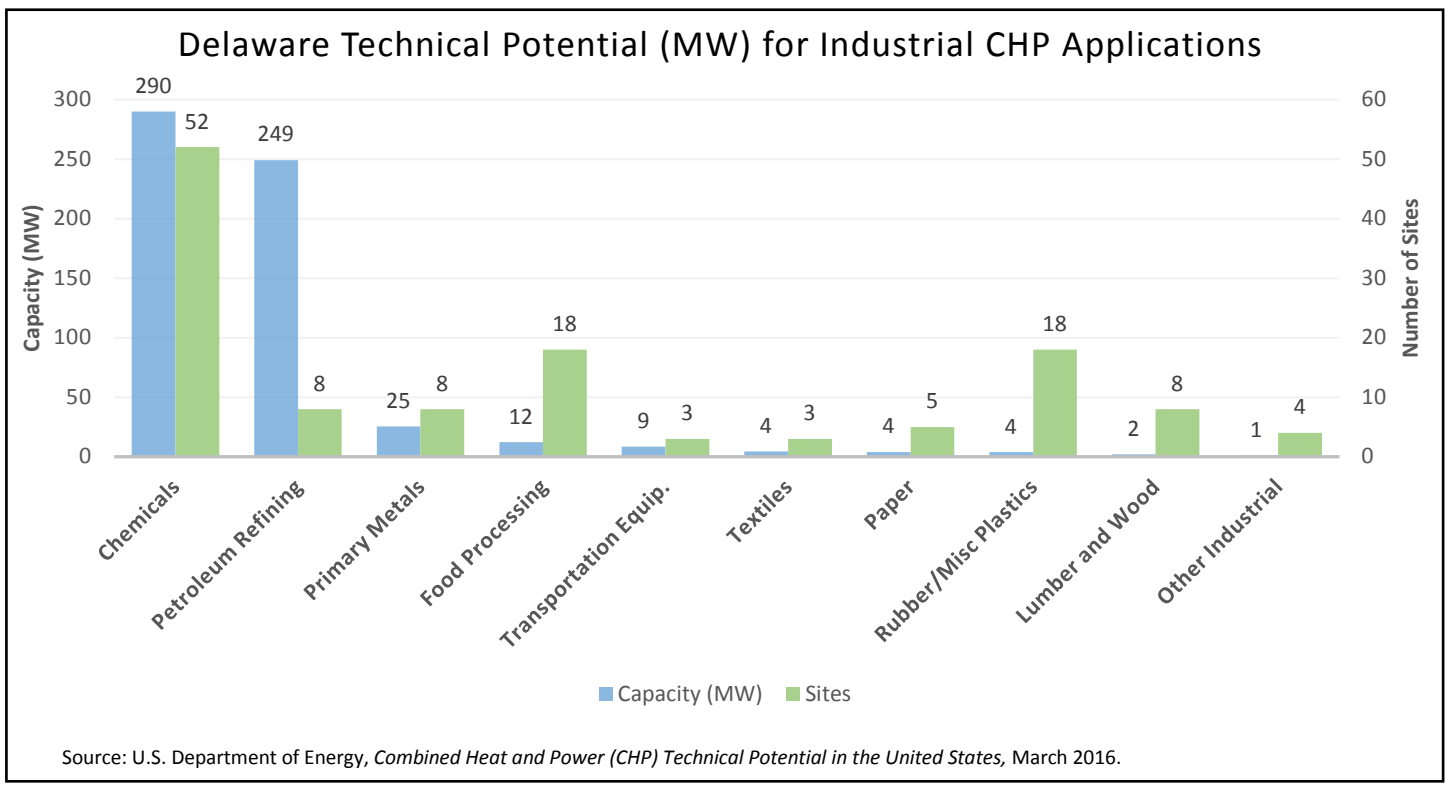
Delaware Technical Potential for New CHP Installations

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

Sector	*Potential Sites*	*Potential Capacity (MW)*
Industrial	127	601
Commercial/Institutional	707	207
Total	**834**	**808**

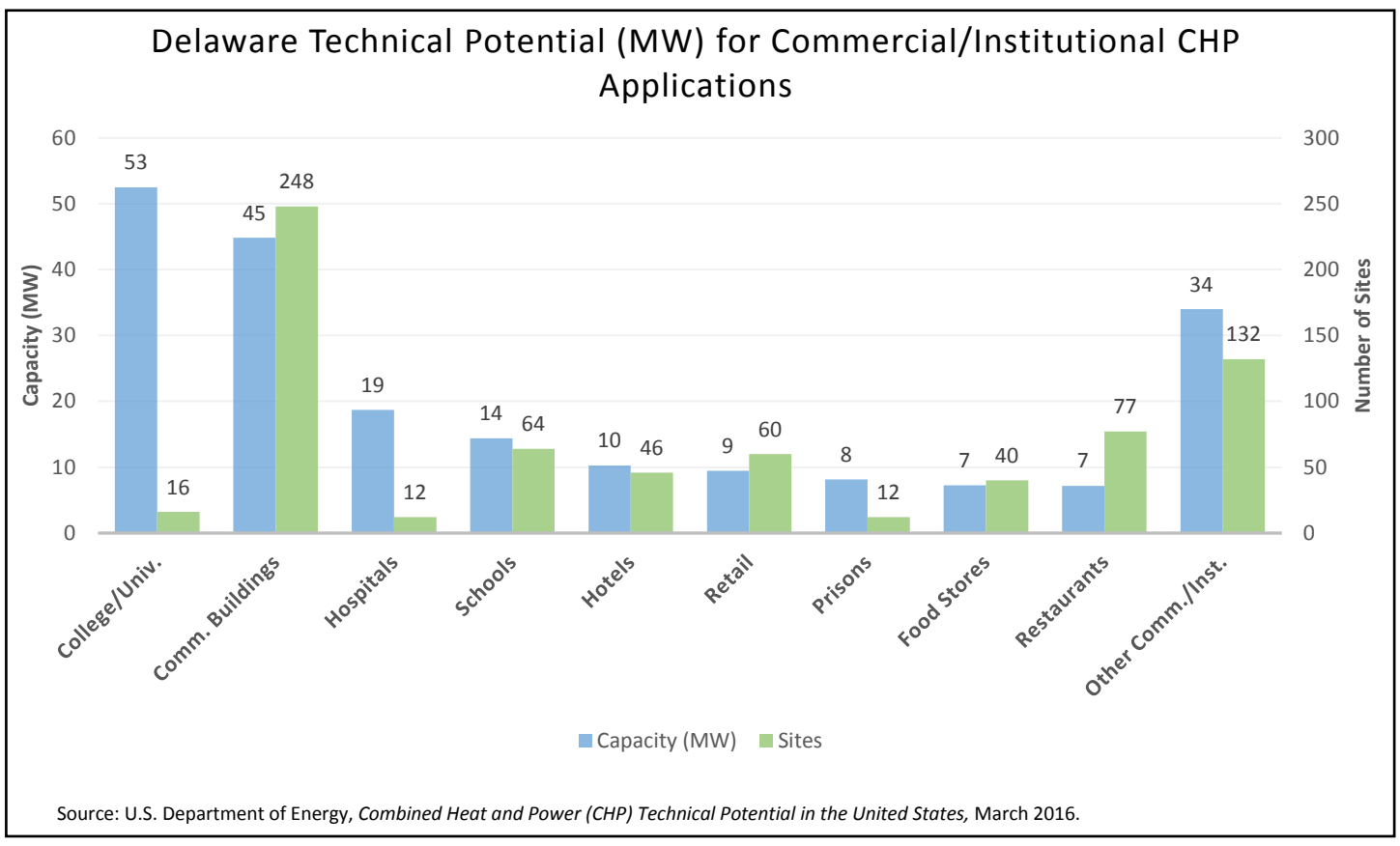


Source: U.S. Department of Energy, *Combined Heat and Power (CHP) Technical Potential in the United States,* March 2016.

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	21	3	6	4	10	22	12	124	3	137	52	290
Petroleum Refining	0	0	0	0	5	11	0	0	2	189	8	249
Primary Metals	3	1	2	1	1	1	1	11	0	0	8	25
Food Processing	11	2.3	3	2	4	8	0	0	0	0	18	12
Transportation Equip.	2	0.3	0	0	0	0	1	8	0	0	3	8.5
Other Industrial	32	6	4	3	2	6	0	0	0	0	38	15
Total	69	13	15	11	22	47	13	132	4	277	127	601

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**
Colleges/Univ.	8	2	1	1	5	11	1	15	1	24	16	53
Commercial Buildings	165	8	66	26	17	10	0	0	0	0	248	45
Hospitals	3	1	2	1	6	9	1	7	0	0	12	19
Schools	62	13	2	1	0	0	0	0	0	0	64	14
Hotels	42	5	3	2	1	4	0	0	0	0	46	10
Other Comm./Inst.	299	40	15	9	5	12	1	5	0	0	321	66
Total	579	69	89	40	34	46	3	27	1	24	707	207

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

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Delaware 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.

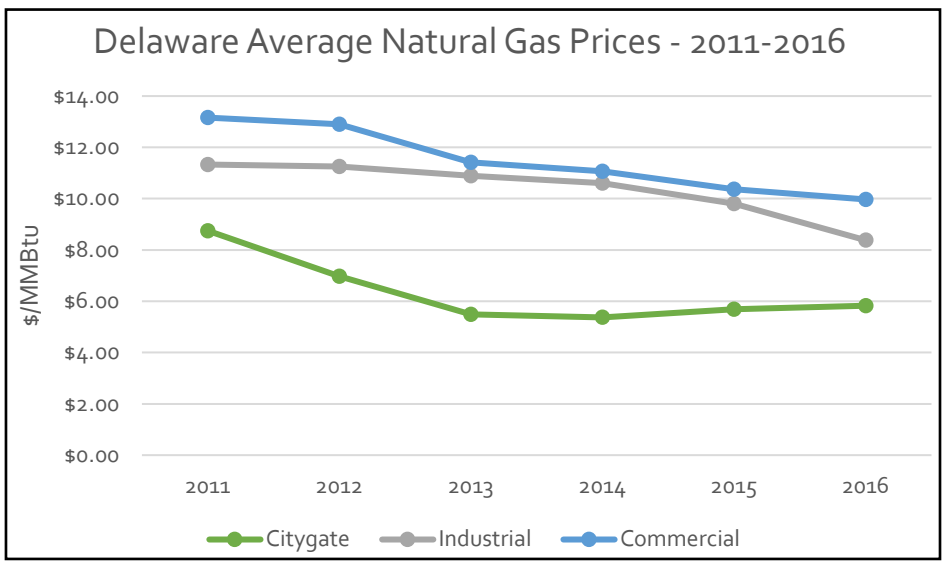
Delaware Natural Gas Prices

Delaware Average Gas Prices - 2016

Sector	*DE Price ($/MMBtu)*	*U.S. Price ($/MMBtu)*
Citygate*	5.83	3.75
Industrial	8.38	3.39
Commercial	9.97	7.22

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



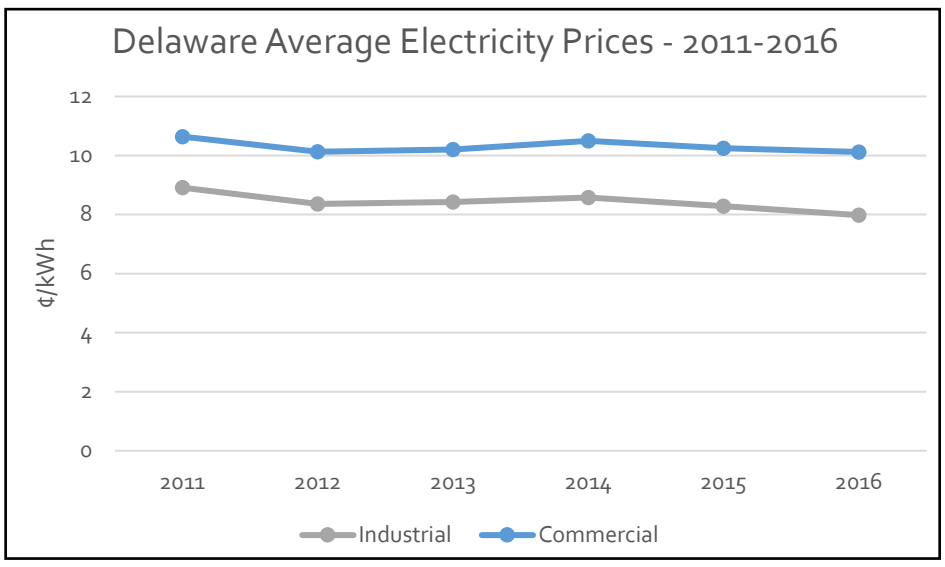
Delaware Electricity Prices

Delaware Average Electricity Prices - 2016

Sector	*DE Price (¢/kWh)*	*U.S. Price (¢/kWh)*
Industrial	7.98	6.75
Commercial	10.12	10.37

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

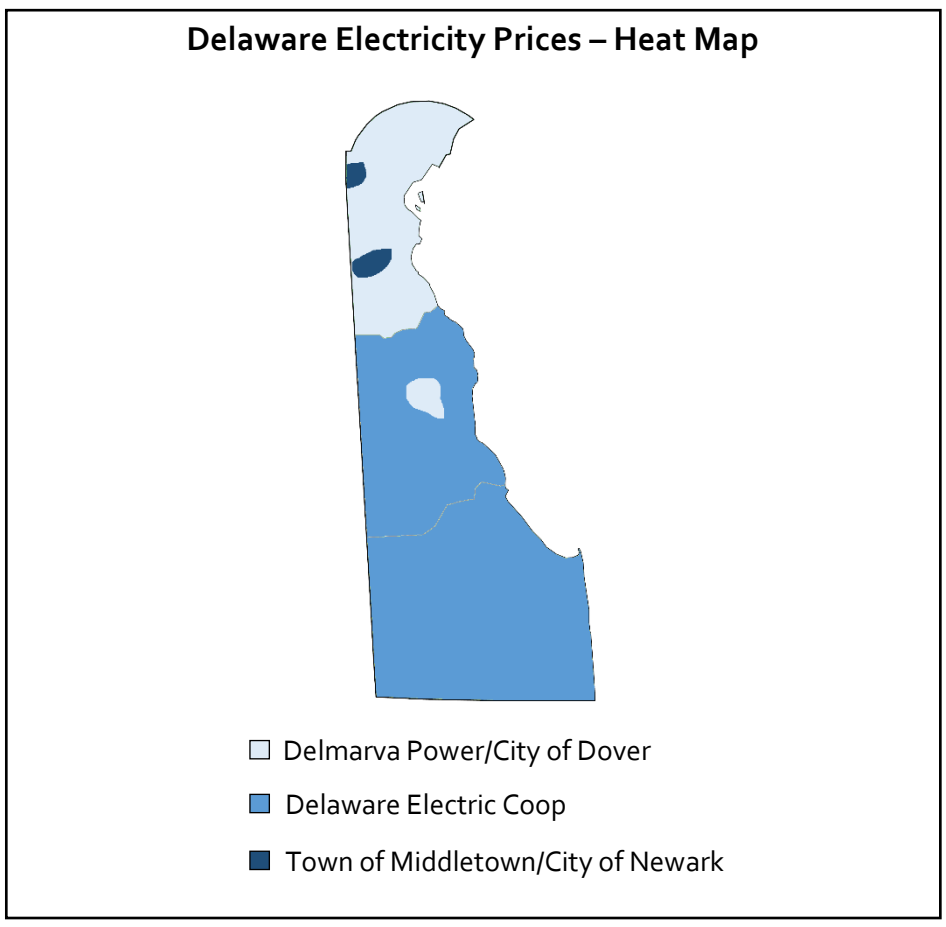
Electricity rates can vary greatly by utility and facility size range. The rates below from EIA represent general averages; individual facility rates may vary.



Delaware Average Delivered Electricity Prices by Utility

Utility	*Industrial Price (¢/kWh)*	*Commercial Price (¢/kWh)*	*Average Price** (¢/kWh)*
Town of Middletown	9.64	15.00	12.32
City of Newark	10.59	14.02	12.30
Delaware Electric Coop	-	11.06	11.06
Delmarva Power	8.84	12.43	10.63
City of Dover	9.23	11.87	10.55

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



*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.

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

Department of Energy CHP Partnerships

Mid-Atlantic CHP Technical Assistance Partnership

U.S. Department of Energy
CHP Technical Assistance Partnerships
MID-ATLANTIC

Mid-Atlantic CHP TAP Director: Jim Freihaut
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Email: jdf11@psu.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 Delaware.

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