

The State of CHP: Vermont



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

Installed CHP

CHP Technical Potential

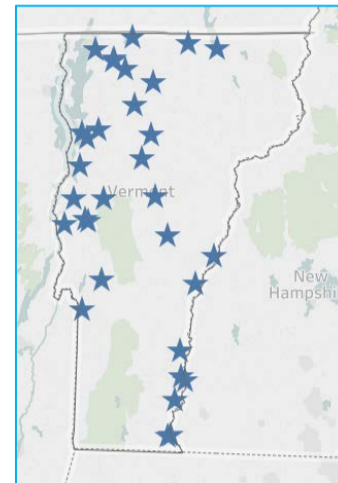
CHP Economics

CHP Partners

Vermont Installed Base of CHP

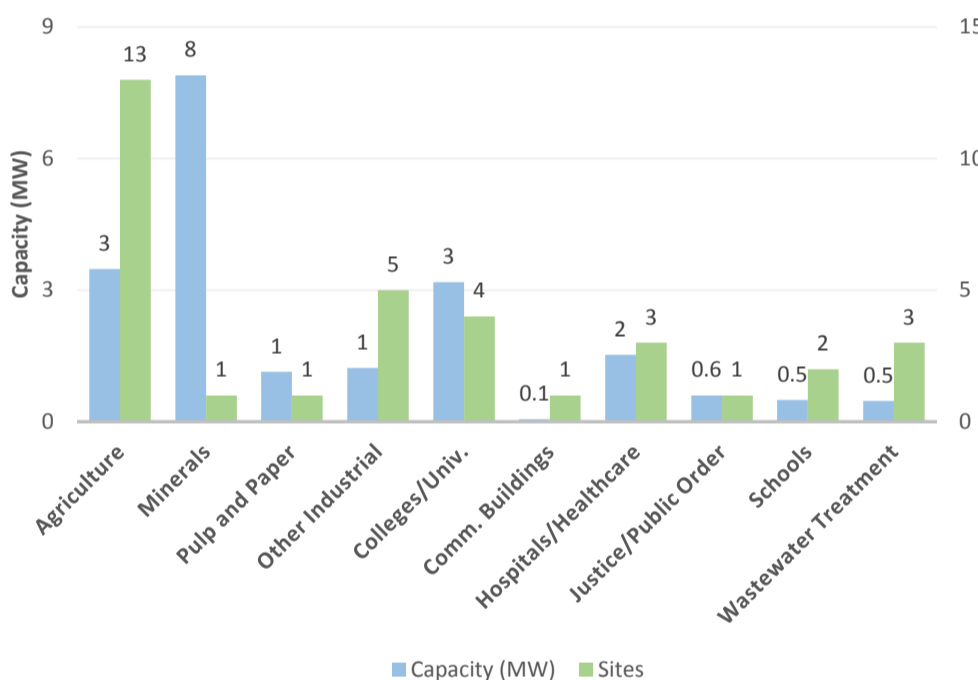
[U.S. DOE Combined Heat and Power Installation Database](#)

Sector	Installations	Capacity (MW)
Industrial	6	2
Commercial/Institutional	14	6
Other	14	11
Total	34	20



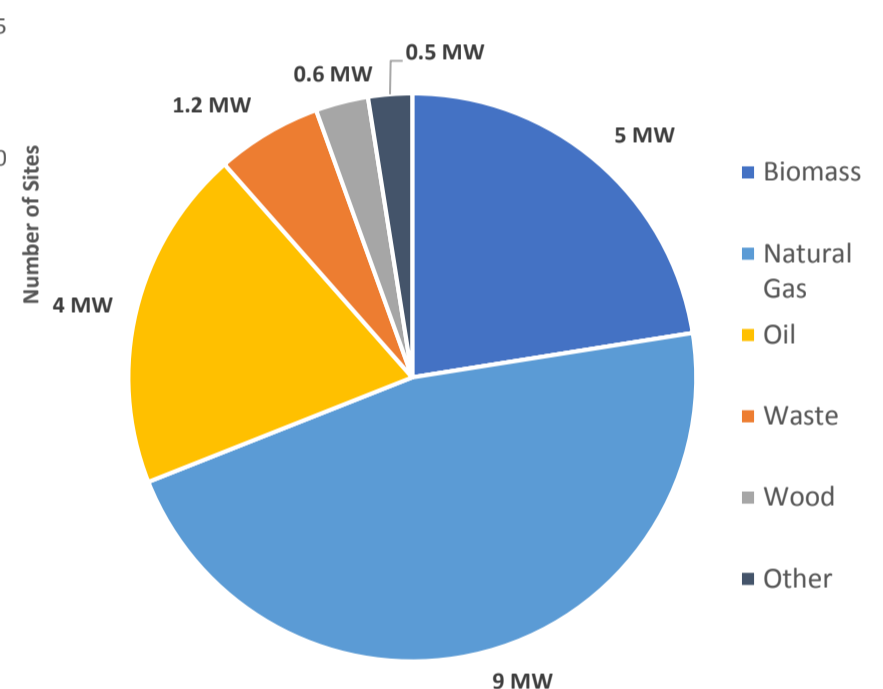
The Northeast CHP Technical Assistance Partnership has compiled information on certain illustrative CHP projects in Vermont. You can access these by visiting the Department of Energy's [CHP Project Profiles Database](#).

Vermont CHP by Application



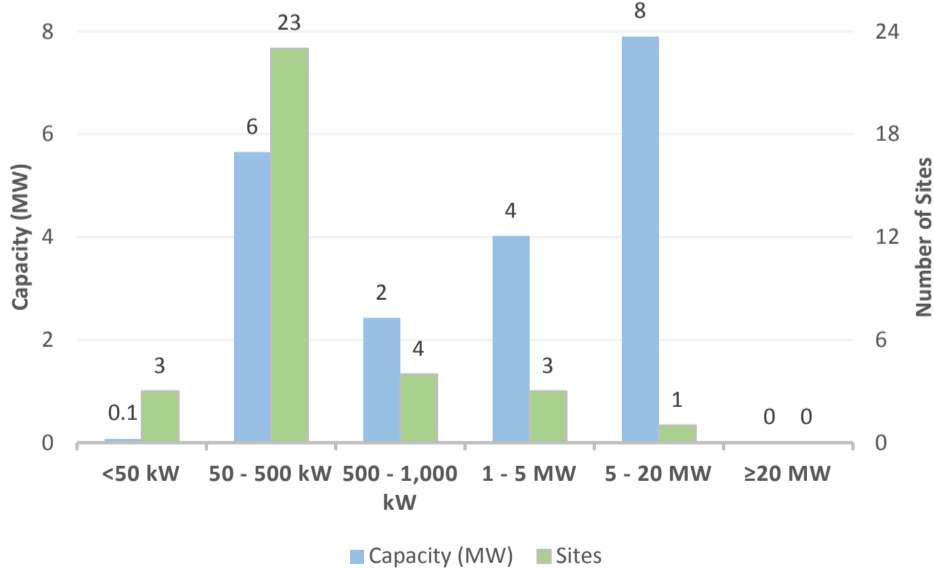
Source: DOE CHP Installation Database (U.S. installations as of Dec. 31, 2016)

Vermont CHP Capacity (MW) by Fuel Type



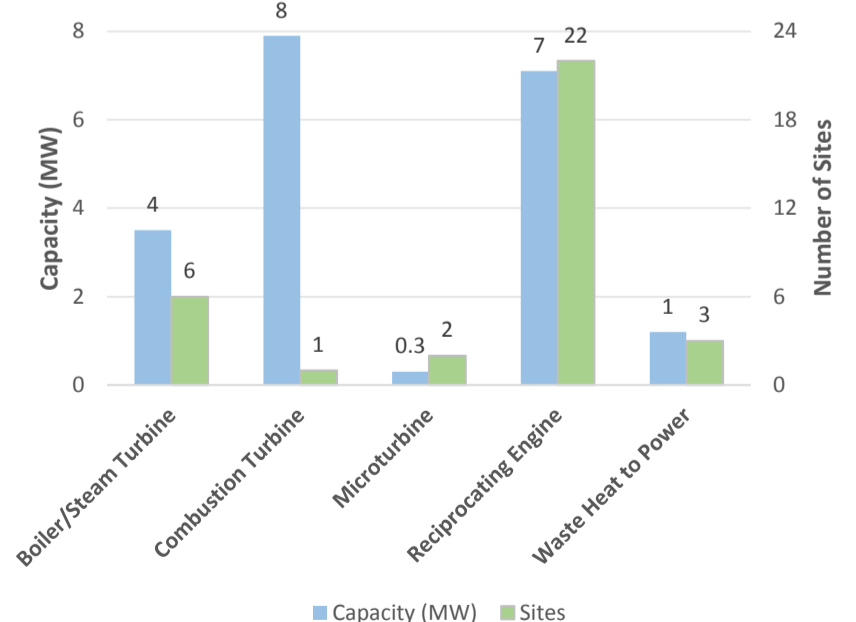
Source: DOE CHP Installation Database (U.S. installations as of Dec. 31, 2016)

Vermont CHP by Size Range



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

Vermont 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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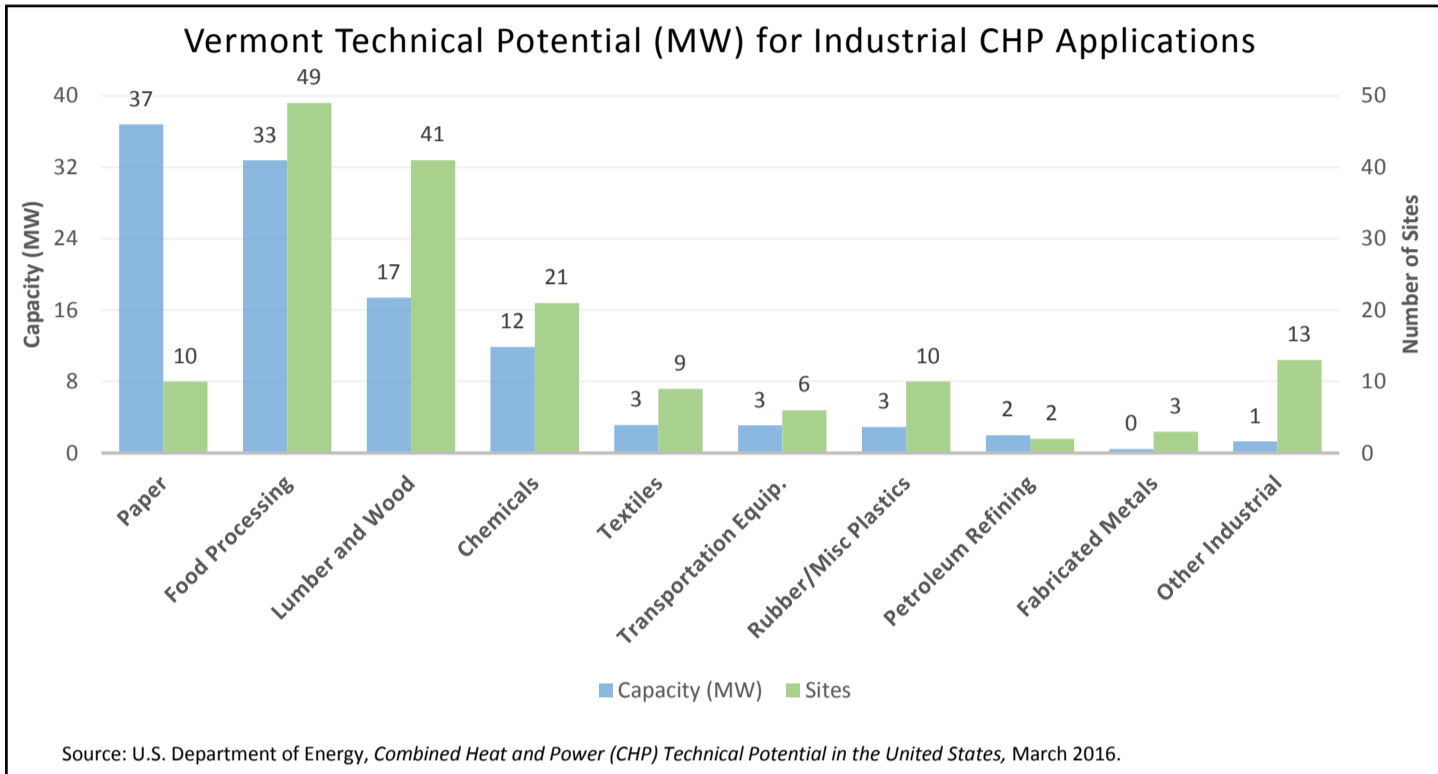
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Vermont Technical Potential for New CHP Installations

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

Sector	Potential Sites	Potential Capacity (MW)
Industrial	164	112
Commercial/Institutional	493	116
Total	657	228

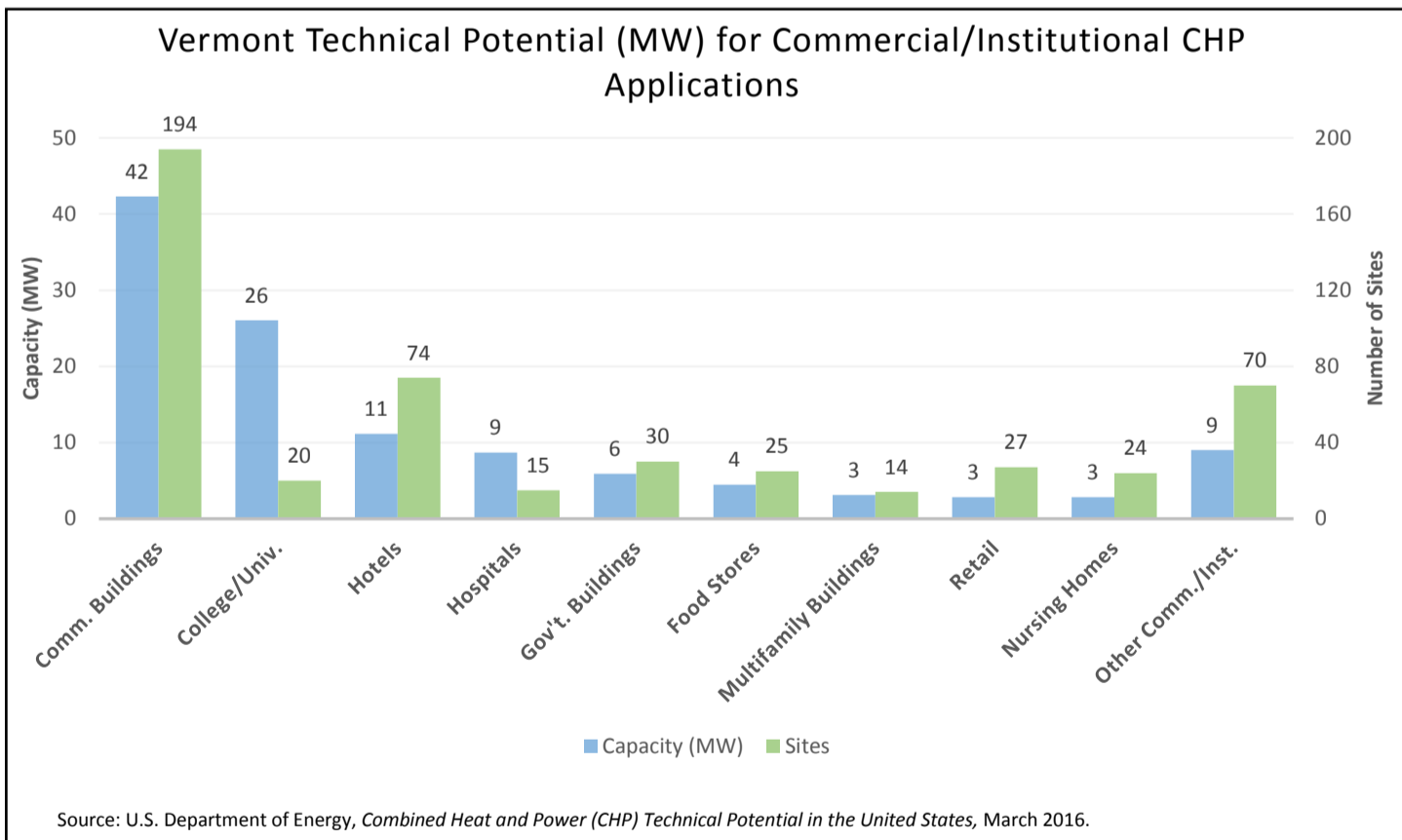


Source: U.S. Department of Energy, *Combined Heat and Power (CHP) Technical Potential in the United States*, March 2016.

Technical Potential by CHP Size Range for Top Five Industrial Sectors

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
Paper	5	1	0	0	4	11	0	0	1	24	10	37
Food Processing	34	6	7	6	7	14	1	7	0	0	49	33
Lumber and Wood	33	7	4	3	4	8	0	0	0	0	41	17
Chemicals	14	2	3	2	4	7	0	0	0	0	21	12
Textiles	7	1	1	1	1	1	0	0	0	0	9	3
Other Industrial	26	3	6	4	2	2	0	0	0	0	34	10
Total	119	21	21	15	22	43	1	7	1	24	164	112

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

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	114	6	57	23	23	14	0	0	0	0	194	42
College/Univ.	14	2	4	3	2	6	0	14	0	0	20	26
Hotels	70	9	4	3	0	0	0	0	0	0	74	11
Hospitals	9	2	3	2	2	5	1	0	0	0	15	9
Government Buildings	28	3	1	1	1	3	0	0	0	0	30	6
Other Comm./Inst.	154	18	6	3	1	1	0	0	0	0	160	22
Total	389	40	75	34	29	28	1	14	0	0	493	116

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

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Vermont 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.

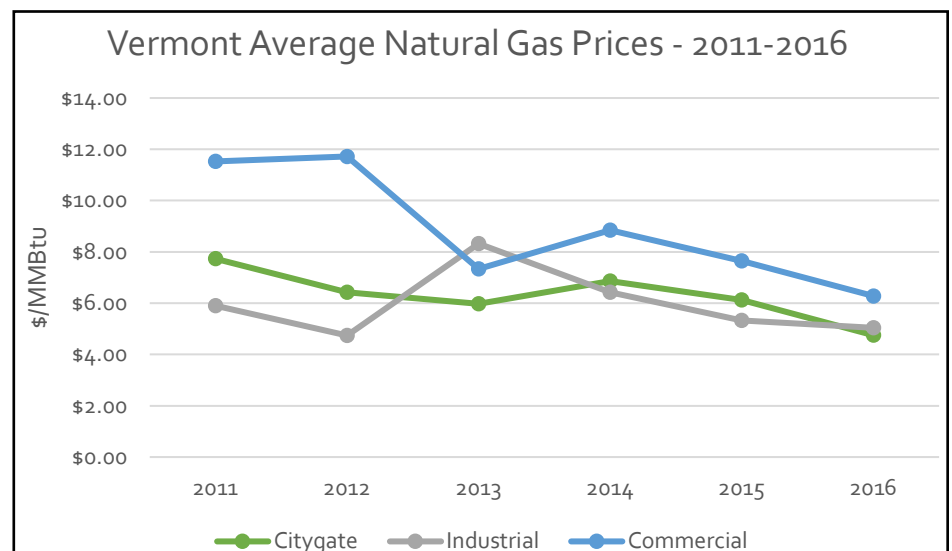
Vermont Natural Gas Prices

Vermont Average Gas Prices - 2016

Sector	VT Price (\$/MMBtu)	U.S. Price (\$/MMBtu)
Citygate*	4.75	3.75
Industrial	5.04	3.39
Commercial	6.28	7.22

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



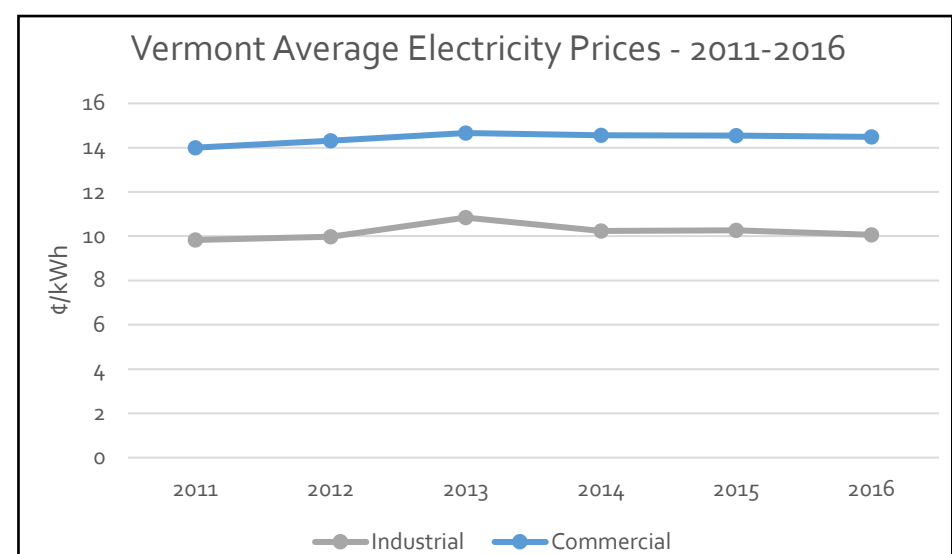
Vermont Electricity Prices

Vermont Average Electricity Prices - 2016

Sector	VT Price (¢/kWh)	U.S. Price (¢/kWh)
Industrial	10.06	6.75
Commercial	14.49	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.



Vermont Average Delivered Electricity Prices by Utility

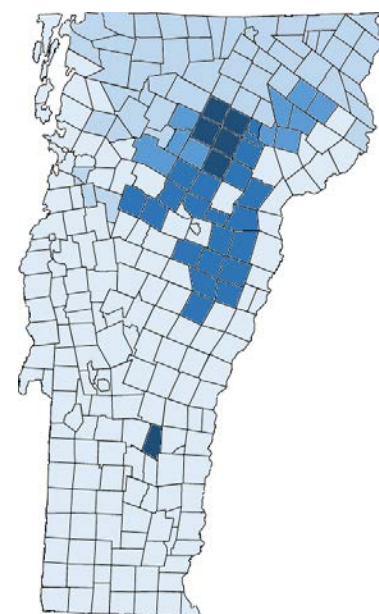
Utility	Industrial Price (¢/kWh)	Commercial Price (¢/kWh)	Average Price** (¢/kWh)
Town of Hardwick	17.35	18.43	17.89
Village of Ludlow	18.21	16.28	17.24
Washington Electric Coop	13.92	19.07	16.49
Village of Lyndonville	15.00	16.05	15.53
Town of Stowe	17.03	13.96	15.50
Village of Morrisville	14.22	16.35	15.28
Vermont Electric Coop	10.81	16.32	13.57
Village of Swanton	-	13.53	13.53
City of Burlington Electric	11.48	14.33	12.91
Green Mountain Power	9.81	14.33	12.07

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.

Vermont Electricity Prices – Heat Map



- Green Mountain Power / City of Burlington Electric
- Vermont Electric Coop / Village of Swanton
- Village of Lyndonville / Town of Stowe / Village of Morrisville
- Washington Electric Coop
- Town of Hardwick / Village of Ludlow

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CHP Technical
Potential

CHP Economics

CHP Partners

Department of Energy CHP Partnerships

Northeast CHP Technical Assistance Partnership



U.S. DEPARTMENT OF ENERGY
CHP Technical Assistance Partnerships

NORTHEAST

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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 Vermont.

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U.S. DEPARTMENT OF ENERGY
CHP Technical Assistance Partnerships