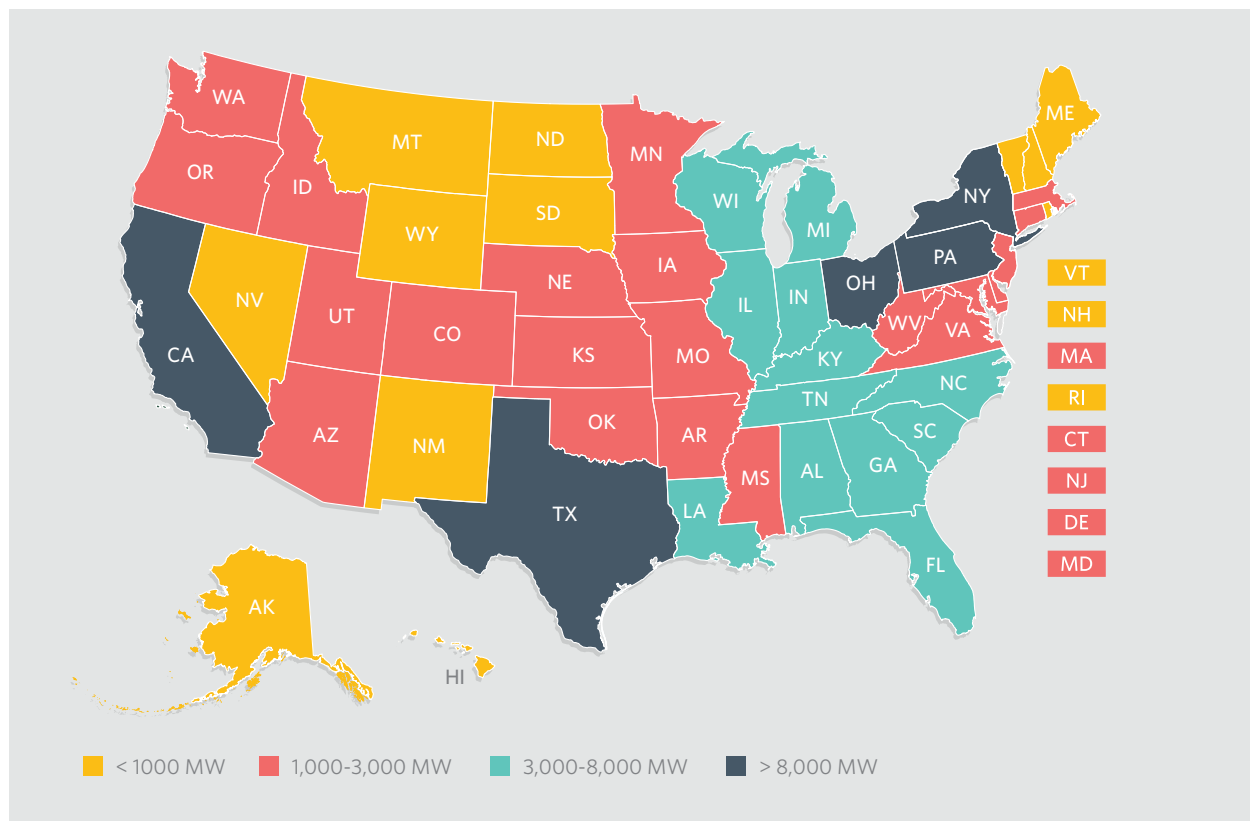


Industrial Energy Efficiency in Minnesota

Overview

Combined heat and power, or CHP, technologies provide reliable electricity, mechanical power, or thermal energy by capturing heat that is wasted during electricity generation. District energy takes heat from a CHP system to warm or cool entire complexes, such as a university campus, office park, or downtown area. More recently, a process called waste heat to power, or WHP, has been used to capture heat released during industrial processes that convert raw materials into products. These on-site technologies allow businesses to achieve energy efficiencies of up to 80 percent. Technologies such as CHP and WHP represent tremendous potential to reduce energy consumption in Minnesota’s industrial sector, saving manufacturers money and creating new energy businesses and jobs.

CHP Technical Potential



Source: U.S. Department of Energy

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State and regional statistics

Manufacturing makes up 14 percent of the state's total gross product and accounts for 92.4 percent of its exports. Of Minnesota's nonfarm workforce, 11.2 percent is employed in the manufacturing sector.

Source: National Association of Manufacturers

Minnesota's industrial energy use ranked 13th nationwide (at 641.6 trillion British thermal units in 2012) and is responsible for 35.1 percent of Minnesota's total energy consumption.

Source: U.S. Energy Information Administration State Energy Data System Rankings and U.S. Energy Information Administration Minnesota Profile

Minnesota ranked 11th in the nation in new CHP sites between 2005 and 2010. The state added nine new sites with a total generating capacity of 1.4 megawatts.

Source: American Council for an Energy-Efficient Economy

Of all regions of the United States, it is the Midwest that procures the least electricity from on-site CHP generation (6 percent).

Source: U.S. Energy Information Administration, Manufacturing Energy Consumption Survey, 2010

Cumulative Electricity Savings of State Energy Efficiency Resource Standard Policies

State	Cumulative 2020 target	State	Cumulative 2020 target
Vermont*	27.00%	Wisconsin*	13.50%
Maryland*	26.70%	Maine*	13.40%
New York*	26.50%	Connecticut*	13.14%
Massachusetts	26.10%	California*	12.94%
Rhode Island*	25.26%	Ohio	12.13%
Arizona	22.00%	Michigan	10.55%
Illinois	18.00%	Oregon*	10.40%
Hawaii*	18.00%	Pennsylvania*	9.98%
Washington	17.24%	New Mexico	8.06%
Minnesota	16.50%	Arkansas*	6.75%
Iowa*	16.10%	Texas	4.60%
Delaware	15.00%	Florida	4.06%
Colorado	14.93%	Nevada	3.76%
Indiana	13.81%	North Carolina	2.92%

*Savings beginning in 2009 extrapolated out to 2020 based on final year of annual savings required.

Source: American Council for an Energy-Efficient Economy

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State policies support industrial energy efficiency

In 2007 Minnesota established a strong energy efficiency resource standard, or EERS, known as the Next Generation Energy Act. It requires investor-owned utilities (both electric and gas) to reduce energy sales to 1.5 percent of average sales and to invest in energy efficiency measures. Waste heat recovery and CHP projects are eligible under the act.

Source: Database of State Incentives for Renewables and Efficiency

Minnesota's renewable development fund was established in 1999 and revised in 2006 to increase funding. Up to \$10.9 million annually must be set aside for renewable energy incentives through Jan. 1, 2021. Of this amount, \$9.4 million goes to support wind energy, and the remainder (up to \$1.5 million annually) may be used as incentives for other technologies, including CHP.

Source: Database of State Incentives for Renewables and Efficiency

CHP improves energy security

Reducing strain on the electrical grid with energy-efficient technologies increases power reliability during electrical outages caused by extreme weather and other causes.

Minnesota had 45 power outages during 2014, lasting nearly 32 hours and affecting 163,793 residents.

Source: Blackout Tracker

Examples of CHP and WHP Facilities in Minnesota

City	Facility	Application	Year operational	Capacity (kW)	Fuel type
Garvin	Northern Border Pipeline Compressor Station (CS-13)	Utilities	2010	5,500	Waste heat to power
Hancock	District 45 Dairy LLP	Agriculture	2010	1,000	Biomass
Morris	Riverview Farms (sites 1 and 2)	Agriculture	2010	1,000	Biomass
Shakopee	Koda Energy LLC	Food processing	2009	23,400	Biomass

Source: U.S. Department of Energy

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For further information, please visit:

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