Combined Heat and Power (CHP) Technical Potential in the United States

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U.S. DEPARTMENT OF ENERGY

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Executive Summary

Combined heat and power (CHP) is an efficient and clean approach to generating electric power and useful thermal energy from a single fuel source. Instead of purchasing electricity from the distribution grid and separately burning fuel in an on-site furnace or boiler to produce thermal energy, an industrial or commercial facility can use combined heat and power to provide both services in one, energy-efficient step. CHP is a clean energy solution that directly addresses a number of national priorities, including improving U.S. competitiveness by:

- reducing energy operating costs,
- increasing energy efficiency,
- reducing greenhouse gas emissions,
- enhancing our energy infrastructure,
- improving energy security and resiliency, and
- "growing" the U.S. economy.

There are several emerging market drivers contributing to current CHP growth, including lower energy operating costs, CHP-friendly environmental regulations, resiliency initiatives, federal and state policies and incentives, utility support, and project replicability. The drivers that are currently influencing the market growth of CHP are part of a larger recognition of the benefits that CHP provides both to the user and the nation as a whole. CHP can reduce strain on the electric grid and lower greenhouse gas (GHG) and other harmful emissions. CHP can lessen the need for new transmission and distribution infrastructure and uses abundant clean domestic energy sources such as natural gas and biomass.

CHP can be utilized in a variety of industrial facilities and commercial buildings with coincident power and thermal loads. Industrial manufacturing facilities that are a good fit for CHP include food processing, chemicals, refining and metal manufacturing. For commercial buildings, year-round coincident on-site loads suitable for CHP are present at hospitals, multifamily buildings, colleges and universities, waste water treatment plants[1] and military campuses. In addition to industrial and commercial facilities, CHP can also be integrated into district energy systems.

This study considers both traditional "topping cycle" CHP and "bottoming cycle" or waste heat to power CHP (WHP CHP). Topping cycle CHP systems are the most common CHP systems currently in use. In a topping cycle system, fuel is first combusted to generate electricitity. A portion of the heat left over from the electricity generation process is then converted into useful thermal energy (e.g. heating, hot water, or steam for industrial processes). A bottoming-cycle CHP system, which will be referred to as WHP CHP in this report, uses the reverse process. Fuel is first combusted to provide thermal input to industrial process equipment like a kiln or furnace, and the heat rejected from the process is then captured and used for power production.

[1] In this report, waste water treatment plants refer to facilities that treat water, wastewater and sewage/sanitary waste.

The study discusses the typical industrial facilities and commercial buildings that support "topping cycle" CHP, "bottoming cycle" or waste heat to power CHP (WHP CHP), and district energy CHP. The goal of the report is to provide data on the technical potential for CHP in sufficient detail for stakeholders to consider combined heat and power in strategic energy planning and energy efficiency program design. Data are provided nationally by CHP system size range, facility type, and location. Each state's technical potential is also delineated by these characteristics.

The technical potential is an estimation of market size constrained only by technological limits — the ability of CHP technologies to fit customer energy needs without regard to economic or market factors. Across all CHP categories, there is estimated to be more than 240GW of technical potential at over 291,000 sites within the U.S. **Table 1** represents the total CHP technical potential identified in the United States by application or business type, including on-site CHP at industrial and commercial facilities, export, waste heat to power applications or district energy systems that could integrate CHP.

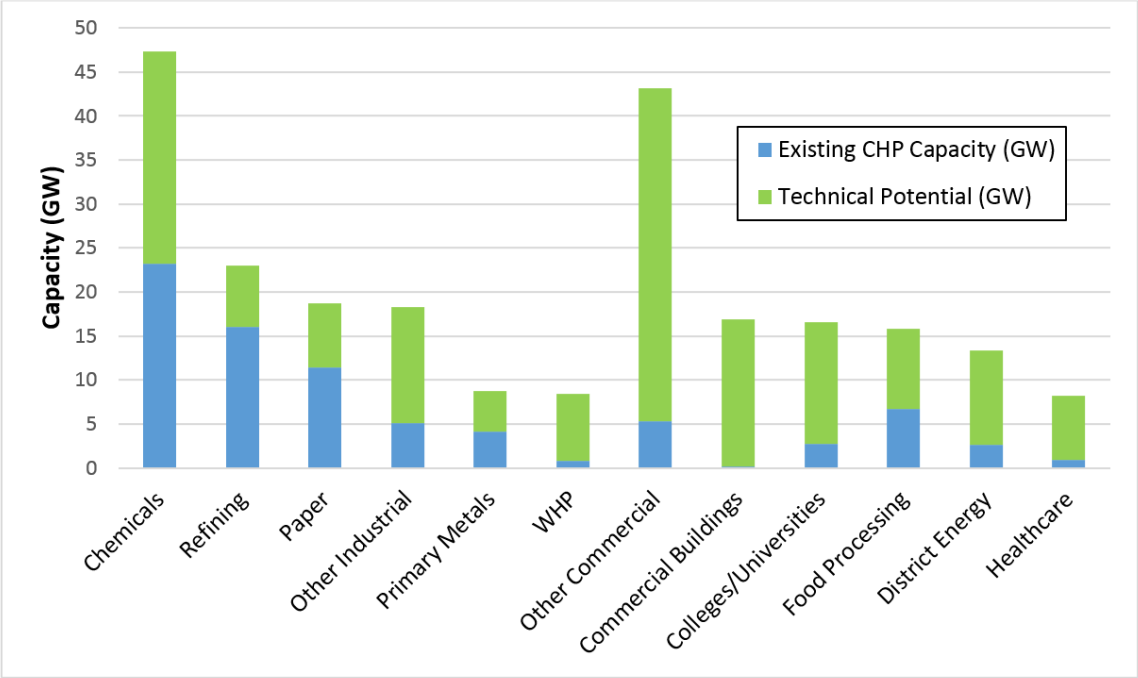
Table 1: Total U.S. CHP Technical Potential Across All Facility Types

Business Type	50-500kW		0.5 - 1 MW		1-5 MW		5-20 MW		>20 MW		Total Sites	Total Capacity (MW)
	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)		
On-site Industrial CHP	34,502	6,281	6,069	4,341	7,424	15,567	1,901	17,036	479	22,157	50,375	65,381
On-site Commercial CHP	185,625	20,068	37,939	18,100	15,535	20,284	1,084	9,452	174	8,026	240,358	75,930
On-site WHP CHP	332	73	132	95	341	868	204	2,003	96	4,585	1,105	7,624
Export Industrial CHP	na	0	na	7	na	3,929	na	11,535	na	65,578	na	81,048
Export District Energy CHP	0	0	0	0	5	18	8	75	51	10,567	64	10,660
Total	**220,459**	**26,422**	**44,140**	**22,543**	**23,305**	**40,666**	**3,197**	**40,101**	**800**	**110,913**	**291,902**	**240,644**

U.S. DOE CHP Deployment Program, 2016.

In contrast to the existing facilities with installed CHP, which are heavily concentrated at large industrial manufacturing facilities, a significant portion of the remaining technical potential for on-site CHP in the U.S. is located in commercial facilities. **Figure 1** shows both existing CHP and estimated technical potential capacity for on-site CHP in the most predominant sectors.

Figure 1: Existing CHP Compared to On-Site Technical Potential by Sector[2]



U.S. DOE CHP Deployment Program, 2016.

The technical potential for CHP is concentrated in states with large population centers (leading to a large amount of commercial facilities) and/or a strong industrial presence. **Table 2** displays the total CHP technical potential in the U.S. on a state-by-state basis. On-site CHP potential includes industrial, commercial, and waste heat to power at the host facility. Export potential includes all electricity in excess of what can be used by the host facility and that could be sold to the electric grid, including district energy with CHP potential.

[2] More detailed information for all industrial and commercial sectors is presented in Section III.

Table 2: Total U.S. CHP Technical Potential Across All States

State	Total On-site Potential (MW)	Total Export Potential (MW)	Total CHP Technical Potential	State	Total On-site Potential (MW)	Total Export Potential (MW)	Total CHP Technical Potential
Alabama	2,777	1,001	3,777	Montana	377	441	818
Alaska	408	242	650	Nebraska	984	520	1,504
Arizona	2,320	533	2,853	Nevada	1,254	360	1,614
Arkansas	1,795	892	2,686	New Hampshire	447	136	584
California	11,542	7,280	18,822	New Jersey	3,761	1,674	5,435
Colorado	1,665	433	2,098	New Mexico	1,140	457	1,597
Connecticut	1,214	455	1,670	New York	6,908	5,559	12,466
Delaware	747	786	1,533	North Carolina	4,352	1,164	5,516
District of Columbia	762	146	908	North Dakota	445	417	862
Florida	6,917	1,484	8,401	Ohio	7,005	4,082	11,087
Georgia	5,110	2,355	7,464	Oklahoma	1,805	1,387	3,192
Hawaii	563	237	799	Oregon	1,337	816	2,153
Idaho	659	304	962	Pennsylvania	7,025	3,872	10,896
Illinois	7,161	5,664	12,825	Rhode Island	616	180	796
Indiana	4,145	2,084	6,229	South Carolina	3,063	1,536	4,599
Iowa	1,993	1,675	3,668	South Dakota	378	222	600
Kansas	1,909	1,007	2,916	Tennessee	3,981	3,005	6,986
Kentucky	2,721	1,796	4,517	Texas	13,675	12,151	25,826
Louisiana	4,903	7,074	11,977	Utah	1,119	416	1,535
Maine	494	250	743	Vermont	228	153	381
Maryland	2,282	809	3,091	Virginia	4,308	1,633	5,941
Massachusetts	3,028	1,040	4,068	Washington	2,387	1,971	4,357
Michigan	4,291	2,021	6,312	West Virginia	929	449	1,378
Minnesota	3,260	3,671	6,931	Wisconsin	3,187	2,622	5,809
Mississippi	1,833	1,512	3,345	Wyoming	847	254	1,101
Missouri	2,882	1,482	4,364	Total	148,936	91,709	240,644

U.S. DOE CHP Deployment Program, 2016.

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I. Introduction

Combined heat and power (CHP) is an efficient and clean approach to generating electric power and useful thermal energy from a single fuel source. Instead of purchasing electricity from the distribution grid and separately burning fuel in an on-site furnace or boiler to produce thermal energy, an industrial or commercial facility can use combined heat and power to provide both services in one energy-efficient step. The average efficiency of power generation in the United States has only improved by three percentage points since the 1960s, from 33% to 36% today.[3] CHP systems capture this waste energy and use it to meet thermal needs, such as providing process heat, heating and/or cooling to factories and businesses, saving money and reducing emissions. CHP is a commercially-available, clean energy solution that directly addresses a number of national priorities including improving the competitiveness of U.S. manufacturing through reduced costs, increasing energy efficiency, reducing emissions, enhancing our energy infrastructure, improving energy security and resiliency, and growing our economy.

While CHP has been in use in the United States for more than 100 years, it remains an underutilized resource today. CHP currently represents approximately 8% of U.S. generating capacity[4], compared to over 30% in countries such as Denmark, Finland and the Netherlands. Its use in the U.S. has been limited, particularly in recent years, by a host of market and non-market barriers. Nevertheless, the outlook for increased CHP use is bright as policymakers at the federal and state level are recognizing the potential benefits and the role that this technology could play in providing clean, reliable, cost-effective energy services to industry and businesses.

There are several emerging market drivers contributing to current combined heat and power growth, including:

- *Lower Operating Costs*: Compared to conventional power generation techniques, CHP systems can save money through increased energy efficiency. Higher operating efficiencies enable CHP systems to consume up to 40% less fuel while generating the same amount of power and useful thermal energy as separate heat and power systems. With stable and low-cost natural gas supply forecasts stemming from the development of shale gas production, the economics of CHP have been improving.[5]
- *Environmental Regulations*: Recent environmental regulations have created opportunities for combined heat and power to help meet compliance goals.
    - *EPA Clean Power Plan:*[6] The Clean Power Plan (CPP) establishes state-specific targets for reducing carbon emissions from existing power plants. The plan allows

[3] U.S. Energy Information Administration, Form EIA-923, Form EIA-906, Form EIA-920, and Form EIA-860.
[4] U.S. Energy Information Administration, Form EIA-860, 'Annual Electric Generator Report.' Shows a net winter electric generating capacity of 1,100,772 MW.
[5] Backer, Scott, "CHP Gains Traction as an Economic Energy Solution," *Cogeneration and On-site Power Production* (Jan 2012), accessed December 2014. http://www.cospp.com/articles/print/volume-13/issue-4/features/chp-gains-traction-as-an-economic-energy-solution.html
[6] For more information on the Clean Power Plan, please see the EPA's CPP website at http://www.epa.gov/cleanpowerplan/clean-power-plan-existing-power-plants

states to use CHP under the broader aegis of energy efficiency measures as a means to comply.

- *Boiler MACT*:[7] The national emissions standard for hazardous air pollutants (known as the Boiler MACT rule) requires affected industrial and commercial boilers to meet new emissions limits. Converting existing boilers to natural gas CHP can help facilities to achieve compliance.

- *Resiliency*: In the event of a man-made or natural disaster that causes a grid outage, CHP systems can be configured to be more resilient and reliable than traditional backup generators. During recent storm events such as Hurricane Sandy, CHP systems enabled a number of critical infrastructure facilities to continue their operations when the electric grid went down. The U.S. Department of Energy and Environmental Protection Agency have provided guidance on how CHP can enhance the resiliency of critical facilities, and the best way to size such systems.[8] The U.S. DOE is launching a new CHP for Resiliency Accelerator early in 2016 to collaborate with states, cities, and utilities to incorporate CHP in resiliency planning efforts.

- *Policy Support*: A number of federal and state policies and financial incentives have encouraged the market for combined heat and power. At the federal level, currently there is a 10% investment tax credit for CHP. In August of 2012, the White House released an executive order[9] creating a goal of adding 40 GW of new CHP capacity. At the state level, several state climate and energy plans include CHP as a way to meet clean energy goals.[10]

- *Utility Interest*: Due to increasing customer awareness of distributed generation generally, utility interest in combined heat and power, a form of distributed generation, has increased. Many utilities are proactively engaging with new stakeholders and finding ways to incorporate CHP into energy efficiency programs and plans for new generation. For example, the Baltimore Gas and Electric (BG&E) Smart Energy Savers Program

Utility Incentives

The Baltimore Gas and Electric (BG&E) Smart Energy Savers Program provides incentives up to $2.5 million to industrial and commercial customers who install an on-site CHP system. The program includes both capital and production incentives based on the progress of the project. Capacity incentives are available for system design and installation and the production incentive is available for the first 18 months of service.

[7] For more information on the Boiler MACT regulation, please see the EPA's Boiler MACT website at http://www3.epa.gov/airquality/combustion/actions.html.
[8] http://www1.eere.energy.gov/manufacturing/distributedenergy/pdfs/chp_for_reliability_guidance.pdf
[9] https://www.whitehouse.gov/the-press-office/2012/08/30/executive-order-accelerating-investment-industrial-energy-efficiency
[10] For more information on state-level energy policies and initiatives, please see the Database of State Incentives for Renewables and Efficiency at www.dsireusa.org.

provides incentives up to $2.5 million to industrial and commercial customers who install on an on-site CHP system. The program includes both capital and production incentives based on the progress of the project. Capacity incentives are available for system design and installation and the production incentive is available for the first 18 months of service.[11] Southern California Gas and Jacksonville Energy Authority are also both working towards owning and operating CHP systems at customer sites.

- *Project Replicability*: Advancements in the packaging of CHP equipment have led to the emergence of a growing number of packaged CHP system options that are available at a variety of system sizes. These systems allow for streamlined installation and maintenance and are increasingly being used by national organizations with multiple facilities as a way to install standardized CHP systems at their facilities. The U.S. DOE anticipates launching a Packaged CHP System Challenge in the summer of 2016, aimed at capitalizing on the replicability, risk reduction, and installation process simplification that is associated with these systems.

CHP can:

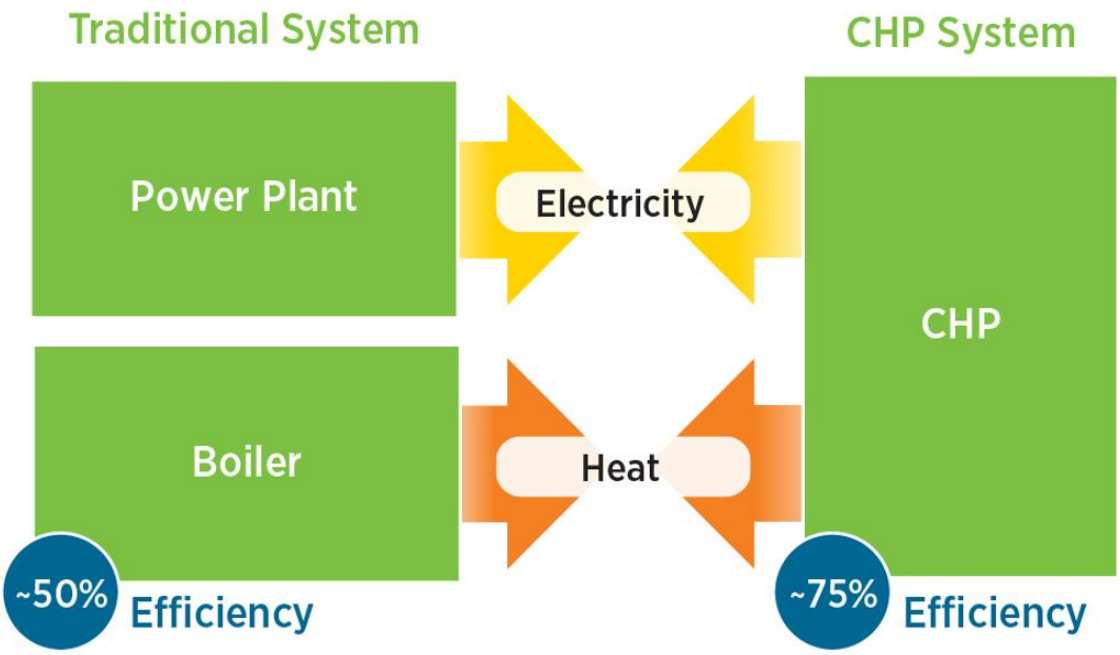
- Increase energy efficiency
- Reduce air pollutant emissions
- Reduce site energy costs
- Enhance site energy reliability
- Delay need for new T&D infrastructure
- Use clean domestic energy sources (natural gas, biomass, and biogas)

The current drivers influencing the market growth of CHP are part of a larger recognition of the benefits that CHP provides both to the user and the nation. These benefits to the individual owner translate to the national level as well. Combined heat and power reduces strain on the electric grid and reduces greenhouse gas (GHG) and other harmful emissions. CHP also lessens the need for new transmission and distribution infrastructure as on-site generation does not need to be transported from a central generation plant. Typically CHP uses abundant clean, domestic energy sources such as natural gas and biomass. These benefits improve U.S. manufacturing competitiveness and make use of highly skilled American labor and American technology.[12]

Figure I-1 illustrates the efficiency benefits that a typical CHP system achieves by offsetting the need for grid electricity and for steam or hot water that would otherwise be produced from an on-site boiler. When electricity and thermal energy are provided separately, overall energy efficiency ranges from 45 – 55%. While efficiencies vary for CHP installations based on site-specific parameters, a properly designed CHP system will typically operate with an overall efficiency of 65 – 85%.

[11] Baltimore Gas & Electric, http://www.bgesmartenergy.com/business/chp
[12] *Combined Heat and Power: A Clean Energy Solution*. US DOE. Aug. 2012. http://energy.gov/sites/prod/files/2013/11/f4/chp_clean_energy_solution.pdf

Figure I-1: Energy Efficiency Advantage of CHP Compared to Traditional Energy Supply



U.S. DOE CHP Deployment Program, 2016.

Though there are many environmental and economic benefits to combined heat and power, there are also barriers to CHP deployment as well. These barriers include:

- *Unclear Utility Value Proposition:* Many investor-owned electric utilities still view customer-sited CHP as a source of revenue erosion due to traditional business models and regulations linking cost recovery and utility revenue to electricity sales. Most facilities that install CHP remain connected to the grid and need to rely on their servicing utility for supplemental power needs beyond their self-generation capacity, as well as for standby and back-up service during outages or planned maintenance. As a result, the policies and actions of utilities can make or break a CHP project's economics. Utility tariff structures and standby rates impact the economics of on-site generation. However, there are several options that utilities can provide to help minimize the costs that customer-generators impose on the electric system. These include allowing the customer to provide their utility with a load reduction plan, offering a self-supply option for reserves, offering daily or monthly as-used demand charges, scheduling maintenance at off-peak times, and allowing customer-generators to buy all of their backup power at market price.[13]

[13] State and Local Energy Efficiency Action Network, *Guide to the Successful Implementation of State Combined Heat and Power Policies*, pp 8-9, 2013. https://www4.eere.energy.gov/seeaction/system/files/documents/see_action_chp_policies_guide.pdf

- *Market and Non-Market Uncertainties:* CHP requires a significant capital investment and the equipment has a long life – potentially over 20 years. It can be challenging to make investment decisions in a rapidly changing policy and economic environment. Uncertainties affecting project economics include: fuel and electricity prices, regional/national economic conditions, market sector growth, utility and power market regulation, and environmental policy.

- *End-User Awareness and Economic Decision-Making:* CHP is not regarded as part of most end-users' core business focus and, as such, is sometimes subject to higher investment hurdle rates than competing internal options. In addition, many potential project hosts are not fully aware of the full array of benefits, or are overly sensitive to perceived CHP investment risks.

- *Local Permitting and Siting Issues:* CHP installations must comply with a host of local zoning, environmental, health and safety requirements at the site. These include rules on air and water quality, fire prevention, fuel storage, hazardous waste disposal, worker safety and building construction standards. Navigating these rules requires interaction with various local agencies including fire districts, air districts, and water districts and planning commissions, many of which may have no previous experience with a CHP project and are unfamiliar with the technologies and systems.

To help mitigate the impacts of these barriers, the U.S. DOE has established seven regional CHP Technical Assistance Partnerships (CHP TAPs) to help promote and assist in transforming the market for CHP, waste heat to power CHP, district energy, and microgrids with CHP. Key services provided by the CHP TAPs are market opportunity analysis, education and outreach, and technical assistance.[14]

Current CHP in the United States

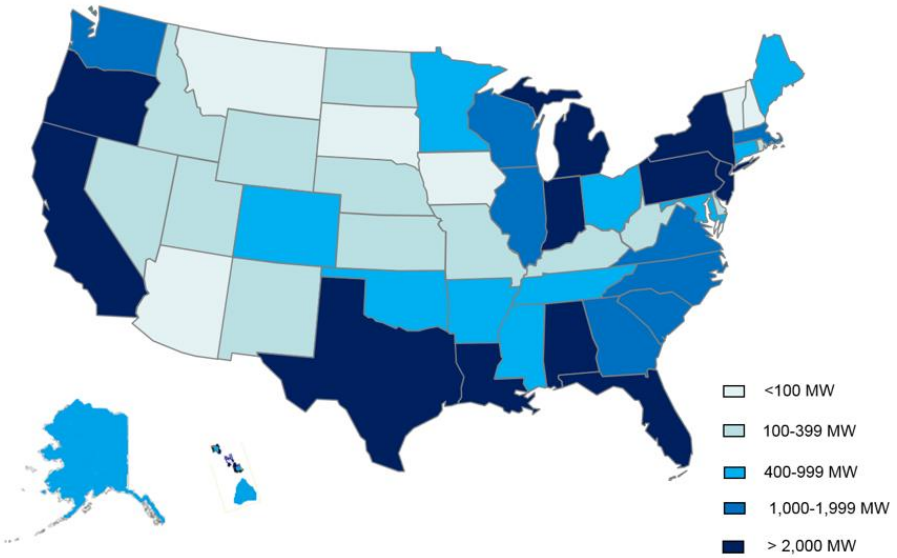
CHP is an important electric generating resource in the United States. Currently, over 82.7GW of CHP capacity exists at over 4,400 industrial and commercial facilities across the country.[15] This represents 8% of U.S. electricity generation capacity, however it represents over 12% of annual U.S. power generation, reflecting the longer operating hours of CHP systems as compared to conventional forms of generation.

CHP systems are installed in every state, however there are significant regional differences in the distribution of CHP sites and capacity. Some states have adoped policies that encourage CHP growth, most notably California, New York and Connecticut, which offer financial and other incentives to CHP projects. Other regional variations come from electricity price variations, energy market structures, and industrial development. For example, chemicals and refining facilities are common in the Gulf Coast states and paper production in the Southeast. States with higher overall energy demand, more energy-intensive industry, and dense population centres with concentrated electricity and thermal energy demand naturally have the highest amounts of CHP capacity.

[14] For more information, please visit the DOE CHP TAPs website at www.energy.gov/chp-contacts.
[15] DOE CHP Installation Database (U.S. installations as of December 31, 2014). www.energy.gov/chp-installs

Figure I-2 displays the distribution of existing CHP capacity by state.

Figure I-2: Existing CHP Capacity by State



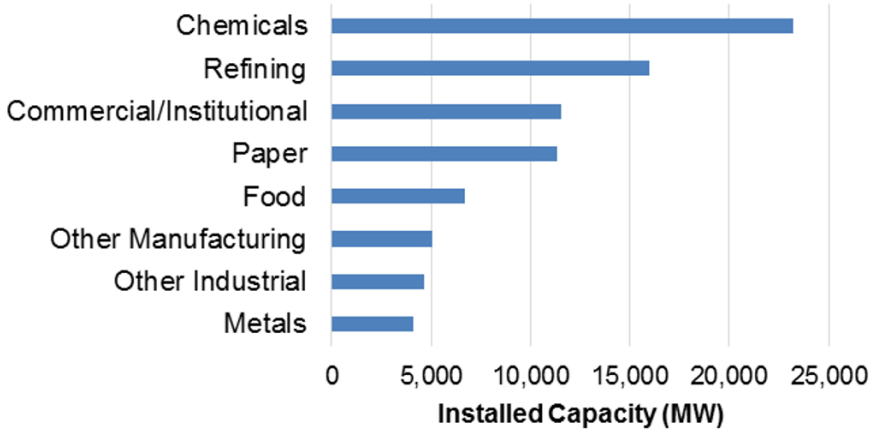
Source: DOE CHP Installation Database (U.S. installations as of December 31, 2014)

CHP can be utilized in a variety of industrial facilities and commercial buildings with coincident power and thermal loads. **Figure I-3** presents a breakdown of CHP capacity by major market sector. The majority of existing CHP capacity in the United States is in the industrial sector and is concentrated in five major facility types: chemicals, refining, paper, food and metals manufacturing.

Commercial and institutional buildings make up the remainder of existing capacity. Commercial CHP systems are typically located in larger facilities such as waste water treatment plants, hospitals, colleges and universities, and military campuses, but they can also produce power and heat for multi-family buildings, hotels, offices, retail stores, recreational facilities, K-12 schools, and nursing homes. CHP installations in commercial facilities make up 58% of CHP sites in the U.S. but account for only 14% of capacity[16]. This is due to the relatively small size of these facilities, which are typically much smaller than industrial facilities. Commercial building types in the services sector are seen as potential growth markets for CHP in the U.S. The U.S. Department of Energy and CHP equipment manufacturers have both invested in technology improvements for small plants, focusing on increasing efficiency, incorporating new thermally activated technologies to provide both heating and cooling services, and integrating components and controls into cost effective packages.[17]

[16] Ibid.
[17] *Combined Heat and Power: A Clean Energy Solution*. US DOE. Aug. 2012. http://energy.gov/sites/prod/files/2013/11/f4/chp_clean_energy_solution.pdf

Figure I-3: Existing CHP Capacity in the United States by Facility Type[18]



Source: DOE CHP Installation Database (U.S. installations as of December 31, 2014)

Figure I-4 shows existing commercial CHP by number of sites. Site installations are relatively evenly distributed between the major commercial business types for CHP, including healthcare, waste water and solid waste facilities, multifamily buildings, and colleges/universities. However, the amount of capacity installed in commercial business types varies widely, as shown in **Figure I-5**. Colleges and universities, district energy facilities, and municipal utilities often install larger systems compared to other commercial business types, and they represent a significant portion of existing commercial CHP capacity. Commercial facilities such as office and multifamily buildings, schools, and hotels have many existing site installations, however these systems are typically smaller around a few hundred kilowatts in size.

[18] The Other Manufacturing category includes textiles, lumber and wood, transportation equipment, rubber and plastics, stone/clay/glass, machinery, instruments, electronics, and miscellaneous manufacturing.

Figure I-4: Existing Commercial CHP Sites by Business Type (2,567 sites)

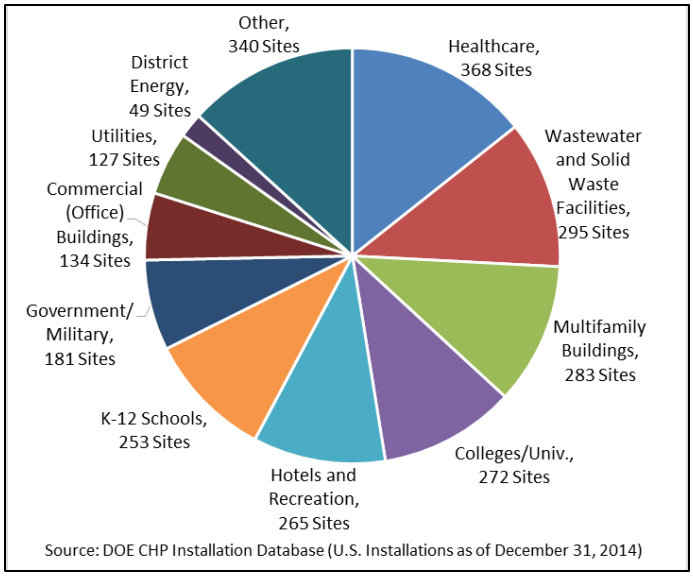
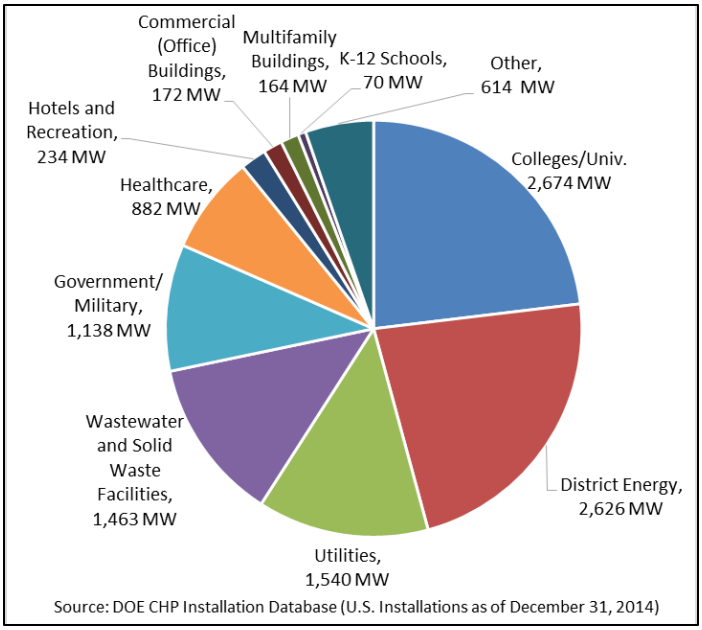


Figure I-5: Existing Commercial CHP Capacity by Business Type (11,577 MW)



This CHP technical potential report will discuss the typical industrial facilities and commercial buildings that support both traditional "topping cycle" CHP and "bottoming cycle" or waste heat to power CHP (WHP CHP) and district energy CHP. The goal of the report is to provide data on the technical potential for CHP in sufficient detail for stakeholders to consider combined heat and power in strategic energy planning and energy efficiency program design. Data are provided nationally by CHP system size range, facility type, and location. Each state's technical potential is also delineated by these characteristics. The report is organized as follows:

- **Facilities Where CHP is a Potential Opportunity** –This section describes the industrial and commercial sectors that are best suited for utilizing CHP. Profiles of successful CHP installations are included for each CHP type that is evaluated.
- **Technical Potential – National Results** – This section provides overall national level results on the amount of CHP technical potential that exists for each CHP type, including on-site industrial, on-site commercial, on-site WHP CHP, industrial export, and district energy export.
- **Technical Potential – State Results** – The state results section provides detailed information on the technical potential in each state, with summary statistics, charts, and tables providing insight into each state's specific market opportunities.
- **Conclusions** – This section brings together the results of the technical potential analysis and compares them to the amount of existing CHP installed in the U.S. to place the potential estimates into context.
- **Appendicies** – Appendix A includes the methodology for calculating the CHP technical potential. Appendix B includes power to heat ratios by facility type. Technical potential results by 4-digit NAICs codes are provided in Appendix C for select industries. Appendix D provides more detailed state-specific breakdowns of CHP technical potential.

II. Facilities Where CHP is a Potential Opportunity

Combined heat and power can be utilized in a variety of industrial facilities and and commercial buildings with coincident power and thermal loads. This study considers both traditional "topping cycle" CHP and "bottoming cycle" or waste heat to power CHP (WHP CHP). Topping cycle CHP systems are the most common CHP systems currently in use. In a topping cycle system, fuel is first combusted to generate electricitity. A portion of the heat left over from the electricity generation process is then used to provide useful thermal energy (e.g. heating/cooling, hot water, or steam for industrial processes). A bottoming-cycle CHP system, which will be referred to as WHP CHP in this report, uses the reverse process. Fuel is first combusted to provide thermal input to industrial process equipment like a kiln or furnace, and the heat rejected from the process is then captured and used for power production.

Industrial Facilities

Facilities in the industrial sector currently represent about 86% of existing CHP capacity in the United States. There are over 1,200 existing industrial CHP facilities totaling about 66GW of capacity.[19] Industrial sites often require large CHP systems (>20MW in nameplate capacity) because of their high thermal and electric loads. The installation of large CHP projects greater than 20MW has declined in recent years. However, as natural gas prices have decreased and in many regions and electricity rates have increased, CHP is being reconsidered by facility owners. Interest in biomass and other alternative fuels is also increasing in areas where natural gas is either too costly or not available. **Table II-1** provides a list of the types of industrial facilities considered in this report.

Table II-1: Types of Industrial CHP Facilities

SIC	NAICS	Industrial Facility Type
20	311	Food & Beverage
22	313	Textiles
24	321	Lumber and Wood
25	337	Furniture
26	322	Paper
27	323	Printing/Publishing
28	325	Chemicals
29	324	Petroleum Refining
30	326	Rubber/Miscellaneous Plastics
32	327	Stone/Clay/Glass
33	331	Primary Metals
34	332	Fabricated Metals
35	333	Machinery/Computer Equip.
37	336	Transportation Equip.
38	334	Instruments
39	339	Miscellaneous Manufacturing
49	486	Gas Processing

[19] DOE CHP Installation Database (U.S. Installations as of December 31, 2014.) www.energy.gov/chp-installs

Top Types of Industrial Facilities Conducive to CHP Opportunities

Examples of industrial facilities that are a good fit for CHP due to their high coincident power and thermal loads include food processing, chemicals, refining and metal manufacturing.

Successful CHP Installations

Food Processing: At the Frito-Lay manufacturing plant in Killingly, CT, a 4.6MW CHP system provides over 90% of the plant's electrical demand and 80% of the plant's steam load. The plant can operate in island mode and saves the facility about $1 million/year in energy costs.[20]

Metals: Kennecott Utah Copper's plant outside of Salt Lake City has a CHP system that produces more than half of the facility's power needs, as well as captured heat that is turned into process steam for the facility's chemical baths, which turn copper anodes into cathodes.[21]

- *Food Processing*: Food processing plants have a diverse range of power and thermal needs. CHP systems at these facilities range from large systems at grain or meat processing centers to smaller systems at local breweries or bakeries. The majority of systems are natural gas-fired and use boiler/steam turbines or reciprocating engines as prime movers.
- *Chemicals:* The chemical manufacturing sector is the second largest consumer of energy in the industrial market. Waste heat captured from power production can be used in an array of chemical manufacturing processes. CHP systems at chemical facilities are typically large (the average size is 80MW). The majority are natural gas-fired and use boiler/steam turbines, or combined cycles as prime movers.
- *Refining:* The refining industry is the largest energy consuming industrial group in the United States. Petroleum refineries have large on-site power and thermal demands for process heat and steam tracing (to keep pipes warm). Most CHP systems at refining facilities are large (the average size is 153MW). Most of these systems are natural gas-fired and use combined cycles or combustion turbines as prime movers.
- *Metals Manufacturing:* Metal manufacturing facilities can have large power and steam demands for equipment like electric arc furnaces and processes such as heating dip tanks and chemical baths. The average size of a CHP system at a metals facility is 65MW. The majority of systems are fueled by natural gas or waste products, and use boiler/steam turbines as prime movers.
- *Paper:* Paper processing facilities can have large power demands, as well as large and consistent thermal demands for steam, which is typically used for cooking pulp and drying paper. Paper plants also tend to produce byproducts like black liquor that can be used as a fuel for a CHP system. The average CHP system at a paper manufacturing facility is

[20] Frito-Lay Project Profile, http://www.energy.gov/sites/prod/files/2015/08/f26/PepsiCo%20Frito-Lay%20CHP%20Case%20Study_07.02.15.pdf
[21] Kennecott Utah Project Profile, http://www.southwestchptap.org/data/sites/1/documents/profiles/Kennecott_Utah_Copper_Refinery-Project_Profile.pdf

50MW. Most systems are fueled by waste products, coal, or natural gas, and the majority use boiler/steam turbines as the prime mover.

CHP Sizing for Industrial CHP

The measure of average industrial CHP size is skewed upward by very large installations at the upper end of the range: hence, the average system size of currently installed industrial CHP in the U.S. is approximately 53MW, while the median size is much lower at 7MW.[22] The optimal way to size a CHP system for a facility is by matching the thermal output of the system to the baseload thermal demand of the facility. Some industrial facilities have thermal loads that exceed their electric demands, and can thereby export excess power to the grid. Additional information about CHP sizing is provided in Appendix A: Technical Potential Estimation Methodology.

Technologies and Fuel Types for Industrial CHP

Boiler/steam turbines and reciprocating engines are the most frequent prime mover choices for industrial CHP customers, making up 43% and 21% of installations respectively. Combined cycles[23] make up only 12% of industrial CHP installations; however, they make up the majority of industrial CHP capacity at 58%. Boiler/steam turbine systems, which represent 32% of total CHP capacity, are typically fuelled by solid fuels such as coal and wood waste, whereas combustion turbines and reciprocating engines are typically fueled by natural gas. **Figure II-1** presents the distribution of prime mover technologies by capacity in the industrial sector.

Figure II-2 shows the distribution of CHP capacity by fuel type used in the industrial sector. Natural gas makes up the majority of both industrial installations and capacity (over 670 installations and 46GW of capacity use natural gas). Given the widespread availability of natural gas, lower per-unit costs, and the frequency that gas combustion turbines and combined cycles are used in industrial CHP systems, it is not surprising that natural gas fuels the majority of industrial capacity and installations. Additionally, air quality and emissions compliance regulations tend to favour natural gas over other fossil fuels, especially in dense urban locations. However, interest in biomass and alternative fuels is increasing in facilities or locations where natural gas is less readily available or more costly. Biomass and biofuels, which make up about 2% of installed capacity, are most frequently used in industries such as food and paper processing, where viable and reliable on-site biogas and biomass resources can be used to produce power.

[22] DOE CHP Installation Database (U.S. installations as of December 31, 2014) www.energy.gov/chp-installs
[23] Combined cycle systems are a combination of a combustion turbine and a steam turbine. When used for CHP, steam is typically extracted from the steam turbine at the temperature and pressure required by a process.

Figure II-1: Existing Industrial CHP Capacity by Prime Mover[24] (66,465 MW)

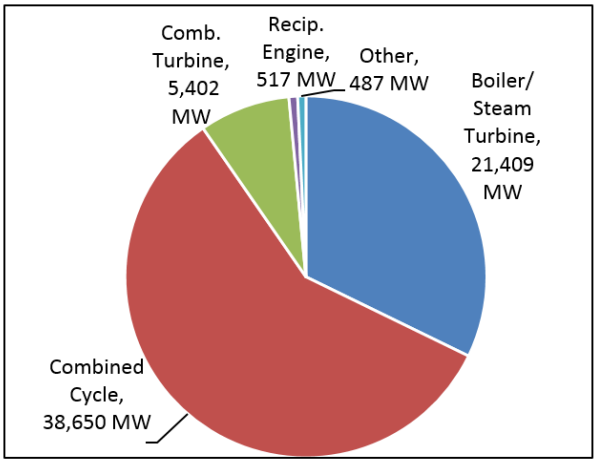
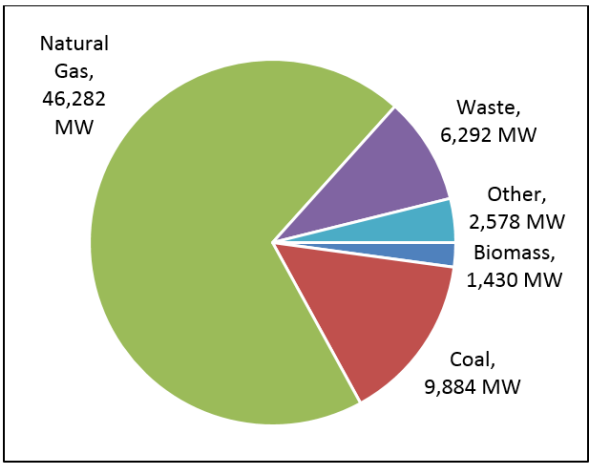


Figure II-2: Existing Industrial CHP Capacity by Fuel Class[25] (66,465 MW)



Source: DOE CHP Installation Database (U.S. Installations as of December 31, 2014)

Commercial, Insitutional, and Multifamily Buildings

There are currently over 2,500 existing commercial, institutional, and multifamily (herein referred to collectively as commercial) CHP installations in the U.S., totaling over 11.5GW of capacity.[26] These installations are typically smaller than those at industrial sites; commercial buildings represent only about 14% of existing CHP capacity, but over 57% of existing CHP sites. Commercial buildings represent the strongest potential growth markets for CHP. Several of these building types have more CHP potential than existing CHP, including but not limited to: retail stores, commercial and multifamily buildings, hotels, and colleges/universities. These building types provide an opportunity to use standardized packaged CHP systems in replicable installations at multiple facilities throughout the country that are owned by the same organization. Some commercial buildings, such as data centers, supermarkets, and refridgerated warehouses, have high and stable demands for space cooling that are good fits for CHP paired with absorption chillers. **Table II-2** provides a list of all commercial building types considered in this report.

[24] Other industrial prime movers include fuel cells, microturbines, and waste heat to power technologies.
[25] Other industrial fuel types include oil and wood. Waste fuel types include black liquor, blast furnace gas, municipal solid waste, other gas, petroleum coke, waste fluid, and waste heat.
[26] DOE CHP Installation Database (U.S. Installations as of December 31, 2014.) www.energy.gov/chp-installs

Table II-2: Commercial CHP Building Types

SIC	NAICS	Commercial Building Type
43	491	Post Offices
52	444	Big Box Retail
4222	493	Refrigerated Warehouses
4581	488	Airports
4952	221	Waste Water Treatment Plants
5411	445	Food Sales
5812	722	Restaurants
6512	531	Commercial Office Buildings
6513	531	Multi-Family Buildings
7011	721	Hotels
7211	812	Laundries
7374	518	Data Centers
7542	811	Carwashes
7832	512	Movie Theaters
7991	713	Health Clubs
7997	713	Golf/Country Clubs
8051	623	Nursing Homes
8062	622	Hospitals
8211	611	Schools
8221	611	Colleges/Universities
8412	712	Museums
9100	921	Government Facilities
9223	922	Prisons
9711	928	Military

Top Types of Commercial Buildings Conducive to Combined Heat and Power Opportunities

Unlike industrial facilities, which have consistent thermal and electric demands, commercial buildings typically exhibit seasonality in on-site power and thermal needs. Thermal needs in the commercial sector include space heat, space cooling, and water heating. Examples of commercial buildings most suitable for CHP include those with year-round thermal needs such as waste water treatment facilities, hospitals, multifamily buildings, colleges and universities, and military campuses.

- *Waste Water Treatment:* Waste water treatment plants that have anaerobic digesters and operate 24 hours a day are prime candidates for CHP. Most CHP systems at waste water treatment plants are between 100kW – 10MW. The majority are fueled by biomass or natural gas, and use combustion turbines or reciprocating engines as prime movers.

- *Hospitals:* Hospitals have the coincident electric and thermal loads that match CHP capabilities and drive project economics. Hospitals need continuous power and have a large demand for domestic hot water, sterilization and laundry. In addition, hospitals are considered critical facilities in the event of a natural disaster or emergency, so the backup reliability of CHP is a good match for their needs. Most CHP systems at hospitals are 5MW or smaller. The vast majority are fueled by natural gas and use reciprocating engines or combustion turbines as prime movers.
- *MultiFamily:* Multifamily buildings have high needs for hot water and space conditioning (location dependent). Most CHP systems at multifamily buildings are smaller (~100kW), compared to their other commercial and industrial counterparts. They are typically fueled by natural gas and use reciprocating engines or microturbines as the prime mover.
- *Colleges/Universities:* Similar to hospitals, colleges and universities have coincident power and thermal loads that are often optimal for CHP systems. The typical college or university campus has a high thermal load for conditioning dormitories, classrooms and research labs. These systems are often served by central utility plants with chilled water and steam or hot water distribution systems. The average college or university CHP system is about 10MW. The majority are fueled by natural gas and use boiler/steam turbines, combustion turbines, or reciprocating engines as prime movers.

Successful CHP Installations

***Waste Water Treatment*:** The Danville Sanitary District in Danville, Illinois has a 150kW CHP system that offsets about 20% of the facility's electric use and almost 100% of the facility's natural gas needs.[27]

MultiFamily: The 75kW CHP system installed at the Boa Vista Apartments in New Bedford, Massachusetts provides electricity, hot water, and space heating to the multifamily building, and it has reduced the building's annual energy costs by 43%.The simple payback for the system was less than 4 years, which exceeded initial estimates.[28]

Military: In 2014, Fort Knox deployed three CHP systems on campus that provide a total of 8MW of power. The locations for each system, a hospital, a data center, and a retail center, were chosen for being critical infrastructure facilities and for being prime locations for the thermal loads produced by the systems.[29]

- *Military Bases:* Much like colleges, military base CHP systems are typically installed at sites with large campuses that have a significant power and thermal loads for barracks, office buildings, traning facilities, medical centers, and other staff support buildings. Military bases are also often served by a large central plant that enables easier CHP integration. CHP systems on military campuses range in size from a few kilowatts to several dozen megawatts, though most systems are under 20MW. The majority of

[27] Danville Sanitary District Project Profile, http://www.midwestchptap.org/profiles/ProjectProfiles/Danville.pdf
[28] Tecogen Brevoort case study, http://www.tecogen.com/resources-case-studies.htm Boa Vista Apartments Project Profile, http://northeastchptap.org/data/sites/5/documents/profiles/boavistachp.pdf
[29] Fort Knox Project Profile, http://southeastchptap.rlmartin.com/Data/Sites/4/documents/profiles/fort-knox-chp_project_profile.pdf

systems are natural gas-fired and use boiler/steam turbines or reciprocating engines as prime movers.

Some commercial buildings, such as hospitals, military campuses, data centers, supermarkets, office buildings, and multifamily buildings, have high and stable demands for cooling. These buildings can be served using a CHP system with an absorption chiller that uses the heat from the CHP system to generate chilled water.

- *Data Centers:* Data centers require high quality, reliable power and have large thermal loads for space cooling. CHP systems at data centers range in size from a few hundred kilowatts up to 10MW. The majority are fueled by natural gas and use microturbines as prime movers.
- *Supermarkets:* Refrigeration and lighting are the two largest electricity loads in the supermarket industry, creating a good fit for CHP, which can provide the electricity and chilling needed to satisfy these energy demands. CHP systems at supermarkets are typically on the small side (<1MW). Most systems are fueled by natural gas and use reciprocating engines as prime movers.
- *Office Buildings:* Office buildings have thermal loads that vary seasonally. CHP systems can be designed to utilize heat in the winter months and use an absorption chiller for cooling in the summer months. The majority of CHP systems at office buildings are under 2MW, though some larger systems do exist. The majority of systems are fueled by natural gas and use reciprocating engines as prime movers.

Successful CHP Installations

***Data Centers*:** Syracuse University installed a microturbine CHP system with a 300-ton absorption chiller, which provides power, heating and cooling to the university's Green Data Center.[30]

Supermarkets: Waldbaum's Supermarket in Hauppauge, NY, installed a 60kW microturbine CHP system in 2002. The system provides power, heating, cooling, and dehumidification to the supermarket.[31]

Office Buildings: The Brandonview Building (formerly the Laclede Gas Building), in St Louis, MO, has a 4.3MW CHP system that provides 100% of the building's power. A 1,050 ton absorption chiller is integrated with the CHP system to provide summer cooling to the building, which has not had an unplanned power outage since 1980.[32] CHP system

CHP Sizing for Commercial CHP

CHP systems at commercial buildings are typically smaller than their counterparts at industrial facilities, but as in industrial facilities, average sizes are skewed upward by a relatively small number of large installations. The average size of existing commercial installations in the U.S. is about 4.5MW, while the median size is only 300kW.[33] Sizing a CHP system to commercial sites

[30] Syracuse University Project Profile, http://www.northeastchptap.org/Data/Sites/5/documents/profiles/Syracuse%20Case%20Study_Final.pdf
[31] Waldbaum's Supermarket Project Profile, http://www.northeastchptap.org/Data/Sites/5/documents/profiles/Waldbaums_CHPProjectProfile.pdf
[32] Brandonview Building Project Profile, http://www.midwestchptap.org/profiles/ProjectProfiles/Brandonview(Laclede%20Gas).pdf
[33] DOE/ICF CHP Installation Database (U.S. installations as of December 31, 2014) www.energy.gov/chp-installs

follows the same methodology as for industrial sites (i.e. sizing the CHP system to the thermal load.). However, the thermal load will rarely exceed electric demand like in some industrial plants, so in most cases, the system will not need to be limited to match on-site power needs. Thus, the key difference for commercial buildings is that these sites will not typically export power, and they will frequently require supplemental utility electricity during hours of operation.

The technical potential analysis section of this report sets the minimum size for commercially available CHP at 50kW.[34] CHP technologies below 50kW have had wide success in other countries; however, they are not common in the U.S. and therefore are not considered in the analysis for this report.

Technologies and Fuel Types for Commercial CHP

Though reciprocating engines make up only 13% of installed commercial CHP capacity, they are the most popular choice for commercial CHP buildings, representing about 67% of all commercial units in the United States.[35] Many large commercial CHP systems have multiple units installed to boost capacity. This is due to the fact that some prime mover technologies, such as reciprocating engines and microturbines, are packaged at predetermined capacities that may not meet the full needs of the facility. Installing multiple units is a way for a facility to meet their thermal requirements in a cost-effective way, and it allows for a measure of flexibility when operating the system. Prime movers with larger portions of commercial CHP capacity (boiler/steam turbines, combined cycles and combustion turbines) can be found at commercial buildings that have higher electric and thermal demands. These commercial buildings include hospitals and colleges/universities. **Figure II-3** represents the distribution of commercial CHP capacity by prime mover type.

Figure II-4 presents the distribution of commercial CHP capacity by fuel type. Natural gas is the most common fuel type used for CHP in commercial buildings. Natural gas serves as the primary fuel for 75% of commercial CHP installations (over 1,900 installations) and accounts for 67% of capacity (7.7GW). Biomass and waste also make up significant portions of both installations and capacity, being common fuels for use at waste water treatment and solid waste facilities. Three commercial building types use 87% of the coal burned in commercial CHP systems: utilities, district energy systems, and universities.

[34] Reciprocating engines in the lower size range from 10 – 50 kW are commercially available for use as backup generators, but are not typically used in conjunction with heat recovery equipment as CHP systems.
[35] DOE/ICF CHP Installation Database (U.S. installations as of December 31, 2014) www.energy.gov/chp-installs

Figure II-3: Existing Commercial CHP Capacity by Prime Mover[36]

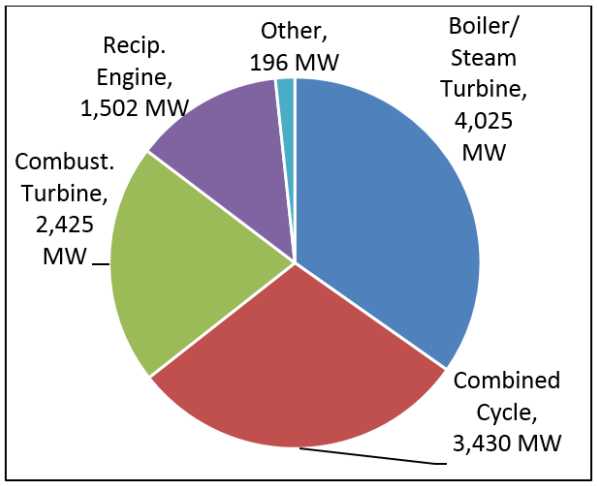
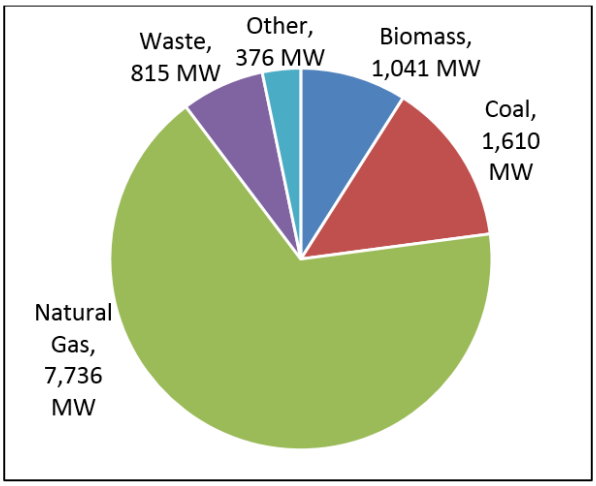


Figure II-4: Existing Commercial CHP Capacity by Fuel Class[37]



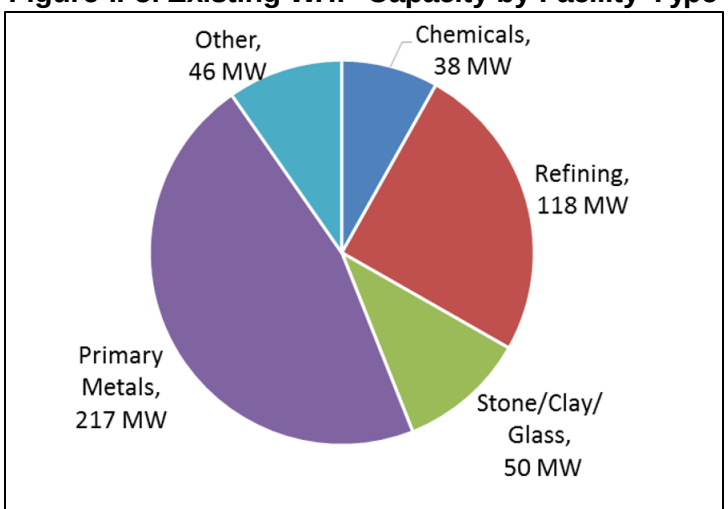
Source: DOE CHP Installation Database (U.S. Installations as of December 31, 2014)

Waste Heat to Power CHP

Waste heat to power (WHP CHP) is the process of capturing heat discarded by an existing thermal process and using it to generate electricity. There is currently 469MW of existing WHP CHP capacity distributed among 75 sites across the country. The majority of this capacity is located within the primary metals (217MW) and refining (118MW) applications.

Figure II-5 shows the existing WHP CHP capacity in the U.S. by facility type.

Figure II-5: Existing WHP Capacity by Facility Type



Source: DOE CHP Installation Database (U.S. Installations as of December 31, 2014)

[36] Other commercial prime movers include fuel cells, microturbines, and waste heat to power technologies.

[37] Other commercial fuel types include oil and wood. Waste fuel types include municipal solid waste, other gas, waste fluid, and waste heat.

Top Types of WHP Facilities Conducive to Combined Heat and Power Opportunities

The top facility types suitable for WHP CHP systems are market sectors with large waste heat streams available for capture at termperatures conducive to generating electric power. These market sectors are typically industries such as refining, chemicals, and metals manufacturing.

- *Refining*: Petroleum refineries, the largest user of energy in the industrial sector, can produce high-quality waste heat that can be recovered for power production in a bottoming-cycle CHP system. One example of this high-quality waste heat is the exhaust from petroleum coke calciners.
- *Chemicals*: Chemical manufacturing can produce a significant amount of waste heat that has the potential to be converted to power. Petrochemicals, industrial gases, and synthetic organic fibers are all examples of chemical manufacturing sectors that produce enough waste heat to make WHP CHP feasible.
- *Metals Manufacturing*: Several metals manufacturing facilities have high temperature processes from which waste heat can be recovered for a WHP CHP system. Iron and steel mills, aluminum production, and fabricated metals manufacturing are all good candidates for WHP CHP.

Successful WHP CHP Installations

Refining: At a petroleum coke plant in Texas, Port Arthur Steam Energy recovers heat from three petroleum coke calcining kilns to produce steam for process use and 5MW of electric power.[38]

Metals: Cokenergy, LLC, owns and operates a WHP CHP system at the ArcelorMittal steel plant in East Chicago, IN. The system has a generating capacity of 95MW, and provides steam for process heating and electricity to the ArcelorMittal plant.[39]

District Energy CHP

District energy systems produce and deliver steam, hot water or chilled water through underground piping networks to buildings in a given area, such as a college campus or downtown city centers. By combining individual user thermal loads, district energy systems can potentially deliver energy services in a more efficient, economic, and environmentally friendly manner. Though district energy systems aggregate thermal loads of multiple customers, they cannot always provide electricity to the same customers because of utility franchise laws. District energy systems are not always integrated with CHP systems; however, combining district energy with a CHP system can be a unique opportunity to provide both thermal and power, serving multiple customers and energy needs at once. *This analysis of potential for CHP at district energy facilities only applies to existing district energy systems that do not currently have CHP or existing district energy systems with CHP that have room for expansion. This analysis does not examine the potential for new district energy systems in the United States.*

[38] Port Arthur Steam Energy case study, Port Arthur Steam Energy Project Profile, http://www.southwestchptap.org/data/sites/1/documents/profiles/Port_Arthur_Steam-Project_Profile.pdf
[39] Cokeenergy Project Profile, http://www.midwestchptap.org/profiles/ProjectProfiles/Cokenergy.pdf

Top Types of District Energy Facilities Conducive to Combined Heat and Power Opportunities

District energy CHP systems are most viable in loops that have multiple thermal hosts, such as a large college or university campus, or an urban center with a variety of customers. These are key targets for CHP because they represent a large portion of existing district energy capacity in the United States. According to the International District Energy Association (IDEA), there are over 400 existing district energy systems in the United States.[42]

- *Colleges/Universities:* IDEA currently estimates that there are about 220 district energy systems on college and university campuses that do not incorporate CHP and 136 systems that do. Colleges and universities have large thermal demands that make district energy systems a practical choice for distributing steam around campus. By incorporating CHP, colleges and universities can increase their efficiency, generate their own power, and capture more waste heat to serve their thermal needs.
- *Downtown Loops*: Downtown loop district energy systems typically provide steam to a variety of customers in a downtown city center, such as commercial office buildings, downtown hospitals, museums, and residential areas. There are over 40 downtown loop district energy systems without CHP and over 35 with CHP systems.[43] By incorporating CHP, district energy systems can provide power in addition to meeting the thermal needs of their customers.

Successful District Energy with CHP Installations

Colleges/Universities: The University of North Carolina at Chapel Hill has an integrated CHP and district energy system that supplies power, chilled water, and district heating and cooling to buildings on campus. In addition, UNC uses district heating and cooling at the UNC Hospital.[40]

Downtown Loops: District Energy St. Paul, is a prominent example of a downtown loop that successfully integrated CHP into the existing district energy system. The CHP system uses wood waste from local sources as fuel and provides up to 33MW of electric power to the local utility, as well as heating and cooling to an array of commercial and residential customers in downtown St. Paul.[41]

[40] University of North Carolina-Chapel Hill project Project Profile, http://southeastchptap.rlmartin.com/Data/Sites/4/documents/profiles/unc-chp_project_profile.pdf

[41] District Energy St. Paul website, http://www.districtenergy.com/technologies/combined-heat-and-power/

[42] District Energy Fact Sheet, IDEA 2011. http://www.districtenergy.org/assets/pdfs/White-Papers/What-IsDistrictEnergyEESI092311.pdf

[43] IDEA – International District Energy Association. http://www.districtenergy.org/map-of-district-energy-in-north-america

III. Technical Potential - National Results

This section provides estimates of the technical potential for combined heat and power in the industrial and commercial sectors in the United States. The technical potential is an estimation of market size constrained only by technological limits — the ability of CHP technologies to fit customer energy needs. CHP technical potential is calculated in terms of CHP electrical generation capacity that could be installed at existing industrial and commercial facilities based on the estimated electric and thermal needs of the site. The technical potential is useful in understanding the potential size and distribution of the CHP market in a particular region. Identifying the technical market potential is a preliminary step in the assessment of the economically feasible market size and ultimate market penetration for CHP.

The determination of technical potential consists of the following elements:

- Identification of target markets where CHP provides a reasonable fit to the electric and thermal needs of the user.
- Quantification of the number and size distribution of target markets. Several data sources were used to identify the number of candidate facilities in each target market that meet the electric and thermal load requirements for CHP.
- Estimation of CHP potential in terms of MW electric capacity. CHP potential is derived based on the thermal and electric load for typical sites by facility type and size range. Total CHP potential for each target market is then calculated by the amount of CHP potential in each size category.
- Subtraction of existing CHP from the identified sites to determine the remaining technical potential.

Three different types of CHP are evaluated in this analysis: traditional topping cycle CHP, WHP CHP (sometimes referred to as bottoming cycle CHP), and district energy CHP.

Across all CHP categories, there is an estimated 240.6GW of technical potential at over 291,900 sites within the U.S. **Table III-1** shows the breakdown across the various system types. Traditional topping cycle CHP has the most overall potential with 222GW (141GW of industrial and commercial on-site and 81GW export). Waste heat to power CHP has about 7.6GW of potential nationwide, and district energy has 10.6GW[44], both almost entirely concentrated at sites with technical potentials greater than 20MW. Overall, the 240.6GW of CHP technical potential in the United States is almost three times the amount of capacity that is currently operational (82.7GW), meaning there is significant potential for increased deployment of CHP.

[44] This 10.6GW of potential is only for existing district energy systems that do not employ CHP or have the ability to expand an existing CHP system. An analysis of the potential for new district energy systems was not conducted.

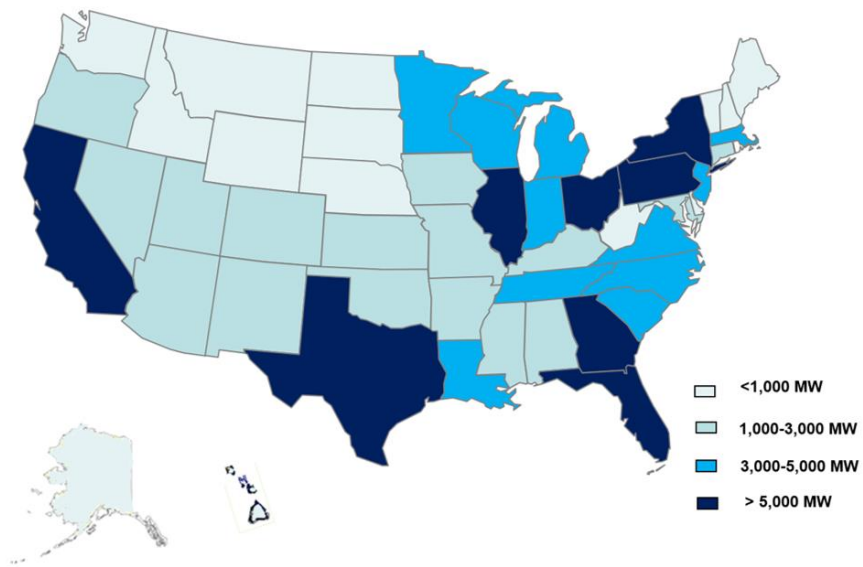
Table III-1: Total CHP Technical Potential across All Facility Types

Business Type	50-500kW		0.5 - 1 MW		1-5 MW		5-20 MW		>20 MW		Total Sites	Total Capacity (MW)
	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)		
On-site Industrial CHP	34,502	6,281	6,069	4,341	7,424	15,567	1,901	17,036	479	22,157	50,375	65,381
On-site Commercial CHP	185,625	20,068	37,939	18,100	15,535	20,284	1,084	9,452	174	8,026	240,358	75,930
On-site WHP CHP	332	73	132	95	341	868	204	2,003	96	4,585	1,105	7,624
Export Industrial CHP	na	0	na	7	na	3,929	na	11,535	na	65,578	na	81,048
Export District Energy CHP	0	0	0	0	5	18	8	75	51	10,567	64	10,660
Total	**220,459**	**26,422**	**44,140**	**22,543**	**23,305**	**40,666**	**3,197**	**40,101**	**800**	**110,913**	**291,902**	**240,644**

U.S. DOE CHP Deployment Program, 2016.

Figure III-1 shows the total on-site technical potential in each state. States with the most technical potential include densely populated states with large manufacturing sectors, such as California, Texas, Ohio, Pennsylvania, New York, and Illinois. The least amount of technical potential is found in rural states in the Northwest and northern New England regions.

Figure III-1: On-site Technical Potential by State



U.S. DOE CHP Deployment Program, 2016.

Table III-2 shows the breakdown of on-site and export technical potential for each state. On-site potential includes industrial, commercial and WHP potential, while export potential includes industrial export and district energy potential. There is an estimated 149GW of on-site and WHP potential across all states, and 92GW of incremental export and district energy potential.

Table III-2: Total On-Site and Export Technical Potential Across all States

State	Total On-site Potential (MW)	Total Export Potential (MW)	Total CHP Technical Potential	State	Total On-site Potential (MW)	Total Export Potential (MW)	Total CHP Technical Potential
Alabama	2,777	1,001	3,777	Montana	377	441	818
Alaska	408	242	650	Nebraska	984	520	1,504
Arizona	2,320	533	2,853	Nevada	1,254	360	1,614
Arkansas	1,795	892	2,686	New Hampshire	447	136	584
California	11,542	7,280	18,822	New Jersey	3,761	1,674	5,435
Colorado	1,665	433	2,098	New Mexico	1,140	457	1,597
Connecticut	1,214	455	1,670	New York	6,908	5,559	12,466
Delaware	747	786	1,533	North Carolina	4,352	1,164	5,516
District of Columbia	762	146	908	North Dakota	445	417	862
Florida	6,917	1,484	8,401	Ohio	7,005	4,082	11,087
Georgia	5,110	2,355	7,464	Oklahoma	1,805	1,387	3,192
Hawaii	563	237	799	Oregon	1,337	816	2,153
Idaho	659	304	962	Pennsylvania	7,025	3,872	10,896
Illinois	7,161	5,664	12,825	Rhode Island	616	180	796
Indiana	4,145	2,084	6,229	South Carolina	3,063	1,536	4,599
Iowa	1,993	1,675	3,668	South Dakota	378	222	600
Kansas	1,909	1,007	2,916	Tennessee	3,981	3,005	6,986
Kentucky	2,721	1,796	4,517	Texas	13,675	12,151	25,826
Louisiana	4,903	7,074	11,977	Utah	1,119	416	1,535
Maine	494	250	743	Vermont	228	153	381
Maryland	2,282	809	3,091	Virginia	4,308	1,633	5,941
Massachusetts	3,028	1,040	4,068	Washington	2,387	1,971	4,357
Michigan	4,291	2,021	6,312	West Virginia	929	449	1,378
Minnesota	3,260	3,671	6,931	Wisconsin	3,187	2,622	5,809
Mississippi	1,833	1,512	3,345	Wyoming	847	254	1,101
Missouri	2,882	1,482	4,364	Total	148,936	91,709	240,644

U.S. DOE CHP Deployment Program, 2016.

On-site CHP Technical Potential Results

The total U.S. on-site CHP potential, which includes industrial and commercial topping cycle CHP and WHP CHP, is just under 149GW. **Table III-3** and **Table III-4** display industrial and commercial potential by facility type. The industrial sector has 73GW of on-site technical potential and the commercial sector has 76GW. Significant markets include chemical manufacturing, paper processing, commercial office buildings, and universities. **Table III-5** displays industrial and commercial on-site technical potential by state. Top states with high technical potential in both the industrial and commercial sectors include California, Illinois, New York, Ohio, Pennsylvania and Texas. These states have large manufacturing sectors (chemicals and refining in Texas, for example) with high CHP technical potential. They also have large cities with many opportunities for CHP at commercial and multifamily buildings as well as high concentrations of colleges and universities.

Table III-3: All On-Site U.S. Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

SIC	NAICS	Industrial Facility	50-500 kW (MW)		0.5-1 MW (MW)		1-5 MW (MW)		5-20 MW (MW)		>20 MW (MW)		Total MW	
			# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)
28	325	Chemicals	5,507	1,003	1,315	955	2,231	4,935	883	7,822	220	9,514	10,156	24,229
29	324	Petroleum Refining	26	4	201	143	370	890	86	912	135	8,625	818	10,574
20	311	Food	6,656	1,283	1,115	818	1,544	3,001	266	2,307	36	1,683	9,617	9,092
26	322	Paper	1,813	467	497	345	643	1,423	186	1,802	77	3,263	3,216	7,299
33	331	Primary Metals	1,529	360	563	407	522	1,145	204	2,186	75	2,737	2,893	6,835
24	321	Lumber and Wood	5,737	1,030	830	572	647	1,231	56	383	3	76	7,273	3,292
22	313	Textiles	1,353	281	317	244	588	1,166	145	1,163	8	241	2,411	3,095
37	336	Transportation Equip.	2,226	364	482	337	457	915	95	860	10	256	3,270	2,733
30	326	Rubber/Misc Plastics	5,891	957	538	372	268	488	34	381	4	104	6,735	2,302
32	327	Stone/Clay/Glass	106	16	28	23	203	639	108	901	5	136	450	1,714
13	211	Oil and Gas Extraction	217	53	89	63	99	201	21	161	1	60	427	538
49	486	Gas Processing	285	60	78	56	79	171	10	80	1	47	453	413
34	332	Fabricated Metals	1,405	180	26	15	3	5	3	29	0	0	1,437	229
35	333	Machinery/Computer Equip.	348	54	29	21	53	109	4	29	0	0	434	212
27	323	Printing	878	121	54	37	13	23	0	0	0	0	945	182
38	334	Instruments	275	39	13	8	27	57	1	6	0	0	316	110
39	339	Misc. Manufacturing	395	57	20	16	12	26	1	5	0	0	428	104
25	337	Furniture	177	25	4	3	1	1	0	0	0	0	182	29
12	212	Mining, Except Oil and Gas	5	1	2	1	5	8	2	13	0	0	14	23
21	312	Beverage and Tobacco	2	0.3	0	0	0	0	0	0	0	0	2	0.3
		Total	**34,831**	**6,354**	**6,201**	**4,435**	**7,765**	**16,435**	**2,105**	**19,039**	**575**	**26,742**	**51,477**	**73,006**

U.S. DOE CHP Deployment Program, 2016.

Table III-4: All On-Site U.S. Commercial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

SIC	NAICS	Commercial Building	50-500 kW (MW)		0.5-1 MW (MW)		1-5 MW (MW)		5-20 MW(MW)		>20 MW (MW)		Total MW	
			# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)
6512	531	Commercial Office Buildings	58,998	2,950	23,999	9,600	6,999	4,199	0	0	0	0	89,996	16,749
8221	611	College/Univ.	2,944	534	399	264	1,369	3,580	541	5,041	132	4,513	5,385	13,932
8062	622	Hospitals	2,946	716	1,177	815	2,001	4,124	112	758	4	900	6,240	7,312
8211	611	Schools	13,174	2,466	3,584	2,407	1,315	1,982	0	0	0	0	18,073	6,854
9100	921	Government Buildings	8,085	1,092	816	570	740	1,286	113	902	6	610	9,760	4,460
7011	721	Hotels	13,119	1,615	928	582	778	1,432	76	600	2	47	14,903	4,275
6513	531	Multifamily Buildings	13,373	1,003	4,824	2,412	849	849	0	0	0	0	19,047	4,265
9711	928	Military	440	86	80	54	180	457	138	1,245	16	1,551	854	3,393
52	444	Retail	16,725	2,445	861	529	159	252	3	24	1	21	17,749	3,271
5411	445	Food Stores	12,004	2,229	192	127	25	54	2	19	0	0	12,223	2,430
9223	922	Prisons	679	115	246	184	612	1,109	40	308	0	0	1,577	1,716
5812	722	Restaurants	17,056	1,574	110	75	35	55	1	6	0	0	17,202	1,710
8051	623	Nursing Homes	10,772	1,279	199	127	94	158	2	13	0	0	11,067	1,577
7374	518	Data Centers	2,079	315	194	130	179	337	18	183	1	20	2,471	985
4581	488	Airports	166	37	40	29	94	224	34	318	12	366	346	973
7997	713	Golf/Country Clubs	4,743	621	42	27	18	28	1	15	0	0	4,804	690
7991	713	Health Clubs	2,597	284	47	30	15	26	1	8	0	0	2,660	349
4952	221	Waste Water Treatment Plants	1,222	153	46	34	34	68	1	7	0	0	1,303	262
7211	812	Laundries	1,167	190	78	48	8	13	0	0	0	0	1,253	251
4222	493	Refrigerated Warehouses	690	97	40	27	14	18	1	7	0	0	745	148
7542	811	Car Washes	1,313	113	7	5	2	3	0	0	0	0	1,322	121
8412	712	Museums	743	94	12	9	8	17	0	0	0	0	763	120
43	491	Post Offices	502	54	17	13	6	11	0	0	0	0	525	78
7832	512	Movie Theaters	91	8	1	1	1	1	0	0	0	0	93	10
		Total	**185,628**	**20,068**	**37,939**	**18,100**	**15,535**	**20,284**	**1,084**	**9,452**	**174**	**8,026**	**240,361**	**75,930**

U.S. DOE CHP Deployment Program, 2016

Table III-5: On-Site Technical Potential Results by State (Including Topping Cycle CHP and WHP CHP)

State	Industrial		Commercial		Total		State	Industrial		Commercial		Total	
	Sites	Capacity (MW)	Sites	Capacity (MW)	Sites	Capacity (MW)		Sites	Capacity (MW)	Sites	Capacity (MW)	Sites	Capacity (MW)
Alabama	1,030	1,634	3,482	1,143	4,512	2,777	Montana	163	198	779	179	942	377
Alaska	98	217	534	191	632	408	Nebraska	403	527	1,664	458	2,067	984
Arizona	577	666	5,123	1,654	5,700	2,320	Nevada	174	283	2,223	971	2,397	1,254
Arkansas	569	1,127	2,095	668	2,664	1,795	New Hampshire	237	170	1,126	277	1,363	447
California	4,315	4,362	24,646	7,179	28,961	11,542	New Jersey	1,490	1,562	7,157	2,199	8,647	3,761
Colorado	614	642	3,929	1,024	4,543	1,665	New Mexico	223	699	1,519	441	1,742	1,140
Connecticut	533	415	2,907	799	3,440	1,214	New York	2,078	1,927	14,819	4,981	16,897	6,908
District of Columbia	9	4	747	757	756	762	North Carolina	2,093	2,421	6,344	1,931	8,437	4,352
Delaware	125	541	707	207	832	747	North Dakota	159	228	731	218	890	445
Florida	1,510	1,281	16,311	5,637	17,821	6,917	Ohio	2,902	4,288	10,288	2,717	13,190	7,005
Georgia	1,891	2,739	7,483	2,371	9,374	5,110	Oklahoma	629	955	2,766	851	3,395	1,805
Hawaii	134	76	1,158	486	1,292	563	Oregon	856	674	2,609	662	3,465	1,337
Idaho	313	316	1,094	342	1,407	659	Pennsylvania	2,582	4,022	10,123	3,003	12,705	7,025
Illinois	2,559	4,085	11,156	3,075	13,715	7,161	Rhode Island	217	225	897	391	1,114	616
Indiana	1,720	2,624	5,552	1,521	7,272	4,145	South Carolina	934	1,812	3,339	1,251	4,273	3,063
Iowa	971	1,323	2,752	670	3,723	1,993	South Dakota	180	153	789	225	969	378
Kansas	635	1,160	2,523	749	3,158	1,909	Tennessee	1,225	2,551	4,907	1,430	6,132	3,981
Kentucky	937	1,809	3,093	911	4,030	2,721	Texas	3,356	6,648	17,492	7,027	20,848	13,675
Louisiana	892	3,793	3,544	1,109	4,436	4,903	Utah	496	501	2,180	618	2,676	1,119
Maine	320	228	1,065	266	1,385	494	Vermont	164	112	493	116	657	228
Maryland	589	701	4,330	1,581	4,919	2,282	Virginia	962	1,768	6,329	2,540	7,291	4,308
Massachusetts	1,013	780	5,644	2,249	6,657	3,028	Washington	957	1,167	4,612	1,220	5,569	2,387
Michigan	2,233	2,324	8,135	1,967	10,368	4,291	West Virginia	288	575	1,342	354	1,630	929
Minnesota	1,268	1,619	5,052	1,641	6,320	3,260	Wisconsin	1,918	1,840	5,088	1,346	7,006	3,187
Mississippi	578	1,141	2,051	691	2,629	1,833	Wyoming	149	733	460	115	609	847
Missouri	1,209	1,361	5,173	1,521	6,382	2,882	**Total**	**51,477**	**73,006**	**240,361**	**75,930**	**291,838**	**148,936**

U.S. DOE CHP Deployment Program, 2016.

CHP Export Technical Potential Results

Table III-6 shows total CHP export technical potential by facility type. This potential represents a CHP unit sized to meet the thermal load, with the facility selling excess electricity back to the grid. Industrial facilities and downtown district energy systems are assumed to be the only facility types that produce export electricity for this analysis. CHP systems provide the most benefit when sized to meet all of the thermal demand of a given facility. Maintaining optimal system efficiency in this scenario requires that more electricity be generated than can be used on-site[45]. This excess electricity could then be exported back to the grid. Total export CHP technical potential is estimated at 92GW. Most of the export potential is found in the refining, paper, chemicals, district energy, and food industries because of the high thermal loads relative to on-site electric demand.

Table III-6: U.S. Industrial and District Energy Export Technical Potential

SIC	NAICS	Industrial Facility	50-500 kW (MW)	0.5-1 MW (MW)	1-5 MW (MW)	5-20 MW (MW)	>20 MW (MW)	Total (MW)
29	324	Petroleum Refining	0	1	283	1,365	32,465	34,114
26	322	Paper	0	0	561	3,119	14,227	17,907
28	325	Chemicals	0	1	872	3,901	11,342	16,116
4961	221	District Energy	0	0	18	75	10,567	10,660
20	311	Food	0	5	1,415	2,089	6,111	9,621
24	321	Lumber and Wood	0	0	731	961	980	2,672
33	331	Primary Metals	0	0	17	66	399	482
30	326	Rubber/Misc Plastics	0	0	14	17	28	58
38	334	Instruments	0	0	23	16	0	39
22	313	Textiles	0	0	3	0	26	29
37	336	Transportation Equip.	0	0	4	0	0	4
35	333	Machinery/Computer Equip.	0	0	3	0	0	3
34	332	Fabricated Metals	0	0	2	0	0	2
39	339	Misc. Manufacturing	0	0	0	0	0	0
25	337	Furniture	0	0	0	0	0	0
27	323	Printing	0	0	0	0	0	0
32	327	Stone/Clay/Glass	0	0	0	0	0	0
49	486	Gas Processing	0	0	0	0	0	0
		Total	**0**	**7**	**3,947**	**11,610**	**76,145**	**91,709**

U.S. DOE CHP Deployment Program, 2016.

The potential to export electricity to the grid is not evenly distributed throughout the country, but is more heavily concentrated in states with large industrial facilities and existing district energy systems. Texas has the most export potential due to its significant chemical and petrochemical facilities, followed by other large industrial states like California, Louisiana, Illinois, and New York.

[45] By nature, downtown district energy systems serve multiple customers. Electricity cannot be sold to multiple customers unless the seller is an electric utility. Therefore, any electricity produced by CHP systems serving downtown district energy loops is assumed to be exported to the grid.

Table III-7 shows the export technical potential brokendown by state.

Table III-7: U.S. Export Technical Potential by State

State	Total Export Potential (MW)	State	Total Export Potential (MW)
Alabama	1,001	Montana	441
Alaska	242	Nebraska	520
Arizona	533	Nevada	360
Arkansas	892	New Hampshire	136
California	7,280	New Jersey	1,674
Colorado	433	New Mexico	457
Connecticut	455	New York	5,559
District of Columbia	146	North Carolina	1,164
Delaware	786	North Dakota	417
Florida	1,484	Ohio	4,082
Georgia	2,355	Oklahoma	1,387
Hawaii	237	Oregon	816
Idaho	304	Pennsylvania	3,872
Illinois	5,664	Rhode Island	180
Indiana	2,084	South Carolina	1,536
Iowa	1,675	South Dakota	222
Kansas	1,007	Tennessee	3,005
Kentucky	1,796	Texas	12,151
Louisiana	7,074	Utah	416
Maine	250	Vermont	153
Maryland	809	Virginia	1,633
Massachusetts	1,040	Washington	1,971
Michigan	2,021	West Virginia	449
Minnesota	3,671	Wisconsin	2,622
Mississippi	1,512	Wyoming	254
Missouri	1,482	**Total**	**91,709**

U.S. DOE CHP Deployment Program, 2016.

Waste Heat to Power CHP Technical Potential Results

Total U.S. WHP CHP technical potential is estimated to be 7.6GW across all facility types and waste heat streams. **Table III-8** displays the WHP technical potential and number of sites in the Unites States by target market. Petroleum, metal, and non-metallic mineral markets contain the highest amount of technical potential. These four facility types represent 91% of the total technical potential within the U.S. These figures represent the amount of remaining technical potential at each site because existing WHP CHP capacity was subtracted from the total amount of technical potential.

Table III-8: U.S. Waste Heat to Power CHP Technical Potential[46]

SIC	NAICS	WHP Business Type	50-500 kW		0.5-1 MW		1-5 MW		5-20 MW		> 20 MW		Total	
			# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)
12	212	Mining, Except Oil and Gas	5	1	2	1	5	8	2	13	0	0	14	23
13	211	Oil and Gas Extraction	217	53	89	63	99	201	21	161	1	60	427	538
20	311	Food	15	3	2	1	2	4	0	0	0	0	19	8
21	312	Beverage and Tobacco	2	0.3	0	0	0	0	0	0	0	0	2	0.3
24	321	Lumber and Wood	2	1	0	0	0	0	0	0	0	0	2	1
26	322	Paper	15	3	2	1	0	0	0	0	0	0	17	5
27	323	Printing	1	0.1	0	0	0	0	0	0	0	0	1	0.1
28	325	Chemical	24	3	5	3	33	66	2	20	0	0	64	92
29	324	Petroleum Refining	25	4	9	6	39	110	47	489	56	2,985	176	3,593
30	326	Rubber/Misc Plastics	2	0.03	0	0	0	0	0	0	0	0	2	0.03
32	327	Stone/Clay/Glass	9	3	18	15	148	438	77	637	3	80	255	1,173
33	331	Primary Metals	7	2	5	3	13	37	55	684	36	1,460	116	2,186
35	333	Machinery/Computer Equip	1	0.2	0	0	1	4	0	0	0	0	2	4
37	336	Transportation Equipment	0	0	0	0	1	2	0	0	0	0	1	2
38	334	Instruments	4	0.1	0	0	0	0	0	0	0	0	4	0.1
4222	493	Warehousing and Storage	1	0.002	0	0	0	0	0	0	0	0	1	0.002
8211	611	College/Univ	2	0.1	0	0	0	0	0	0	0	0	2	0.1
		Total	**332**	**73**	**132**	**95**	**341**	**868**	**204**	**2,003**	**96**	**4,585**	**1,105**	**7,624**

U.S. DOE CHP Deployment Program, 2016.

[46] Also Known as Bottoming Cycle CHP this is a Subset of Total On-site CHP Technical Potential

Table III-9 displays the WHP technical potential and number of sites by state. Roughly 38% of the entire U.S. technical potential is contained within Texas, Louisiana, and California manufacturing facilities.

Table III-9: U.S. Waste Heat to Power CHP Technical Potential by State[47]

State	# Sites	Capacity (MW)	State	# Sites	Capacity (MW)
Alabama	35	251	Missouri	15	85
Alaska	7	73	Montana	7	58
Arizona	4	28	Nebraska	9	39
Arkansas	11	162	Nevada	2	7
California	62	729	New Jersey	10	106
Colorado	32	84	New Mexico	28	43
Connecticut	1	0	New York	13	50
Delaware	2	60	North Carolina	14	82
Florida	13	65	North Dakota	9	10
Georgia	7	14	Ohio	38	307
Hawaii	2	7	Oklahoma	70	165
Idaho	1	2	Oregon	5	29
Illinois	25	353	Pennsylvania	52	402
Indiana	27	473	Rhode Island	1	0
Iowa	16	88	South Carolina	12	156
Kansas	21	122	South Dakota	3	8
Kentucky	18	211	Tennessee	16	82
Louisiana	93	782	Texas	244	1,432
Maine	3	4	Utah	21	61
Maryland	4	40	Virginia	11	65
Massachusetts	3	3	Washington	14	138
Michigan	36	154	West Virginia	14	148
Minnesota	12	123	Wisconsin	15	57
Mississippi	9	176	Wyoming	38	91
			Total	**1,105**	**7,624**

U.S. DOE CHP Deployment Program, 2016.

District Energy CHP Technical Potential Results

This analysis of potential for CHP at district energy facilities only applies to existing district energy systems that do not currently have CHP or existing district energy systems with CHP that have room for expansion. This analysis does not examine the potential for new district energy systems in the United States.

Table III-10 displays the total technical potential for district energy systems by size range. The table is divided in two categories to show the potential for district energy loops that do not currently include CHP systems and the potential to expand existing CHP systems serving district energy systems. In total, 10.6GW of technical potential was identified at 64 existing downtown and district energy loops across the nation. The vase majority of district energy CHP potential is found in the >20MW size bin, which contains 51 of the systems and 10.5GW of the total 10.6GW. District

[47] Also known as Bottoming Cycle CHP, this is a subset of Total CHP Technical Potential

energy systems greater than 20MW will often be large, downtown district energy systems serving multiple customers in a geographical area.

Table III-10: Total U.S. District Energy Technical Potential by Size Range[48]

SIC	NAICS	District Energy Type	1-5 MW		5-20 MW		>20 MW		Total Sites	Total Capacity (MW)
			# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)		
4961	221	Current Loops without CHP	3	10	5	51	27	3,055	35	3,116
4961	221	Current Loops with CHP Expansion	2	8	3	24	24	7,511	29	7,543
		Total	5	18	8	75	51	10,567	64	10,660

U.S. DOE CHP Deployment Program, 2016.

Table III-11 shows the breakdown of technical potential for district energy systems by size range and state. The first two size bins (50-500kW and 500-1,000kW) were left out of the table due to a lack of systems in this size range. This table shows that New York has the most potential capacity for CHP at district energy systems, mainly due to the CHP capacity that could be added to the district energy system that serves New York City. Other states with high amounts of technical potential are Minnesota, Pennsylvania, and Michigan. Each of these states has large cities that are served by district energy systems where CHP could be installed or expanded.

[48] This is a subset of Total CHP Technical Potential

Table III-11: Total U.S. District Energy Technical Potential by State

State	1-5 MW		5-20 MW		>20 MW		Total	
	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)
Arizona	2	8	0	0	1	94	3	102
California	1	1	3	31	3	198	7	230
Colorado	0	0	0	0	1	53	1	53
Connecticut	1	4	0	0	2	105	3	109
District of Columbia	0	0	0	0	1	146	1	146
Florida	0	0	1	11	1	40	2	51
Illinois	0	0	0	0	2	303	2	303
Indiana	0	0	0	0	1	465	1	465
Louisiana	0	0	0	0	1	43	1	43
Massachusetts	0	0	1	7	1	399	2	406
Maryland	0	0	0	0	1	363	1	363
Michigan	0	0	0	0	2	696	2	696
Minnesota	0	0	0	0	6	1,050	6	1,050
Missouri	0	0	0	0	2	408	2	408
New Jersey	0	0	1	7	1	29	2	35
Nevada	0	0	0	0	2	124	2	124
New York	0	0	1	8	3	3,901	4	3,910
Ohio	0	0	0	0	4	283	4	283
Oklahoma	0	0	0	0	2	111	2	111
Oregon	1	5	0	0	0	0	1	5
Pennsylvania	0	0	0	0	3	734	3	734
Tennessee	0	0	0	0	2	202	2	202
Texas	0	0	1	12	6	375	7	387
Washington	0	0	0	0	1	158	1	158
Wisconsin	0	0	0	0	2	287	2	287
Total	**5**	**18**	**8**	**75**	**51**	**10,567**	**64**	**10,660**

U.S. DOE CHP Deployment Program, 2016.

IV. Technical Potential - State Results

The national CHP technical potential is distributed unevenly among the 50 states and the District of Columbia, with the more populous and industrial states containing more technical potential than other states. The following state profiles provide information and data on the state-specific technical potential for industrial CHP, commercial CHP, waste heat to power (WHP) CHP, and district energy CHP. They are intended to provide an overview of the full technical potential for CHP in each state and can serve as a reference to stakeholders considering CHP as an energy efficiency solution in their jurisdiction.

State Profile Format

The state profiles are organized by CHP technical potential category for easy reference. The first section of each profile includes an overview of CHP potential by sector in each state. Next, two charts show the major facility types for both industrial on-site CHP and commercial CHP technical potential.[49] These charts serve as an indicator of where the most CHP technical potential exists in each state. Finally, the state profiles include two tables on the identified waste heat to power and district energy CHP potential in each state. The waste heat to power technical potential is organized by facility type, while the district energy CHP potential shows the available CHP potential in downtown loops that do not have existing CHP systems as well as downtown loops that have room for expansion of their current CHP system.

These state profiles are intended as a starting point to understand the CHP technical potential market at the state level. Additional information on CHP technical potential in each state is available in Appendix D. This includes a summary of overall CHP technical potential as well as detailed breakouts on the number of sites and capacity identified in each target facility type.

[49] Note that the state profile pages do not include information about export potential.

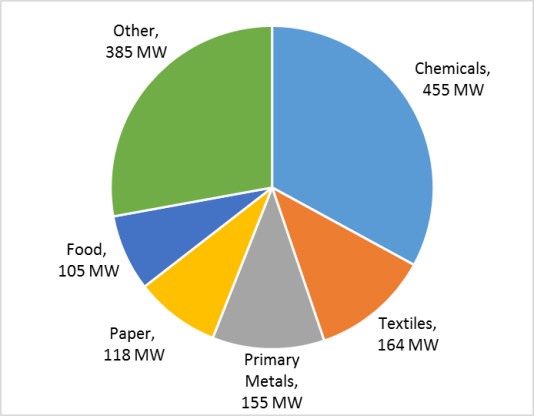
Alabama

Alabama has 2,777 MW of CHP technical potential capacity identified at 4,512 sites.[50]

Table 1: Overview of CHP Technical Potential in Alabama

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	630	117	150	105	168	356	35	338	12	466	995	1,382
Commercial Topping Cycle CHP	2,782	347	495	231	178	221	22	192	5	151	3,482	1,143
WHP CHP	10	2	2	2	9	28	11	111	3	109	35	251
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**3,422**	**467**	**647**	**338**	**355**	**605**	**68**	**641**	**20**	**726**	**4,512**	**2,777**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

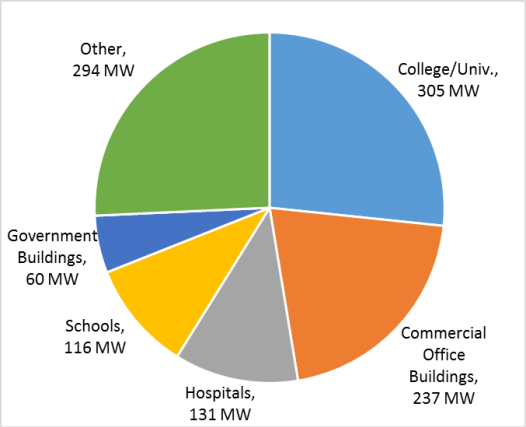


There is 1,382 MW of industrial on-site CHP technical potential in Alabama, primarily in the chemicals, textiles, primary metals, paper, and food sectors.

Table 1.1: Alabama WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
12	Mining, Except Oil and Gas	1	1
13	Oil and Gas Extraction	9	10
26	Paper	3	1
29	Petroleum Refining	4	17
32	Stone/Clay/Glass	8	37
33	Primary Metals	10	186
	Total	**35**	**251**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 1,143 MW of commercial, institutional and multifamily on-site CHP technical potential in Alabama, primarily in the colleges/universities, commercial (office) buildings, hospitals, schools, and government buildings sectors.

Table 1.2: Additional CHP Technical Potential in Existing Alabama District Energy

There is no known CHP technical potential at existing district energy loops in Alabama.

[50] A detailed breakdown of Alabama technical potential by application and size range is available in Appendix D, page D-1. For more information on existing US CHP projects or contacts for DOE CHP Deployment Program see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

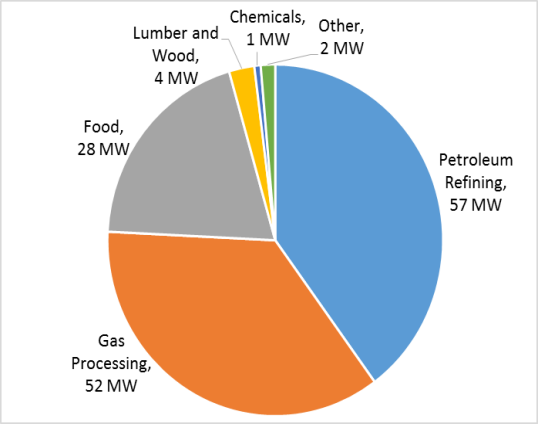
Alaska

Alaska has 408 MW CHP technical potential capacity identified at 632 sites.[51]

Table 1: Overall CHP Technical Potential in Alaska

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	54	9	13	8	19	40	4	40	1	47	91	144
Commercial Topping Cycle CHP	440	48	58	27	29	35	6	53	1	29	534	191
WHP CHP	2	0.1	0	0	4	13	0	0	1	60	7	73
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**496**	**57**	**71**	**35**	**52**	**87**	**10**	**92**	**3**	**136**	**632**	**408**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

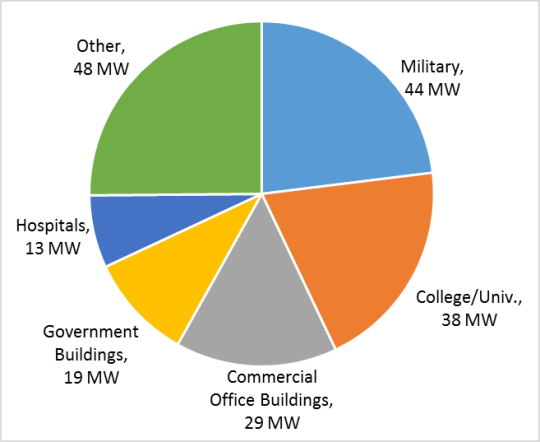


There is 144 MW of industrial on-site CHP technical potential in Alaska, primarily in the petroleum refining, gas processing, food, lumber and wood, and chemicals sectors.

Table 1.1: Alaska WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
12	Mining, Except Oil and Gas	1	3
13	Oil and Gas Extraction	4	66
29	Petroleum Refining	2	4
	Total	**7**	**73**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 191 MW of commercial, institutional and multifamily on-site CHP technical potential in Alaska, primarily in the military, colleges/universities, commercial (office) buildings, government buildings, and hospitals sectors.

Table 1.2: Additional CHP Technical Potential in Existing Alaska District Energy

There is no known CHP technical potential at existing district energy loops in Alaska.

[51] A detailed breakdown of Alaska technical potential by application and size range is available in Appendix D, page D-3. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

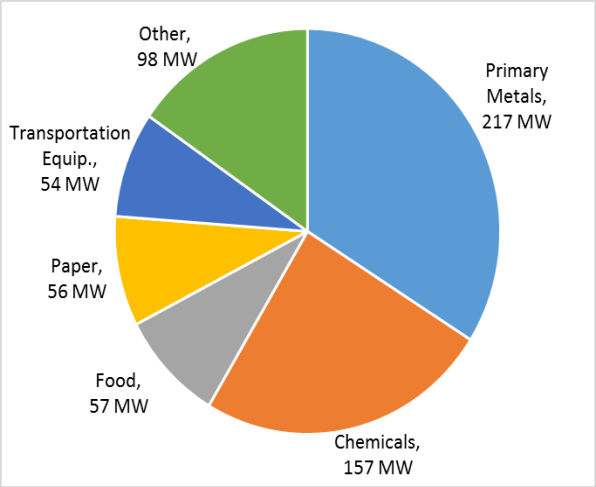
Arizona

Arizona has 2,422 MW of CHP technical potential capacity identified at 5,703 sites.[52]

Table 1: Overall CHP Technical Potential in Arizona

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	427	73	57	43	66	142	17	157	6	222	573	638
Commercial Topping Cycle CHP	3,833	417	894	465	376	567	17	132	3	73	5,123	1,654
WHP CHP	0	0	0	0	1	3	3	25	0	0	4	28
District Energy CHP	0	0	0	0	0	8	0	0	0	94	3	102
Total	**4,260**	**491**	**951**	**508**	**443**	**720**	**37**	**314**	**9**	**389**	**5,703**	**2,422**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

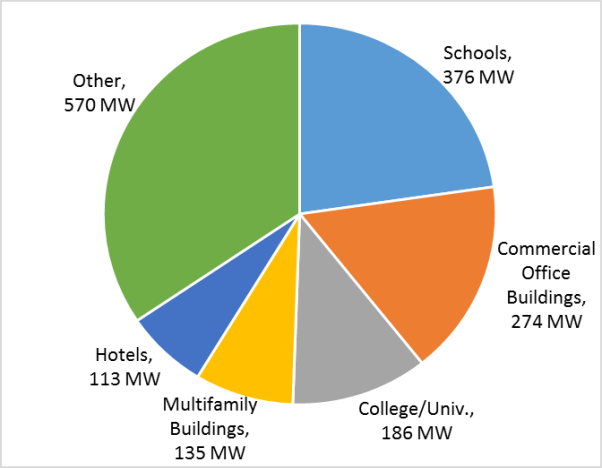


There is 638 MW of industrial on-site CHP technical potential in Arizona, primarily in the primary metals, chemicals, food, paper, and transportation equipment sectors.

Table 1.1: Arizona WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
32	Stone/Clay/Glass	4	28
	Total	**4**	**28**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 1,654 MW of commercial, institutional and multifamily on-site CHP technical potential in Arizona, primarily in the schools, commercial (office) buildings, colleges/universities, multifamily buildings and hotels sectors.

Table 1.2: Additional CHP Technical Potential in Existing Arizona District Energy

SIC	District Energy Type	Total Sites	Total MW
4961	Current Loops without CHP	1	94
4961	Current Loops with CHP expansion	2	8
	Total	**3**	**102**

[52] A detailed breakdown of Arizona technical potential by application and size range is available in Appendix D, page D-5. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

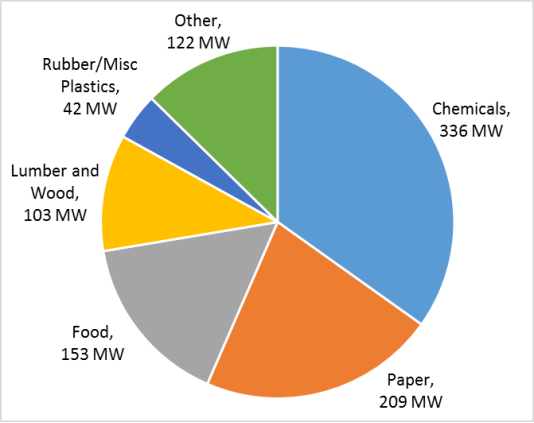
Arkansas

Arkansas has 1,795 MW of CHP technical potential capacity identified at 2,664 sites.[53]

Table 1: Overall CHP Technical Potential in Arkansas

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	339	61	84	60	100	219	24	228	11	396	558	965
Commercial Topping Cycle CHP	1,645	199	318	153	120	172	10	98	2	46	2,095	668
WHP CHP	2	0.4	2	2	1	2	4	31	2	127	11	162
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**1,986**	**261**	**404**	**215**	**221**	**393**	**38**	**357**	**15**	**569**	**2,664**	**1,795**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

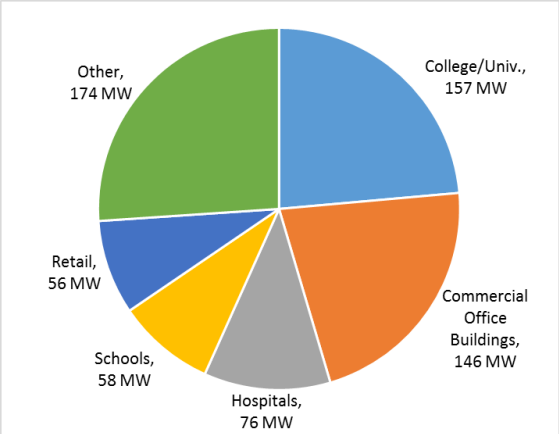


There is 965 MW of industrial on-site CHP technical potential in Arkansas, primarily in the chemicals, paper, food, lumber and wood, and rubber/plastics sectors.

Table 1.1: Arkansas WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
13	Oil and Gas Extraction	2	6
26	Paper	2	1
29	Petroleum Refining	2	9
32	Stone/Clay/Glass	2	7
33	Primary Metals	3	138
	Total	**11**	**162**

Figure 2: Top Commercial On-site CHP Technical Potential Business Types



There is 668 MW of commercial, institutional and multifamily on-site CHP technical potential in Arkansas, primarily in the colleges and universities, commercial (office) buildings, hospitals, schools, and retail sectors.

Table 1.2: Additional CHP Technical Potential in Existing Arkansas District Energy

There is no known CHP technical potential at existing district energy loops in Arkansas.

[53] A detailed breakdown of Arkansas technical potential by application and size range is available in Appendix D, page D-7. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

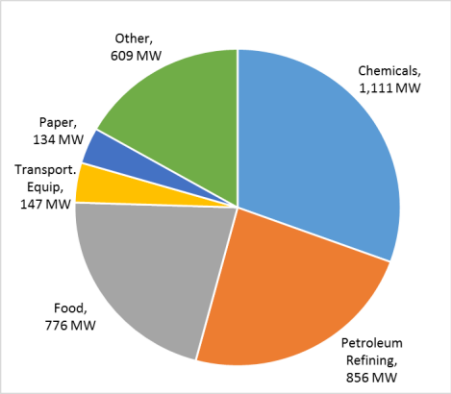
California

California has 11,772 MW of CHP technical potential capacity identified at 28,968 sites.[54]

Table 1: Overall CHP Technical Potential in California

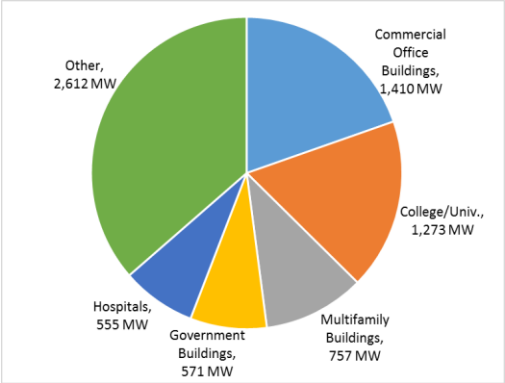
	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	**Sites**	**50-500 kW (MW)**	**Sites**	**0.5-1 MW (MW)**	**Sites**	**1-5 MW (MW)**	**Sites**	**5-20 MW (MW)**	**Sites**	**>20 MW (MW)**	**Total Sites**	**Total MW**
Industrial Topping Cycle CHP	3,174	549	458	334	518	1,117	89	741	15	892	4,254	3,633
Commercial Topping Cycle CHP	19,813	2,055	3,364	1,571	1,308	1,882	146	1,170	14	501	24,645	7,179
WHP CHP	20	4	6	4	13	38	10	89	13	594	62	729
District Energy CHP	0	0	0	0	1	1	3	31	0	198	7	230
Total	**23,007**	**2,608**	**3,828**	**1,909**	**1,840**	**3,038**	**248**	**2,031**	**42**	**2,186**	**28,968**	**11,772**

Figure 1: Top Industrial Types with On-site CHP Technical Potential



There is 3,633 MW of industrial on-site CHP technical potential in California, primarily in the chemicals, refining, food, transportation equipment, and paper sectors.

Figure 2: Top Commercial Business Types with CHP Technical Potential



There is 7,179 MW of commercial, institutional and multifamily CHP technical potential in California, primarily in the commercial (office) buildings, colleges/universities, multifamily buildings, government, and hospitals sectors.

Table 1.1: California WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
12	Mining, Except Oil and Gas	1	1
13	Oil and Gas Extraction	20	7
29	Petroleum Refining	18	571
32	Stone/Clay/Glass	19	133
33	Primary Metals	2	17
38	Instruments	1	0.1
8221	College/Univ.	1	0.02
	Total	**62**	**729**

Table 1.2: Additional CHP Technical Potential in Existing California District Energy

SIC	District Energy Type	Total Sites	Total MW
4961	Current Loops without CHP	6	219
4961	Current Loops with CHP expansion	1	11
	Total	**7**	**230**

[54] A detailed breakdown of California technical potential by application and size range is available in Appendix D, page D-9. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

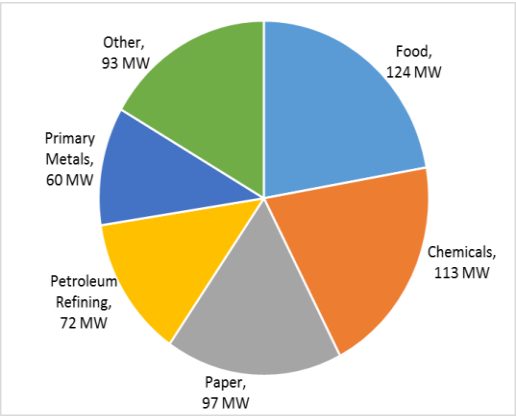
Colorado

Colorado has 1,718 MW of CHP technical potential capacity identified at 4,544 sites.[55]

Table 1: Overall CHP Technical Potential in Colorado

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	422	79	74	53	68	150	15	136	3	139	582	558
Commercial Topping Cycle CHP	3,255	337	470	221	189	274	11	106	3	86	3,929	1,024
WHP CHP	15	4	2	1	10	21	4	31	1	26	32	84
District Energy CHP	0	0	0	0	0	0	0	0	1	53	1	53
Total	**3,692**	**421**	**546**	**275**	**267**	**445**	**30**	**273**	**8**	**305**	**4,544**	**1,718**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

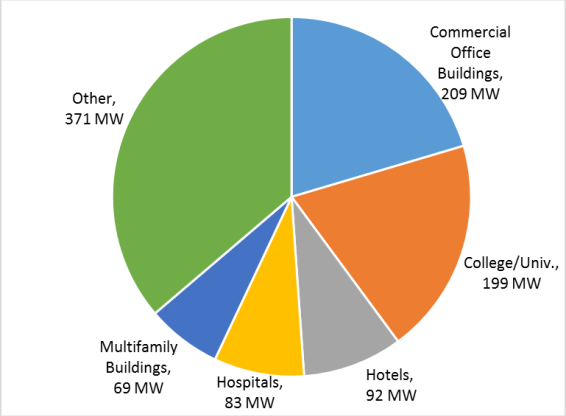


There is 558 MW of industrial on-site CHP technical potential in Colorado, primarily in the food, chemicals, paper, refining, and primary metals sectors.

Table 1.1: Colorado WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
13	Oil and Gas Extraction	22	30
29	Petroleum Refining	3	10
32	Stone/Clay/Glass	6	19
33	Primary Metals	1	26
	Total	**32**	**84**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 1,024 MW of commercial, institutional and multifamily on-site CHP technical potential in Colorado, primarily in the commercial (office) buildings, colleges/universities, hotels, hospitals, and multifamily buildings sectors.

Table 1.2: Additional CHP Technical Potential in Existing Colorado District Energy

SIC	District Energy Type	Total Sites	Total MW
4961	Current Loops without CHP	0	0
4961	Current Loops with CHP expansion	1	53
	Total	**1**	**53**

[55] A detailed breakdown of Colorado technical potential by application and size range is available in Appendix D, page D-11. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

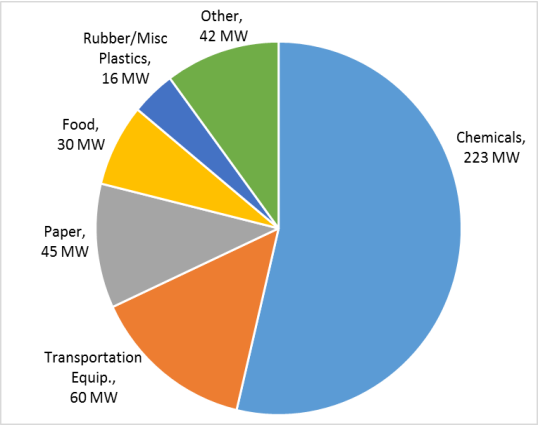
Connecticut

Connecticut has 1,323 MW of CHP technical potential capacity identified at 3,443 sites.[56]

Table 1: Overall CHP Technical Potential in Connecticut

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	418	70	47	33	52	106	11	99	4	107	532	415
Commercial Topping Cycle CHP	2,223	235	465	213	206	207	13	116	1	28	2,907	799
WHP CHP	1	0.1	0	0	0	0	0	0	0	0	1	0.1
District Energy CHP	0	0	0	0	1	4	0	0	2	105	3	109
Total	**2,642**	**305**	**512**	**246**	**259**	**317**	**24**	**215**	**7**	**240**	**3,443**	**1,323**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

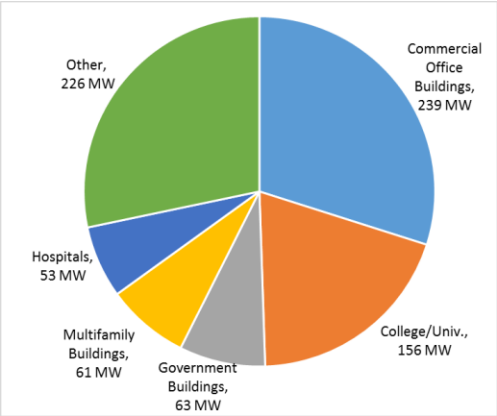


There is 415 MW of industrial on-site CHP technical potential in Connecticut, primarily in the chemicals, transportation equipment, paper, food, and rubber/plastics sectors.

Table 1.1: Connecticut WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
28	Chemicals	1	0.1
	Total	**1**	**0.1**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 799 MW of commercial, institutional and multifamily on-site CHP technical potential in Connecticut, primarily in the commercial (office) buildings, colleges/universities, government buildings, multifamily buildings, and hospitals sectors.

Table 1.2: Additional CHP Technical Potential in Existing Connecticut District Energy

SIC	District Energy Type	Total Sites	Total MW
4961	Current Loops without CHP	1	4
4961	Current Loops with CHP expansion	2	105
	Total	**3**	**109**

[56] A detailed breakdown of Connecticut technical potential by application and size range is available in Appendix D, page D-13. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

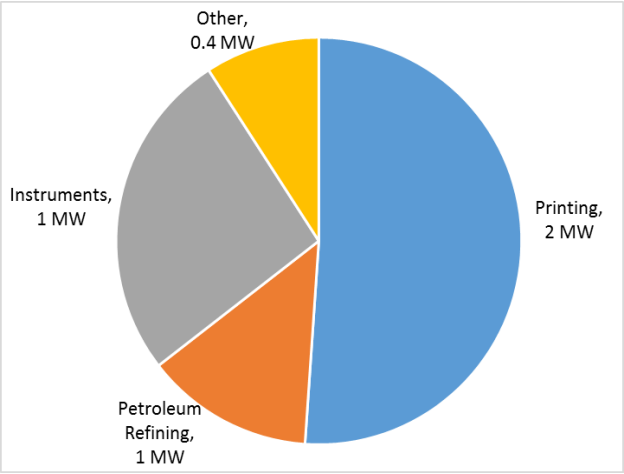
District of Columbia

The District of Columbia has 908 MW CHP technical potential capacity identified at 757 sites[57].

Table 1: Overall CHP Technical Potential in the District of Columbia

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	6	1	1	1	2	3	0	0	0	0	9	4
Commercial Topping Cycle CHP	539	50	135	66	58	91	11	87	3	463	747	757
WHP CHP	0	0	0	0	0	0	0	0	0	0	0	0
District Energy CHP	0	0	0	0	0	0	0	0	1	146	1	146
Total	**545**	**51**	**136**	**67**	**60**	**94**	**11**	**87**	**4**	**609**	**757**	**908**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

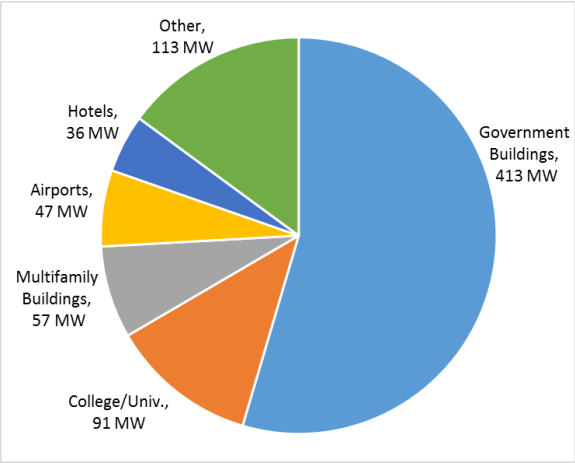


There is 4 MW of industrial on-site CHP technical potential in the District of Columbia, primarily in the printing, refining, and instruments sectors.

Table 1.1: District of Columbia WHP CHP Technical Potential

There is no WHP CHP technical potential identified in the District of Columbia.

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 757 MW of commercial, institutional and multifamily on-site CHP technical potential in the District of Columbia, primarily in the government buildings, universities, multifamily buildings, airports, and hotels sectors.

Table 1.1: Additional CHP Technical Potential in Existing District of Columbia District Energy

SIC	District Energy Type	Total Sites	Total MW
4961	Current Loops without CHP	1	146
4961	Current Loops with CHP expansion	0	0
	Total	**1**	**146**

[57] A detailed breakdown of the District of Columbia technical potential by application and size range is available in Appendix D, page D-15. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

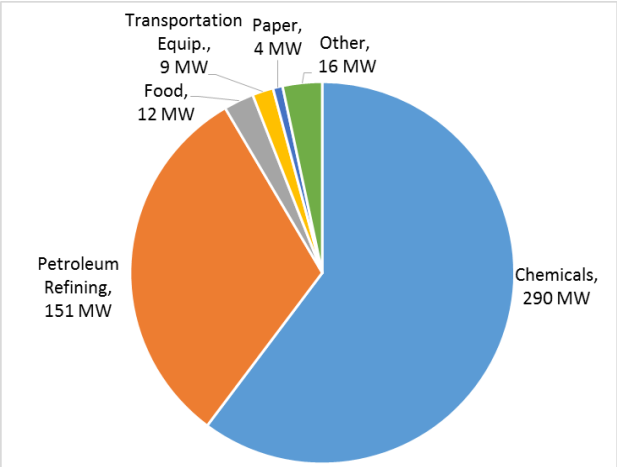
Delaware

Delaware has 747 MW of CHP technical potential capacity identified at 832 sites.[58]

Table 1: Overall CHP Technical Potential in Delaware

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	69	13	15	11	22	47	13	132	4	277	123	481
Commercial Topping Cycle CHP	579	69	89	40	34	46	3	27	1	24	707	207
WHP CHP	0	0	0	0	0	0	1	11	1	49	2	60
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**648**	**82**	**104**	**52**	**56**	**94**	**17**	**170**	**6**	**350**	**832**	**747**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

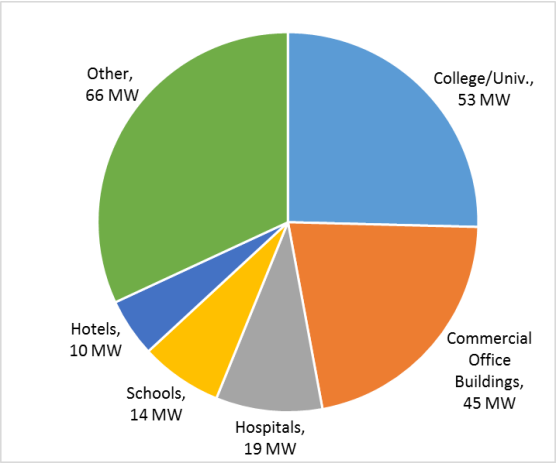


There is 481 MW of industrial on-site CHP technical potential in Delaware, primarily in the chemicals, refining, food, transportation equipment, and paper sectors.

Table 1.1: Delaware WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
29	Petroleum Refining	1	49
33	Primary Metals	1	11
	Total	**2**	**60**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 207 MW of commercial, institutional and multifamily on-site CHP technical potential in Delaware, primarily in the colleges/universities, commercial (office) buildings, schools, hospitals, and hotels sectors.

Table 1.2: Additional CHP Technical Potential in Existing Delaware District Energy

There is no known CHP technical potential at existing district energy loops in Delaware.

[58] A detailed breakdown of Delaware technical potential by application and size range is available in Appendix D, page D-17. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

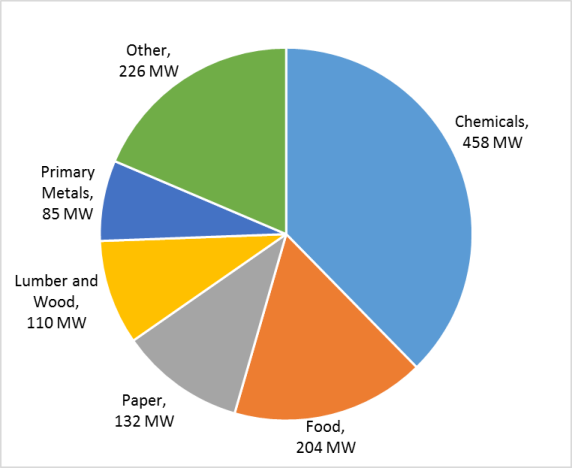
Florida

Florida has 6,968 MW of CHP technical potential capacity identified at 17,823 sites.[59]

Table 1: Overall CHP Technical Potential in Florida

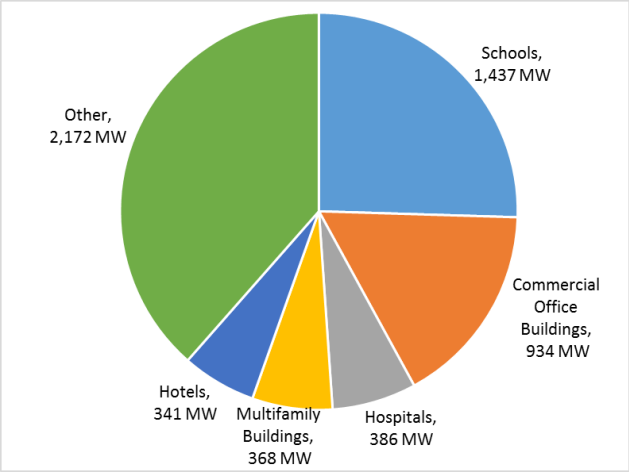
	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	1,099	191	171	122	188	386	34	298	5	220	1,497	1,215
Commercial Topping Cycle CHP	11,828	1,282	3,107	1,677	1,312	1,831	54	541	10	306	16,311	5,637
WHP CHP	4	1	0	0	6	19	2	21	1	24	13	65
District Energy CHP	0	0	0	0	0	0	1	11	1	40	2	51
Total	**12,931**	**1,474**	**3,278**	**1,799**	**1,506**	**2,235**	**91**	**871**	**17**	**590**	**17,823**	**6,968**

Figure 1: Top Industrial Types with On-site CHP Technical Potential



There is 1,215 MW of industrial on-site CHP technical potential in Florida, primarily in the chemicals, food, paper, lumber and wood, and primary metals sectors.

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 5,637 MW of commercial, institutional and multifamily on-site CHP technical potential in Florida, primarily in the schools, commercial (office) buildings, hospitals, multifamily buildings, and hotels sectors.

Table 1.1: Florida WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
13	Oil and Gas Extraction	1	0.2
20	Food	1	0.1
26	Paper	2	0.4
32	Stone/Clay/Glass	8	40
33	Primary Metals	1	24
	Total	**13**	**65**

Table 1.2: Additional CHP Technical Potential in Existing Florida District Energy

SIC	District Energy Type	Total Sites	Total MW
4961	Current Loops without CHP	2	51
4961	Current Loops with CHP expansion	0	0
	Total	**2**	**51**

[59] A detailed breakdown of Florida technical potential by application and size range is available in Appendix D, page D-19. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

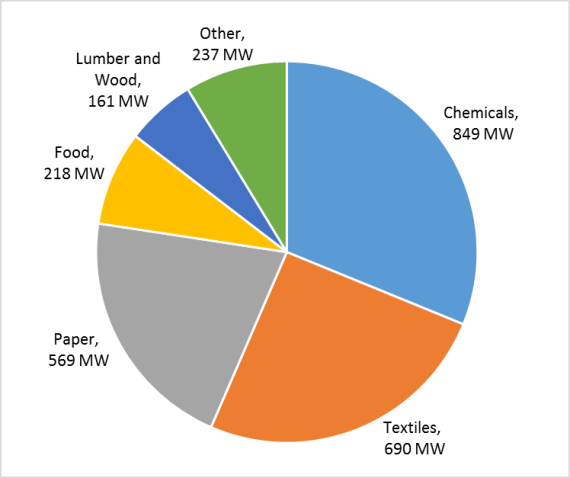
Georgia

Georgia has 5,110 MW of CHP technical potential capacity identified at 9,374 sites.[60]

Table 1: Overall CHP Technical Potential in Georgia

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	1,209	224	215	157	336	694	103	849	21	802	1,884	2,725
Commercial Topping Cycle CHP	5,880	748	1,127	542	446	605	23	233	7	243	7,483	2,371
WHP CHP	2	0.2	0	0	5	14	0	0	0	0	7	14
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**7,091**	**972**	**1,342**	**699**	**787**	**1,312**	**126**	**1,083**	**28**	**1,044**	**9,374**	**5,110**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

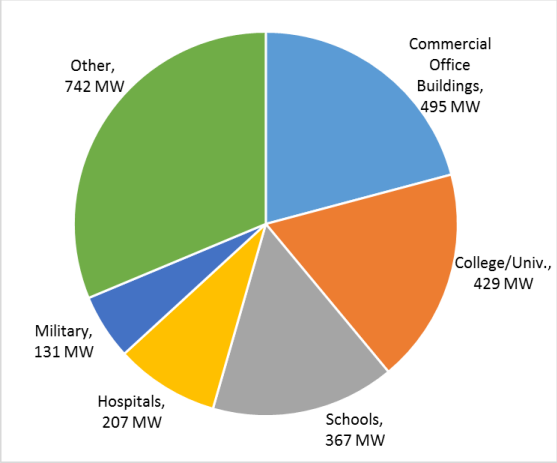


There is 2,725 MW of industrial on-site CHP technical potential in Georgia, primarily in the chemicals, textiles, food, paper, and lumber and wood sectors.

Table 1.1: Georgia WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
26	Paper	1	0.04
28	Chemicals	2	2
32	Stone/Clay/Glass	4	12
	Total	**7**	**14**

Figure 2: Top Commercial Business Types with On-site CHP Technical



There is 2,371 MW of commercial, institutional and multifamily on-site CHP technical potential in Georgia, primarily in the commercial (office) buildings, colleges and universities, schools, hospitals and military sectors.

Table 1.2: Additional CHP Technical Potential in Existing Georgia District Energy

There is no known CHP technical potential at existing district energy loops in Georgia.

[60] A detailed breakdown of Georgia technical potential by application and size range is available in Appendix D, page D-21. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

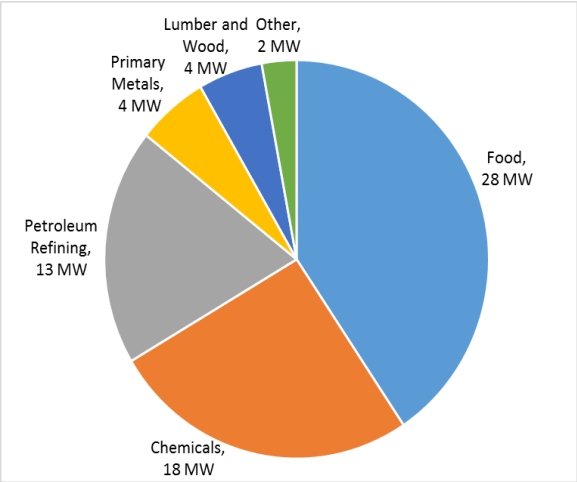
Hawaii

Hawaii has 563 MW of CHP technical potential capacity identified at 1,292 sites.[61]

Table 1: Overall CHP Technical Potential in Hawaii

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	104	17	13	9	13	23	2	20	0	0	132	69
Commercial Topping Cycle CHP	811	83	208	120	134	219	5	40	1	25	1,158	486
WHP CHP	0	0	0	0	2	7	0	0	0	0	2	7
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**915**	**100**	**221**	**129**	**149**	**250**	**7**	**59**	**1**	**25**	**1,292**	**563**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

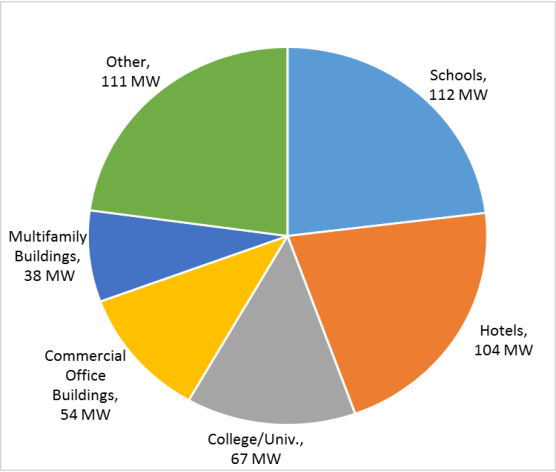


There is 69 MW of industrial on-site CHP technical potential in Hawaii, primarily in the food, chemicals, refining, primary metals, and lumber and wood sectors.

Table 1.1: Hawaii WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
29	Petroleum Refining	2	7
	Total	**2**	**7**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 486 MW of commercial, institutional and multifamily on-site CHP technical potential, primarily in the schools, hotels, colleges and universities commercial (office) buildings, and multifamily buildings sectors.

Table 1.2: Additional CHP Technical Potential in Existing Hawaii District Energy

There is no known CHP technical potential at existing district energy loops in Hawaii.

[61] A detailed breakdown of Hawaii technical potential by application and size range is available in Appendix D, page D-23. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

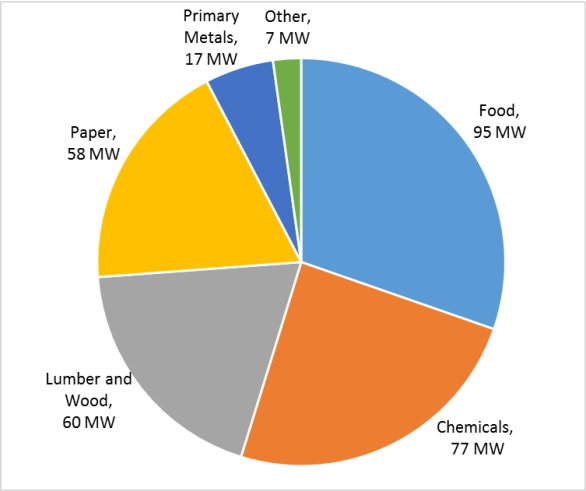
Idaho

Idaho has 659 MW of CHP technical potential capacity identified at 1,407 sites.[62]

Table 1: Overall CHP Technical Potential in Idaho

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	**Sites**	**50-500 kW (MW)**	**Sites**	**0.5-1 MW (MW)**	**Sites**	**1-5 MW (MW)**	**Sites**	**5-20 MW (MW)**	**Sites**	**>20 MW (MW)**	**Total Sites**	**Total MW**
Industrial Topping Cycle CHP	207	36	36	24	61	119	6	54	2	81	312	315
Commercial Topping Cycle CHP	926	94	117	54	45	58	3	39	3	97	1,094	342
WHP CHP	0	0	0	0	1	2	0	0	0	0	1	2
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**1,133**	**130**	**153**	**78**	**107**	**180**	**9**	**93**	**5**	**178**	**1,407**	**659**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

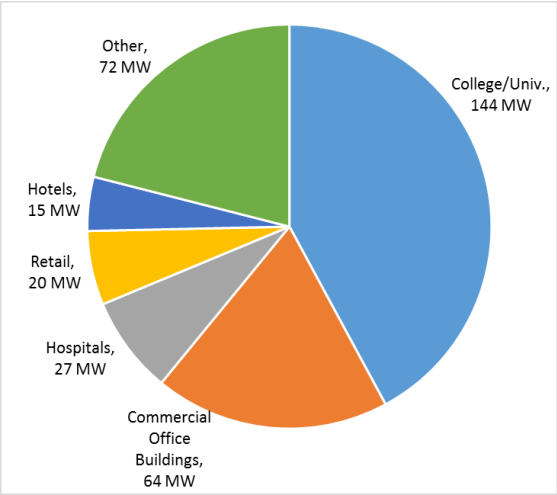


There is 315 MW of industrial on-site CHP technical potential in Idaho, primarily in the food, chemicals, lumber and wood, paper, and primary metals sectors.

Table 1.1: Idaho WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
32	Stone/Clay/Glass	1	2
	Total	**1**	**2**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 342 MW of commercial, institutional and multifamily on-site CHP technical potential in Idaho, primarily in the colleges and universities, commercial (office) buildings, hospitals, retail, and hotels sectors.

Table 1.2: Additional CHP Technical Potential in Existing Idaho District Energy

There is no known CHP technical potential at existing district energy loops in Idaho.

[62] A detailed breakdown of Idaho technical potential by application and size range is available in Appendix D, page D-25. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

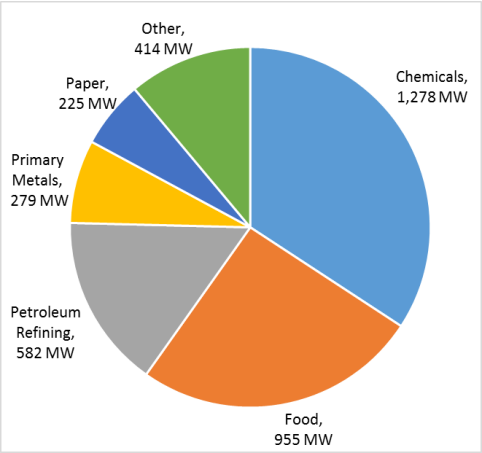
Illinois

Illinois has 7,464 MW of CHP technical potential capacity identified at 13,717 sites.[63]

Table 1: Overall CHP Technical Potential in Illinois

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	1,751	322	291	207	368	770	91	839	33	1,595	2,534	3,733
Commercial Topping Cycle CHP	8,544	862	1,891	848	680	831	34	332	7	201	11,156	3,075
WHP CHP	3	1	0	0	8	24	9	108	5	220	25	353
District Energy CHP	0	0	0	0	0	0	0	0	2	303	2	303
Total	**10,298**	**1,184**	**2,182**	**1,056**	**1,056**	**1,625**	**134**	**1,280**	**47**	**2,319**	**13,717**	**7,464**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

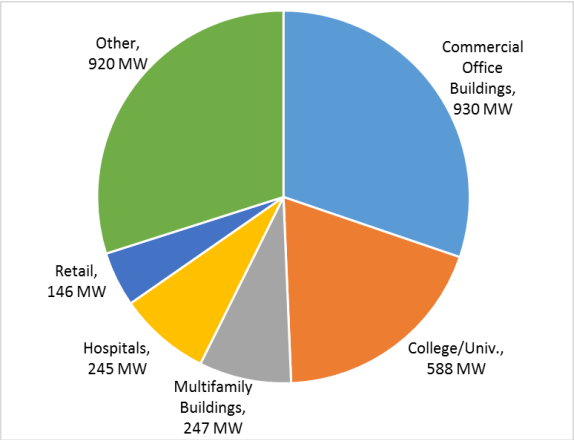


There is 3,733 MW of industrial on-site CHP technical potential in Illinois, primarily in the chemicals, food, refining, primary metals, and paper sectors.

Table 1.1: Illinois WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
13	Oil and Gas Extraction	1	15
28	Chemicals	5	5
29	Petroleum Refining	6	210
32	Stone/Clay/Glass	9	44
33	Primary Metals	4	78
	Total	**25**	**353**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 3,075 MW of commercial, institutional and multifamily on-site CHP technical potential in Illinois, primarily in the commercial (office) buildings, colleges and universities, multifamily buildings, hospitals, and retail sectors.

Table 1.2: Additional CHP Technical Potential in Existing Illinois District Energy

SIC	District Energy Type	Total Sites	Total MW
4961	Current Loops without CHP	1	235
4961	Current Loops with CHP expansion	1	67
	Total	**2**	**303**

[63] A detailed breakdown of Illinois technical potential by application and size range is available in Appendix D, page D-27. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

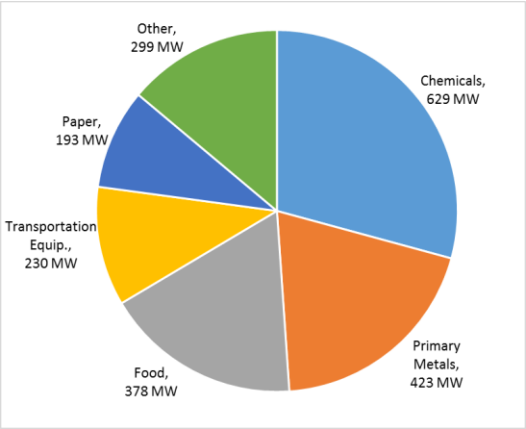
Indiana

Indiana has 4,610 MW of CHP technical potential capacity identified at 7,273 sites.[64]

Table 1: Overall CHP Technical Potential in Indiana

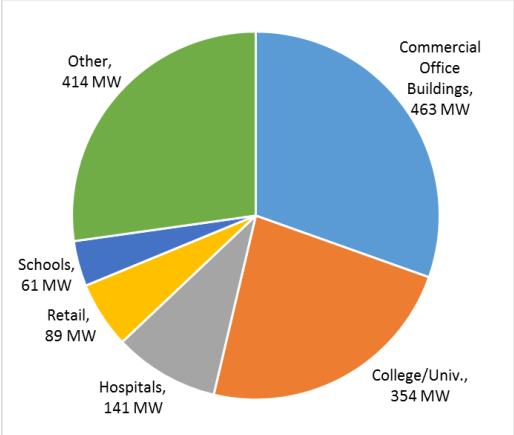
	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	1,147	212	201	144	242	495	88	795	15	506	1,693	2,151
Commercial Topping Cycle CHP	4,346	446	864	387	319	381	18	162	5	145	5,552	1,521
WHP CHP	2	1	2	1	10	30	6	61	7	381	27	473
District Energy CHP	0	0	0	0	0	0	0	0	1	465	1	465
Total	**5,495**	**658**	**1,067**	**531**	**571**	**906**	**112**	**1,018**	**28**	**1,496**	**7,273**	**4,610**

Figure 1: Top Industrial Types with On-site CHP Technical Potential



There is 2,151 MW of industrial on-site CHP technical potential in Indiana, primarily in the chemicals, primary metals, food, transportation equipment, and paper sectors.

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 1,521 MW of commercial, institutional and multifamily on-site CHP technical potential in Indiana, primarily in the commercial (office) buildings, colleges and universities, hospitals, retail, and schools sectors.

Table 1.1: Indiana WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
28	Chemicals	2	5
29	Petroleum Refining	3	63
32	Stone/Clay/Glass	10	44
33	Primary Metals	12	362
	Total	**27**	**473**

Table 1.2: Additional CHP Technical Potential in Existing Indiana District Energy

SIC	District Energy Type	Total Sites	Total MW
4961	Current Loops without CHP	0	0
4961	Current Loops with CHP expansion	1	465
	Total	**1**	**465**

[64] A detailed breakdown of Indiana technical potential by application and size range is available in Appendix D, page D-29. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

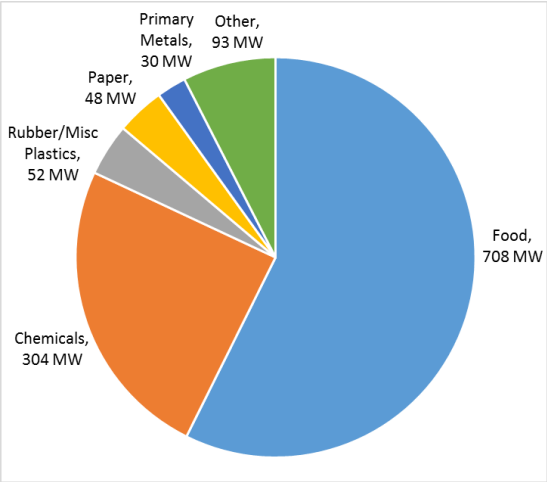
Iowa

Iowa has 1,993 MW of CHP technical potential capacity identified at 3,723 sites.[65]

Table 1: Overall CHP Technical Potential in Iowa

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	647	118	103	75	167	363	31	268	7	411	955	1,235
Commercial Topping Cycle CHP	2,184	224	399	176	162	197	6	50	1	23	2,752	670
WHP CHP	1	0	1	1	10	28	3	31	1	28	16	88
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**2,832**	**342**	**503**	**251**	**339**	**588**	**40**	**350**	**9**	**461**	**3,723**	**1,993**

Figure 1: Top Industrial On-site CHP Technical Potential Business Types

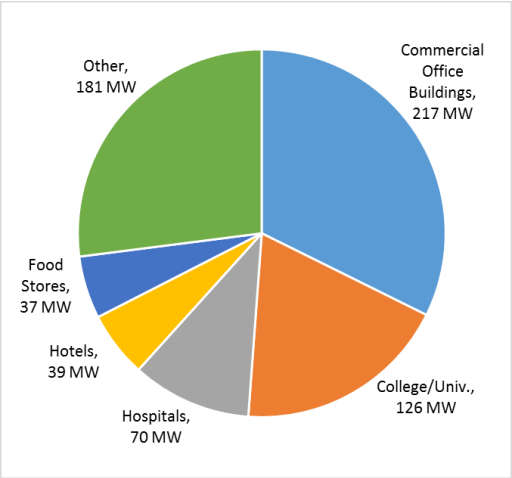


There is 1,235 MW of industrial on-site CHP technical potential in Iowa, primarily in the food, chemicals, rubber and plastics, paper, and primary metals sectors.

Table 1.1: Iowa WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
29	Petroleum Refining	7	16
32	Stone/Clay/Glass	5	25
33	Primary Metals	3	47
35	Machinery	1	0.2
	Total	**16**	**88**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 670 MW of commercial, institutional and multifamily on-site CHP technical potential in Iowa, primarily in the commercial (office) buildings, colleges and universities, hospitals, hotels, and food stores sectors.

Table 1.2: Additional CHP Technical Potential in Existing Iowa District Energy

There is no known CHP technical potential at existing district energy loops in Iowa.

[65] A detailed breakdown of Iowa technical potential by application and size range is available in Appendix D, page D-31. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

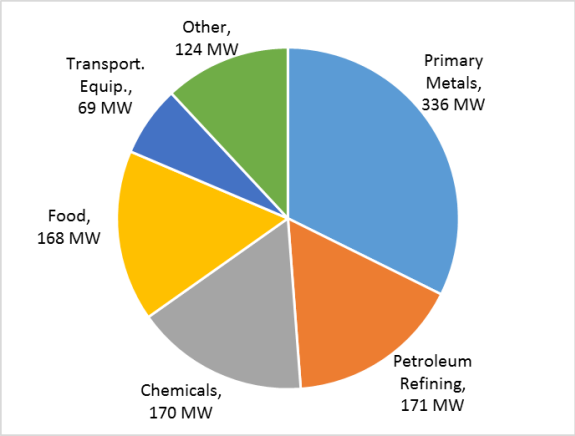
Kansas

Kansas has 1,909 MW of CHP technical potential capacity identified at 3,158 sites.[66]

Table 1: Overall CHP Technical Potential in Kansas

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	400	76	59	41	104	222	45	479	6	221	614	1,039
Commercial Topping Cycle CHP	1,954	216	413	194	139	161	16	144	1	33	2,523	749
WHP CHP	5	1	3	2	6	18	5	43	2	57	21	122
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**2,359**	**293**	**475**	**237**	**249**	**401**	**66**	**666**	**9**	**312**	**3,158**	**1,909**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

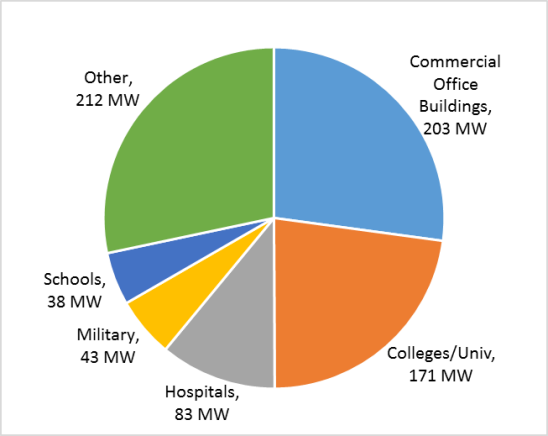


There is 1,039 MW of industrial on-site CHP technical potential in Kansas, primarily in the primary metals, refining, chemicals, food, and transportation equipment sectors.

Table 1.1: Kansas WHP CHP Technical Potential

SIC	WHPCHP Business Type	Total Sites	Total MW
13	Oil and Gas Extraction	9	20
21	Beverage and Tobacco	1	0.002
28	Chemicals	2	3
29	Petroleum Refining	4	76
32	Stone/Clay/Glass	5	23
	Total	**21**	**122**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 749 MW of commercial, institutional and multifamily on-site CHP technical potential in Kansas, primarily in the commercial (office) buildings, colleges/universities, hospitals, and military and schools sectors.

Table 1.2: Additional CHP Technical Potential in Existing Kansas District Energy

There is no known CHP technical potential at existing district energy loops in Kansas.

[66] A detailed breakdown of Kansas technical potential by application and size range is available in Appendix D, page D-33. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

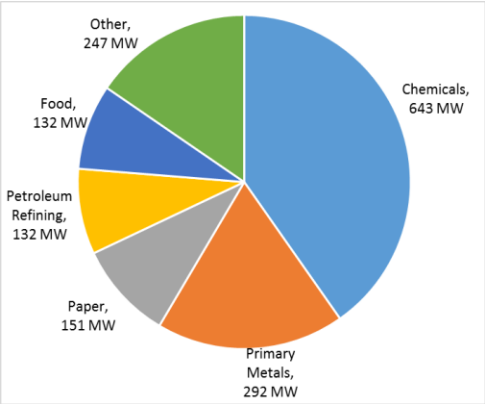
Kentucky

Kentucky has 2,721 MW of CHP technical potential capacity identified at 4,030 sites.[67]

Table 1: Overall CHP Technical Potential in Kentucky

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	567	113	131	94	151	301	57	555	13	536	919	1,598
Commercial Topping Cycle CHP	2,479	273	423	194	177	242	11	121	3	82	3,093	911
WHP CHP	7	2	0	0	3	6	4	42	4	160	18	211
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**3,053**	**387**	**554**	**288**	**331**	**550**	**72**	**718**	**20**	**778**	**4,030**	**2,721**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

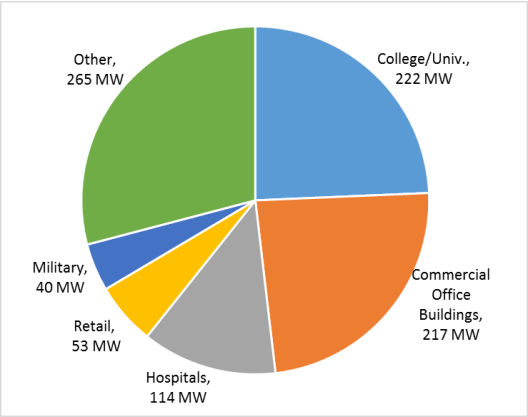


There is 1,598 MW of industrial on-site CHP technical potential in Kentucky, primarily in the chemicals, primary metals, paper, refining, and food sectors.

Table 1.1: Kentucky WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
13	Oil and Gas Extraction	3	2
26	Paper	1	0.5
27	Printing	1	0.1
28	Chemicals	2	0.3
29	Petroleum Refining	2	39
32	Stone/Clay/Glass	6	48
33	Primary Metals	3	122
	Total	**18**	**211**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 911 MW of commercial, institutional and multifamily on-site CHP technical potential in Kentucky, primarily in the colleges and universities, commercial (office) buildings, hospitals, retail, and military sectors.

Table 1.2: Additional CHP Technical Potential in Existing Kentucky District Energy

There is no known CHP technical potential at existing district energy loops in Kentucky.

[67] A detailed breakdown of Kentucky technical potential by application and size range is available in Appendix D, page D-35. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

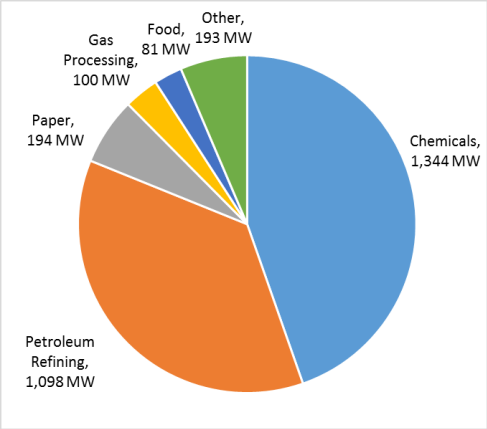
Louisiana

Louisiana has 4,946 MW of CHP technical potential capacity identified at 4,437 sites.[68]

Table 1: Overall CHP Technical Potential in Louisiana

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	477	89	74	51	170	382	50	517	29	1,973	800	3,011
Commercial Topping Cycle CHP	2,730	323	576	288	210	263	26	215	1	21	3,543	1,109
WHP CHP	21	5	14	9	35	104	14	128	9	536	93	782
District Energy CHP	0	0	0	0	0	0	0	0	1	43	1	43
Total	**3,228**	**416**	**664**	**349**	**415**	**749**	**90**	**859**	**40**	**2,573**	**4,437**	**4,946**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

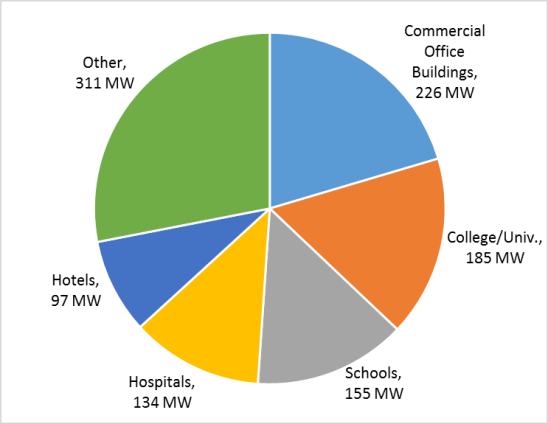


There is 3,011 MW of industrial on-site CHP technical potential in Louisiana, primarily in the chemicals, refining, paper, gas processing, and food sectors.

Table 1.1: Louisiana WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
12	Mining, Except Oil and Gas	1	1
13	Oil and Gas Extraction	51	128
20	Food	1	2
26	Paper	1	0.4
28	Chemcials	8	7
29	Petroleum Refining	26	615
32	Stone/Clay/Glass	2	4
33	Primary Metals	2	26
4222	Warehousing and Storage	1	0.002
	Total	**93**	**782**

Figure 2: Top Commercial On-site CHP Technical Potential Business Types



There is 1,109 MW of commercial, institutional and multifamily on-site CHP technical potential in Louisiana, primarily in the commercial (office) buildings, colleges and universities, schools, hospitals, and hotels sectors.

Table 1.2: Additional CHP Technical Potential in Existing Louisiana District Energy

SIC	District Energy Type	Total Sites	Total MW
4961	Current Loops without CHP	0	0
4961	Current Loops with CHP expansion	1	43
	Total	**1**	**43**

[68] A detailed breakdown of Louisiana technical potential by application and size range is available in Appendix D, page D-37. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

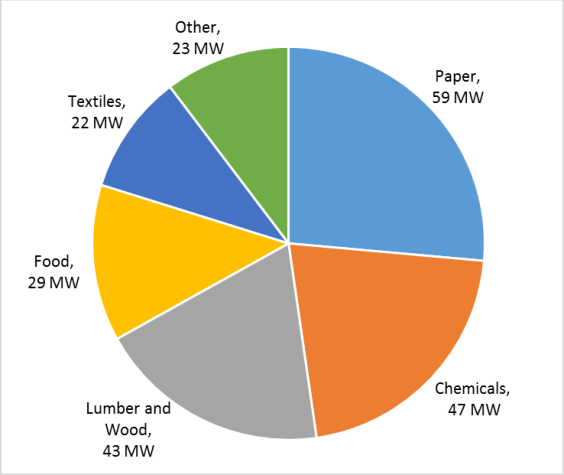
Maine

Maine has 494 MW of CHP technical potential capacity identified at 1,385 sites.[69]

Table 1: Overall CHP Technical Potential in Maine

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	239	41	33	24	39	85	5	43	1	30	317	223
Commercial Topping Cycle CHP	832	90	157	72	71	73	4	31	0	0	1,065	266
WHP CHP	1	0.1	1	1	1	3	0	0	0	0	3	4
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**1,072**	**132**	**191**	**97**	**111**	**161**	**9**	**74**	**1**	**30**	**1,385**	**494**

Figure 1: Top Industrial On-site CHP Technical Potential Business Types

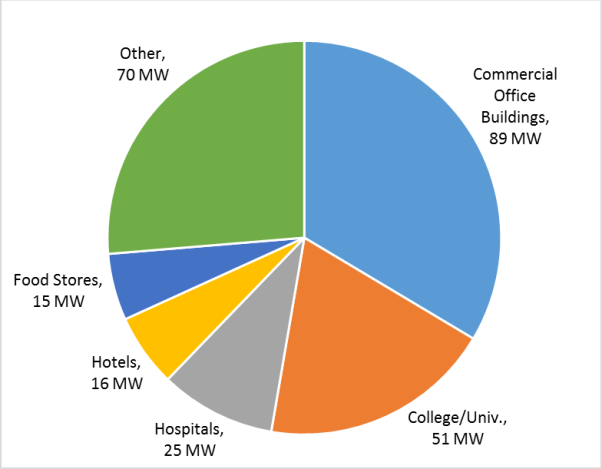


There is 223 MW of industrial on-site CHP technical potential in Maine, primarily in the paper, chemicals, lumber and wood, food, and textiles sectors.

Table 1.1: Maine WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
26	Paper	2	1
32	Stone/Clay/Glass	1	3
	Total	**3**	**4**

Figure 2: Top Commercial On-site CHP Technical Potential Business Types



There is 266 MW of commercial, institutional and multifamily on-site CHP technical potential in Maine, primarily in the commercial (office) buildings, colleges and universities, hospitals, hotels, and food stores sectors.

Table 1.2: Additional CHP Technical Potential in Existing Maine District Energy

There is no known CHP technical potential at existing district energy loops in Maine.

[69] A detailed breakdown of Maine technical potential by application and size range is available in Appendix D, page D-39. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

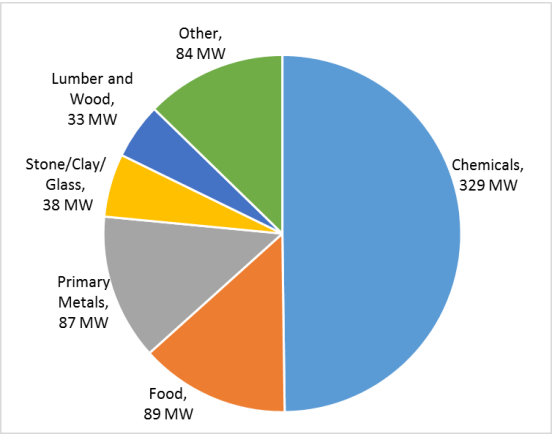
Maryland

Maryland has 2,645 MW of CHP technical potential capacity identified at 4,920 sites.[70]

Table 1: Overall CHP Technical Potential in Maryland

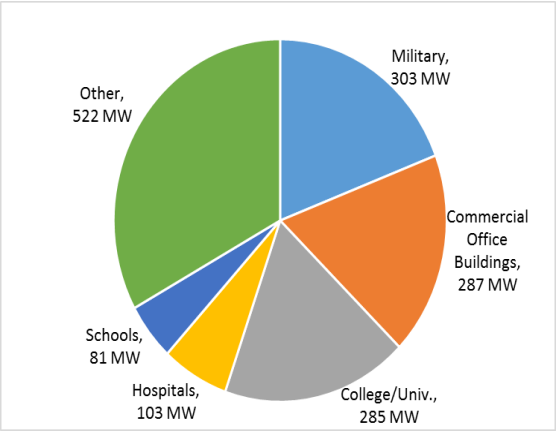
	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	401	72	88	63	74	140	15	136	7	250	585	661
Commercial Topping Cycle CHP	3,429	384	638	295	235	323	22	191	6	387	4,330	1,581
WHP CHP	0	0	0	0	1	2	2	15	1	22	4	40
District Energy CHP	0	0	0	0	0	0	0	0	1	363	1	363
Total	**3,830**	**456**	**726**	**358**	**310**	**466**	**39**	**342**	**15**	**1,023**	**4,920**	**2,645**

Figure 1: Top Industrial Types with On-site CHP Technical Potential



There is 661 MW of industrial on-site CHP technical potential in Maryland, primarily in the chemicals, food, primary metals, stone/clay/glass, and lumber and wood sectors.

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 1,581 MW of commercial, institutional and multifamily on-site CHP technical potential in Maryland, primarily in the military, commercial (office) buildings, colleges/universities, hospitals and schools sectors.

Table 1.1: Maryland WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
32	Stone/Clay/Glass	3	18
33	Primary Metals	1	22
	Total	**4**	**40**

Table 1.2: Additional CHP Technical Potential in Existing Maryland District Energy

SIC	District Energy Type	Total Sites	Total MW
4961	Current Loops without CHP	0	0
4961	Current Loops with CHP expansion	1	363
	Total	**1**	**363**

[70] A detailed breakdown of Maryland technical potential by application and size range is available in Appendix D, page D-41. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

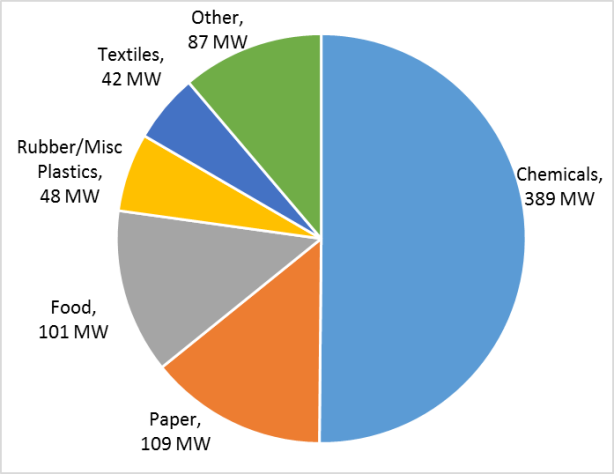
Massachusetts

Massachusetts has 3,434 MW of CHP technical potential capacity identified at 6,659 sites.[71]

Table 1: Overall CHP Technical Potential in Massachusetts

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	756	129	103	74	126	252	21	172	4	149	1,010	777
Commercial Topping Cycle CHP	4,307	458	911	419	396	404	23	193	6	774	5,644	2,249
WHP CHP	1	0.005	1	1	1	2	0	0	0	0	3	3
District Energy CHP	0	0	0	0	0	0	1	7	1	399	2	406
Total	**5,064**	**587**	**1,015**	**494**	**523**	**658**	**45**	**372**	**11**	**1,322**	**6,659**	**3,434**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

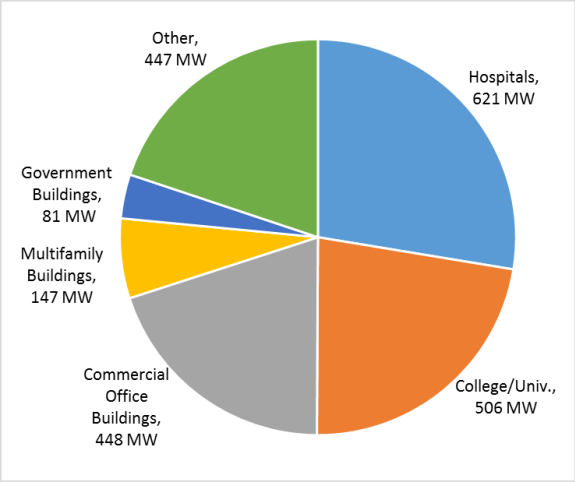


There is 777 MW of industrial on-site CHP technical potential in Massachusetts, primarily in the chemicals, paper, food, rubber and plastics, and textiles sectors.

Table 1.1: Massachusetts WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
32	Stone/Clay/Glass	2	3
38	Instruments	1	0.005
	Total	**3**	**3**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 2,249 MW of commercial, institutional and multifamily on-site CHP potential in Massachusetts, primarily in the hospitals, colleges and universities, commercial (office) buildings, multifamily buildings, and government sectors.

Table 1.2: Additional CHP Technical Potential in Existing Massachusetts District Energy

SIC	District Energy Type	Total Sites	Total MW
4961	Current Loops without CHP	0	0
4961	Current Loops with CHP expansion	2	406
	Total	**2**	**406**

[71] A detailed breakdown of Massachusetts technical potential by application and size range is available in Appendix D, page D-43. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

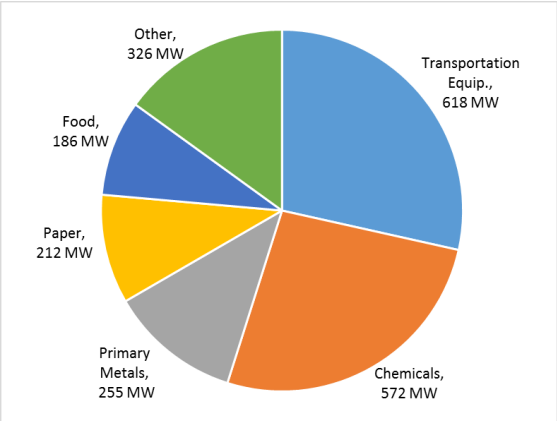
Michigan

Michigan has 4,987 MW of CHP technical potential capacity identified at 10,370 sites.[72]

Table 1: Overall CHP Technical Potential in Michigan

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	1,542	276	289	205	287	596	66	577	14	515	2,198	2,170
Commercial Topping Cycle CHP	6,293	593	1,315	576	502	563	22	174	2	62	8,134	1,967
WHP CHP	16	4	1	1	8	19	9	84	2	47	36	154
District Energy CHP	0	0	0	0	0	0	0	0	2	696	2	696
Total	**7,851**	**872**	**1,605**	**782**	**797**	**1,179**	**97**	**834**	**20**	**1,320**	**10,370**	**4,987**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

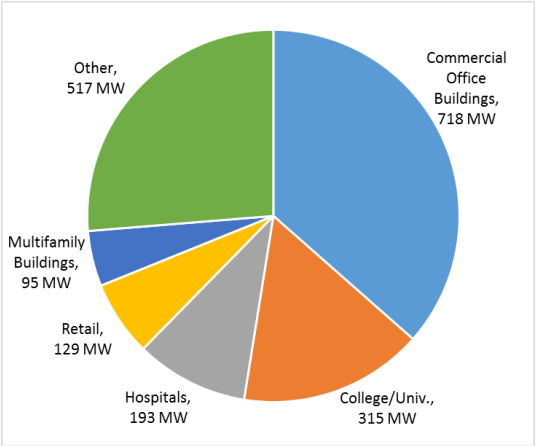


There is 2,170 MW of industrial on-site CHP technical potential in Michigan, primarily in the transportation equipment, chemicals, primary metals, paper, and food sectors.

Table 1.1: Michigan WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
13	Oil and Gas Extraction	12	10
20	Food	4	2
24	Lumber and Wood	1	0.1
28	Chemicals	2	3
29	Petroleum Refining	2	14
32	Stone/Clay/Glass	6	57
33	Primary Metals	8	68
8211	College/Univ.	1	0.1
	Total	**36**	**154**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 1,967 MW of commercial, institutional and multifamily on-site CHP technical potential in Michigan, primarily in the commercial (office) buildings, colleges and universities, hospitals, retail, and multifamily buildings sectors.

Table 1.2: Additional CHP Technical Potential in Existing Michigan District Energy

SIC	District Energy Type	Total Sites	Total MW
4961	Current Loops without CHP	2	696
4961	Current Loops with CHP expansion	0	0
	Total	**2**	**696**

[72] A detailed breakdown of Michigan technical potential by application and size range is available in Appendix D, page D-45. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

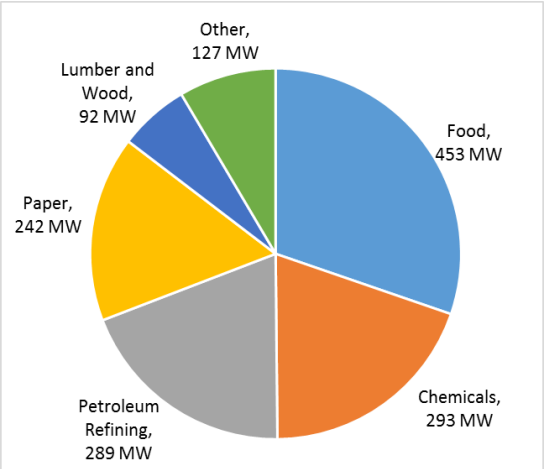
Minnesota

Minnesota has 4,310 MW of CHP technical potential capacity identified at 6,326 sites.[73]

Table 1: Overall CHP Technical Potential in Minnesota

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	899	158	129	93	171	356	47	399	10	489	1,256	1,495
Commercial Topping Cycle CHP	3,934	402	809	371	286	315	18	175	6	378	5,052	1,641
WHP CHP	5	1	0	0	3	4	3	36	1	82	12	123
District Energy CHP	0	0	0	0	0	0	0	0	6	1,050	6	1,050
Total	**4,838**	**561**	**938**	**464**	**460**	**676**	**68**	**610**	**23**	**2,000**	**6,326**	**4,310**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

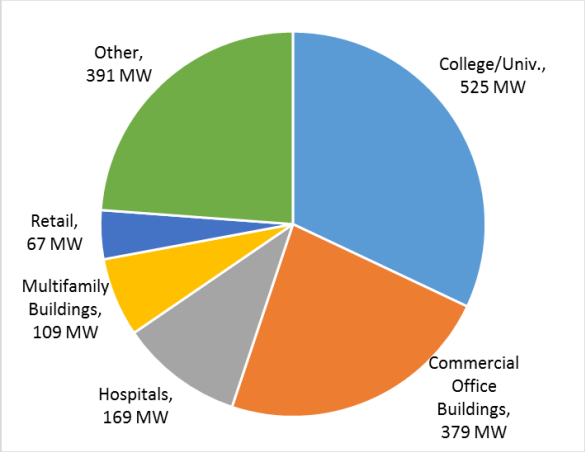


There is 1,495 MW of industrial on-site CHP technical potential in Minnesota, primarily in the food, chemicals, refining, paper, and lumber and wood sectors.

Table 1.1: Minnesota WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
20	Food	4	1
26	Paper	1	0.4
28	Chemicals	1	6
29	Petroleum Refining	2	93
32	Stone/Clay/Glass	2	3
33	Primary Metals	2	20
	Total	**12**	**123**

Figure 2: Top Commercial On-site CHP Technical Potential Business Types



There is 1,641 MW of commercial, institutional and multifamily on-site CHP technical potential in Minnesota, primarily in the colleges and universities, commercial (office) buildings, hospitals, multifamily buildings, and retail sectors.

Table 1.2: Additional CHP Technical Potential in Existing Minnesota District Energy

SIC	District Energy Type	Total Sites	Total MW
4961	Current Loops without CHP	2	433
4961	Current Loops with CHP expansion	4	618
	Total	**6**	**1,050**

[73] A detailed breakdown of Minnesota technical potential by application and size range is available in Appendix D, page D-47. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

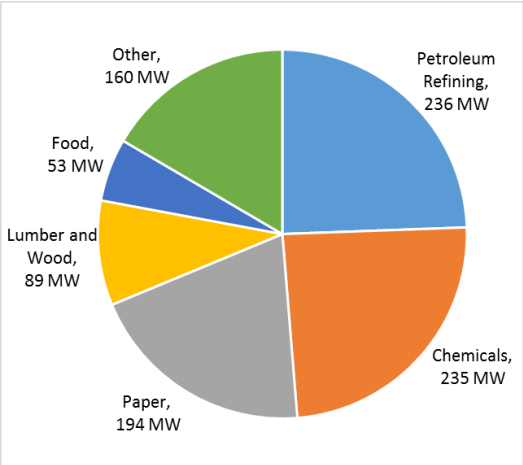
Mississippi

Mississippi has 1,833 MW of CHP technical potential capacity identified at 2,629 sites.[74]

Table 1: Overall CHP Technical Potential in Mississippi

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	359	68	80	56	98	203	26	248	6	391	569	966
Commercial Topping Cycle CHP	1,569	198	327	157	142	213	12	103	1	20	2,051	691
WHP CHP	1	0	2	2	1	3	3	28	2	144	9	176
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**1,929**	**266**	**409**	**214**	**241**	**419**	**41**	**378**	**9**	**555**	**2,629**	**1,833**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

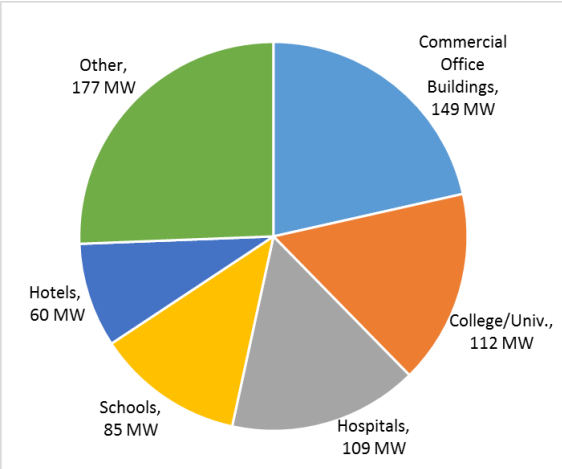


There is 966 MW of industrial on-site CHP technical potential in Mississippi, primarily in the refining, chemicals, paper, lumber and wood, and food sectors.

Table 1.1: Mississippi WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
13	Oil and Gas Extraction	2	11
26	Paper	1	0.1
29	Petroleum Refining	3	112
32	Stone/Clay/Glass	1	3
33	Primary Metals	2	50
	Total	**9**	**176**

Figure 2: Top Commercial On-site CHP Technical Potential Business Types



There is 691 MW of commercial, institutional and multifamily on-site CHP technical potential in Mississippi, primarily in the commercial (office) buildings, colleges and universities, hospitals, schools, and hotels sectors.

Table 1.2: Additional CHP Technical Potential in Existing Mississippi District Energy

There is no known CHP technical potential at existing district energy loops in Mississippi.

[74] A detailed breakdown of Mississippi technical potential by application and size range is available in Appendix D, page D-49. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

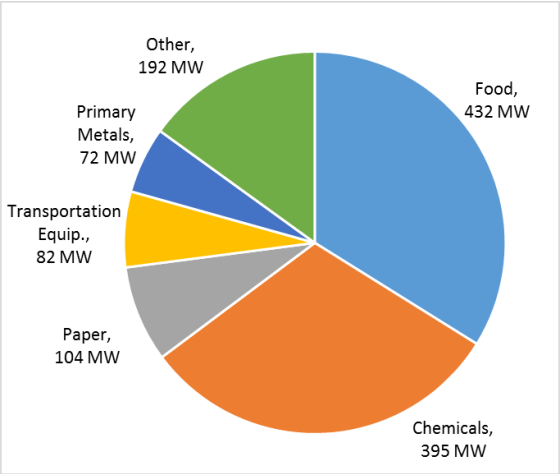
Missouri

Missouri has 3,290 MW of CHP technical potential capacity identified at 6,384 sites.[75]

Table 1: Overall CHP Technical Potential in Missouri

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	851	155	128	91	166	338	40	377	9	316	1,194	1,276
Commercial Topping Cycle CHP	4,017	424	816	365	310	376	24	217	6	138	5,173	1,521
WHP CHP	3	1	1	1	5	12	5	49	1	23	15	85
District Energy CHP	0	0	0	0	0	0	0	0	2	408	2	408
Total	**4,871**	**580**	**945**	**457**	**481**	**726**	**69**	**643**	**18**	**885**	**6,384**	**3,290**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

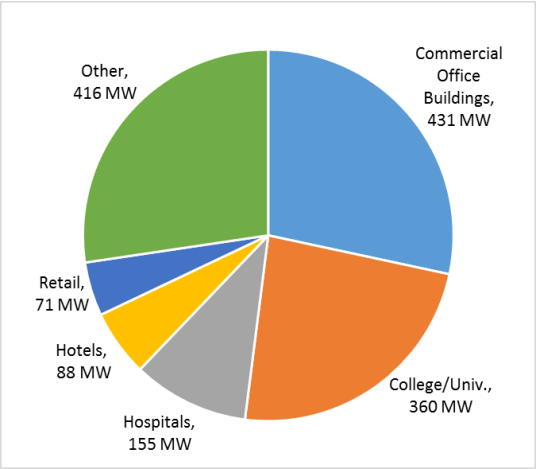


There is 1,276 MW of industrial on-site CHP potential in Missouri, primarily in the food, chemicals, paper, transportation equipment, and primary metals sectors.

Table 1.1: Missouri WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
12	Mining, Except Oil and Gas	1	0.5
28	Chemicals	2	4
32	Stone/Clay/Glass	11	81
33	Primary Metals	1	0.1
	Total	**15**	**85**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 1,521 MW of commercial, institutional and multifamily on-site CHP technical potential in Missouri, primarily in the commercial (office) buildings, colleges and universities, hospitals, hotels, and retail sectors.

Table 1.2: Additional CHP Technical Potential in Existing Missouri District Energy

SIC	District Energy Type	Total Sites	Total MW
4961	Current Loops without CHP	0	0
4961	Current Loops with CHP expansion	2	408
	Total	**2**	**408**

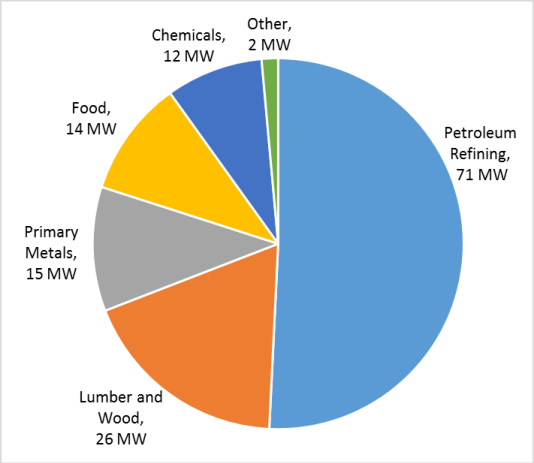
[75] A detailed breakdown of Missouri technical potential by application and size range is available in Appendix D, page D-51. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

Montana

Montana has 377 MW of CHP technical potential capacity identified at 942 sites.[76]

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	123	19	10	7	18	29	3	19	2	65	156	140
Commercial Topping Cycle CHP	659	69	86	43	30	36	4	31	0	0	779	179
WHP CHP	1	0.4	0	0	3	5	2	25	1	27	7	58
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**783**	**89**	**96**	**50**	**51**	**71**	**9**	**74**	**3**	**92**	**942**	**377**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

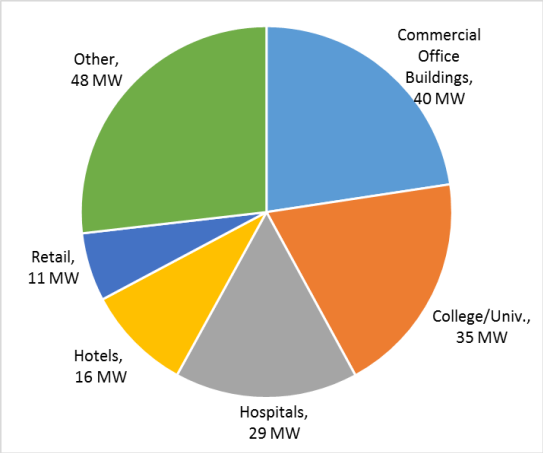


There is 140 MW of industrial on-site CHP technical potential in Montana, primarily in the refining, lumber and wood, primary metals, food, and chemicals sectors.

Table 1.1: Montana WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
20	Food	1	0.4
29	Petroleum Refining	4	53
32	Stone/Clay/Glass	2	4
	Total	**7**	**58**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 179 MW of commercial, institutional and multifamily on-site CHP technical potential in Montana, primarily in the commercial (office) buildings, colleges and universities, hospitals, hotels, and retail sectors.

Table 1.2: Additional CHP Technical Potential in Existing Montana District Energy

There is no known CHP technical potential at existing district energy loops in Montana.

[76] A detailed breakdown of Montana technical potential by application and size range is available in Appendix D, page D-53. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

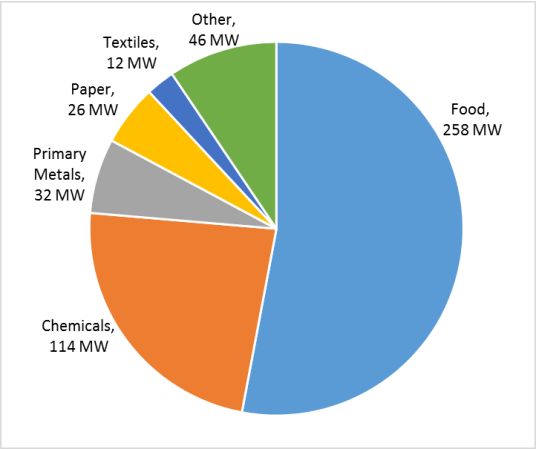
Nebraska

Nebraska has 984 MW of CHP technical potential capacity identified at 2,067 sites.[77]

Table 1: Overall CHP Technical Potential in Nebraska

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	244	43	49	35	77	166	23	206	1	37	394	487
Commercial Topping Cycle CHP	1,318	142	239	106	98	114	9	95	0	0	1,664	458
WHP CHP	2	0.3	0	0	6	15	0	0	1	24	9	39
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**1,564**	**185**	**288**	**141**	**181**	**295**	**32**	**302**	**2**	**62**	**2,067**	**984**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

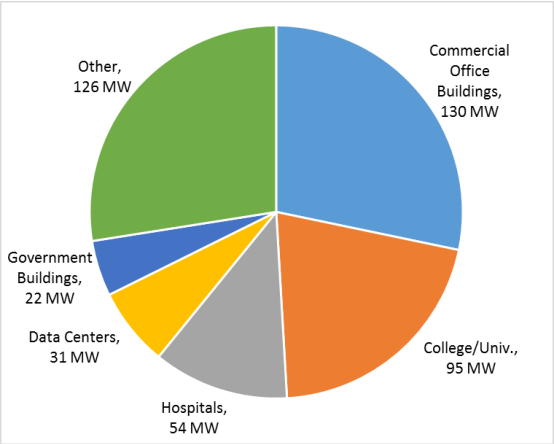


There is 487 MW of industrial on-site CHP technical potential in Nebraska, primarily in the food, chemicals, primary metals, paper, and textiles sectors.

Table 1.1: Nebraska WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
20	Food	2	0.3
29	Petroleum Refining	5	11
32	Stone/Clay/Glass	1	4
33	Primary Metals	1	24
	Total	**9**	**39**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 458 MW of commercial, institutional and multifamily on-site CHP technical potential in Nebraska, primarily in the commercial (office) buildings, colleges/universities, hospitals, data centers and government buildings sectors.

Table 1.2: Additional CHP Technical Potential in Existing Nebraska District Energy

There is no known CHP technical potential at existing district energy loops in Nebraska.

[77] A detailed breakdown of Nebraska technical potential by application and size range is available in Appendix D, page D-55. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

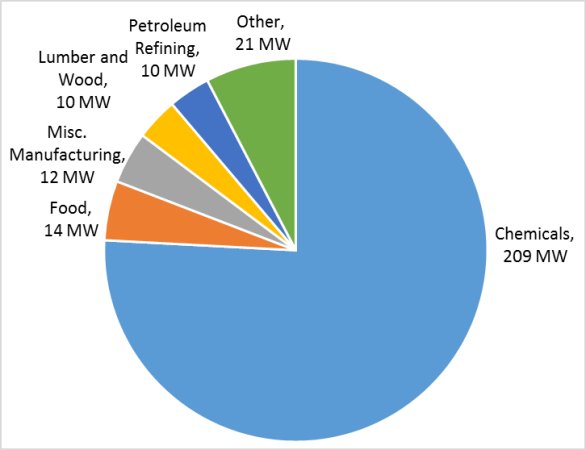
Nevada

Nevada has 1,378 MW of CHP technical potential capacity identified at 2,399 sites. [78]

Table 1: Overall CHP Technical Potential in Nevada

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	123	21	19	13	22	41	5	26	3	174	172	275
Commercial Topping Cycle CHP	1,684	202	341	173	170	276	22	187	5	132	2,223	971
WHP CHP	0	0	0	0	2	7	0	0	0	0	2	7
District Energy CHP	0	0	0	0	0	0	0	0	2	124	2	124
Total	**1,807**	**223**	**360**	**186**	**194**	**325**	**27**	**214**	**10**	**429**	**2,399**	**1,378**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

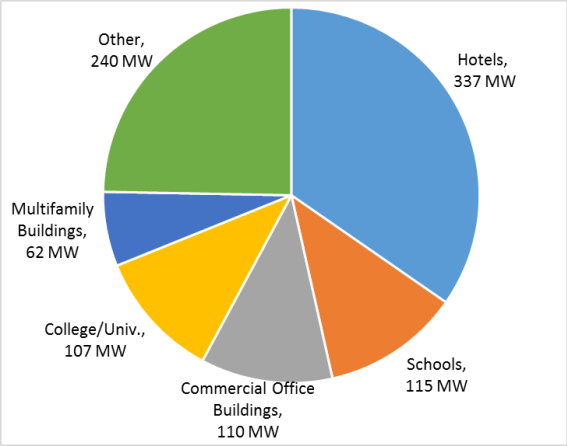


There is 275 MW of industrial on-site CHP technical potential in Nevada, primarily in the chemicals, food, miscellaneous manufacturing, refining, and lumber and wood sectors.

Table 1.1: Nevada WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
32	Stone/Clay/Glass	2	7
	Total	**2**	**7**

Figure 2: Top Commercial On-site CHP Technical Potential Business Types



There is 971 MW of commercial, institutional and multifamily on-site CHP potential in Nevada, primarily in the hotels, schools, commercial (office) buildings, colleges and universities, and multifamily buildings sectors.

Table 1.2: Additional CHP Technical Potential in Existing Nevada District Energy

SIC	District Energy Type	Total Sites	Total MW
4961	Current Loops without CHP	2	124
4961	Current Loops with CHP expansion	0	0
	Total	**2**	**124**

[78] A detailed breakdown of Nevada technical potential by application and size range is available in Appendix D, page D-57. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

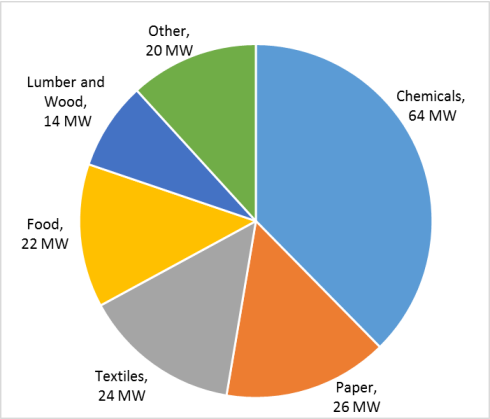
New Hampshire

New Hampshire has 447 MW of CHP technical potential capacity identified at 1,363 sites.[79]

Table 1: Overall CHP Technical Potential in New Hampshire

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	**Sites**	**50-500 kW (MW)**	**Sites**	**0.5-1 MW (MW)**	**Sites**	**1-5 MW (MW)**	**Sites**	**5-20 MW (MW)**	**Sites**	**>20 MW (MW)**	**Total Sites**	**Total MW**
Industrial Topping Cycle CHP	183	31	27	20	21	45	5	35	1	40	237	170
Commercial Topping Cycle CHP	886	97	168	77	71	64	1	12	1	26	1,126	277
WHP CHP	0	0	0	0	0	0	0	0	0	0	0	0
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**1,069**	**128**	**195**	**97**	**92**	**109**	**6**	**47**	**2**	**66**	**1,363**	**447**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

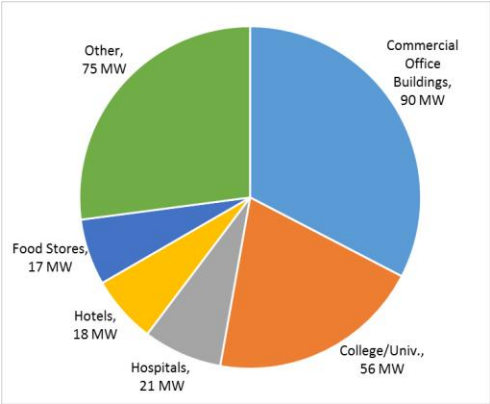


There is 170 MW of industrial on-site CHP technical potential in New Hampshire, primarily in the chemicals, paper, textiles, food, and lumber and wood sectors.

Table 1.1: New Hampshire WHP CHP Technical Potential

There is no WHP CHP technical potential identified in New Hampshire.

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 277 MW of commercial, institutional and multifamily on-site CHP technical potential in New Hampshire, primarily in the commercial (office) buildings, colleges and universities, hospitals, hotels, and food stores sectors.

Table 1.2: Additional CHP Technical Potential in Existing New Hampshire District Energy

There is no known CHP technical potential at existing district energy loops in New Hampshire.

[79] A detailed breakdown of New Hampshire technical potential by application and size range is available in Appendix D, page D-59. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

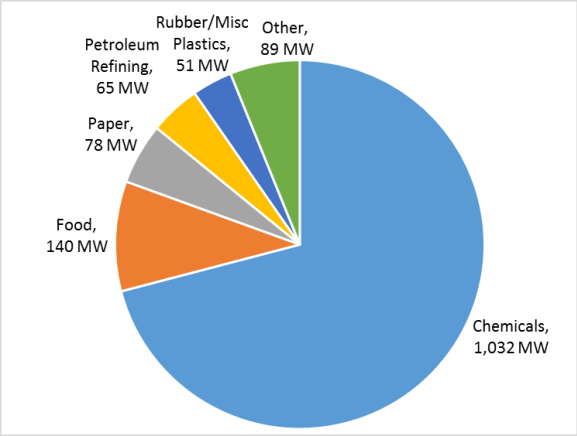
New Jersey

New Jersey has 3,796 MW of CHP technical potential capacity identified at 8,649 sites. [80]

Table 1: Overall CHP Technical Potential in New Jersey

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	1,060	192	183	130	170	346	55	456	12	331	1,480	1,456
Commercial Topping Cycle CHP	5,417	616	1,170	538	534	636	31	270	4	139	7,157	2,199
WHP CHP	1	0.4	1	1	4	9	2	27	2	69	10	106
District Energy CHP	0	0	0	0	0	0	1	7	1	29	2	35
Total	**6,478**	**809**	**1,354**	**669**	**708**	**992**	**89**	**760**	**19**	**567**	**8,649**	**3,796**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

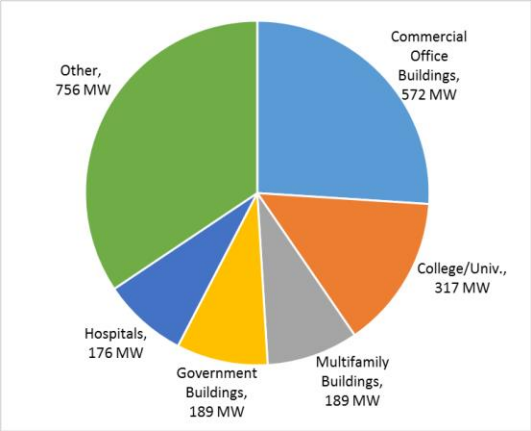


There is 1,456 MW of industrial on-site CHP technical potential in New Jersey, primarily in the chemicals, food, paper, refining, and rubber/plastics sectors.

Table 1.1: New Jersey WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
29	Petroleum Refining	4	79
32	Stone/Clay/Glass	4	9
33	Primary Metals	2	17
	Total	**10**	**106**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 2,199 MW of commercial, institutional and multifamily on-site CHP technical potential in New Jersey, primarily in the commercial (office) buildings, colleges and universities, multifamily buildings, government buildings, and hospitals sectors.

Table 1.2: Additional CHP Technical Potential in Existing New Jersey District Energy

SIC	District Energy Type	Total Sites	Total MW
4961	Current Loops without CHP	0	0
4961	Current Loops with CHP expansion	2	35
	Total	**2**	**35**

[80] A detailed breakdown of New Jersey technical potential by application and size range is available in Appendix D, page D-61. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

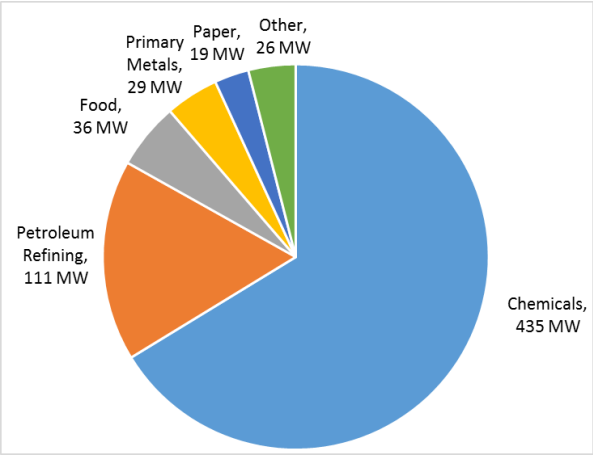
New Mexico

New Mexico has 1,140 MW of CHP technical potential capacity identified at 1,742 sites.[81]

Table 1: Overall CHP Technical Potential in New Mexico

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	**Sites**	**50-500 kW (MW)**	**Sites**	**0.5-1 MW (MW)**	**Sites**	**1-5 MW (MW)**	**Sites**	**5-20 MW (MW)**	**Sites**	**>20 MW (MW)**	**Total Sites**	**Total MW**
Industrial Topping Cycle CHP	125	23	24	17	36	90	5	45	5	481	195	657
Commercial Topping Cycle CHP	1,240	135	194	95	74	112	10	75	1	24	1,519	441
WHP CHP	14	4	5	3	7	16	2	19	0	0	28	43
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**1,379**	**162**	**223**	**115**	**117**	**218**	**17**	**140**	**6**	**505**	**1,742**	**1,140**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

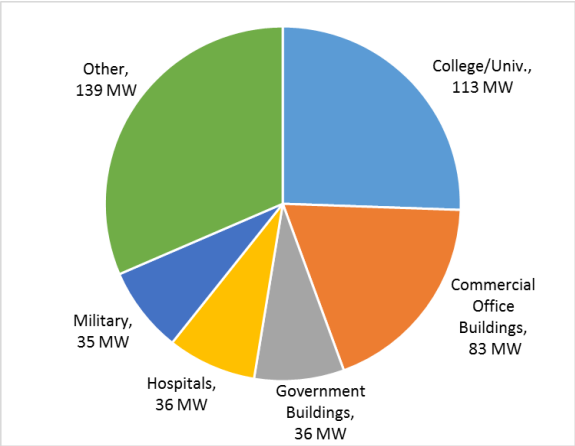


There is 657 MW of industrial on-site CHP technical potential in New Mexico, primarily in the chemicals, refining, food, primary metals, and paper sectors.

Table 1.1: New Mexico WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
13	Oil and Gas Extraction	24	22
29	Petroleum Refining	3	18
32	Stone/Clay/Glass	1	2
	Total	**28**	**43**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 441 MW of commercial, institutional and multifamily on-site CHP technical potential in New Mexico, primarily in the colleges and universities, commercial (office) buildings, government buildings, hospitals, and military sectors.

Table 1.2: Additional CHP Technical Potential in Existing New Mexico District Energy

There is no known CHP technical potential at existing district energy loops in New Mexico.

[81] A detailed breakdown of New Mexico technical potential by application and size range is available in Appendix D, page D-63. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

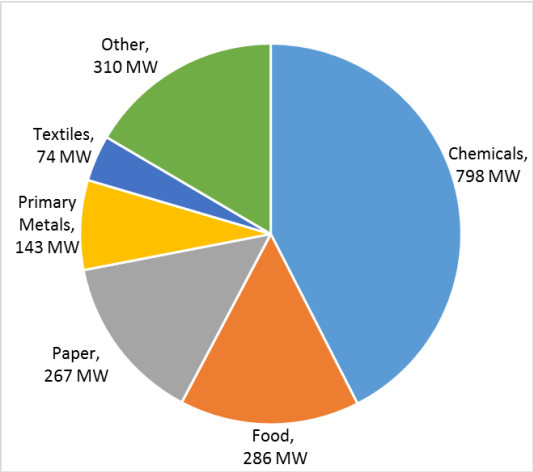
New York

New York has 10,818 MW of CHP technical potential capacity identified at 16,901 sites.[82]

Table 1: Overall CHP Technical Potential in New York

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	1,477	257	245	176	270	582	65	607	8	255	2,065	1,877
Commercial Topping Cycle CHP	10,810	1,125	2,636	1,211	1,296	1,544	67	604	10	497	14,819	4,981
WHP CHP	2	0.3	2	1	6	15	3	33	0	0	13	50
District Energy CHP	0	0	0	0	0	0	1	8	3	3,901	4	3,910
Total	**12,289**	**1,382**	**2,883**	**1,389**	**1,572**	**2,141**	**136**	**1,252**	**21**	**4,652**	**16,901**	**10,818**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

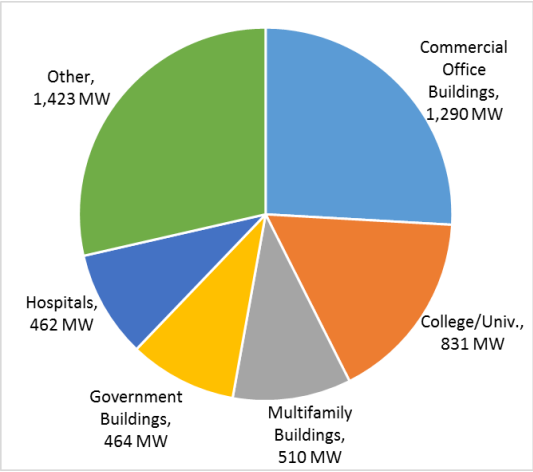


There is 1,877 MW of industrial on-site CHP technical potential in New York, primarily in the chemicals, food, paper, primary metals, and textiles.

Table 1.1: New York WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
20	Food	1	2
28	Chemicals	3	3
32	Stone/Clay/Glass	8	31
33	Primary Metals	1	14
	Total	**13**	**50**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 4,981 MW of commercial, institutional and multifamily on-site CHP technical potential in New York, primarily in the commercial (office) buildings, colleges and universities, multifamily buildings, government buildings, and hospitals sectors.

Table 1.2: Additional CHP Technical Potential in Existing New York District Energy

SIC	District Energy Type	Total Sites	Total MW
4961	Current Loops without CHP	2	103
4961	Current Loops with CHP expansion	2	3,807
	Total	**4**	**3,910**

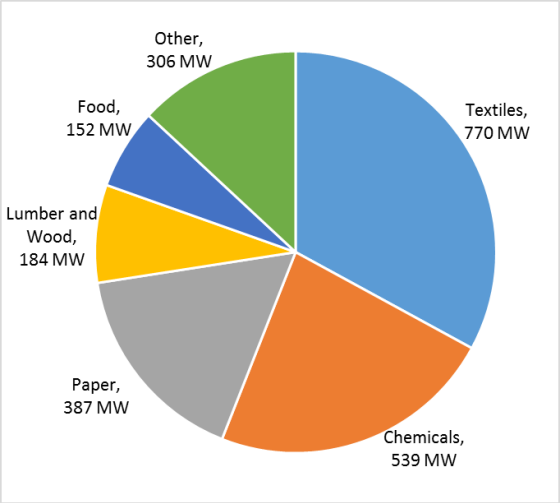
[82] A detailed breakdown of New York technical potential by application and size range is available in Appendix D, page D-65. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

North Carolina

North Carolina has 4,352 MW of CHP technical potential capacity identified at 8,437 sites.[83]

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	1,343	261	246	177	395	791	82	670	13	440	2,079	2,339
Commercial Topping Cycle CHP	5,092	596	892	431	317	415	37	300	6	188	6,344	1,931
WHP CHP	2	0.1	1	1	6	14	4	37	1	31	14	82
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**6,437**	**857**	**1,139**	**609**	**718**	**1,219**	**123**	**1,008**	**20**	**660**	**8,437**	**4,352**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

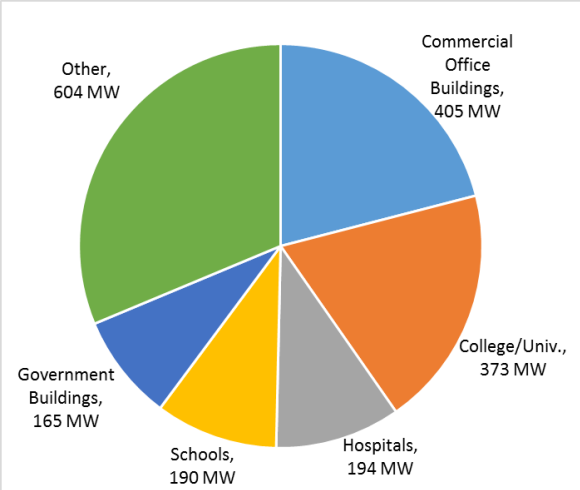


There is 2,339 MW of industrial on-site CHP technical potential in North Carolina, primarily in the textiles, chemicals, paper, lumber and wood, and food sectors.

Table 1.1: North Carolina WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
12	Mining, Except Oil and Gas	1	2
26	Paper	1	0.1
28	Chemicals	1	0.0003
32	Stone/Clay/Glass	9	40
33	Primary Metals	2	41
	Total	**14**	**82**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 1,931 MW of commercial, institutional and multifamily on-site CHP technical potential in North Carolina, primarily in the commercial (office) buildings, colleges and universities, hospitals, schools, and government buildings sectors.

Table 1.2: Additional CHP Technical Potential in Existing North Carolina District Energy

There is no known CHP technical potential at existing district energy loops in North Carolina.

[83] A detailed breakdown of North Carolina technical potential by application and size range is available in Appendix D, page D-67. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

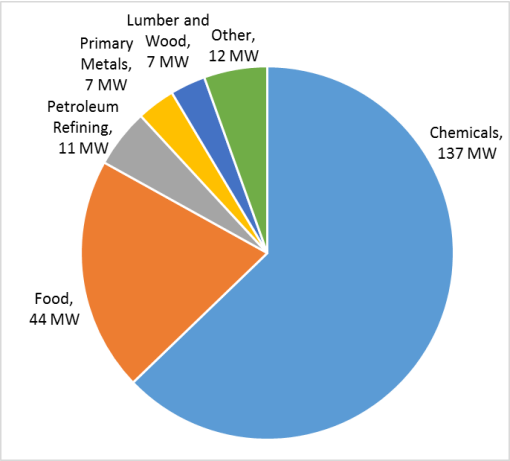
North Dakota

North Dakota has 445 MW of CHP technical potential capacity identified at 890 sites.[84]

Table 1: Overall CHP Technical Potential in North Dakota

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	111	19	15	10	18	41	4	29	2	119	150	218
Commercial Topping Cycle CHP	586	64	102	49	38	52	5	54	0	0	731	218
WHP CHP	4	1	4	3	0	0	1	6	0	0	9	10
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**701**	**84**	**121**	**61**	**56**	**93**	**10**	**89**	**2**	**119**	**890**	**445**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

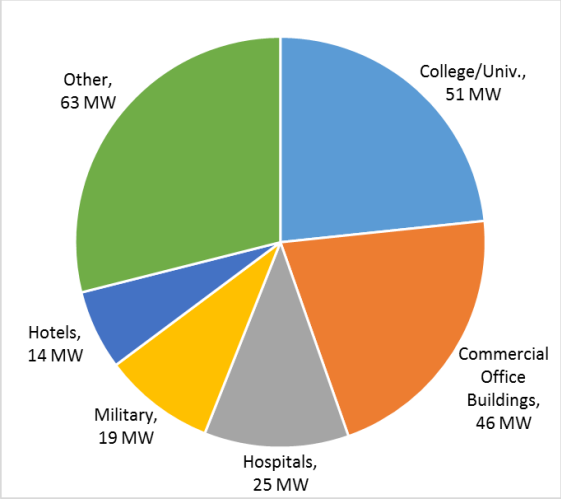


There is 218 MW of industrial on-site CHP technical potential in North Dakota, primarily in the chemicals, food, refining, primary metals, and lumber and wood sectors.

Table 1.1: North Dakota WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
13	Oil and Gas Extraction	4	3
20	Food	4	1
29	Petroleum Refining	1	6
	Total	**9**	**10**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 218 MW of commercial, institutional and multifamily on-site CHP technical potential in North Dakota, primarily in the colleges and universities, commercial (office) buildings, hospitals, military, and hotels sectors.

Table 1.2: Additional CHP Technical Potential in Existing North Dakota District Energy

There is no known CHP technical potential at existing district energy loops in North Dakota.

[84] A detailed breakdown of North Dakota technical potential by application and size range is available in Appendix D, page D-69. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

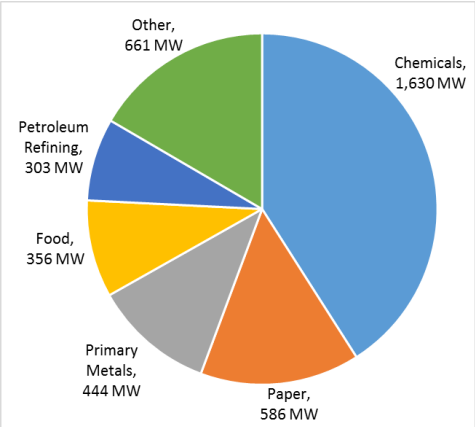
Ohio

Ohio has 7,288 MW of CHP technical potential capacity identified at 13,194 sites.[85]

Table 1: Overall CHP Technical Potential in Ohio

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	1,886	342	388	276	433	917	127	1,174	30	1,272	2,864	3,981
Commercial Topping Cycle CHP	8,094	836	1,518	668	638	794	31	248	6	170	10,288	2,717
WHP CHP	6	0	2	2	12	32	14	146	4	127	38	307
District Energy CHP	0	0	0	0	0	0	0	0	4	283	4	283
Total	**9,986**	**1,178**	**1,908**	**946**	**1,083**	**1,744**	**172**	**1,569**	**44**	**1,852**	**13,194**	**7,288**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

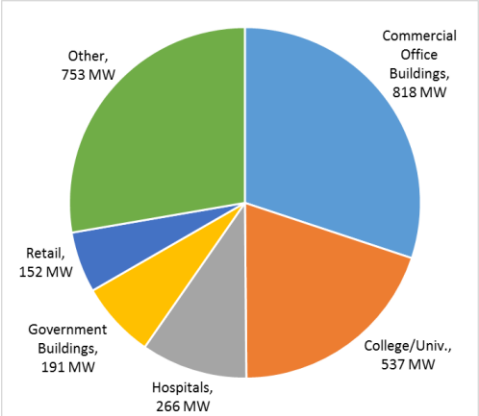


There is 3,981 MW of industrial on-site CHP technical potential in Ohio, primarily in the chemicals, paper, primary metals, food, and refining sectors.

Table 1.1: Ohio WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
13	Oil and Gas Extraction	1	0.1
28	Chemicals	1	2
29	Petroleum Refining	7	84
30	Rubber/Misc Plastics	1	0.02
32	Stone/Clay/Glass	14	48
33	Primary Metals	13	171
37	Transportation Equip.	1	2
	Total	**38**	**307**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 2,717 MW of commercial, institutional and multifamily on-site CHP technical potential in Ohio, primarily in the commercial (office) buildings, colleges and universities, hospitals, government buildings, and retail sectors.

Table 1.2: Additional CHP Technical Potential in Existing Ohio District Energy

SIC	District Energy Type	Total Sites	Total MW
4961	Current Loops without CHP	3	199
4961	Current Loops with CHP expansion	1	84
	Total	**4**	**283**

[85] A detailed breakdown of Ohio technical potential by application and size range is available in Appendix D, page D-71. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

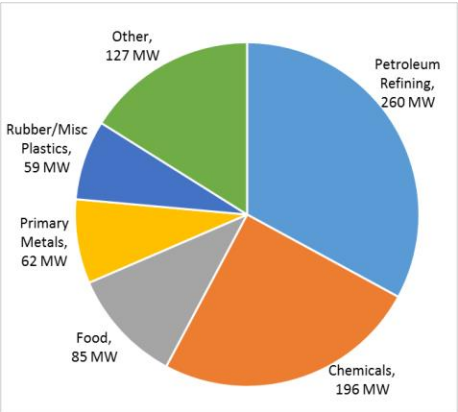
Oklahoma

Oklahoma has 1,916 MW of CHP technical potential capacity identified at 3,397 sites.[86]

Table 1: Overall CHP Technical Potential in Oklahoma

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	375	70	70	53	83	173	26	279	5	214	559	790
Commercial Topping Cycle CHP	2,166	253	419	204	161	217	18	155	1	21	2,766	851
WHP CHP	31	7	16	11	14	29	8	78	1	40	70	165
District Energy CHP	0	0	0	0	0	0	0	0	2	111	2	111
Total	**2,572**	**330**	**505**	**268**	**258**	**419**	**52**	**512**	**9**	**386**	**3,397**	**1,916**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

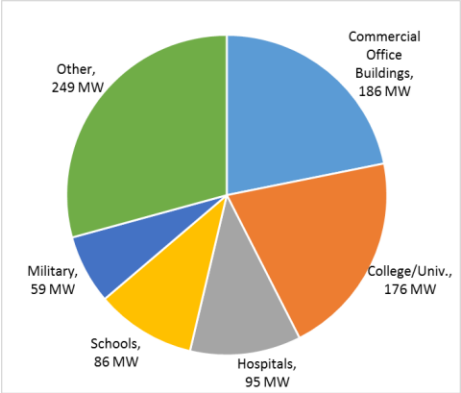


There is 790 MW of industrial on-site CHP technical potential in Oklahoma, primarily in the refining, chemicals, food, primary metals, and rubber/plastics sectors.

Table 1.1: Oklahoma WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
13	Oil and Gas Extraction	53	30
26	Paper	1	0.2
29	Petroleum Refining	7	90
32	Stone/Clay/Glass	8	32
33	Primary Metals	1	13
	Total	**70**	**165**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 851 MW of commercial, institutional and multifamily on-site CHP technical potential in Oklahoma, primarily in the commercial (office) buildings, colleges and universities, hospitals, schools, and military sectors.

Table 1.2: Additional CHP Technical Potential in Existing Oklahoma District Energy

SIC	District Energy Type	Total Sites	Total MW
4961	Current Loops without CHP	0	0
4961	Current Loops with CHP expansion	2	111
	Total	**2**	**111**

[86] A detailed breakdown of Oklahoma technical potential by application and size range is available in Appendix D, page D-73. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

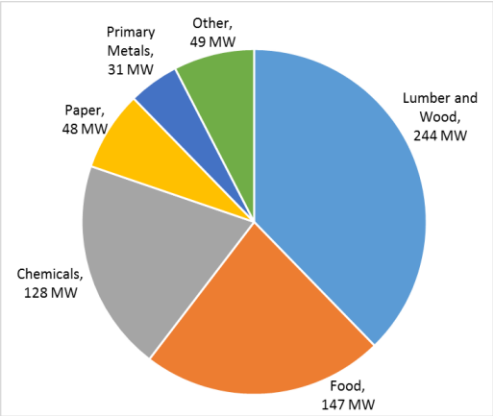
Oregon

Oregon has 1,342 MW of CHP technical potential capacity identified at 3,466 sites.[87]

Table 1: Overall CHP Technical Potential in Oregon

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	608	111	94	66	127	262	21	167	1	39	851	646
Commercial Topping Cycle CHP	2,122	211	347	164	130	197	9	67	1	23	2,609	662
WHP CHP	1	0.02	0	0	3	10	1	18	0	0	5	29
District Energy CHP	0	0	0	0	1	5	0	0	0	0	1	5
Total	**2,731**	**323**	**441**	**230**	**261**	**474**	**31**	**252**	**2**	**62**	**3,466**	**1,342**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

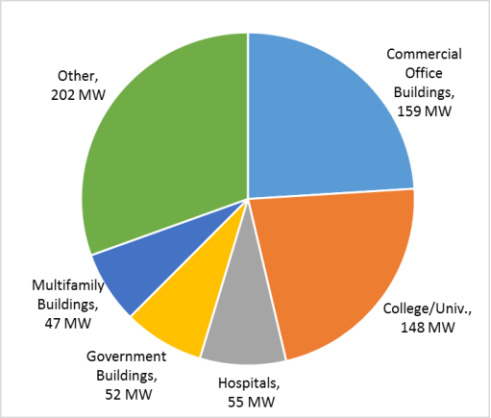


There is 646 MW of industrial on-site CHP technical potential in Oregon, primarily in the lumber and wood, food, chemicals, paper, and primary metals sectors.

Table 1.1: Oregon WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
32	Stone/Clay/Glass	3	10
33	Primary Metals	1	18
38	Instruments	1	0.02
	Total	**5**	**29**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 662 MW of commercial, institutional and multifamily on-site CHP technical potential in Oregon, primarily in the commercial (office) buildings, colleges and universities, hospitals, government buildings, and multifamily buildings sectors.

Table 1.2: Additional CHP Technical Potential in Existing Oregon District Energy

SIC	District Energy Type	Total Sites	Total MW
4961	Current Loops without CHP	1	5
4961	Current Loops with CHP expansion	0	0
	Total	**1**	**5**

[87] A detailed breakdown of Oregon technical potential by application and size range is available in Appendix D, page D-75. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

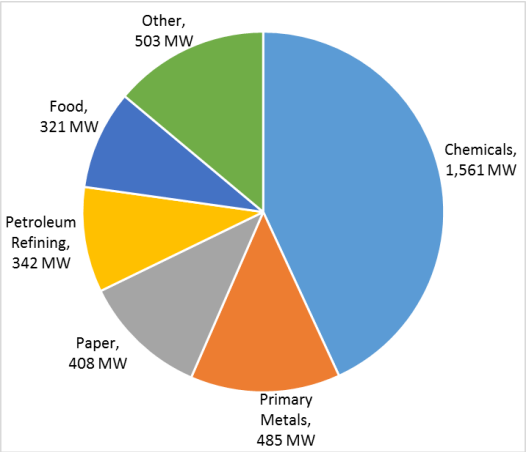
Pennsylvania

Pennsylvania has 7,759 MW of CHP technical potential capacity identified at 12,708 sites.[88]

Table 1: Overall CHP Technical Potential in Pennsylvania

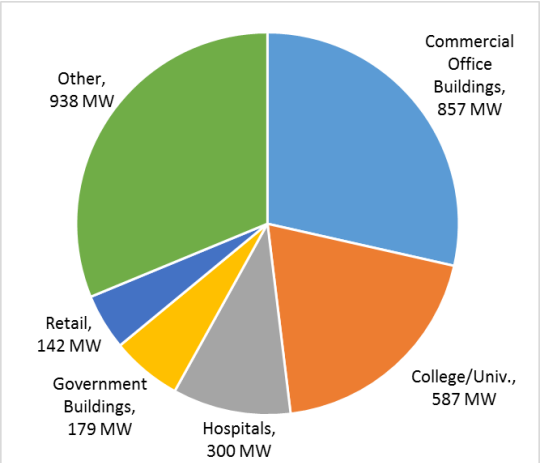
	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	1,670	307	322	235	401	878	109	947	28	1,252	2,530	3,620
Commercial Topping Cycle CHP	7,714	829	1,571	711	787	912	45	383	6	168	10,123	3,003
WHP CHP	7	1	6	4	15	41	19	171	5	184	52	402
District Energy CHP	0	0	0	0	0	0	0	0	3	734	3	734
Total	**9,391**	**1,138**	**1,899**	**951**	**1,203**	**1,830**	**173**	**1,501**	**42**	**2,338**	**12,708**	**7,759**

Figure 1: Top Industrial Types with On-site CHP Technical Potential



There is 3,620 MW of industrial on-site CHP technical potential in Pennsylvania, primarily in the chemicals, primary metals, paper, refining, and food sectors.

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 3,003 MW of commercial, institutional and multifamily on-site CHP technical potential in Pennsylvania, primarily in the commercial (office) buildings, colleges and universities, hospitals, government buildings, and retail sectors.

Table 1.1: Pennsylvania WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
12	Mining, Except Oil and Gas	2	0.1
13	Oil and Gas Extraction	2	1
29	Petroleum Refining	11	77
32	Stone/Clay/Glass	22	103
33	Primary Metals	15	221
	Total	**52**	**402**

Table 1.2: Additional CHP Technical Potential in Existing Pennsylvania District Energy

SIC	District Energy Type	Total Sites	Total MW
4961	Current Loops without CHP	1	61
4961	Current Loops with CHP expansion	2	672
	Total	**3**	**734**

[88] A detailed breakdown of Pennsylvania technical potential by application and size range is available in Appendix D, page D-77. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

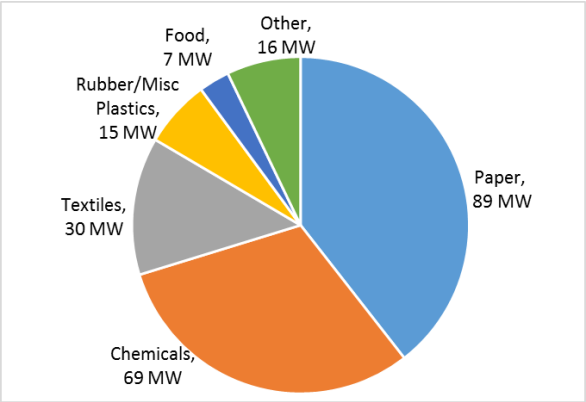
Rhode Island

Rhode Island has 616 MW of CHP technical potential capacity identified at 1,114 sites.[89]

Table 1: Overall CHP Technical Potential in Rhode Island

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	163	28	18	13	24	53	9	69	2	62	216	225
Commercial Topping Cycle CHP	684	71	143	65	63	76	6	53	1	125	897	391
WHP CHP	1	0.01	0	0	0	0	0	0	0	0	1	0.01
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**848**	**99**	**161**	**79**	**87**	**128**	**15**	**122**	**3**	**188**	**1,114**	**616**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

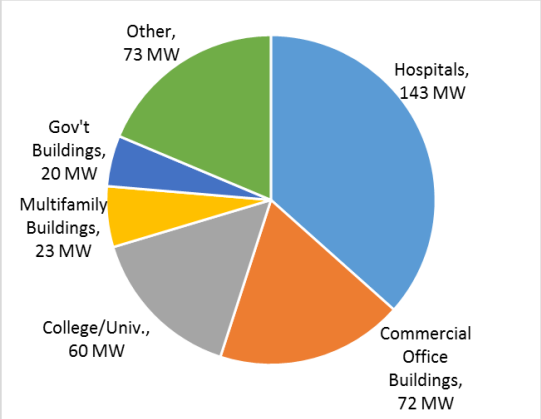


There is 225 MW of industrial on-site CHP technical potential in Rhode Island, primarily in the paper, chemicals, textiles, rubber/plastics, and food sectors.

Table 1.1: Rhode Island WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
30	Rubber/Misc Plastics	1	0.01
	Total	**1**	**0.01**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 391 MW of commercial, institutional and multifamily on-site CHP technical potential in Rhode Island, primarily in the hospitals, commercial (office) buildings, colleges/universities, multifamily buildings and government buildings sectors.

Table 1.2: Additional CHP Technical Potential in Existing Rhode Island District Energy

There is no known CHP technical potential at existing district energy loops in Rhode Island.

[89] A detailed breakdown of Rhode Island technical potential by application and size range is available in Appendix D, page D-79. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

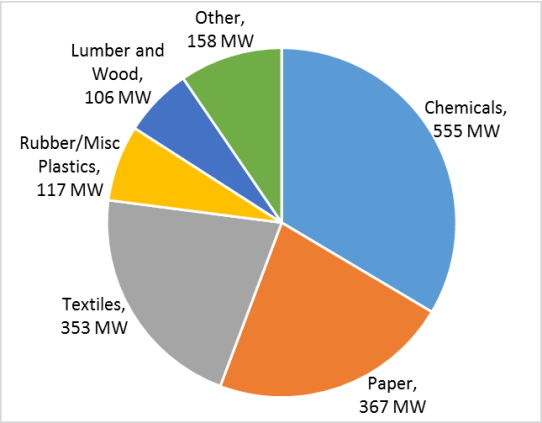
South Carolina

South Carolina has 3,063 MW of CHP technical potential capacity identified at 4,273 sites.[90]

Table 1: Overall CHP Technical Potential in South Carolina

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	540	107	120	89	202	444	46	413	14	602	922	1,656
Commercial Topping Cycle CHP	2,654	335	472	235	199	297	13	94	1	291	3,339	1,251
WHP CHP	2	1	0	0	4	12	4	45	2	99	12	156
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**3,196**	**443**	**592**	**324**	**405**	**752**	**63**	**552**	**17**	**992**	**4,273**	**3,063**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

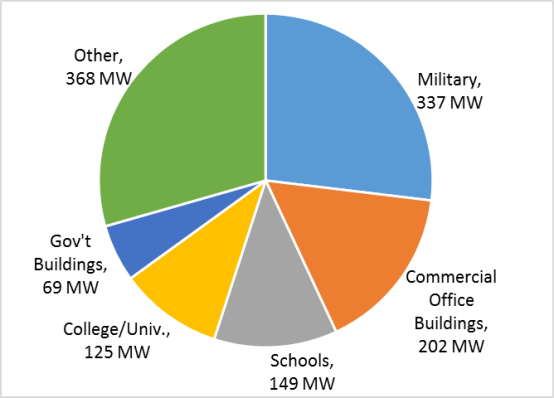


There is 1,656 MW of industrial on-site CHP technical potential in South Carolina, primarily in the chemicals, paper, textiles, rubber/plastics and lumber and wood sectors.

Table 1.1: South Carolina WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
24	Lumber and Wood	1	0.5
26	Paper	1	0.1
32	Stone/Clay/Glass	6	27
33	Primary Metals	4	129
	Total	**12**	**156**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 1,251 MW of commercial, institutional and multifamily on-site CHP technical potential in South Carolina, primarily in the military, commercial (office) buildings, schools, colleges/universities and government buildings.

Table 1.2: Additional CHP Technical Potential in Existing South Carolina District Energy

There is no known CHP technical potential at existing district energy loops in South Carolina.

[90] A detailed breakdown of South Carolina technical potential by application and size range is available in Appendix D, page D-81. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

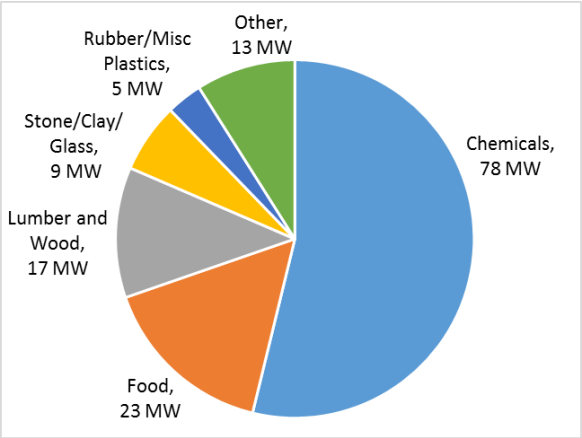
South Dakota

South Dakota has 378 MW of CHP technical potential capacity identified at 969 sites.[91]

Table 1: Overall CHP Technical Potential in South Dakota

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	123	21	18	12	32	72	4	40	0	0	177	145
Commercial Topping Cycle CHP	622	63	118	56	43	53	6	53	0	0	789	225
WHP CHP	0	0	0	0	3	8	0	0	0	0	3	8
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**745**	**84**	**136**	**68**	**78**	**133**	**10**	**93**	**0**	**0**	**969**	**378**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

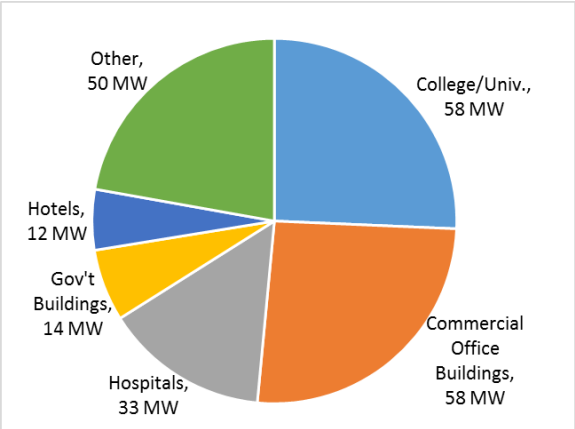


There is 145 MW of industrial on-site CHP technical potential in South Dakota, primarily in the chemicals, food, lumber and wood, stone/clay/glass and rubber/plastics sectors.

Table 1.1: South Dakota WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
28	Chemicals	1	1
32	Stone/Clay/Glass	2	6
	Total	**3**	**8**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 225 MW of commercial, institutional and multifamily on-site CHP technical potential in South Dakota, primarily in the colleges/universities, commercial (office) buildings, hospitals, government buildings and hotels sectors.

Table 1.2: Additional CHP Technical Potential in Existing South Dakota District Energy

There is no known CHP technical potential at existing district energy loops in South Dakota.

[91] A detailed breakdown of South Dakota technical potential by application and size range is available in Appendix D, page D-83. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

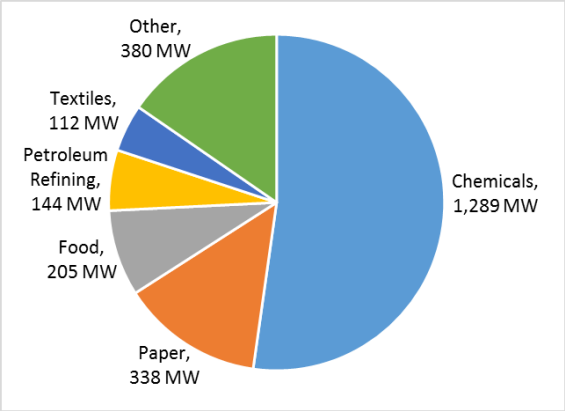
Tennessee

Tennessee has 4,183 MW of CHP technical potential capacity identified at 6,134 sites.[92]

Table 1: Overall CHP Technical Potential in Tennessee

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	760	146	154	107	213	439	65	583	17	1,193	1,209	2,468
Commercial Topping Cycle CHP	3,960	451	669	308	254	348	22	193	2	130	4,907	1,430
WHP CHP	3	1	0	0	9	23	3	37	1	21	16	82
District Energy CHP	0	0	0	0	0	0	0	0	2	202	2	202
Total	**4,723**	**598**	**823**	**416**	**476**	**809**	**90**	**813**	**22**	**1,547**	**6,134**	**4,183**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

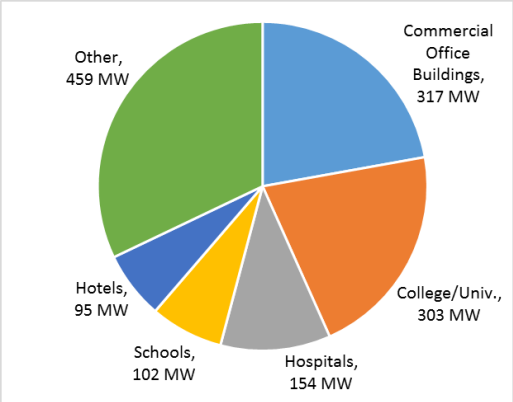


There is 2,468 MW of industrial on-site CHP technical potential in Tennessee, primarily in the chemicals, paper, food, refining, and textiles sectors.

Table 1.1: Tennessee WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
28	Chemicals	1	2
29	Petroleum Refining	2	22
32	Stone/Clay/Glass	11	27
33	Primary Metals	2	32
	Total	**16**	**82**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 1,430 MW of commercial, institutional and multifamily on-site CHP technical potential in Tennessee, primarily in the commercial (office) buildings, colleges/universities, hospitals, schools, and hotels sectors.

Table 1.2: Additional CHP Technical Potential in Existing Tennessee District Energy

SIC	District Energy Type	Total Sites	Total MW
4961	Current Loops without CHP	2	202
4961	Current Loops with CHP expansion	0	0
	Total	**2**	**202**

[92] A detailed breakdown of Tennessee technical potential by application and size range is available in Appendix D, page D-85. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

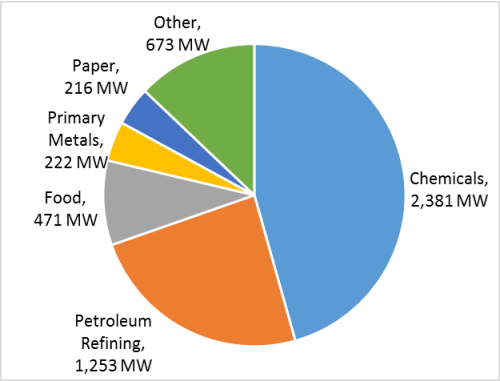
Texas

Texas has 14,062 MW of CHP technical potential capacity identified at 20,855 sites.[93]

Table 1: Overall CHP Technical Potential in Texas

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	2,116	387	382	268	424	885	142	1,244	48	2,432	3,112	5,216
Commercial Topping Cycle CHP	12,265	1,371	3,695	1,970	1,430	2,125	83	701	18	860	17,492	7,027
WHP CHP	103	23	47	34	57	119	21	222	16	1,035	244	1,432
District Energy CHP	0	0	0	0	0	0	1	12	6	375	7	387
Total	**14,484**	**1,781**	**4,124**	**2,272**	**1,911**	**3,128**	**247**	**2,179**	**88**	**4,701**	**20,855**	**14,062**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

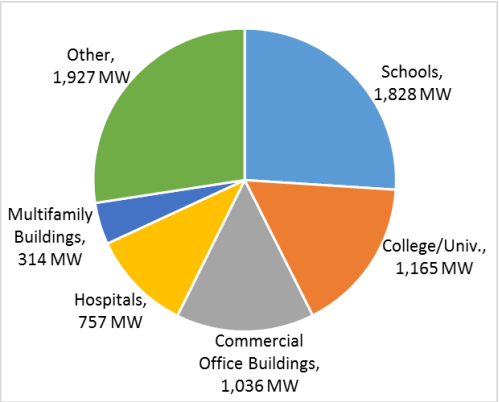


There is 5,216 MW of industrial on-site CHP technical potential in Texas, primarily in the chemicals, refining, food, primary metals and paper sectors.

Table 1.1: Texas WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
12	Mining, Except Oil and Gas	1	1
13	Oil and Gas Extraction	162	122
28	Chemicals	14	20
29	Petroleum Refining	36	1,105
32	Stone/Clay/Glass	23	105
33	Primary Metals	7	79
38	Instruments	1	0.01
	Total	**244**	**1,432**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 7,027 MW of commercial, institutional and multifamily on-site CHP technical potential in Texas, primarily in the schools, colleges/universities, commercial (office) buildings, hospitals and multifamily sectors.

Table 1.2: Additional CHP Technical Potential in Existing Texas District Energy

SIC	District Energy Type	Total Sites	Total MW
4961	Current Loops without CHP	7	387
4961	Current Loops with CHP expansion	0	0
	Total	**7**	**387**

[93] A detailed breakdown of Texas technical potential by application and size range is available in Appendix D, page D-87. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

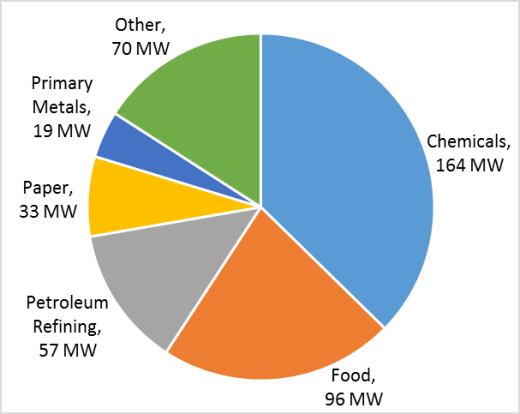
Utah

Utah has 1,119 MW of CHP technical potential capacity identified at 2,676 sites.[94]

Table 1: Overall CHP Technical Potential in Utah

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	324	59	62	46	70	155	18	157	1	24	475	440
Commercial Topping Cycle CHP	1,851	189	229	105	88	116	9	92	3	116	2,180	618
WHP CHP	10	2	2	1	6	20	2	13	1	25	21	61
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**2,185**	**250**	**293**	**153**	**164**	**290**	**29**	**262**	**5**	**164**	**2,676**	**1,119**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

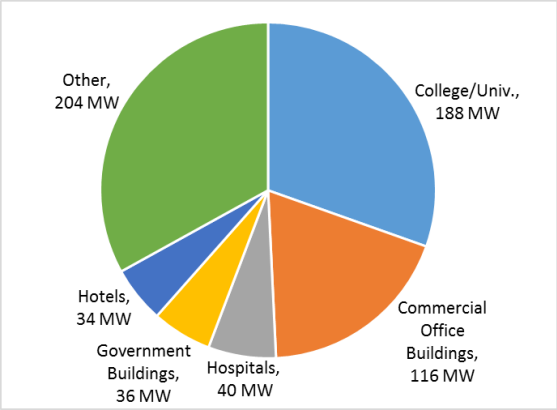


There is 440 MW of industrial on-site CHP technical potential in Utah, primarily in the chemicals, food, refining, paper, and primary metals sectors.

Table 1.1: Utah WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
12	Mining, Except Oil and Gas	1	0.01
13	Oil and Gas Extraction	10	4
29	Petroleum Refining	6	22
32	Stone/Clay/Glass	3	10
33	Primary Metals	1	25
	Total	**21**	**61**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 618 MW of commercial, institutional and multifamily on-site CHP technical potential in Utah, primarily in the colleges/universities, commercial (office) buildings, hospitals, government buildings, and hotels sectors.

Table 1.2: Additional CHP Technical Potential in Existing Utah District Energy

There is no known CHP technical potential at existing district energy loops in Utah.

[94] A detailed breakdown of Utah technical potential by application and size range is available in Appendix D, page D-89. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

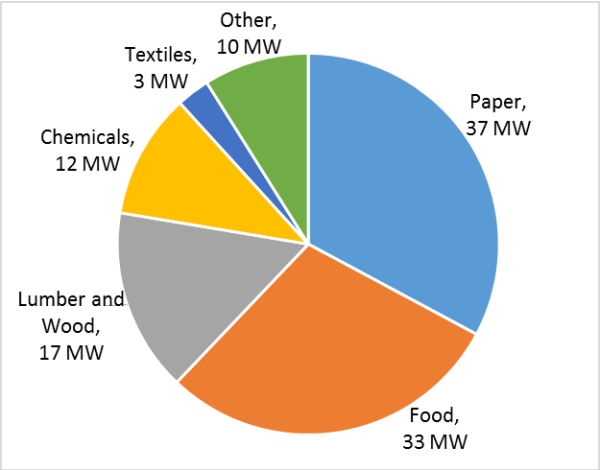
Vermont

Vermont has 228 MW of CHP technical potential capacity identified at 657 sites.[95]

Table 1: Overall CHP Technical Potential in Vermont

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	**Sites**	**50-500 kW (MW)**	**Sites**	**0.5-1 MW (MW)**	**Sites**	**1-5 MW (MW)**	**Sites**	**5-20 MW (MW)**	**Sites**	**>20 MW (MW)**	**Total Sites**	**Total MW**
Industrial Topping Cycle CHP	119	21	21	15	22	43	1	7	1	24	164	112
Commercial Topping Cycle CHP	389	40	75	34	29	28	1	14	0	0	493	116
WHP CHP	0	0	0	0	0	0	0	0	0	0	0	0
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**508**	**61**	**96**	**49**	**51**	**71**	**2**	**22**	**1**	**24**	**657**	**228**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

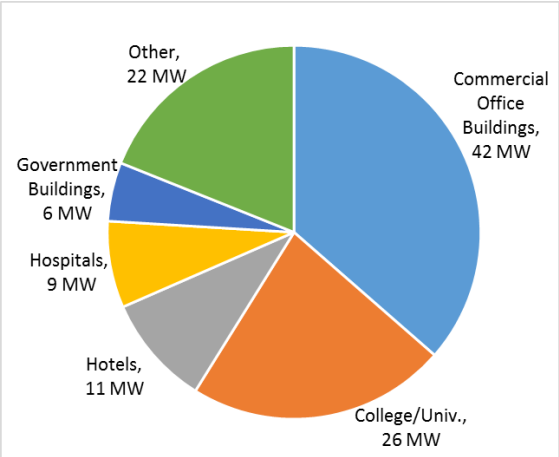


There is 112 MW of industrial on-site CHP technical potential in Vermont, primarily in the paper, food, lumber and wood, chemicals and textiles sectors.

Table 1.1: Vermont WHP CHP Technical Potential

There is no WHP CHP technical potential identified in Vermont.

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 116 MW of commercial, institutional and multifamily on-site CHP technical potential in Vermont, primarily in the commercial (office) buildings, colleges/universities, hotels, hospitals, and government buildings sectors.

Table 1.2: Additional CHP Technical Potential in Existing Vermont District Energy

There is no known CHP technical potential at existing district energy loops in Vermont.

[95] A detailed breakdown of Vermont technical potential by application and size range is available in Appendix D, page D-91. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

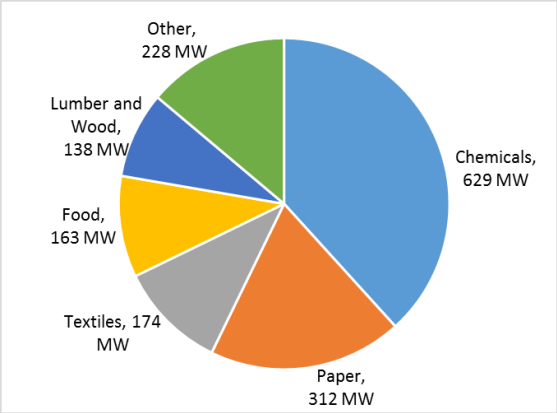
Virginia

Virginia has 4,308 MW of CHP technical potential capacity identified at 7,291 sites.[96]

Table 1: Overall CHP Technical Potential in Virginia

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	594	110	143	100	152	295	42	364	20	834	951	1,703
Commercial Topping Cycle CHP	5,035	581	886	418	357	474	45	391	6	676	6,329	2,540
WHP CHP	1	0.2	1	1	5	14	4	49	0	0	11	65
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**5,630**	**691**	**1,030**	**518**	**514**	**783**	**91**	**805**	**26**	**1,510**	**7,291**	**4,308**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

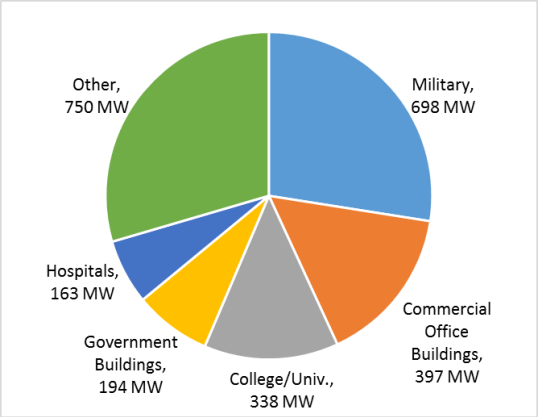


There is 1,703 MW of industrial on-site CHP technical potential in Virginia, primarily in the chemicals, paper, textiles, food, and lumber and wood sectors.

Table 1.1: Virginia WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
21	Beverage and Tobacco	1	0.2
28	Chemicals	1	1
29	Petroleum Refining	1	14
32	Stone/Clay/Glass	5	16
33	Primary Metals	3	34
	Total	**11**	**65**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 2,540 MW of commercial, institutional and multifamily on-site CHP technical potential in Virginia, primarily in the military, commercial (office) buildings, colleges/universities, government buildings, and hospitals sectors.

Table 1.2: Additional CHP Technical Potential in Existing Virginia District Energy

There is no known CHP technical potential at existing district energy loops in Virginia.

[96] A detailed breakdown of Virginia technical potential by application and size range is available in Appendix D, page D-93. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

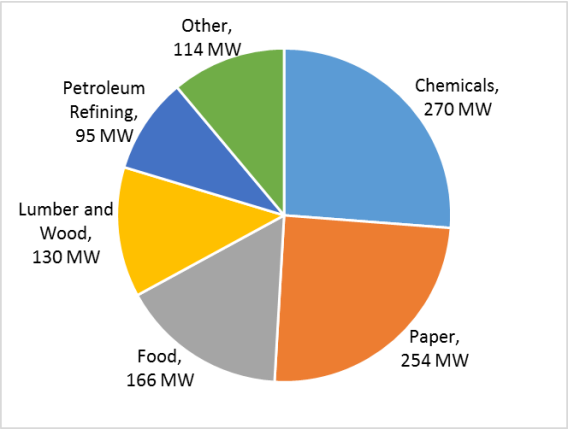
Washington

Washington has 2,545 MW of CHP technical potential capacity identified at 5,570 sites.[97]

Table 1: Overall CHP Technical Potential in Washington

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	686	133	111	76	113	222	22	203	11	396	943	1,029
Commercial Topping Cycle CHP	3,759	379	581	265	257	384	13	126	2	66	4,612	1,220
WHP CHP	3	0.5	2	2	3	7	3	28	3	100	14	138
District Energy CHP	0	0	0	0	0	0	0	0	1	158	1	158
Total	**4,448**	**512**	**694**	**343**	**373**	**614**	**38**	**357**	**17**	**719**	**5,570**	**2,545**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

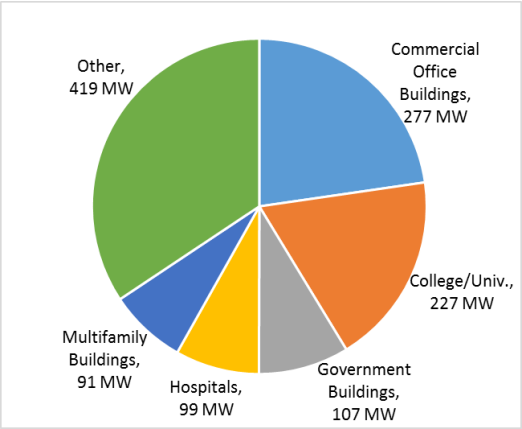


There is 1,029 MW of industrial on-site CHP technical potential in Washington, primarily in the chemicals, paper, food, lumber and wood, and refining sectors.

Table 1.1: Washington WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
28	Chemicals	1	0.04
29	Petroleum Refining	7	100
32	Stone/Clay/Glass	5	13
33	Primary Metals	1	24
	Total	**14**	**138**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 1,220 MW of commercial, institutional and multifamily on-site CHP technical potential in Washington, primarily in the commercial (office) buildings, colleges/universities, government buildings, hospitals and multifamily sectors.

Table 1.2: Additional CHP Technical Potential in Existing Washington District Energy

SIC	District Energy Type	Total Sites	Total MW
4961	Current Loops without CHP	1	158
4961	Current Loops with CHP expansion	0	0
	Total	**1**	**158**

[97] A detailed breakdown of Washington technical potential by application and size range is available in Appendix D, page D-95. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

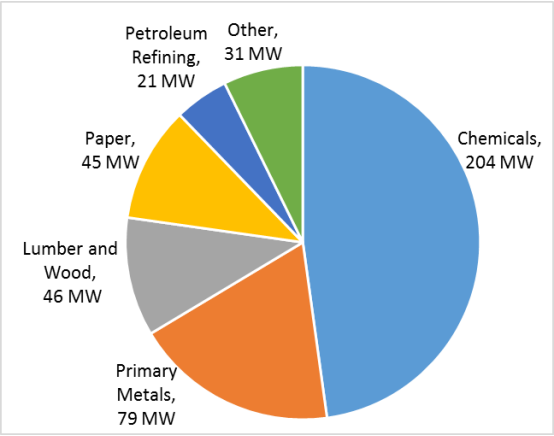
West Virginia

West Virginia has 929 MW of CHP technical potential capacity identified at 1,630 sites.[98]

Table 1: Overall CHP Technical Potential in West Virginia

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	172	36	41	30	38	89	20	195	3	77	274	427
Commercial Topping Cycle CHP	1,083	114	170	76	79	100	9	64	0	0	1,342	354
WHP CHP	4	0.9	2	2	5	11	2	21	1	113	14	148
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**1,259**	**150**	**213**	**108**	**122**	**200**	**31**	**280**	**4**	**190**	**1,630**	**929**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

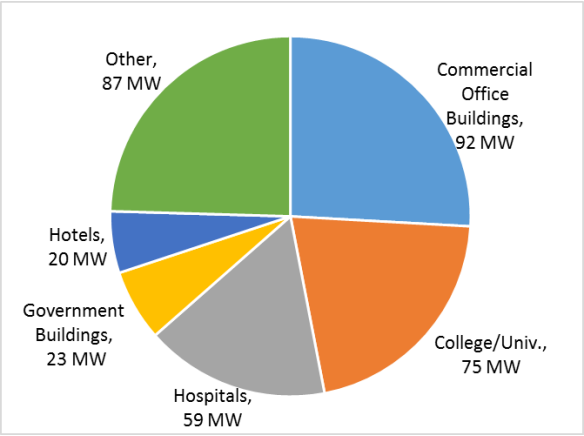


There is 427 MW of industrial on-site CHP technical potential in West Virginia, primarily in the chemicals, primary metals, lumber and wood, paper, and refining sectors.

Table 1.1: West Virginia WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
12	Mining, Except Oil and Gas	1	0.1
13	Oil and Gas Extraction	7	7
28	Chemicals	1	0.3
29	Petroleum Refining	1	3
32	Stone/Clay/Glass	2	18
33	Primary Metals	2	119
	Total	**14**	**148**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 354 MW of commercial, institutional and multifamily on-site CHP technical potential in West Virginia, primarily in the commercial (office) buildings, colleges/universities, hospitals, government buildings, and hotels sectors.

Table 1.2: Additional CHP Technical Potential in Existing West Virginia District Energy

There is no known CHP technical potential at existing district energy loops in West Virginia.

[98] A detailed breakdown of West Virginia technical potential by application and size range is available in Appendix D, page D-97. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

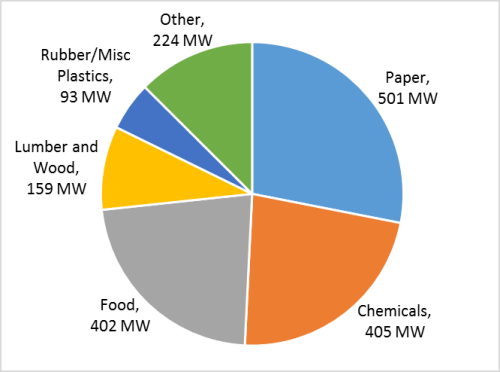
Wisconsin

Wisconsin has 3,474 MW of CHP technical potential capacity identified at 7,008 sites.[99]

Table 1: Overall CHP Technical Potential in Wisconsin

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	1,329	255	248	180	255	532	62	554	9	262	1,903	1,783
Commercial Topping Cycle CHP	3,979	401	776	345	306	340	26	223	1	37	5,088	1,346
WHP CHP	1	0.1	1	1	9	24	4	32	0	0	15	57
District Energy CHP	0	0	0	0	0	0	0	0	2	287	2	287
Total	**5,309**	**656**	**1,025**	**527**	**570**	**895**	**92**	**810**	**12**	**586**	**7,008**	**3,474**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

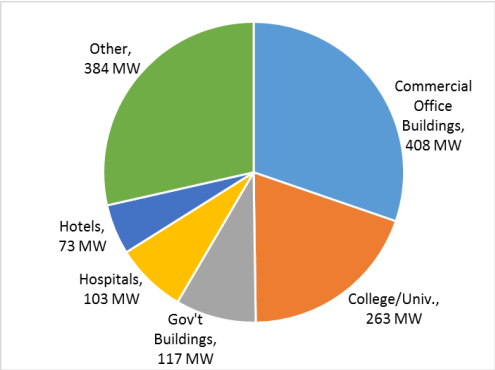


There is 1,783 MW of industrial on-site CHP technical potential in Wisconsin, primarily in the paper, chemicals, food, lumber and wood, and rubber/plastics sectors.

Table 1.1: Wisconsin WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
20	Food	1	0.1
28	Chemicals	1	2
29	Petroleum Refining	1	3
32	Stone/Clay/Glass	7	23
33	Primary Metals	4	25
35	Machinery	1	4
	Total	**15**	**57**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



There is 1,346 MW of commercial, institutional and multifamily on-site CHP technical potential in Wisconsin, primarily in the commercial (office) buildings, colleges/universities, government buildings, hospitals, and hotels sectors.

Table 1.2: Additional CHP Technical Potential in Existing Wisconsin District Energy

SIC	District Energy Type	Total Sites	Total MW
4961	Current Loops without CHP	0	0
4961	Current Loops with CHP expansion	2	287
	Total	**2**	**287**

[99] A detailed breakdown of Wisconsin technical potential by application and size range is available in Appendix D, page D-99. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

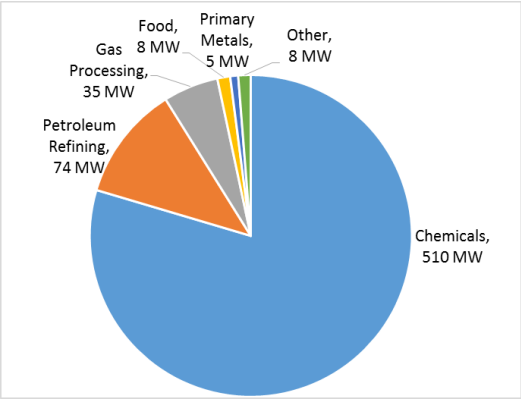
Wyoming

Wyoming has 847 MW of CHP technical potential capacity identified at 609 sites.[100]

Table 1: Overall CHP Technical Potential in Wyoming

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	54	10	16	12	32	70	5	48	4	501	111	641
Commercial Topping Cycle CHP	384	42	55	28	19	22	2	22	0	0	460	115
WHP CHP	11	2.7	2	1	18	36	7	51	0	0	38	91
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**449**	**55**	**73**	**42**	**69**	**128**	**14**	**121**	**4**	**501**	**609**	**847**

Figure 1: Top Industrial Types with On-site CHP Technical Potential

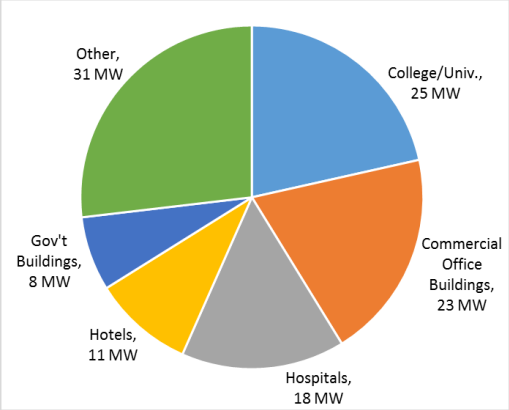


There is 641 MW of industrial on-site CHP technical potential in Wyoming, primarily in the chemicals, refining, gas processing, food, and primary metals sectors.

Table 1.1: Wyoming WHP CHP Technical Potential

SIC	WHP CHP Business Type	Total Sites	Total MW
12	Mining, Except Oil and Gas	3	14
13	Oil and Gas Extraction	28	45
29	Petroleum Refining	5	27
32	Stone/Clay/Glass	2	6
	Total	**38**	**91**

Figure 2: Top Commercial Business Types with On-site CHP Technical Potential



115 MW of commercial, institutional and multifamily on-site CHP technical potential, primarily in the colleges/universities, commercial (office) buildings, hospitals, hotels, and government buildings sectors.

Table 1.2: Additional CHP Technical Potential in Existing Wyoming District Energy

There is no known CHP technical potential at existing district energy loops in Wyoming.

[100] A detailed breakdown of Wyoming technical potential by application and size range is available in Appendix D, page D-101. For more information see: www.energy.gov/chp-installs, www.energy.gov/chp-projects, www.energy.gov/chp-contacts.

V. Conclusions

Overall, multiple factors point toward increasing levels of CHP market penetration in the United States in the future. Some of these include lower operating costs for CHP due to the abundance of low-cost natural gas, environmental regulations that recognize CHP's efficiency benefits, the increasing need for resiliency in the face of grid outages, availability and replicability of packaged CHP systems, favorable policies and incentives, and utility interest. CHP will continue to play an important role in meeting demands for distributed generation, particularly in applications with favorable electric and thermal loads.

The analysis in this report shows that there is significant technical potential for additional CHP capacity. There is about 141GW of traditional topping cycle CHP potential for on-site use distributed among the industrial (65GW) and commercial (76GW) sectors. The commercial sector has a higher potential because of the higher number of sites and the smaller base of existing installed CHP capacity. Due to the high thermal and electric loads found within industrial applications, many prime candidate sites have already chosen to install a CHP unit, however this analysis shows that many of these sites have the potential for further expansion of their CHP capacity.

In addition to the on-site CHP potential in the industrial and commercial sectors, the industrial sector has several application types that have significant potential to export electricity to the grid if they size CHP systems to the thermal load at their facility. The refining and chemical industries have the most such potential, and there is 81GW of total export capacity that could be installed.

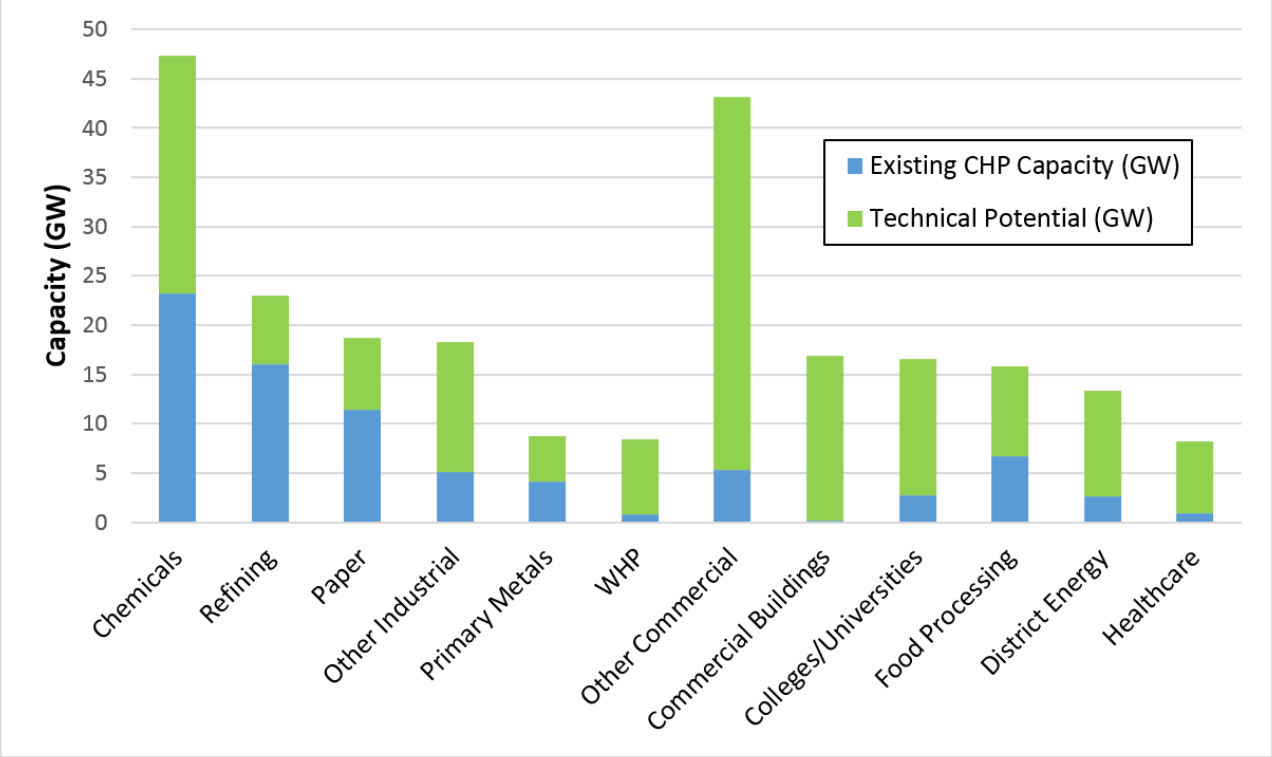
The total WHP CHP technical potential is 7.6GW across all potential industries and waste heat streams at 1,105 candidate facilities. Petroleum refining, metals, and non-metallic minerals contain roughly 7GW (91%) of the entire technical potential. Unlike traditional CHP potential that is more spread out around the country, about one third of the WHP CHP technical potential is geographically located in just three states: Texas, Louisiana, and Indiana.

District energy technical potential represents a new area explored in this report compared to previous analyses on CHP technical potential. Downtown loops were divided into those with existing CHP systems with the potential for expansion and those without CHP installed. Overall, there is 10.6GW of CHP technical potential among 64 identified downtown or utility district energy loops in the U.S. This is technical potential only, and therefore does not take economics into account, however, all of the electricity generation from this CHP potential is assumed to be exported to the grid, which could impact the economic potential compared to facilities that could use the electricity on-site.

In **Figure V-1**, the amount of existing CHP is shown along with the amount of remaining CHP technical potential by application (except for district energy where the export CHP potential is shown). Export potential would increase the green portion of the bars significantly; however exporting electricity is often uneconomical. While there is still remaining CHP potential in large

industrial applications, it is the commercial applications that show the greatest amount of technical potential.

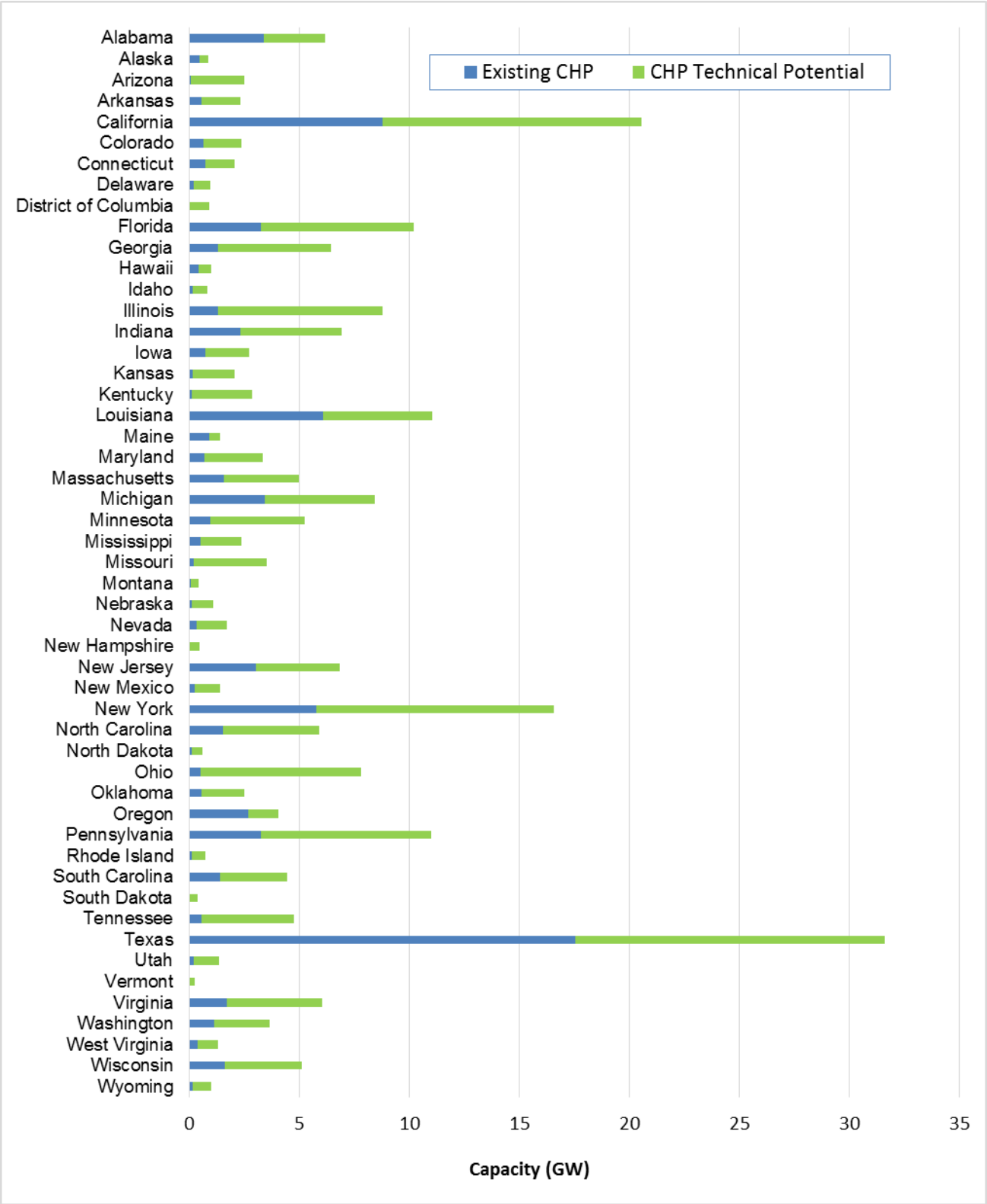
Figure V-1: Existing CHP Compared to CHP Technical Potential by Sector



U.S. DOE CHP Deployment Program, 2016.

In **Figure V-2**, the amount of existing CHP is shown on the state level, along with the remaining amount of technical potential in each state. The CHP technical potential in each bar includes the on-site industrial topping cycle CHP, commercial topping cycle CHP, WHP CHP, and district energy CHP.

Figure V-2: Existing CHP Compared to CHP Technical Potential by State



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Appendix A. Technical Potential Estimation Methodology

The technical potential is an estimation of market size constrained only by technological limits — the ability of CHP technologies to fit customer energy needs. CHP technical potential is calculated in terms of CHP electrical generation capacity that could be installed at existing industrial and commercial facilities based on the estimated electric and thermal needs of the site. The technical potential is useful in understanding the potential size and distribution of the CHP market in a target region. Identifying the technical market potential is a preliminary step in the assessment of the economically feasible market size and ultimate market penetration. This analysis focuses on sites with CHP technical potential of 50kW or higher.

Three different types of CHP markets were included in the evaluation of CHP technical potential for this study:

- Traditional Topping Cycle CHP (including cooling)
- Waste Heat to Power (WHP) CHP
- District Energy including CHP

General CHP Technical Potential Estimation Approach

The determination of technical market potential consists of the following elements:

- Identify target markets where CHP provides a reasonable fit to the electric and thermal needs of the user. Target applications are identified based on reviewing the electric and thermal energy consumption data for various building types and industrial facilities.
- Quantify the number and size distribution of target markets. Several data sources were used to identify the number of target candidate facilities in each target application that meet the electric and thermal load requirements for CHP.
- Estimate CHP potential in terms of MW electric capacity. CHP potential is derived based on the thermal and electric load for each site. Total CHP potential for each target market is then calculated by the amount of CHP potential in each size category.
- Subtract existing CHP from the identified sites to determine the remaining technical potential.

Technical Potential for Traditional Topping Cycle CHP

TRADITIONAL CHP TARGET MARKETS

There are a number of commercial buildings and industrial facilities that characteristically have sufficient and coincident thermal and electric loads for CHP. Most commercial and light industrial markets have low base thermal loads relative to the electric load, but have high thermal loads in the cooler months for heating. Such commercial buildings include hotels, hospitals, nursing homes, college campuses, correctional facilities, and light manufacturing. **Table A- 1** and **Table A- 2** display the target markets used for this study with an indicator of which market type each facility type fits under.

Table A- 1: Industrial CHP Target Markets

SIC	NAICS	Industrial Facility Type	Market Type
20	311	Food & Beverage	High Load Traditional
22	313	Textiles	High Load Traditional
24	321	Lumber and Wood	High Load Traditional
25	337	Furniture	High Load Traditional
26	322	Paper	High Load Traditional
27	323	Printing/Publishing	High Load Traditional
28	325	Chemicals	High Load Traditional
29	324	Petroleum Refining	High Load Traditional
30	326	Rubber/Miscellaneous Plastics	High Load Traditional
32	327	Stone/Clay/Glass	High Load Traditional
33	331	Primary Metals	High Load Traditional
34	332	Fabricated Metals	High Load Traditional
35	333	Machinery/Computer Equip.	High Load Traditional
37	336	Transportation Equip.	High Load Traditional
38	334	Instruments	High Load Traditional
39	339	Miscellaneous Manufacturing	High Load Traditional
49	486	Gas Processing	High Load Traditional

Table A- 2: Commercial CHP Target Markets

SIC	NAICS	Commercial Building Type	Market Type
43	491	Post Offices	Low Load Cooling
52	444	Big Box Retail	Low Load Cooling
4222	493	Refrigerated Warehouses	High Load Cooling
4581	488	Airports	Low Load Cooling
4952	221	Waste Water Treatment Plants	High Load Traditional
5411	445	Food Sales	Low Load Cooling
5812	722	Restaurants	Low Load Cooling
6512	531	Commercial Buildings	Low Load Cooling
6513	531	Multi-Family Buildings	High Load Cooling
7011	721	Hotels	High Load Cooling
7211	812	Laundries	Low Load Traditional
7374	518	Data Centers	High Load Cooling
7542	811	Carwashes	Low Load Traditional
7832	512	Movie Theaters	Low Load Cooling
7991	713	Health Clubs	Low Load Traditional
7997	713	Golf/Country Clubs	Low Load Traditional
8051	623	Nursing Homes	High Load Cooling
8062	622	Hospitals	High Load Cooling
8211	611	Schools	Low Load Cooling
8221	611	Colleges/Universities	High Load Cooling
8412	712	Museums	Low Load Cooling
9100	921	Government Facilities	Low Load Cooling
9223	922	Prisons	High Load Traditional
9711	928	Military	High Load Cooling

Traditional CHP Target Facilities Identification

Several commercial and industrial facility databases were used to identify the target market facilities in the country by sector and size range (electric demand) that meet the thermal and electric load requirements for CHP. The two primary sources used to identify potential targets for CHP were the Dun and Bradstreet (Hoover's) database and the Manufacturer's News (MNI) database. The Hoovers database contains information on the majority of businesses throughout the country, and can be sorted to provide a listing of industrial and commercial facilities in a specific region or application.[101] For commercial office buildings and multi-family dwellings, data was extracted from the U.S. Census and Emporis database on the number of buildings in each state and the size of the buildings.

Electric and Thermal Loads for Traditional CHP Target Facility Types

ELECTRIC LOAD ESTIMATION

The electric requirements for each of the target facility types were estimated based on either electricity consumption factors applied to the number of employees at the site or another application-specific characteristic of the site. Some sources contained specific site information that could be used to estimate the facility electric load, such as, production capacity or equipment (for many industrial facilities), number of students, number of beds, or number of inmates (for commercial buildings). For sites containing no specific information, the number of employees working on-site was used as an indicator of site electric load. An average MWh per employee factor was then applied to site data, resulting in the average on-site electric requirements.

THERMAL LOAD ESTIMATION

Thermal load estimation is important to properly size the CHP system for high thermal utilization. This study assumes that CHP systems would be sized to meet the base thermal loads (heating and cooling) of each site, because sizing to the thermal load leads to the most efficient CHP system operation. In order to size the CHP system to meet the thermal demand of the facility, the project team applied a market-specific thermal factor to estimate the CHP system capacity that could meet the thermal needs of the facility.

The thermal factor is based on both the power-to-heat ratio (P/H) of the facility type as well as the P/H ratio of a typical CHP system by size range. The thermal factors indicate the ratio of electricity generation to thermal energy generation. A thermal factor of one would size a CHP system to match the electric load of the facility. A thermal factor less than one would result in a system capacity below the average electric load of the facility. A thermal factor greater than one would

[101] The full list of sources used to compile the data for this study is: Association for Iron and Steel Plant Directory, Hoovers, Lockwood Post, Major Industrial Plant Database (MIPD), Manufacturer's News, Oil & Gas Journal, Portland Cement Directory, USGS Aluminum Data, American Hospital Association, Census of Federal Facilities, Emporis, Federal Aviation Administration Airports List, International District Energy Association, National Center for Education Statistics, the U.S. Census and the U.S. Military Base List.

result in a system sized to the thermal load, producing more electricity than what is required on-site. A number of industrial facilities have thermal factors greater than one, indicating the potential to export power to the grid for CHP systems sized to meet thermal loads.[102]

Thermal factors vary by size range due to differences in CHP system P/H ratios. As CHP systems increase in size, their P/H ratios also tend to increase as electrical efficiency improves and heat available for recovery decreases. This analysis is based primarily on natural gas-fired reciprocating engines and combustion turbine systems, however for some market types like paper and wood products that tend to use waste fuels in a boiler/steam turbine system, lower P/H ratios were used[103].

Traditional CHP System Sizing

Using the estimated site electric loads and thermal factors, a potential CHP capacity was determined for each target facility type, which were then grouped into size bins based on the CHP system size that would best meet the site electric and thermal needs. The five size bins included in this study are:

- 50 – 500kW
- 500kW – 1MW
- 1 – 5MW
- 5 – 20MW
- >20MW

These size bins are used for characterization purposes, as well as the means for assigning appropriate CHP system characteristics for later economic potential analysis. There is no maximum size for CHP systems in the study.

Technical Potential for Waste Heat to Power (Bottoming-Cycle CHP)

Waste heat to power technologies produce power by capturing some form of waste heat, typically steam, and converting it into electricity. Unlike traditional topping cycle CHP, which produces power and useful thermal energy, WHP's sole purpose is to produce electricity using existing waste heat streams. While three primary categories[104] for waste heat to power exist, this report will only analyze bottoming-cycle CHP or WHP CHP. In a WHP CHP bottoming-cycle, fuel is

[102] The P/H ratios for industrial markets were calculated based on EIA's Manufacturing Energy Consumption Survey (MECS) and for commercial markets based on EIA's Commercial Building Energy Consumption Survey (CBECS). This data was cross-checked and adjusted based on data from other sources like the California Energy Use Survey (CEUS) and the Major Industrial Plant Database (MIPD). A table showing the P/H ratios that were used for each business type is located in Appendix B.

[103] P/H ratios for natural gas-fired technologies ranged from 0.6 to 1.2 and P/H ratios for waste fuel technologies ranged from 0.1 to 0.6.

[104] The two classifications of WHP not discussed in this report are waste heat recovery from a mechanical drive and general waste heat recovery. These differ from bottoming cycle CHP in that a fuel is not combusted to create thermal energy. In waste heat recovery, the waste heat is generally a byproduct of a process (i.e. gas turbine, a kiln, or another industrial process).

combusted to provide thermal input to industrial process equipment like a kiln or furnace, and the heat rejected from the process is then captured and used for power production. Heat in a WHP CHP can be recovered from a furnace, oven, kiln, and other industrial processes[105] and converted to electricity using a thermodynamic process such as a Rankine cycle steam turbine.[106]

There are approximately 75 known waste heat to power systems currently installed in the United States, totaling 469MW of capacity.[107] Existing systems are concentrated in the chemical, primary metals, and petroleum refining industries.

The determination of the WHP CHP technical potential includes the following process:

- Identify target markets with available waste heat flow and where WHP CHP provides a reasonable fit to the electric needs of the user. Target markets are identified based on reviewing the electric consumption and waste heat data data for various building types and industrial markets.
- Quantify the number and size distribution of target markets. Several data sources were used to identify the number of target candidate facilities in each target market that meet the waste heat requirements for WHP CHP.
- Estimate WHP CHP potential in terms of MW electric capacity. WHP CHP potential is derived based on the waste heat quality and electric load for each site. Total WHP CHP potential for each target market is then calculated by the amount of WHP CHP potential in each size category.

WHP CHP TARGET MARKETS

WHP CHP systems require a constant and ample supply of waste heat, because WHP CHP systems will typically run for most hours of the year.[108] Heavy industrial processes such as cement production, advanced oil extraction and refining, or paper production will typically have the waste heat streams necessary to drive a WHP CHP system. Key commercial markets include colleges, and waste management. These markets will typically have waste heat temperatures high enough to make a WHP CHP system an economically viable option for on-site power generation. **Table A- 3** shows ideal applications for WHP CHP.

[105] Processes include calciners, kilns, flares, incinerators, ovens, reciprocating engines, regenerative oxidizers, thermal oxidizers, and exhaust from petroleum refining.

[106] Other thermodynamic processes, such as organic Rankine cycle (ORC) and Kalina cycles, can be used, particularly for lower temperature waste heat streams.

[107] DOE/ICF CHP Installation Database (U.S. installations as of December 31, 2014)

[108] For the purposes of this study, ICF assumes 8,000 hours/year.

Table A- 3: WHP CHP Target Markets

SIC	NAICS	Application Description
	324	Total Petroleum and Coal Products
29	*324111*	*Petroleum Refining*
	Other 324	*Other Petroleum and Coal*
	331	Total Primary Metals
33	*331111*	*Primary Metals - Iron and Steel*
	331511	*Primary Metals - Iron Foundries*
	Other 331	*Primary Metals – Other*
	327	Total Non-Metallic Minerals
	3272	*Non-Metallic Minerals – Glass*
32	*327310*	*Non-Metallic Minerals - Cement*
	327410	*Non-Metallic Minerals - Lime*
	Other 327	*Non-Metallic Minerals - Other*
13	211	Oil and Gas Extraction
28	325	Chemicals
12	212	Mining, except Oil and Gas
20	311	Food
26	322	Paper
35	333	Machinery
37	336	Transportation Equipment
24	321	Lumber and Wood
21	312	Beverage and Tobacco
27	323	Printing
38	334	Computer and Electronic Products
8221	611	Colleges/Universities
30	326	Rubber/Misc Plastics
4222	493	Warehousing and Storage

WHP CHP DATA COLLECTION

ICF used data from a variety of sources to estimate the WHP CHP technical potential, including the EPA Greenhouse Gas Reporting Program (EPA GHGRP) database, Oil and Gas Journal, Portland Cement Association, and Association of Iron and Steel.

The technical potential analysis for WHP CHP sites was constrained to waste heat sources with a temperature of 450°F or higher. Power generation from waste heat has predominantly occurred with medium- to high-temperature waste heat sources (i.e., > 450°F) for commercially available technologies. There are several emerging technologies that utilize low-temperature waste heat streams that are in the demonstration stage in the U.S. and may become commercially available in the future.

WHP CHP System Sizing

Sizing a WHP CHP system to a facility follows a different process than sizing a conventional CHP system. The methodology to estimate the WHP CHP system size utilized the temperature of the stack gas emissions minus an assumed minimum temperature of 250°F. This difference was then

multiplied by the average specific heat for combustion of 0.26 BTU/lb. The result was the energy content of the stack gas emissions. **Table A- 4** displays the exhaust heat stack temperatures assumed for the various processes and equipment types. Each waste heat temperature has a Carnot theoretical electrical efficiency associated with converting the waste heat steam into electricity. In practice, however, the actual electrical efficiencies achieved by these systems are less than the Carnot efficiency.[109]

The WHP CHP prime mover technology chosen for the site was tailored to each facility type.

Table A- 5 displays the assumed prime mover selected by application. The project team selected an Organic Rankine Cycle (ORC) or a Steam Rankine Cycle (SRC), depending on the application in which the WHP system is installed. Rankine cycle technologies were chosen because of their widespread commercial availability and economic feasibility compared to other types of WHP CHP prime mover technologies. The selection by market will often depend on the quality of the waste heat (in terms of temperature). Commercially available ORC technologies using gaseous heat sources usually require a temperature of at least 450°F.[110]

Table A- 4: Stack Emissions Temperature by Equipment

Equipment	Temperature (^{0}F)	Equipment	Temperature (^{0}F)
GHGRP Equipment		**Gas Refining**	
Calciner, Kilns	700	Crude Distillation	316
Flare	1,200	Vacuum Distillation	421
Incinerator	1,400	Coking	800
Oven	700	Thermal Cracking	800
Reciprocating Engine	800	Visbreaking	800
Regenerative Oxidizer	1,200	Catalytic Cracking	1,148
Thermal Oxidizer	1,200	Catalytic Reforming	900
Cement Manufacturing (type of kiln)		Hydrocracking	800
Dry	840	Desulfurization	968
Dry/Precalciner	640	Alkylation	800
Dry/Preheater	640	Coke Production	1,000

[109] For WHP systems using the Rankine cycle, the electrical efficiencies are generally 30-50% of the "theoretical" or Carnot efficiency for the technology-temperature pairing. For this study, Rankine cycle efficiencies were estimated to be 40% of the Carnot efficiency.

[110] Hot exhaust gas from industrial processes will typically satisfy this criterion.

Wet	640	Steam Methane Reforming	1,500

Table A- 5: WHP Prime Mover Technology by Facility Type

NAICS	NAICS Description	WHP Technology
211	Oil and Gas Extraction[111]	ORC
212	Mining, Except Oil and Gas	ORC
311	Food	SRC
312	Beverage and Tobacco	SRC
321	Wood	SRC
322	Paper	SRC
323	Printing	SRC
324	Petroleum and Coke Products	SRC
325	Chemical	SRC
327	Non-Metallic Minerals	SRC
331	Primary Metals	SRC
333	Machinery	SRC
336	Transportation Equipment	SRC
611	Colleges/Universities	SRC
326	Rubber/Misc Plastics	SRC
493	Warehousing and Storage	ORC

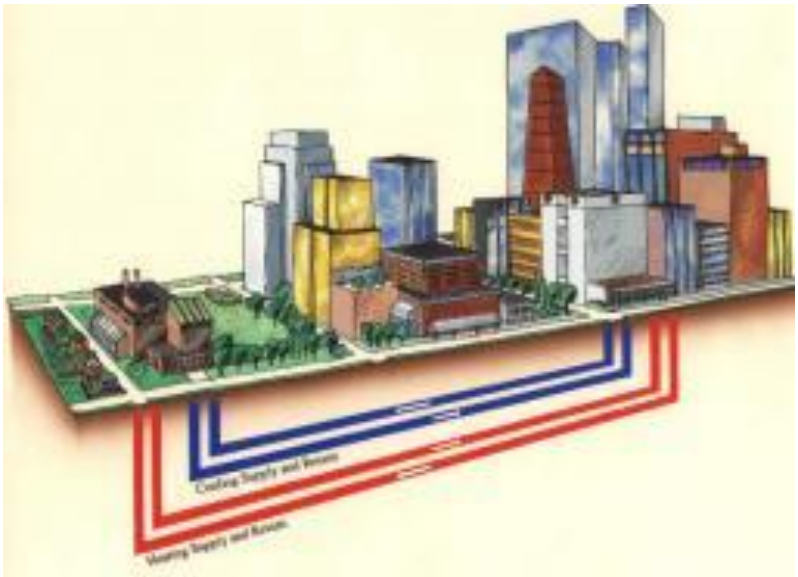
Technical Potential for District Energy

A new market that is included in this study as a target market for CHP is district energy. District energy systems produce and deliver steam, hot water or chilled water through dedicated underground piping networks to heat or cool buildings in a given area. By combining individual user loads, district energy systems can deliver energy services in a more efficient, economic, and environmentally friendly manner. District energy systems also provide economies of scale for equipment management to optimize the use of fuels, power and resources[112]. Typical settings ideal for district energy are downtown urban areas, college campuses, military bases, airports, or hospital campuses.

[111] The gas processing sizing methodology is the only market that used a noticeably different methodology than that of the GHGRP data. This data originated from the Oil and Gas Journal's gas processing database. In order to estimate the WHP technical potential, ICF used the daily gas processing rate (in MMcfd) and matched it to an existing site's characteristics that has WHP as a model to size a system.

[112] Energy and Environmental Analysis, Inc. and the International District Energy Association. "District Energy Services, Commercial Data Analysis for EIA's National Energy Modeling System." August 2007.

Figure A- 1: Diagram of a District Energy Loop



Source: International District Energy Association

Combined heat and power is particularly well-suited for integration into a district energy system. The high thermal loads exhibited by district energy systems are ideal for a CHP system's thermal outputs and provide a consistent thermal load that allows for high operating hours. The captured heat from the CHP unit can be used to create the steam and hot/chilled water necessary for the district energy system. Applying a CHP unit to a power plant and connecting it to a district energy loop will increase the efficiency of the power plant due to the capture and utilization of the waste heat.

Most district energy systems in the United States use steam as the medium to provide heating services. Hot water is also used for thermal energy distribution and can provide heat transmission over longer distances with less distribution heat loss. Cooling services are provided to users through the distribution of chilled water through closed loop networks. The majority of cooling capacity is provided by electrically driven centrifugal chillers, however, steam turbine-driven chillers and absorption chillers are used in a number of combined district heating and cooling systems. Cooling can also be provided on-site through the use of steam turbine and absorption chillers driven by steam supplied through district heating loops.[113]

[113] Ibid.

CHP Sizing of District Energy Systems

For this study, a dataset of existing district energy systems compiled by the International District Energy Association (IDEA) was used to identify district energy loops operating in the U.S. that have CHP and those that do not.

The project team separated the systems out by the facility types that they served, therefore separating university, military bases, and other system types from “downtown/utility” systems. Doing so reduced the risk of double counting the CHP potential in district energy with traditional CHP potential already identified. Downtown loops are also unique from other district energy markets because multiple legal entities are recipients of energy from the system. This creates a complex scenario for how to deal with the electricity generated by a CHP system. Most states limit the number of entities that can buy electricity from one provider before it is labeled as an electric utility. Because of this, the electricity produced by a CHP unit serving a district energy system is assumed to be exported back to the grid.

Since district energy systems provide thermal energy (in the form of steam, hot water, and/or chilled water) to satisfy the heating and cooling requirements of a group of buildings or a campus, there is not always an on-site electric load. In the analysis for traditional CHP and WHP, the CHP system size is limited so as not to exceed on-site electric demand, therefore avoiding the need to export power to the grid. However, in the case of district energy systems that serve multiple customers, all of the electricity generated by the system may need to be sold to the local utility due to regulatory requirements around the sale of electricity.

For this analysis, when sizing a CHP system to a district energy loop, the system is sized to the thermal load of the system with no limitations on the electric capacity, because all electricity is assumed to be exported to the grid. For systems that only had one thermal product (i.e. steam or hot water), the CHP system was sized to meet that thermal demand. If a site had multiple thermal requirements (i.e. chilled water and hot water), the CHP system was sized to meet the largest of the thermal loads. This ensures that the system satisfies both requirements throughout the year. This is a conservative method to avoid overestimation of CHP technical potential for district energy systems.

Appendix B. Power to Heat Ratios by Facility Type

NAICS	NAICS Description	P/H Ratio
311111	Dog and cat food manufacturing	0.451
311119	Other animal food manufacturing	0.547
311211	Flour milling	0.547
311212	Rice milling	0.511
311213	Malt manufacturing	0.547
311221	Wet corn milling	0.339
311222	Soybean processing	0.199
311223	Other oilseed processing	0.502
311225	Fats and oils refining and blending	0.109
311230	Breakfast cereal manufacturing	0.362
311311	Sugarcane mills	0.112
311312	Cane sugar refining	0.076
311313	Beet sugar manufacturing	0.213
311320	Chocolate and confectionery manufacturing from cacao beans	0.547
311330	Confectionery manufacturing from purchased chocolate	0.547
311340	Nonchocolate confectionery manufacturing	0.547
311411	Frozen fruit, juice, and vegetable manufacturing	1.176
311412	Frozen specialty food manufacturing	2.787
311421	Fruit and vegetable canning	0.361
311422	Specialty canning	0.385
311423	Dried and dehydrated food manufacturing	1.146
311511	Fluid milk manufacturing	1.204
311512	Creamery butter manufacturing	0.269
311513	Cheese manufacturing	0.722
311514	Dry, condensed, and evaporated dairy product manufacturing	0.331
311520	Ice cream and frozen dessert manufacturing	0.547
311611	Animal (except poultry) slaughtering	0.767
311612	Meat processed from carcasses	0.448
311613	Rendering and meat byproduct processing	0.133
311615	Poultry processing	0.822
311711	Seafood canning	0.547
311712	Fresh and frozen seafood processing	0.547
311811	Retail bakeries	1.425
311812	Commercial bakeries	0.773
311813	Frozen cakes, pies, and other pastries manufacturing	1.359
311821	Cookie and cracker manufacturing	2.268
311822	Flour mixes and dough manufacturing from purchased flour	1.213
311823	Dry pasta manufacturing	1.103

NAICS	NAICS Description	P/H Ratio
311830	Tortilla manufacturing	0.061
311911	Roasted nuts and peanut butter manufacturing	0.547
311919	Other snack food manufacturing	26.751
311920	Coffee and tea manufacturing	0.547
311930	Flavoring syrup and concentrate manufacturing	0.547
311941	Mayonnaise, dressing, and other prepared sauce manufacturing	0.547
311942	Spice and extract manufacturing	0.547
311991	Perishable prepared food manufacturing	0.547
311999	All other miscellaneous food manufacturing	0.547
312111	Soft drink manufacturing	1.847
312112	Bottled water manufacturing	0.650
312113	Ice manufacturing	0.650
312120	Breweries	0.343
312130	Wineries	0.650
312140	Distilleries	0.003
3122	Tobacco product manufacturing	0.650
313	Textile mills	1.054
314	Textile product mills	1.213
315	Apparel manufacturing	2.196
316110	Leather and allied product manufacturing	61.268
316211	Rubber and plastics footwear manufacturing	61.268
321113	Sawmills	0.363
321114	Wood preservation	0.488
321211	Hardwood veneer and plywood manufacturing	0.488
321212	Softwood veneer and plywood manufacturing	0.341
321213	Engineered wood member (except truss) manufacturing	0.488
321214	Truss manufacturing	0.488
321219	Reconstituted wood product manufacturing	0.230
3219	Other Wood Product Manufacturing	0.488
322110	Pulp mills	0.148
322121	Paper (except newsprint) mills	0.268
322122	Newsprint mills	1.387
322130	Paperboard mills	0.254
322211	Corrugated and solid fiber box manufacturing	0.317
322212	Folding paperboard box manufacturing	0.376
322213	Setup paperboard box manufacturing	0.293
322214	Fiber can, tube, drum, and similar products manufacturing	0.293
322215	Nonfolding sanitary food container manufacturing	0.293
322221	Coated and laminated packaging paper mfg.	0.439
322222	Coated and laminated paper manufacturing	0.439
322223	Coated paper bag and pouch manufacturing	0.293
322224	Uncoated paper and multiwall bag manufacturing	0.293

NAICS	NAICS Description	P/H Ratio
322225	Flexible packaging foil manufacturing	0.383
322226	Surface-coated paperboard manufacturing	0.439
322231	Die-cut paper and paperboard office supplies manufacturing	0.293
322232	Envelope manufacturing	0.293
322233	Stationery, tablet, and related product manufacturing	0.293
322291	Sanitary paper product manufacturing	0.594
322299	All other converted paper product manufacturing	0.293
323	Printing and related support activities	11.165
324110	Petroleum refineries	0.254
324121	Asphalt paving mixture and block manufacturing	0.261
324191	Petroleum lubricating oil and grease manufacturing	0.261
324199	All other petroleum and coal products manufacturing	3.024
325110	Petrochemical manufacturing	0.145
325120	Industrial gas manufacturing	9.205
325131	Inorganic dye and pigment manufacturing	0.249
325132	Synthetic organic dye and pigment manufacturing	0.659
325181	Alkalies and chlorine manufacturing	1.189
325182	Carbon black manufacturing	0.850
325188	All other basic inorganic chemical manufacturing	1.599
325191	Gum and wood chemical manufacturing	0.659
325192	Cyclic crude and intermediate manufacturing	0.457
325193	Ethyl alcohol manufacturing	0.224
325199	All other basic organic chemical manufacturing	0.368
325211	Plastics material and resin manufacturing	0.622
325212	Synthetic rubber manufacturing	0.347
325221	Cellulosic organic fiber manufacturing	0.659
325222	Noncellulosic organic fiber manufacturing	0.569
325311	Nitrogenous fertilizer manufacturing	0.376
325312	Phosphatic fertilizer manufacturing	9.751
325314	Fertilizer (mixing only) manufacturing	0.659
325320	Pesticide and other agricultural chemical manufacturing	1.663
325411	Medicinal and botanical manufacturing	0.659
325412	Pharmaceutical preparation manufacturing	1.552
325414	Biological product (except diagnostic) manufacturing	0.659
3255	Paint, Coating, and Adhesive Manufacturing	0.659
3256	Soap, Cleaning Compound, and Toilet Preparation Manufacturing	0.659
325992	Photographic film, paper, plate, and chemical manufacturing	0.446
3259	Other miscellaneous chemical product mfg.	0.659
326	Plastics and Rubber Products Manufacturing	3.079
326211	Tire manufacturing (except retreading)	0.961
327	Nonmetallic Mineral Product Manufacturing	8.726
327211	Flat glass manufacturing	4.058

NAICS	NAICS Description	P/H Ratio
327215	Glass product manufacturing made of purchased glass	1.742
327310	Cement manufacturing	831.227
327420	Gypsum product manufacturing	2.261
331111	Iron and steel mills	2.764
331112	Electrometallurgical ferroalloy product manufacturing	4.896
3312	Iron and steel manufacturing from purchased steel	4.690
331311	Alumina refining	0.209
331312	Primary aluminum production	89.000
331314	Secondary smelting and alloying of aluminum	0.580
331315	Aluminum sheet, plate, and foil manufacturing	5.229
331316	Aluminum extruded product manufacturing	8.504
331319	Other aluminum rolling and drawing	4.690
331411	Primary smelting and refining of copper	1.560
331419	Primary nonferrous metal, except Cu and Al	4.690
331421	Copper rolling, drawing, and extruding	4.690
331422	Copper wire (except mechanical) drawing	4.690
331423	Secondary smelting, refining, and alloying of copper	0.580
331491	Nonferrous metal, except Cu and Al, shaping	4.690
331492	Secondary processing of other nonferrous	4.690
331511	Iron foundries	31.900
331521	Aluminum die-casting foundries	8.261
331522	Nonferrous (except aluminum) die-casting foundries	4.690
331524	Aluminum foundries (except die-casting)	4.690
331525	Copper foundries (except die-casting)	4.690
331528	Other nonferrous foundries (except die-casting)	4.690
332	Fabricated Metal Product Manufacturing	5.026
333	Machinery Manufacturing	6.846
334	Computer and Electronic manufacturing	6.162
334413	Semiconductor and related device manufacturing	6.010
335	Electrical Equipment, Appliance, and Component Manufacturing	7.842
336	Transportation equipment manufacturing	2.000
337	Furniture and related product manufacturing	4.437
339	Miscellaneous manufacturing	10.318

Appendix C. Technical Potential Results by 4-Digit NAICS

The following industrial facility types have been broken down by the 4-digit NAICS code to provide more detail on the technical potential in each facility type.

Lumber, Wood and Paper Products

NAICS	Buisiness Type	50-500 kW (MW)		0.5-1 MW (MW)		1-5 MW (MW)		5-20 MW(MW)		>20 MW (MW)		Total MW	
		# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)
1133	Logging	538	72	6	4	2	3	0	0	0	0	**546**	**79**
3211	Sawmills and Wood Preservation	1,628	401	470	322	347	592	12	87	1	21	**2,458**	**1,423**
3212	Veneer, Plywood, and Engineered Wood	537	151	259	183	274	598	41	274	2	54	**1,113**	**1,260**
3219	Other Wood Product Manufacturing	2,970	397	95	64	24	39	3	21	0	0	**3,092**	**521**
3221	Pulp, Paper, and Paperboard Mills	40	10	35	30	369	945	142	1,352	50	1,991	**636**	**4,329**
3222	Converted Paper Products	1,837	465	462	314	274	478	44	450	27	1,271	**2,644**	**2,979**
	Total	**7,550**	**1,497**	**1,327**	**917**	**1,290**	**2,655**	**242**	**2,184**	**80**	**3,338**	**10,489**	**10,591**

Primary Metals Manufacturing

NAICS	Business Type	50-500 kW (MW)		0.5-1 MW (MW)		1-5 MW (MW)		5-20 MW(MW)		>20 MW (MW)		Total MW	
		# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	**# Sites**	**Capacity (MW)**
3311	Iron and Steel Mills and Ferroalloy Manufacturing	1,030	292	536	389	482	1,052	183	1,969	70	2,537	**2,301**	**6,239**
3312	Steel Product Manufacturing	36	6	10	6	3	7	4	43	0	0	**53**	**62**
3313	Alumina and Aluminum Production	2	0	0	0	15	44	0	0	0	0	**17**	**44**
3314	Non-ferrous Metal Production	384	52	14	10	13	28	17	175	5	200	**433**	**465**
3315	Foundries	77	9	3	2	9	14	0	0	0	0	**89**	**25**
	Total	**1,529**	**360**	**563**	**407**	**522**	**1,145**	**204**	**2,186**	**75**	**2,737**	**2,893**	**6,835**

Stone/Clay/Glass

NAICS	Business Type	50-500 kW (MW)		0.5-1 MW (MW)		1-5 MW (MW)		5-20 MW(MW)		>20 MW (MW)		Total MW	
		# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)
3271	Clay Product and Refactory	66	9	18	15	203	639	108	901	5	136	**400**	**1,699**
3274	Lime and Gypsum Product	40	7	10	8	0	0	0	0	0	0	**50**	**15**
	Total	**106**	**16**	**28**	**23**	**203**	**639**	**108**	**901**	**5**	**136**	**450**	**1,714**

Food Processing

NAICS	Business Type	50-500 kW (MW)		0.5-1 MW (MW)		1-5 MW (MW)		5-20 MW(MW)		>20 MW (MW)		Total MW	
		# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)
3111	Animal Food Manufacturing	1,144	247	142	102	153	296	10	82	3	96	**1,452**	**823**
3112	Grain and Oilseed Milling	183	63	141	100	333	667	106	967	23	1,194	**786**	**2,991**
3113	Sugar and Confectionery Product Manufacturing	355	61	39	29	89	174	10	70	1	33	**494**	**367**
3114	Fruit and Vegetable Preserving and Specialty Food	887	177	130	97	268	533	21	156	0	0	**1,306**	**963**
3115	Dairy Product Manufacturing	450	94	145	111	157	318	28	199	2	61	**782**	**783**
3116	Animal Slaughtering Processing	0	0	3	3	99	243	48	466	0	0	**150**	**712**
3117	Seafood Preparation and Packaging	361	60	36	24	22	33	0	0	0	0	**419**	**117**
3118	Bakeries and Tortilla Manufacturing	1,156	204	211	153	94	137	3	23	0	0	**1,464**	**516**
3119	Other Food Manufacturing	1,067	178	78	59	97	164	6	54	1	22	**1,249**	**476**
3121	Beverage Manufacturing	1,053	199	190	142	232	435	34	290	6	278	**1,515**	**1,344**
	Total	**6,656**	**1,283**	**1,115**	**818**	**1,544**	**3,001**	**266**	**2,307**	**36**	**1,683**	**9,617**	**9,092**

Rubber and Plastics

NAICS	Business Type	50-500 kW (MW)		0.5-1 MW (MW)		1-5 MW (MW)		5-20 MW(MW)		>20 MW (MW)		Total MW	
		# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)
3261	Plastics Product Manufacturing	5,202	838	457	315	213	389	7	52	0	0	**5,878**	**1,595**
3262	Rubber Product Manufacturing	690	119	81	57	56	99	28	329	4	104	**858**	**707**
	Total	**5,891**	**957**	**538**	**372**	**268**	**488**	**34**	**381**	**4**	**104**	**6,735**	**2,302**

Chemicals

NAICS	Business Type	50-500 kW (MW)		0.5-1 MW (MW)		1-5 MW (MW)		5-20 MW(MW)		>20 MW (MW)		Total MW	
		# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)	# Sites	Capacity (MW)
3251	Basic Chemical Manufacturing	267	85	467	352	1,000	2,300	466	4,151	148	6,636	**2,348**	**13,525**
3252	Resin, Synthetic Rubber, and Fibers	27	9	128	94	472	1,101	290	2,566	52	2,058	**969**	**5,829**
3253	Pesticide, Fertilizer, and Other Agricultural Chemical Manufacturing	886	126	56	40	179	394	47	417	10	515	**1,178**	**1,492**
3254	Pharmaceutical and Medicine Manufacturing	1,105	206	239	166	269	557	44	378	8	227	**1,665**	**1,535**
3255	Paint, Coating, and Adhesive Manufacturing	1,006	176	119	86	76	141	4	49	1	45	**1,206**	**497**
3256	Soap, Cleaning Compound, and Toilet Preparation Manufacturing	1,208	207	160	114	138	257	19	162	1	33	**1,526**	**773**
3259	Other Chemical Product and Preparation Manufacturing	1,008	193	146	103	97	186	13	97	0	0	**1,264**	**578**
	Total	**5,507**	**1,003**	**1,315**	**955**	**2,231**	**4,935**	**883**	**7,822**	**220**	**9,514**	**10,156**	**24,229**

Appendix D. Detailed Breakdowns of State CHP Technical Potential

Alabama

- Alabama has 2,777 MW of overall CHP capacity identified at 4,512 sites.
  - 1,382 MW of industrial on-site CHP potential, primarily in the chemicals, textiles, primary metals, paper and food sectors.
  - 1,143 MW of commercial on-site CHP potential, primarily in the government buildings, commercial buildings, colleges/universities, hospitals and schools sectors.
- Alabama has 251 MW of WHP CHP potential identified at 35 sites in the mining, oil and gas extraction, paper, refining, stone/clay/glass and primary metals sectors.
- There is no CHP district energy potential identified in Alabama.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	630	117	150	105	168	356	35	338	12	466	995	1,382
Commercial Topping Cycle CHP	2,782	347	495	231	178	221	22	192	5	151	3,482	1,143
WHP CHP	10	2	2	2	9	28	11	111	3	109	35	251
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**3,422**	**467**	**647**	**338**	**355**	**605**	**68**	**641**	**20**	**726**	**4,512**	**2,777**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	1	1	0	0	0	0	1	1
13	Oil and Gas Extraction	5	1	1	1	3	8	0	0	0	0	9	10
20	Food	69	13	17	11	17	35	2	20	1	27	106	105
22	Textiles	34	6	12	10	25	50	5	45	2	53	78	164
24	Lumber and Wood	191	38	45	31	24	48	2	11	0	0	262	128
25	Furniture	8	2	0	0	0	0	0	0	0	0	8	2
26	Paper	31	8	7	5	11	24	2	19	2	63	53	118
27	Printing	11	1	0	0	0	0	0	0	0	0	11	1
28	Chemicals	56	10	18	13	35	74	13	113	5	245	127	455
29	Petroleum Refining	1	0	2	1	11	26	3	33	1	51	18	111
30	Rubber/Misc Plastics	82	12	6	4	3	6	2	32	0	0	93	54
32	Stone/Clay/Glass	10	2	2	2	7	28	5	35	0	0	24	66
33	Primary Metals	54	11	19	13	21	45	11	134	4	138	109	341
34	Fabricated Metals	16	2	2	1	0	0	0	0	0	0	18	4
35	Machinery/Computer Equip.	8	2	1	1	0	0	0	0	0	0	9	2
37	Transportation Equip.	50	9	18	13	15	32	1	6	0	0	84	59
38	Instruments	0	0	1	1	0	0	0	0	0	0	1	1
39	Misc. Manufacturing	8	1	1	1	1	1	0	0	0	0	10	4
49	Gas Processing	6	1	0	0	3	6	0	0	0	0	9	7
	Total	**640**	**119**	**152**	**107**	**177**	**384**	**46**	**448**	**15**	**575**	**1,030**	**1,634**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	7	1	0	0	0	0	0	0	0	0	7	1
52	Retail	283	42	12	7	0	0	0	0	0	0	295	49
4222	Refrigerated Warehouses	9	1	1	1	0	0	0	0	0	0	10	2
4581	Airports	2	0.5	1	1	2	4	1	7	0	0	6	13
4952	Waste Water Treatment Plants	42	5	3	2	0	0	0	0	0	0	45	7
4961	District Energy	0	0	0	0	0	0	0	0	0	0	0	0
5411	Food Stores	161	28	1	1	0	0	0	0	0	0	162	29
5812	Restaurants	280	25	1	1	0	0	0	0	0	0	281	25
6512	Commercial Office Buildings	878	44	351	140	88	53	0	0	0	0	1,317	237
6513	Multifamily Buildings	74	6	27	13	4	4	0	0	0	0	105	23
7011	Hotels	191	22	5	3	2	3	0	0	0	0	198	28
7211	Laundries	21	3	0	0	0	0	0	0	0	0	21	3
7374	Data Centers	15	3	0	0	3	4	1	8	0	0	19	15
7542	Car Washes	21	2	0	0	0	0	0	0	0	0	21	2
7832	Movie Theaters	0	0	0	0	0	0	0	0	0	0	0	0
7991	Health Clubs	22	2	0	0	0	0	0	0	0	0	22	2
7997	Golf/Country Clubs	75	10	0	0	0	0	0	0	0	0	75	10
8051	Nursing Homes	177	23	2	1	1	2	0	0	0	0	180	26
8062	Hospitals	58	16	28	19	38	76	3	19	0	0	127	131
8211	Schools	226	80	47	31	4	4	0	0	0	0	277	116
8221	College/Univ.	33	8	8	5	21	48	10	93	5	151	77	305
8412	Museums	5	1	0	0	0	0	0	0	0	0	5	1
9100	Government Buildings	176	23	6	4	9	13	3	20	0	0	194	60
9223	Prisons	15	2	1	1	4	7	0	0	0	0	20	9
9711	Military	11	2	1	1	2	4	4	44	0	0	18	50
	Total	**2,782**	**347**	**495**	**231**	**178**	**221**	**22**	**192**	**5**	**151**	**3,482**	**1,143**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	1	1	0	0	0	0	1	1
13	Oil and Gas Extraction	5	1	1	1	3	8	0	0	0	0	9	10
26	Paper	3	1	0	0	0	0	0	0	0	0	3	1
29	Petroleum Refining	1	0.1	1	1	0	0	2	16	0	0	4	17
32	Stone/Clay/Glass	1	0.5	0	0	4	15	3	21	0	0	8	37
33	Primary Metals	0	0	0	0	1	4	6	73	3	109	10	186
	Total	**10**	**2**	**2**	**2**	**9**	**28**	**11**	**111**	**3**	**109**	**35**	**251**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no known CHP technical potential at existing district energy loops in Alabama.

Alaska

- Alaska has 408 MW of overall CHP capacity identified at 632 sites.
  - 144 MW of industrial on-site CHP potential, primarily in the petroleum refining, chemicals, gas processing, food, lumber and wood, and chemicals sectors.
  - 191 MW of commercial on-site CHP potential, primarily in the military, colleges/universities, commercial (office) buildings, government buildings and hospitals sectors.
- Alaska has 73 MW of WHP CHP potential identified at 7 sites in the mining, oil and gas extraction, and petroleum refining sectors.
- There is no CHP district energy potential identified in Alaska.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	54	9	13	8	19	40	4	40	1	47	91	144
Commercial Topping Cycle CHP	440	48	58	27	29	35	6	53	1	29	534	191
WHP CHP	2	0.1	0	0	4	13	0	0	1	60	7	73
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**496**	**57**	**71**	**35**	**52**	**87**	**10**	**92**	**3**	**136**	**632**	**408**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	1	3	0	0	0	0	1	3
13	Oil and Gas Extraction	1	0.1	0	0	2	6	0	0	1	60	4	66
20	Food	36	7	10	6	10	16	0	0	0	0	56	28
22	Textiles	0	0	0	0	0	0	0	0	0	0	0	0
24	Lumber and Wood	5	1	1	1	1	2	0	0	0	0	7	4
25	Furniture	0	0	0	0	0	0	0	0	0	0	0	0
26	Paper	0	0	0	0	0	0	0	0	0	0	0	0
27	Printing	3	1	0	0	0	0	0	0	0	0	3	1
28	Chemicals	2	0.2	1	1	0	0	0	0	0	0	3	1
29	Petroleum Refining	1	0.0002	0	0	7	22	4	40	0	0	12	61
30	Rubber/Misc Plastics	5	0.4	0	0	0	0	0	0	0	0	5	0.4
32	Stone/Clay/Glass	0	0	0	0	0	0	0	0	0	0	0	0
33	Primary Metals	2	0.1	0	0	0	0	0	0	0	0	2	0.1
34	Fabricated Metals	0	0	0	0	0	0	0	0	0	0	0	0
35	Machinery/Computer Equip.	0	0	0	0	0	0	0	0	0	0	0	0
37	Transportation Equip.	1	0.1	1	1	0	0	0	0	0	0	2	1
38	Instruments	0	0	0	0	0	0	0	0	0	0	0	0
39	Misc. Manufacturing	0	0	0	0	0	0	0	0	0	0	0	0
49	Gas Processing	0	0	0	0	2	4	0	0	1	47	3	52
	Total	**56**	**9**	**13**	**8**	**23**	**52**	**4**	**40**	**2**	**107**	**98**	**217**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	0	0	0	0	0	0	0	0	0	0	0	0
52	Retail	41	6	0	0	1	1	0	0	0	0	42	8
4222	Refrigerated Warehouses	0	0	0	0	0	0	0	0	0	0	0	0
4581	Airports	19	3	1	1	3	6	0	0	0	0	23	9
4952	Waste Water Treatment Plants	2	0.2	0	0	0	0	0	0	0	0	2	0.2
4961	District Energy	0	0	0	0	0	0	0	0	0	0	0	0
5411	Food Stores	21	2	0	0	0	0	0	0	0	0	21	2
5812	Restaurants	27	2	0	0	0	0	0	0	0	0	27	2
6512	Commercial Office Buildings	133	7	41	16	10	6	0	0	0	0	184	29
6513	Multifamily Buildings	12	1	4	2	1	1	0	0	0	0	17	4
7011	Hotels	58	7	2	1	3	4	0	0	0	0	63	12
7211	Laundries	3	1	0	0	0	0	0	0	0	0	3	1
7374	Data Centers	1	0.2	0	0	0	0	0	0	0	0	1	0.2
7542	Car Washes	1	0.1	0	0	0	0	0	0	0	0	1	0.1
7832	Movie Theaters	0	0	0	0	0	0	0	0	0	0	0	0
7991	Health Clubs	8	1	0	0	0	0	0	0	0	0	8	1
7997	Golf/Country Clubs	4	0.4	0	0	0	0	0	0	0	0	4	0.4
8051	Nursing Homes	9	1	0	0	0	0	0	0	0	0	9	1
8062	Hospitals	19	4	3	2	4	7	0	0	0	0	26	13
8211	Schools	2	0.2	0	0	0	0	0	0	0	0	2	0.2
8221	College/Univ.	5	1	2	1	0	0	1	7	1	29	9	38
8412	Museums	4	0.3	0	0	0	0	0	0	0	0	4	0.3
9100	Government Buildings	44	6	4	3	2	3	1	8	0	0	51	19
9223	Prisons	16	2	1	1	2	4	0	0	0	0	19	7
9711	Military	11	2	0	0	3	4	4	38	0	0	18	44
	Total	**440**	**48**	**58**	**27**	**29**	**35**	**6**	**53**	**1**	**29**	**534**	**191**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Application	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	1	3	0	0	0	0	1	3
13	Oil and Gas Extraction	1	0.1	0	0	2	6	0	0	1	60	4	66
29	Petroleum Refining	1	0.0002	0	0	1	4	0	0	0	0	2	4
	Total	**2**	**0.1**	**0**	**0**	**4**	**13**	**0**	**0**	**1**	**60**	**7**	**73**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no known CHP technical potential at existing district energy loops in Alaska.

Arizona

- Arizona has 2,422 MW of overall CHP capacity identified at 5,703 sites.
  - 638 MW of industrial on-site CHP potential, primarily in the primary metals, chemicals, food, paper and transportation equipment sectors.
  - 1,654 MW of commercial on-site CHP potential, primarily in the schools, commercial (office) buildings, colleges/universities, multifamily buildings and hotels sectors.
- Arizona has 28 MW of WHP CHP potential identified at 4 sites in the stone/clay/glass sector.
- Arizona has 102 MW of CHP potential identified at 3 district energy sites.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	427	73	57	43	66	142	17	157	6	222	573	638
Commercial Topping Cycle CHP	3,833	417	894	465	376	567	17	132	3	73	5,123	1,654
WHP CHP	0	0	0	0	1	3	3	25	0	0	4	28
District Energy CHP	0	0	0	0	0	8	0	0	0	94	3	102
Total	**4,260**	**491**	**951**	**508**	**443**	**720**	**37**	**314**	**9**	**389**	**5,703**	**2,422**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	73	15	8	6	13	24	2	11	0	0	96	57
22	Textiles	4	1	1	1	2	3	0	0	0	0	7	5
24	Lumber and Wood	67	12	7	5	6	11	0	0	0	0	80	28
25	Furniture	4	0.2	0	0	0	0	0	0	0	0	4	0.2
26	Paper	18	5	5	4	4	13	1	10	1	24	29	56
27	Printing	14	2	2	1	0	0	0	0	0	0	16	3
28	Chemicals	94	16	13	10	21	41	10	91	0	0	138	157
29	Petroleum Refining	0	0	2	2	9	24	0	0	0	0	11	26
30	Rubber/Misc Plastics	70	10	3	2	0	0	0	0	0	0	73	12
32	Stone/Clay/Glass	0	0.0	0	0	2	5	5	40	0	0	7	45
33	Primary Metals	23	5	11	9	5	10	1	18	4	174	44	217
34	Fabricated Metals	12	1	0	0	0	0	0	0	0	0	12	1
35	Machinery/Computer Equip.	2	0.2	0	0	1	1	0	0	0	0	3	1
37	Transportation Equip	35	5	2	1	4	11	1	12	1	24	43	54
38	Instruments	3	0.2	0	0	0	0	0	0	0	0	3	0
39	Misc. Manufacturing	8	1	3	3	0	0	0	0	0	0	11	4
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**427**	**73**	**57**	**43**	**67**	**145**	**20**	**182**	**6**	**222**	**577**	**666**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	8	0.4	1	1	0	0	0	0	0	0	9	1
52	Retail	348	51	14	8	1	1	0	0	0	0	363	61
4222	Refrigerated Warehouses	6	1	0	0	0	0	0	0	0	0	6	1
4581	Airports	6	1	2	2	3	8	0	0	1	24	12	35
4952	Waste Water Treatment Plants	14	2	0	0	0	0	0	0	0	0	14	2
4961	District Energy	0	0	0	0	0	8	0	0	0	94	3	102
5411	Food Stores	316	47	2	2	0	0	0	0	0	0	318	49
5812	Restaurants	407	37	0	0	0	0	0	0	0	0	407	37
6512	Commercial Office Buildings	1,252	63	385	154	96	58	0	0	0	0	1,733	274
6513	Multifamily Buildings	431	32	156	78	24	24	0	0	0	0	611	135
7011	Hotels	292	37	22	14	29	57	1	5	0	0	344	113
7211	Laundries	22	4	1	1	0	0	0	0	0	0	23	5
7374	Data Centers	46	7	1	1	1	1	0	0	1	20	49	29
7542	Car Washes	46	4	1	1	1	2	0	0	0	0	48	7
7832	Movie Theaters	1	0.1	0	0	0	0	0	0	0	0	1	0.1
7991	Health Clubs	50	6	0	0	0	0	0	0	0	0	50	6
7997	Golf/Country Clubs	106	17	5	3	3	5	0	0	0	0	114	25
8051	Nursing Homes	103	14	4	3	1	1	0	0	0	0	108	17
8062	Hospitals	49	13	19	14	37	83	0	0	0	0	105	109
8211	Schools	92	44	239	157	117	175	0	0	0	0	448	376
8221	College/Univ.	61	11	8	5	24	71	8	70	1	29	102	186
8412	Museums	15	2	0	0	0	0	0	0	0	0	15	2
9100	Government Buildings	151	22	29	19	25	44	2	20	0	0	207	106
9223	Prisons	4	1	3	3	9	19	4	24	0	0	20	46
9711	Military	7	1	2	1	5	17	2	14	0	0	16	33
	Total	**3,833**	**417**	**894**	**465**	**376**	**567**	**17**	**132**	**3**	**73**	**5,126**	**1,756**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
32	Stone/Clay/Glass	0	0	0	0	1	3	3	25	0	0	4	28
	Total	**0**	**0**	**0**	**0**	**1**	**3**	**3**	**25**	**0**	**0**	**4**	**28**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	District Energy Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
4961	Current Loops without CHP	0	0	0	0	0	0	0	0	1	94	1	94
4961	Current Loops with CHP expansion	0	0	0	0	2	8	0	0	0	0	2	8
	Total	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**0**	**94**	**3**	**102**

Arkansas

- Arkansas has 1,795 MW of overall CHP capacity identified at 2,664 sites.
  - 965 MW of industrial on-site CHP potential, primarily in the chemicals, paper, food, lumber and wood, and rubber/plastics sectors.
  - 668 MW of commercial on-site CHP potential, primarily in the colleges and universities, commercial (office) buildings, hospitals, schools, and retail sectors.
- Arkansas has 162 MW of WHP CHP potential identified at 11 sites in the oil and gas extraction, paper, refining, stone/clay/glass, and primary metals sectors.
- There is no CHP district energy potential identified in Arkansas.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	339	61	84	60	100	219	24	228	11	396	558	965
Commercial Topping Cycle CHP	1,645	199	318	153	120	172	10	98	2	46	2,095	668
WHP CHP	2	0.4	2	2	1	2	4	31	2	127	11	162
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**1,986**	**261**	**404**	**215**	**221**	**393**	**38**	**357**	**15**	**569**	**2,664**	**1,795**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	1	0.1	0	0	0	0	1	6	0	0	2	6
20	Food	52	12	15	11	29	67	6	64	0	0	102	153
22	Textiles	10	2	0	0	2	3	1	10	0	0	13	15
24	Lumber and Wood	106	17	24	17	27	58	2	11	0	0	159	103
25	Furniture	2	1	0	0	0	0	0	0	0	0	2	1
26	Paper	16	4	12	8	13	26	2	15	3	158	46	210
27	Printing	8	1	0	0	0	0	0	0	0	0	8	1
28	Chemicals	41	7	7	6	11	25	9	88	7	211	75	336
29	Petroleum Refining	0	0	1	1	5	11	1	8	1	28	8	47
30	Rubber/Misc Plastics	51	9	11	8	5	8	1	16	0	0	68	42
32	Stone/Clay/Glass	2	0.1	1	1	0	0	1	6	0	0	4	7
33	Primary Metals	17	4	6	5	3	6	4	35	2	127	32	177
34	Fabricated Metals	7	1	1	1	0	0	0	0	0	0	8	2
35	Machinery/Computer Equip.	4	1	1	1	0	0	0	0	0	0	5	1
37	Transportation Equip	21	3	7	5	5	12	0	0	0	0	33	20
38	Instruments	0	0	0	0	0	0	0	0	0	0	0	0
39	Misc. Manufacturing	2	0.4	0	0	0	0	0	0	0	0	2	0.4
49	Gas Processing	1	0.1	0	0	1	5	0	0	0	0	2	5
	Total	**341**	**62**	**86**	**62**	**101**	**221**	**28**	**259**	**13**	**523**	**569**	**1,127**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	4	1	0	0	0	0	0	0	0	0	4	1
52	Retail	178	28	13	8	0	0	0	0	1	21	192	56
4222	Refrigerated Warehouses	14	2	2	1	0	0	0	0	0	0	16	3
4581	Airports	1	0.2	1	1	1	3	1	5	0	0	4	9
4952	Waste Water Treatment Plants	20	2	0	0	0	0	0	0	0	0	20	2
4961	District Energy	0	0	0	0	0	0	0	0	0	0	0	0
5411	Food Stores	57	9	1	1	0	0	0	0	0	0	58	10
5812	Restaurants	131	11	0	0	0	0	0	0	0	0	131	11
6512	Commercial Office Buildings	539	27	216	86	54	32	0	0	0	0	809	146
6513	Multifamily Buildings	28	2	10	5	2	2	0	0	0	0	40	9
7011	Hotels	98	11	7	5	2	2	0	0	0	0	107	19
7211	Laundries	19	3	0	0	0	0	0	0	0	0	19	3
7374	Data Centers	4	1	3	2	3	6	1	12	0	0	11	21
7542	Car Washes	14	1	0	0	0	0	0	0	0	0	14	1
7832	Movie Theaters	0	0	0	0	0	0	0	0	0	0	0	0
7991	Health Clubs	7	1	1	1	0	0	0	0	0	0	8	1
7997	Golf/Country Clubs	32	4	0	0	0	0	0	0	0	0	32	4
8051	Nursing Homes	147	14	2	1	3	6	0	0	0	0	152	22
8062	Hospitals	61	15	21	14	22	46	0	0	0	0	104	76
8211	Schools	117	41	20	13	4	5	0	0	0	0	141	58
8221	College/Univ.	25	5	11	7	14	43	7	76	1	25	58	157
8412	Museums	2	0.2	0	0	0	0	0	0	0	0	2	0.2
9100	Government Buildings	130	15	3	2	7	10	0	0	0	0	140	27
9223	Prisons	14	4	7	5	6	10	0	0	0	0	27	19
9711	Military	3	1	0	0	2	7	1	5	0	0	6	13
	Total	**1,645**	**199**	**318**	**153**	**120**	**172**	**10**	**98**	**2**	**46**	**2,095**	**668**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
13	Oil and Gas Extraction	1	0.1	0	0	0	0	1	6	0	0	2	6
26	Paper	1	0.2	1	1	0	0	0	0	0	0	2	1
29	Petroleum Refining	0	0	0	0	1	2	1	8	0	0	2	9
32	Stone/Clay/Glass	0	0	1	1	0	0	1	6	0	0	2	7
33	Primary Metals	0	0	0	0	0	0	1	11	2	127	3	138
	Total	**2**	**0.4**	**2**	**2**	**1**	**2**	**4**	**31**	**2**	**127**	**11**	**162**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no known CHP technical potential at existing district energy loops in Arkansas.

California

- California has 11,772 of overall CHP capacity identified at 28,968 sites.
  - 3,633 MW of industrial on-site CHP potential, primarily in the chemicals, refining, food, transportation equipment and paper sectors.
  - 7,179 MW of on-site commercial CHP potential, primarily in the commercial (office) buildings, colleges/universities, multifamily buildings, government and hospitals sectors.
- California has 729 MW of WHP CHP potential identified at 62 sites, primarily in the refining, and stone/clay/glass sectors.
- California has 230 MW of CHP potential identified at 7 district energy sites.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	3,174	549	458	334	518	1,117	89	741	15	892	4,254	3,633
Commercial Topping Cycle CHP	19,813	2,055	3,364	1,571	1,308	1,882	146	1,170	14	501	24,645	7,179
WHP CHP	20	4	6	4	13	38	10	89	13	594	62	729
District Energy CHP	0	0	0	0	1	1	3	31	0	198	7	230
Total	**23,007**	**2,608**	**3,828**	**1,909**	**1,840**	**3,038**	**248**	**2,031**	**42**	**2,186**	**28,968**	**11,772**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	1	1	0	0	0	0	0	0	1	1
13	Oil and Gas Extraction	14	3	4	2	2	2	0	0	0	0	20	7
20	Food	852	155	131	97	132	263	30	240	1	21	1,146	776
22	Textiles	113	24	15	13	28	54	1	6	0	0	157	96
24	Lumber and Wood	258	43	36	25	27	47	0	0	0	0	321	116
25	Furniture	22	3	1	1	0	0	0	0	0	0	23	3
26	Paper	146	39	32	22	31	60	2	13	0	0	211	134
27	Printing	62	8	12	8	3	7	0	0	0	0	77	23
28	Chemicals	492	94	123	91	181	430	39	331	5	165	840	1,111
29	Petroleum Refining	3	0.6	10	8	42	102	6	48	21	1,268	82	1,427
30	Rubber/Misc Plastics	469	71	31	21	16	25	0	0	0	0	516	117
32	Stone/Clay/Glass	2	0.5	1	1	13	48	14	122	1	33	31	204
33	Primary Metals	74	21	30	23	23	47	1	17	0	0	128	107
34	Fabricated Metals	234	29	4	2	0	0	0	0	0	0	238	31
35	Machinery/Computer Equip.	13	2	5	3	5	9	0	0	0	0	23	14
37	Transportation Equip.	242	35	21	14	18	45	6	53	0	0	287	147
38	Instruments	121	15	4	3	9	15	0	0	0	0	134	33
39	Misc. Manufacturing	57	7	1	1	1	1	0	0	0	0	59	9
49	Gas Processing	19	4	2	2	0	0	0	0	0	0	21	6
	Total	**3,193**	**553**	**464**	**338**	**531**	**1,155**	**99**	**831**	**28**	**1,486**	**4,315**	**4,362**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	70	7	3	2	0	0	0	0	0	0	73	9
52	Retail	1,562	242	53	34	9	16	0	0	0	0	1,624	292
4222	Refrigerated Warehouses	112	16	5	3	0	0	0	0	0	0	117	19
4581	Airports	14	2	2	1	7	21	2	16	1	29	26	69
4952	Waste Water Treatment Plants	131	22	9	7	5	7	0	0	0	0	145	36
4961	District Energy	0	0	0	0	1	1	3	31	3	198	7	230
5411	Food Stores	1,344	197	12	8	2	4	1	10	0	0	1,359	218
5812	Restaurants	807	70	5	3	1	1	0	0	0	0	813	74
6512	Commercial Office Buildings	6,430	322	1,979	792	495	297	0	0	0	0	8,904	1,410
6513	Multifamily Buildings	2,130	160	825	413	185	185	0	0	0	0	3,140	757
7011	Hotels	1,326	162	124	78	96	176	6	39	0	0	1,552	455
7211	Laundries	173	29	10	6	2	3	0	0	0	0	185	38
7374	Data Centers	279	41	27	18	19	39	0	0	0	0	325	99
7542	Car Washes	96	13	1	1	0	0	0	0	0	0	97	13
7832	Movie Theaters	16	2	0	0	1	1	0	0	0	0	17	3
7991	Health Clubs	13	3	1	1	1	1	0	0	0	0	15	4
7997	Golf/Country Clubs	340	57	1	1	1	2	1	15	0	0	343	74
8051	Nursing Homes	805	81	5	4	3	6	1	6	0	0	814	96
8062	Hospitals	114	32	93	67	192	390	9	66	0	0	408	555
8211	Schools	2,598	387	69	42	1	1	0	0	0	0	2,668	430
8221	College/Univ.	336	55	33	20	141	423	63	538	8	236	581	1,273
8412	Museums	74	10	2	1	0	0	0	0	0	0	76	11
9100	Government Buildings	948	131	85	58	97	189	19	148	2	45	1,151	571
9223	Prisons	49	7	6	4	15	42	25	175	0	0	95	227
9711	Military	47	9	14	9	35	78	19	157	3	191	118	445
	Total	**19,814**	**2,055**	**3,364**	**1,571**	**1,309**	**1,883**	**149**	**1,201**	**17**	**699**	**24,653**	**7,409**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5-1 MW		1-5 MW		5-20 MW		>20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	1	1	0	0	0	0	0	0	1	1
13	Oil and Gas Extraction	14	3	4	2	2	2	0	0	0	0	20	7
29	Petroleum Refining	3	1	0	0	2	3	1	6	12	561	18	571
32	Stone/Clay/Glass	0	0	1	1	9	33	8	67	1	33	19	133
33	Primary Metals	1	0.3	0	0	0	0	1	17	0	0	2	17
38	Instruments	1	0.1	0	0	0	0	0	0	0	0	1	0.1
8221	College/Univ.	1	0.02	0	0	0	0	0	0	0	0	1	0.02
	Total	**20**	**4**	**6**	**4**	**13**	**38**	**10**	**89**	**13**	**594**	**62**	**729**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	District Energy Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
4961	Current Loops without CHP	0	0	0	0	1	1	2	20	3	198	6	219
4961	Current Loops with CHP expansion	0	0	0	0	0	0	1	11	0	0	1	11
	Total	**0**	**0**	**0**	**0**	**1**	**1**	**3**	**31**	**0**	**198**	**7**	**230**

Colorado

- Colorado has 1,719 MW of overall CHP capacity identified at 4,544 sites.
  - 558 MW of industrial on-site CHP potential primarily in the food, chemicals, paper, refining, and primary metals sectors.
  - 1,024 MW of commercial on-site CHP potential, primarily in the commercial (office) buildings, colleges/universities, hotels, hospitals, and multifamily buildings sectors.
- Colorado has 84 MW of WHP CHP potential identified at 32 sites in the oil and gas extraction, refining, stone/clay/glass, and primary metals sectors.
- Colorado has 53 MW of CHP potential identified at 1 district energy site.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	422	79	74	53	68	150	15	136	3	139	582	558
Commercial Topping Cycle CHP	3,255	337	470	221	189	274	11	106	3	86	3,929	1,024
WHP CHP	15	4	2	1	10	21	4	31	1	26	32	84
District Energy CHP	0	0	0	0	0	0	0	0	1	53	1	53
Total	**3,692**	**421**	**546**	**275**	**267**	**445**	**30**	**273**	**8**	**305**	**4,544**	**1,718**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	13	3	2	1	5	8	2	17	0	0	22	30
20	Food	98	22	20	14	21	42	4	47	0	0	143	124
22	Textiles	2	1	1	1	2	3	0	0	0	0	5	5
24	Lumber and Wood	73	12	7	5	1	1	0	0	0	0	81	18
25	Furniture	1	0.1	0	0	0	0	0	0	0	0	1	0.1
26	Paper	13	4	2	1	3	8	0	0	1	84	19	97
27	Printing	11	1	1	1	0	0	0	0	0	0	12	2
28	Chemicals	82	15	23	16	14	28	7	53	0	0	126	113
29	Petroleum Refining	1	0.2	1	1	15	37	2	16	1	28	20	81
30	Rubber/Misc Plastics	64	9	3	2	0	0	0	0	0	0	67	11
32	Stone/Clay/Glass	3	0.5	0	0	6	17	2	15	0	0	11	33
33	Primary Metals	25	6	13	10	6	16	0	0	2	54	46	87
34	Fabricated Metals	4	1	0	0	0	0	0	0	0	0	4	1
35	Machinery/Computer Equip.	4	1	0	0	0	0	0	0	0	0	4	1
37	Transportation Equip	17	2	1	1	1	2	1	10	0	0	20	15
38	Instruments	2	0.4	0	0	0	0	0	0	0	0	2	0.4
39	Misc. Manufacturing	4	1	0	0	0	0	0	0	0	0	4	1
49	Gas Processing	20	4	2	1	4	10	1	9	0	0	27	24
	Total	**437**	**83**	**76**	**54**	**78**	**171**	**19**	**167**	**4**	**166**	**614**	**642**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	9	1	0	0	0	0	0	0	0	0	9	1
52	Retail	304	47	15	9	1	1	0	0	0	0	320	57
4222	Refrigerated Warehouses	8	1	1	1	0	0	0	0	0	0	9	1
4581	Airports	8	2	0	0	1	1	0	0	1	31	10	34
4952	Waste Water Treatment Plants	22	2	0	0	1	4	0	0	0	0	23	6
4961	District Energy	0	0	0	0	0	0	0	0	1	53	1	53
5411	Food Stores	240	38	3	2	0	0	0	0	0	0	243	40
5812	Restaurants	404	36	3	2	1	1	0	0	0	0	408	40
6512	Commercial Office Buildings	954	48	294	118	73	44	0	0	0	0	1,321	209
6513	Multifamily Buildings	221	17	80	40	12	12	0	0	0	0	314	69
7011	Hotels	287	37	22	14	23	41	0	0	0	0	332	92
7211	Laundries	19	3	0	0	0	0	0	0	0	0	19	3
7374	Data Centers	48	6	2	1	2	3	0	0	0	0	52	10
7542	Car Washes	26	3	0	0	0	0	0	0	0	0	26	3
7832	Movie Theaters	3	0.2	0	0	0	0	0	0	0	0	3	0.2
7991	Health Clubs	98	12	1	1	1	2	0	0	0	0	100	15
7997	Golf/Country Clubs	76	10	0	0	0	0	0	0	0	0	76	10
8051	Nursing Homes	145	17	2	1	0	0	0	0	0	0	147	18
8062	Hospitals	60	15	12	9	28	60	0	0	0	0	100	83
8211	Schools	121	10	0	0	0	0	0	0	0	0	121	10
8221	College/Univ.	51	9	8	5	25	68	8	84	1	33	93	199
8412	Museums	10	1	0	0	0	0	0	0	0	0	10	1
9100	Government Buildings	99	15	14	9	8	10	1	7	0	0	122	42
9223	Prisons	35	5	12	9	10	15	0	0	0	0	57	29
9711	Military	7	1	1	1	3	11	2	14	1	22	14	50
	Total	**3,255**	**337**	**470**	**221**	**189**	**274**	**11**	**106**	**4**	**86**	**3,930**	**1,077**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
13	Oil and Gas Extraction	13	3	2	1	5	8	2	17	0	0	22	30
29	Petroleum Refining	1	0.2	0	0	1	2	1	7	0	0	3	10
32	Stone/Clay/Glass	1	0.4	0	0	4	11	1	7	0	0	6	19
33	Primary Metals	0	0	0	0	0	0	0	0	1	26	1	26
	Total	**15**	**4**	**2**	**1**	**10**	**21**	**4**	**31**	**1**	**26**	**32**	**84**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	District Energy Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
4961	Current Loops without CHP	0	0	0	0	0	0	0	0	0	0	0	0
4961	Current Loops with CHP expansion	0	0	0	0	0	0	0	0	1	53	1	53
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**53**	**1**	**53**

Connecticut

- Connecticut has 1,323 MW of overall CHP capacity identified at 3,443 sites.
  - 415 MW of industrial on-site CHP potential primarily in the chemicals, transportation equipment, paper, food, and rubber/plastics sectors.
  - 799 MW of commercial on-site CHP potential, primarily in the commercial (office) buildings, colleges/universities, government buildings, multifamily buildings and hospitals sectors.
- Connecticut has 0.1 MW of WHP CHP potential identified at 1 site in the chemicals sector.
- Connecticut has 109 MW of CHP potential identified at 3 district energy sites.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	418	70	47	33	52	106	11	99	4	107	532	415
Commercial Topping Cycle CHP	2,223	235	465	213	206	207	13	116	1	28	2,907	799
WHP CHP	1	0.1	0	0	0	0	0	0	0	0	1	0.1
District Energy CHP	0	0	0	0	1	4	0	0	2	105	3	109
Total	**2,642**	**305**	**512**	**246**	**259**	**317**	**24**	**215**	**7**	**240**	**3,443**	**1,323**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	50	9	7	5	5	10	1	5	0	0	63	30
22	Textiles	18	4	1	1	1	1	0	0	0	0	20	6
24	Lumber and Wood	43	6	2	1	0	0	0	0	0	0	45	7
25	Furniture	2	0.3	0	0	0	0	0	0	0	0	2	0.3
26	Paper	28	7	7	5	10	24	1	8	0	0	46	45
27	Printing	22	4	0	0	0	0	0	0	0	0	22	4
28	Chemicals	64	11	17	12	22	44	6	49	4	107	113	223
29	Petroleum Refining	0	0	1	1	1	2	0	0	0	0	2	2
30	Rubber/Misc Plastics	74	10	5	3	2	2	0	0	0	0	81	16
32	Stone/Clay/Glass	0	0	0	0	0	0	0	0	0	0	0	0
33	Primary Metals	20	5	1	1	6	10	0	0	0	0	27	15
34	Fabricated Metals	38	5	1	1	0	0	0	0	0	0	39	5
35	Machinery/Computer Equip.	2	0.1	0	0	0	0	0	0	0	0	2	0.1
37	Transportation Equip	49	7	5	4	4	12	3	36	0	0	61	60
38	Instruments	2	0.4	0	0	1	1	0	0	0	0	3	2
39	Misc. Manufacturing	7	1	0	0	0	0	0	0	0	0	7	1
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**419**	**70**	**47**	**33**	**52**	**106**	**11**	**99**	**4**	**107**	**533**	**415**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	11	1	0	0	0	0	0	0	0	0	11	1
52	Retail	213	28	1	1	2	2	0	0	0	0	216	31
4222	Refrigerated Warehouses	5	1	0	0	0	0	0	0	0	0	5	1
4581	Airports	1	0.1	0	0	0	0	0	0	0	0	1	0.1
4952	Waste Water Treatment Plants	6	1	2	2	2	4	0	0	0	0	10	6
4961	District Energy	0	0	0	0	1	4	0	0	2	105	3	109
5411	Food Stores	164	40	6	4	0	0	0	0	0	0	170	43
5812	Restaurants	169	15	0	0	0	0	0	0	0	0	169	15
6512	Commercial Office Buildings	646	32	323	129	129	77	0	0	0	0	1,098	239
6513	Multifamily Buildings	195	15	71	35	11	11	0	0	0	0	276	61
7011	Hotels	120	15	9	6	2	3	0	0	0	0	131	23
7211	Laundries	13	2	0	0	0	0	0	0	0	0	13	2
7374	Data Centers	36	6	6	4	1	1	0	0	0	0	43	11
7542	Car Washes	10	1	0	0	0	0	0	0	0	0	10	1
7832	Movie Theaters	2	0.2	0	0	0	0	0	0	0	0	2	0.2
7991	Health Clubs	46	5	0	0	0	0	0	0	0	0	46	5
7997	Golf/Country Clubs	69	9	0	0	0	0	0	0	0	0	69	9
8051	Nursing Homes	176	24	4	2	0	0	0	0	0	0	180	26
8062	Hospitals	14	5	9	7	19	35	1	7	0	0	43	53
8211	Schools	182	18	0	0	0	0	0	0	0	0	182	18
8221	College/Univ.	36	6	8	5	14	28	10	89	1	28	69	156
8412	Museums	13	1	0	0	0	0	0	0	0	0	13	1
9100	Government Buildings	77	8	16	11	14	24	2	20	0	0	109	63
9223	Prisons	11	1	7	6	10	16	0	0	0	0	28	23
9711	Military	8	2	3	2	2	6	0	0	0	0	13	10
	Total	**2,223**	**235**	**465**	**213**	**207**	**207**	**13**	**116**	**3**	**28**	**2,910**	**908**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
28	Chemicals	1	0.1	0	0	0	0	0	0	0	0	1	0.1
	Total	**1**	**0.1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0.1**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	District Energy Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
4961	Current Loops without CHP	0	0	0	0	1	4	0	0	0	0	1	4
4961	Current Loops with CHP expansion	0	0	0	0	0	0	0	0	2	105	2	105
	Total	**0**	**0**	**0**	**0**	**1**	**4**	**0**	**0**	**2**	**105**	**3**	**109**

District of Columbia

- The District of Columbia has 908 MW of overall CHP capacity identified at 757 sites.
  - 4 MW of industrial on-site CHP potential primarily in the printing, refining and instruments sectors.
  - 757 MW of commercial on-site CHP potential, primarily in the government buildings, colleges and universities, multifamily buildings, airports, and hotels sectors.
- There is no WHP CHP potential identified in the District of Columbia.
- The District of Columbia has 146 MW of CHP potential identified at 1 district energy site.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	6	1	1	1	2	3	0	0	0	0	9	4
Commercial Topping Cycle CHP	539	50	135	66	58	91	11	87	3	463	747	757
WHP CHP	0	0	0	0	0	0	0	0	0	0	0	0
District Energy CHP	0	0	0	0	0	0	0	0	1	146	1	146
Total	**545**	**51**	**136**	**67**	**60**	**94**	**11**	**87**	**4**	**609**	**757**	**908**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	1	0.2	0	0	0	0	0	0	0	0	1	0.2
22	Textiles	0	0	0	0	0	0	0	0	0	0	0	0
24	Lumber and Wood	1	0	0	0	0	0	0	0	0	0	1	0
25	Furniture	0	0	0	0	0	0	0	0	0	0	0	0
26	Paper	0	0	0	0	0	0	0	0	0	0	0	0
27	Printing	4	0.4	0	0	1	2	0	0	0	0	5	2
28	Chemicals	0	0	0	0	0	0	0	0	0	0	0	0
29	Petroleum Refining	0	0	1	1	0	0	0	0	0	0	1	1
30	Rubber/Misc Plastics	0	0	0	0	0	0	0	0	0	0	0	0
32	Stone/Clay/Glass	0	0	0	0	0	0	0	0	0	0	0	0
33	Primary Metals	0	0	0	0	0	0	0	0	0	0	0	0
34	Fabricated Metals	0	0	0	0	0	0	0	0	0	0	0	0
35	Machinery/Computer Equip.	0	0	0	0	0	0	0	0	0	0	0	0
37	Transportation Equip	0	0	0	0	0	0	0	0	0	0	0	0
38	Instruments	0	0	0	0	1	1	0	0	0	0	1	1
39	Misc. Manufacturing	0	0	0	0	0	0	0	0	0	0	0	0
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**6**	**1**	**1**	**1**	**2**	**3**	**0**	**0**	**0**	**0**	**9**	**4**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	3	0.2	0	0	0	0	0	0	0	0	3	0.2
52	Retail	8	1	0	0	0	0	0	0	0	0	8	1
4222	Refrigerated Warehouses	0	0	0	0	0	0	0	0	0	0	0	0
4581	Airports	0	0	0	0	0	0	0	0	1	47	1	47
4952	Waste Water Treatment Plants	0	0	0	0	1	4	0	0	0	0	1	4
4961	District Energy	0	0	0	0	0	0	0	0	1	146	1	146
5411	Food Stores	19	3	0	0	0	0	0	0	0	0	19	3
5812	Restaurants	68	6	1	1	0	0	0	0	0	0	69	7
6512	Commercial Office Buildings	112	6	45	18	11	7	0	0	0	0	168	30
6513	Multifamily Buildings	182	14	66	33	10	10	0	0	0	0	259	57
7011	Hotels	58	9	14	9	14	18	0	0	0	0	86	36
7211	Laundries	0	0	1	1	0	0	0	0	0	0	1	1
7374	Data Centers	9	1	2	1	1	1	0	0	0	0	12	4
7542	Car Washes	3	0.2	0	0	0	0	0	0	0	0	3	0.2
7832	Movie Theaters	1	0.1	0	0	0	0	0	0	0	0	1	0.1
7991	Health Clubs	12	1	0	0	0	0	0	0	0	0	12	1
7997	Golf/Country Clubs	1	0.1	0	0	0	0	0	0	0	0	1	0.1
8051	Nursing Homes	13	3	0	0	0	0	0	0	0	0	13	3
8062	Hospitals	0	0	4	3	10	23	1	6	0	0	15	31
8211	Schools	13	1	0	0	0	0	0	0	0	0	13	1
8221	College/Univ.	8	1	1	1	4	9	5	49	1	31	19	91
8412	Museums	10	1	0	0	1	2	0	0	0	0	11	4
9100	Government Buildings	15	2	1	1	3	6	3	20	1	385	23	413
9223	Prisons	2	0.2	0	0	0	0	0	0	0	0	2	0.2
9711	Military	2	1	0	0	3	10	2	12	0	0	7	23
	Total	**539**	**50**	**135**	**66**	**58**	**91**	**11**	**87**	**4**	**463**	**748**	**903**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no WHP CHP potential identified in the District of Columbia.

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	District Energy Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
4961	Current Loops without CHP	0	0	0	0	0	0	0	0	1	146	1	146
4961	Current Loops with CHP expansion	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**146**	**1**	**146**

Delaware

- Delaware has 747 MW of overall CHP capacity identified at 832 sites.
  - 481 MW of industrial on-site CHP potential primarily in the chemicals, refining, food, transportation equipment, and paper sectors.
  - 207 MW of commercial on-site CHP potential, primarily in the colleges/universities, commercial (office) buildings, schools, hospitals, and hotels sectors.
- Delaware has 60 MW of WHP CHP potential identified at 2 sites in the refining and primary metals sectors.
- There is no CHP district energy potential identified in Delaware.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	69	13	15	11	22	47	13	132	4	277	123	481
Commercial Topping Cycle CHP	579	69	89	40	34	46	3	27	1	24	707	207
WHP CHP	0	0	0	0	0	0	1	11	1	49	2	60
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**648**	**82**	**104**	**52**	**56**	**94**	**17**	**170**	**6**	**350**	**832**	**747**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	11	2	3	2	4	8	0	0	0	0	18	12
22	Textiles	1	0	1	1	1	3	0	0	0	0	3	4
24	Lumber and Wood	6	1	2	1	0	0	0	0	0	0	8	2
25	Furniture	0	0	0	0	0	0	0	0	0	0	0	0
26	Paper	3	1	1	1	1	2	0	0	0	0	5	4
27	Printing	3	1	0	0	0	0	0	0	0	0	3	1
28	Chemicals	21	3	6	4	10	22	12	124	3	137	52	290
29	Petroleum Refining	0	0	0	0	5	11	0	0	2	189	7	200
30	Rubber/Misc Plastics	18	4	0	0	0	0	0	0	0	0	18	4
32	Stone/Clay/Glass	0	0.0	0	0	0	0	0	0	0	0	0	0
33	Primary Metals	3	1	2	1	1	1	1	11	0	0	7	15
34	Fabricated Metals	0	0	0	0	0	0	0	0	0	0	0	0
35	Machinery/Computer Equip.	0	0	0	0	0	0	0	0	0	0	0	0
37	Transportation Equip	2	0	0	0	0	0	1	8	0	0	3	9
38	Instruments	0	0.0	0	0	0	0	0	0	0	0	0	0
39	Misc. Manufacturing	1	0	0	0	0	0	0	0	0	0	1	0
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**69**	**13**	**15**	**11**	**22**	**47**	**14**	**143**	**5**	**326**	**125**	**541**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	2	0.3	0	0	0	0	0	0	0	0	2	0.3
52	Retail	59	9	1	1	0	0	0	0	0	0	60	9
4222	Refrigerated Warehouses	6	1	0	0	0	0	0	0	0	0	6	1
4581	Airports	0	0	0	0	0	0	0	0	0	0	0	0
4952	Waste Water Treatment Plants	4	1	0	0	0	0	0	0	0	0	4	1
4961	District Energy	0	0	0	0	0	0	0	0	0	0	0	0
5411	Food Stores	40	7	0	0	0	0	0	0	0	0	40	7
5812	Restaurants	77	7	0	0	0	0	0	0	0	0	77	7
6512	Commercial Office Buildings	165	8	66	26	17	10	0	0	0	0	248	45
6513	Multifamily Buildings	20	2	7	4	1	1	0	0	0	0	29	6
7011	Hotels	42	5	3	2	1	4	0	0	0	0	46	10
7211	Laundries	3	1	0	0	0	0	0	0	0	0	3	1
7374	Data Centers	6	1	1	1	1	4	0	0	0	0	8	5
7542	Car Washes	5	0.4	0	0	0	0	0	0	0	0	5	0.4
7832	Movie Theaters	0	0	0	0	0	0	0	0	0	0	0	0
7991	Health Clubs	3	0.3	0	0	0	0	0	0	0	0	3	0.3
7997	Golf/Country Clubs	17	3	0	0	0	0	0	0	0	0	17	3
8051	Nursing Homes	30	4	0	0	0	0	0	0	0	0	30	4
8062	Hospitals	3	1	2	1	6	9	1	7	0	0	12	19
8211	Schools	62	13	2	1	0	0	0	0	0	0	64	14
8221	College/Univ.	8	2	1	1	5	11	1	15	1	24	16	53
8412	Museums	3	1	0	0	0	0	0	0	0	0	3	1
9100	Government Buildings	13	2	6	4	0	0	0	0	0	0	19	6
9223	Prisons	9	2	0	0	3	7	0	0	0	0	12	8
9711	Military	2	1	0	0	0	0	1	5	0	0	3	6
	Total	**579**	**69**	**89**	**40**	**34**	**46**	**3**	**27**	**1**	**24**	**707**	**207**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
29	Petroleum Refining	0	0	0	0	0	0	0	0	1	49	1	49
33	Primary Metals	0	0	0	0	0	0	1	11	0	0	1	11
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**11**	**1**	**49**	**2**	**60**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no known CHP technical potential at existing district energy loops in Delaware.

Florida

- Florida has 6,968 MW of overall CHP capacity identified at 17,823 sites.
  - 1,215 MW of industrial on-site CHP potential primarily in the chemicals, food, paper, lumber and wood, and primary metals sectors.
  - 5,637 MW of commercial on-site CHP potential, primarily in the schools, commercial (office) buildings, hospitals, multifamily buildings, and hotels sectors.
- Florida has 65 MW of WHP CHP potential identified at 13 sites in the oil and gas extraction, food, paper, stone/clay/glass, and primary metals sectors.
- Florida has 51 MW of CHP potential identified at 2 district energy sites.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	1,099	191	171	122	188	386	34	298	5	220	1,497	1,215
Commercial Topping Cycle CHP	11,828	1,282	3,107	1,677	1,312	1,831	54	541	10	306	16,311	5,637
WHP CHP	4	1	0	0	6	19	2	21	1	24	13	65
District Energy CHP	0	0	0	0	0	0	1	11	1	40	2	51
Total	**12,931**	**1,474**	**3,278**	**1,799**	**1,506**	**2,235**	**91**	**871**	**17**	**590**	**17,823**	**6,968**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	1	0.2	0	0	0	0	0	0	0	0	1	0.2
20	Food	201	38	35	25	47	87	3	22	1	33	287	204
22	Textiles	28	5	5	4	7	11	3	34	0	0	43	54
24	Lumber and Wood	195	35	27	19	26	45	2	12	0	0	250	110
25	Furniture	4	0.5	0	0	0	0	0	0	0	0	4	0.5
26	Paper	42	10	13	10	14	33	1	17	2	63	72	132
27	Printing	40	8	1	1	0	0	0	0	0	0	41	9
28	Chemicals	248	44	47	32	48	99	22	181	1	102	366	458
29	Petroleum Refining	0	0	5	4	12	28	0	0	0	0	17	32
30	Rubber/Misc Plastics	170	24	12	8	5	9	0	0	0	0	187	41
32	Stone/Clay/Glass	2	0.1	0	0	13	46	4	43	0	0	19	89
33	Primary Metals	46	10	16	11	14	32	1	10	2	46	79	109
34	Fabricated Metals	18	2	0	0	0	0	0	0	0	0	18	2
35	Machinery/Computer Equip.	4	1	0	0	1	2	0	0	0	0	5	3
37	Transportation Equip	79	12	10	7	6	12	0	0	0	0	95	31
38	Instruments	6	0.9	0	0	0	0	0	0	0	0	6	1
39	Misc. Manufacturing	18	2	0	0	1	2	0	0	0	0	19	4
49	Gas Processing	1	0.2	0	0	0	0	0	0	0	0	1	0.2
	Total	**1,103**	**191**	**171**	**122**	**194**	**405**	**36**	**319**	**6**	**244**	**1,510**	**1,281**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	29	4	1	1	1	1	0	0	0	0	31	6
52	Retail	1,092	149	75	47	3	4	0	0	0	0	1,170	200
4222	Refrigerated Warehouses	41	6	2	1	0	0	0	0	0	0	43	7
4581	Airports	2	1	0	0	12	33	6	58	1	21	21	112
4952	Waste Water Treatment Plants	29	4	3	2	2	5	1	7	0	0	35	19
4961	District Energy	0	0	0	0	0	0	1	0	1	0	2	51
5411	Food Stores	1,223	263	3	2	0	0	0	0	0	0	1,226	265
5812	Restaurants	1,412	132	14	10	5	8	0	0	0	0	1,431	150
6512	Commercial Office Buildings	3,457	173	1,383	553	346	208	0	0	0	0	5,186	934
6513	Multifamily Buildings	1,177	88	427	213	66	66	0	0	0	0	1,670	368
7011	Hotels	1,110	144	92	58	75	127	2	11	0	0	1,279	341
7211	Laundries	58	9	6	4	0	0	0	0	0	0	64	13
7374	Data Centers	115	16	8	5	2	3	2	30	0	0	127	54
7542	Car Washes	109	9	0	0	0	0	0	0	0	0	109	9
7832	Movie Theaters	5	0.3	0	0	0	0	0	0	0	0	5	0.3
7991	Health Clubs	335	30	1	1	1	1	0	0	0	0	337	32
7997	Golf/Country Clubs	507	72	12	8	6	10	0	0	0	0	525	89
8051	Nursing Homes	518	70	14	9	1	1	0	0	0	0	533	80
8062	Hospitals	67	20	61	43	122	262	7	62	0	0	257	386
8211	Schools	0	0	928	666	515	771	0	0	0	0	1,443	1,437
8221	College/Univ.	208	38	14	10	53	133	26	291	9	285	310	757
8412	Museums	38	4	1	1	0	0	0	0	0	0	39	5
9100	Government Buildings	229	37	41	29	42	75	4	27	0	0	316	168
9223	Prisons	46	7	12	10	51	97	0	0	0	0	109	114
9711	Military	21	5	9	6	9	25	6	56	0	0	45	92
	Total	**11,828**	**1,282**	**3,107**	**1,677**	**1,312**	**1,831**	**55**	**541**	**11**	**306**	**16,313**	**5,688**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
13	Oil and Gas Extraction	1	0.2	0	0	0	0	0	0	0	0	1	0.2
20	Food	1	0.1	0	0	0	0	0	0	0	0	1	0.1
26	Paper	2	0.4	0	0	0	0	0	0	0	0	2	0.4
32	Stone/Clay/Glass	0	0	0	0	6	19	2	21	0	0	8	40
33	Primary Metals	0	0	0	0	0	0	0	0	1	24	1	24
	Total	**4**	**0.8**	**0**	**0**	**6**	**19**	**2**	**21**	**1**	**24**	**13**	**65**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	District Energy Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
4961	Current Loops without CHP	0	0	0	0	0	0	1	11	1	40	2	51
4961	Current Loops with CHP expansion	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**11**	**1**	**40**	**2**	**51**

Georgia

- Georgia has 5,110 MW of overall CHP capacity identified at 9,374 sites.
  - 2,725 MW of industrial on-site CHP potential primarily in the chemicals, textiles, food, paper, and lumber and wood sectors.
  - 2,371 MW of commercial on-site CHP potential, primarily in the commercial (office) buildings, colleges and universities, schools, hospitals and military sectors.
- Georgia has 14 MW of WHP CHP potential identified at 7 sites in the paper, chemicals, and stone/clay/glass sectors.
- There is no CHP district energy potential identified in Georgia.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	1,209	224	215	157	336	694	103	849	21	802	1,884	2,725
Commercial Topping Cycle CHP	5,880	748	1,127	542	446	605	23	233	7	243	7,483	2,371
WHP CHP	2	0.2	0	0	5	14	0	0	0	0	7	14
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**7,091**	**972**	**1,342**	**699**	**787**	**1,312**	**126**	**1,083**	**28**	**1,044**	**9,374**	**5,110**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	166	32	22	16	43	72	9	75	1	22	241	218
22	Textiles	175	37	38	28	89	198	46	358	2	69	350	690
24	Lumber and Wood	237	42	28	20	40	81	3	17	0	0	308	161
25	Furniture	2	0.2	0	0	0	0	0	0	0	0	2	0.2
26	Paper	78	19	8	5	20	39	10	89	10	417	126	569
27	Printing	16	2	3	2	1	2	0	0	0	0	20	6
28	Chemicals	202	35	59	44	89	188	33	290	8	294	391	851
29	Petroleum Refining	0	0	4	3	5	12	0	0	0	0	9	15
30	Rubber/Misc Plastics	199	31	25	18	14	25	0	0	0	0	238	75
32	Stone/Clay/Glass	3	0.3	0	0	5	15	0	0	0	0	8	16
33	Primary Metals	37	9	19	15	16	39	0	0	0	0	72	62
34	Fabricated Metals	17	1	0	0	0	0	0	0	0	0	17	1
35	Machinery/Computer Equip.	11	2	0	0	2	2	0	0	0	0	13	4
37	Transportation Equip	53	10	8	6	16	30	2	19	0	0	79	65
38	Instruments	4	0.6	1	1	1	3	0	0	0	0	6	4
39	Misc. Manufacturing	11	2	0	0	0	0	0	0	0	0	11	2
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**1,211**	**224**	**215**	**157**	**341**	**707**	**103**	**849**	**21**	**802**	**1,891**	**2,739**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	7	1	1	1	0	0	0	0	0	0	8	2
52	Retail	579	82	32	19	3	4	0	0	0	0	614	105
4222	Refrigerated Warehouses	24	4	1	1	1	1	0	0	0	0	26	6
4581	Airports	5	1	0	0	2	5	0	0	1	53	8	59
4952	Waste Water Treatment Plants	12	1	3	2	1	1	0	0	0	0	16	4
4961	District Energy	0	0	0	0	0	0	0	0	0	0	0	0
5411	Food Stores	431	84	0	0	0	0	0	0	0	0	431	84
5812	Restaurants	634	56	4	3	1	1	0	0	0	0	639	59
6512	Commercial Office Buildings	1,833	92	733	293	183	110	0	0	0	0	2,749	495
6513	Multifamily Buildings	227	17	82	41	13	13	0	0	0	0	322	71
7011	Hotels	416	51	13	7	21	38	0	0	0	0	450	97
7211	Laundries	33	5	2	1	0	0	0	0	0	0	35	6
7374	Data Centers	56	7	8	6	15	32	0	0	0	0	79	45
7542	Car Washes	58	5	0	0	0	0	0	0	0	0	58	5
7832	Movie Theaters	2	0.2	0	0	0	0	0	0	0	0	2	0.2
7991	Health Clubs	130	11	2	1	0	0	0	0	0	0	132	12
7997	Golf/Country Clubs	130	17	2	1	1	2	0	0	0	0	133	20
8051	Nursing Homes	253	29	2	1	2	5	0	0	0	0	257	35
8062	Hospitals	70	18	39	27	74	156	1	7	0	0	184	207
8211	Schools	696	222	167	114	26	31	0	0	0	0	889	367
8221	College/Univ.	70	14	13	8	58	128	13	123	5	155	159	429
8412	Museums	18	2	0	0	0	0	0	0	0	0	18	2
9100	Government Buildings	140	18	15	10	9	20	1	17	0	0	165	65
9223	Prisons	45	8	6	5	33	51	0	0	0	0	84	64
9711	Military	11	1	2	1	3	8	8	87	1	34	25	131
	Total	**5,880**	**748**	**1,127**	**542**	**446**	**605**	**23**	**233**	**7**	**243**	**7,483**	**2,371**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
26	Paper	1	0.04	0	0	0	0	0	0	0	0	1	0.04
28	Chemicals	1	0.2	0	0	1	2	0	0	0	0	2	2
32	Stone/Clay/Glass	0	0	0	0	4	12	0	0	0	0	4	12
	Total	**2**	**0.2**	**0**	**0**	**5**	**14**	**0**	**0**	**0**	**0**	**7**	**14**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no known CHP technical potential at existing district energy loops in Georgia.

Hawaii

- Hawaii has 563 MW of overall CHP capacity identified at 1,292 sites.
  - 69 MW of industrial on-site CHP potential primarily in the food, chemicals, refining, primary metals, and lumber and wood sectors.
  - 486 MW of commercial on-site CHP potential, primarily in the schools, hotels, colleges and universities, commercial (office) buildings, and multifamily buildings sectors.
- Hawaii has 7 MW of WHP CHP potential identified at 2 sites in the petroleum refining sector.
- There is no CHP district energy potential identified in Hawaii.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	104	17	13	9	13	23	2	20	0	0	132	69
Commercial Topping Cycle CHP	811	83	208	120	134	219	5	40	1	25	1,158	486
WHP CHP	0	0	0	0	2	7	0	0	0	0	2	7
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**915**	**100**	**221**	**129**	**149**	**250**	**7**	**59**	**1**	**25**	**1,292**	**563**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	60	10	10	7	7	11	0	0	0	0	77	28
22	Textiles	1	0.1	0	0	0	0	0	0	0	0	1	0.1
24	Lumber and Wood	7	1	0	0	2	2	0	0	0	0	9	4
25	Furniture	0	0	0	0	0	0	0	0	0	0	0	0
26	Paper	0	0	0	0	0	0	0	0	0	0	0	0
27	Printing	7	1	0	0	0	0	0	0	0	0	7	1
28	Chemicals	17	2	3	2	3	7	1	7	0	0	24	18
29	Petroleum Refining	0	0	0	0	2	7	1	13	0	0	3	21
30	Rubber/Misc Plastics	5	1	0	0	0	0	0	0	0	0	5	1
32	Stone/Clay/Glass	0	0	0	0	0	0	0	0	0	0	0	0
33	Primary Metals	5	1	0	0	1	3	0	0	0	0	6	4
34	Fabricated Metals	0	0	0	0	0	0	0	0	0	0	0	0
35	Machinery/Computer Equip.	0	0	0	0	0	0	0	0	0	0	0	0
37	Transportation Equip	2	0.2	0	0	0	0	0	0	0	0	2	0.2
38	Instruments	0	0	0	0	0	0	0	0	0	0	0	0
39	Misc. Manufacturing	0	0	0	0	0	0	0	0	0	0	0	0
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**104**	**17**	**13**	**9**	**15**	**30**	**2**	**20**	**0**	**0**	**134**	**76**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	0	0	0	0	0	0	0	0	0	0	0	0
52	Retail	54	7	3	2	1	1	0	0	0	0	58	10
4222	Refrigerated Warehouses	5	0.4	0	0	0	0	0	0	0	0	5	0.4
4581	Airports	0	0	4	3	3	6	1	10	0	0	8	20
4952	Waste Water Treatment Plants	5	0.5	0	0	1	2	0	0	0	0	6	2
4961	District Energy	0	0	0	0	0	0	0	0	0	0	0	0
5411	Food Stores	50	6	0	0	0	0	0	0	0	0	50	6
5812	Restaurants	106	11	4	3	1	1	0	0	0	0	111	15
6512	Commercial Office Buildings	246	12	76	30	19	11	0	0	0	0	341	54
6513	Multifamily Buildings	122	9	44	22	7	7	0	0	0	0	172	38
7011	Hotels	77	12	23	15	29	62	2	15	0	0	131	104
7211	Laundries	3	0.4	0	0	0	0	0	0	0	0	3	0.4
7374	Data Centers	10	1	0	0	0	0	0	0	0	0	10	1
7542	Car Washes	2	0.3	0	0	0	0	0	0	0	0	2	0.3
7832	Movie Theaters	0	0	0	0	0	0	0	0	0	0	0	0
7991	Health Clubs	18	2	1	1	0	0	0	0	0	0	19	2
7997	Golf/Country Clubs	40	7	0	0	1	1	0	0	0	0	41	8
8051	Nursing Homes	21	3	1	1	0	0	0	0	0	0	22	4
8062	Hospitals	10	2	4	3	10	16	0	0	0	0	24	21
8211	Schools	0	0	46	40	45	72	0	0	0	0	91	112
8221	College/Univ.	8	1	2	2	9	25	2	15	1	25	22	67
8412	Museums	9	1	0	0	0	0	0	0	0	0	9	1
9100	Government Buildings	18	4	0	0	6	11	0	0	0	0	24	15
9223	Prisons	7	2	0	0	2	3	0	0	0	0	9	4
9711	Military	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**811**	**83**	**208**	**120**	**134**	**219**	**5**	**40**	**1**	**25**	**1,158**	**486**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
29	Petroleum Refining	0	0	0	0	2	7	0	0	0	0	2	7
	Total	**0**	**0**	**0**	**0**	**2**	**7**	**0**	**0**	**0**	**0**	**2**	**7**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no known CHP technical potential at existing district energy loops in Hawaii.

Idaho

- Idaho has 659 MW of overall CHP capacity identified at 1,407 sites.
  - 315 MW of industrial on-site CHP potential primarily in the food, chemicals, lumber and wood, paper, and primary metals sectors.
  - 342 MW of commercial on-site CHP potential, primarily in the colleges and universities, commercial (office) buildings, hospitals, retail, and hotels sectors.
- Idaho has 2 MW of WHP CHP potential identified at 1 site in the stone/clay/glass sector.
- There is no CHP district energy potential identified in Idaho.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	207	36	36	24	61	119	6	54	2	81	312	315
Commercial Topping Cycle CHP	926	94	117	54	45	58	3	39	3	97	1,094	342
WHP CHP	0	0	0	0	1	2	0	0	0	0	1	2
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**1,133**	**130**	**153**	**78**	**107**	**180**	**9**	**93**	**5**	**178**	**1,407**	**659**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	54	10	18	12	32	62	2	12	0	0	106	95
22	Textiles	2	1	0	0	0	0	0	0	0	0	2	1
24	Lumber and Wood	77	13	15	10	15	30	1	7	0	0	108	60
25	Furniture	0	0	0	0	0	0	0	0	0	0	0	0
26	Paper	4	1	1	1	0	0	1	16	1	40	7	58
27	Printing	8	1	0	0	0	0	0	0	0	0	8	1
28	Chemicals	28	4	1	1	7	12	2	20	1	41	39	77
29	Petroleum Refining	0	0	0	0	1	2	0	0	0	0	1	2
30	Rubber/Misc Plastics	11	2	0	0	0	0	0	0	0	0	11	2
32	Stone/Clay/Glass	0	0	0	0	1	2	0	0	0	0	1	2
33	Primary Metals	12	3	1	1	6	14	0	0	0	0	19	17
34	Fabricated Metals	2	0.4	0	0	0	0	0	0	0	0	2	0.4
35	Machinery/Computer Equip.	3	0.3	0	0	0	0	0	0	0	0	3	0.3
37	Transportation Equip	3	0.4	0	0	0	0	0	0	0	0	3	0.4
38	Instruments	0	0	0	0	0	0	0	0	0	0	0	0
39	Misc. Manufacturing	3	0.3	0	0	0	0	0	0	0	0	3	0.3
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**207**	**36**	**36**	**24**	**62**	**121**	**6**	**54**	**2**	**81**	**313**	**316**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	3	0.4	0	0	0	0	0	0	0	0	3	0.4
52	Retail	92	14	3	2	2	5	0	0	0	0	97	20
4222	Refrigerated Warehouses	8	1	0	0	0	0	0	0	0	0	8	1
4581	Airports	4	1	0	0	1	2	0	0	0	0	5	3
4952	Waste Water Treatment Plants	7	1	0	0	0	0	0	0	0	0	7	1
4961	District Energy	0	0	0	0	0	0	0	0	0	0	0	0
5411	Food Stores	63	9	1	1	0	0	0	0	0	0	64	10
5812	Restaurants	88	9	0	0	0	0	0	0	0	0	88	9
6512	Commercial Office Buildings	293	15	90	36	23	14	0	0	0	0	406	64
6513	Multifamily Buildings	15	1	5	3	1	1	0	0	0	0	21	5
7011	Hotels	90	10	4	2	2	2	0	0	0	0	96	15
7211	Laundries	5	1	0	0	0	0	0	0	0	0	5	1
7374	Data Centers	4	1	0	0	1	2	0	0	0	0	5	3
7542	Car Washes	9	1	0	0	0	0	0	0	0	0	9	1
7832	Movie Theaters	0	0	0	0	0	0	0	0	0	0	0	0
7991	Health Clubs	22	3	0	0	1	1	0	0	0	0	23	4
7997	Golf/Country Clubs	26	3	0	0	0	0	0	0	0	0	26	3
8051	Nursing Homes	50	5	0	0	0	0	0	0	0	0	50	5
8062	Hospitals	39	7	8	6	6	14	0	0	0	0	53	27
8211	Schools	41	3	0	0	0	0	0	0	0	0	41	3
8221	College/Univ.	12	2	0	0	5	12	2	33	3	97	22	144
8412	Museums	1	0.1	1	1	0	0	0	0	0	0	2	1
9100	Government Buildings	45	6	2	2	0	0	0	0	0	0	47	8
9223	Prisons	8	1	3	2	2	3	0	0	0	0	13	7
9711	Military	1	0.1	0	0	1	2	1	6	0	0	3	9
	Total	**926**	**94**	**117**	**54**	**45**	**58**	**3**	**39**	**3**	**97**	**1,094**	**342**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
32	Stone/Clay/Glass	0	0	0	0	1	2	0	0	0	0	1	2
	Total	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**0**	**1**	**2**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no known CHP technical potential at existing district energy loops in Idaho.

Illinois

- Illinois has 7,464 MW of overall CHP capacity identified at 13,717 sites.
  - 3,733 MW of industrial on-site CHP potential primarily in the chemicals, food, refining, primary metals, and paper sectors.
  - 3,075 MW of commercial on-site CHP potential, primarily in the commercial (office) buildings, colleges and universities, multifamily buildings, hospitals, and retail sectors.
- Illinois has 353 MW of WHP CHP potential identified at 25 sites in the oil and gas extraction, chemicals, refining, stone/clay/glass, and primary metals sectors.
- Illinois has 303 MW of CHP potential identified at 2 district energy sites.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	1,751	322	291	207	368	770	91	839	33	1,595	2,534	3,733
Commercial Topping Cycle CHP	8,544	862	1,891	848	680	831	34	332	7	201	11,156	3,075
WHP CHP	3	1	0	0	8	24	9	108	5	220	25	353
District Energy CHP	0	0	0	0	0	0	0	0	2	303	2	303
Total	**10,298**	**1,184**	**2,182**	**1,056**	**1,056**	**1,625**	**134**	**1,280**	**47**	**2,319**	**13,717**	**7,464**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	0	0	0	0	1	15	0	0	1	15
20	Food	331	66	55	40	95	175	22	189	7	484	510	955
22	Textiles	31	7	8	6	5	11	0	0	0	0	44	24
24	Lumber and Wood	163	25	14	9	6	13	1	9	0	0	184	56
25	Furniture	1	0	0	0	0	0	0	0	0	0	1	0
26	Paper	136	34	38	27	39	88	5	56	1	20	219	225
27	Printing	41	6	1	1	1	1	0	0	0	0	43	8
28	Chemicals	344	65	73	54	129	280	49	455	14	429	609	1,283
29	Petroleum Refining	0	0	5	4	10	21	2	15	11	753	28	792
30	Rubber/Misc Plastics	391	64	33	22	13	27	4	25	1	28	442	165
32	Stone/Clay/Glass	1	0.1	0	0	10	35	3	24	0	0	14	59
33	Primary Metals	83	21	36	26	38	82	10	128	4	101	171	358
34	Fabricated Metals	88	12	3	2	0	0	0	0	0	0	91	14
35	Machinery/Computer Equip.	23	3	3	2	5	10	0	0	0	0	31	15
37	Transportation Equip	89	16	19	12	24	49	2	19	0	0	134	96
38	Instruments	5	0.8	0	0	1	1	0	0	0	0	6	2
39	Misc. Manufacturing	27	4	3	2	0	0	0	0	0	0	30	6
49	Gas Processing	0	0	0	0	0	0	1	12	0	0	1	12
	Total	**1,754**	**323**	**291**	**207**	**376**	**793**	**100**	**947**	**38**	**1,815**	**2,559**	**4,085**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	27	3	1	1	0	0	0	0	0	0	28	4
52	Retail	766	112	35	21	8	13	0	0	0	0	809	146
4222	Refrigerated Warehouses	37	5	2	1	1	1	0	0	0	0	40	8
4581	Airports	3	1	2	1	1	1	1	11	1	38	8	53
4952	Waste Water Treatment Plants	42	5	1	1	0	0	0	0	0	0	43	5
4961	District Energy	0	0	0	0	0	0	0	0	2	303	2	303
5411	Food Stores	426	86	4	2	0	0	0	0	0	0	430	89
5812	Restaurants	793	72	6	4	0	0	0	0	0	0	799	76
6512	Commercial Office Buildings	3,099	155	1,356	542	387	232	0	0	0	0	4,842	930
6513	Multifamily Buildings	789	59	286	143	44	44	0	0	0	0	1,119	247
7011	Hotels	371	48	50	31	27	56	0	0	0	0	448	135
7211	Laundries	35	7	2	1	1	1	0	0	0	0	38	9
7374	Data Centers	77	12	7	5	3	8	0	0	0	0	87	25
7542	Car Washes	74	6	0	0	0	0	0	0	0	0	74	6
7832	Movie Theaters	7	1	0	0	0	0	0	0	0	0	7	1
7991	Health Clubs	147	19	13	8	2	6	0	0	0	0	162	33
7997	Golf/Country Clubs	219	27	0	0	0	0	0	0	0	0	219	27
8051	Nursing Homes	549	64	7	4	5	10	0	0	0	0	561	78
8062	Hospitals	70	17	48	34	92	183	2	12	0	0	212	245
8211	Schools	615	104	34	23	3	4	0	0	0	0	652	131
8221	College/Univ.	106	18	15	10	63	189	23	207	6	163	213	588
8412	Museums	28	4	2	2	0	0	0	0	0	0	30	5
9100	Government Buildings	239	31	15	10	13	21	1	6	0	0	268	68
9223	Prisons	13	2	2	1	26	51	4	67	0	0	45	122
9711	Military	12	3	3	2	4	10	3	29	0	0	22	44
	Total	**8,544**	**862**	**1,891**	**848**	**680**	**831**	**34**	**332**	**9**	**201**	**11,158**	**3,378**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
13	Oil and Gas Extraction	0	0	0	0	0	0	1	15	0	0	1	15
28	Chemicals	3	1	0	0	2	4	0	0	0	0	5	5
29	Petroleum Refining	0	0	0	0	0	0	2	15	4	196	6	210
32	Stone/Clay/Glass	0	0	0	0	6	20	3	24	0	0	9	44
33	Primary Metals	0	0	0	0	0	0	3	54	1	24	4	78
	Total	**3**	**1**	**0**	**0**	**8**	**24**	**9**	**108**	**5**	**220**	**25**	**353**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	District Energy Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
4961	Current Loops without CHP	0	0	0	0	0	0	0	0	1	235	1	235
4961	Current Loops with CHP expansion	0	0	0	0	0	0	0	0	1	67	1	67
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**303**	**2**	**303**

Indiana

- Indiana has 4,610 MW of overall CHP capacity identified at 7,273 sites.
  - 2,151 MW of industrial on-site CHP potential primarily in the chemicals, primary metals, food, transportation equipment, and paper sectors.
  - 1,521 MW of commercial on-site CHP potential, primarily in the commercial (office) buildings, college and universities, hospitals, retail, and schools sectors.
- Indiana has 473 MW of WHP CHP potential identified at 27 sites in the chemicals, petroleum refining, stone/clay/glass, and primary metals sectors.
- Indiana has 465 MW of CHP potential identified at 1 district energy site.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	1,147	212	201	144	242	495	88	795	15	506	1,693	2,151
Commercial Topping Cycle CHP	4,346	446	864	387	319	381	18	162	5	145	5,552	1,521
WHP CHP	2	1	2	1	10	30	6	61	7	381	27	473
District Energy CHP	0	0	0	0	0	0	0	0	1	465	1	465
Total	**5,495**	**658**	**1,067**	**531**	**571**	**906**	**112**	**1,018**	**28**	**1,496**	**7,273**	**4,610**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	135	29	25	18	43	77	8	67	6	187	217	378
22	Textiles	12	3	4	3	2	3	0	0	0	0	18	9
24	Lumber and Wood	201	39	32	21	17	27	1	6	0	0	251	93
25	Furniture	8	1	0	0	0	0	0	0	0	0	8	1
26	Paper	59	15	13	9	21	43	11	105	1	21	105	193
27	Printing	28	4	1	1	0	0	0	0	0	0	29	4
28	Chemicals	148	27	33	24	69	158	27	204	5	220	282	634
29	Petroleum Refining	1	0.4	5	4	8	20	1	10	1	59	16	93
30	Rubber/Misc Plastics	284	47	31	22	18	34	1	15	0	0	334	119
32	Stone/Clay/Glass	1	0.4	1	1	8	26	4	32	0	0	14	59
33	Primary Metals	60	12	26	18	26	57	29	298	9	399	150	785
34	Fabricated Metals	64	9	1	1	0	0	0	0	0	0	65	10
35	Machinery/Computer Equip.	12	2	4	3	2	9	0	0	0	0	18	14
37	Transportation Equip	121	22	27	19	38	71	12	117	0	0	198	230
38	Instruments	4	0.7	0	0	0	0	0	0	0	0	4	1
39	Misc. Manufacturing	11	2	0	0	0	0	0	0	0	0	11	2
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**1,149**	**212**	**203**	**145**	**252**	**525**	**94**	**856**	**22**	**887**	**1,720**	**2,624**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	7	1	1	1	0	0	0	0	0	0	8	2
52	Retail	382	55	46	28	5	6	0	0	0	0	433	89
4222	Refrigerated Warehouses	10	1	1	1	1	1	0	0	0	0	12	3
4581	Airports	1	0.5	2	2	0	0	1	10	0	0	4	12
4952	Waste Water Treatment Plants	37	4	2	2	0	0	0	0	0	0	39	6
4961	District Energy	0	0	0	0	0	0	0	0	1	465	1	465
5411	Food Stores	283	54	2	1	0	0	0	0	0	0	285	55
5812	Restaurants	562	52	4	3	1	1	0	0	0	0	567	56
6512	Commercial Office Buildings	1,542	77	675	270	193	116	0	0	0	0	2,410	463
6513	Multifamily Buildings	128	10	46	23	7	7	0	0	0	0	181	40
7011	Hotels	209	24	6	4	6	18	2	14	0	0	223	59
7211	Laundries	33	5	2	1	0	0	0	0	0	0	35	6
7374	Data Centers	21	4	5	3	2	3	0	0	0	0	28	10
7542	Car Washes	31	2	0	0	0	0	0	0	0	0	31	2
7832	Movie Theaters	1	0.1	0	0	0	0	0	0	0	0	1	0.1
7991	Health Clubs	65	7	1	1	0	0	0	0	0	0	66	8
7997	Golf/Country Clubs	98	10	1	1	0	0	0	0	0	0	99	11
8051	Nursing Homes	307	33	4	2	0	0	0	0	0	0	311	35
8062	Hospitals	88	20	32	22	43	83	2	16	0	0	165	141
8211	Schools	320	52	11	7	1	1	0	0	0	0	332	61
8221	College/Univ.	67	12	3	2	32	92	11	103	5	145	118	354
8412	Museums	18	2	2	1	0	0	0	0	0	0	20	3
9100	Government Buildings	119	16	16	12	12	16	1	5	0	0	148	49
9223	Prisons	9	2	2	1	12	29	0	0	0	0	23	32
9711	Military	8	2	0	0	4	8	1	14	0	0	13	24
	Total	**4,346**	**446**	**864**	**387**	**319**	**381**	**18**	**162**	**6**	**145**	**5,553**	**1,986**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
28	Chemicals	0	0	0	0	2	5	0	0	0	0	2	5
29	Petroleum Refining	1	0.4	0	0	1	3	0	0	1	59	3	63
32	Stone/Clay/Glass	0	0	1	1	6	17	3	26	0	0	10	44
33	Primary Metals	1	0.3	1	1	1	4	3	35	6	322	12	362
	Total	**2**	**1**	**2**	**1**	**10**	**30**	**6**	**61**	**7**	**381**	**27**	**473**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	District Energy Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
4961	Current Loops without CHP	0	0	0	0	0	0	0	0	0	0	0	0
4961	Current Loops with CHP expansion	0	0	0	0	0	0	0	0	1	465	1	465
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**465**	**1**	**465**

Iowa

- Iowa has 1,993 MW of overall CHP capacity identified at 3,723 sites.
  - 1,235 MW of industrial on-site CHP potential primarily in the food, chemicals, rubber and plastics, paper, and primary metals sectors.
  - 670 MW of commercial on-site CHP potential, primarily in the commercial (office) buildings, colleges and universities, hospitals, hotels, and food stores sectors.
- Iowa has 88 MW of WHP CHP potential identified at 16 sites in the chemicals, stone/clay/glass, primary metals and machinery sectors.
- There is no CHP district energy potential identified in Iowa.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	647	118	103	75	167	363	31	268	7	411	955	1,235
Commercial Topping Cycle CHP	2,184	224	399	176	162	197	6	50	1	23	2,752	670
WHP CHP	1	0	1	1	10	28	3	31	1	28	16	88
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**2,832**	**342**	**503**	**251**	**339**	**588**	**40**	**350**	**9**	**461**	**3,723**	**1,993**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	201	44	47	36	70	149	9	91	6	390	333	708
22	Textiles	2	0.5	0	0	4	5	0	0	0	0	6	6
24	Lumber and Wood	61	11	13	9	7	10	0	0	0	0	81	30
25	Furniture	0	0	0	0	0	0	0	0	0	0	0	0
26	Paper	21	5	6	4	7	15	2	24	0	0	36	48
27	Printing	17	2	1	1	0	0	0	0	0	0	18	2
28	Chemicals	121	20	17	12	58	140	17	126	1	21	214	320
29	Petroleum Refining	0	0	0	0	5	13	0	0	0	0	5	13
30	Rubber/Misc Plastics	107	18	8	5	4	6	2	22	0	0	121	52
32	Stone/Clay/Glass	1	0.1	1	1	5	21	2	16	0	0	9	37
33	Primary Metals	21	4	3	2	11	22	2	21	1	28	38	77
34	Fabricated Metals	16	2	0	0	0	0	0	0	0	0	16	2
35	Machinery/Computer Equip.	33	5	2	2	3	6	0	0	0	0	38	12
37	Transportation Equip	41	6	6	5	3	4	0	0	0	0	50	15
38	Instruments	0	0	0	0	0	0	0	0	0	0	0	0
39	Misc. Manufacturing	6	1	0	0	0	0	0	0	0	0	6	1
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**648**	**119**	**104**	**76**	**177**	**391**	**34**	**299**	**8**	**439**	**971**	**1,323**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	8	1	0	0	0	0	0	0	0	0	8	1
52	Retail	215	29	7	4	1	1	0	0	0	0	223	34
4222	Refrigerated Warehouses	14	1	1	1	0	0	0	0	0	0	15	2
4581	Airports	3	0.3	0	0	2	3	0	0	0	0	5	4
4952	Waste Water Treatment Plants	18	3	0	0	0	0	0	0	0	0	18	3
4961	District Energy	0	0	0	0	0	0	0	0	0	0	0	0
5411	Food Stores	125	29	12	8	0	0	0	0	0	0	137	37
5812	Restaurants	210	18	0	0	0	0	0	0	0	0	210	18
6512	Commercial Office Buildings	722	36	316	126	90	54	0	0	0	0	1,128	217
6513	Multifamily Buildings	44	3	16	8	2	2	0	0	0	0	62	14
7011	Hotels	127	15	5	3	9	21	0	0	0	0	141	39
7211	Laundries	8	2	0	0	0	0	0	0	0	0	8	2
7374	Data Centers	18	3	1	1	4	8	0	0	0	0	23	11
7542	Car Washes	16	2	1	1	0	0	0	0	0	0	17	2
7832	Movie Theaters	1	0.1	0	0	0	0	0	0	0	0	1	0.1
7991	Health Clubs	24	3	0	0	0	0	0	0	0	0	24	3
7997	Golf/Country Clubs	59	6	1	1	0	0	0	0	0	0	60	7
8051	Nursing Homes	238	22	0	0	1	1	0	0	0	0	239	23
8062	Hospitals	83	17	23	14	19	40	0	0	0	0	125	70
8211	Schools	104	13	1	1	0	0	0	0	0	0	105	14
8221	College/Univ.	33	7	7	4	21	47	5	45	1	23	67	126
8412	Museums	11	1	0	0	0	0	0	0	0	0	11	1
9100	Government Buildings	85	10	5	3	6	9	0	0	0	0	96	22
9223	Prisons	14	1	3	2	6	8	0	0	0	0	23	11
9711	Military	4	1	0	0	1	3	1	5	0	0	6	10
	Total	**2,184**	**224**	**399**	**176**	**162**	**197**	**6**	**50**	**1**	**23**	**2,752**	**670**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
29	Petroleum Refining	0	0	0	0	7	16	0	0	0	0	7	16
32	Stone/Clay/Glass	0	0	1	1	2	8	2	16	0	0	5	25
33	Primary Metals	0	0	0	0	1	4	1	15	1	28	3	47
35	Machinery	1	0.2	0	0	0	0	0	0	0	0	1	0.2
	Total	**1**	**0.2**	**1**	**1**	**10**	**28**	**3**	**31**	**1**	**28**	**16**	**88**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no known CHP technical potential at existing district energy loops in Iowa.

Kansas

- Kansas has 1,909 MW of overall CHP capacity identified at 3,158 sites.
  - 1,039 MW of industrial on-site CHP potential, primarily in the primary metals, refining, chemicals, food, and transportation equipment sectors.
  - 749 MW of commercial on-site CHP potential, primarily in the commercial (office) buildings, colleges/universities, hospitals and military and schools sectors.
- Kansas has 122 MW of WHP CHP potential identified at 21 sites in the refining, stone/clay/glass, chemicals, and oil/gas extraction sectors.
- There is no CHP district energy potential identified in Kansas.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	400	76	59	41	104	222	45	479	6	221	614	1,039
Commercial Topping Cycle CHP	1,954	216	413	194	139	161	16	144	1	33	2,523	749
WHP CHP	5	1	3	2	6	18	5	43	2	57	21	122
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**2,359**	**293**	**475**	**237**	**249**	**401**	**66**	**666**	**9**	**312**	**3,158**	**1,909**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
13	Oil and Gas Extraction	3	1	2	1	2	5	2	12	0	0	9	20
20	Food	107	23	17	12	39	80	5	53	0	0	168	168
21	Beverage and Tobacco	1	0.002	0	0	0	0	0	0	0	0	1	0.002
22	Textiles	3	1	0	0	4	11	0	0	0	0	7	12
24	Lumber and Wood	49	7	5	3	2	3	1	5	0	0	57	19
25	Furniture	2	0.2	0	0	0	0	0	0	0	0	2	0.2
26	Paper	13	4	5	4	5	11	0	0	0	0	23	19
27	Printing	7	1	0	0	0	0	0	0	0	0	7	1
28	Chemicals	71	14	14	10	28	60	11	89	0	0	124	173
29	Petroleum Refining	1	0.1	5	3	9	22	4	51	4	171	23	247
30	Rubber/Misc Plastics	61	12	4	3	3	4	1	17	0	0	69	35
32	Stone/Clay/Glass	0	0	0	0	4	16	3	20	0	0	7	36
33	Primary Metals	3	0	2	1	5	8	17	219	4	107	31	336
34	Fabricated Metals	13	2	0	0	0	0	0	0	0	0	13	2
35	Machinery/Computer Equip	16	3	0	0	2	3	0	0	0	0	18	6
37	Transportation Equip.	42	6	6	4	4	9	5	50	0	0	57	69
38	Instruments	3	0.4	0	0	0	0	0	0	0	0	3	0.4
39	Misc. Manufacturing	6	1	1	1	0	0	0	0	0	0	7	2
49	Gas Processing	4	1	1	1	3	8	1	5	0	0	9	15
	Total	**405**	**77**	**62**	**43**	**110**	**240**	**50**	**522**	**8**	**278**	**635**	**1,160**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	3	0.2	0	0	0	0	0	0	0	0	3	0.2
52	Retail	178	28	9	6	1	1	0	0	0	0	188	35
4222	Refrigerated Warehouses	8	1	0	0	1	1	0	0	0	0	9	3
4581	Airports	5	1	0	0	1	3	0	0	0	0	6	4
4952	Waste Water Treatment Plants	10	1	0	0	0	0	0	0	0	0	10	1
4961	District Energy	0	0	0	0	0	0	0	0	0	0	0	0
5411	Food Stores	103	20	2	1	0	0	0	0	0	0	105	21
5812	Restaurants	186	17	2	2	1	1	0	0	0	0	189	20
6512	Commercial Office Buildings	677	34	296	118	85	51	0	0	0	0	1,058	203
6513	Multifamily Buildings	48	4	17	9	3	3	0	0	0	0	68	15
7011	Hotels	102	9	10	6	1	2	1	5	0	0	114	23
7211	Laundries	12	2	1	1	0	0	0	0	0	0	13	2
7374	Data Centers	14	3	4	3	0	0	0	0	0	0	18	6
7542	Car Washes	12	1	1	1	0	0	0	0	0	0	13	2
7832	Movie Theaters	2	0.2	0	0	0	0	0	0	0	0	2	0.2
7991	Health Clubs	23	3	1	1	0	0	0	0	0	0	24	3
7997	Golf/Country Clubs	44	5	0	0	0	0	0	0	0	0	44	5
8051	Nursing Homes	180	16	1	1	2	3	0	0	0	0	183	20
8062	Hospitals	117	28	20	13	19	36	1	6	0	0	157	83
8211	Schools	73	20	26	17	0	0	0	0	0	0	99	38
8221	College/Univ.	35	6	12	8	15	36	9	87	1	33	72	171
8412	Museums	9	1	0	0	0	0	0	0	0	0	9	1
9100	Government Buildings	103	13	6	5	4	8	2	11	0	0	115	37
9223	Prisons	3	1	4	4	4	9	0	0	0	0	11	14
9711	Military	7	1	1	1	2	6	3	35	0	0	13	43
	Total	**1,954**	**216**	**413**	**194**	**139**	**161**	**16**	**144**	**1**	**33**	**2,523**	**749**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
13	Oil and Gas Extraction	3	1	2	1	2	5	2	12	0	0	9	20
21	Beverage and Tobacco	1	0.002	0	0	0	0	0	0	0	0	1	0.002
28	Chemicals	0	0	1	1	1	2	0	0	0	0	2	3
29	Petroleum Refining	1	0.1	0	0	0	0	1	18	2	57	4	76
32	Stone/Clay/Glass	0	0	0	0	3	11	2	12	0	0	5	23
	Total	**5**	**1**	**3**	**2**	**6**	**18**	**5**	**43**	**2**	**57**	**21**	**122**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no known CHP technical potential at existing district energy loops in Kansas.

Kentucky

- Kentucky has 2,721 MW of overall CHP capacity identified at 4,030 sites.
  - 1,598 MW of industrial on-site CHP potential primarily in the chemicals, food, petroleum refining, paper, and primary metals sectors.
  - 911 MW of commercial on-site CHP potential, primarily in the military, retail, commercial buildings, universities, and hospitals sectors.
- Kentucky has 211 MW of WHP CHP potential identified at 18 sites in the chemical, stone/clay/glass, oil and gas extraction, paper, printing, and primary metals sectors.
- There is no CHP district energy potential identified in Kentucky.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	567	113	131	94	151	301	57	555	13	536	919	1,598
Commercial Topping Cycle CHP	2,479	273	423	194	177	242	11	121	3	82	3,093	911
WHP CHP	7	2	0	0	3	6	4	42	4	160	18	211
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**3,053**	**387**	**554**	**288**	**331**	**550**	**72**	**718**	**20**	**778**	**4,030**	**2,721**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	2	1	0	0	1	1	0	0	0	0	3	2
20	Food	73	15	19	14	35	64	6	40	0	0	133	132
22	Textiles	7	1	5	4	3	6	2	14	0	0	17	25
24	Lumber and Wood	130	27	26	19	15	25	0	0	0	0	171	71
25	Furniture	4	0.5	0	0	0	0	0	0	0	0	4	1
26	Paper	37	11	4	2	14	27	6	59	1	53	62	152
27	Printing	13	1	2	1	0	0	0	0	0	0	15	3
28	Chemicals	62	12	22	16	37	89	27	265	7	261	155	643
29	Petroleum Refining	2	0.5	5	4	6	11	0	0	2	157	15	171
30	Rubber/Misc Plastics	116	21	13	8	8	16	0	0	0	0	137	46
32	Stone/Clay/Glass	0	0	0	0	2	5	5	49	0	0	7	54
33	Primary Metals	27	6.8	9	6	8	18	14	157	7	225	65	414
34	Fabricated Metals	28	3	0	0	0	0	0	0	0	0	28	3
35	Machinery/Computer Equip	2	0	0	0	1	1	0	0	0	0	3	1
37	Transportation Equip.	64	14	24	18	24	45	1	13	0	0	113	89
38	Instruments	1	0.1	1	1	0	0	0	0	0	0	2	1
39	Misc. Manufacturing	4	1	0	0	0	0	0	0	0	0	4	1
49	Gas Processing	2	1	1	1	0	0	0	0	0	0	3	2
	Total	**574**	**115**	**131**	**94**	**154**	**307**	**61**	**597**	**17**	**696**	**937**	**1,809**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	4	0.2	0	0	0	0	0	0	0	0	4	0.2
52	Retail	208	33	24	15	3	6	0	0	0	0	235	53
4222	Refrigerated Warehouses	6	1	0	0	0	0	0	0	0	0	6	1
4581	Airports	2	0.2	0	0	2	5	1	9	0	0	5	15
4952	Waste Water Treatment Plants	29	4	1	1	0	0	0	0	0	0	30	4
4961	District Energy	0	0	0	0	0	0	0	0	0	0	0	0
5411	Food Stores	131	27	2	2	1	1	0	0	0	0	134	30
5812	Restaurants	324	29	1	1	1	1	0	0	0	0	326	31
6512	Commercial Office Buildings	805	40	322	129	80	48	0	0	0	0	1,207	217
6513	Multifamily Buildings	55	4	20	10	3	3	0	0	0	0	78	17
7011	Hotels	147	16	6	4	5	6	0	0	0	0	158	27
7211	Laundries	21	4	0	0	0	0	0	0	0	0	21	4
7374	Data Centers	22	4	2	1	2	3	2	11	0	0	28	19
7542	Car Washes	20	1	0	0	0	0	0	0	0	0	20	1
7832	Movie Theaters	1	0.1	0	0	0	0	0	0	0	0	1	0.1
7991	Health Clubs	31	3	0	0	0	0	0	0	0	0	31	3
7997	Golf/Country Clubs	57	6	0	0	0	0	0	0	0	0	57	6
8051	Nursing Homes	199	22	1	1	0	0	0	0	0	0	200	23
8062	Hospitals	62	16	29	21	39	78	0	0	0	0	130	114
8211	Schools	213	41	3	2	0	0	0	0	0	0	216	42
8221	College/Univ.	45	10	3	2	27	67	5	61	3	82	83	222
8412	Museums	6	1	0	0	0	0	0	0	0	0	6	1
9100	Government Buildings	77	9	2	2	2	3	0	0	0	0	81	13
9223	Prisons	10	1	7	6	12	21	0	0	0	0	29	28
9711	Military	4	1	0	0	0	0	3	40	0	0	7	40
	Total	**2,479**	**273**	**423**	**194**	**177**	**242**	**11**	**121**	**3**	**82**	**3,093**	**911**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
13	Oil and Gas Extraction	2	1	0	0	1	1	0	0	0	0	3	2
26	Paper	1	0.5	0	0	0	0	0	0	0	0	1	0.5
27	Printing	1	0.1	0	0	0	0	0	0	0	0	1	0.1
28	Chemicals	2	0.3	0	0	0	0	0	0	0	0	2	0.3
29	Petroleum Refining	1	0.3	0	0	0	0	0	0	1	39	2	39
32	Stone/Clay/Glass	0	0	0	0	2	5	4	42	0	0	6	48
33	Primary Metals	0	0	0	0	0	0	0	0	3	122	3	122
	Total	**7**	**2**	**0**	**0**	**3**	**6**	**4**	**42**	**4**	**160**	**18**	**211**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no known CHP technical potential at existing district energy loops in Kentucky.

Louisiana

- Louisiana has 4,946 MW of overall CHP capacity identified at 4,437 sites.
  - 3,011 MW of industrial on-site CHP potential primarily in the chemicals, food, petroleum refining, paper, and gas processing sectors.
  - 1,109 MW of commercial on-site CHP potential, primarily in the commercial (office) buildings, colleges and universities, schools, hospitals, and hotels sectors.
- Louisiana has 782 MW of WHP CHP potential identified at 93 sites, primarily in the oil and gas extraction, petroleum refining and primary metals sectors.
- Louisiana has 43 MW of identified at 1 district energy site.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	477	89	74	51	170	382	50	517	29	1,973	800	3,011
Commercial Topping Cycle CHP	2,730	323	576	288	210	263	26	215	1	21	3,543	1,109
WHP CHP	21	5	14	9	35	104	14	128	9	536	93	782
District Energy CHP	0	0	0	0	0	0	0	0	1	43	1	43
Total	**3,228**	**416**	**664**	**349**	**415**	**749**	**90**	**859**	**40**	**2,573**	**4,437**	**4,946**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	1	1	0	0	0	0	0	0	1	1
13	Oil and Gas Extraction	15	4	9	6	21	63	6	55	0	0	51	128
20	Food	125	23	10	7	26	48	1	5	0	0	162	83
22	Textiles	5	1	0	0	6	9	0	0	0	0	11	10
24	Lumber and Wood	82	14	10	7	17	36	2	18	0	0	111	74
25	Furniture	0	0	0	0	0	0	0	0	0	0	0	0
26	Paper	18	5	5	3	8	21	1	19	2	147	34	194
27	Printing	7	1	1	1	0	0	0	0	0	0	8	2
28	Chemicals	84	17	25	17	60	142	33	351	16	824	218	1,351
29	Petroleum Refining	1	0.0	11	8	25	78	10	90	20	1,538	67	1,713
30	Rubber/Misc Plastics	51	7	2	2	3	6	0	0	0	0	56	14
32	Stone/Clay/Glass	2	0.3	0	0	2	4	0	0	0	0	4	4
33	Primary Metals	29	7.4	5	4	13	22	5	59	0	0	52	92
34	Fabricated Metals	10	1	0	0	0	0	0	0	0	0	10	1
35	Machinery/Computer Equip	2	0	1	1	0	0	0	0	0	0	3	1
37	Transportation Equip.	41	7	3	2	3	8	1	7	0	0	48	24
38	Instruments	2	0.1	0	0	0	0	0	0	0	0	2	0.1
39	Misc. Manufacturing	3	0.4	0	0	0	0	0	0	0	0	3	0.4
49	Gas Processing	20	5	5	3	21	52	5	39	0	0	51	100
	Total	**497**	**94**	**88**	**61**	**205**	**486**	**64**	**644**	**38**	**2,509**	**892**	**3,793**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	4	1	0	0	1	1	0	0	0	0	5	2
52	Retail	236	39	16	10	1	2	0	0	0	0	253	52
4222	Refrigerated Warehouses	13	2	0	0	0	0	0	0	0	0	13	2
4581	Airports	1	0.4	2	1	3	5	1	5	0	0	7	12
4952	Waste Water Treatment Plants	28	2	3	2	1	3	0	0	0	0	32	8
4961	District Energy	0	0	0	0	0	0	0	0	1	43	1	43
5411	Food Stores	141	24	0	0	0	0	0	0	0	0	141	24
5812	Restaurants	294	27	1	1	1	1	0	0	0	0	296	29
6512	Commercial Office Buildings	838	42	335	134	84	50	0	0	0	0	1,257	226
6513	Multifamily Buildings	113	8	41	20	6	6	0	0	0	0	160	35
7011	Hotels	224	28	10	6	7	11	7	52	0	0	248	97
7211	Laundries	18	2	1	1	0	0	0	0	0	0	19	3
7374	Data Centers	19	3	1	1	0	0	0	0	0	0	20	3
7542	Car Washes	25	2	0	0	0	0	0	0	0	0	25	2
7832	Movie Theaters	0	0	0	0	0	0	0	0	0	0	0	0
7991	Health Clubs	71	7	1	1	0	0	0	0	0	0	72	8
7997	Golf/Country Clubs	40	5	0	0	0	0	0	0	0	0	40	5
8051	Nursing Homes	229	26	2	1	0	0	0	0	0	0	231	27
8062	Hospitals	171	33	24	17	36	66	3	19	0	0	234	134
8211	Schools	102	47	120	79	25	29	0	0	0	0	247	155
8221	College/Univ.	43	7	6	5	20	48	13	125	0	0	82	185
8412	Museums	9	1	0	0	0	0	0	0	0	0	9	1
9100	Government Buildings	107	14	9	6	12	17	0	0	0	0	128	38
9223	Prisons	5	1	3	2	10	17	1	8	0	0	19	28
9711	Military	0	0	1	1	3	6	1	6	1	21	6	34
	Total	**2,731**	**323**	**576**	**288**	**210**	**263**	**26**	**215**	**2**	**64**	**3,545**	**1,152**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	1	1	0	0	0	0	0	0	1	1
13	Oil and Gas Extraction	15	4	9	6	21	63	6	55	0	0	51	128
20	Food	0	0	0	0	1	2	0	0	0	0	1	2
26	Paper	1	0.4	0	0	0	0	0	0	0	0	1	0.4
28	Chemcials	3	1	2	1	3	6	0	0	0	0	8	7
29	Petroleum Refining	1	0.02	2	1	8	31	6	47	9	536	26	615
32	Stone/Clay/Glass	0	0	0	0	2	4	0	0	0	0	2	4
33	Primary Metals	0	0	0	0	0	0	2	26	0	0	2	26
4222	Warehousing and Storage	1	0.002	0	0	0	0	0	0	0	0	1	0.002
	Total	**21**	**5**	**14**	**9**	**35**	**104**	**14**	**128**	**9**	**536**	**93**	**782**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	District Energy Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
4961	Current Loops without CHP	0	0	0	0	0	0	0	0	0	0	0	0
4961	Current Loops with CHP expansion	0	0	0	0	0	0	0	0	1	43	1	43
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**43**	**1**	**43**

Maine

- Maine has 494 MW of overall CHP capacity identified at 1,385 sites.
  - 223 MW of industrial on-site CHP potential primarily in the paper, chemicals, lumber and wood, food, and textiles sectors.
  - 266 MW of commercial on-site CHP potential, primarily in the commercial (office) buildings, colleges and universities, hospitals, hotels, and food stores sectors.
- Maine has 4 MW of WHP CHP potential identified at 3 sites in the paper and stone/clay/glass sectors.
- There is no CHP district energy potential identified in Maine.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	239	41	33	24	39	85	5	43	1	30	317	223
Commercial Topping Cycle CHP	832	90	157	72	71	73	4	31	0	0	1,065	266
WHP CHP	1	0.1	1	1	1	3	0	0	0	0	3	4
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**1,072**	**132**	**191**	**97**	**111**	**161**	**9**	**74**	**1**	**30**	**1,385**	**494**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	50	8	10	8	7	12	0	0	0	0	67	29
22	Textiles	18	4	4	3	6	15	0	0	0	0	28	22
24	Lumber and Wood	101	17	10	7	8	19	0	0	0	0	119	43
25	Furniture	1	0.1	0	0	0	0	0	0	0	0	1	0.1
26	Paper	5	1	2	1	9	21	1	7	1	30	18	60
27	Printing	6	1	0	0	0	0	0	0	0	0	6	1
28	Chemicals	18	3	4	3	7	12	3	30	0	0	32	47
29	Petroleum Refining	0	0	3	2	0	0	0	0	0	0	3	2
30	Rubber/Misc Plastics	21	3	0	0	0	0	0	0	0	0	21	3
32	Stone/Clay/Glass	0	0	0	0	2	7	0	0	0	0	2	7
33	Primary Metals	2	0.5	1	1	0	0	0	0	0	0	3	1
34	Fabricated Metals	6	1	0	0	0	0	0	0	0	0	6	1
35	Machinery/Computer Equip	2	1	0	0	0	0	0	0	0	0	2	1
37	Transportation Equip.	6	1	0	0	1	3	1	7	0	0	8	11
38	Instruments	0	0	0	0	0	0	0	0	0	0	0	0
39	Misc. Manufacturing	4	0.3	0	0	0	0	0	0	0	0	4	0.3
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**240**	**41**	**34**	**25**	**40**	**88**	**5**	**43**	**1**	**30**	**320**	**228**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	1	0.3	0	0	0	0	0	0	0	0	1	0.3
52	Retail	84	10	3	2	0	0	0	0	0	0	87	12
4222	Refrigerated Warehouses	2	0.2	0	0	0	0	0	0	0	0	2	0.2
4581	Airports	1	0.5	1	1	0	0	0	0	0	0	2	1
4952	Waste Water Treatment Plants	13	1	0	0	0	0	0	0	0	0	13	1
4961	District Energy	0	0	0	0	0	0	0	0	0	0	0	0
5411	Food Stores	64	14	1	1	0	0	0	0	0	0	65	15
5812	Restaurants	69	6	1	1	1	2	0	0	0	0	71	9
6512	Commercial Office Buildings	242	12	121	48	48	29	0	0	0	0	411	89
6513	Multifamily Buildings	20	2	7	4	1	1	0	0	0	0	29	6
7011	Hotels	96	12	5	3	1	1	0	0	0	0	102	16
7211	Laundries	5	1	0	0	0	0	0	0	0	0	5	1
7374	Data Centers	7	1	0	0	1	2	0	0	0	0	8	3
7542	Car Washes	1	0.4	0	0	0	0	0	0	0	0	1	0.4
7832	Movie Theaters	0	0	0	0	0	0	0	0	0	0	0	0
7991	Health Clubs	13	1	0	0	0	0	0	0	0	0	13	1
7997	Golf/Country Clubs	16	2	0	0	0	0	0	0	0	0	16	2
8051	Nursing Homes	86	10	1	1	0	0	0	0	0	0	87	11
8062	Hospitals	24	6	9	6	8	14	0	0	0	0	41	25
8211	Schools	0	0	0	0	0	0	0	0	0	0	0	0
8221	College/Univ.	18	3	4	3	8	19	3	25	0	0	33	51
8412	Museums	4	0.4	0	0	0	0	0	0	0	0	4	0.4
9100	Government Buildings	52	5	2	1	2	4	0	0	0	0	56	10
9223	Prisons	4	0.5	2	2	0	0	0	0	0	0	6	2
9711	Military	10	1	0	0	1	2	1	5	0	0	12	8
	Total	**832**	**90**	**157**	**72**	**71**	**73**	**4**	**31**	**0**	**0**	**1,065**	**266**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
26	Paper	1	0.1	1	1	0	0	0	0	0	0	2	1
32	Stone/Clay/Glass	0	0	0	0	1	3	0	0	0	0	1	3
	Total	**1**	**0.1**	**1**	**1**	**1**	**3**	**0**	**0**	**0**	**0**	**3**	**4**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no known CHP technical potential at existing district energy loops in Maine.

Maryland

- Maryland has 2,645 MW of overall CHP capacity identified at 4,920 sites.
  - 661 MW of industrial on-site CHP potential at 585 sites, primarily in the chemicals, food, primary metals, stone/clay/glass and lumber and wood sectors.
  - 1,581 MW of commercial on-site CHP potential at 4,330 sites, primarily in the military, commercial (office) buildings, colleges and universities, hospitals and schools sectors.
- Maryland has 40 MW of WHP CHP potential identified at 4 sites in the stone/clay/glass and primary metals sectors.
- Maryland has 363 MW of CHP potential identified at 1 district energy site.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	401	72	88	63	74	140	15	136	7	250	585	661
Commercial Topping Cycle CHP	3,429	384	638	295	235	323	22	191	6	387	4,330	1,581
WHP CHP	0	0	0	0	1	2	2	15	1	22	4	40
District Energy CHP	0	0	0	0	0	0	0	0	1	363	1	363
Total	**3,830**	**456**	**726**	**358**	**310**	**466**	**39**	**342**	**15**	**1,023**	**4,920**	**2,645**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
20	Food	105	19	12	7	14	25	4	39	0	0	135	89
22	Textiles	8	2	4	3	3	7	0	0	0	0	15	12
24	Lumber and Wood	70	12	12	8	7	13	0	0	0	0	89	33
25	Furniture	0	0	0	0	0	0	0	0	0	0	0	0
26	Paper	17	5	7	5	7	17	0	0	0	0	31	27
27	Printing	13	1	2	1	0	0	0	0	0	0	15	3
28	Chemicals	92	19	29	22	28	52	9	81	5	155	163	329
29	Petroleum Refining	0	0	5	4	5	10	0	0	0	0	10	14
30	Rubber/Misc Plastics	46	8	5	3	2	3	0	0	0	0	53	14
32	Stone/Clay/Glass	1	0.1	0	0	2	5	3	26	1	25	7	55
33	Primary Metals	13	3	7	5	3	3	1	6	2	93	26	110
34	Fabricated Metals	8	1	0	0	0	0	0	0	0	0	8	1
35	Machinery/Computer Equip.	2	0.5	1	1	1	1	0	0	0	0	4	3
37	Transportation Equip.	17	2	4	3	3	6	0	0	0	0	24	11
38	Instruments	2	0.4	0	0	0	0	0	0	0	0	2	0
39	Misc. Manufacturing	7	1	0	0	0	0	0	0	0	0	7	1
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**401**	**72**	**88**	**63**	**75**	**142**	**17**	**151**	**8**	**273**	**589**	**701**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	6	1	1	1	0	0	0	0	0	0	7	2
52	Retail	298	40	12	8	4	5	0	0	0	0	314	53
4222	Refrigerated Warehouses	12	2	0	0	0	0	0	0	0	0	12	2
4581	Airports	1	0.4	0	0	0	0	1	13	0	0	2	14
4952	Waste Water Treatment Plants	12	1	1	1	1	3	0	0	0	0	14	5
4961	District Energy	0	0	0	0	0	0	0	0	1	363	1	363
5411	Food Stores	283	48	4	3	0	0	0	0	0	0	287	51
5812	Restaurants	385	38	5	3	1	1	0	0	0	0	391	43
6512	Commercial Office Buildings	1,063	53	425	170	106	64	0	0	0	0	1,594	287
6513	Multifamily Buildings	253	19	92	46	14	14	0	0	0	0	359	79
7011	Hotels	236	29	21	13	13	26	1	9	0	0	271	78
7211	Laundries	9	2	3	2	0	0	0	0	0	0	12	3
7374	Data Centers	52	10	3	2	4	10	0	0	0	0	59	21
7542	Car Washes	28	2	0	0	0	0	0	0	0	0	28	2
7832	Movie Theaters	0	0	0	0	0	0	0	0	0	0	0	0
7991	Health Clubs	80	9	5	3	0	0	0	0	0	0	85	13
7997	Golf/Country Clubs	79	10	1	1	2	2	0	0	0	0	82	13
8051	Nursing Homes	165	24	5	3	4	7	0	0	0	0	174	34
8062	Hospitals	12	4	16	11	38	82	1	6	0	0	67	103
8211	Schools	317	67	22	13	0	0	0	0	0	0	339	81
8221	College/Univ.	34	7	6	4	22	53	13	103	4	119	79	285
8412	Museums	17	2	0	0	1	2	0	0	0	0	18	4
9100	Government Buildings	67	11	5	3	6	13	1	7	1	47	80	81
9223	Prisons	10	2	8	6	9	17	0	0	0	0	27	25
9711	Military	10	2	3	2	10	23	5	54	1	222	29	303
	Total	**3,429**	**384**	**638**	**295**	**235**	**323**	**22**	**191**	**7**	**750**	**4,331**	**1,944**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
32	Stone/Clay/Glass	0	0	0	0	1	2	2	15	0	0	3	18
33	Primary Metals	0	0	0	0	0	0	0	0	1	22	1	22
	Total	**0**	**0**	**0**	**0**	**1**	**2**	**2**	**15**	**1**	**22**	**4**	**40**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	District Energy Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
4961	Current Loops without CHP	0	0	0	0	0	0	0	0	0	0	0	0
4961	Current Loops with CHP expansion	0	0	0	0	0	0	0	0	1	363	1	363
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**363**	**1**	**363**

Massachusetts

- Massachusetts has 3,434 MW of overall CHP capacity identified at 6,659 sites.
  - 777 MW of industrial on-site CHP potential primarily in the chemicals, paper, food, rubber and plastics, and textiles sectors.
  - 2,249 MW of commercial on-site CHP potential primarily in the hospitals, colleges and universities, commercial (office) buildings, multifamily buildings and government sectors.
- Massachusetts has 3 MW of WHP CHP potential identified at 3 sites in the stone/clay/glass and instruments sectors.
- Massachusetts has 406 MW of CHP potential identified at 2 district energy sites.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	756	129	103	74	126	252	21	172	4	149	1,010	777
Commercial Topping Cycle CHP	4,307	458	911	419	396	404	23	193	6	774	5,644	2,249
WHP CHP	1	0.005	1	1	1	2	0	0	0	0	3	3
District Energy CHP	0	0	0	0	0	0	1	7	1	399	2	406
Total	**5,064**	**587**	**1,015**	**494**	**523**	**658**	**45**	**372**	**11**	**1,322**	**6,659**	**3,434**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	167	29	22	17	18	34	3	21	0	0	210	101
22	Textiles	54	11	9	7	14	24	0	0	0	0	77	42
24	Lumber and Wood	77	13	4	3	5	8	0	0	0	0	86	24
25	Furniture	2	0.2	0	0	0	0	0	0	0	0	2	0.2
26	Paper	57	14	14	9	21	46	4	39	0	0	96	109
27	Printing	36	5	1	1	1	2	0	0	0	0	38	8
28	Chemicals	127	24	25	18	53	112	11	87	4	149	220	389
29	Petroleum Refining	0	0	3	2	4	7	0	0	0	0	7	9
30	Rubber/Misc Plastics	135	20	11	8	6	13	1	7	0	0	153	48
32	Stone/Clay/Glass	1	0	1	1	1	2	0	0	0	0	3	3
33	Primary Metals	14	2.7	10	7	2	2	0	0	0	0	26	12
34	Fabricated Metals	44	5	1	1	1	1	0	0	0	0	46	7
35	Machinery/Computer Equip.	1	0.1	0	0	0	0	0	0	0	0	1	0.1
37	Transportation Equip.	21	2	2	1	0	0	2	17	0	0	25	21
38	Instruments	12	1.6	1	1	0	0	0	0	0	0	13	2
39	Misc. Manufacturing	8	1	0	0	1	4	0	0	0	0	9	5
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**756**	**129**	**104**	**75**	**127**	**254**	**21**	**172**	**4**	**149**	**1,012**	**780**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	17	2	0	0	0	0	0	0	0	0	17	2
52	Retail	303	40	9	6	6	8	0	0	0	0	318	55
4222	Refrigerated Warehouses	18	3	0	0	1	1	0	0	0	0	19	4
4581	Airports	4	1	0	0	0	0	1	17	0	0	5	18
4952	Waste Water Treatment Plants	48	5	0	0	0	0	0	0	0	0	48	5
4961	District Energy	0	0	0	0	0	0	1	7	1	399	2	406
5411	Food Stores	314	76	5	3	0	0	0	0	0	0	319	79
5812	Restaurants	427	41	8	5	0	0	0	0	0	0	435	46
6512	Commercial Office Buildings	1,211	61	606	242	242	145	0	0	0	0	2,059	448
6513	Multifamily Buildings	469	35	170	85	26	26	0	0	0	0	666	147
7011	Hotels	265	36	30	20	9	17	0	0	0	0	304	72
7211	Laundries	29	5	0	0	0	0	0	0	0	0	29	5
7374	Data Centers	49	8	3	2	3	7	0	0	0	0	55	17
7542	Car Washes	19	2	0	0	0	0	0	0	0	0	19	2
7832	Movie Theaters	4	0.3	0	0	0	0	0	0	0	0	4	0.3
7991	Health Clubs	130	16	1	1	0	0	0	0	0	0	131	16
7997	Golf/Country Clubs	101	13	2	1	0	0	0	0	0	0	103	14
8051	Nursing Homes	329	43	4	3	3	7	0	0	0	0	336	53
8062	Hospitals	33	10	27	19	46	86	5	28	1	479	112	621
8211	Schools	247	21	0	0	0	0	0	0	0	0	247	21
8221	College/Univ.	79	15	17	11	26	57	13	127	5	296	140	506
8412	Museums	30	4	0	0	2	3	0	0	0	0	32	7
9100	Government Buildings	162	20	24	16	19	28	3	16	0	0	208	81
9223	Prisons	8	2	4	3	6	8	0	0	0	0	18	13
9711	Military	11	2	1	1	7	10	1	5	0	0	20	18
	Total	**4,307**	**458**	**911**	**419**	**396**	**404**	**24**	**200**	**7**	**1,173**	**5,646**	**2,655**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
32	Stone/Clay/Glass	0	0	1	1	1	2	0	0	0	0	2	3
38	Instruments	1	0.005	0	0	0	0	0	0	0	0	1	0.005
	Total	**1**	**0.005**	**1**	**1**	**1**	**2**	**0**	**0**	**0**	**0**	**3**	**3**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	District Energy Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
4961	Current Loops without CHP	0	0	0	0	0	0	0	0	0	0	0	0
4961	Current Loops with CHP expansion	0	0	0	0	0	0	1	7	1	399	2	406
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**7**	**1**	**399**	**2**	**406**

Michigan

- Michigan has 4,987 MW of overall CHP capacity identified at 10,370 sites.
  - 2,170 MW of industrial on-site CHP potential primarily in the transportation equipment, chemicals, primary metals, paper, and food sectors.
  - 1,967 MW of commercial on-site CHP potential, primarily in the commercial (office) buildings, colleges and universities, hospitals, retail, and multifamily buildings sectors.
- Michigan has 154 MW of WHP CHP potential identified at 36 sites primarily in the oil and gas extraction, refining, stone/clay/glass, and primary metals sectors.
- Michigan has 696 MW of CHP potential identified at 2 district energy sites.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	1,542	276	289	205	287	596	66	577	14	515	2,198	2,170
Commercial Topping Cycle CHP	6,293	593	1,315	576	502	563	22	174	2	62	8,134	1,967
WHP CHP	16	4	1	1	8	19	9	84	2	47	36	154
District Energy CHP	0	0	0	0	0	0	0	0	2	696	2	696
Total	**7,851**	**872**	**1,605**	**782**	**797**	**1,179**	**97**	**834**	**20**	**1,320**	**10,370**	**4,987**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	10	2	0	0	1	2	1	6	0	0	12	10
20	Food	197	37	35	26	39	75	6	49	0	0	277	188
22	Textiles	19	4	4	3	0	0	0	0	0	0	23	6
24	Lumber and Wood	182	32	20	14	18	36	2	13	0	0	222	95
25	Furniture	7	0.7	0	0	0	0	0	0	0	0	7	1
26	Paper	64	17	12	10	23	52	2	16	3	118	104	212
27	Printing	36	4	2	1	0	0	0	0	0	0	38	6
28	Chemicals	150	27	42	30	67	154	24	234	3	132	286	576
29	Petroleum Refining	0	0	10	7	10	20	1	12	1	44	22	83
30	Rubber/Misc Plastics	300	49	21	15	11	19	1	5	0	0	333	88
32	Stone/Clay/Glass	2	0.2	0	0	2	7	5	42	1	25	10	74
33	Primary Metals	104	25	31	22	29	64	10	95	3	117	177	323
34	Fabricated Metals	147	17	2	1	0	0	0	0	0	0	149	18
35	Machinery/Computer Equip.	14	2	0	0	2	3	1	11	0	0	17	16
37	Transportation Equip.	300	59	111	77	91	178	22	178	5	127	529	618
38	Instruments	5	0.9	0	0	0	0	0	0	0	0	5	1
39	Misc. Manufacturing	6	0.5	0	0	0	0	0	0	0	0	6	0.5
49	Gas Processing	14	2	0	0	2	6	0	0	0	0	16	8
	Total	**1,557**	**279**	**290**	**206**	**295**	**616**	**75**	**661**	**16**	**562**	**2,233**	**2,324**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	24	2	0	0	0	0	0	0	0	0	24	2
52	Retail	602	90	43	25	8	14	0	0	0	0	653	129
4222	Refrigerated Warehouses	22	2	0	0	1	1	0	0	0	0	23	3
4581	Airports	7	2	2	1	2	4	0	0	0	0	11	7
4952	Waste Water Treatment Plants	24	3	0	0	1	2	0	0	0	0	25	5
4961	District Energy	0	0	0	0	0	0	0	0	2	696	2	696
5411	Food Stores	296	49	4	2	0	0	0	0	0	0	300	52
5812	Restaurants	701	62	2	1	3	4	0	0	0	0	706	67
6512	Commercial Office Buildings	2,393	120	1,047	419	299	179	0	0	0	0	3,739	718
6513	Multifamily Buildings	303	23	110	55	17	17	0	0	0	0	430	95
7011	Hotels	315	40	21	14	14	24	0	0	0	0	350	77
7211	Laundries	32	5	3	2	0	0	0	0	0	0	35	7
7374	Data Centers	52	8	10	7	8	13	0	0	0	0	70	28
7542	Car Washes	37	3	0	0	0	0	0	0	0	0	37	3
7832	Movie Theaters	4	0	0	0	0	0	0	0	0	0	4	0
7991	Health Clubs	76	7	3	2	0	0	0	0	0	0	79	9
7997	Golf/Country Clubs	243	28	0	0	0	0	0	0	0	0	243	28
8051	Nursing Homes	308	39	5	3	0	0	0	0	0	0	313	43
8062	Hospitals	79	20	29	19	59	127	4	27	0	0	171	193
8211	Schools	462	43	0	0	0	0	0	0	0	0	462	43
8221	College/Univ.	82	14	11	7	34	91	17	141	2	62	146	315
8412	Museums	26	3	0	0	1	2	0	0	0	0	27	5
9100	Government Buildings	193	26	15	10	16	30	1	5	0	0	225	71
9223	Prisons	8	2	8	6	36	50	0	0	0	0	52	57
9711	Military	5	1	2	1	3	7	0	0	0	0	10	9
	Total	**6,294**	**593**	**1,315**	**576**	**502**	**563**	**22**	**174**	**4**	**758**	**8,137**	**2,663**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
13	Oil and Gas Extraction	10	2	0	0	1	2	1	6	0	0	12	10
20	Food	3	1	1	1	0	0	0	0	0	0	4	2
24	Lumber and Wood	1	0.1	0	0	0	0	0	0	0	0	1	0
28	Chemicals	0	0	0	0	2	3	0	0	0	0	2	3
29	Petroleum Refining	0	0	0	0	1	2	1	12	0	0	2	14
32	Stone/Clay/Glass	0	0	0	0	2	7	3	25	1	25	6	57
33	Primary Metals	1	0.2	0	0	2	4	4	41	1	22	8	68
8211	College/Univ.	1	0.1	0	0	0	0	0	0	0	0	1	0.1
	Total	**16**	**4**	**1**	**1**	**8**	**19**	**9**	**84**	**2**	**47**	**36**	**154**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	District Energy Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
4961	Current Loops without CHP	0	0	0	0	0	0	0	0	2	696	2	696
4961	Current Loops with CHP expansion	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**696**	**2**	**696**

Minnesota

- Minnesota has 4,310 MW of overall CHP capacity identified at 6,326 sites.
  - 1,495 MW of industrial on-site CHP potential primarily in the food, chemicals, refining, paper, and lumber and wood sectors.
  - 1,641 MW of commercial on-site CHP potential, primarily in the colleges and universities, commercial (office) buildings, hospitals, multifamily buildings, and retail sectors.
- Minnesota has 123 MW of WHP CHP potential identified at 12 sites primarily in the primary metals and refining sectors.
- Minnesota has 1,050 MW of CHP potential identified at 6 district energy sites.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	899	158	129	93	171	356	47	399	10	489	1,256	1,495
Commercial Topping Cycle CHP	3,934	402	809	371	286	315	18	175	6	378	5,052	1,641
WHP CHP	5	1	0	0	3	4	3	36	1	82	12	123
District Energy CHP	0	0	0	0	0	0	0	0	6	1,050	6	1,050
Total	**4,838**	**561**	**938**	**464**	**460**	**676**	**68**	**610**	**23**	**2,000**	**6,326**	**4,310**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	214	44	39	30	66	127	19	174	2	79	340	453
22	Textiles	14	3	1	1	1	2	0	0	0	0	16	5
24	Lumber and Wood	137	23	17	12	12	17	5	39	0	0	171	92
25	Furniture	0	0	0	0	0	0	0	0	0	0	0	0
26	Paper	44	13	13	8	16	37	4	49	4	135	81	243
27	Printing	18	3	2	1	0	0	0	0	0	0	20	4
28	Chemicals	165	28	24	18	60	137	16	116	0	0	265	298
29	Petroleum Refining	0	0	5	3	1	4	2	17	5	358	13	382
30	Rubber/Misc Plastics	165	25	13	9	1	2	1	5	0	0	180	41
32	Stone/Clay/Glass	0	0	0	0	2	3	0	0	0	0	2	3
33	Primary Metals	28	6	8	6	9	20	2	26	0	0	47	58
34	Fabricated Metals	58	7	1	1	0	0	0	0	0	0	59	7
35	Machinery/Computer Equip	11	2	0	0	1	1	0	0	0	0	12	3
37	Transportation Equip.	36	5	6	4	4	9	1	8	0	0	47	27
38	Instruments	3	0.2	0	0	0	0	0	0	0	0	3	0.2
39	Misc. Manufacturing	11	1	0	0	1	1	0	0	0	0	12	3
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**904**	**159**	**129**	**93**	**174**	**360**	**50**	**435**	**11**	**571**	**1,268**	**1,619**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	4	0.4	0	0	1	1	0	0	0	0	5	1
52	Retail	373	56	12	8	3	4	0	0	0	0	388	67
4222	Refrigerated Warehouses	15	2	2	1	0	0	1	7	0	0	18	10
4581	Airports	3	1	0	0	0	0	1	19	0	0	4	20
4952	Waste Water Treatment Plants	11	1	0	0	1	3	0	0	0	0	12	4
4961	District Energy	0	0	0	0	0	0	0	0	6	1,050	6	1,050
5411	Food Stores	192	44	8	5	0	0	0	0	0	0	200	49
5812	Restaurants	358	35	0	0	1	1	0	0	0	0	359	37
6512	Commercial Office Buildings	1,264	63	553	221	158	95	0	0	0	0	1,975	379
6513	Multifamily Buildings	348	26	126	63	20	20	0	0	0	0	493	109
7011	Hotels	240	30	17	10	9	16	1	9	0	0	267	65
7211	Laundries	17	3	4	3	0	0	0	0	0	0	21	5
7374	Data Centers	35	6	4	3	5	10	1	6	0	0	45	24
7542	Car Washes	28	2	0	0	0	0	0	0	0	0	28	2
7832	Movie Theaters	1	0.1	0	0	0	0	0	0	0	0	1	0.1
7991	Health Clubs	57	7	4	3	2	4	0	0	0	0	63	14
7997	Golf/Country Clubs	117	14	2	1	0	0	0	0	0	0	119	15
8051	Nursing Homes	295	38	9	6	4	5	0	0	0	0	308	50
8062	Hospitals	82	17	36	24	28	56	1	6	1	67	148	169
8211	Schools	276	24	0	0	0	0	0	0	0	0	276	24
8221	College/Univ.	56	10	11	7	31	68	13	128	5	312	116	525
8412	Museums	10	2	1	1	0	0	0	0	0	0	11	3
9100	Government Buildings	143	19	19	15	10	14	0	0	0	0	172	48
9223	Prisons	3	1	1	1	11	14	0	0	0	0	15	15
9711	Military	6	1	0	0	2	5	0	0	0	0	8	6
	Total	**3,934**	**402**	**809**	**371**	**286**	**315**	**18**	**175**	**12**	**1,428**	**5,058**	**2,691**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
20	Food	4	1	0	0	0	0	0	0	0	0	4	1
26	Paper	1	0.4	0	0	0	0	0	0	0	0	1	0.4
28	Chemicals	0	0	0	0	0	0	1	6	0	0	1	6
29	Petroleum Refining	0	0	0	0	0	0	1	11	1	82	2	93
32	Stone/Clay/Glass	0	0	0	0	2	3	0	0	0	0	2	3
33	Primary Metals	0	0	0	0	1	1	1	19	0	0	2	20
	Total	**5**	**1**	**0**	**0**	**3**	**4**	**3**	**36**	**1**	**82**	**12**	**123**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	District Energy Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
4961	Current Loops without CHP	0	0	0	0	0	0	0	0	2	433	2	433
4961	Current Loops with CHP expansion	0	0	0	0	0	0	0	0	4	618	4	618
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**1,050**	**6**	**1,050**

Mississippi

- Mississippi has 1,833 MW of overall CHP capacity identified at 2,629 sites.
  - 966 MW of industrial on-site CHP potential primarily in the refining, chemicals, paper, lumber and wood, and food sectors.
  - 691 MW of commercial on-site CHP potential, primarily in the commercial (office) buildings, colleges and universities, hospitals, schools, and hotels sectors.
- Mississippi has 176 MW of WHP CHP potential identified at 9 sites, primarily in the oil and gas extraction, refining and primary metals sectors.
- There is no CHP district energy potential identified in Mississippi.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	359	68	80	56	98	203	26	248	6	391	569	966
Commercial Topping Cycle CHP	1,569	198	327	157	142	213	12	103	1	20	2,051	691
WHP CHP	1	0.1	2	2	1	3	3	28	2	144	9	176
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**1,929**	**266**	**409**	**214**	**241**	**419**	**41**	**378**	**9**	**555**	**2,629**	**1,833**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	1	1	0	0	1	10	0	0	2	11
20	Food	38	8	9	6	15	30	1	8	0	0	63	53
22	Textiles	7	2	5	3	8	14	1	5	0	0	21	24
24	Lumber and Wood	118	22	26	19	23	48	0	0	0	0	167	89
25	Furniture	5	0.9	0	0	0	0	0	0	0	0	5	1
26	Paper	22	6	6	4	7	18	3	23	3	144	41	194
27	Printing	7	1	0	0	0	0	0	0	0	0	7	1
28	Chemicals	44	8	14	11	22	37	14	144	1	34	95	235
29	Petroleum Refining	0	0	8	5	7	17	4	29	2	297	21	348
30	Rubber/Misc Plastics	59	9	4	3	3	5	1	12	0	0	67	29
32	Stone/Clay/Glass	3	0.4	0	0	2	8	0	0	0	0	5	8
33	Primary Metals	16	3	5	3	9	25	1	12	2	60	33	103
34	Fabricated Metals	6	1	0	0	0	0	0	0	0	0	6	1
35	Machinery/Computer Equip.	4	0.5	1	1	0	0	0	0	0	0	5	1
37	Transportation Equip.	29	6	2	1	3	5	2	23	0	0	36	36
38	Instruments	0	0	0	0	0	0	0	0	0	0	0	0
39	Misc. Manufacturing	2	0.3	0	0	0	0	0	0	0	0	2	0.3
49	Gas Processing	0	0	1	1	0	0	1	8	0	0	2	9
	Total	**360**	**68**	**82**	**57**	**99**	**206**	**29**	**276**	**8**	**534**	**578**	**1,141**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	2	0.2	0	0	0	0	0	0	0	0	2	0.2
52	Retail	162	25	14	8	0	0	0	0	0	0	176	34
4222	Refrigerated Warehouses	4	0	0	0	0	0	0	0	0	0	4	0
4581	Airports	6	1	0	0	2	5	0	0	0	0	8	7
4952	Waste Water Treatment Plants	10	1	0	0	0	0	0	0	0	0	10	1
4961	District Energy	0	0	0	0	0	0	0	0	0	0	0	0
5411	Food Stores	70	12	0	0	0	0	0	0	0	0	70	12
5812	Restaurants	123	11	0	0	0	0	0	0	0	0	123	11
6512	Commercial Office Buildings	551	28	220	88	55	33	0	0	0	0	826	149
6513	Multifamily Buildings	31	2	11	6	2	2	0	0	0	0	44	10
7011	Hotels	111	12	4	3	13	25	2	21	0	0	130	60
7211	Laundries	5	1	0	0	0	0	0	0	0	0	5	1
7374	Data Centers	5	2	0	0	0	0	0	0	0	0	5	2
7542	Car Washes	6	0.4	0	0	0	0	0	0	0	0	6	0.4
7832	Movie Theaters	0	0	0	0	0	0	0	0	0	0	0	0
7991	Health Clubs	27	3	0	0	0	0	0	0	0	0	27	3
7997	Golf/Country Clubs	34	3	1	1	0	0	0	0	0	0	35	4
8051	Nursing Homes	109	11	0	0	2	4	0	0	0	0	111	15
8062	Hospitals	58	16	21	15	34	66	2	12	0	0	115	109
8211	Schools	136	55	44	27	2	3	0	0	0	0	182	85
8221	College/Univ.	16	3	3	2	18	47	4	39	1	20	42	112
8412	Museums	3	0.4	0	0	0	0	0	0	0	0	3	0.4
9100	Government Buildings	77	9	6	4	0	0	1	7	0	0	84	20
9223	Prisons	17	2	1	1	9	16	1	6	0	0	28	25
9711	Military	6	2	2	1	5	13	2	18	0	0	15	34
	Total	**1,569**	**198**	**327**	**157**	**142**	**213**	**12**	**103**	**1**	**20**	**2,051**	**691**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
13	Oil and Gas Extraction	0	0	1	1	0	0	1	10	0	0	2	11
26	Paper	1	0.1	0	0	0	0	0	0	0	0	1	0.1
29	Petroleum Refining	0	0	1	1	0	0	1	5	1	106	3	112
32	Stone/Clay/Glass	0	0	0	0	1	3	0	0	0	0	1	3
33	Primary Metals	0	0	0	0	0	0	1	12	1	38	2	50
	Total	**1**	**0.1**	**2**	**2**	**1**	**3**	**3**	**28**	**2**	**144**	**9**	**176**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no known CHP technical potential at existing district energy loops in Mississippi.

Missouri

- Missouri has 3,290 MW of overall CHP capacity identified at 6,384 sites.
  - 1,276 MW of industrial on-site CHP potential primarily in the food, chemicals, paper, transportation equipment, and primary metals sectors.
  - 1,521 MW of commercial on-site CHP potential, primarily in the commercial (office) buildings, colleges and universities, hospitals, hotels, and retail sectors.
- Missouri has 85 MW of WHP CHP potential identified at 15 sites, primarily in the stone/clay/glass and chemicals sectors.
- Missouri has 408 MW of CHP potential identified at 2 district energy sites.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	851	155	128	91	166	338	40	377	9	316	1,194	1,276
Commercial Topping Cycle CHP	4,017	424	816	365	310	376	24	217	6	138	5,173	1,521
WHP CHP	3	1	1	1	5	12	5	49	1	23	15	85
District Energy CHP	0	0	0	0	0	0	0	0	2	408	2	408
Total	**4,871**	**580**	**945**	**457**	**481**	**726**	**69**	**643**	**18**	**885**	**6,384**	**3,290**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	1	0.5	0	0	0	0	0	0	0	0	1	0.5
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	174	36	24	17	51	98	14	135	3	147	266	432
22	Textiles	22	4	2	2	3	5	0	0	0	0	27	11
24	Lumber and Wood	142	24	17	12	9	17	0	0	0	0	168	53
25	Furniture	2	0.4	0	0	0	0	0	0	0	0	2	0.4
26	Paper	46	12	12	9	16	30	1	10	1	43	76	104
27	Printing	16	2	1	1	0	0	0	0	0	0	17	2
28	Chemicals	155	27	25	18	52	110	16	140	4	103	252	398
29	Petroleum Refining	0	0	2	1	11	22	0	0	0	0	13	23
30	Rubber/Misc Plastics	149	25	21	14	7	13	0	0	0	0	177	52
32	Stone/Clay/Glass	3	0	1	1	3	8	9	89	1	23	17	122
33	Primary Metals	44	9	8	6	11	29	3	28	0	0	66	72
34	Fabricated Metals	29	4	1	1	0	0	0	0	0	0	30	5
35	Machinery/Computer Equip.	4	0.5	2	1	0	0	0	0	0	0	6	2
37	Transportation Equip.	57	9	13	9	8	17	2	24	1	23	81	82
38	Instruments	1	0.1	0	0	0	0	0	0	0	0	1	0.1
39	Misc. Manufacturing	9	2	0	0	0	0	0	0	0	0	9	2
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**854**	**155**	**129**	**92**	**171**	**349**	**45**	**426**	**10**	**339**	**1,209**	**1,361**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	6	1	0	0	0	0	0	0	0	0	6	1
52	Retail	381	56	23	14	1	2	0	0	0	0	405	71
4222	Refrigerated Warehouses	13	1	0	0	0	0	0	0	0	0	13	1
4581	Airports	3	1	0	0	1	1	2	13	0	0	6	15
4952	Waste Water Treatment Plants	19	3	1	1	0	0	0	0	0	0	20	4
4961	District Energy	0	0	0	0	0	0	0	0	2	408	2	408
5411	Food Stores	165	37	8	5	0	0	0	0	0	0	173	42
5812	Restaurants	461	41	4	3	1	2	0	0	0	0	466	46
6512	Commercial Office Buildings	1,437	72	629	252	180	108	0	0	0	0	2,246	431
6513	Multifamily Buildings	127	10	46	23	7	7	0	0	0	0	180	40
7011	Hotels	273	31	17	10	16	27	3	19	0	0	309	88
7211	Laundries	37	6	0	0	0	0	0	0	0	0	37	6
7374	Data Centers	32	5	5	3	6	11	1	9	0	0	44	29
7542	Car Washes	30	3	0	0	0	0	0	0	0	0	30	3
7832	Movie Theaters	6	0.5	0	0	0	0	0	0	0	0	6	0.5
7991	Health Clubs	46	4	0	0	0	0	0	0	0	0	46	4
7997	Golf/Country Clubs	80	10	0	0	0	0	0	0	0	0	80	10
8051	Nursing Homes	336	32	5	3	1	1	0	0	0	0	342	36
8062	Hospitals	80	20	30	22	43	96	2	16	0	0	155	155
8211	Schools	254	55	28	16	0	0	0	0	0	0	282	71
8221	College/Univ.	81	15	3	2	33	77	13	128	6	138	136	360
8412	Museums	14	2	0	0	0	0	0	0	0	0	14	2
9100	Government Buildings	120	15	9	6	4	7	1	7	0	0	134	35
9223	Prisons	2	0.3	6	4	16	33	0	0	0	0	24	37
9711	Military	14	3	2	2	1	4	2	25	0	0	19	33
	Total	**4,017**	**424**	**816**	**365**	**310**	**376**	**24**	**217**	**8**	**546**	**5,175**	**1,929**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	1	0.5	0	0	0	0	0	0	0	0	1	0.5
28	Chemicals	0	0	0	0	2	4	0	0	0	0	2	4
32	Stone/Clay/Glass	1	0.05	1	1	3	8	5	49	1	23	11	81
33	Primary Metals	1	0.1	0	0	0	0	0	0	0	0	1	0.1
	Total	**3**	**1**	**1**	**1**	**5**	**12**	**5**	**49**	**1**	**23**	**15**	**85**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	District Energy Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
4961	Current Loops without CHP	0	0	0	0	0	0	0	0	0	0	0	0
4961	Current Loops with CHP expansion	0	0	0	0	0	0	0	0	2	408	2	408
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**408**	**2**	**408**

Montana

- Montana has 377 MW of overall CHP capacity identified at 942 sites.
  - 140 MW of industrial on-site CHP potential primarily in the refining, lumber and wood, primary metals, food, and chemicals sectors.
  - 179 MW of commercial on-site CHP potential, primarily in the commercial (office) buildings, colleges and universities, hospitals, hotels, and retail sectors.
- Montana has 58 MW of WHP CHP potential identified at 7 sites in the refining, food, and stone/clay/glass sectors.
- There is no CHP district energy potential identified in Montana.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	123	19	10	7	18	29	3	19	2	65	156	140
Commercial Topping Cycle CHP	659	69	86	43	30	36	4	31	0	0	779	179
WHP CHP	1	0.4	0	0	3	5	2	25	1	27	7	58
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**783**	**89**	**96**	**50**	**51**	**71**	**9**	**74**	**3**	**92**	**942**	**377**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	33	6	3	2	4	6	0	0	0	0	40	15
22	Textiles	0	0	0	0	0	0	0	0	0	0	0	0
24	Lumber and Wood	44	8	1	1	9	12	1	5	0	0	55	26
25	Furniture	0	0	0	0	0	0	0	0	0	0	0	0
26	Paper	0	0	0	0	0	0	0	0	0	0	0	0
27	Printing	6	1	0	0	0	0	0	0	0	0	6	1
28	Chemicals	17	2	4	3	1	2	1	5	0	0	23	12
29	Petroleum Refining	0	0	1	1	3	6	2	25	3	92	9	124
30	Rubber/Misc Plastics	10	1	0	0	0	0	0	0	0	0	10	1
32	Stone/Clay/Glass	1	0	0	0	2	4	0	0	0	0	3	4
33	Primary Metals	5	1	1	1	2	5	1	8	0	0	9	15
34	Fabricated Metals	1	0.1	0	0	0	0	0	0	0	0	1	0.1
35	Machinery/Computer Equip.	0	0	0	0	0	0	0	0	0	0	0	0
37	Transportation Equip.	5	0.4	0	0	0	0	0	0	0	0	5	0.4
38	Instruments	0	0	0	0	0	0	0	0	0	0	0	0
39	Misc. Manufacturing	2	0.1	0	0	0	0	0	0	0	0	2	0.1
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**124**	**20**	**10**	**7**	**21**	**35**	**5**	**44**	**3**	**92**	**163**	**198**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	1	0.1	0	0	0	0	0	0	0	0	1	0.1
52	Retail	68	9	2	1	0	0	0	0	0	0	70	11
4222	Refrigerated Warehouses	0	0	0	0	0	0	0	0	0	0	0	0
4581	Airports	6	2	0	0	0	0	0	0	0	0	6	2
4952	Waste Water Treatment Plants	1	0.1	0	0	0	0	0	0	0	0	1	0.1
4961	District Energy	0	0	0	0	0	0	0	0	0	0	0	0
5411	Food Stores	49	7	0	0	0	0	0	0	0	0	49	7
5812	Restaurants	39	3	0	0	0	0	0	0	0	0	39	3
6512	Commercial Office Buildings	185	9	57	23	14	8	0	0	0	0	256	40
6513	Multifamily Buildings	11	1	4	2	1	1	0	0	0	0	16	4
7011	Hotels	102	10	0	0	1	1	1	5	0	0	104	16
7211	Laundries	8	1	0	0	0	0	0	0	0	0	8	1
7374	Data Centers	8	1	1	1	0	0	0	0	0	0	9	2
7542	Car Washes	3	0.2	0	0	0	0	0	0	0	0	3	0.2
7832	Movie Theaters	1	0.1	0	0	0	0	0	0	0	0	1	0.1
7991	Health Clubs	14	1	0	0	0	0	0	0	0	0	14	1
7997	Golf/Country Clubs	16	2	0	0	0	0	0	0	0	0	16	2
8051	Nursing Homes	47	5	1	1	0	0	0	0	0	0	48	6
8062	Hospitals	43	9	14	10	5	10	0	0	0	0	62	29
8211	Schools	2	0.1	0	0	0	0	0	0	0	0	2	0.1
8221	College/Univ.	12	2	0	0	7	14	2	19	0	0	21	35
8412	Museums	5	0.5	0	0	0	0	0	0	0	0	5	0.5
9100	Government Buildings	27	3	4	3	1	1	0	0	0	0	32	8
9223	Prisons	8	1	1	1	1	2	0	0	0	0	10	3
9711	Military	3	0.4	2	1	0	0	1	7	0	0	6	9
	Total	**659**	**69**	**86**	**43**	**30**	**36**	**4**	**31**	**0**	**0**	**779**	**179**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
20	Food	1	0.4	0	0	0	0	0	0	0	0	1	0.4
29	Petroleum Refining	0	0	0	0	1	1	2	25	1	27	4	53
32	Stone/Clay/Glass	0	0	0	0	2	4	0	0	0	0	2	4
	Total	**1**	**0.4**	**0**	**0**	**3**	**5**	**2**	**25**	**1**	**27**	**7**	**58**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no known CHP technical potential at existing district energy loops in Montana.

Nebraska

- Nebraska has 984 MW of overall CHP capacity identified at 2,067 sites.
  - 487 MW of industrial on-site CHP potential primarily in the food, chemicals, primary metals, paper, and textiles sectors.
  - 458 MW of commercial on-site CHP potential, primarily in the commercial (office) buildings, colleges and universities, hospitals, data centers, and government buildings sectors.
- Nebraska has 39 MW of WHP CHP potential identified at 9 sites in the food, refining, stone/clay/glass and primary metals sectors.
- There is no CHP district energy potential identified in Nebraska.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	244	43	49	35	77	166	23	206	1	37	394	487
Commercial Topping Cycle CHP	1,318	142	239	106	98	114	9	95	0	0	1,664	458
WHP CHP	2	0.3	0	0	6	15	0	0	1	24	9	39
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**1,564**	**185**	**288**	**141**	**181**	**295**	**32**	**302**	**2**	**62**	**2,067**	**984**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	82	17	14	10	26	56	15	138	1	37	138	258
22	Textiles	2	0.4	2	1	1	2	1	8	0	0	6	12
24	Lumber and Wood	30	4	6	4	3	4	0	0	0	0	39	12
25	Furniture	0	0	0	0	0	0	0	0	0	0	0	0
26	Paper	11	3	4	3	4	5	1	15	0	0	20	26
27	Printing	7	1	2	1	0	0	0	0	0	0	9	2
28	Chemicals	41	6	6	5	32	81	4	22	0	0	83	114
29	Petroleum Refining	0	0	0	0	7	14	0	0	0	0	7	14
30	Rubber/Misc Plastics	29	5	4	3	1	1	0	0	0	0	34	9
32	Stone/Clay/Glass	1	0.1	0	0	1	4	0	0	0	0	2	4
33	Primary Metals	11	2	4	3	2	4	2	23	1	24	20	56
34	Fabricated Metals	8	1	1	1	0	0	0	0	0	0	9	1
35	Machinery/Computer Equip.	14	3	0	0	2	3	0	0	0	0	16	5
37	Transportation Equip.	6	1	6	4	4	7	0	0	0	0	16	12
38	Instruments	0	0	0	0	0	0	0	0	0	0	0	0
39	Misc. Manufacturing	3	0.2	0	0	0	0	0	0	0	0	3	0.2
49	Gas Processing	1	0.1	0	0	0	0	0	0	0	0	1	0.1
	Total	**246**	**43**	**49**	**35**	**83**	**181**	**23**	**206**	**2**	**62**	**403**	**527**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	1	0.1	0	0	0	0	0	0	0	0	1	0.1
52	Retail	128	17	4	2	0	0	0	0	0	0	132	20
4222	Refrigerated Warehouses	12	1	0	0	0	0	0	0	0	0	12	1
4581	Airports	2	1	0	0	1	2	0	0	0	0	3	3
4952	Waste Water Treatment Plants	5	1	0	0	0	0	0	0	0	0	5	1
4961	District Energy	0	0	0	0	0	0	0	0	0	0	0	0
5411	Food Stores	60	14	1	1	0	0	0	0	0	0	61	15
5812	Restaurants	109	11	0	0	0	0	0	0	0	0	109	11
6512	Commercial Office Buildings	431	22	189	76	54	32	0	0	0	0	674	130
6513	Multifamily Buildings	36	3	13	7	2	2	0	0	0	0	51	11
7011	Hotels	67	7	9	5	2	4	0	0	0	0	78	16
7211	Laundries	6	1	0	0	0	0	0	0	0	0	6	1
7374	Data Centers	22	3	3	2	5	10	1	16	0	0	31	31
7542	Car Washes	9	1	0	0	0	0	0	0	0	0	9	1
7832	Movie Theaters	0	0	0	0	0	0	0	0	0	0	0	0
7991	Health Clubs	11	1	0	0	0	0	0	0	0	0	11	1
7997	Golf/Country Clubs	34	4	0	0	0	0	0	0	0	0	34	4
8051	Nursing Homes	135	13	1	1	0	0	0	0	0	0	136	14
8062	Hospitals	70	14	7	5	21	36	0	0	0	0	98	54
8211	Schools	69	12	0	0	0	0	0	0	0	0	69	12
8221	College/Univ.	19	4	4	3	9	22	6	66	0	0	38	95
8412	Museums	6	1	0	0	0	0	0	0	0	0	6	1
9100	Government Buildings	73	9	5	4	3	4	1	5	0	0	82	22
9223	Prisons	5	1	3	2	1	1	0	0	0	0	9	5
9711	Military	8	2	0	0	0	0	1	7	0	0	9	9
	Total	**1,318**	**142**	**239**	**106**	**98**	**114**	**9**	**95**	**0**	**0**	**1,664**	**458**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
20	Food	2	0.3	0	0	0	0	0	0	0	0	2	0.3
29	Petroleum Refining	0	0	0	0	5	11	0	0	0	0	5	11
32	Stone/Clay/Glass	0	0	0	0	1	4	0	0	0	0	1	4
33	Primary Metals	0	0	0	0	0	0	0	0	1	24	1	24
	Total	**2**	**0.3**	**0**	**0**	**6**	**15**	**0**	**0**	**1**	**24**	**9**	**39**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no known CHP technical potential at existing district energy loops in Nebraska.

Nevada

- Nevada has 1,378 MW of overall CHP capacity identified at 2,399 sites.
  - 275 MW of industrial on-site CHP potential primarily in the chemicals, food, miscellaneous manufacturing, refining, and lumber and wood sectors.
  - 971 MW of commercial on-site CHP potential, primarily in the hotels, schools, commercial (office) buildings, colleges and universities, and multifamily buildings sectors.
- Nevada has 7 MW of WHP CHP potential identified at 2 sites in the stone/clay/glass sector.
- Nevada has 124 MW of CHP potential identified at 2 district energy sites.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	123	21	19	13	22	41	5	26	3	174	172	275
Commercial Topping Cycle CHP	1,684	202	341	173	170	276	22	187	5	132	2,223	971
WHP CHP	0	0	0	0	2	7	0	0	0	0	2	7
District Energy CHP	0	0	0	0	0	0	0	0	2	124	2	124
Total	**1,807**	**223**	**360**	**186**	**194**	**325**	**27**	**214**	**10**	**429**	**2,399**	**1,378**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	31	5	3	3	4	6	0	0	0	0	38	14
22	Textiles	2	0.4	0	0	0	0	0	0	0	0	2	0.4
24	Lumber and Wood	7	1	1	1	2	3	1	5	0	0	11	10
25	Furniture	0	0	0	0	0	0	0	0	0	0	0	0
26	Paper	4	1	3	2	2	3	0	0	0	0	9	6
27	Printing	6	2	0	0	0	0	0	0	0	0	6	2
28	Chemicals	26	4	6	4	6	11	3	16	3	174	44	209
29	Petroleum Refining	0	0	2	1	3	9	0	0	0	0	5	10
30	Rubber/Misc Plastics	26	4	2	1	0	0	0	0	0	0	28	5
32	Stone/Clay/Glass	0	0	0	0	3	9	0	0	0	0	3	9
33	Primary Metals	4	1	1	1	2	4	0	0	0	0	7	5
34	Fabricated Metals	1	0.1	0	0	0	0	0	0	0	0	1	0.1
35	Machinery/Computer Equip.	0	0	0	0	0	0	0	0	0	0	0	0
37	Transportation Equip.	9	1	0	0	0	0	0	0	0	0	9	1
38	Instruments	0	0	0	0	0	0	0	0	0	0	0	0
39	Misc. Manufacturing	7	1	1	1	2	5	1	5	0	0	11	12
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**123**	**21**	**19**	**13**	**24**	**49**	**5**	**26**	**3**	**174**	**174**	**283**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	7	1	0	0	0	0	0	0	0	0	7	1
52	Retail	150	23	7	4	0	0	0	0	0	0	157	27
4222	Refrigerated Warehouses	2	0.3	1	1	0	0	0	0	0	0	3	1
4581	Airports	3	1	1	1	1	2	0	0	1	24	6	28
4952	Waste Water Treatment Plants	3	0.3	0	0	1	2	0	0	0	0	4	3
4961	District Energy	0	0	0	0	0	0	0	0	2	124	2	124
5411	Food Stores	157	23	0	0	0	0	0	0	0	0	157	23
5812	Restaurants	135	14	1	1	2	3	0	0	0	0	138	18
6512	Commercial OfficeBuildings	502	25	154	62	39	23	0	0	0	0	695	110
6513	Multifamily Buildings	199	15	72	36	11	11	0	0	0	0	283	62
7011	Hotels	134	18	26	16	45	116	19	162	1	25	225	337
7211	Laundries	7	1	2	1	1	1	0	0	0	0	10	4
7374	Data Centers	14	2	0	0	1	1	0	0	0	0	15	3
7542	Car Washes	18	2	0	0	0	0	0	0	0	0	18	2
7832	Movie Theaters	1	0.1	0	0	0	0	0	0	0	0	1	0.1
7991	Health Clubs	31	4	0	0	2	4	0	0	0	0	33	7
7997	Golf/Country Clubs	38	6	0	0	1	2	0	0	0	0	39	8
8051	Nursing Homes	32	4	0	0	0	0	0	0	0	0	32	4
8062	Hospitals	30	8	11	7	16	33	0	0	0	0	57	49
8211	Schools	117	40	57	38	30	36	0	0	0	0	204	115
8221	College/Univ.	30	5	0	0	7	20	0	0	3	82	40	107
8412	Museums	1	0.3	0	0	0	0	0	0	0	0	1	0.3
9100	Government Buildings	56	7	7	5	4	5	1	5	0	0	68	22
9223	Prisons	14	2	2	2	5	10	0	0	0	0	21	14
9711	Military	3	1	0	0	4	7	2	20	0	0	9	28
	Total	**1,684**	**202**	**341**	**173**	**170**	**276**	**22**	**187**	**7**	**256**	**2,225**	**1,095**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
32	Stone/Clay/Glass	0	0	0	0	2	7	0	0	0	0	2	7
	Total	**0**	**0**	**0**	**0**	**2**	**7**	**0**	**0**	**0**	**0**	**2**	**7**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	District Energy Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
4961	Current Loops without CHP	0	0	0	0	0	0	0	0	2	124	2	124
4961	Current Loops with CHP expansion	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**124**	**2**	**124**

New Hampshire

- New Hampshire has 447 MW of overall CHP capacity identified at 1,363 sites.
  - 170 MW of industrial on-site CHP potential primarily in the chemicals, paper, textiles, food, and lumber and wood sectors.
  - 277 MW of commercial on-site CHP potential, primarily in the commercial (office) buildings, colleges and universities, hospitals, hotels, and food stores sectors.
- There is no WHP CHP potential identified in New Hampshire.
- There is no CHP district energy potential identified in New Hampshire.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	183	31	27	20	21	45	5	35	1	40	237	170
Commercial Topping Cycle CHP	886	97	168	77	71	64	1	12	1	26	1,126	277
WHP CHP	0	0	0	0	0	0	0	0	0	0	0	0
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**1,069**	**128**	**195**	**97**	**92**	**109**	**6**	**47**	**2**	**66**	**1,363**	**447**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	24	5	5	4	2	5	1	8	0	0	32	22
22	Textiles	13	3	1	1	3	7	2	13	0	0	19	24
24	Lumber and Wood	51	8	6	4	1	1	0	0	0	0	58	14
25	Furniture	0	0	0	0	0	0	0	0	0	0	0	0
26	Paper	9	2	1	1	7	17	1	5	0	0	18	26
27	Printing	9	1	0	0	0	0	0	0	0	0	9	1
28	Chemicals	22	3	7	5	3	7	1	8	1	40	34	64
29	Petroleum Refining	0	0	2	2	1	1	0	0	0	0	3	3
30	Rubber/Misc Plastics	41	6	2	1	0	0	0	0	0	0	43	7
32	Stone/Clay/Glass	0	0	0	0	0	0	0	0	0	0	0	0
33	Primary Metals	3	0.3	1	1	1	1	0	0	0	0	5	2
34	Fabricated Metals	5	0.4	0	0	0	0	0	0	0	0	5	0.4
35	Machinery/Computer Equip.	3	0.3	0	0	0	0	0	0	0	0	3	0.3
37	Transportation Equip.	2	0.2	2	1	1	1	0	0	0	0	5	3
38	Instruments	0	0	0	0	1	2	0	0	0	0	1	2
39	Misc. Manufacturing	1	0.3	0	0	1	2	0	0	0	0	2	2
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**183**	**31**	**27**	**20**	**21**	**45**	**5**	**35**	**1**	**40**	**237**	**170**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	1	0.1	0	0	0	0	0	0	0	0	1	0.1
52	Retail	121	15	0	0	0	0	0	0	0	0	121	15
4222	Refrigerated Warehouses	1	0.1	0	0	0	0	0	0	0	0	1	0.1
4581	Airports	0	0	0	0	1	2	0	0	0	0	1	2
4952	Waste Water Treatment Plants	4	1	1	1	0	0	0	0	0	0	5	2
4961	District Energy	0	0	0	0	0	0	0	0	0	0	0	0
5411	Food Stores	69	17	1	1	0	0	0	0	0	0	70	17
5812	Restaurants	91	8	0	0	1	1	0	0	0	0	92	10
6512	Commercial Office Buildings	243	12	122	49	49	29	0	0	0	0	414	90
6513	Multifamily Buildings	27	2	10	5	2	2	0	0	0	0	38	8
7011	Hotels	96	12	5	3	1	3	0	0	0	0	102	18
7211	Laundries	8	1	0	0	0	0	0	0	0	0	8	1
7374	Data Centers	11	1	1	1	0	0	0	0	0	0	12	2
7542	Car Washes	0	0	0	0	0	0	0	0	0	0	0	0
7832	Movie Theaters	2	0.2	0	0	0	0	0	0	0	0	2	0.2
7991	Health Clubs	12	2	1	1	0	0	0	0	0	0	13	3
7997	Golf/Country Clubs	19	2	0	0	0	0	0	0	0	0	19	2
8051	Nursing Homes	52	7	2	1	0	0	0	0	0	0	54	8
8062	Hospitals	15	3	8	5	8	12	0	0	0	0	31	21
8211	Schools	22	2	0	0	0	0	0	0	0	0	22	2
8221	College/Univ.	10	2	6	4	7	12	1	12	1	26	25	56
8412	Museums	3	0.2	0	0	0	0	0	0	0	0	3	0.2
9100	Government Buildings	73	8	9	7	1	1	0	0	0	0	83	16
9223	Prisons	3	0.5	1	1	1	2	0	0	0	0	5	3
9711	Military	3	0.4	1	1	0	0	0	0	0	0	4	1
	Total	**886**	**97**	**168**	**77**	**71**	**64**	**1**	**12**	**1**	**26**	**1,126**	**277**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no WHP CHP potential identified in New Hampshire.

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no known CHP technical potential at existing district energy loops in New Hampshire.

New Jersey

- New Jersey has 3,796 MW of overall CHP capacity identified at 8,649 sites.
  - 1,456 MW of industrial on-site CHP potential primarily in the chemicals, food, paper, refining, and rubber/plastics sectors.
  - 2,199 MW of commercial on-site CHP potential, primarily in the commercial (office) buildings, colleges and universities, multifamily buildings, government buildings, and hospitals sectors.
- New Jersey has 106 MW of WHP CHP potential identified at 10 sites in the refining, stone/clay/glass, and primary metals sectors.
- New Jersey has 35 MW of CHP potential identified at 2 district energy sites.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	1,060	192	183	130	170	346	55	456	12	331	1,480	1,456
Commercial Topping Cycle CHP	5,417	616	1,170	538	534	636	31	270	4	139	7,157	2,199
WHP CHP	1	0.4	1	1	4	9	2	27	2	69	10	106
District Energy CHP	0	0	0	0	0	0	1	7	1	29	2	35
Total	**6,478**	**809**	**1,354**	**669**	**708**	**992**	**89**	**760**	**19**	**567**	**8,649**	**3,796**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	219	40	29	21	34	65	2	14	0	0	284	140
22	Textiles	52	11	15	12	6	10	0	0	0	0	73	33
24	Lumber and Wood	74	11	4	3	0	0	0	0	0	0	78	14
25	Furniture	0	0	0	0	0	0	0	0	0	0	0	0
26	Paper	72	17	28	19	12	22	2	20	0	0	114	78
27	Printing	22	4	2	2	0	0	0	0	0	0	24	6
28	Chemicals	331	62	74	52	99	214	50	405	11	299	565	1,032
29	Petroleum Refining	1	0.4	10	7	5	9	2	26	3	101	21	144
30	Rubber/Misc Plastics	193	30	10	7	6	14	0	0	0	0	209	51
32	Stone/Clay/Glass	0	0	0	0	4	9	0	0	0	0	4	9
33	Primary Metals	29	8	9	6	5	7	1	17	0	0	44	37
34	Fabricated Metals	21	2	0	0	0	0	0	0	0	0	21	2
35	Machinery/Computer Equip.	3	0.2	0	0	0	0	0	0	0	0	3	0.2
37	Transportation Equip.	18	3	2	1	2	4	0	0	0	0	22	8
38	Instruments	12	2	0	0	0	0	0	0	0	0	12	2
39	Misc. Manufacturing	14	3	1	1	1	1	0	0	0	0	16	5
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**1,061**	**193**	**184**	**131**	**174**	**356**	**57**	**483**	**14**	**400**	**1,490**	**1,562**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	23	2	1	1	1	4	0	0	0	0	25	7
52	Retail	457	71	10	6	11	19	0	0	0	0	478	96
4222	Refrigerated Warehouses	33	5	4	3	0	0	0	0	0	0	37	8
4581	Airports	0	0	0	0	1	2	0	0	1	20	2	22
4952	Waste Water Treatment Plants	68	9	2	1	0	0	0	0	0	0	70	10
4961	District Energy	0	0	0	0	0	0	1	7	1	29	2	36
5411	Food Stores	425	95	17	11	2	3	0	0	0	0	444	108
5812	Restaurants	356	36	1	1	0	0	0	0	0	0	357	37
6512	Commercial Office Buildings	1,546	77	773	309	309	185	0	0	0	0	2,628	572
6513	Multifamily Buildings	605	45	219	110	34	34	0	0	0	0	859	189
7011	Hotels	279	35	22	13	8	13	11	95	0	0	320	156
7211	Laundries	37	8	3	2	1	4	0	0	0	0	41	13
7374	Data Centers	96	14	8	5	10	15	2	18	0	0	116	53
7542	Car Washes	27	2	0	0	0	0	0	0	0	0	27	2
7832	Movie Theaters	2	0.4	0	0	0	0	0	0	0	0	2	0.4
7991	Health Clubs	90	10	2	2	0	0	0	0	0	0	92	12
7997	Golf/Country Clubs	121	15	1	1	0	0	0	0	0	0	122	16
8051	Nursing Homes	260	35	9	6	1	1	0	0	0	0	270	43
8062	Hospitals	14	3	18	13	67	159	0	0	0	0	99	176
8211	Schools	521	88	20	12	0	0	0	0	0	0	541	100
8221	College/Univ.	65	9	12	7	28	84	10	98	3	119	118	317
8412	Museums	7	1	0	0	0	0	0	0	0	0	7	1
9100	Government Buildings	366	50	42	31	45	76	4	33	0	0	457	189
9223	Prisons	11	2	6	4	13	27	1	6	0	0	31	39
9711	Military	8	2	0	0	3	11	3	20	0	0	14	33
	Total	**5,417**	**616**	**1,170**	**538**	**534**	**636**	**32**	**277**	**5**	**168**	**7,159**	**2,235**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
29	Petroleum Refining	1	0.4	0	0	0	0	1	10	2	69	4	79
32	Stone/Clay/Glass	0	0	0	0	4	9	0	0	0	0	4	9
33	Primary Metals	0	0	1	1	0	0	1	17	0	0	2	17
	Total	**1**	**0.4**	**1**	**1**	**4**	**9**	**2**	**27**	**2**	**69**	**10**	**106**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	District Energy Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
4961	Current Loops without CHP	0	0	0	0	0	0	0	0	0	0	0	0
4961	Current Loops with CHP expansion	0	0	0	0	0	0	1	7	1	29	2	35
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**7**	**1**	**29**	**2**	**35**

New Mexico

- New Mexico has 1,140 MW of overall CHP capacity identified at 1,742 sites.
  - 657 MW of industrial on-site CHP potential primarily in the chemicals, refining, food, primary metals, and paper sectors.
  - 441 MW of commercial on-site CHP potential, primarily in the colleges and universities, commercial (office) buildings, government buildings, hospitals, and military sectors.
- New Mexico has 43 MW of WHP CHP potential identified at 28 sites in the oil and gas extraction, refining, and primary metals sectors.
- There is no CHP district energy potential identified in New Mexico.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	125	23	24	17	36	90	5	45	5	481	195	657
Commercial Topping Cycle CHP	1,240	135	194	95	74	112	10	75	1	24	1,519	441
WHP CHP	14	4	5	3	7	16	2	19	0	0	28	43
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**1,379**	**162**	**223**	**115**	**117**	**218**	**17**	**140**	**6**	**505**	**1,742**	**1,140**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	14	4	5	3	4	9	1	6	0	0	24	22
20	Food	46	8	5	3	7	17	1	8	0	0	59	36
22	Textiles	2	0.3	0	0	0	0	0	0	0	0	2	0.3
24	Lumber and Wood	20	4	2	1	0	0	0	0	0	0	22	5
25	Furniture	0	0	0	0	0	0	0	0	0	0	0	0
26	Paper	4	1	0	0	3	7	1	11	0	0	8	19
27	Printing	7	1	0	0	0	0	0	0	0	0	7	1
28	Chemicals	14	2	6	5	5	10	1	5	3	413	29	435
29	Petroleum Refining	0	0	4	3	19	50	3	35	1	42	27	129
30	Rubber/Misc Plastics	7	1	1	1	0	0	0	0	0	0	8	2
32	Stone/Clay/Glass	0	0	0	0	2	6	0	0	0	0	2	6
33	Primary Metals	7	2	2	1	0	0	0	0	1	26	10	29
34	Fabricated Metals	1	0.2	0	0	0	0	0	0	0	0	1	0.2
35	Machinery/Computer Equip.	0	0	0	0	0	0	0	0	0	0	0	0
37	Transportation Equip.	1	0.1	0	0	0	0	0	0	0	0	1	0.1
38	Instruments	0	0	0	0	0	0	0	0	0	0	0	0
39	Misc. Manufacturing	0	0	0	0	0	0	0	0	0	0	0	0
49	Gas Processing	16	4	4	3	3	6	0	0	0	0	23	13
	Total	**139**	**27**	**29**	**21**	**43**	**106**	**7**	**65**	**5**	**481**	**223**	**699**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	1	0.2	0	0	0	0	0	0	0	0	1	0.2
52	Retail	113	16	10	6	0	0	0	0	0	0	123	22
4222	Refrigerated Warehouses	2	0.2	0	0	0	0	0	0	0	0	2	0.2
4581	Airports	3	0.5	0	0	1	3	0	0	0	0	4	4
4952	Waste Water Treatment Plants	2	0.2	0	0	0	0	0	0	0	0	2	0.2
4961	District Energy	0	0	0	0	0	0	0	0	0	0	0	0
5411	Food Stores	61	9	1	1	0	0	0	0	0	0	62	10
5812	Restaurants	123	11	0	0	0	0	0	0	0	0	123	11
6512	Commercial Office Buildings	382	19	117	47	29	17	0	0	0	0	528	83
6513	Multifamily Buildings	45	3	16	8	3	3	0	0	0	0	64	14
7011	Hotels	128	16	15	10	3	6	0	0	0	0	146	31
7211	Laundries	11	2	0	0	0	0	0	0	0	0	11	2
7374	Data Centers	3	0.3	0	0	1	1	0	0	0	0	4	1
7542	Car Washes	11	1	0	0	0	0	0	0	0	0	11	1
7832	Movie Theaters	0	0	0	0	0	0	0	0	0	0	0	0
7991	Health Clubs	13	1	0	0	0	0	0	0	0	0	13	1
7997	Golf/Country Clubs	22	3	0	0	0	0	0	0	0	0	22	3
8051	Nursing Homes	60	6	0	0	2	3	0	0	0	0	62	9
8062	Hospitals	30	7	14	9	10	20	0	0	0	0	54	36
8211	Schools	87	18	4	2	0	0	0	0	0	0	91	21
8221	College/Univ.	18	4	3	2	14	40	6	43	1	24	42	113
8412	Museums	12	1	0	0	0	0	0	0	0	0	12	1
9100	Government Buildings	105	14	10	7	5	8	1	7	0	0	121	36
9223	Prisons	4	1	3	2	3	4	0	0	0	0	10	7
9711	Military	4	1	1	1	3	8	3	25	0	0	11	35
	Total	**1,240**	**135**	**194**	**95**	**74**	**112**	**10**	**75**	**1**	**24**	**1,519**	**441**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
13	Oil and Gas Extraction	14	4	5	3	4	9	1	6	0	0	24	22
29	Petroleum Refining	0	0	0	0	2	5	1	14	0	0	3	18
32	Stone/Clay/Glass	0	0	0	0	1	2	0	0	0	0	1	2
	Total	**14**	**4**	**5**	**3**	**7**	**16**	**2**	**19**	**0**	**0**	**28**	**43**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no known CHP technical potential at existing district energy loops in New Mexico.

New York

- New York has 10,818 MW of overall CHP capacity identified at 16,901 sites.
  - 1,877 MW of industrial on-site CHP potential primarily in the chemicals, food, paper, primary metals, and textiles.
  - 4,981 MW of commercial on-site CHP potential, primarily in the commercial (office) buildings, colleges and universities, multifamily buildings, government buildings, and hospitals sectors.
- New York has 50 MW of WHP CHP potential identified at 13 sites in the food, chemicals, stone/clay/glass, and primary metals sectors.
- New York has 3,910 MW of CHP potential identified at 4 district energy sites.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	1,477	257	245	176	270	582	65	607	8	255	2,065	1,877
Commercial Topping Cycle CHP	10,810	1,125	2,636	1,211	1,296	1,544	67	604	10	497	14,819	4,981
WHP CHP	2	0.3	2	1	6	15	3	33	0	0	13	50
District Energy CHP	0	0	0	0	0	0	1	8	3	3,901	4	3,910
Total	**12,289**	**1,382**	**2,883**	**1,389**	**1,572**	**2,141**	**136**	**1,252**	**21**	**4,652**	**16,901**	**10,818**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	350	63	50	36	52	111	9	78	0	0	461	288
22	Textiles	107	19	29	24	14	24	1	8	0	0	151	74
24	Lumber and Wood	200	34	21	14	12	23	0	0	0	0	233	71
25	Furniture	9	1	0	0	0	0	0	0	0	0	9	1
26	Paper	86	20	28	21	51	120	7	49	1	57	173	267
27	Printing	59	8	1	1	2	4	0	0	0	0	62	13
28	Chemicals	251	44	62	45	88	174	38	369	6	168	445	800
29	Petroleum Refining	0	0	13	8	14	37	0	0	0	0	27	45
30	Rubber/Misc Plastics	212	34	15	10	8	14	1	11	0	0	236	69
32	Stone/Clay/Glass	1	0.3	1	1	6	16	2	19	0	0	10	36
33	Primary Metals	40	10	17	12	12	26	7	78	1	29	77	157
34	Fabricated Metals	47	6	3	2	0	0	0	0	0	0	50	7
35	Machinery/Computer Equip	7	1	1	1	5	14	0	0	0	0	13	16
37	Transportation Equip.	55	8	4	3	5	13	3	27	0	0	67	51
38	Instruments	29	5	1	1	7	20	0	0	0	0	37	25
39	Misc. Manufacturing	26	4	1	1	0	0	0	0	0	0	27	5
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**1,479**	**257**	**247**	**178**	**276**	**597**	**68**	**640**	**8**	**255**	**2,078**	**1,927**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	42	4	1	1	1	1	0	0	0	0	44	6
52	Retail	656	98	36	22	3	7	1	13	0	0	696	140
4222	Refrigerated Warehouses	26	4	2	1	1	2	0	0	0	0	29	7
4581	Airports	6	2	0	0	6	12	1	14	0	0	13	29
4952	Waste Water Treatment Plants	50	6	3	2	4	8	0	0	0	0	57	16
4961	District Energy	0	0	0	0	0	0	1	8	3	3,901	4	3,910
5411	Food Stores	481	100	34	24	6	17	0	0	0	0	521	142
5812	Restaurants	451	41	11	8	2	3	1	6	0	0	465	57
6512	Commercial Office Buildings	3,487	174	1,743	697	697	418	0	0	0	0	5,927	1,290
6513	Multifamily Buildings	1,653	124	523	262	125	125	0	0	0	0	2,301	510
7011	Hotels	961	138	56	37	98	189	7	57	1	21	1,123	442
7211	Laundries	72	11	4	2	2	2	0	0	0	0	78	16
7374	Data Centers	150	22	13	9	9	18	0	0	0	0	172	49
7542	Car Washes	33	3	0	0	1	1	0	0	0	0	34	4
7832	Movie Theaters	5	0.3	0	0	0	0	0	0	0	0	5	0.3
7991	Health Clubs	72	8	0	0	1	3	1	8	0	0	74	19
7997	Golf/Country Clubs	223	28	1	1	0	0	0	0	0	0	224	29
8051	Nursing Homes	488	79	34	23	25	40	0	0	0	0	547	141
8062	Hospitals	38	11	35	26	139	318	15	107	0	0	227	462
8211	Schools	1,238	156	37	24	0	0	0	0	0	0	1,275	180
8221	College/Univ.	172	35	30	21	86	217	22	221	7	338	317	831
8412	Museums	75	10	0	0	2	7	0	0	0	0	77	16
9100	Government Buildings	387	61	53	37	49	94	17	161	1	112	507	464
9223	Prisons	19	4	18	14	34	56	0	0	0	0	71	74
9711	Military	25	4	2	1	5	9	2	16	1	26	35	57
	Total	**10,810**	**1,125**	**2,636**	**1,211**	**1,296**	**1,544**	**68**	**612**	**13**	**4,398**	**14,823**	**8,891**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
20	Food	0	0	0	0	1	2	0	0	0	0	1	2
28	Chemicals	1	0.01	1	1	1	2	0	0	0	0	3	3
32	Stone/Clay/Glass	1	0.3	1	1	4	11	2	19	0	0	8	31
33	Primary Metals	0	0	0	0	0	0	1	14	0	0	1	14
	Total	**2**	**0.3**	**2**	**1**	**6**	**15**	**3**	**33**	**0**	**0**	**13**	**50**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	District Energy Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
4961	Current Loops without CHP	0	0	0	0	0	0	1	8	1	94	2	103
4961	Current Loops with CHP expansion	0	0	0	0	0	0	0	0	2	3,807	2	3,807
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**8**	**3**	**3,901**	**4**	**3,910**

North Carolina

- North Carolina has 4,352 MW of overall CHP capacity identified at 8,437 sites.
  - 2,339 MW of industrial on-site CHP potential primarily in the textiles, chemicals, paper, lumber and wood, and food sectors.
  - 1,931 MW of commercial on-site CHP potential, primarily in the commercial (office) buildings, colleges and universities, hospitals, schools, and government buildings sectors.
- North Carolina has 82 MW of WHP CHP potential identified at 14 sites primarily in the stone/clay/glass and primary metals sectors.
- There is no CHP district energy potential identified in North Carolina.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	1,343	261	246	177	395	791	82	670	13	440	2,079	2,339
Commercial Topping Cycle CHP	5,092	596	892	431	317	415	37	300	6	188	6,344	1,931
WHP CHP	2	0.1	1	1	6	14	4	37	1	31	14	82
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**6,437**	**857**	**1,139**	**609**	**718**	**1,219**	**123**	**1,008**	**20**	**660**	**8,437**	**4,352**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	1	2	0	0	0	0	1	2
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	142	29	24	18	36	70	4	35	0	0	206	152
22	Textiles	195	44	53	40	157	308	40	327	2	52	447	770
24	Lumber and Wood	306	55	49	34	35	65	4	31	0	0	394	184
25	Furniture	45	7	1	1	0	0	0	0	0	0	46	8
26	Paper	69	19	28	19	29	59	8	80	5	210	139	388
27	Printing	23	3	0	0	0	0	0	0	0	0	23	3
28	Chemicals	188	35	39	29	80	183	21	168	4	125	332	539
29	Petroleum Refining	0	0	0	0	0	0	0	0	0	0	0	0
30	Rubber/Misc Plastics	228	41	19	13	15	28	0	0	2	53	264	136
32	Stone/Clay/Glass	9	1	1	1	5	12	3	27	0	0	18	41
33	Primary Metals	40	9	16	12	14	25	4	28	1	31	75	105
34	Fabricated Metals	23	4	0	0	0	0	0	0	0	0	23	4
35	Machinery/Computer Equip.	8	1	0	0	3	4	0	0	0	0	11	5
37	Transportation Equip.	63	11	15	11	25	46	2	12	0	0	105	80
38	Instruments	3	0.4	0	0	1	3	0	0	0	0	4	3
39	Misc. Manufacturing	3	1	2	1	0	0	0	0	0	0	5	2
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**1,345**	**261**	**247**	**177**	**401**	**805**	**86**	**707**	**14**	**471**	**2,093**	**2,421**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	15	2	0	0	0	0	0	0	0	0	15	2
52	Retail	486	68	31	19	5	10	0	0	0	0	522	98
4222	Refrigerated Warehouses	17	2	1	1	0	0	0	0	0	0	18	3
4581	Airports	5	1	1	1	4	8	1	5	1	23	12	38
4952	Waste Water Treatment Plants	7	1	0	0	0	0	0	0	0	0	7	1
4961	District Energy	0	0	0	0	0	0	0	0	0	0	0	0
5411	Food Stores	291	46	2	1	0	0	1	9	0	0	294	57
5812	Restaurants	479	41	1	1	2	9	0	0	0	0	482	50
6512	Commercial Office Buildings	1,501	75	600	240	150	90	0	0	0	0	2,251	405
6513	Multifamily Buildings	96	7	35	17	5	5	0	0	0	0	136	30
7011	Hotels	409	43	12	7	10	17	0	0	0	0	431	68
7211	Laundries	39	7	3	2	0	0	0	0	0	0	42	9
7374	Data Centers	35	5	5	3	3	4	0	0	0	0	43	12
7542	Car Washes	46	3	0	0	0	0	0	0	0	0	46	3
7832	Movie Theaters	1	0.1	0	0	0	0	0	0	0	0	1	0.1
7991	Health Clubs	79	8	0	0	0	0	0	0	0	0	79	8
7997	Golf/Country Clubs	187	24	0	0	0	0	0	0	0	0	187	24
8051	Nursing Homes	345	39	2	1	1	2	0	0	0	0	348	43
8062	Hospitals	40	11	42	29	48	100	9	53	0	0	139	194
8211	Schools	571	145	64	43	2	2	0	0	0	0	637	190
8221	College/Univ.	66	14	23	16	44	101	17	156	3	86	153	373
8412	Museums	21	3	0	0	0	0	0	0	0	0	21	3
9100	Government Buildings	303	38	41	28	30	50	6	49	0	0	380	165
9223	Prisons	42	10	28	21	13	15	0	0	0	0	83	46
9711	Military	11	2	1	1	0	0	3	27	2	80	17	110
	Total	**5,092**	**596**	**892**	**431**	**317**	**415**	**37**	**300**	**6**	**188**	**6,344**	**1,931**

Sub-Table 1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	1	2	0	0	0	0	1	2
26	Paper	1	0.1	0	0	0	0	0	0	0	0	1	0.1
28	Chemicals	1	0.0003	0	0	0	0	0	0	0	0	1	0.0003
32	Stone/Clay/Glass	0	0	1	1	5	12	3	27	0	0	9	40
33	Primary Metals	0	0	0	0	0	0	1	10	1	31	2	41
	Total	**2**	**0.1**	**1**	**1**	**6**	**14**	**4**	**37**	**1**	**31**	**14**	**82**

Sub-Table 2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no known CHP technical potential at existing district energy loops in North Carolina.

North Dakota

- North Dakota has 445 MW of overall CHP capacity identified at 890 sites.
  - 218 MW of industrial on-site CHP potential primarily in the chemicals, food, refining, primary metals, and lumber and wood sectors.
  - 218 MW of commercial on-site CHP potential, primarily in the colleges and universities, commercial (office) buildings, hospitals, military, and hotels sectors.
- North Dakota has 10 MW of WHP CHP potential identified at 9 sites in the oil and gas extraction, food and refining sectors.
- There is no CHP district energy potential identified in North Dakota.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	111	19	15	10	18	41	4	29	2	119	150	218
Commercial Topping Cycle CHP	586	64	102	49	38	52	5	54	0	0	731	218
WHP CHP	4	1	4	3	0	0	1	6	0	0	9	10
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**701**	**84**	**121**	**61**	**56**	**93**	**10**	**89**	**2**	**119**	**890**	**445**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	1	0.4	3	2	0	0	0	0	0	0	4	3
20	Food	36	7	8	6	9	21	2	13	0	0	55	46
22	Textiles	0	0	0	0	0	0	0	0	0	0	0	0
24	Lumber and Wood	12	2	2	1	2	3	0	0	0	0	16	7
25	Furniture	3	0.5	0	0	0	0	0	0	0	0	3	0.5
26	Paper	1	0.4	0	0	0	0	0	0	0	0	1	0.4
27	Printing	4	1	0	0	0	0	0	0	0	0	4	1
28	Chemicals	18	3	0	0	4	10	1	5	2	119	25	137
29	Petroleum Refining	0	0	0	0	0	0	2	17	0	0	2	17
30	Rubber/Misc Plastics	15	2	0	0	0	0	0	0	0	0	15	2
32	Stone/Clay/Glass	0	0	0	0	0	0	0	0	0	0	0	0
33	Primary Metals	2	0.4	2	1	2	6	0	0	0	0	6	7
34	Fabricated Metals	2	0.1	0	0	0	0	0	0	0	0	2	0.1
35	Machinery/Computer Equip.	14	2	1	1	1	2	0	0	0	0	16	5
37	Transportation Equip.	4	1	0	0	0	0	0	0	0	0	4	1
38	Instruments	1	0.2	0	0	0	0	0	0	0	0	1	0.2
39	Misc. Manufacturing	1	0.1	0	0	0	0	0	0	0	0	1	0.1
49	Gas Processing	1	0	3	2	0	0	0	0	0	0	4	2
	Total	**115**	**20**	**19**	**13**	**18**	**41**	**5**	**35**	**2**	**119**	**159**	**228**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	0	0	0	0	0	0	0	0	0	0	0	0
52	Retail	59	8	2	1	0	0	0	0	0	0	61	9
4222	Refrigerated Warehouses	2	0.1	1	1	0	0	0	0	0	0	3	1
4581	Airports	4	1	1	1	0	0	0	0	0	0	5	2
4952	Waste Water Treatment Plants	5	0.5	0	0	0	0	0	0	0	0	5	0.5
4961	District Energy	0	0	0	0	0	0	0	0	0	0	0	0
5411	Food Stores	34	7	0	0	0	0	0	0	0	0	34	7
5812	Restaurants	56	6	1	1	0	0	0	0	0	0	57	6
6512	Commercial Office Buildings	155	8	68	27	19	11	0	0	0	0	242	46
6513	Multifamily Buildings	17	1	6	3	1	1	0	0	0	0	24	5
7011	Hotels	56	7	5	3	3	4	0	0	0	0	64	14
7211	Laundries	2	1	0	0	0	0	0	0	0	0	2	1
7374	Data Centers	4	0.4	2	2	1	3	0	0	0	0	7	5
7542	Car Washes	6	1	0	0	0	0	0	0	0	0	6	1
7832	Movie Theaters	0	0	0	0	0	0	0	0	0	0	0	0
7991	Health Clubs	6	1	1	1	0	0	0	0	0	0	7	1
7997	Golf/Country Clubs	8	1	0	0	0	0	0	0	0	0	8	1
8051	Nursing Homes	64	8	0	0	2	2	0	0	0	0	66	10
8062	Hospitals	38	7	7	5	5	13	0	0	0	0	50	25
8211	Schools	9	1	0	0	0	0	0	0	0	0	9	1
8221	College/Univ.	9	2	3	2	6	16	2	31	0	0	20	51
8412	Museums	2	0.1	0	0	0	0	0	0	0	0	2	0.1
9100	Government Buildings	39	4	3	2	1	1	1	5	0	0	44	12
9223	Prisons	6	1	1	1	0	0	0	0	0	0	7	1
9711	Military	5	1	1	1	0	0	2	18	0	0	8	19
	Total	**586**	**64**	**102**	**49**	**38**	**52**	**5**	**54**	**0**	**0**	**731**	**218**

Sub-Table 1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
13	Oil and Gas Extraction	1	0.4	3	2	0	0	0	0	0	0	4	3
20	Food	3	0.8	1	1	0	0	0	0	0	0	4	1
29	Petroleum Refining	0	0	0	0	0	0	1	6	0	0	1	6
	Total	**4**	**1**	**4**	**3**	**0**	**0**	**1**	**6**	**0**	**0**	**9**	**10**

Sub-Table 2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no known CHP technical potential at existing district energy loops in North Dakota.

Ohio

- Ohio has 7,288 MW of overall CHP capacity identified at 13,194 sites.
  - 3,981 MW of industrial on-site CHP potential primarily in the chemicals, paper, primary metals, food, and refining sectors.
  - 2,717 MW of commercial on-site CHP potential, primarily in the commercial (office) buildings, colleges and universities, hospitals, government buildings, and retail sectors.
- Ohio has 307 MW of WHP CHP potential identified at 38 sites primarily in the refining, stone/clay/glass, and primary metals sectors.
- Ohio has 283 MW of CHP potential identified at 4 district energy sites.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	1,886	342	388	276	433	917	127	1,174	30	1,272	2,864	3,981
Commercial Topping Cycle CHP	8,094	836	1,518	668	638	794	31	248	6	170	10,288	2,717
WHP CHP	6	0	2	2	12	32	14	146	4	127	38	307
District Energy CHP	0	0	0	0	0	0	0	0	4	283	4	283
Total	**9,986**	**1,178**	**1,908**	**946**	**1,083**	**1,744**	**172**	**1,569**	**44**	**1,852**	**13,194**	**7,288**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	1	0.1	0	0	0	0	0	0	0	0	1	0.1
20	Food	252	47	38	29	70	136	8	67	2	78	370	356
22	Textiles	21	4	6	4	12	23	1	10	0	0	40	40
24	Lumber and Wood	225	41	20	15	17	34	2	15	0	0	264	105
25	Furniture	3	0.4	0	0	1	1	0	0	0	0	4	2
26	Paper	121	32	41	29	44	94	17	173	6	258	229	586
27	Printing	41	5	2	1	1	2	0	0	0	0	44	8
28	Chemicals	272	51	106	78	153	362	68	625	13	516	612	1,633
29	Petroleum Refining	2	0.1	15	10	12	25	2	29	6	322	37	387
30	Rubber/Misc Plastics	499	83	59	40	22	31	2	28	0	0	582	182
32	Stone/Clay/Glass	10	1	1	1	9	26	3	21	0	0	23	49
33	Primary Metals	123	29	55	40	53	124	21	199	7	224	259	615
34	Fabricated Metals	128	17	0	0	0	0	1	12	0	0	129	28
35	Machinery/Computer Equip.	13	2	1	1	3	4	2	13	0	0	19	20
37	Transportation Equip.	158	25	44	30	47	86	14	129	0	0	263	270
38	Instruments	6	1	0	0	1	1	0	0	0	0	7	2
39	Misc. Manufacturing	16	3	2	2	0	0	0	0	0	0	18	4
49	Gas Processing	1	0.1	0	0	0	0	0	0	0	0	1	0.1
	Total	**1,892**	**343**	**390**	**277**	**445**	**950**	**141**	**1,320**	**34**	**1,398**	**2,902**	**4,288**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	18	2	1	1	1	2	0	0	0	0	20	5
52	Retail	756	108	47	28	13	16	0	0	0	0	816	152
4222	Refrigerated Warehouses	16	3	0	0	1	1	0	0	0	0	17	4
4581	Airports	2	0.5	0	0	3	8	1	5	0	0	6	14
4952	Waste Water Treatment Plants	68	8	0	0	2	4	0	0	0	0	70	13
4961	District Energy	0	0	0	0	0	0	0	0	4	283	4	283
5411	Food Stores	344	73	9	6	1	2	0	0	0	0	354	81
5812	Restaurants	908	83	6	4	0	0	0	0	0	0	914	86
6512	Commercial Office Buildings	2,726	136	1,192	477	341	205	0	0	0	0	4,259	818
6513	Multifamily Buildings	381	29	138	69	21	21	0	0	0	0	541	119
7011	Hotels	371	47	13	8	13	19	0	0	0	0	397	74
7211	Laundries	43	7	3	2	0	0	0	0	0	0	46	9
7374	Data Centers	59	9	7	5	11	17	0	0	0	0	77	31
7542	Car Washes	59	4	0	0	0	0	0	0	0	0	59	4
7832	Movie Theaters	4	0.2	0	0	0	0	0	0	0	0	4	0.2
7991	Health Clubs	63	7	1	1	0	0	0	0	0	0	64	8
7997	Golf/Country Clubs	224	28	4	3	0	0	0	0	0	0	228	31
8051	Nursing Homes	654	79	13	8	5	9	0	0	0	0	672	97
8062	Hospitals	99	25	30	21	87	175	7	44	0	0	223	266
8211	Schools	569	77	4	2	0	0	0	0	0	0	573	79
8221	College/Univ.	167	28	9	6	66	176	18	157	6	170	266	537
8412	Museums	30	4	0	0	0	0	0	0	0	0	30	4
9100	Government Buildings	484	70	34	23	49	83	2	14	0	0	569	191
9223	Prisons	25	3	5	3	22	48	0	0	0	0	52	55
9711	Military	24	4	2	1	2	7	3	28	0	0	31	40
	Total	**8,094**	**836**	**1,518**	**668**	**638**	**794**	**31**	**248**	**10**	**453**	**10,292**	**3,000**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
13	Oil and Gas Extraction	1	0.1	0	0	0	0	0	0	0	0	1	0.1
28	Chemicals	0	0	0	0	1	2	0	0	0	0	1	2
29	Petroleum Refining	2	0.1	0	0	1	2	2	29	2	52	7	84
30	Rubber/Misc Plastics	1	0.02	0	0	0	0	0	0	0	0	1	0.02
32	Stone/Clay/Glass	1	0.1	1	1	9	26	3	21	0	0	14	48
33	Primary Metals	1	0.2	1	1	0	0	9	96	2	74	13	171
37	Transportation Equip.	0	0	0	0	1	2	0	0	0	0	1	2
	Total	**6**	**0.5**	**2**	**2**	**12**	**32**	**14**	**146**	**4**	**127**	**38**	**307**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	District Energy Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
4961	Current Loops without CHP	0	0	0	0	0	0	0	0	3	199	3	199
4961	Current Loops with CHP expansion	0	0	0	0	0	0	0	0	1	84	1	84
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**283**	**4**	**283**

Oklahoma

- Oklahoma has 1,916 MW of overall CHP capacity identified at 3,397 sites.
  - 790 MW of industrial on-site CHP potential primarily in the refining, chemicals, food, primary metals, and rubber/plastics sectors.
  - 851 MW of commercial on-site CHP potential, primarily in the commercial (office) buildings, colleges and universities, hospitals, schools, and military sectors.
- Oklahoma has 165 MW of WHP CHP potential identified at 70 sites in the oil and gas extraction, paper, refining, stone/clay/glass, and primary metals sectors.
- Oklahoma has 111 MW of CHP potential identified at 2 district energy sites.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	375	70	70	53	83	173	26	279	5	214	559	790
Commercial Topping Cycle CHP	2,166	253	419	204	161	217	18	155	1	21	2,766	851
WHP CHP	31	7	16	11	14	29	8	78	1	40	70	165
District Energy CHP	0	0	0	0	0	0	0	0	2	111	2	111
Total	**2,572**	**330**	**505**	**268**	**258**	**419**	**52**	**512**	**9**	**386**	**3,397**	**1,916**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	29	7	15	11	9	12	0	0	0	0	53	30
20	Food	51	11	18	14	17	34	3	26	0	0	89	85
22	Textiles	6	1	0	0	4	7	0	0	0	0	10	8
24	Lumber and Wood	49	8	3	2	1	1	1	5	0	0	54	16
25	Furniture	0	0	0	0	0	0	0	0	0	0	0	0
26	Paper	15	4	3	3	3	9	4	34	0	0	25	50
27	Printing	10	1	1	1	0	0	0	0	0	0	11	2
28	Chemicals	60	11	11	8	21	52	11	125	0	0	103	196
29	Petroleum Refining	1	0.01	1	1	13	27	7	91	5	231	27	350
30	Rubber/Misc Plastics	38	6	8	5	3	6	1	18	1	23	51	59
32	Stone/Clay/Glass	5	0.4	1	1	6	18	3	19	0	0	15	38
33	Primary Metals	33	8	7	5	12	24	4	39	0	0	56	76
34	Fabricated Metals	12	1	0	0	0	0	0	0	0	0	12	1
35	Machinery/Computer Equip.	6	1	0	0	0	0	0	0	0	0	6	1
37	Transportation Equip.	36	6	7	5	3	6	0	0	0	0	46	18
38	Instruments	5	0.9	0	0	0	0	0	0	0	0	5	1
39	Misc. Manufacturing	6	1	0	0	0	0	0	0	0	0	6	1
49	Gas Processing	44	10	11	8	5	6	0	0	0	0	60	24
	Total	**406**	**78**	**86**	**64**	**97**	**202**	**34**	**357**	**6**	**254**	**629**	**955**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	2	0.2	0	0	0	0	0	0	0	0	2	0.2
52	Retail	210	32	13	8	0	0	0	0	0	0	223	40
4222	Refrigerated Warehouses	5	1	0	0	1	2	0	0	0	0	6	3
4581	Airports	0	0	1	1	2	4	0	0	0	0	3	4
4952	Waste Water Treatment Plants	18	2	1	1	0	0	0	0	0	0	19	3
4961	District Energy	0	0	0	0	0	0	0	0	2	111	2	111
5411	Food Stores	82	15	1	1	0	0	0	0	0	0	83	15
5812	Restaurants	200	18	2	1	0	0	0	0	0	0	202	20
6512	Commercial Office Buildings	688	34	275	110	69	41	0	0	0	0	1,032	186
6513	Multifamily Buildings	67	5	24	12	4	4	0	0	0	0	96	21
7011	Hotels	130	16	6	4	4	8	0	0	0	0	140	27
7211	Laundries	11	2	3	2	0	0	0	0	0	0	14	4
7374	Data Centers	27	3	1	1	2	4	0	0	0	0	30	8
7542	Car Washes	8	0.5	0	0	0	0	0	0	0	0	8	0.5
7832	Movie Theaters	0	0	0	0	0	0	0	0	0	0	0	0
7991	Health Clubs	20	3	0	0	0	0	0	0	0	0	20	3
7997	Golf/Country Clubs	39	5	0	0	0	0	0	0	0	0	39	5
8051	Nursing Homes	190	17	0	0	0	0	0	0	0	0	190	17
8062	Hospitals	110	24	24	16	22	44	2	11	0	0	158	95
8211	Schools	91	38	42	29	15	18	0	0	0	0	148	86
8221	College/Univ.	64	9	8	6	16	47	12	92	1	21	101	176
8412	Museums	13	2	0	0	0	0	0	0	0	0	13	2
9100	Government Buildings	157	20	8	6	10	20	0	0	0	0	175	46
9223	Prisons	28	4	9	7	14	20	0	0	0	0	51	31
9711	Military	6	1	1	1	2	5	4	52	0	0	13	59
	Total	**2,166**	**253**	**419**	**204**	**161**	**217**	**18**	**155**	**3**	**132**	**2,768**	**962**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
13	Oil and Gas Extraction	29	7	15	11	9	12	0	0	0	0	53	30
26	Paper	1	0.2	0	0	0	0	0	0	0	0	1	0.2
29	Petroleum Refining	1	0.01	0	0	1	5	4	45	1	40	7	90
32	Stone/Clay/Glass	0	0	1	1	4	12	3	19	0	0	8	32
33	Primary Metals	0	0	0	0	0	0	1	13	0	0	1	13
	Total	**31**	**7**	**16**	**11**	**14**	**29**	**8**	**78**	**1**	**40**	**70**	**165**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	District Energy Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
4961	Current Loops without CHP	0	0	0	0	0	0	0	0	0	0	0	0
4961	Current Loops with CHP expansion	0	0	0	0	0	0	0	0	2	111	2	111
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**111**	**2**	**111**

Oregon

- Oregon has 1,342 MW of overall CHP capacity identified at 3,466 sites.
  - 646 MW of industrial on-site CHP potential primarily in the lumber and wood, food, chemicals, paper, and primary metals sectors.
  - 662 MW of commercial on-site CHP potential, primarily in the commercial (office) buildings, colleges and universities, hospitals, government buildings, and multifamily buildings sectors.
- Oregon has 29 MW of WHP CHP potential identified at 5 sites in the stone/clay/glass, primary metals, and instruments sectors.
- Oregon has 5 MW of CHP potential identified at 1 district energy site.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	608	111	94	66	127	262	21	167	1	39	851	646
Commercial Topping Cycle CHP	2,122	211	347	164	130	197	9	67	1	23	2,609	662
WHP CHP	1	0.02	0	0	3	10	1	18	0	0	5	29
District Energy CHP	0	0	0	0	1	5	0	0	0	0	1	5
Total	**2,731**	**323**	**441**	**230**	**261**	**474**	**31**	**252**	**2**	**62**	**3,466**	**1,342**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	146	30	19	15	34	59	5	44	0	0	204	147
22	Textiles	4	1	0	0	2	5	0	0	0	0	6	6
24	Lumber and Wood	240	43	48	33	43	92	10	75	0	0	341	244
25	Furniture	1	0.1	0	0	0	0	0	0	0	0	1	0
26	Paper	18	5	3	2	11	24	2	18	0	0	34	48
27	Printing	11	1	1	1	0	0	0	0	0	0	12	2
28	Chemicals	69	11	14	10	19	46	3	23	1	39	106	128
29	Petroleum Refining	0	0	3	2	3	6	0	0	0	0	6	8
30	Rubber/Misc Plastics	55	9	2	1	1	2	0	0	0	0	58	12
32	Stone/Clay/Glass	0	0	0	0	4	13	0	0	0	0	4	13
33	Primary Metals	20	5	4	3	7	16	2	25	0	0	33	49
34	Fabricated Metals	9	2	0	0	0	0	0	0	0	0	9	2
35	Machinery/Computer Equip.	5	1	0	0	0	0	0	0	0	0	5	1
37	Transportation Equip.	24	3	0	0	5	6	0	0	0	0	29	9
38	Instruments	4	0.7	0	0	1	4	0	0	0	0	5	5
39	Misc. Manufacturing	3	0.2	0	0	0	0	0	0	0	0	3	0.2
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**609**	**111**	**94**	**66**	**130**	**273**	**22**	**185**	**1**	**39**	**856**	**674**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	3	0.3	0	0	0	0	0	0	0	0	3	0.3
52	Retail	190	30	6	4	0	0	0	0	0	0	196	34
4222	Refrigerated Warehouses	9	1	1	1	1	2	0	0	0	0	11	3
4581	Airports	3	1	0	0	0	0	1	6	0	0	4	7
4952	Waste Water Treatment Plants	16	2	1	1	0	0	0	0	0	0	17	3
4961	District Energy	0	0	0	0	0	0	0	0	1	5	1	5
5411	Food Stores	169	24	0	0	2	5	0	0	0	0	171	29
5812	Restaurants	158	15	0	0	0	0	0	0	0	0	158	15
6512	Commercial Office Buildings	726	36	223	89	56	34	0	0	0	0	1,005	159
6513	Multifamily Buildings	149	11	54	27	8	8	0	0	0	0	211	47
7011	Hotels	182	21	10	6	7	11	1	6	0	0	200	44
7211	Laundries	23	3	1	1	0	0	0	0	0	0	24	4
7374	Data Centers	31	6	2	1	1	1	0	0	0	0	34	8
7542	Car Washes	11	1	0	0	0	0	0	0	0	0	11	1
7832	Movie Theaters	1	0.1	1	1	0	0	0	0	0	0	2	1
7991	Health Clubs	53	6	1	1	0	0	0	0	0	0	54	7
7997	Golf/Country Clubs	45	6	0	0	2	3	0	0	0	0	47	9
8051	Nursing Homes	121	12	0	0	0	0	0	0	0	0	121	12
8062	Hospitals	37	9	12	8	16	38	0	0	0	0	65	55
8211	Schools	7	0.5	0	0	0	0	0	0	0	0	7	0.5
8221	College/Univ.	34	6	5	3	21	60	7	55	1	23	68	148
8412	Museums	12	1	0	0	0	0	0	0	0	0	12	1
9100	Government Buildings	132	17	27	20	9	15	0	0	0	0	168	52
9223	Prisons	7	2	2	2	6	14	0	0	0	0	15	18
9711	Military	3	0.4	1	1	1	5	0	0	0	0	5	6
	Total	**2,122**	**211**	**347**	**164**	**130**	**197**	**9**	**67**	**2**	**28**	**2,610**	**667**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
32	Stone/Clay/Glass	0	0	0	0	3	10	0	0	0	0	3	10
33	Primary Metals	0	0	0	0	0	0	1	18	0	0	1	18
38	Instruments	1	0.02	0	0	0	0	0	0	0	0	1	0.02
	Total	**1**	**0.02**	**0**	**0**	**3**	**10**	**1**	**18**	**0**	**0**	**5**	**29**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	District Energy Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
4961	Current Loops without CHP	0	0	0	0	1	5	0	0	0	0	1	5
4961	Current Loops with CHP expansion	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**0**	**0**	**0**	**0**	**1**	**5**	**0**	**0**	**0**	**0**	**1**	**5**

Pennsylvania

- Pennsylvania has 7,759 MW of overall CHP capacity identified at 12,708 sites.
  - 3,620 MW of industrial on-site CHP potential primarily in the chemicals, primary metals, paper, refining, and food sectors.
  - 3,003 MW of commercial on-site CHP potential, primarily in the commercial (office) buildings, colleges and universities, hospitals, government buildings, and retail sectors.
- Pennsylvania has 402 MW of WHP CHP potential identified at 52 sites primarily in the refining, stone/clay/glass, and primary metals sectors.
- Pennsylvania has 734 MW of CHP potential identified at 3 district energy sites.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	1,670	307	322	235	401	878	109	947	28	1,252	2,530	3,620
Commercial Topping Cycle CHP	7,714	829	1,571	711	787	912	45	383	6	168	10,123	3,003
WHP CHP	7	1	6	4	15	41	19	171	5	184	52	402
District Energy CHP	0	0	0	0	0	0	0	0	3	734	3	734
Total	**9,391**	**1,138**	**1,899**	**951**	**1,203**	**1,830**	**173**	**1,501**	**42**	**2,338**	**12,708**	**7,759**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	2	0.1	0	0	0	0	0	0	0	0	2	0.1
13	Oil and Gas Extraction	2	1	0	0	0	0	0	0	0	0	2	1
20	Food	316	59	43	32	75	156	10	74	0	0	444	321
22	Textiles	68	15	9	7	22	37	3	18	0	0	102	75
24	Lumber and Wood	295	54	55	39	38	79	0	0	0	0	388	172
25	Furniture	5	0.7	0	0	0	0	0	0	0	0	5	1
26	Paper	98	25	30	22	37	73	15	135	4	154	184	408
27	Printing	56	8	3	3	0	0	0	0	0	0	59	11
28	Chemicals	247	44	57	42	134	301	61	543	15	631	514	1,561
29	Petroleum Refining	3	1	15	11	22	56	2	19	7	333	49	419
30	Rubber/Misc Plastics	329	54	41	30	19	39	1	5	0	0	390	129
32	Stone/Clay/Glass	7	1	2	1	15	48	11	80	0	0	35	131
33	Primary Metals	104	26	59	44	45	107	21	210	7	320	236	706
34	Fabricated Metals	51	7	2	1	0	0	0	0	0	0	53	8
35	Machinery/Computer Equip.	15	2	0	0	3	10	1	5	0	0	19	18
37	Transportation Equip.	53	8	10	6	4	9	2	23	0	0	69	46
38	Instruments	4	0.4	2	1	0	0	1	6	0	0	7	8
39	Misc. Manufacturing	18	2	0	0	2	4	0	0	0	0	20	6
49	Gas Processing	4	1	0	0	0	0	0	0	0	0	4	1
	Total	**1,677**	**309**	**328**	**239**	**416**	**918**	**128**	**1,118**	**33**	**1,437**	**2,582**	**4,022**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	24	3	1	1	0	0	0	0	0	0	25	3
52	Retail	729	106	30	19	10	18	0	0	0	0	769	142
4222	Refrigerated Warehouses	30	4	5	4	1	1	0	0	0	0	36	9
4581	Airports	4	1	1	1	3	7	1	18	0	0	9	27
4952	Waste Water Treatment Plants	96	11	3	2	1	1	0	0	0	0	100	14
4961	District Energy	0	0	0	0	0	0	0	0	3	734	3	734
5411	Food Stores	562	104	20	14	4	9	0	0	0	0	586	127
5812	Restaurants	738	71	2	1	1	2	0	0	0	0	741	75
6512	Commercial Office Buildings	2,316	116	1,158	463	463	278	0	0	0	0	3,937	857
6513	Multifamily Buildings	416	31	151	75	23	23	0	0	0	0	590	130
7011	Hotels	468	60	39	23	25	38	1	6	0	0	533	127
7211	Laundries	39	7	5	3	0	0	0	0	0	0	44	10
7374	Data Centers	103	16	10	7	10	18	1	10	0	0	124	51
7542	Car Washes	37	3	2	1	0	0	0	0	0	0	39	4
7832	Movie Theaters	2	0.1	0	0	0	0	0	0	0	0	2	0.1
7991	Health Clubs	82	10	0	0	0	0	0	0	0	0	82	10
7997	Golf/Country Clubs	243	31	3	2	1	1	0	0	0	0	247	34
8051	Nursing Homes	521	73	19	12	11	16	1	7	0	0	552	108
8062	Hospitals	81	23	54	37	106	204	5	35	0	0	246	300
8211	Schools	660	82	10	7	0	0	0	0	0	0	670	88
8221	College/Univ.	150	27	22	13	64	170	28	229	5	147	269	587
8412	Museums	27	4	1	1	1	1	0	0	0	0	29	6
9100	Government Buildings	361	44	30	21	27	51	4	42	1	21	423	179
9223	Prisons	11	1	2	2	30	58	0	0	0	0	43	61
9711	Military	14	3	3	2	6	16	4	34	0	0	27	54
	Total	**7,714**	**829**	**1,571**	**711**	**787**	**912**	**45**	**383**	**9**	**902**	**10,126**	**3,737**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	2	0.1	0	0	0	0	0	0	0	0	2	0.1
13	Oil and Gas Extraction	2	1	0	0	0	0	0	0	0	0	2	1
29	Petroleum Refining	3	1	2	1	2	3	2	19	2	53	11	77
32	Stone/Clay/Glass	0	0	2	1	11	33	9	68	0	0	22	103
33	Primary Metals	0	0	2	2	2	5	8	83	3	132	15	221
	Total	**7**	**2**	**6**	**4**	**15**	**41**	**19**	**171**	**5**	**184**	**52**	**402**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	District Energy Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
4961	Current Loops without CHP	0	0	0	0	0	0	0	0	1	61	1	61
4961	Current Loops with CHP expansion	0	0	0	0	0	0	0	0	2	672	2	672
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**734**	**3**	**734**

Rhode Island

- Rhode Island has 616 MW of overall CHP capacity identified at 1,114 sites.
  - 225 MW of industrial on-site CHP potential, primarily in the paper, chemicals, textiles, rubber/plastics and food sectors.
  - 391 MW of commercial on-site CHP potential, primarily in the hospitals, commercial (office) buildings, colleges/universities, multifamily buildings and government buildings sectors.
- Rhode Island has 10 kW of WHP CHP potential identified at 1 rubber/plastics site.
- There is no CHP district energy potential identified in Rhode Island.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	163	28	18	13	24	53	9	69	2	62	216	225
Commercial Topping Cycle CHP	684	71	143	65	63	76	6	53	1	125	897	391
WHP CHP	1	0.01	0	0	0	0	0	0	0	0	1	0.01
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**848**	**99**	**161**	**79**	**87**	**128**	**15**	**122**	**3**	**188**	**1,114**	**616**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	31	6	1	1	0	0	0	0	0	0	32	7
22	Textiles	24	6	8	6	6	12	1	7	0	0	39	30
24	Lumber and Wood	21	3	1	1	0	0	0	0	0	0	22	3
25	Furniture	0	0	0	0	0	0	0	0	0	0	0	0
26	Paper	14	3	1	1	2	5	2	18	2	62	21	89
27	Printing	4	0	0	0	1	2	0	0	0	0	5	2
28	Chemicals	19	4	3	2	11	24	5	38	0	0	38	69
29	Petroleum Refining	0	0	0	0	0	0	0	0	0	0	0	0
30	Rubber/Misc Plastics	26	3	3	2	1	4	1	6	0	0	31	15
32	Stone/Clay/Glass	0	0	0	0	0	0	0	0	0	0	0	0
33	Primary Metals	5	0	0	0	2	4	0	0	0	0	7	4
34	Fabricated Metals	13	2	0	0	0	0	0	0	0	0	13	2
35	Machinery/Computer Equip.	1	0.2	0	0	0	0	0	0	0	0	1	0.2
37	Transportation Equip.	3	1	0	0	1	3	0	0	0	0	4	4
38	Instruments	3	0.3	0	0	0	0	0	0	0	0	3	0.3
39	Misc. Manufacturing	0	0	1	1	0	0	0	0	0	0	1	0.6
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**164**	**28**	**18**	**13**	**24**	**53**	**9**	**69**	**2**	**62**	**217**	**225**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	2	0.1	0	0	0	0	0	0	0	0	2	0.1
52	Retail	46	7	1	1	0	0	0	0	0	0	47	7
4222	Refrigerated Warehouses	2	0.1	0	0	0	0	0	0	0	0	2	0.1
4581	Airports	0	0	0	0	1	4	0	0	0	0	1	4
4952	Waste Water Treatment Plants	5	1	0	0	0	0	0	0	0	0	5	1
4961	District Energy	0	0	0	0	0	0	0	0	0	0	0	0
5411	Food Stores	39	9	0	0	0	0	0	0	0	0	39	9
5812	Restaurants	57	6	0	0	0	0	0	0	0	0	57	6
6512	Commercial Office Buildings	194	10	97	39	39	23	0	0	0	0	330	72
6513	Multifamily Buildings	75	6	27	14	4	4	0	0	0	0	106	23
7011	Hotels	39	4	4	3	1	2	0	0	0	0	44	9
7211	Laundries	4	1	1	1	0	0	0	0	0	0	5	2
7374	Data Centers	5	1	2	1	0	0	0	0	0	0	7	2
7542	Car Washes	2	0.1	0	0	0	0	0	0	0	0	2	0.1
7832	Movie Theaters	1	0.1	0	0	0	0	0	0	0	0	1	0.1
7991	Health Clubs	8	1	0	0	0	0	0	0	0	0	8	1
7997	Golf/Country Clubs	20	3	0	0	0	0	0	0	0	0	20	3
8051	Nursing Homes	60	7	0	0	0	0	0	0	0	0	60	7
8062	Hospitals	4	2	4	3	7	13	0	0	1	125	16	143
8211	Schools	54	5	0	0	0	0	0	0	0	0	54	5
8221	College/Univ.	9	1	1	1	5	19	4	40	0	0	19	60
8412	Museums	6	1	0	0	0	0	0	0	0	0	6	1
9100	Government Buildings	41	5	5	4	3	4	1	6	0	0	50	20
9223	Prisons	4	1	1	1	2	2	0	0	0	0	7	4
9711	Military	7	1	0	0	1	4	1	7	0	0	9	12
	Total	**684**	**71**	**143**	**65**	**63**	**76**	**6**	**53**	**1**	**125**	**897**	**391**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
30	Rubber/Misc Plastics	1	0.01	0	0	0	0	0	0	0	0	1	0.01
	Total	**1**	**0.01**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0.01**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no known CHP technical potential at existing district energy loops in Rhode Island.

South Carolina

- South Carolina has 3,063 MW of overall CHP capacity identified at 4,273 sites.
  - 1,656 MW of industrial on-site CHP potential, primarily in the chemicals, paper, textiles, rubber/plastics and lumber and wood sectors.
  - 1,251 MW of commercial on-site CHP potential, primarily in the military, commercial (office) buildings, schools, colleges/universities and government buildings.
- South Carolina has 156 MW of WHP CHP potential identified at 12 sites in the lumber and wood, paper, stone/clay/glass and primary metals sectors.
- There is no CHP district energy potential identified in South Carolina.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	540	107	120	89	202	444	46	413	14	602	922	1,656
Commercial Topping Cycle CHP	2,654	335	472	235	199	297	13	94	1	291	3,339	1,251
WHP CHP	2	1	0	0	4	12	4	45	2	99	12	156
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**3,196**	**443**	**592**	**324**	**405**	**752**	**63**	**552**	**17**	**992**	**4,273**	**3,063**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	42	8	10	7	10	19	0	0	0	0	62	34
22	Textiles	71	17	23	19	73	158	19	160	0	0	186	353
24	Lumber and Wood	112	19	10	7	24	42	1	5	1	32	148	106
25	Furniture	2	0.2	0	0	0	0	0	0	0	0	2	0.2
26	Paper	30	7	8	5	10	29	6	66	4	260	58	368
27	Printing	14	2	0	0	0	0	0	0	0	0	14	2
28	Chemicals	76	17	25	19	49	105	14	104	9	310	173	555
29	Petroleum Refining	0	0	0	0	0	0	0	0	0	0	0	0
30	Rubber/Misc Plastics	94	20	10	7	7	18	5	71	0	0	116	117
32	Stone/Clay/Glass	3	0.3	0	0	6	21	2	15	0	0	11	36
33	Primary Metals	26	6	13	9	11	33	2	30	2	99	54	177
34	Fabricated Metals	17	2	1	1	0	0	0	0	0	0	18	3
35	Machinery/Computer Equip	6	1	0	0	3	5	0	0	0	0	9	6
37	Transportation Equip.	36	6	20	15	12	24	1	7	0	0	69	52
38	Instruments	9	0.9	0	0	1	1	0	0	0	0	10	2
39	Misc. Manufacturing	4	1	0	0	0	0	0	0	0	0	4	1
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**542**	**108**	**120**	**89**	**206**	**455**	**50**	**458**	**16**	**702**	**934**	**1,812**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	5	1	0	0	0	0	0	0	0	0	5	1
52	Retail	235	37	12	7	0	0	0	0	0	0	247	44
4222	Refrigerated Warehouses	6	1	0	0	0	0	0	0	0	0	6	1
4581	Airports	0	0	2	1	4	13	0	0	0	0	6	14
4952	Waste Water Treatment Plants	14	2	0	0	0	0	0	0	0	0	14	2
4961	District Energy	0	0	0	0	0	0	0	0	0	0	0	0
5411	Food Stores	154	23	1	1	1	2	0	0	0	0	156	26
5812	Restaurants	288	24	1	1	0	0	0	0	0	0	289	25
6512	Commercial Office Buildings	748	37	299	120	75	45	0	0	0	0	1,122	202
6513	Multifamily Buildings	51	4	19	9	3	3	0	0	0	0	73	16
7011	Hotels	293	33	13	8	12	18	0	0	0	0	318	58
7211	Laundries	18	4	0	0	0	0	0	0	0	0	18	4
7374	Data Centers	18	2	2	1	0	0	0	0	0	0	20	4
7542	Car Washes	27	2	0	0	0	0	0	0	0	0	27	2
7832	Movie Theaters	1	0.1	0	0	0	0	0	0	0	0	1	0.1
7991	Health Clubs	32	3	0	0	0	0	0	0	0	0	32	3
7997	Golf/Country Clubs	146	18	0	0	0	0	0	0	0	0	146	18
8051	Nursing Homes	133	16	3	2	1	1	0	0	0	0	137	19
8062	Hospitals	36	10	22	16	28	62	2	11	0	0	88	98
8211	Schools	229	85	73	50	12	14	0	0	0	0	314	149
8221	College/Univ.	39	8	6	5	30	80	5	33	0	0	80	125
8412	Museums	5	0.4	0	0	0	0	0	0	0	0	5	0.4
9100	Government Buildings	158	21	12	9	14	26	1	14	0	0	185	69
9223	Prisons	11	3	5	4	17	27	0	0	0	0	33	33
9711	Military	7	2	2	1	2	6	5	36	1	291	17	337
	Total	**2,654**	**335**	**472**	**235**	**199**	**297**	**13**	**94**	**1**	**291**	**3,339**	**1,251**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
24	Lumber and Wood	1	0.5	0	0	0	0	0	0	0	0	1	0.5
26	Paper	1	0.1	0	0	0	0	0	0	0	0	1	0.1
32	Stone/Clay/Glass	0	0	0	0	4	12	2	15	0	0	6	27
33	Primary Metals	0	0	0	0	0	0	2	30	2	99	4	129
	Total	**2**	**1**	**0**	**0**	**4**	**12**	**4**	**45**	**2**	**99**	**12**	**156**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no known CHP technical potential at existing district energy loops in South Carolina.

South Dakota

- South Dakota has 378 MW of overall CHP capacity identified at 969 sites.
  - 145 MW of industrial on-site CHP potential, primarily in the chemicals, food, lumber and wood, stone/clay/glass and rubber/plastics sectors.
  - 225 MW of commercial on-site CHP potential, primarily in the colleges/universities, commercial (office) buildings, hospitals, government buildings and hotels sectors.
- South Dakota has 8 MW of WHP CHP potential identified at 3 sites in the chemicals and stone/clay/glass sectors.
- There is no CHP district energy potential identified in South Dakota.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	123	21	18	12	32	72	4	40	0	0	177	145
Commercial Topping Cycle CHP	622	63	118	56	43	53	6	53	0	0	789	225
WHP CHP	0	0	0	0	3	8	0	0	0	0	3	8
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**745**	**84**	**136**	**68**	**78**	**133**	**10**	**93**	**0**	**0**	**969**	**378**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	32	6	5	3	7	14	0	0	0	0	44	23
22	Textiles	0	0	0	0	0	0	0	0	0	0	0	0
24	Lumber and Wood	25	4	5	4	4	9	0	0	0	0	34	17
25	Furniture	1	0.1	0	0	0	0	0	0	0	0	1	0.1
26	Paper	5	1	3	2	1	1	0	0	0	0	9	4
27	Printing	6	1	0	0	0	0	0	0	0	0	6	1
28	Chemicals	11	2	1	1	18	46	3	31	0	0	33	79
29	Petroleum Refining	0	0	1	1	0	0	0	0	0	0	1	1
30	Rubber/Misc Plastics	16	2	2	1	1	1	0	0	0	0	19	5
32	Stone/Clay/Glass	0	0	0	0	2	6	1	9	0	0	3	15
33	Primary Metals	6	1	1	1	1	1	0	0	0	0	8	3
34	Fabricated Metals	1	0.1	0	0	0	0	0	0	0	0	1	0.1
35	Machinery/Computer Equip	6	1	0	0	0	0	0	0	0	0	6	1
37	Transportation Equip.	12	2	0	0	1	1	0	0	0	0	13	3
38	Instruments	1	0.1	0	0	0	0	0	0	0	0	1	0.1
39	Misc. Manufacturing	1	0.2	0	0	0	0	0	0	0	0	1	0.2
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**123**	**21**	**18**	**12**	**35**	**80**	**4**	**40**	**0**	**0**	**180**	**153**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	0	0	0	0	0	0	0	0	0	0	0	0
52	Retail	54	7	1	1	0	0	0	0	0	0	55	7
4222	Refrigerated Warehouses	2	0.2	0	0	0	0	0	0	0	0	2	0.2
4581	Airports	1	0.1	2	1	0	0	0	0	0	0	3	2
4952	Waste Water Treatment Plants	5	1	0	0	0	0	0	0	0	0	5	1
4961	District Energy	0	0	0	0	0	0	0	0	0	0	0	0
5411	Food Stores	21	4	3	2	0	0	0	0	0	0	24	6
5812	Restaurants	38	3	0	0	0	0	0	0	0	0	38	3
6512	Commercial Office Buildings	195	10	85	34	24	14	0	0	0	0	304	58
6513	Multifamily Buildings	12	1	4	2	1	1	0	0	0	0	17	4
7011	Hotels	79	9	3	2	1	1	0	0	0	0	83	12
7211	Laundries	3	1	0	0	0	0	0	0	0	0	3	1
7374	Data Centers	5	1	0	0	0	0	0	0	0	0	5	1
7542	Car Washes	6	1	0	0	0	0	0	0	0	0	6	1
7832	Movie Theaters	0	0	0	0	0	0	0	0	0	0	0	0
7991	Health Clubs	4	0.5	0	0	0	0	0	0	0	0	4	0.5
7997	Golf/Country Clubs	12	1	0	0	0	0	0	0	0	0	12	1
8051	Nursing Homes	68	6	0	0	1	2	0	0	0	0	69	8
8062	Hospitals	42	8	10	7	8	18	0	0	0	0	60	33
8211	Schools	20	2	0	0	0	0	0	0	0	0	20	2
8221	College/Univ.	11	3	3	2	6	14	4	39	0	0	24	58
8412	Museums	3	0.4	0	0	0	0	0	0	0	0	3	0.4
9100	Government Buildings	38	4	4	3	0	0	1	7	0	0	43	14
9223	Prisons	2	0.4	1	1	2	3	0	0	0	0	5	5
9711	Military	1	0.1	2	1	0	0	1	7	0	0	4	8
	Total	**622**	**63**	**118**	**56**	**43**	**53**	**6**	**53**	**0**	**0**	**789**	**225**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
28	Chemicals	0	0	0	0	1	1	0	0	0	0	1	1
32	Stone/Clay/Glass	0	0	0	0	2	6	0	0	0	0	2	6
	Total	**0**	**0**	**0**	**0**	**3**	**8**	**0**	**0**	**0**	**0**	**3**	**8**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no known CHP technical potential at existing district energy loops in South Dakota.

Tennessee

- Tennessee has 4,183 MW of overall CHP capacity identified at 6,134 sites.
  - 2,468 MW of industrial on-site CHP potential, primarily in the chemicals, paper, food, refining and textiles sectors.
  - 1,430 MW of commercial on-site CHP potential, primarily in the commercial (office) buildings, colleges/universities, hospitals, schools, and hotels sectors.
- Tennessee has 82 MW of WHP CHP potential identified at 16 sites in the chemicals, refining, and stone/clay/glass and primary metals sectors.
- Tennessee has 202 MW of CHP potential identified at 2 district energy sites.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	760	146	154	107	213	439	65	583	17	1,193	1,209	2,468
Commercial Topping Cycle CHP	3,960	451	669	308	254	348	22	193	2	130	4,907	1,430
WHP CHP	3	1	0	0	9	23	3	37	1	21	16	82
District Energy CHP	0	0	0	0	0	0	0	0	2	202	2	202
Total	**4,723**	**598**	**823**	**416**	**476**	**809**	**90**	**813**	**22**	**1,547**	**6,134**	**4,183**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	76	15	21	15	42	78	5	45	1	51	145	205
22	Textiles	27	6	16	12	20	37	6	58	0	0	69	112
24	Lumber and Wood	184	38	22	15	15	26	0	0	0	0	221	79
25	Furniture	4	0.3	0	0	0	0	0	0	0	0	4	0
26	Paper	55	14	17	11	22	52	9	87	3	175	106	338
27	Printing	14	2	1	1	0	0	0	0	0	0	15	3
28	Chemicals	91	16	16	11	58	125	38	330	10	810	213	1,291
29	Petroleum Refining	1	0.3	5	3	4	9	0	0	3	153	13	165
30	Rubber/Misc Plastics	142	26	10	7	12	24	3	27	0	0	167	83
32	Stone/Clay/Glass	3	1	0	0	10	28	1	5	0	0	14	34
33	Primary Metals	56	12	15	10	12	24	4	53	1	25	88	124
34	Fabricated Metals	41	6	0	0	0	0	0	0	0	0	41	6
35	Machinery/Computer Equip.	8	1	1	1	0	0	0	0	0	0	9	2
37	Transportation Equip.	57	10	29	21	27	60	2	15	0	0	115	106
38	Instruments	2	0.2	1	1	0	0	0	0	0	0	3	1
39	Misc. Manufacturing	2	0.5	0	0	0	0	0	0	0	0	2	0.5
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**763**	**147**	**154**	**107**	**222**	**462**	**68**	**620**	**18**	**1,214**	**1,225**	**2,551**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	6	1	1	1	0	0	0	0	0	0	7	2
52	Retail	402	59	24	15	5	6	0	0	0	0	431	80
4222	Refrigerated Warehouses	10	2	0	0	0	0	0	0	0	0	10	2
4581	Airports	0	0	1	1	2	4	2	11	0	0	5	16
4952	Waste Water Treatment Plants	37	5	0	0	2	5	0	0	0	0	39	10
4961	District Energy	0	0	0	0	0	0	0	0	2	202	2	202
5411	Food Stores	219	41	5	3	0	0	0	0	0	0	224	45
5812	Restaurants	453	42	1	1	2	3	0	0	0	0	456	46
6512	Commercial Office Buildings	1,174	59	470	188	117	70	0	0	0	0	1,761	317
6513	Multifamily Buildings	143	11	52	26	8	8	0	0	0	0	203	45
7011	Hotels	307	33	15	9	8	14	3	38	0	0	333	95
7211	Laundries	23	3	3	2	0	0	0	0	0	0	26	5
7374	Data Centers	43	6	3	2	2	6	1	9	0	0	49	23
7542	Car Washes	21	2	0	0	0	0	0	0	0	0	21	2
7832	Movie Theaters	1	0.1	0	0	0	0	0	0	0	0	1	0.1
7991	Health Clubs	45	5	0	0	0	0	0	0	0	0	45	5
7997	Golf/Country Clubs	64	8	1	1	0	0	0	0	0	0	65	9
8051	Nursing Homes	244	30	6	4	1	1	0	0	0	0	251	35
8062	Hospitals	68	18	31	21	47	100	2	16	0	0	148	154
8211	Schools	377	81	35	21	0	0	0	0	0	0	412	102
8221	College/Univ.	100	17	6	3	23	58	11	94	2	130	142	303
8412	Museums	13	1	0	0	0	0	0	0	0	0	13	1
9100	Government Buildings	200	25	10	7	20	32	2	13	0	0	232	77
9223	Prisons	3	1	3	2	11	21	0	0	0	0	17	24
9711	Military	7	1	2	1	6	18	1	13	0	0	16	33
	Total	**3,960**	**451**	**669**	**308**	**254**	**348**	**22**	**193**	**4**	**333**	**4,909**	**1,633**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
28	Chemicals	0	0	0	0	1	2	0	0	0	0	1	2
29	Petroleum Refining	1	0.3	0	0	0	0	0	0	1	21	2	22
32	Stone/Clay/Glass	2	1	0	0	8	21	1	5	0	0	11	27
33	Primary Metals	0	0	0	0	0	0	2	32	0	0	2	32
	Total	**3**	**1**	**0**	**0**	**9**	**23**	**3**	**37**	**1**	**21**	**16**	**82**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	District Energy Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
4961	Current Loops without CHP	0	0	0	0	0	0	0	0	2	202	2	202
4961	Current Loops with CHP expansion	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**202**	**2**	**202**

Texas

- Texas has 14,062 MW of overall CHP capacity identified at 20,855 sites.
  - 5,216 MW of industrial on-site CHP potential, primarily in the chemicals, refining, food, primary metals and paper sectors.
  - 7,027 MW of commercial on-site CHP potential, primarily in the schools, colleges/universities, commercial (office) buildings, hospitals and multifamily sectors.
- Texas has 1,432 MW of WHP CHP potential identified at 244 sites in the refining, stone/clay/glass, oil and gas extraction and primary metals sectors.
- Texas has 387 MW of CHP potential identified at 7 district energy sites.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	2,116	387	382	268	424	885	142	1,244	48	2,432	3,112	5,216
Commercial Topping Cycle CHP	12,265	1,371	3,695	1,970	1,430	2,125	83	701	18	860	17,492	7,027
WHP CHP	103	23	47	34	57	119	21	222	16	1,035	244	1,432
District Energy CHP	0	0	0	0	0	0	1	12	6	375	7	387
Total	**14,484**	**1,781**	**4,124**	**2,272**	**1,911**	**3,128**	**247**	**2,179**	**88**	**4,701**	**20,855**	**14,062**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	1	1	0	0	0	0	1	1
13	Oil and Gas Extraction	85	20	41	30	33	55	3	16	0	0	162	122
20	Food	347	66	58	40	80	160	19	184	1	21	505	471
22	Textiles	121	20	15	11	15	25	3	19	0	0	154	75
24	Lumber and Wood	318	57	39	26	28	57	4	22	1	21	390	183
25	Furniture	2	0.2	0	0	0	0	0	0	0	0	2	0.2
26	Paper	114	29	20	13	25	50	13	100	1	25	173	216
27	Printing	40	5	4	3	1	1	0	0	0	0	45	8
28	Chemicals	404	78	114	82	176	380	84	769	28	1,092	806	2,400
29	Petroleum Refining	3	0.1	4	2	7	16	10	126	29	2,214	53	2,358
30	Rubber/Misc Plastics	342	57	26	19	21	36	2	19	0	0	391	131
32	Stone/Clay/Glass	13	2	8	6	16	52	11	102	0	0	48	162
33	Primary Metals	114	28	40	28	37	84	12	89	3	73	206	301
34	Fabricated Metals	49	5	1	1	1	3	0	0	0	0	51	8
35	Machinery/Computer Equip.	20	3	3	2	0	0	0	0	0	0	23	5
37	Transportation Equip.	102	13	15	11	17	43	2	19	1	21	137	106
38	Instruments	14	3	1	1	0	0	0	0	0	0	15	3
39	Misc. Manufacturing	27	4	1	1	0	0	0	0	0	0	28	5
49	Gas Processing	104	22	39	27	23	41	0	0	0	0	166	90
	Total	**2,219**	**410**	**429**	**302**	**481**	**1,003**	**163**	**1,466**	**64**	**3,466**	**3,356**	**6,648**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	41	4	3	2	0	0	0	0	0	0	44	6
52	Retail	1,277	191	78	48	28	45	2	11	0	0	1,385	295
4222	Refrigerated Warehouses	33	7	4	3	2	2	0	0	0	0	39	12
4581	Airports	9	2	5	3	10	26	2	11	2	56	28	99
4952	Waste Water Treatment Plants	95	12	3	2	5	8	0	0	0	0	103	22
4961	District Energy	0	0	0	0	0	0	1	12	6	375	7	387
5411	Food Stores	873	165	6	4	2	6	0	0	0	0	881	175
5812	Restaurants	1,462	143	12	9	2	4	0	0	0	0	1,476	156
6512	Commercial Office Buildings	3,839	192	1,535	614	384	230	0	0	0	0	5,758	1,036
6513	Multifamily Buildings	1,003	75	364	182	56	56	0	0	0	0	1,424	314
7011	Hotels	751	85	62	40	44	80	3	21	0	0	860	227
7211	Laundries	89	13	9	5	0	0	0	0	0	0	98	19
7374	Data Centers	143	21	14	10	14	35	2	18	0	0	173	83
7542	Car Washes	165	15	1	1	0	0	0	0	0	0	166	15
7832	Movie Theaters	6	1	0	0	0	0	0	0	0	0	6	1
7991	Health Clubs	169	18	0	0	2	2	0	0	0	0	171	20
7997	Golf/Country Clubs	256	38	4	3	0	0	0	0	0	0	260	41
8051	Nursing Homes	637	69	4	2	6	11	0	0	0	0	647	82
8062	Hospitals	358	86	87	59	128	274	16	109	1	229	590	757
8211	Schools	237	116	1,386	902	510	811	0	0	0	0	2,133	1,828
8221	College/Univ.	179	33	17	11	85	233	39	388	13	500	333	1,165
8412	Museums	41	6	0	0	0	0	0	0	0	0	41	6
9100	Government Buildings	567	75	71	50	53	89	6	38	0	0	697	251
9223	Prisons	18	4	28	19	89	186	3	16	0	0	138	224
9711	Military	17	2	2	2	10	27	10	89	2	74	41	194
	Total	**12,265**	**1,371**	**3,695**	**1,970**	**1,430**	**2,125**	**84**	**714**	**24**	**1,234**	**17,499**	**7,413**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	1	1	0	0	0	0	1	1
13	Oil and Gas Extraction	85	20	41	30	33	55	3	16	0	0	162	122
28	Chemicals	10	1	0	0	3	5	1	14	0	0	14	20
29	Petroleum Refining	3	0.1	3	2	7	16	10	126	13	962	36	1,105
32	Stone/Clay/Glass	2	1	3	2	11	36	7	65	0	0	23	105
33	Primary Metals	2	1	0	0	2	6	0	0	3	73	7	79
38	Instruments	1	0.01	0	0	0	0	0	0	0	0	1	0.01
	Total	**103**	**23**	**47**	**34**	**57**	**119**	**21**	**222**	**16**	**1,035**	**244**	**1,432**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	District Energy Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
4961	Current Loops without CHP	0	0	0	0	0	0	1	12	6	375	7	387
4961	Current Loops with CHP expansion	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**12**	**6**	**375**	**7**	**387**

Utah

- Utah has 1,119 MW of overall CHP capacity identified at 2,676 sites.
  - 440 MW of industrial on-site CHP potential, primarily in the chemicals, food, refining, paper and primary metals sectors.
  - 618 MW of commercial on-site CHP potential, primarily in the colleges/universities, commercial (office) buildings, hospitals, government buildings, and hotels sectors.
- Utah has 61 MW of WHP CHP potential identified at 21 sites in the refining, stone/clay/glass, oil and gas extraction and primary metals sectors.
- There is no CHP district energy potential identified in Utah.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	324	59	62	46	70	155	18	157	1	24	475	440
Commercial Topping Cycle CHP	1,851	189	229	105	88	116	9	92	3	116	2,180	618
WHP CHP	10	2	2	1	6	20	2	13	1	25	21	61
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**2,185**	**250**	**293**	**153**	**164**	**290**	**29**	**262**	**5**	**164**	**2,676**	**1,119**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	1	0.01	0	0	0	0	0	0	0	0	1	0.01
13	Oil and Gas Extraction	7	1	2	1	1	1	0	0	0	0	10	4
20	Food	73	16	13	10	18	40	5	30	0	0	109	96
22	Textiles	3	0	1	1	1	1	1	9	0	0	6	12
24	Lumber and Wood	53	8	7	5	1	3	0	0	0	0	61	16
25	Furniture	1	0.1	0	0	0	0	0	0	0	0	1	0.1
26	Paper	15	4	6	5	2	3	2	21	0	0	25	33
27	Printing	7	1	0	0	0	0	0	0	0	0	7	1
28	Chemicals	68	12	14	11	30	68	6	50	1	24	119	164
29	Petroleum Refining	2	1	4	3	8	20	5	56	0	0	19	79
30	Rubber/Misc Plastics	40	6	6	4	1	2	0	0	0	0	47	12
32	Stone/Clay/Glass	1	0.1	0	0	5	18	0	0	0	0	6	18
33	Primary Metals	24	5	7	5	5	9	0	0	1	25	37	44
34	Fabricated Metals	4	0.3	0	0	0	0	0	0	0	0	4	0.3
35	Machinery/Computer Equip.	4	0.5	0	0	1	3	0	0	0	0	5	3
37	Transportation Equip.	16	3	3	2	3	5	1	5	0	0	23	15
38	Instruments	0	0	0	0	0	0	0	0	0	0	0	0
39	Misc. Manufacturing	5	0.8	0	0	0	0	0	0	0	0	5	0.8
49	Gas Processing	10	2	1	1	0	0	0	0	0	0	11	3
	Total	**334**	**61**	**64**	**47**	**76**	**174**	**20**	**170**	**2**	**48**	**496**	**501**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	3	0.2	0	0	0	0	0	0	0	0	3	0.2
52	Retail	173	26	7	4	0	0	0	0	0	0	180	30
4222	Refrigerated Warehouses	4	0.4	0	0	0	0	0	0	0	0	4	0.4
4581	Airports	2	0.3	0	0	0	0	1	12	0	0	3	12
4952	Waste Water Treatment Plants	16	2	0	0	0	0	0	0	0	0	16	2
4961	District Energy	0	0	0	0	0	0	0	0	0	0	0	0
5411	Food Stores	135	24	1	1	0	0	0	0	0	0	136	24
5812	Restaurants	150	14	1	1	0	0	0	0	0	0	151	15
6512	Commercial Office Buildings	529	26	163	65	41	25	0	0	0	0	733	116
6513	Multifamily Buildings	60	4	22	11	3	3	0	0	0	0	85	19
7011	Hotels	125	15	3	2	10	17	0	0	0	0	138	34
7211	Laundries	9	1	1	1	0	0	0	0	0	0	10	2
7374	Data Centers	37	6	4	3	2	2	1	10	0	0	44	22
7542	Car Washes	10	1	0	0	0	0	0	0	0	0	10	1
7832	Movie Theaters	2	0.1	0	0	0	0	0	0	0	0	2	0.1
7991	Health Clubs	36	3	1	1	0	0	0	0	0	0	37	4
7997	Golf/Country Clubs	37	4	0	0	0	0	0	0	0	0	37	4
8051	Nursing Homes	52	5	2	1	0	0	0	0	0	0	54	6
8062	Hospitals	29	6	13	10	12	25	0	0	0	0	54	40
8211	Schools	275	27	0	0	0	0	0	0	0	0	275	27
8221	College/Univ.	32	5	3	2	7	17	5	49	3	116	50	188
8412	Museums	4	0.4	0	0	0	0	0	0	0	0	4	0.4
9100	Government Buildings	116	17	7	4	8	15	0	0	0	0	131	36
9223	Prisons	5	0.4	0	0	1	1	1	6	0	0	7	7
9711	Military	10	2	1	1	4	10	1	16	0	0	16	29
	Total	**1,851**	**189**	**229**	**105**	**88**	**116**	**9**	**92**	**3**	**116**	**2,180**	**618**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	1	0.01	0	0	0	0	0	0	0	0	1	0.01
13	Oil and Gas Extraction	7	1	2	1	1	1	0	0	0	0	10	4
29	Petroleum Refining	2	1	0	0	2	8	2	13	0	0	6	22
32	Stone/Clay/Glass	0	0	0	0	3	10	0	0	0	0	3	10
33	Primary Metals	0	0	0	0	0	0	0	0	1	25	1	25
	Total	**10**	**2**	**2**	**1**	**6**	**20**	**2**	**13**	**1**	**25**	**21**	**61**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no known CHP technical potential at existing district energy loops in Utah.

Vermont

- Vermont has 228 MW of overall CHP capacity identified at 657 sites.
  - 112 MW of industrial on-site CHP potential, primarily in the paper, food, lumber and wood, chemicals, and textiles sectors.
  - 116 MW of commercial on-site CHP potential, primarily in the commercial (office) buildings, colleges/universities, hotels, hospitals, and government buildings sectors.
- There is no waste heat to power CHP potential identified in Vermont.
- There is no CHP district energy potential identified in Vermont.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	119	21	21	15	22	43	1	7	1	24	164	112
Commercial Topping Cycle CHP	389	40	75	34	29	28	1	14	0	0	493	116
WHP CHP	0	0	0	0	0	0	0	0	0	0	0	0
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**508**	**61**	**96**	**49**	**51**	**71**	**2**	**22**	**1**	**24**	**657**	**228**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	34	6	7	6	7	14	1	7	0	0	49	33
22	Textiles	7	1	1	1	1	1	0	0	0	0	9	3
24	Lumber and Wood	33	7	4	3	4	8	0	0	0	0	41	17
25	Furniture	3	0.4	0	0	0	0	0	0	0	0	3	0.4
26	Paper	5	1	0	0	4	11	0	0	1	24	10	37
27	Printing	4	0.3	0	0	0	0	0	0	0	0	4	0.3
28	Chemicals	14	2	3	2	4	7	0	0	0	0	21	12
29	Petroleum Refining	0	0	1	1	1	1	0	0	0	0	2	2
30	Rubber/Misc Plastics	8	1	1	1	1	1	0	0	0	0	10	3
32	Stone/Clay/Glass	2	0.1	0	0	0	0	0	0	0	0	2	0.1
33	Primary Metals	1	0.2	0	0	0	0	0	0	0	0	1	0.2
34	Fabricated Metals	3	0.4	0	0	0	0	0	0	0	0	3	0.4
35	Machinery/Computer Equip.	1	0.1	0	0	0	0	0	0	0	0	1	0.1
37	Transportation Equip.	2	0.2	4	3	0	0	0	0	0	0	6	3
38	Instruments	0	0	0	0	0	0	0	0	0	0	0	0
39	Misc. Manufacturing	2	0.2	0	0	0	0	0	0	0	0	2	0.2
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**119**	**21**	**21**	**15**	**22**	**43**	**1**	**7**	**1**	**24**	**164**	**112**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	1	0.1	0	0	0	0	0	0	0	0	1	0.1
52	Retail	27	3	0	0	0	0	0	0	0	0	27	3
4222	Refrigerated Warehouses	0	0	0	0	0	0	0	0	0	0	0	0
4581	Airports	0	0	1	1	0	0	0	0	0	0	1	1
4952	Waste Water Treatment Plants	4	0.4	0	0	0	0	0	0	0	0	4	0.4
4961	District Energy	0	0	0	0	0	0	0	0	0	0	0	0
5411	Food Stores	24	4	1	1	0	0	0	0	0	0	25	4
5812	Restaurants	23	2	0	0	0	0	0	0	0	0	23	2
6512	Commercial Office Buildings	114	6	57	23	23	14	0	0	0	0	194	42
6513	Multifamily Buildings	10	1	4	2	1	1	0	0	0	0	14	3
7011	Hotels	70	9	4	3	0	0	0	0	0	0	74	11
7211	Laundries	3	1	0	0	0	0	0	0	0	0	3	1
7374	Data Centers	5	1	0	0	0	0	0	0	0	0	5	1
7542	Car Washes	0	0	0	0	0	0	0	0	0	0	0	0
7832	Movie Theaters	0	0	0	0	0	0	0	0	0	0	0	0
7991	Health Clubs	5	1	0	0	0	0	0	0	0	0	5	1
7997	Golf/Country Clubs	13	1	0	0	0	0	0	0	0	0	13	1
8051	Nursing Homes	24	3	0	0	0	0	0	0	0	0	24	3
8062	Hospitals	9	2	3	2	2	5	1	0	0	0	15	9
8211	Schools	1	0.1	0	0	0	0	0	0	0	0	1	0.1
8221	College/Univ.	14	2	4	3	2	6	0	14	0	0	20	26
8412	Museums	3	0.2	0	0	0	0	0	0	0	0	3	0.2
9100	Government Buildings	28	3	1	1	1	3	0	0	0	0	30	6
9223	Prisons	7	1	0	0	0	0	0	0	0	0	7	1
9711	Military	4	1	0	0	0	0	0	0	0	0	4	1
	Total	**389**	**40**	**75**	**34**	**29**	**28**	**1**	**14**	**0**	**0**	**493**	**116**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no waste heat to power CHP potential identified in Vermont.

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no known CHP technical potential at existing district energy loops in Vermont.

Virginia

- Virginia has 4,308 MW of overall CHP capacity identified at 7,291 sites.
  - 1,703 MW of industrial on-site CHP potential, primarily in the chemicals, paper, textiles, food, and lumber and wood sectors.
  - 2,540 MW of commercial on-site CHP potential, primarily in the military, commercial (office) buildings, colleges/universities, government buildings and hospitals sectors.
- Virginia has 65 MW of WHP CHP potential identified at 11 sites in the beverages and tobacco, chemicals, refining, stone/clay/glass and primary metals sectors.
- There is no CHP district energy potential identified in Virginia.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	594	110	143	100	152	295	42	364	20	834	951	1,703
Commercial Topping Cycle CHP	5,035	581	886	418	357	474	45	391	6	676	6,329	2,540
WHP CHP	1	0.2	1	1	5	14	4	49	0	0	11	65
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**5,630**	**691**	**1,030**	**518**	**514**	**783**	**91**	**805**	**26**	**1,510**	**7,291**	**4,308**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	96	15	19	15	28	46	3	30	1	57	147	163
22	Textiles	14	3	9	7	19	40	8	55	2	68	52	174
24	Lumber and Wood	190	38	43	29	25	43	5	29	0	0	263	138
25	Furniture	15	2	2	1	0	0	0	0	0	0	17	4
26	Paper	25	7	10	6	19	54	6	59	5	186	65	312
27	Printing	19	3	3	2	1	1	0	0	0	0	23	6
28	Chemicals	76	13	17	12	27	46	16	148	8	411	144	629
29	Petroleum Refining	0	0	6	4	7	15	1	14	1	22	15	55
30	Rubber/Misc Plastics	72	12	10	7	10	19	3	38	0	0	95	75
32	Stone/Clay/Glass	4	1	3	2	4	11	2	11	1	30	14	55
33	Primary Metals	26	7	11	8	7	13	2	31	1	30	47	87
34	Fabricated Metals	7	1	0	0	0	0	0	0	0	0	7	1
35	Machinery/Computer Equip	5	1	0	0	0	0	0	0	0	0	5	1
37	Transportation Equip.	35	7	10	7	9	16	0	0	1	31	55	62
38	Instruments	2	0.4	0	0	0	0	0	0	0	0	2	0.4
39	Misc. Manufacturing	9	1	1	1	1	5	0	0	0	0	11	6.9
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**595**	**110**	**144**	**100**	**157**	**309**	**46**	**414**	**20**	**834**	**962**	**1,768**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	12	1	0	0	0	0	0	0	0	0	12	1
52	Retail	459	68	33	21	11	15	0	0	0	0	503	104
4222	Refrigerated Warehouses	17	2	0	0	1	1	0	0	0	0	18	3
4581	Airports	3	1	1	1	4	7	2	24	0	0	10	32
4952	Waste Water Treatment Plants	29	3	2	2	1	1	0	0	0	0	32	6
4961	District Energy	0	0	0	0	0	0	0	0	0	0	0	0
5411	Food Stores	339	61	3	2	2	2	0	0	0	0	344	65
5812	Restaurants	523	50	1	1	1	1	0	0	0	0	525	52
6512	Commercial Office Buildings	1,470	74	588	235	147	88	0	0	0	0	2,205	397
6513	Multifamily Buildings	257	19	93	47	14	14	0	0	0	0	364	80
7011	Hotels	465	58	26	17	19	29	0	0	0	0	510	104
7211	Laundries	26	4	3	2	0	0	0	0	0	0	29	6
7374	Data Centers	114	17	7	4	9	13	1	16	0	0	131	50
7542	Car Washes	34	2	0	0	0	0	0	0	0	0	34	2
7832	Movie Theaters	2	0.2	0	0	0	0	0	0	0	0	2	0.2
7991	Health Clubs	63	7	3	3	0	0	0	0	0	0	66	10
7997	Golf/Country Clubs	119	15	0	0	0	0	0	0	0	0	119	15
8051	Nursing Homes	213	26	8	5	3	7	0	0	0	0	224	38
8062	Hospitals	41	11	27	19	50	101	5	33	0	0	123	163
8211	Schools	486	103	45	28	3	3	0	0	0	0	534	134
8221	College/Univ.	77	15	7	5	33	78	14	114	4	126	135	338
8412	Museums	26	4	1	1	0	0	0	0	0	0	27	5
9100	Government Buildings	212	31	24	17	30	52	10	93	0	0	276	194
9223	Prisons	32	6	9	7	19	30	0	0	0	0	60	42
9711	Military	16	3	5	4	10	31	13	111	2	550	46	698
	Total	**5,035**	**581**	**886**	**418**	**357**	**474**	**45**	**391**	**6**	**676**	**6,329**	**2,540**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
21	Beverage and Tobacco	1	0.2	0	0	0	0	0	0	0	0	1	0.2
28	Chemicals	0	0	1	1	0	0	0	0	0	0	1	1
29	Petroleum Refining	0	0	0	0	0	0	1	14	0	0	1	14
32	Stone/Clay/Glass	0	0	0	0	4	11	1	5	0	0	5	16
33	Primary Metals	0	0	0	0	1	3	2	31	0	0	3	34
	Total	**1**	**0.2**	**1**	**1**	**5**	**14**	**4**	**49**	**0**	**0**	**11**	**65**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no known CHP technical potential at existing district energy loops in Virginia.

Washington

- Washington has 2,545 MW of overall CHP capacity identified at 5,570 sites.
  - 1,029 MW of industrial on-site CHP potential, primarily in the chemicals, paper, food, lumber and wood, and refining sectors.
  - 1,220 MW of commercial on-site CHP potential, primarily in the commercial (office) buildings, colleges/universities, government buildings, hospitals and multifamily sectors.
- Washington has 138 MW of WHP CHP potential identified at 14 sites in the chemicals, refining, stone/clay/glass and primary metals sectors.
- Washington has 158 MW of CHP potential identified at 1 district energy site.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	686	133	111	76	113	222	22	203	11	396	943	1,029
Commercial Topping Cycle CHP	3,759	379	581	265	257	384	13	126	2	66	4,612	1,220
WHP CHP	3	0.5	2	2	3	7	3	28	3	100	14	138
District Energy CHP	0	0	0	0	0	0	0	0	1	158	1	158
Total	**4,448**	**512**	**694**	**343**	**373**	**614**	**38**	**357**	**17**	**719**	**5,570**	**2,545**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	214	44	25	17	34	62	5	43	0	0	278	166
22	Textiles	10	2	3	2	5	10	0	0	0	0	18	14
24	Lumber and Wood	162	31	31	21	34	66	1	12	0	0	228	130
25	Furniture	0	0	0	0	0	0	0	0	0	0	0	0
26	Paper	32	9	11	7	7	12	6	67	4	159	60	254
27	Printing	18	3	0	0	0	0	0	0	0	0	18	3
28	Chemicals	95	17	14	10	21	47	8	65	4	131	142	270
29	Petroleum Refining	2	0	8	6	4	7	3	32	4	151	21	196
30	Rubber/Misc Plastics	56	10	7	5	0	0	0	0	0	0	63	15
32	Stone/Clay/Glass	1	0.2	2	2	3	9	1	5	0	0	7	17
33	Primary Metals	13	4	6	4	6	14	0	0	1	24	26	46
34	Fabricated Metals	12	2	0	0	0	0	0	0	0	0	12	2
35	Machinery/Computer Equip.	8	1	0	0	0	0	0	0	0	0	8	1
37	Transportation Equip.	60	9	5	3	2	2	1	7	1	31	69	51
38	Instruments	0	0	0	0	0	0	0	0	0	0	0	0
39	Misc. Manufacturing	6	1	1	1	0	0	0	0	0	0	7	1.8
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**689**	**133**	**113**	**77**	**116**	**230**	**25**	**231**	**14**	**495**	**957**	**1,167**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	9	1	0	0	0	0	0	0	0	0	9	1
52	Retail	351	50	16	10	4	9	0	0	0	0	371	69
4222	Refrigerated Warehouses	30	4	2	1	0	0	0	0	0	0	32	6
4581	Airports	2	1	1	1	0	0	1	10	0	0	4	12
4952	Waste Water Treatment Plants	35	4	1	1	1	1	0	0	0	0	37	6
4961	District Energy	0	0	0	0	0	0	0	0	1	158	1	158
5411	Food Stores	378	54	0	0	1	1	0	0	0	0	379	55
5812	Restaurants	302	28	0	0	1	2	0	0	0	0	303	30
6512	Commercial Office Buildings	1,265	63	389	156	97	58	0	0	0	0	1,751	277
6513	Multifamily Buildings	293	22	106	53	16	16	0	0	0	0	415	91
7011	Hotels	283	35	17	10	17	25	0	0	0	0	317	70
7211	Laundries	21	4	0	0	1	1	0	0	0	0	22	5
7374	Data Centers	62	10	3	2	3	4	0	0	0	0	68	15
7542	Car Washes	24	2	0	0	0	0	0	0	0	0	24	2
7832	Movie Theaters	0	0	0	0	0	0	0	0	0	0	0	0
7991	Health Clubs	85	9	0	0	1	1	0	0	0	0	86	11
7997	Golf/Country Clubs	76	9	0	0	0	0	0	0	0	0	76	9
8051	Nursing Homes	197	23	0	0	0	0	0	0	0	0	197	23
8062	Hospitals	57	13	15	10	32	70	1	6	0	0	105	99
8211	Schools	0	0	0	0	0	0	0	0	0	0	0	0
8221	College/Univ.	40	7	3	2	45	117	6	74	1	26	95	227
8412	Museums	21	3	0	0	0	0	0	0	0	0	21	3
9100	Government Buildings	200	31	25	17	23	43	2	15	0	0	250	107
9223	Prisons	11	2	2	2	7	15	0	0	0	0	20	19
9711	Military	17	3	1	1	8	20	3	20	1	40	30	84
	Total	**3,759**	**379**	**581**	**265**	**257**	**384**	**13**	**126**	**3**	**224**	**4,613**	**1,378**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
28	Chemicals	1	0.04	0	0	0	0	0	0	0	0	1	0.04
29	Petroleum Refining	2	0.4	0	0	1	2	2	23	2	75	7	100
32	Stone/Clay/Glass	0	0	2	2	2	6	1	5	0	0	5	13
33	Primary Metals	0	0	0	0	0	0	0	0	1	24	1	24
	Total	**3**	**0.5**	**2**	**2**	**3**	**7**	**3**	**28**	**3**	**100**	**14**	**138**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	District Energy Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
4961	Current Loops without CHP	0	0	0	0	0	0	0	0	1	158	1	158
4961	Current Loops with CHP expansion	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**158**	**1**	**158**

West Virginia

- West Virginia has 929 MW of overall CHP capacity identified at 1,630 sites.
  - 427 MW of industrial on-site CHP potential, primarily in the chemicals, primary metals, lumber and wood, paper, and refining sectors.
  - 354 MW of commercial on-site CHP potential, primarily in the commercial (office) buildings, colleges/universities, hospitals, government buildings and hotels sectors.
- West Virginia has 148 MW of WHP CHP potential identified at 14 sites in the mining, oil and gas extraction, chemicals, refining, stone/clay/glass and primary metals sectors.
- There is no CHP district energy potential identified in West Virginia.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	172	36	41	30	38	89	20	195	3	77	274	427
Commercial Topping Cycle CHP	1,083	114	170	76	79	100	9	64	0	0	1,342	354
WHP CHP	4	0.9	2	2	5	11	2	21	1	113	14	148
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**1,259**	**150**	**213**	**108**	**122**	**200**	**31**	**280**	**4**	**190**	**1,630**	**929**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	1	0.1	0	0	0	0	0	0	0	0	1	0.1
13	Oil and Gas Extraction	2	0.5	2	2	3	5	0	0	0	0	7	7
20	Food	15	2	1	1	0	0	0	0	0	0	16	3
22	Textiles	2	1	1	1	1	1	0	0	0	0	4	2
24	Lumber and Wood	63	14	15	11	4	9	2	13	0	0	84	46
25	Furniture	0	0	0	0	0	0	0	0	0	0	0	0
26	Paper	3	1	1	1	4	9	3	34	0	0	11	45
27	Printing	11	1	0	0	0	0	0	0	0	0	11	1
28	Chemicals	20	4	7	6	17	43	11	100	2	51	57	204
29	Petroleum Refining	0	0	3	2	4	11	1	11	0	0	8	25
30	Rubber/Misc Plastics	25	6	3	2	1	2	0	0	0	0	29	11
32	Stone/Clay/Glass	3	1	0	0	1	3	1	15	0	0	5	19
33	Primary Metals	14	4	5	3	4	10	4	42	2	139	29	198
34	Fabricated Metals	3	1	0	0	0	0	0	0	0	0	3	1
35	Machinery/Computer Equip	0	0	1	1	0	0	0	0	0	0	1	1
37	Transportation Equip.	9	1	1	1	1	3	0	0	0	0	11	4
38	Instruments	2	0.2	0	0	1	1	0	0	0	0	3	2
39	Misc. Manufacturing	0	0	0	0	0	0	0	0	0	0	0	0
49	Gas Processing	3	0	3	2	2	3	0	0	0	0	8	6
	Total	**176**	**37**	**43**	**32**	**43**	**100**	**22**	**216**	**4**	**190**	**288**	**575**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	6	0.4	0	0	0	0	0	0	0	0	6	0.4
52	Retail	120	19	3	2	0	0	0	0	0	0	123	20
4222	Refrigerated Warehouses	1	0.1	0	0	0	0	0	0	0	0	1	0.1
4581	Airports	2	0.3	1	1	0	0	0	0	0	0	3	1
4952	Waste Water Treatment Plants	23	3	0	0	0	0	0	0	0	0	23	3
4961	District Energy	0	0	0	0	0	0	0	0	0	0	0	0
5411	Food Stores	49	8	0	0	0	0	0	0	0	0	49	8
5812	Restaurants	104	9	0	0	0	0	0	0	0	0	104	9
6512	Commercial Office Buildings	339	17	136	54	34	20	0	0	0	0	509	92
6513	Multifamily Buildings	20	2	7	4	1	1	0	0	0	0	29	6
7011	Hotels	79	9	2	1	2	4	1	5	0	0	84	20
7211	Laundries	3	0.2	0	0	0	0	0	0	0	0	3	0.2
7374	Data Centers	4	1	0	0	1	1	0	0	0	0	5	2
7542	Car Washes	1	0.1	0	0	0	0	0	0	0	0	1	0.1
7832	Movie Theaters	0	0	0	0	0	0	0	0	0	0	0	0
7991	Health Clubs	9	1	0	0	0	0	0	0	0	0	9	1
7997	Golf/Country Clubs	21	2	0	0	0	0	0	0	0	0	21	2
8051	Nursing Homes	91	9	0	0	0	0	0	0	0	0	91	9
8062	Hospitals	31	9	12	8	21	36	1	6	0	0	65	59
8211	Schools	60	7	0	0	0	0	0	0	0	0	60	7
8221	College/Univ.	23	4	4	3	10	21	6	47	0	0	43	75
8412	Museums	3	0.4	0	0	0	0	0	0	0	0	3	0.4
9100	Government Buildings	80	10	2	1	3	5	1	6	0	0	86	23
9223	Prisons	9	1	2	2	6	9	0	0	0	0	17	13
9711	Military	5	1	1	1	1	2	0	0	0	0	7	4
	Total	**1,083**	**114**	**170**	**76**	**79**	**100**	**9**	**64**	**0**	**0**	**1,342**	**354**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	1	0.1	0	0	0	0	0	0	0	0	1	0.1
13	Oil and Gas Extraction	2	0.5	2	2	3	5	0	0	0	0	7	7
28	Chemicals	1	0.3	0	0	0	0	0	0	0	0	1	0.3
29	Petroleum Refining	0	0	0	0	1	3	0	0	0	0	1	3
32	Stone/Clay/Glass	0	0	0	0	1	3	1	15	0	0	2	18
33	Primary Metals	0	0	0	0	0	0	1	6	1	113	2	119
	Total	**4**	**1**	**2**	**2**	**5**	**11**	**2**	**21**	**1**	**113**	**14**	**148**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no known CHP technical potential at existing district energy loops in West Virginia.

Wisconsin

- Wisconsin has 3,474 MW of overall CHP capacity identified at 7,008 sites.
  - 1,783 MW of industrial on-site CHP potential, primarily in the paper, chemicals, food, lumber and wood, and rubber/plastics sectors.
  - 1,346 MW of commercial on-site CHP potential, primarily in the commercial (office) buildings, colleges/universities, government buildings, hospitals, and hotels sectors.
- Wisconsin has 57 MW of WHP CHP potential identified at 15 sites in the food, chemicals, refining, stone/clay/glass, primary metals and machinery sectors.
- Wisconsin has 287 MW of CHP potential identified at 2 district energy sites.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	1,329	255	248	180	255	532	62	554	9	262	1,903	1,783
Commercial Topping Cycle CHP	3,979	401	776	345	306	340	26	223	1	37	5,088	1,346
WHP CHP	1	0.1	1	1	9	24	4	32	0	0	15	57
District Energy CHP	0	0	0	0	0	0	0	0	2	287	2	287
Total	**5,309**	**656**	**1,025**	**527**	**570**	**895**	**92**	**810**	**12**	**586**	**7,008**	**3,474**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0
13	Oil and Gas Extraction	0	0	0	0	0	0	0	0	0	0	0	0
20	Food	322	68	75	58	66	131	11	93	2	51	476	402
22	Textiles	12	3	5	4	10	20	0	0	0	0	27	28
24	Lumber and Wood	229	43	34	23	29	55	2	15	1	22	295	159
25	Furniture	6	0.5	0	0	0	0	0	0	0	0	6	0
26	Paper	89	23	26	19	44	110	21	218	4	131	184	501
27	Printing	24	3	1	1	0	0	0	0	0	0	25	4
28	Chemicals	142	27	42	29	55	120	22	173	2	58	263	407
29	Petroleum Refining	0	0	4	3	8	18	1	12	0	0	13	33
30	Rubber/Misc Plastics	281	46	35	24	14	22	0	0	0	0	330	93
32	Stone/Clay/Glass	4	1	1	1	4	9	2	13	0	0	11	24
33	Primary Metals	58	13	16	12	13	30	4	40	0	0	91	95
34	Fabricated Metals	81	12	1	1	1	1	2	17	0	0	85	31
35	Machinery/Computer Equip.	24	4	0	0	6	16	0	0	0	0	30	20
37	Transportation Equip.	41	7	9	7	13	20	1	6	0	0	64	39
38	Instruments	1	0.3	0	0	1	4	0	0	0	0	2	4
39	Misc. Manufacturing	16	3	0	0	0	0	0	0	0	0	16	3
49	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**1,330**	**255**	**249**	**181**	**264**	**556**	**66**	**586**	**9**	**262**	**1,918**	**1,840**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	11	1	0	0	0	0	0	0	0	0	11	1
52	Retail	421	55	11	7	5	8	0	0	0	0	437	70
4222	Refrigerated Warehouses	18	3	1	1	0	0	0	0	0	0	19	3
4581	Airports	4	1	1	1	1	1	1	7	0	0	7	10
4952	Waste Water Treatment Plants	21	3	0	0	0	0	0	0	0	0	21	3
4961	District Energy	0	0	0	0	0	0	0	0	2	287	2	287
5411	Food Stores	241	45	5	3	0	0	0	0	0	0	246	48
5812	Restaurants	284	26	2	1	1	1	0	0	0	0	287	29
6512	Commercial Office Buildings	1,358	68	594	238	170	102	0	0	0	0	2,122	408
6513	Multifamily Buildings	181	14	66	33	10	10	0	0	0	0	257	57
7011	Hotels	301	33	16	10	14	24	1	5	0	0	332	73
7211	Laundries	25	4	1	1	0	0	0	0	0	0	26	4
7374	Data Centers	44	7	3	2	7	13	1	11	0	0	55	32
7542	Car Washes	27	3	0	0	0	0	0	0	0	0	27	3
7832	Movie Theaters	1	0.1	0	0	0	0	0	0	0	0	1	0.1
7991	Health Clubs	36	4	1	1	1	1	0	0	0	0	38	6
7997	Golf/Country Clubs	142	16	0	0	0	0	0	0	0	0	142	16
8051	Nursing Homes	287	36	15	10	2	2	0	0	0	0	304	48
8062	Hospitals	85	20	21	13	39	65	1	5	0	0	146	103
8211	Schools	200	16	0	0	0	0	0	0	0	0	200	16
8221	College/Univ.	46	9	7	5	21	61	16	152	1	37	91	263
8412	Museums	13	2	1	1	0	0	0	0	0	0	14	3
9100	Government Buildings	207	31	25	17	23	34	5	34	0	0	260	117
9223	Prisons	23	5	4	3	11	15	0	0	0	0	38	23
9711	Military	3	1	2	2	1	2	1	9	0	0	7	13
	Total	**3,979**	**401**	**776**	**345**	**306**	**340**	**26**	**223**	**3**	**324**	**5,090**	**1,633**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
20	Food	1	0.1	0	0	0	0	0	0	0	0	1	0.1
28	Chemicals	0	0	0	0	1	2	0	0	0	0	1	2
29	Petroleum Refining	0	0	0	0	1	3	0	0	0	0	1	3
32	Stone/Clay/Glass	0	0	1	1	4	9	2	13	0	0	7	23
33	Primary Metals	0	0	0	0	2	6	2	19	0	0	4	25
35	Machinery	0	0	0	0	1	4	0	0	0	0	1	4
	Total	**1**	**0.1**	**1**	**1**	**9**	**24**	**4**	**32**	**0**	**0**	**15**	**57**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	District Energy Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
4961	Current Loops without CHP	0	0	0	0	0	0	0	0	0	0	0	0
4961	Current Loops with CHP expansion	0	0	0	0	0	0	0	0	2	287	2	287
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**287**	**2**	**287**

Wyoming

- Wyoming has 847 MW of overall CHP capacity identified at 609 sites.
  - 641 MW of industrial on-site CHP potential, primarily in the chemicals, refining, gas processing, food, and primary metals sectors.
  - 115 MW of commercial on-site CHP potential, primarily in the colleges/universities, commercial (office) buildings, hospitals, hotels, and government buildings sectors.
- Wyoming has 91 MW of WHP CHP potential identified at 38 sites in the mining, oil and gas extraction, refining and stone/clay/glass sectors.
- There is no CHP district energy potential identified in Wyoming.

Table 1: Overall CHP Technical Potential

	50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
Industrial Topping Cycle CHP	54	10	16	12	32	70	5	48	4	501	111	641
Commercial Topping Cycle CHP	384	42	55	28	19	22	2	22	0	0	460	115
WHP CHP	11	2.7	2	1	18	36	7	51	0	0	38	91
District Energy CHP	0	0	0	0	0	0	0	0	0	0	0	0
Total	**449**	**55**	**73**	**42**	**69**	**128**	**14**	**121**	**4**	**501**	**609**	**847**

Table 2: All Industrial CHP Technical Potential (Including Topping Cycle CHP and WHP CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Industrial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	1	1	2	13	0	0	3	14
13	Oil and Gas Extraction	11	3	2	1	12	23	3	18	0	0	28	45
20	Food	7	1	1	1	4	7	0	0	0	0	12	8
22	Textiles	0	0	0	0	0	0	0	0	0	0	0	0
24	Lumber and Wood	15	3	1	1	1	1	0	0	0	0	17	5
25	Furniture	0	0	0	0	0	0	0	0	0	0	0	0
26	Paper	0	0	0	0	0	0	0	0	0	0	0	0
27	Printing	2	0.2	0	0	0	0	0	0	0	0	2	0.2
28	Chemicals	7	2	2	2	4	6	2	26	3	475	18	510
29	Petroleum Refining	0	0	5	4	14	34	4	36	1	26	24	101
30	Rubber/Misc Plastics	4	1	0	0	0	0	0	0	0	0	4	1
32	Stone/Clay/Glass	1	0.1	0	0	3	8	0	0	0	0	4	8
33	Primary Metals	3	1	2	1	1	3	0	0	0	0	6	5
34	Fabricated Metals	0	0	0	0	0	0	0	0	0	0	0	0
35	Machinery/Computer Equip.	0	0	0	0	0	0	0	0	0	0	0	0
37	Transportation Equip.	1	0.1	0	0	0	0	0	0	0	0	1	0.1
38	Instruments	0	0	0	0	0	0	0	0	0	0	0	0
39	Misc. Manufacturing	0	0	0	0	0	0	0	0	0	0	0	0
49	Gas Processing	14	3	5	4	10	23	1	6	0	0	30	35
	Total	**65**	**13**	**18**	**14**	**50**	**106**	**12**	**99**	**4**	**501**	**149**	**733**

Table 3: All Commercial CHP Technical Potential (Including Topping Cycle CHP, WHP CHP and District Energy CHP)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	Commercial Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
43	Post Offices	2	0.2	0	0	0	0	0	0	0	0	2	0.2
52	Retail	36	5	2	1	0	0	0	0	0	0	38	6
4222	Refrigerated Warehouses	0	0	0	0	0	0	0	0	0	0	0	0
4581	Airports	3	1	0	0	0	0	0	0	0	0	3	1
4952	Waste Water Treatment Plants	0	0	0	0	0	0	0	0	0	0	0	0
4961	District Energy	0	0	0	0	0	0	0	0	0	0	0	0
5411	Food Stores	26	3	0	0	1	2	0	0	0	0	27	5
5812	Restaurants	26	2	1	1	0	0	0	0	0	0	27	3
6512	Commercial Office Buildings	103	5	32	13	8	5	0	0	0	0	143	23
6513	Multifamily Buildings	4	0.3	2	1	0	0	0	0	0	0	6	1
7011	Hotels	63	8	3	2	1	1	0	0	0	0	67	11
7211	Laundries	4	1	0	0	0	0	0	0	0	0	4	1
7374	Data Centers	4	0.3	0	0	0	0	0	0	0	0	4	0.3
7542	Car Washes	1	0.1	0	0	0	0	0	0	0	0	1	0.1
7832	Movie Theaters	1	0.1	0	0	0	0	0	0	0	0	1	0.1
7991	Health Clubs	5	0.4	0	0	0	0	0	0	0	0	5	0.4
7997	Golf/Country Clubs	8	1	0	0	0	0	0	0	0	0	8	1
8051	Nursing Homes	20	3	0	0	0	0	0	0	0	0	20	3
8062	Hospitals	18	4	9	6	5	7	0	0	0	0	32	18
8211	Schools	3	0.2	0	0	0	0	0	0	0	0	3	0.2
8221	College/Univ.	2	1	3	2	4	7	1	15	0	0	10	25
8412	Museums	4	1	0	0	0	0	0	0	0	0	4	1
9100	Government Buildings	46	6	2	2	0	0	0	0	0	0	48	8
9223	Prisons	4	1	1	1	0	0	0	0	0	0	5	1
9711	Military	1	0.5	0	0	0	0	1	6	0	0	2	7
	Total	**384**	**42**	**55**	**28**	**19**	**22**	**2**	**22**	**0**	**0**	**460**	**115**

Sub-Table 1.1: Waste Heat to Power CHP Technical Potential (Subset of Total CHP Technical Potential)

		50-500 kW		0.5 - 1 MW		1 - 5 MW		5 - 20 MW		> 20 MW		Total	
SIC	WHP CHP Business Type	Sites	50-500 kW (MW)	Sites	0.5-1 MW (MW)	Sites	1-5 MW (MW)	Sites	5-20 MW (MW)	Sites	>20 MW (MW)	Total Sites	Total MW
12	Mining, Except Oil and Gas	0	0	0	0	1	1	2	13	0	0	3	14
13	Oil and Gas Extraction	11	3	2	1	12	23	3	18	0	0	28	45
29	Petroleum Refining	0	0	0	0	3	7	2	20	0	0	5	27
32	Stone/Clay/Glass	0	0	0	0	2	6	0	0	0	0	2	6
	Total	**11**	**3**	**2**	**1**	**18**	**36**	**7**	**51**	**0**	**0**	**38**	**91**

Sub-Table 1.2: District Energy CHP Technical Potential (Subset of Total CHP Technical Potential)

There is no known CHP technical potential at existing district energy loops in Wyoming.