

CHP AND THE CLEAN ENERGY FUTURE

How CHP Fits into a Modern Electric Grid and a Green Gas System

Combined heat and power (CHP) systems are an important part of our nation's energy future as we collectively seek energy resources that are cleaner, reliable, and more resilient.

The electric grid of the future will connect more distributed resources, will include more microgrids, and will be less carbon intensive. CHP systems are an integral part of the grid of the future, providing energy close to where it is consumed, enhancing resiliency, and reducing emissions.

The gas system of the future will be greener as well, incorporating more clean fuels such as renewable natural gas (RNG) and clean hydrogen. CHP systems are an important part of this system too, as they can use these clean fuels efficiently, requiring less fuel inputs to achieve the same energy outputs.

CHP is an integral component of both the electric grid of the future and a future greener gas system. CHP is a clean, reliable, and resilient energy resource that can help governments, utilities, businesses, institutions, and communities meet their energy system goals, including reducing emissions, saving money, maintain energy reliability, and improving resiliency in the face of a changing climate.

Attributes of CHP systems make this technology uniquely qualified to provide cleaner, reliable, and more resilient electric and thermal energy resources, including:

- In almost all regions of the U.S., CHP systems installed through 2035 and operating through 2050 are expected to cause a net reduction in carbon emissions over their system life.
- Properly designed CHP systems typically operate with an overall efficiency of 65-85 percent.
- CHP systems require less fuel inputs for the same energy outputs, saving money and reducing emissions.
- CHP can be integrated with other clean resources, including as part of a net-zero energy facility.
- CHP is the backbone of many microgrids, and used in 67% of continuously operating microgrids in the U.S.
- Flexible CHP systems can provide generating capacity to the utility electric grid when demand increases or intermittent renewable resources are not available.
- Renewable and lower-carbon fuel technologies such as RNG and hydrogen can serve as the primary fuel source for CHP systems.

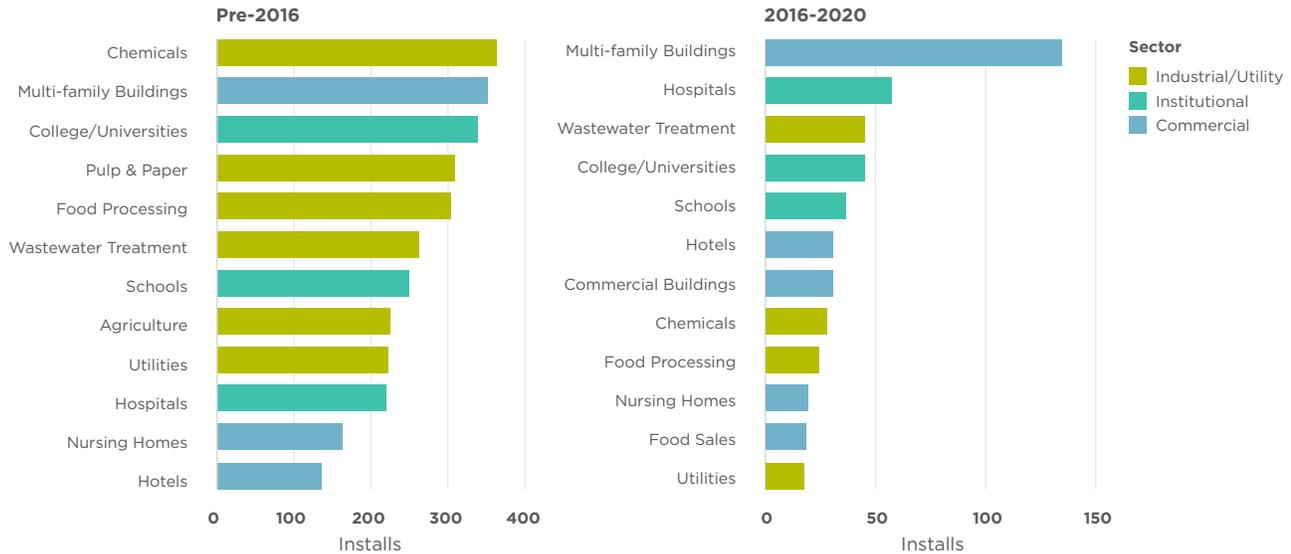
The grid of the future will connect more distributed resources, include more microgrids, and be less carbon intensive. CHP systems are an integral part of this future grid.

The gas system of the future has the potential to be less carbon-intensive.



Current trends in the CHP market may continue as more entities seek to maintain energy reliability while reducing their emissions. There has been growing activity in non-traditional CHP markets, including light industrial, commercial, institutional, and multi-family locations, as can be seen in Figure 1.

FIGURE 1. Top Market Sectors for CHP — Pre-2016 vs. 2016-2020 (Installs)



David Jones, ICF, "CHP State of the Market," National Summit on CHP, State of the Market panel, September 13, 2021.

Learn more by reading the full report, [CHP and the Clean Energy Future: How CHP Fits into a Modern Electric Grid and a Green Gas System.](#)

