

U.S. Department of Energy "CHP Challenge"

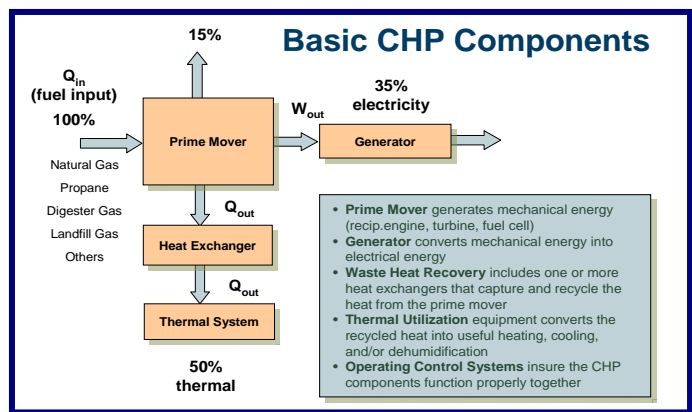
What is CHP?

A Combined Heat and Power (CHP) system is a form of Distributed Generation (DG) and is defined as:

- ✚ an integrated system
- ✚ generates at least a portion of the electricity requirements of a building, facility, and/or campus
- ✚ recycles the thermal energy exhausted from the electric generation equipment to provide:
 - space heating / cooling
 - process heating / cooling
 - dehumidification
 - domestic hot water

These systems utilize commercially available state of the art technologies, and if properly sized and installed can provide:

- ✚ Reduced Energy Costs
- ✚ Improved Power Reliability
- ✚ Improved Power Quality
- ✚ Increased Energy Efficiency
- ✚ Improved Environmental Quality



U.S. Department of Energy CHP Challenge

The U.S. DOE established a national challenge to double the installed capacity of CHP in the U.S. by the year 2010. The base year established by DOE for the challenge was 1998 with a starting CHP installation capacity of 46,000 MW. The challenge is to reach 92,000 MW of installed CHP capacity by the year 2010.

National Installed CHP Statistics (Fall 2008):

- Over 85,200 MW of installed CHP capacity
- Approximately 3,300 sites
- Represents about 8% of the U.S. generating capacity and 12% of U.S. annual power generation
- Saving the U.S. over 3 Quads of fuel each year
- Eliminates over 400 million tons of CO₂ emissions each year
- Industrial applications represent about 80% of the existing CHP capacity
- Over 50% of the CHP installations are in the Commercial & Institutional market sectors

As of the fall of 2008, the Midwest Region is approaching its targeted contribution to the National CHP Challenge goals:

Midwest CHP Challenge Status	
	Estimated Installed Capacity
1998 (Base Year)	6 GW
2008 (Most Current Status)	10.6 GW
2010 (Challenge Goal Midwest)	12 GW

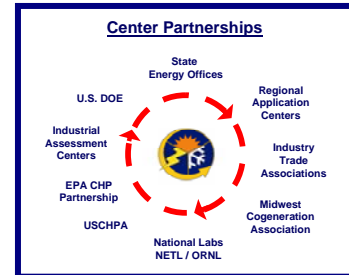
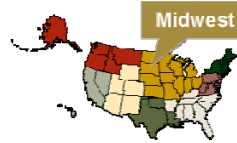
Organizations Advancing CHP Concepts and Technologies in the Midwest

Midwest CHP Application Center

In 2001, the U.S. Department of Energy established the first of its kind CHP Application Center at the University of Illinois at Chicago, Energy Resources Center. The mission of the Midwest CHP Application Center is to develop technology application knowledge and the educational infrastructure necessary to foster CHP as a viable energy option in the Midwest and reduce any perceived risks associated with its implementation through Targeted Education, Unbiased Information, and Technical Assistance.

The twelve state Midwest Region includes:

- Illinois
- Indiana
- Iowa
- Kansas
- Missouri
- Nebraska
- North Dakota
- Ohio
- Michigan
- Minnesota
- South Dakota
- Wisconsin



For Further Information

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NiSource Energy Technologies

NET primarily markets and sells power generation systems to commercial and small industrial customers. These small, onsite generating systems enhance power quality, improve reliability, and operate with or without the local electric utility grid. In fact, NETS experience with CHP systems includes the world's first grid-isolated commercial application.

The NiSource heritage provides NET with several competitive strengths in the DG marketplace. These strengths include:

- Access to more than 3 million energy distribution customers.
- Over 5,880 miles of gas distribution pipeline extending from offshore in the Gulf of Mexico to Lake Erie, New York, and the eastern seaboard.
- Operating experience in both gas and electric distribution.
- Generation and risk management expertise.



For Further Information

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Microturbine CHP Installations by Nisource Energy Technologies

Vestil Manufacturing

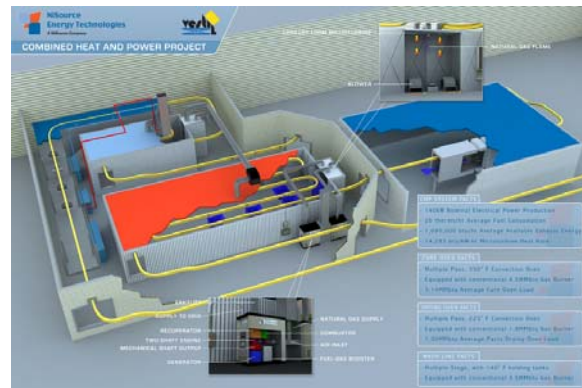
Date Installed: June 2005

Location: Angola, Indiana

Customer Description: Vestil Manufacturing is an industry leader in the manufacturing and distributing of materials-handling equipment, Providing a complete product range at competitive pricing.

Major Equipment: (2) 70 kW Ingersoll-Rand Microturbines, (2) Direct Vent Heat Recovery Systems, (1) Thermal Fluid Loop, and (1) Custom Designed Heat Exchanger

CHP Application: This CHP system boasts two natural gas-fired power sources which operate in parallel with the utility grid, offsetting an average of 140 kW of monthly billing demand and 24,000 kW-hr of plant power consumption each month. To increase CHP system efficiency, the 450°F engine exhaust streams are routed directly to the intake plenum of the circulating blower inside the 350°F powder coat cure oven. In an effort to further improve plant efficiency, additional heat energy from the cure oven and dryoff oven exhaust streams is being captured for use at adjacent plant processes.



Manchester Tank

Date Installed: March 2005

Location: Elkhart, Indiana

Customer Description: Manchester Tank, Elkhart, Indiana, is a privately-held leading manufacturer of low-pressure vessels for propane, air, refrigerant, and industrial applications in North America and Australia.

Major Equipment: (1) 70 kW Ingersoll-Rand Microturbine, (1) Direct Vent Heat Recovery System, and (1) 130 kW Ingersoll-Rand Backup Generator

CHP Application: System features a natural gas-fueled power source, operating in parallel with the utility grid and offsetting an average of 70 kW of monthly billing demand and 16,000 kW-hr of plant power consumption each month. To boost CHP system efficiency, the 450°F engine exhaust stream is routed directly to the intake plenum of the circulating blower inside the 400°F powder coat cure oven. In order to provide the customer with emergency standby power to critical plant processes, a 130 kW natural gas-fueled backup generator is installed at the main electric distribution panel.

