

Combined Heat and Power

Efficient Energy for Local Governments

Local governments are using combined heat and power (CHP) to reduce their operating costs, provide a hedge against volatile energy costs, increase their energy efficiency, and reduce emissions of greenhouse gases and other pollutants from the combustion of fossil fuel.

Is My Facility a Good Candidate for CHP?

If you answer "yes" to 3 or more of these of these questions, your facility may be good candidate for CHP.

- Do you pay more than \$0.06/kilowatt hour (kWh) on average for electricity (including generation, transmission, and distribution)?
- Are you concerned about the impact of current or future energy costs?
- Is your facility located in a deregulated electricity market?
- Are you concerned about power reliability?
- Does your facility operate more than 5,000 hours per year?
- Do you have thermal loads throughout the year (including steam, hot water, chilled water, process heat, etc.)?

What Is CHP?

CHP, also referred to as cogeneration, is an efficient, clean, and reliable approach to generating electric power and useful thermal energy from a single fuel source. CHP systems achieve fuel-use efficiencies of 60 to 80 percent, compared to average fossil-fueled power plant efficiencies of 33 percent in the United States. This significant efficiency benefit occurs because CHP applications involve the recovery of otherwise wasted heat to produce additional power or useful thermal energy for heating, cooling, or other mechanical processes. By making use of the waste heat from onsite electricity production, CHP increases energy efficiency and decreases energy costs.

CHP is not a specific technology, but an application of technologies to meet an energy user's needs. These technologies include reciprocating engines, combustion or gas turbines, steam turbines, microturbines, or fuel cells as the prime mover and fossil fuels, biomass, or biogas as the fuel source. The thermal energy from CHP systems can be used in direct process applications or indirectly to produce steam, hot water, hot air for drying, or chilled water for process cooling.

Where Can Local Governments Use CHP?

Local government facilities can utilize CHP systems in:

- Wastewater treatment facilities
- Landfills
- Government buildings
- District energy systems
- K-12 schools and community colleges
- Hospitals and health centers

What Is the EPA CHP Partnership?

The U.S. Environmental Protection Agency (EPA) CHP Partnership is a voluntary EPA-industry effort designed to foster cost-effective CHP projects. The goal of the CHP Partnership is to build relationships among EPA, the CHP industry, state and local governments, and other stakeholders to expand the use of CHP.

Through 2006, CHP Partners installed more than 3,550 megawatts (MW) of CHP with Partnership assistance. The resulting carbon dioxide emission savings



are equivalent to removing the annual emissions of more than 1.7 million automobiles.

What Resources Are Available?

Education and Outreach

The CHP Partnership provides information for regulators, policymakers, and utilities to encourage energy efficiency and CHP, as well as peer-to-peer marketing and networking at workshops and conferences. Models of state policies for promoting CHP, such as output-based emission regulations, CHP-friendly utility rates, and renewable portfolio standards that include CHP are also maintained online and in various Partnership publications.

Technical Assistance

The CHP Partnership has developed services and tools to assist those considering implementing CHP at their facilities. Visit the **Streamlining Project Development** pages of the Partnership Web site at www.epa.gov/chp/project-development/index.html to learn more about the CHP project development process, whom to involve on your CHP project team, typical options for system financing, and other services EPA provides.

Project Resources

Take advantage of the CHP Partnership's up-to-date lists of state and federal incentives (e.g., rebates, tax credits, loans, grants) for CHP, along with lists of regulatory rules and rates that are advantageous to clean distributed generation. This information is updated monthly on the **Funding Resources** pages of the Partnership Web site at: www.epa.gov/chp/funding/funding.html.

Public Recognition

EPA's ENERGY STAR CHP Award recognizes highly efficient CHP projects that achieve fuel and emission savings over comparable state-of-the-art separate heat and power. EPA accepts award applications continuously and presents these awards at key events. For more information on applying for an ENERGY STAR CHP Award, visit www.epa.gov/chp/public-recognition/awards.html.

CHP in Use in Local Governments

More than 800 municipal governments currently use CHP, generating over 6,300 MW of electricity. The following case studies from local governments provide examples of recent successful CHP installations.

District Energy Saint Paul

St. Paul, Minnesota

District Energy Saint Paul's 25 MW CHP plant captures the waste heat from a wood-fired power plant, reducing District Energy's reliance on coal by 80 percent, soot emissions by 50 percent, and greenhouse gas emissions by 280,000 tons each year. The resulting carbon dioxide emission savings are equivalent to removing the annual emissions of more than 200,000 automobiles. The CHP plant heats more than 170 buildings and 300 single-family homes, representing over 29 million square feet of building space, or about 80 percent of Saint Paul's central business district. The reduced energy use saves customers \$32 million each year, and the savings increase as natural gas prices rise.

The plant was completed in 2003 and uses urban wood waste as a fuel source, thereby diverting items from the local waste stream.

Essex Junction Wastewater Treatment Facility

Essex Junction, Vermont

Essex Junction's wastewater treatment facility uses two 30 kilowatt (kW) microturbines to generate electricity and thermal energy from the methane gas produced by its digester. Before CHP was installed, the plant used only half of the methane it produced. Now the plant uses 100 percent of the methane produced to heat the anaerobic digester, saving 412,000 kWh and \$37,000 each year. These energy savings represent 36 percent of the facility's electricity demand. The project has an estimated payback of seven years.

For more information about the EPA CHP Partnership, including how to join, contact:



Tom Frankiewicz
Program Manager

Tel.: (202) 343-9794

Fax: (202) 343-2208

E-mail: frankiewicz.thomas@epa.gov

Web site: www.epa.gov/chp

