

CHP: Energy Efficiency Strategy for Local Governments

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

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 \$0.07/kilo-watt hour (kWh) on average for electricity (including generation, transmission, and distribution)?
- Are you concerned about the impact of current or future energy costs?
- Do you have thermal loads throughout the year (including steam, hot water, chilled water, process heat, etc.)?
- Are you concerned about power reliability?
- Does your facility operate more than 5,000 hours per year?
- Do you expect to expand your facility; build a new facility; or replace, upgrade, or retrofit your central plant equipment in the next 3-5 years?

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 50 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 single technology, but an integrated energy system that can be modified depending on the end-user’s needs. CHP provides on-site generation of electrical and/or mechanical power; waste-heat recovery for heating, cooling, and/or process needs; and seamless system integrations for a variety of technologies, thermal applications, and fuel types into the existing building infrastructure.

Where Can Local Governments Use CHP?

Local government facilities can utilize CHP systems in:

- Wastewater treatment facilities;
- Government buildings, including detention facilities, office buildings, community centers, etc;
- District energy systems;
- K-12 schools and community colleges;
- Hospitals and health centers; and
- Landfills

What Is the EPA CHP Partnership?

The U.S. Environmental Protection Agency (EPA) CHP Partnership is a voluntary public/private 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 2009, the Partnership has helped install more than 460 projects representing 4,850 megawatts (MW) of capacity. The resulting carbon dioxide



emission savings are equivalent to removing the annual emissions of more than 2.3 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 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 bi-weekly on the **Funding Resources** pages of the Partnership Web site.

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. More information on applying for an ENERGY STAR CHP Award is available on the Partnership Web site.

CHP in Use in Local Governments

More than 800 municipal governments currently use CHP, generating over 5,600 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 EPA's CHP Helpline at (703) 373-8108 or chp@epa.gov.

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