Local Government Resources for Clean Energy and GHG Reductions

Emma L. Zinsmeister

U.S. EPA State and Local Climate and Energy Program

Combined Heat and Power Partnership Webcast

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U.S. EPA's State and Local Climate and Energy Program

Bridging the Gap Across Environment and Energy Decision-Making

State and Local Climate and Energy Program

Helping state and local governments reduce GHGs

- We use co-benefits strategies to achieve GHG and policy goals
  - Environmental, energy, economic, health benefits
  - Example: EE/RE/CHP can lower costs to comply with air standards
- We foster inter-agency collaboration
  - States – air offices, energy offices, PUCs
  - Locals – planning, environmental services, energy and many other related departments
- We help state and local governments make the case for action
  - Best practice-based policy approaches
  - Analytical tools and information
  - Communications resources including peer exchanges, lessons learned
- **All our resources are available at:**

  www.epa.gov/statelocalclimate

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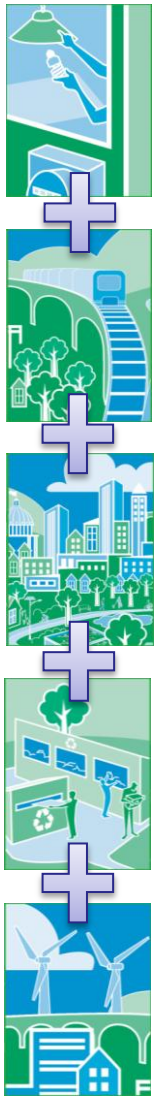
Resources for local governments

- Climate Showcase Communities www.epa.gov/climateshowcase
  - 50 models of local climate change action
  - Case studies, templates, and other resources to support replication
- Key Guidance and Tools
  - Comprehensive Local Climate and Energy Website www.epa.gov/statelocalclimate
  - ★ **Local Government Climate and Energy Strategy Series** on EE, RE, transportation, waste management, and community design topics www.epa.gov/statelocalclimate/web-podcasts/local-webcasts.html
  - Newsletter updates on new funding opportunities, tools, and events www.epa.gov/statelocalclimate/web-podcasts/local-webcasts.html
  - Access to other federal technical support programs
- Peer Exchanges
  - Local Climate and Energy Webcast Series on mitigation and adaptation topics http://www.epa.gov/statelocalclimate/web-podcasts/index.html

Local Climate and Energy Strategy Series

Guides for Developing and Implementing GHG Reductions

State and Local Climate and Energy Program



Energy Efficiency
K-12 Schools, Affordable Housing, Local Government Operations, Water & Wastewater Facilities, Combined Heat and Power, Product Procurement

Transportation
Transportation Control Measures

Community Planning & Design
Smart Growth

Solid Waste & Materials Management
Resource Conservation & Recovery

Renewable Energy
Green Power Procurement, On-Site Renewable Energy Generation, Landfill Gas Energy

Comprehensive Climate Change Mitigation for Local Governments

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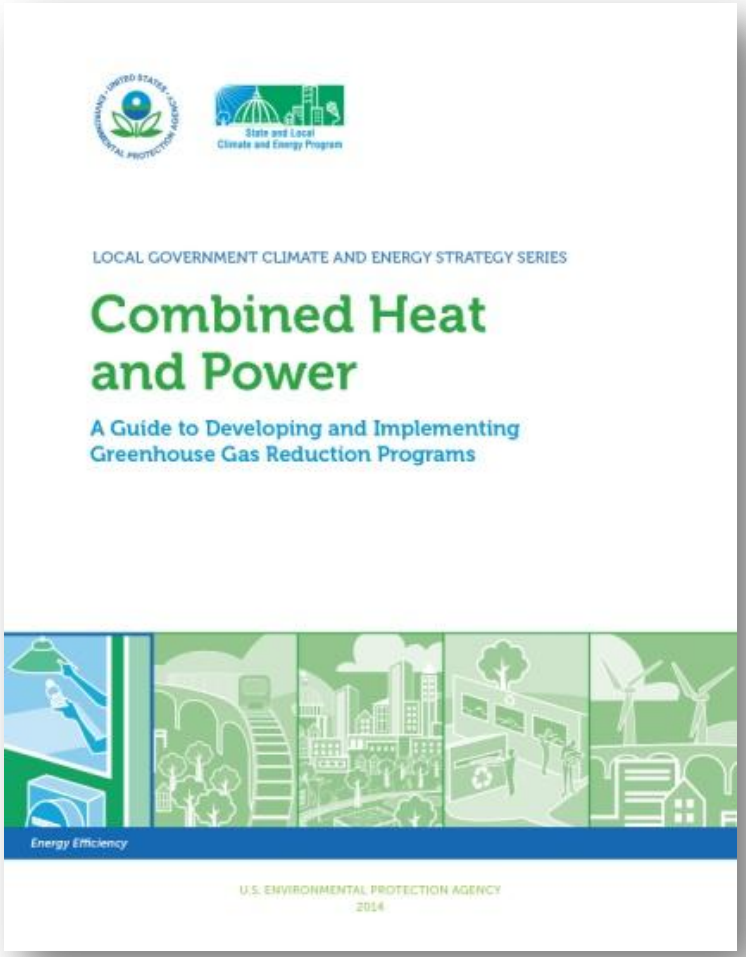
U.S. EPA Guide for Local Governments on Reducing Greenhouse Gas Emissions through CHP

State and Local Climate and Energy Program

- Comprehensive information for local government staff and policy makers on:
  - Local government CHP applications
  - Environmental, energy, and economic benefits
  - Steps for designing procurement plans/installations
  - Key stakeholders to engage
  - Policy mechanisms for initiating programs
  - Implementation strategies for success
  - Costs and funding opportunities
- Key features:
  - Case studies and examples from communities across the United States
  - Links to technical resources, analytical tools, and sources of funding
- Part of EPA's Local Government Climate and Energy Strategy Series
  - http://www.epa.gov/statelocalclimate/resources/strategy-guides.html



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Example Guide Content

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CHP SYSTEM CONFIGURATIONS

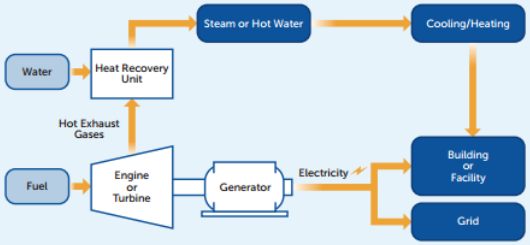
CHP systems consist of a number of individual components—prime mover (heat engine), generator, heat recovery, and electrical interconnection—configured into an integrated whole. Every CHP application involves the recovery of otherwise-wasted thermal energy to produce useful thermal energy or electricity.

CHP systems can be configured either as a topping or a bottoming cycle, as explained below.

In a typical topping cycle system, fuel is burned in a prime mover such as a gas turbine or reciprocating engine to generate electricity. Energy normally lost in the prime mover's hot exhaust and cooling systems is instead recovered to provide heat for industrial processes (such as petroleum refining or food processing); hot water (e.g., for laundry or dishwashing); or for space heating, cooling, and dehumidification.

In a bottoming cycle system, also referred to as "waste heat to power," fuel is burned to provide thermal input to a furnace or other industrial process, and heat rejected from the process is then used to produce electricity.

The graphic below demonstrates the configuration of a typical topping cycle gas turbine CHP.



Source: U.S. EPA, 2011a, 2013a.

PROFILE: BOSTON, MA

Area: 48 square miles

Population: 636,000 (2012)

Structure: Boston residents elect a mayor every four years, and the mayor can serve for multiple terms. Members of the Boston City Council are elected every two years. Boston's Environment Department and the Environmental and Energy Services Cabinet coordinate activities for promoting CHP.

Program Scope: Boston's Environment Department and the Environmental and Energy Services Cabinet work with local businesses and public entities to provide technical assistance and information on CHP technologies. The Boston Housing Authority has also installed CHP systems under programs to promote energy efficiency.

Program Creation Mechanism: In 2007, Boston adopted a Climate Action Plan, and the mayor issued an executive order requiring all existing municipal properties to evaluate the feasibility of installing CHP and certain other technologies. The City of Boston has also worked on improving interconnection standards for distributed generation, including CHP.

Program Results: Since 2000, 11 CHP systems have been installed in Boston, with a combined capacity of 2 MW. Two sites serve public facilities (a jail and a multifamily housing building), and nine serve private facilities.

CHP PROJECT DEVELOPMENT

Planning, installing, and operating CHP systems requires attention to many implementation issues. These issues can be addressed in five steps:

- **Qualification assessment.** At the initial planning stage of project, it is important to determine whether CHP is appropriate for the site in consideration. Many technical and economic factors must be considered, such as electricity and thermal energy demand and source fuel availability.
- **Level 1 feasibility analysis.** Goals at this stage include identifying project goals and potential barriers, and quantifying technical and economic opportunities.
- **Level 2 feasibility analysis.** Goals at this stage include optimizing CHP system design, accounting for capacity, thermal output, and operation needs. This stage should also involve final CHP system pricing and a determination of expected investment return.
- **Procurement.** This stage involves selecting a qualified contractor or developer, financing the project, and ensuring and recording compliance with siting and permitting requirements.
- **Operations and maintenance.** This stage involves maintaining a CHP system so that it continues to provide expected energy savings and emission reductions.

The EPA Combined Heat and Power Partnership has developed tools and resources, including a Spark Spread Estimator and a CHP Project Development Handbook, to assist with each of these stages in the CHP project development process. Local governments can find these resources on the CHP Partnership Website: ***http://www.epa.gov/chp/project-development/index.html***.

Source: U.S. EPA, 2013h.

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Contact Information

Emma Zinsmeister, MPH CPH

Lead Local Climate Strategy Analyst

U.S. Environmental Protection Agency

State and Local Climate and Energy Program

zinsmeister.emma@epa.gov