

Combined Heat & Power Overview

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Agenda

- Barriers to CHP
- Characteristics of Good Opportunities
- CHP Installation Examples
- RAC Program & Resources Available

Leading Barriers to CHP Development

- **Utility resistance**
 - Excessive interconnection requirements
 - Special rates for potential users
- **Fuel price uncertainty**
- **Poor “spark spread”**
- **Permitting/siting issues**
- **Environmental regulatory treatment**

Barriers Specific to Multi-Family CHP

- Decision makers unfamiliar with CHP
- Sub-metering issues
 - Utility meters in each residence
 - Thermal energy cost allocation
- Utility tariffs
 - High standby charges
 - Interconnection charges
- Limited availability of small CHP systems
- Underdeveloped sales/service infrastructure for small CHP
- Lack of O&M resources on-site

Characteristics of Good Applications

Good residential applications have 1 or more of the following characteristics:

- High electric rates & low fuel costs
- Larger load/complex size – which yields lower first cost per kW
 - Minimum feasible size is around 100 units
 - Larger complexes tend to have more common areas /facilities (laundromat, pool, health club)
- Long operating hours
- Master metering
- Central heating and/or cooling plant – need thermal loads
- Need to replace/upgrade HVAC system
- Opportunity fuel available (neighboring facility)
- Want more reliable power supply

Representative Installations



Trent Center East -- Trenton, N.J.

- 14 story building opened in 1965
- 225 units HUD senior housing
- Two 70 kW packaged units installed in 2002
- Absorption chiller powered with steam from boiler
- \$250,000 investment
- 50% electricity & all DHW
- Shared savings project
- Payback period is 4-5 yrs



Wooster Manor – Danbury, CT



- 100 unit, all electric public housing complex built 1970's
- Converted 3 floors to hot water & installed 60kW system in 1998
- CHP system provides 66% of electricity, 50% of space heat and all DHW
- Energy cost reduced by \$40,000 annually
- Installed & maintained under energy performance contract
- Financed with \$275,000 gas company loan

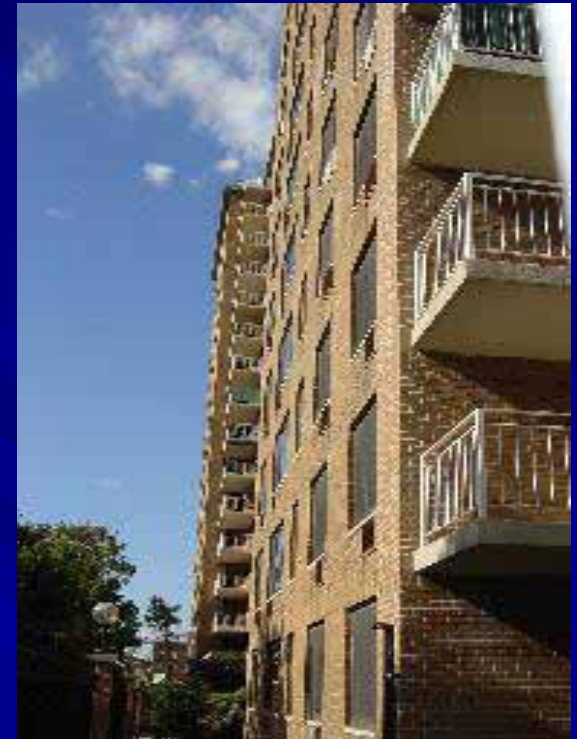
Broomall Presbyterian Home – Philadelphia



- Nursing home with 147 residents, mostly elderly
- Replaced 30 yr old electric chiller with EDC in 1996
- Recovered heat used for DHW (boiler supplement)
- Utility grant covered 25% of cost of new system
- 3.5 yr payback

Clinton Hills Apartments – Brooklyn, NY

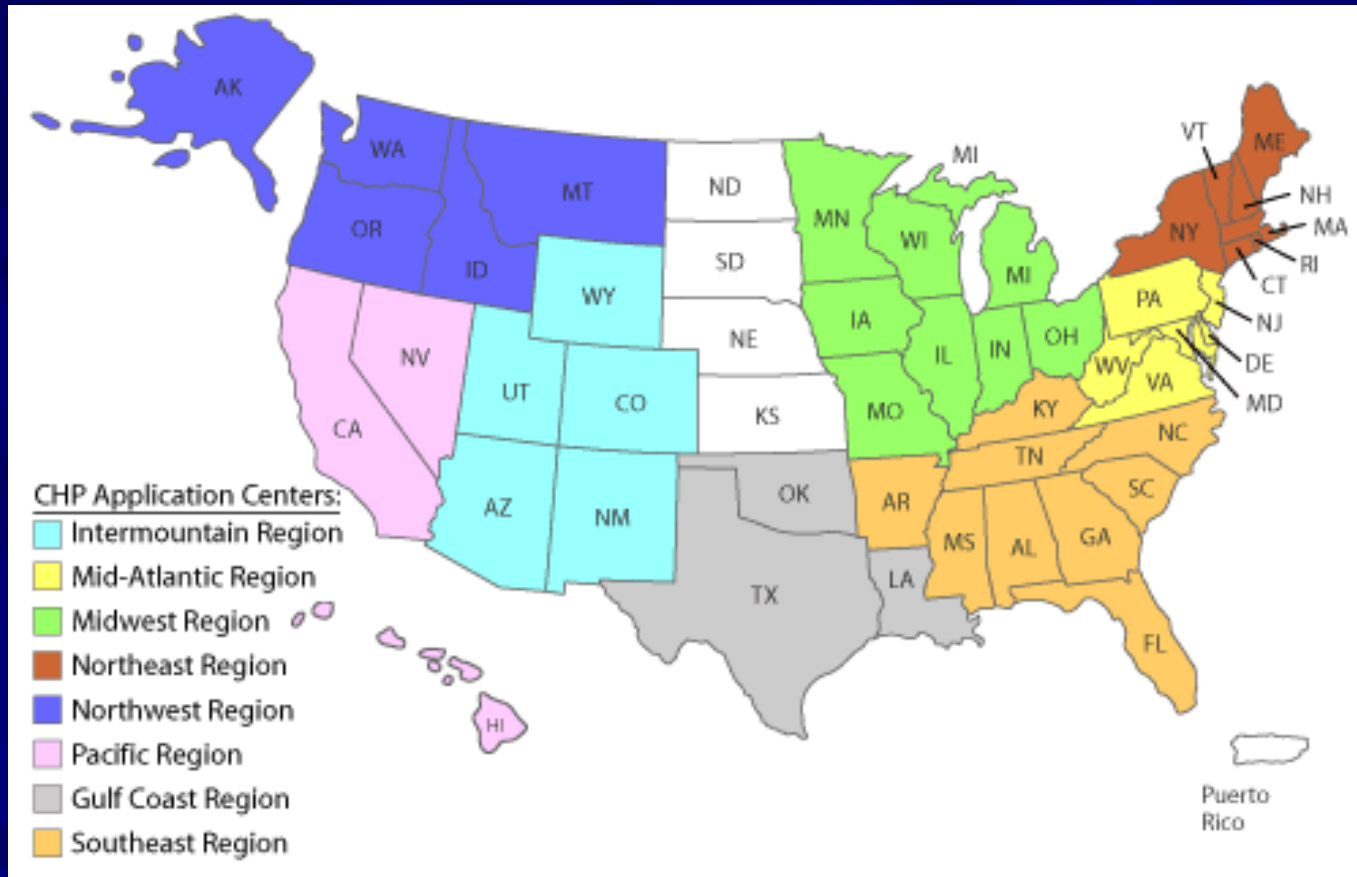
- 7 Buildings with a total of 750 apts.
- Use microturbine CHP system
 - Seven 60 kW plus six 30 kW
 - Provide elect, hot water, and space heat
- Six turbines configured for emergency power
- Installation in progress; commissioning expected within next 2 months
- NYSERDA grant covering \$758,000 of \$1.6 MM cost



Resources Available



8 Regional Centers Support Development and Implementation of CHP Projects



Mid-Atlantic CHP Application Center

- **DOE Distributed Energy Program provides primary funding**
- **Goal is to increase use of CHP by:**
 - Increasing awareness of CHP
 - Providing technical assistance for promising projects
- **Activities/focus of each Center tailored to region**
- **Mid-Atlantic region focuses on:**
 - Federal projects
 - State environmental & utility regulatory issues
 - Opportunity fuels

For Additional Information or Support

Information, technical support, and some economic support are available from many sources including:

- Mid-Atlantic CHP Application Center
<http://www.chpcenterma.org>; 301-405-4681
- DOE Energy Efficiency & Renewable Energy Program
<http://www.eere.energy.gov/>
- US EPA CHP Program
<http://www.epa.gov/chp>
- U.S. Combined Heat and Power Association
<http://uschpa.admgt.com/>
- HUD – Robert Groberg, Office of Environment & Energy
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