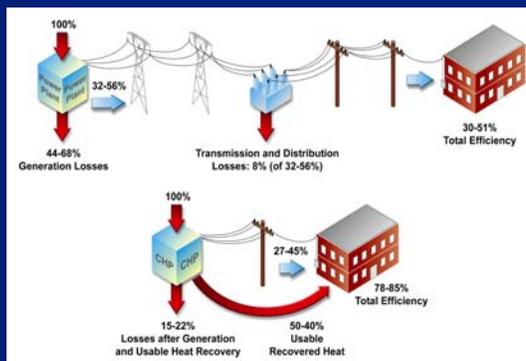


What is “combined heat and power (CHP)” or “cogeneration”?

**CHP is a way to produce electricity in
your own building and,
at the same time,
a way to use heat usually wasted
when electricity is generated.**

How CHP Saves Energy



Why Consider CHP?

- Lower operating cost: reduced electricity and/or fuel bills
- Avoid some cost of electric service
- Offset cost of HVAC system upgrades
- Increase reliability/avoid power outages
- Reduce emissions – satisfy new restrictions, generate salable credits
- Public relations – enhance “green” image

Why CHP for Multifamily?

- For space heating, can use hot water or steam
- Can run absorption cooling
- Can run desiccant dehumidifiers to reduce mold
- Can reduce demand during peak times
- Can be financed in various ways

How Housing Finance Agencies Support CHP

- Massachusetts HFA
 - Sees reduced energy costs as a means of maintaining affordability.
 - Financed the addition of CHP to 18 existing developments with over 5,000 apartments.
 - Supports CHP for new construction.
 - Utilities provide financial support.
 - Also use reserves; realizes 3-year payback.
 - Stresses the importance of the company.

Key Factors for CHP Attractiveness

- 80-100+ apartments in building
- Access to natural gas
- Master metered for electricity
- High percentage of hours with need for *both* power and thermal
- BTU cost of grid electricity significantly higher than cost of gas
- Installation cost competitive with conventional system.

CHP SYSTEMS

Include 2 or 3 basic pieces of equipment:

- Electricity generator
 - Combustion / steam turbines
 - Reciprocating engines
 - Micro-turbines
 - Fuel cells
- Heat recovery / steam generator
- Thermally activated technologies (if cooling, space conditioning, or dehumidification are needed)

CHP Equipment for Multifamily Buildings Reciprocating Engines, Microturbines



Combined Heat and Power Trenton, NJ—Trent Center East

- The East Building – 1965
- 225 units HUD senior housing
- (2) 70 kW package installed in 2003
- 50% electricity; all DHW
- \$250,000 investment
- Shared savings
4-5 year payback



Combined Heat and Power Danbury, CT—Wooster Manor



- 100 units PH built 1970's
- 60kW system installed 1998
- Provides 66% electricity, 50% space and all domestic hot water.
- Energy cost reduced by \$40,000 annually
- \$275,000 gas company loan

Combined Heat and Power Cambridge, MA—808 Memorial



- 300 units built in 1975 with MassHousing financing
- 2004-75 kW cogen system installed in boiler room
- Provides 42% electricity, 33% heating and DHW
- \$175,000 MassHousing loan
- Payback estimated 3.4 years

HUD Promotes CHP in Housing

- Encouraging CHP use in multifamily public and assisted housing
- Posted guides for owners/managers:
 - “Q&A- What is CHP”
 - “How to do CHP feasibility screening.”
- Working with DOE Regional CHP Application Centers to provide assistance to property owners

Q&A for Building Owners

- CHP basics
- Packaged CHP systems
- Building
- Residents
- Space
- Installation
- Utilities
- Load
- Fuels
- Electric rates
- Electric metering
- Economics
- Environment
- Service and Maintenance

First steps . . .

- For a quick preliminary view of potential: EPA has 11 Questions
- For a simple calculation of the payback potential for a building, try **HUD CHP Feasibility Screening Software**
- For sources of technical assistance, contact **DOE Regional Application Centers**



Is My Facility a Good Candidate for CHP?

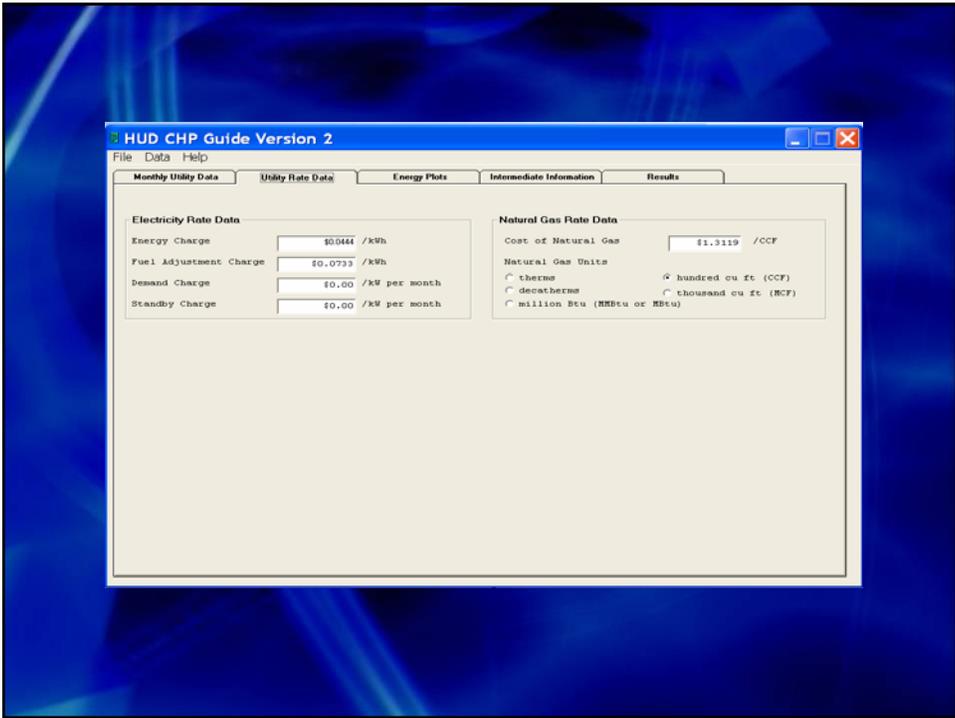
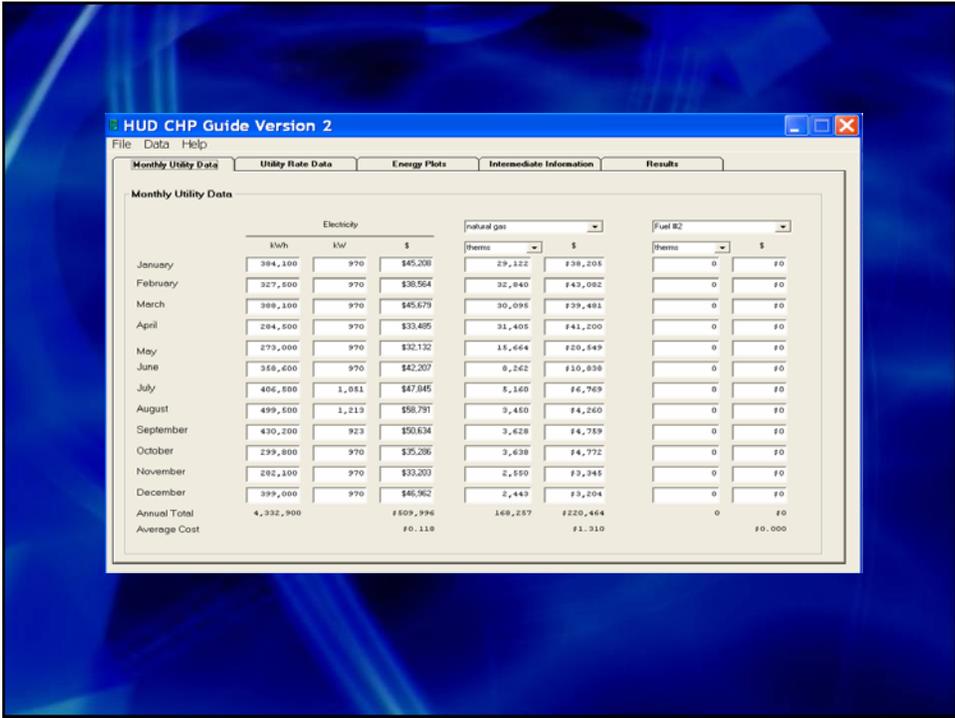
Please check the boxes that apply to you:

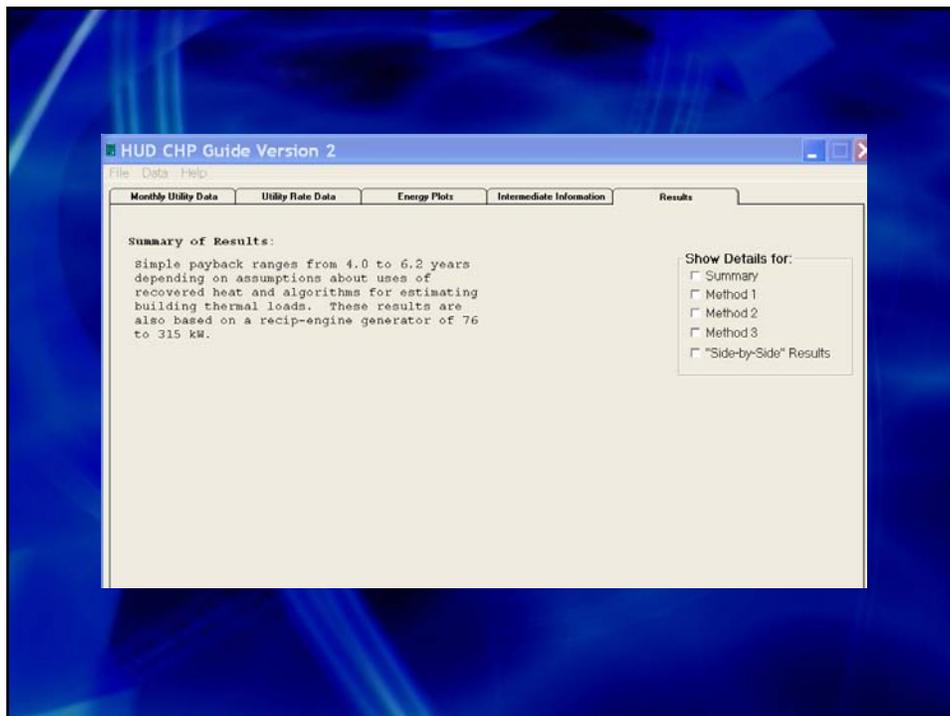
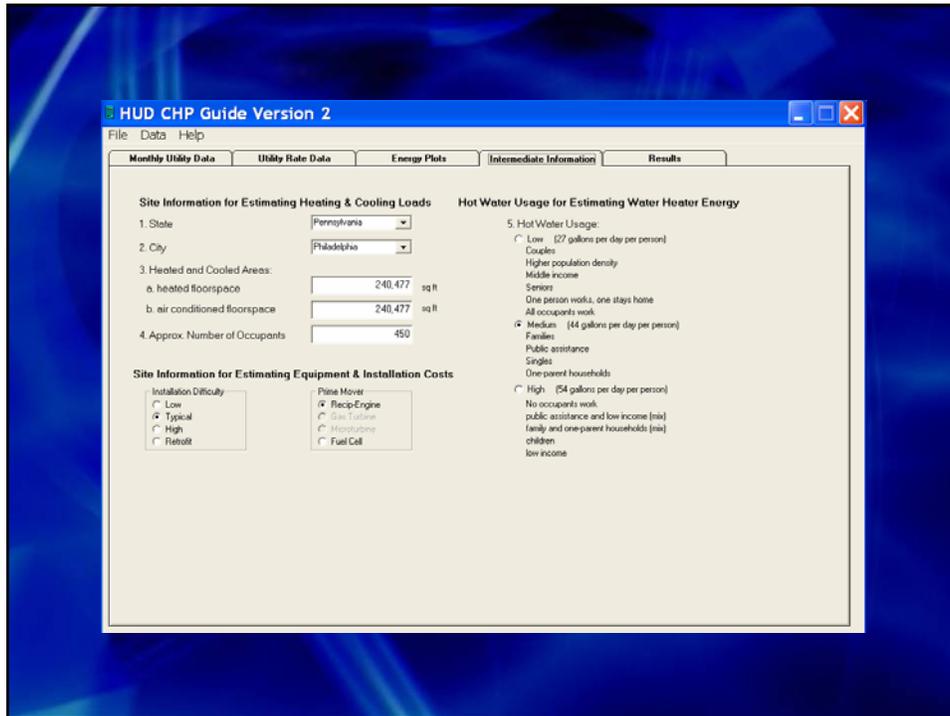
- Do you pay more than \$.06/ kWh on average for electricity (including generation, transmission and distribution)?
- Are you concerned about the impact of current or future energy costs on your business?
- Is your facility located in a deregulated electricity market?
- Are you concerned about power reliability? Is there a substantial financial impact to your business if the power goes out for 1 hour? For 5 minutes?
- Does your facility operate for more than 5000 hours/ year?
- Do you have thermal loads throughout the year (including steam, hot water, chilled water, hot air, etc.)?
- Does your facility have an existing central plant?
- Do you expect to replace, upgrade or retrofit central plant equipment within the next 3-5 years?
- Do you anticipate a facility expansion or new construction project within the next 3-5 years?
- Have you already implemented energy efficiency measures and still have high energy costs?
- Are you interested in reducing your facility's impact on the environment?

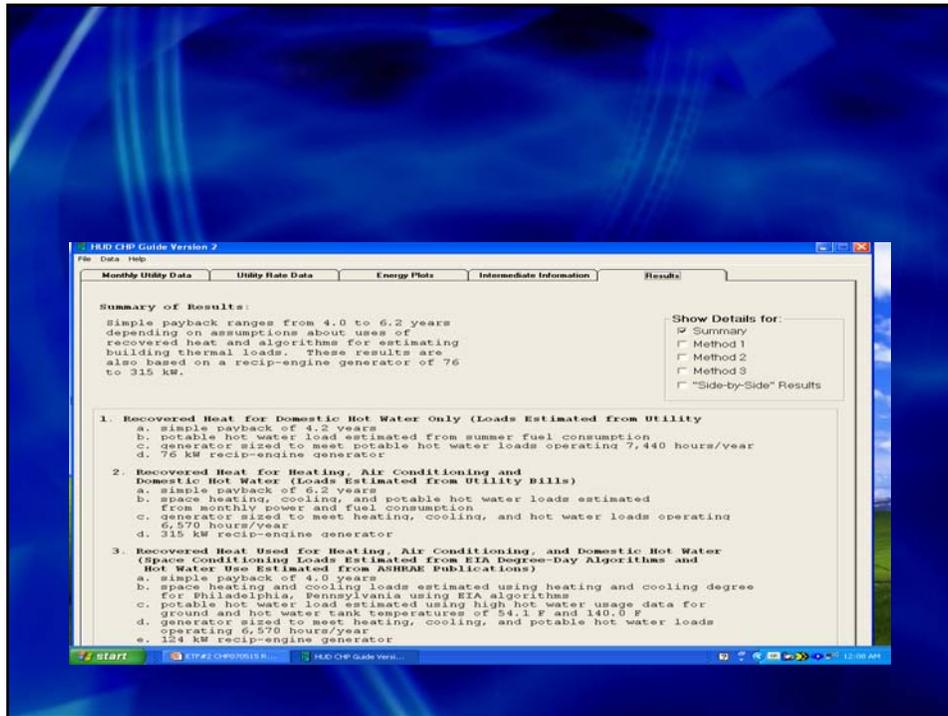
If you have answered "yes" to 3 or more of these of these questions, your facility may be good candidate for CHP.

Data needed for preliminary CHP Feasibility Screening

- Utility consumption (energy and demand)
- Utility rates
- Building area for heating and cooling
- Number of occupants
- Intermediate information







What "Results" Mean

- Indicates whether a more detailed analysis would be worthwhile doing
- Encouraging results are a prelude to a more rigorous analysis by engineering professionals

Regional CHP Application Centers



Sources of Information

CHP Regional Application Centers RACs:
www.bchp.org/rac.html

DOE CHP Initiative: www.eren.doe.gov/der/chp

EPA CHP Partnership: www.epa.gov/chp

HUD CHP information:

CHP Guides and link to ORNL software:
www.hud.gov/offices/cpd/library/energy/index.cfm

Profile- www.hud.gov/offices/cpd/energyenviron/energy/library/hudchpDanburyCT.pdf

USCHPA www.uschpa.org

NYSERDA www.nyserda.org