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EPA COMBINED HEAT AND POWER PARTNERSHIP

Where Waste Heat Fits . . .

3rd Annual Waste Heat to Power Workshop 2007
September 25, 2007

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within Combined Heat and Power?

- Generation of Heat and Power from a single fuel source
- Captures “waste” heat
- Similar barriers and drivers
- Similar equipment
- Similar community

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within Clean Energy?

- EPA has consistently supported clean energy – energy efficiency, renewable energy, and distributed generation as effective Greenhouse Gas reduction strategy
- Waste heat to power fits squarely within this strategy

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Benefits of Clean Energy (EE, RE, and DG)

- Economic
  - Lower cost compared to new generation and transmission
  - Downward pressure on natural gas prices
  - Lower wholesale electricity prices
  - Improved local economy
  - Improved service to low income and seniors
- Risk Management
  - Diversify a utility's generation supply portfolio
  - Reduce environmental regulatory risk to utilities
- Environmental
  - Lower greenhouse gas emissions and air pollutants
  - Lower water use
- Utility System Benefits
  - Quick fix with longer term benefits
  - Improved security of electricity and gas systems
  - Lower peak demand / improved reliability

✓ ***"Clean Energy" includes cost-effective energy efficiency (EE), renewable energy (RE), and clean distributed generation (DG) such as combined heat and power (CHP).***

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within a Greenhouse Gas Reduction Strategy?

- Displaces fossil fuel use
- Effective and economic greenhouse gas reduction measure
- Consistently cited as top measure by state and local regulatory initiatives as well as regional and corporate voluntary initiatives

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Global and Local Benefits

- Efficiency gains translate to emission reductions:
  - SO_2
  - NO_x
- Commensurate greenhouse gas reductions.

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Recognizing Environmental Benefit

- Key to encouraging CHP-DG & waste heat recovery is in recognizing its primary benefits:
  - Higher efficiency
  - Onsite thermal and electrical generation (avoid transmission & distribution losses)
  - State-of-the-art technology (emission offsets)

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Monetizing Environmental Benefits

Environmental Revenue Streams: *Any number of programs that reward clean power generation and provide one time or ongoing revenue source.*

Emissions Programs

- Emission allowance trading programs (cap and trade)
- New source emission offset programs
- CO_2 offset programs

Generation Programs

- Energy portfolio standard programs
- Voluntary green power purchases

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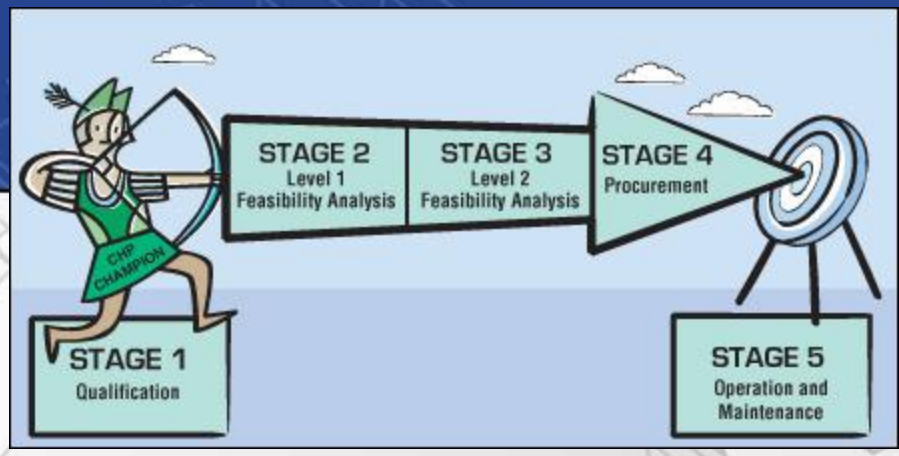
Supporting Projects

- Procurement Guide
- CHP Emissions Calculator
- Funding Database



CHP Results

Annual Emissions Analysis

	CHP System	Displaced Electricity Production	Displaced Thermal Production	Emissions Reduction	Percent Reduction
NOx (tons/year)	29.01	208.81	6.09	185.89	86%
SO2 (tons/year)	0.11	542.78	4.41	547.09	100%
CO2 (tons/year)	21,303	92,200	4,876	75,773	78%
Carbon (metric tons/year)	5,810	25,146	1,330	20,665	78%
Fuel Consumption (MMBtu/year)	364,159	940,211	60,945	636,998	64%
Acres of Forest				20,665	
Number of Cars				12,916	

This CHP project will reduce emissions of Carbon Dioxide (CO2) by 75,773 tons per year

This is equal to 20,665 metric tons of carbon equivalent (MTCE) per year

This reduction is equal to the carbon absorbed by 20,665 acres of forest

OR

This reduction is equal to the carbon absorbed by 12,916 cars off the road

CHP Funding Opportunities

Sort by Name	Type	State
Adv Power System Tech Program - Sec 1224	Rebate	National
Agriculture Energy Efficiency Program	Grant	AL
Alaska Power Project Loan Fund	Loan	AK

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Waste Heat is Starting to Get Recognition

- 10 State Renewable Portfolio Standards - 3 specifically call out waste heat
- 2005 Energy Policy Act & New FERC Regs
- AB 1613 “Waste Heat and Carbon Emissions Reduction Act.”
- Self Generation Incentive Program
- House Energy Bill
- Other state efforts to improve interconnection practices and other policies that facilitate EE

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The EPA CHP Partnership

- Voluntary program - seeks to reduce the environmental impact of power generation by promoting the use of CHP.
- Actively providing education/outreach and direct project assistance since 2001.
- Provide services and tools for Partners to assist with CHP project development, regulatory barriers, market transformation.
- Work with government and environmental community to evaluate environmental benefits of CHP.

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Resources for Greenhouse Gas Reductions

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