



2008 EPA CHP Partnership Update

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U.S. EPA CHP Partnership

Presented to the EPA 2008 CHPP Partners Meeting

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Outline

- Partnership Overview
- Goals
- Accomplishments
- New Tools and Resources
- Opportunities in 2008
- Upcoming Events
- Goals for this Meeting

EPA CHP Partnership

- Voluntary program that seeks to reduce the environmental impact of power generation by promoting the use of highly-efficient combined heat and power (CHP)
- The Partnership works with clean energy stakeholders from the private and public sectors to support the deployment of new CHP projects and to promote their energy, environmental, and economic benefits

Technical Assistance for Partner Candidate Sites

- Partnership can help Partners:
 - Identify opportunities for cost-effective CHP
 - Assess goals, drivers, and potential barriers for a project
 - Direct energy users to existing tools and resources
 - Determine next steps for project technical assistance: Spark spread analyses, Level 1 feasibility studies, third-party review of feasibility/design studies, incentive/policy analysis, quantifying environmental benefits

Public Recognition

- Profile on the **Partnership Web site** with information about each Partner
- **Annual Greenhouse Gas Reduction Report**
 - Shows carbon reductions associated with Partner's projects, as well as equivalent benefits in acres of trees planted and car emissions prevented.
- **ENERGY STAR CHP Awards**
 - Performance-based award with review of 1 year of operating data.
 - Recognizes projects that require at least 5 percent less fuel than state-of-the-art separate heat and power generation.

2007 and 2008 Awards

- **2007 ENERGY STAR CHP Awards**

- Adkins Energy, LLC, Adkins Energy CHP System
- Macon Municipal Utilities, Macon Energy Center CHP Project
- Arizona State University, Arizona State University CHP System
- Princeton University, Princeton University Energy Plant
- University of New Mexico, University of New Mexico CHP Project
- Kent State University, Kent State University Cogeneration Plant

- **2008 ENERGY STAR CHP Awards (to date)**

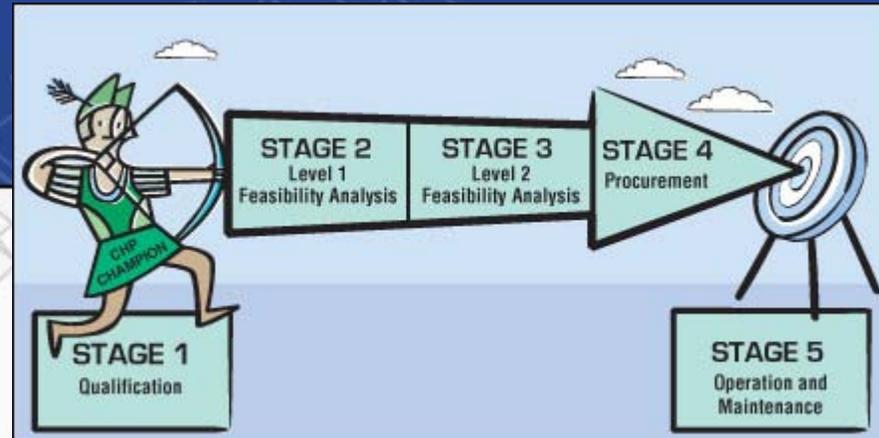
- Calpine Corporation, Columbia Energy Center CHP Project
- Verizon Communications, Verizon Garden City Fuel Cell CHP Project
- Clinton Hill Apartment Owners Corp., Clinton Hill Apartments CHP System
- Red Hook Green Power, LLC, Red Hook Fairway Market CHP System
- POET, LLC, POET Biorefining Ahston CHP System
- East Kansas Agri-Energy, LLC, East Kansas Agri-Energy CHP System

- **Awarded the first EPA CHP Partnership International CHP Award!**

- 5.3 MW Jinneng Gas Turbine Coke Oven Gas CHP system of Shandong Jinneng Coal Gasification Co., Ltd.

Project Resources

- CHP Emissions Calculator
- Funding & Incentives Database
- Project Development Guide
- Market Sector Reports



Annual Emissions Analysis						
	CHP System	Displaced Electricity Production	Displaced Thermal Production	Emissions Reduction	Percent Reduction	
9	NO _x (tons/year)	23.01	208.81	6.09	195.89	86%
10	SO ₂ (tons/year)	0.11	542.78	4.41	542.09	100%
11	CO ₂ (tons/year)	21,303	92,200	4,876	75,773	78%
12	Carbon (metric tons/year)	5,810	25,146	1,330	20,665	78%
13	Fuel Consumption (MMBtu/year)	364,159	940,211	60,945	636,938	64%
14	Acres of Forest				20,665	
15	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

Why EPA Supports CHP

- Significant cost-effective emissions reductions can be achieved from the fuel efficiency of CHP systems
- CHP systems achieve effective electrical efficiencies of 50 to 70 percent, compared to average fossil-fueled power plant efficiencies of 33 percent in the U.S. This improvement in efficiency translates to:
 - Reduced total fossil fuel use
 - Reduced emissions of regulated air pollutants
 - Reduced emissions of carbon dioxide, the leading greenhouse gas associated with global climate change
- Through its use in onsite electricity generation, CHP can reduce transmission and distribution losses that occur when distributing centrally generated power—and this results in further efficiency gains

CHP Partnership Goals

- Raise visibility of CHP as a GHG mitigation strategy
- Reduce GHG emissions from projected levels by approximately 3.24 million metric tons of carbon equivalent (MMTCE) per year
- Address primary barriers to CHP deployment in the U.S., through education, policy outreach efforts, technical assistance and strategic markets outreach
- Help our Partners implement CHP projects
- Contribute to the national goal of reaching 92 gigawatts (GW) of CHP capacity in the U.S. by 2010

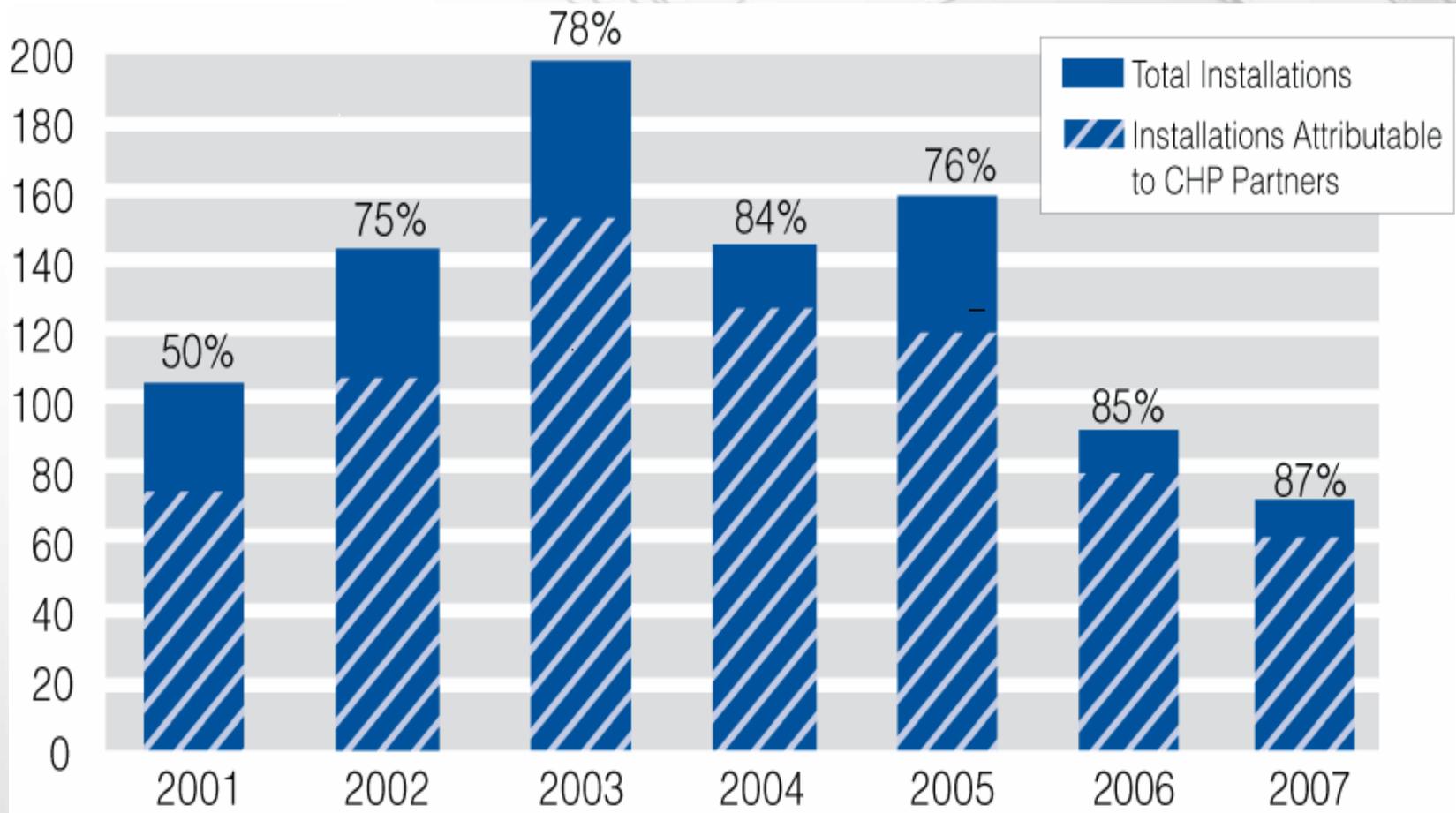
CHP Partnership Accomplishments

- Through 2007, the CHP Partnership has helped install more than 335 CHP projects, representing 4,450 megawatts (MW) of capacity, and more than 12 million tons of annual CO₂ emissions reduction
 - Removing the annual emissions of more than 2.0 million automobiles, or
 - Planting more than 2.4 million acres of forest

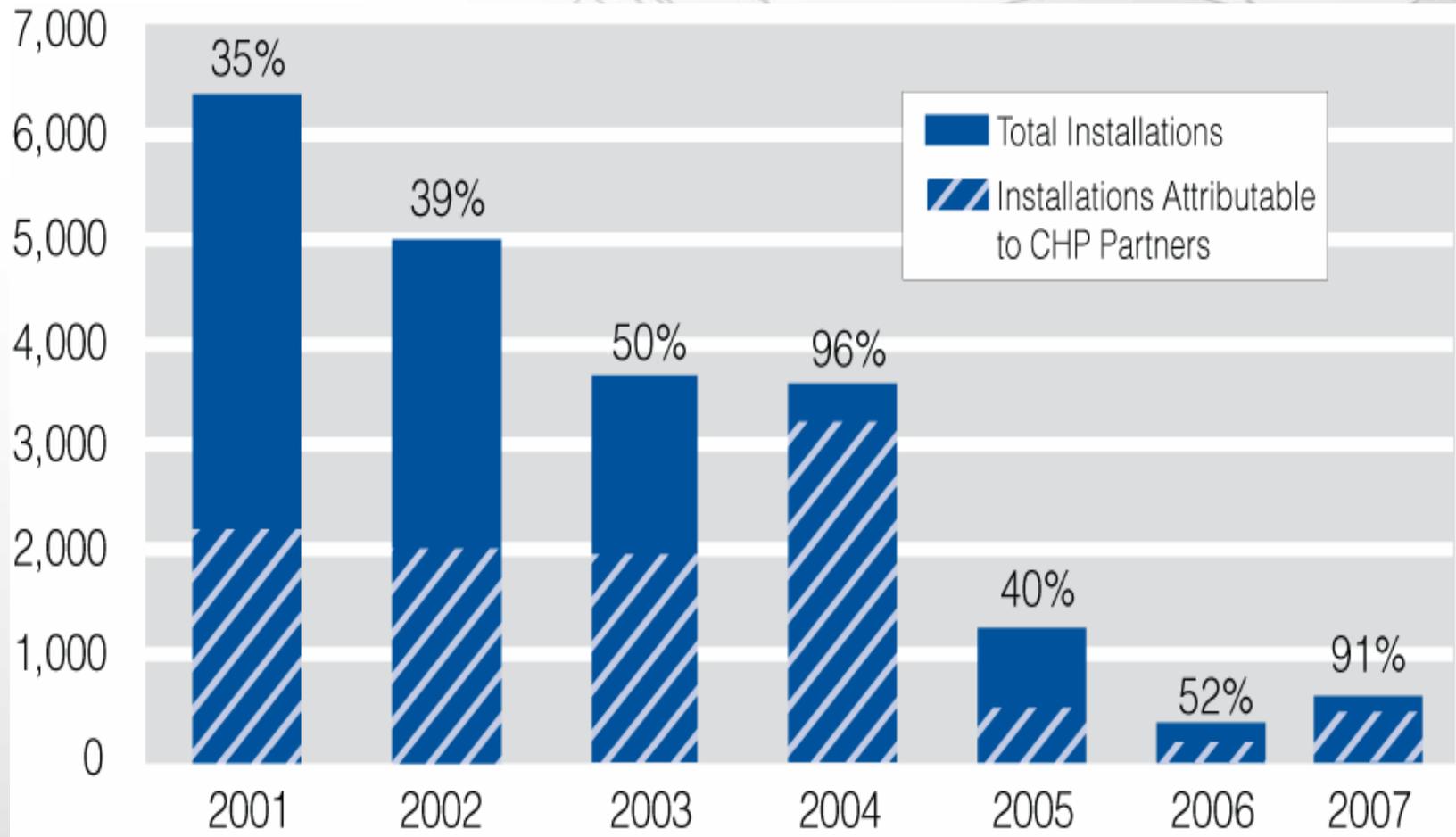
CHP Partners

- 247 Partners, representing end users, project developers, consultants/engineers, utilities, financiers, state and local government, and equipment manufacturers
 - In 2007, the CHP Partnership welcomed 33 new Partners.
 - 14 new Partners have joined in 2008 so far.
 - Each one of our Partners is of immense value to EPA as you all recognize the environmental and economic benefits of CHP, and are at the forefront of saving energy and improving the environment.

Partner Accomplishments: Total # of New Installations Added per Year



Partner Accomplishments: Total New Capacity of CHP Projects Added per Year



Partnership in 2007: Strategic Market Outreach

- Dry Mill Ethanol

- 16 dry mill ethanol facilities with CHP in the U.S., accounting for 218.7 MW of electric capacity; 9 dry mill ethanol facilities with planned CHP systems for a total of 110.7 MW of additional CHP capacity.
- 1,097 MW of CHP potential in the dry mill ethanol industry.

CHP Partnership is the first agency/organization widely promoting and raising visibility for CHP in this sector!

- Extensive outreach since 2002
- **New Resource in 2007: *The Impact of CHP on Energy Use and Carbon Emissions in the Dry Mill Ethanol Process***
- Title Sponsor of Fuel Ethanol Workshop in 2007 and 2008

- Casinos and Hotels

- Currently 110 casino and hotel sites with CHP in the U.S., accounting for 71.7 MW of electric capacity
- 1,456 MW of market potential for CHP in these industries
- Updated market analysis in 2007
- Extensive outreach planned for 2008/2009

Partnership in 2007: Strategic Market Outreach

- **Municipal Wastewater Treatment Facilities**
 - Currently 105 WWTFs with CHP in the U.S., accounting for 465.3 MW of electric capacity; 75 of these sites are fueled by biogas generated at the facility, for a total of 210.8 MW.
 - 100 kW of electric grid capacity can be offset by CHP with a WWTF influent rate of 4.5 MGD.
 - 1,066 WWTFs with influent rates above 5 MGD, 544 of which utilize anaerobic digestion;
 - These 544 sites with anaerobic digestion would account for 224.6 MW of CHP potential.
 - **New Resource in 2007: *Opportunities for and Benefits of CHP at Wastewater Treatment Facilities***
- **Emerging Market Opportunities**
 - **Datacenters**
 - 16 data centers in the U.S. with CHP systems, accounting for 16.2 MW of electric capacity.
 - CHP potential of 2,260 MW, with an increase to 4,178 MW in 2010.
 - New Resource in 2007: ***The Role of Distributed Generation CHP Systems in Data Centers***
 - **Utilities**
 - New resources and outreach coming in 2008!

Partnership in 2007: Promoting Biomass as an Energy Resource

- Technical assistance for biomass and biogas CHP projects
- Published Biomass CHP Catalog of Technologies in 2007
 - Detailed technology characterization of biomass CHP systems
 - Includes technical and economic information about biomass resources, biomass preparation, energy conversion technologies, power production systems, and complete integrated systems.
- Biomass web page
- Interagency Woody BUG; Pinchot Institute Biomass Sustainability; EPA ORD, OW; Society of American Foresters; WEFTEC wastewater sector outreach
- Increasing interest from rural and municipal cooperative utilities

Partnership in 2007: Policy Resources and Opportunities

- Reach out to states and municipalities, providing technical information on state energy, environmental, and utility practices that encourage environmentally beneficial CHP
 - Output-Based Regulations
 - Renewable Portfolio Standards
 - Interconnection Standards
 - Utility Rates
 - Public Benefits Funds
- Energy Independence and Security Act of 2007
 - Subtitle D of the Act focuses on industrial energy efficiency and contains provisions designed to improve efficiency by promoting CHP, waste energy recovery, and district energy systems.

Partnership in 2007/2008: Additional New Tools and Resources

- ***2007 Partners Update***
- ***CHP Project Development Guide***
- ***Quantifying the Reliability Benefits of CHP***
 - Estimates the value of CHP as emergency or primary power that can function without the grid. How various design approaches impact project economics.
- ***Efficient Energy for Local Governments Fact Sheet***
 - Potential opportunities for installing CHP in municipalities with case study examples and explanation of assistance the Partnership offers to local governments.
- ***Facilitating Deployment of Highly Efficient CHP Applications in China***
 - Developed under the Asia-Pacific Partnership for Clean Development and Climate; EPA member of the REDGTF.
 - CHPP Project: Facilitate deployment/ implementation of highly efficient combined heat and power (CHP) and clean distributed generation (DG) in China.
 - Report analyzes the technical, economic and strategic target markets and “low hanging fruit” opportunities for DG and CHP in China.

Opportunity to Reduce GHGs through CHP in 2008

- CHP an important part of energy mix & is already making an impact
- 85,198 MW installed at 3,374 sites (nationally)
 - Represents approximately 8.6% of total U.S. generating capacity
 - Saves an estimated 2 to 3 quads of fuel use per year
 - Eliminates over 260 million tons of CO₂ emissions annually
- Potential for additional CHP is large
 - Industrial: 70 to 90 Gigawatts
 - Commercial / Institutional: 40 to 60 Gigawatts
 - 4 to 5 Quads of Energy Savings
 - Reduction of 500 to 700 million tons of annual CO₂ emissions

Highlights for Remainder of 2008

- Capturing Partner Successes
- Strategic Market Sector Outreach
- Partner Project Reporting – July!
- Clean DG Policy and CHP Monthly Webinar Series
- Upcoming Events: 2008 FEW, NYSERDA CHP in NYS, WEFTEC
- Establish a recoverable waste energy inventory program, as directed under EISA

Purpose of Partners Meeting

- Share CHP successes and challenges
- Discuss the role for CHP in climate change mitigation
- Listen to informative briefings on the latest market and industry trends
- Recognize highly efficient CHP systems (ENERGY STAR CHP Awards)
- Hear from YOU – the CHP industry – on how to implement highly-efficient CHP projects
- Learn how the CHP Partnership can assist your organization
- Network with others in the CHP community

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