



# **CHP at Data Centers: Opportunities, Challenges and Applications**

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# Webinar Objectives

- CHP applications at data centers
  - Opportunities
  - Challenges
- CHP Partnership and Data Centers
  - Case studies
  - EPA's Energy Star Program
  - Going forward

# CHP Benefits for Data Centers

## Data Center Needs

- High electric loads
- High cooling needs
- High reliability
- Operate continuously

## CHP Capabilities

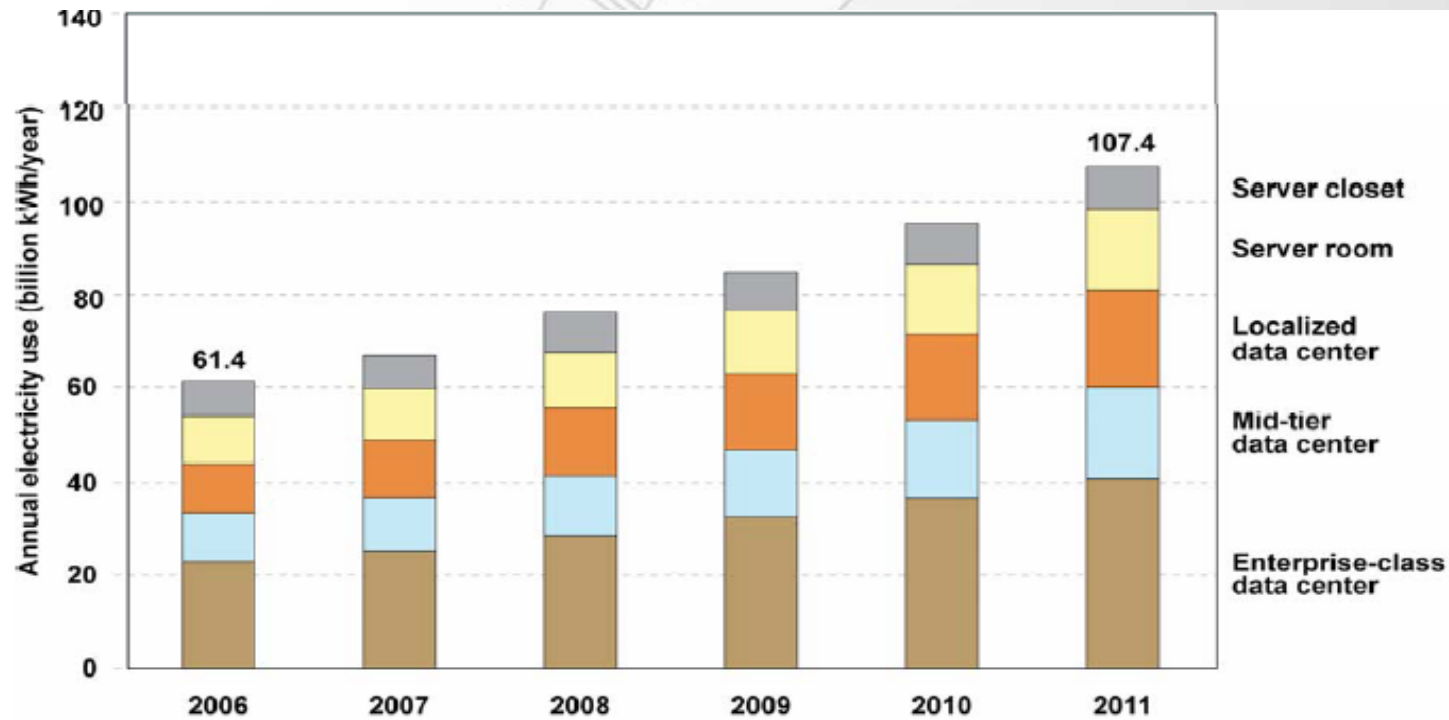
- CHP systems meet energy and cooling needs more efficiently than stand-alone systems.
- CHP systems that operate continuously provide high reliability

# CHPP Data Center Activities

- 2007 Partnership Study on “The Role of Distributed Generation and Combined Heat and Power (CHP) Systems in Data Centers.”
- Verizon Garden City Fuel Cell Project awarded a 2008 Energy Star CHP Award

# CHP Opportunities at Data Centers

Projected electric consumption at data centers



# CHP Opportunities at Data Centers

- CHP market incentives
- Public recognition of energy efficiency
- Current research on CHP at data centers
  - DOE has funded a research project by Exergy Partners on the use of a low temperature absorption chiller that would be designed to better match waste heat from natural gas engines. This unit will be developed in collaboration with Johnson Controls and Integrated CHP Systems Corporation and targeted for data center applications.

# CHP Challenges at Data Centers

- Limited CHP applications at data centers.
- *Raise awareness to the successful application of CHP at data centers.*

# CHP Challenges at Data Centers

- Market perception on the success of primary CHP movers and their ability to meet critical data center needs.
- *Changes in primary technologies over the last few decades are not reflected in their use at data centers. Successful applications of emerging technologies have not been broadly viewed.*

# CHP Challenges at Data Centers

- A lack of understanding to how CHP could fit into the existing Tier Classification utilized in the data center industry.
- *Experience in the field has shown that a properly designed and maintained CHP system can meet Tier III and potentially Tier IV reliability classification.*

# CHPP and Data Centers

- Continue to raise awareness of
  - successful CHP applications.
  - concurrent government activities that make CHP applications attractive.
- Support partners in exploring CHP feasibility for their operations.
- Analyze perceived barriers to raise market awareness.