



CHP Deployment Program: AMO Technical Assistance Overview

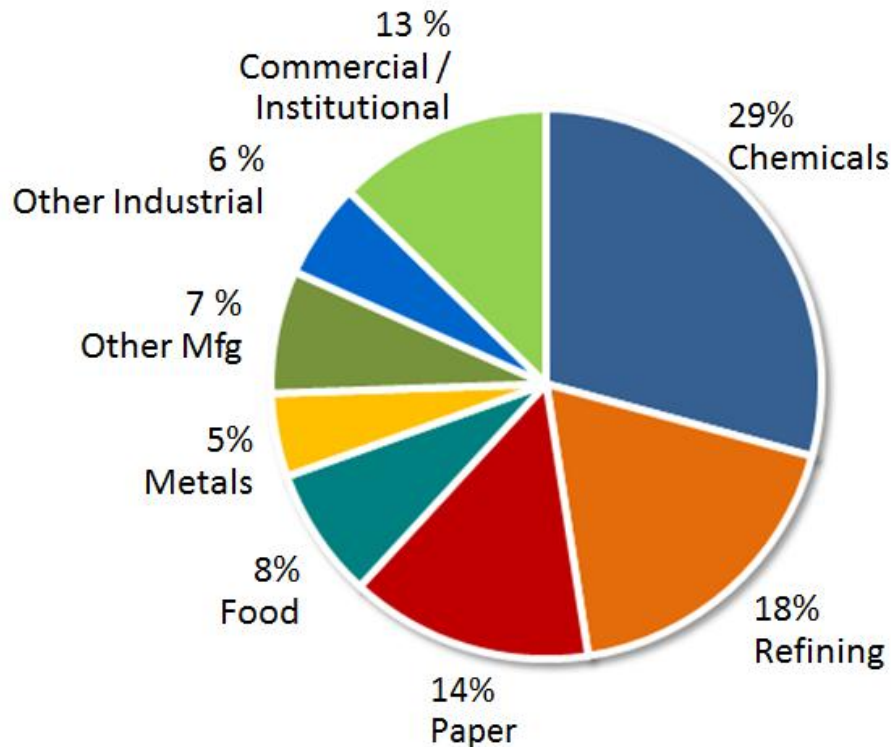
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Combined Heat and Power (CHP): History

- First developed by Thomas Edison in 1880s and is one of the world's most common form of energy recycling
- Since the '70s CHP used mostly by large industrials (PURPA set the stage)
- Today there are hundreds of CHP facilities in the U.S. in both industrial, institutional and commercial settings in both stand-alone and district energy or microgrid configurations
- Trend towards “smaller” facilities where resiliency, cost-savings, environmental impacts, economic development, and grid stabilization are significant drivers.

CHP Today in the United States (2012 Data)

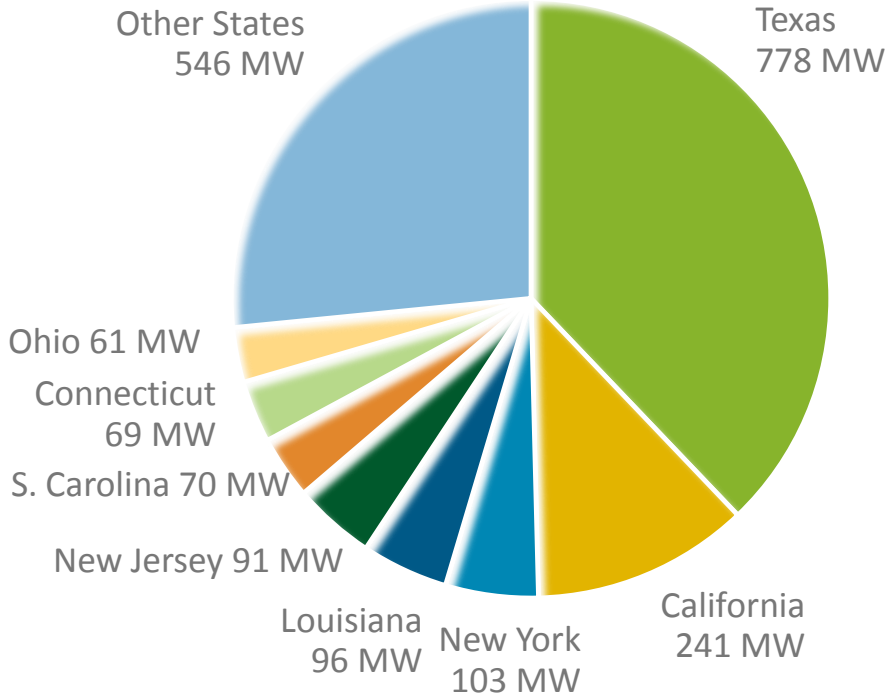


- **82.4 GW** of installed CHP over 4,200 industrial and commercial facilities
- **7%** of U.S. Electric Generating Capacity; **14%** of Manufacturing
- Avoids more than **1.8 quadrillion Btus** of fuel consumption annually
- Avoids **241 million metric tons of CO₂** compared to separate production

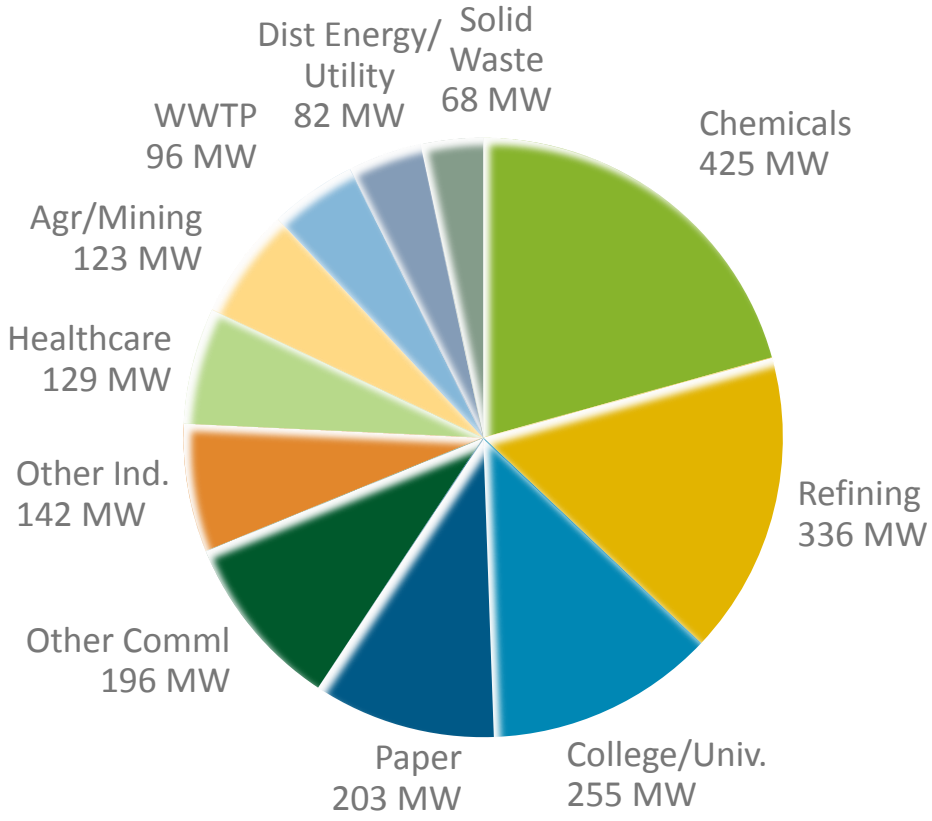
Sources: ICF CHP Installation Database (2012 Data);
EIA <http://www.eia.gov/todayinenergy/detail.cfm?id=8250>
Energetics, "US Manufacturing Energy Use and Greenhouse Gas Emissions Analysis, November 2012"

CHP Additions, 2010-2012 (2,054 MW)

By State (MW)



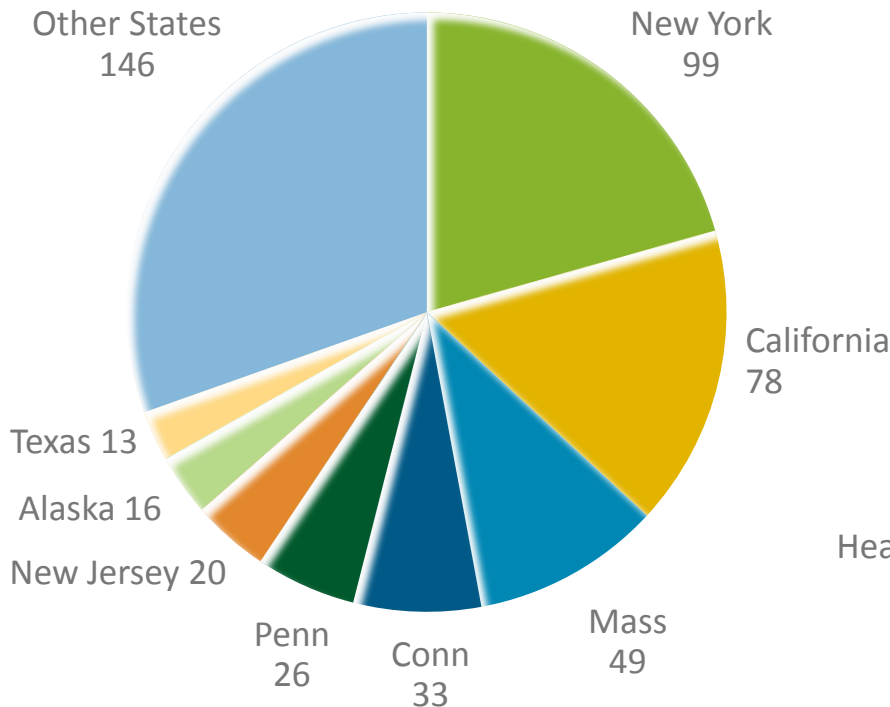
By Application (MW)



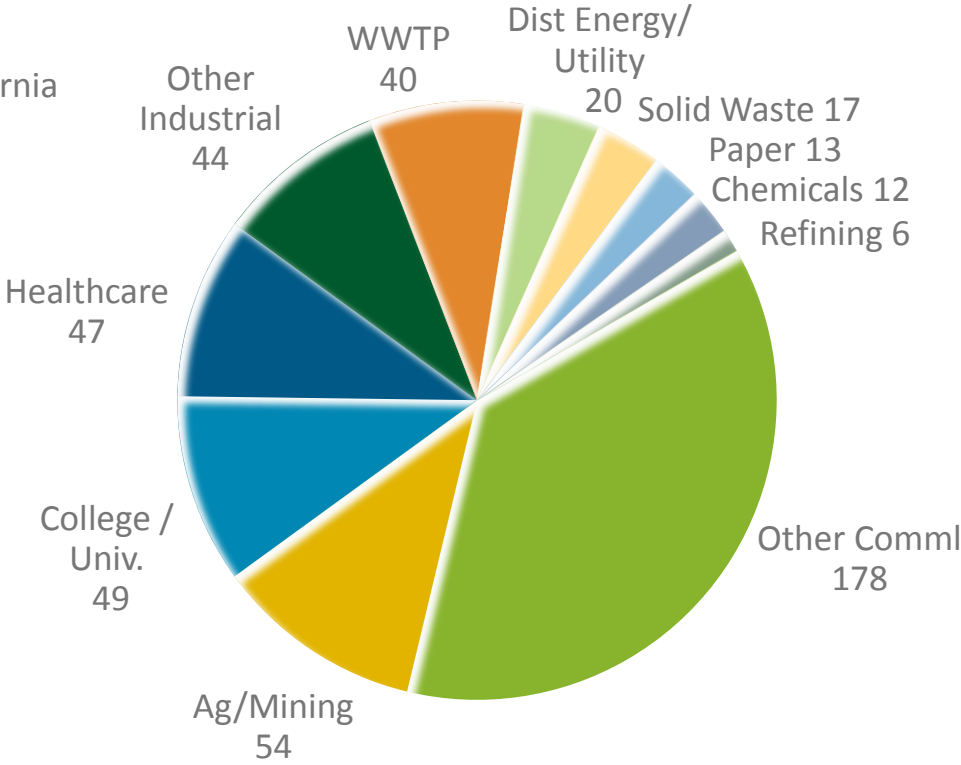
Source: ICF CHP Installation Database (2012 Data)

CHP Additions, 2010-2012 (480 Sites)

By State (Sites)



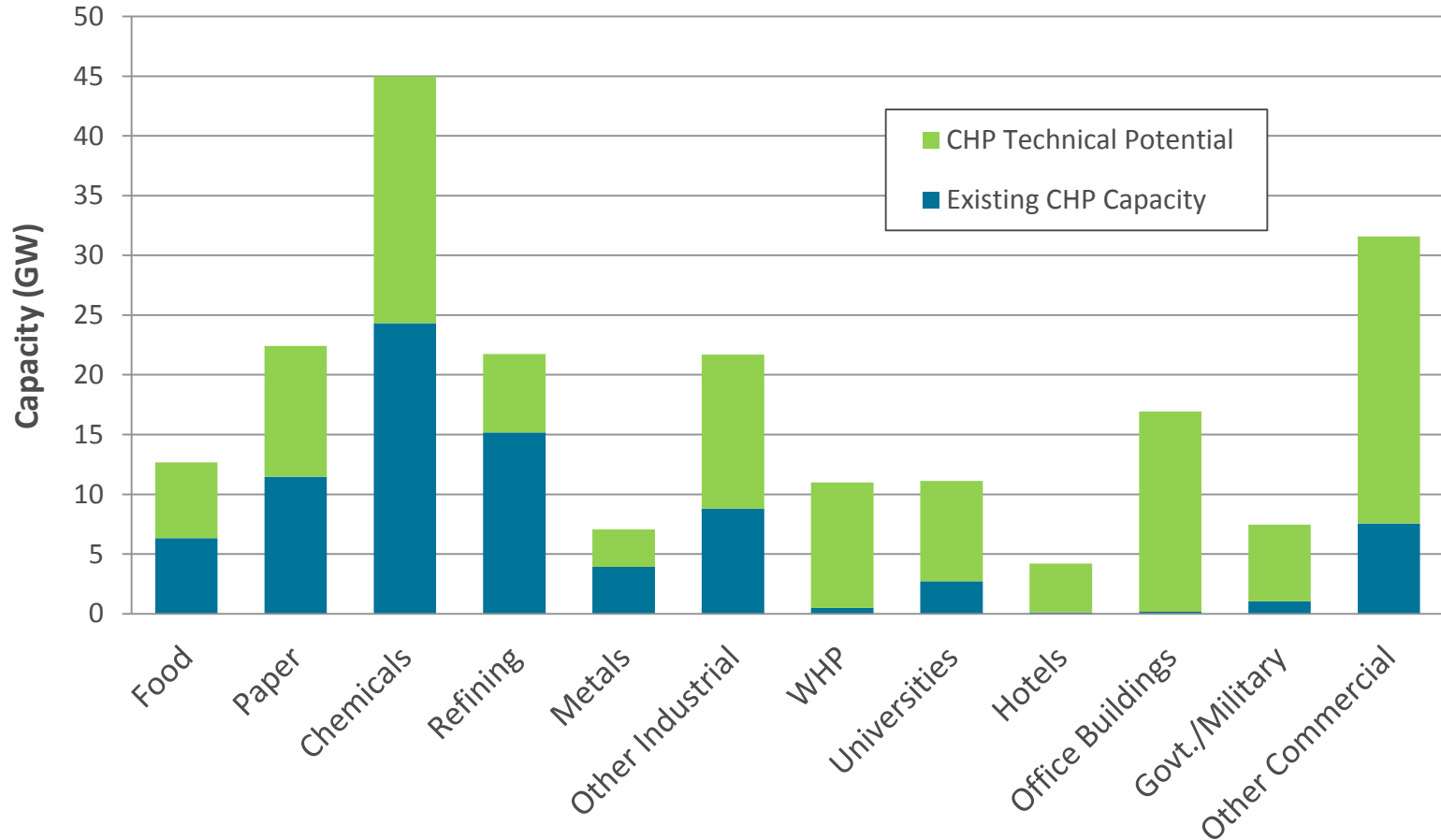
By Application (Sites)



Source: ICF CHP Installation Database (2012 Data)

Where is the Remaining Potential for CHP?

Existing CHP vs. Technical Potential



The Role of CHP in Energy Strategy

CHP considered formidable energy efficiency solution on both sides of meter:

- CHP provides significant technical, economic, and environmental benefits
- CHP offers resiliency options when faced with man-made and natural disasters
- CHP provides additional economic development options in capacity constrained areas
- CHP can harden/stabilize the grid

Source: McKinsey, DOE 2012

DOE's CHP Deployment Program Overview

History

- Started as a pilot program in the Mid West in 2001
- Expanded to national coverage in 2005
- Name has changed from Regional Application Centers (RACs), to Clean Energy Application Centers (CEACs), and now are the CHP Technical Assistance Partnerships (CHP TAPs)
- Purpose the same – assist in the installation of CHP (proven EE technology with market barriers)

Program Vision: Well-designed CHP installed in facilities and buildings that provide end-user, utility, state and national benefits

Program Goal: Support the installation of cost-effective CHP by providing technical and educational services to potential end-users, policymakers, and other stakeholders.

Key Feature: Flexibility to meet changing CHP market.

Executive Order: Game Changer

- August 30th, 2012: President Obama signed an Executive Order to **accelerate investments in industrial energy efficiency (EE), including combined heat and power (CHP)** with the goal of bringing together all stakeholders to seize this opportunity and ensuring that Federal agencies are taking the maximal steps to support private sector investment in this space.
- Sets a national **goal of 40 GW** of new **combined heat and power** installation over the next decade
- The Executive Order is part of the President's efforts to both **Revitalize American Manufacturing** and to pursue **an All-of-the-Above energy strategy**
- Often **barriers exist** that prevent otherwise economic investments in industrial EE and CHP from occurring.
- The Administration believes it is important to **accelerate investment in industrial energy efficiency** in a way that **benefits all stakeholders**.

National Goal of 40 GW of CHP by 2020

Achieving the President's goal would:

- Increase total CHP capacity in the U.S. by **50 percent** in less than a decade
- Save energy users **\$10 billion a year** compared to current energy use
- Save **one quadrillion Btus** (Quad) of energy — the equivalent of 1 percent of all energy use in the U.S.
- Reduce emissions by **150 million metric tons of CO2 annually** — equivalent to the emissions from over 25 million cars
- Result in **\$40-\$80 billion in new capital investment in manufacturing** and other U.S. facilities over the next decade

Source: DOE/EPA, CHP: A Clean Energy Solution, August, 2012,
www1.eere.energy.gov/manufacturing/distributedenergy/pdfs/chp_clean_energy_solution.pdf

DOE's Support of the President's 40GW Goal

DOE's AMO CHP Deployment Program's *CHP Technical Assistance Partnerships (CHP TAPs)* are critical components to achieve the President's CHP goal.

CHP TAPs provide:

- Regional CHP expertise
- Fact-based, un-biased information on CHP:
 - Technologies
 - Project development
 - Project financing
 - Local electric and natural gas supplier interfaces
 - State best practice policies
- Vendor, fuel, and technology neutral assessments of CHP viability.



Key Activities:

Market Opportunity Analysis: Supporting analyses of CHP market opportunities in diverse markets including industrial, federal, institutional, and commercial sectors.

Education and Outreach: Providing information on the energy and non-energy benefits and applications of CHP to state and local policy makers, utilities, energy end-users, trade associations and others.

Technical Assistance: Providing technical assistance to end-users and stakeholders to help them consider CHP, waste heat to power, and/or district energy with CHP in their facility and to help them through the project development process from initial CHP screening to installation

CHP Deployment Program Accomplishments (1 of 2)

Technical Assistance:

- Between FY 2009 and 2013, CHP centers (RAC, CEAC, TAP) provided:
 - Technical support to over 590 CHP projects
 - About 350 of those projects received Technical Site Evaluations (either alone or in conjunction with other support) and the remainder were provided with other types of technical assistance, often on multiple occasions.
 - More than 190 are currently under development or online with a total capacity of 1540 MW.
- 869 MW of new, cost-effective CHP was installed in 2012, largest single year capacity additions since 2005

Outreach & Education:

- SEE Action “Guide to Successful Implementation of State CHP Policies” published
- CHP Regional Dialogues (Ohio, Arkansas, Maryland, Utah)
- Numerous state-specific policy engagement activities

CHP Deployment Program Accomplishments (2 of 2)

- Education and Outreach:
 - Focus on Strategic Target Market Working Groups Developed to focus on high-impact, low-penetration markets
 - Critical Infrastructure
 - Hospitals
 - Biomass
 - Federal Facilities
 - Microgrids with CHP
 - “Tool kits” developed to speak the audience’s “language”
- Partners: CHP TAPs; EPA; FEMP; WIP; BTO; OE; CHPA

CHP Deployment Program FY14 Plan

Program Goals FY14: Support the installation of the President's 40GW goal

- Technical Assistance: Provide site-specific technical support to over 140 potential CHP projects
 - Move towards portfolio analyses
 - Continue to streamline the process
- Policy Education: Provide over 20 educational opportunities for policymakers to learn about CHP benefits and the constraints that certain policies place on CHP installations
 - State-specific policy Fact Sheets being developed
 - Policy-category Fact Sheets being developed (standby rates, interconnection standards, excess power sales, and Clean Energy Portfolio Standards –CEPS)
- Education and Outreach: Provide over 40 educational opportunities for prospective end-users and other stakeholders to learn about CHP applications
 - Strategic market focus (Critical Infrastructure, Federal Facilities, Hospitals, Biomass and Microgrids with CHP)
 - Designed for constituent drivers/motivations

CHP Deployment Program Outlook

- Strategic Market Focused – proactive approach to key-in on large, untapped CHP potential
- Synergize with Federal, State and utility efforts around CHP deployment
 - Reach the Better Plants and IAC recipients on potential
- Overarching Analyses:
 - Waste Heat to Power
 - CHP Equipment Cost and Performance Updates
 - State-Specific CHP Policy Fact Sheets
 - Standby Rates
 - Interconnection Standards
 - Excess Power Sales
 - Clean Energy Portfolio Standards (CEPS)

DOE CHP Technical Assistance Partnerships (CHP TAPs)

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CHP Deployment Program Get Involved

Interested in learning if CHP is an energy efficiency solution for you?

Visit:

DOE Advanced Manufacturing Office's CHP Deployment Program Website:

<http://www1.eere.energy.gov/manufacturing/distributedenergy/>

Review:

CHP Deployment Program Fact Sheet:

http://www1.eere.energy.gov/manufacturing/distributedenergy/pdfs/chp_taps_handout.pdf

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