



U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

Federal Policies and Actions in Support of CHP

Jumpstarting Combined Heat and Power
Initiatives in the US – IIP and CESC
webinar

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CHP Themes Across the US

- Federal and State policy critical
- Efficient use of low-cost natural gas
- Energy savings and associated benefits
- Manufacturing renaissance and reshoring
- District energy / microgrids and community planning
- Resiliency

Current Key Issues – Market Conditions

- Closure of coal-fired, central station power plants due to competition from lower cost natural gas and expected rising costs of environmental compliance. DOE estimates approx. 49 GW of coal capacity to retire through 2020*.
- Lower cost natural gas due to supply growth from hydraulic fracturing/directional drilling; shale gas extraction. Historical low US oil imports and record high US oil production.
- Low wholesale electricity prices = tough market for CHP.
- Recent severe storms and extreme weather (Hurricane Sandy; Irene; etc) leading to extended grid outages are driving strong interest in energy resiliency; distributed generation; utility hardening; and “microgrids.”
- ~ 1 GW new CHP installed in 2012 – the largest single year capacity additions since 2005. Installations expected to continue increasing, reflecting lower gas prices and that state policy makers are increasingly recognizing the benefits of CHP.

* Source: EIA AEO 2012 <http://www.eia.gov/todayinenergy/detail.cfm?id=7330>



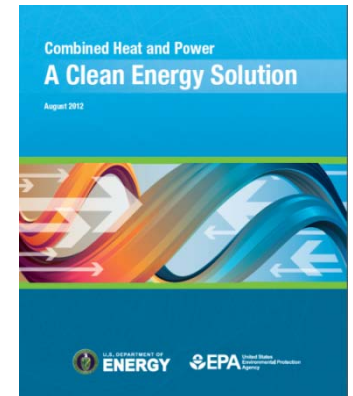
August 30, 2012 Executive Order – “Accelerating Investments in Industrial Energy Efficiency”

Executive Order 13624

- 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.
- 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**.

What the Executive Order Does

- Sets a national **goal of 40 GW** of new **combined heat and power** installation over the next decade;
- Directs DOE and EPA to convene stakeholders through ongoing **regional workshops to foster a national dialogue** to identify, develop, and encourage the adoption of **best practice policies and investment models**;
- Directs all Federal agencies to support and encourage efforts to accelerate investment in industrial energy efficiency and CHP by:
 - Providing general **guidance, technical analysis and information**, and financial analysis on the value of investment in industrial efficiency and CHP to States, utilities, and owners and operators of industrial facilities;
 - Assisting **States in developing and implementing State specific best practice policies** that can accelerate investment in industrial energy efficiency and CHP.



National Goal of 40 GW of CHP by 2020

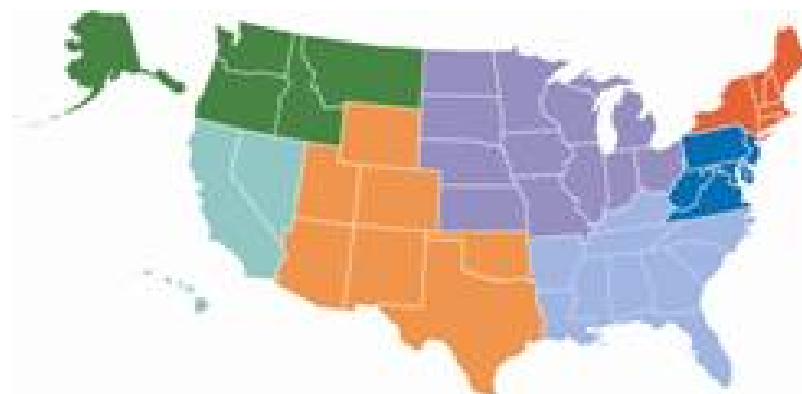
- Achieving this goal would:
 - Increase total CHP capacity in the U.S. by **50 percent** in less than a decade
 - Save energy users **\$10 billion a year** compared to current energy use
 - Save **one quadrillion Btus** (Quad) of energy — the equivalent of 1 percent of all energy use in the U.S.
 - Reduce emissions by **150 million metric tons of CO₂ annually** — equivalent to the annual 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,
https://www1.eere.energy.gov/manufacturing/distributedenergy/pdfs/chp_clean_energy_solution.pdf

DOE CHP and District Energy with CHP Technical Assistance

CHP Technical Assistance Partnerships (CHP TAPs) - Regional Services:

- **Market Assessments:** Analyses of CHP market potential in diverse sectors, such as health care, industrial sites, hotels, & new commercial and institutional buildings.
- **Education and Outreach:** Providing information on the benefits and applications of CHP to state and local policy makers, regulators, energy end-users, trade associations and others.
- **Technical Assistance:** Providing technical information to energy end-users and others to help them consider if CHP makes sense for them. Includes performing site assessments, producing project feasibility studies, and providing technical and financial analyses.



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



State & Local Energy Efficiency Action Network

What is the SEE Action Network?

- Network of 200+ leaders and professionals, led by state and local policymakers, bringing energy efficiency to scale
- Support on energy efficiency policy and program decision making for:
 - Utility regulators, utilities and consumer advocates
 - Legislators, governors, mayors, county officials
 - Air and energy office directors, and others
- Facilitated by DOE and EPA; successor to the National Action Plan for Energy Efficiency



To stay updated on SEE Action activities and resources, sign-up for email alerts:

<http://www1.eere.energy.gov/seeaction/index.html>

The Guide provides state policy makers with actionable information regarding:

- Design of standby rates
- Interconnection standards for CHP with no electricity export
- Excess power sales
- Clean energy portfolio standards
- Emerging market opportunities: CHP in critical infrastructure and utility participation in CHP markets

In development: State workshops w/ PUCs on the Guide & how to refine policy implementation to achieve greater CHP.

SEE Action
STATE & LOCAL ENERGY EFFICIENCY ACTION NETWORK



Guide to the Successful Implementation of State Combined Heat and Power Policies

Industrial Energy Efficiency and Combined Heat and Power Working Group

Driving Ratepayer-Funded Efficiency through Regulatory Policies Working Group

March 2013

The State and Local Energy Efficiency Action Network is a state and local effort facilitated by the federal government that helps states, utilities, and other local stakeholders take energy efficiency to scale and achieve all cost-effective energy efficiency by 2020.

Learn more at www.seeaction.energy.gov

http://www1.eere.energy.gov/seeaction/chp_policies_guide.html



Boiler MACT Technical Assistance Effort

DOE Boiler MACT Technical Assistance

- On December 20, 2012, EPA finalized a specific set of adjustments to March 2011 Clean Air Act standards for boilers and certain solid waste incinerators (Major Source Rule – ICI Boiler MACT)
- DOE is providing site-specific technical and cost information on clean energy compliance strategies to those major source facilities affected by the Boiler MACT rule currently burning coal or oil.
- Affected facilities may have opportunities to develop compliance strategies, such as CHP, that are cleaner, more energy efficient, and that can have a positive economic return for the plant over time
- Preliminary Findings Reported (*as of November 15, 2013*):
 - Over 535 companies contacted
 - 220+ feel they are already in compliance
 - 71 no longer in business
 - Technical Assistance for 80+ in various stages
 - All companies are now aware of how CHP can assist in a compliance strategy
- DOE will continue to track results of results of technical assistance



Upcoming “Report on the Deployment of Industrial Energy Efficiency” to Congress (H.R. 6582)

Report on the Deployment of Industrial EE (H.R. 6582)

- *Background to the American Energy Manufacturing Technical Corrections Act (H.R. 6582) passed Dec 4, 2012*
- DOE report due in 2 years describing:
 - “The legal, regulatory, and economic barriers to the deployment of industrial energy efficiency in all electricity markets (including organized wholesale electricity markets, and regulated electricity markets).”
 - “In coordination with the industrial sector and other stakeholders, shall develop policy recommendations regarding the deployment of industrial energy efficiency, including proposed regulatory guidance to States and relevant Federal agencies to address barriers to deployment.”
- *Industrial Energy Efficiency*
 - “...*improve energy efficiency or to generate or transmit electrical power and heat,...*”
 - “...*including electric motor efficiency ... demand response, direct or indirect combined heat and power, and waste heat recovery.*”

Report on the Deployment of Industrial EE (H.R. 6582)

Analyze key barriers

- Transmission and distribution interconnection requirements.
- Standby, back-up, and maintenance fees (including demand ratchets).
- Exit fees.
- Life of contract demand ratchets.
- Net metering.
- Calculation of avoided cost rates.
- Power purchase agreements.
- Energy market and capacity market structures.
- Other barriers as may be identified by the Secretary, in coordination with the industrial sector and other stakeholders.

Identify successful examples

- State and Federal policies that resulted in greater use of industrial energy efficiency
- private initiatives that resulted in greater use of industrial energy efficiency; and
- cost-effective policies used by foreign countries to foster industrial energy efficiency.

Estimate Benefits

- Economic benefits of providing the industrial sector with Federal EE matching grants of \$5,000,000,000 for 5- and 10-year periods,
- Energy savings available from increased use of recycled material in energy-intensive manufacturing processes.

Status

- DOE has convened a stakeholder group to provide input and contribute to this study.
- DOE is on track to meet Congressional deadline of Dec 2014.



DOE Funding Opportunities Supporting CHP

DOE CHP State Opportunity

- DOE Weatherization Office - State Energy Program 2013 Competitive Awards
 - Area of Interest 1 – *Advancing Industrial Energy Efficiency* will assist states with the development of programs and strategies that support the productivity and competitiveness of the States' industrial sectors by addressing specific policy, regulatory, or market barriers that deter a higher percentage of companies from achieving the economic and environmental benefits of greater investment in industrial energy efficiency and CHP.
 - Awards forthcoming – Fall 2013

DOE CHP Funding Opportunities

- Nov 5, 2013: DOE's **Federal Energy Management Program (FEMP)** issued the "[Assisting Federal Facilities with Energy Conservation Technologies \(AFFECT\)](#)" Funding Opportunity Announcement (FOA).
- Up to \$5 million in direct funding to Federal agencies for the development of CHP and renewable energy capital projects at U.S. Federal government-owned facilities.
- Letters of intent are due 12/10/2013
- Full Applications are due 2/18/2014
- FEMP and AMO are making technical assistance available upon request to Federal agencies to identify and analyze CHP or renewable energy opportunities and technologies.
- For more information: http://www1.eere.energy.gov/femp/services/pa_callforprojects.html

DOE CHP Funding Opportunities

- **DOE Loan Guarantee Office** forthcoming solicitation - Advanced Fossil Energy Projects. Up to **\$8 billion** in loan guarantee authority
- Seeks applications for loan guarantees to finance projects and facilities located in the US that employ innovative and advanced fossil energy technologies that avoid, reduce, or sequester air pollutants or greenhouse gases.
- Qualifying Projects include Efficiency Improvements:
 - A. Combined heat and power;
 - B. Waste heat recovery on industrial facilities;
- Eligible Projects include Efficiency Improvements -- Projects or facilities that incorporate new or improved technologies to increase efficiencies and substantially reduce greenhouse gas emissions associated with fossil fuel supply and use; and that meet both of the following requirements:
 - A. Projects or facilities that avoid, reduce, or sequester air pollutants or anthropogenic emission of greenhouse gases; and
 - B. Projects or facilities that employ New or Significantly Improved Technology as compared to Commercial Technology in service in the United State at the time the Term Sheet is issued.
- For more information:
- <http://lpo.energy.gov/resource-library/solicitations/advanced-fossil-energy-projects-solicitation/>
- <https://lpo.energy.gov/wp-content/uploads/2013/07/Draft-Advanced-Fossil-Solicitation.02.07.13.pdf>

Snapshot: State Policies & Laws

- **Maryland:** Investor-owned utilities running CHP incentive program for customers
- **Illinois:** State energy office included CHP in 3-yr program filing for public sector incentive programs
- **Minnesota:** Waste Heat Recovery Law (HF 729); signed May, 2013 - “waste heat recovered and used as thermal energy”, from existing machinery, buildings or industrial processes, including combined heat and power, for heating or cooling.
 - Can reduce demand side energy usage and is eligible for utility conservation programs and resulting energy savings eligible towards a utility’s natural gas or electric energy savings goals.
- **Texas:** [House Bill \(HB\) 2049](#) clarifies Texas Utility Code to allow CHP facilities to sell electricity and heat energy to multiple customers within the proximity of the facility thereby maximizing efficiency and minimizing financial risk.
- **Texas:** [HB 1864](#) instructs [State Energy Conservation Office](#) to issue compliance guidelines on how to conduct a CHP feasibility analysis prior to construction or renovation of any government facility deemed critical for disaster preparedness and emergency response.

Topic in Focus: Resiliency



- Governors, Mayors, Planners and Regulators now facing fragility of grid – seeking viable solutions due to frequent and more severe storm outages.
- “Microgrids” – successful operating examples are US universities & military bases with robust district energy/CHP
- Needed focus on regulatory reform; proper valuation of business continuity; grid integration and business models to ensure robust assets are deployed.
- District Energy/CHP well positioned but need focus.

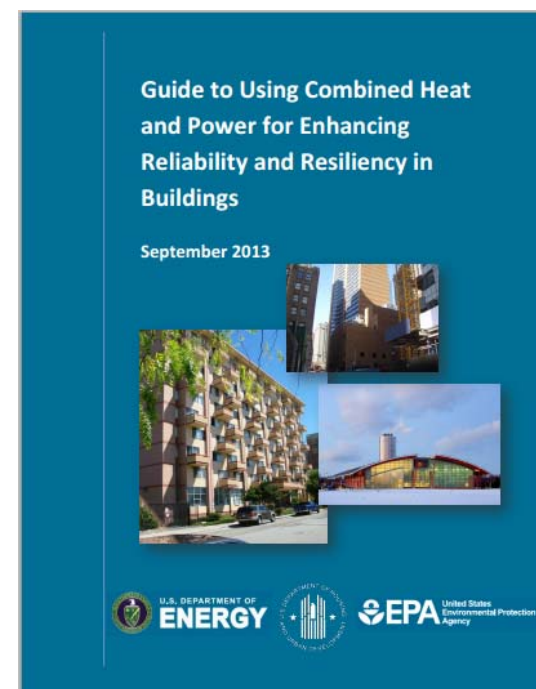


Federal Hurricane Sandy Rebuilding Task Force

- August 2013: Federal Hurricane Sandy Rebuilding Task Force published “*Hurricane Sandy Rebuilding Strategy*”
- Describes how CHP and district energy with CHP played a successful role in keeping a number of college campuses, multifamily housing, critical medical facilities, sewage treatment plants and other facilities running during the storm and its aftermath.
- Strategy offers **two recommendations** to bolster CHP, district energy and other forms of clean distributed generation, including:
 - Ensuring that Sandy recovery energy investments in critical infrastructure are resilient (Recommendation 12)
 - Encouraging Federal and State cooperation to improve electric grid policies and standards (Recommendation 14).

New DOE / EPA / HUD Guidance: CHP for Reliability & Resiliency in Buildings

- DOE, EPA and HUD ***“Guide to Using Combined Heat and Power for Enhancing Reliability and Resiliency in Buildings”*** to assist State and local officials and others involved in the Hurricane Sandy rebuilding process.
- Purpose: to provide practical information on CHP, including what factors must be considered when configuring a CHP system to operate independently of the electricity grid, and what steps are involved in a typical CHP project development process.
- Includes focus on district energy, microgrids and CHP.



http://www.eere.energy.gov/manufacturing/distributedenergy/pdfs/chp_for_reliability_guidance.pdf

New DOE / EPA / HUD Guidance: CHP for Reliability & Resiliency in Buildings

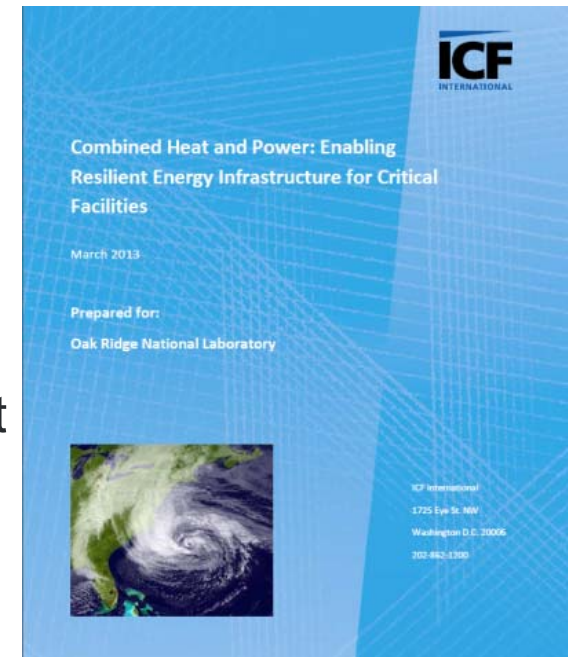
Guide discusses:

- The policy context for CHP, including in the aftermath of Hurricane Sandy
- CHP in State and local resiliency planning efforts
- CHP basics and benefits
- The opportunities for CHP to contribute to reliability;
- Factors for determining whether CHP is an appropriate choice for multifamily housing and critical facilities and steps in the CHP project development process
- Options for financing CHP
- Additional resources that provide more detailed information

CHP & Critical Infrastructure

March 2013 DOE report (ICF): **CHP: Enabling Resilient Energy Infrastructure for Critical Facilities**

- Summarizes how critical infrastructure facilities with CHP systems operated during Superstorm Sandy.
- Several examples from other storms and blackout events in other regions of the country are also included.
- Provides information on the design and use of CHP for reliability purposes,
- Provides information on state and local policies designed to promote CHP in critical infrastructure applications.



http://www1.eere.energy.gov/manufacturing/distribute_denergy/pdfs/chp_critical_facilities.pdf

For More Information

- President Obama's Executive Order 13624
<http://www.whitehouse.gov/the-press-office/2012/08/30/executive-order-accelerating-investment-industrial-energy-efficiency>
- SEE Action IEE and CHP Working Group
<http://www1.eere.energy.gov/seeaction/>
- DOE Combined Heat & Power Program
<http://www1.eere.energy.gov/manufacturing/distributedenergy/index.html>

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