Industrial Combined Heat and Power: Why is it Stalled in the U.S.?

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Numerous Market Failures and Barriers Inhibit the Growth of Industrial CHP

- **Key strengths**
  - Waste heat recycling = free fuel and high efficiency*
  - Low-cost & clean energy
  - Enhances system reliability

- **Numerous barriers to CHP investments**
  - Regulatory barriers
    - CHP cuts utility profits
  - Financial barriers
  - Information and workforce barriers

*Central generation cannot economically recycle waste heat because steam, hot or chilled water travel at most ≈5 miles.

**Policy options are available to tackle these barriers.**

Source: Shipley et al. (2008) and Brown et al. (2011)
Some Recent Policies: A CHP Goal, a Tax Credit, State Portfolio Standards, and DOE Technical Assistance

- The U.S. has about 84 GW of CHP capacity (about 12% of power generation); the vast majority is in the industrial sector.

- In August 2012, an executive order set a national goal of **40 GW of new industrial CHP by 2020**.

- The Energy Information Administration forecasts that the nation will meet only **about half** of this goal by 2020.

- Baer, Brown and Kim (2013) estimate that a 30% Investment tax credit (ITC) would meet the goal in 2023, and would create jobs.*

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Methodology for Estimating Job Impacts: Hybrid NEMS-Input/Output Model

• We first modeled the investment tax credit in Georgia Tech’s National Energy Modeling System (GT-NEMS).

• NEMS outputs (capacity, supply, & energy bill changes) drive input-output multipliers (based on IMPLAN) to estimate employment impacts.

The Job Generation Benefits of Expanding Industrial Cogeneration

Each GW of installed CHP capacity creates and maintains ≈2,000-3,000 full-time equivalent jobs throughout the lifetime of the system.

Job Coefficients by Sector (Jobs per Million of Expenditures, in $2009)
14 GW of new CHP capacity between 2015 and 2035 would create 21,000-34,000 jobs.

- Direct jobs in manufacturing, construction, O&M
- Indirect and induced jobs, resulting from redirection of industrial energy expenditures and re-spending of energy-bill savings due to price and demand changes

Such job impacts are typical of energy efficiency investments.

CONCLUSIONS/RECOMMENDATIONS

• Create a shared vision about the value of CHP – today and in light of forthcoming Clean Air Act rules.
• Include CHP in integrated system planning.
• Address regulatory barriers.
• With a policy makeover, CHP could help America build a prosperous and secure future based on low-carbon and clean energy.

Weyerhaeuser, MS, pulp plant on 6/21/11: Producing 68 MW of electricity, consuming 49 MW, and selling 19 MW back to the grid.
FOR MORE INFORMATION

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