

Opportunities for Combined Heat and Power in West Virginia

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Outline

- What is CHP?
 - Case studies
- Benefits of CHP
- Status and potential of CHP in WV
- Overcoming barriers

What is CHP?

- Using waste heat from electricity generation
- Capturing waste heat from industrial processes to generate electricity (waste heat recovery)
- 9% of US generating capacity (82 GW): 87% of this capacity in manufacturing plants
- Thermal efficiency up to 80% (vs. 45% for generating heat and power separately)

Case Studies

- Sikorsky Aircraft (CT)
- 10 MW CHP unit provides 84% of electricity, 85% of steam for facility
- \$26 million investment, expected payback < 4 years
- Kept running during Hurricane Sandy; allowed the 9,000 employees access to food, showers, etc while surrounding communities were out of power

Case Studies

- Baptist Medical Center (MS)
- 4.3 MW CHP unit meets 60% of electrical needs, 80% of steam needs
- \$4.2 million investment, payback 6.3 years
- Remained fully operational when grid was down for 52 hours during Hurricane Katrina

Case Studies

- Co-op City (NY)
- Major residential neighborhood in the Bronx
- 40 MW CHP system provides all electricity needs, some steam needs
- Excess power exported to power grid
- Maintained full functionality during Hurricane Sandy (no power outage)

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- **Benefits of CHP**
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Benefits of CHP

- Financial savings relative to purchasing electricity and heat separately
- Reliability, protection against blackouts
- Creation/retention of jobs:
 - ArcelorMittal's 38 MW CHP system, installed 2012 in Indiana, created 360 manufacturing and construction jobs and is expected to help retain 6,000 employees by lowering the production cost of steel by \$5/ton

Benefits of CHP

- More efficient use of fossil fuels and reduced line losses
 - Lower greenhouse gas emissions
- Potential for deferring transmission and distribution system upgrades
- Smaller, incremental additions of capacity to the electrical system – greater planning flexibility
- Local economic development and job creation

Why Now?

- Low natural gas prices
- Increasing concerns about reliability
- Need to upgrade some industrial boilers to comply with EPA air toxics regulations
- Both WV power companies are short on generating capacity
- Federal Executive Order: goal of 40 GW new CHP capacity by 2020

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Current Status

- 382 MW
- 7% of our utilities' generating capacity (less than national average, even though we're an industry-heavy state)
- Largest CHP facilities at PPG Natrium, Weirton Steel, WVU

Potential in WV

- 1.7 GW of remaining technical potential
 - Mainly in chemical and paper industries
- Economic potential:
 - 588 MW with utility support
 - 71 MW without utility support
- Specific example:
 - Alloy plant waste heat recovery

Barriers to CHP development

- No incentives for utilities to support / purchase power
 - Typically CHP facilities will generate excess power if sized to meet thermal load
- Lack of technical expertise / not core business for manufacturing facilities
- Longer payback period than host may be willing to accept
- Lack of access to financing

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Overcoming barriers

- Policies to support a fair price for the electricity output of CHP systems:
 - Clean Energy Standard Offer Program: would provide a guaranteed price (based on the price of new baseload coal or gas capacity) for the electricity generated by CHP units
 - Carve-out in Alternative Portfolio Standard: would require utilities to own or buy a certain fraction of their generation from CHP units

Overcoming Barriers

- Technical assistance:

- Mid-Atlantic Clean Energy Application Center

- <http://www.maceac.psu.edu/>

- Technical assistance to facilities impacted by EPA air toxics regulations of industrial boilers

- Other policies:

- Upfront incentives, loan guarantees

Examples from other states

- Ohio: carve-out for CHP in their energy efficiency resource standard
- Maryland: some utilities have issued an RFP for CHP capacity which includes upfront incentives of \$250/kW and production incentive per kWh for first 18 months – helps utilities fulfill energy efficiency obligations
- New Jersey: allows CHP generators to sell electricity and heat to a third party, not the utility (utility can charge fee for use of distribution lines)

Thank you!

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