Opportunities for Combined Heat and Power in West Virginia

Cathy Kunkel
Energy Efficient West Virginia
May 22, 2013
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
• 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)
Outline

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

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

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

Cathy Kunkel
Energy Efficient West Virginia
304-237-3802
cathykunkel@gmail.com
www.eewv.org