Promoting Industrial Energy Efficiency, CHP, & WHP in CPP Implementation

Electricity Consumers Resource Council – Spring Workshop

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April 12, 2016
Agenda

- Energy efficiency offers significant benefits
- CHP is a valuable compliance option under the CPP
- EPA treats CHP well in the final CPP
- States will need to develop plans that take advantage of this opportunity
- Next steps
ArcelorMittal (Indiana)

- Energy recovery and reuse 504 boiler project
- $63.2 million total project cost
- $31.6 million DOE grant
- $20 million in annual energy savings
- Payback (with DOE grant): 1.58 years
- Generates 90 MW
- Provides 20% of energy needs
Sikorsky Aircraft (Connecticut)

- $30.6-million installed costs
- $4.66-million state grant
- $6.5-million in annual energy savings
- Generates 10 MW
- Provides 85% of energy needs
- Enhanced reliability
Nissin Brake (Ohio)

- Air compressor controls, air drying, lighting
- $185,322 total project cost
- $58,012 total incentives paid
- Payback period without AEP incentives: 2.8 years
- Payback period with AEP incentives: 1.9 years
- 801,921 kWh in annual energy savings
The Clean Power Plan should reduce power plant carbon pollution 32% below 2005 levels in 2030.

- **2005**: 2,664 million short tons of CO₂
- **2030**: 1,814 million short tons of CO₂
Energy Efficiency Keeps Bills Down

Source: ACEEE 2014
Industrial Efficiency Is the Cheapest Source of Efficiency

Source: Aden et al. 2013
CHP Is Cost Effective

Levelized Costs of Energy across Power Generation Technologies, Q4 2013 ($/MWh)

Source: BCSE 2014
CHP Is an Efficient Way to Produce Power .... And Lower Emissions
Ohio CHP Potential

Energy Efficiency Helps Ohio Achieve CPP Targets

Source: ACEEE’s SUPR-2 Calculator
Impact of CHP on Ohio’s CPP Targets

Source: ACEEE’s SUPR-2 Calculator
Current CHP Projects

Source: CHP Installation Database, March 2014
Affected Units

- Constructed before 2014
- Sell more than 25 MW to the grid
- **Excludes** units that sell < 25 MW or < 1/3 power to the grid
- **Excludes** units which have historically limited fossil fuel use to < 10% capacity factor
- **Excludes** units that are not connected to natural gas pipelines
- **Excludes** highly efficient units
CHP Technical Potential

On-Site Technical Potential by State

Remaining Potential for CHP
CHP as a Compliance Option

- Installed after 2012 (post-2022 generation)
- Non-affected units
- Eligible under a rate or mass-based approach

“Electric generation from non-affected CHP units may be used to adjust the CO\textsubscript{2} emission rate of an affected EGU, as CHP units are low-emitting electric generating resources that can replace generation from affected EGUs.”

- 80 Fed. Reg. at 64902
Two Compliance Approaches

**Rate**

Target = \( \frac{\text{CO}_2 \text{ emitted (lbs)}}{\text{Generation} + \text{ERCs (MWh)}} \)

e.g., 1,190 lbs/MWh in 2030 (Ohio)

*CHP may earn Emission Rate Credits (ERCs)*

**Mass**

Target = \( \text{CO}_2 \text{ emitted (tons)} \)

e.g., 73,769,806 tons in 2030 (Ohio)

*CHP may earn Allowances or other incentives*
How Could it Work in Practice?

Manufacturer Installs a 10 MW CHP system

- Estimate MWh savings
- Verify savings (registry)
- Earn ERCs
- Sell ERCs

- Reducing CO₂ from grid implicitly contributes to state compliance
- State may fund with auction proceeds
- Allocate allowances to CHP
Invest Auction Revenue in Energy Efficiency

RGGI Investments (2008 - 2013)

- Energy Efficiency: 62%
- Direct Bill Assistance: 15%
- GHG Abatement: 9%
- Clean & Renewable Energy: 8%
- Administration: 5%
- RGGI, Inc.: 1%

Direct Allocation

90%: Allowances for Power Plants

10%: Set-Aside
- Renewables
- Energy Efficiency
- Combined Heat and Power

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Output-Based Direct Allocation

Emissions Budget

EPA-SET
Mass-Based ➞
State Goal

Allowances are distributed periodically based on output (after generation occurs or EE savings is demonstrated)

Affected Units

CHP
Energy
EE

Energy Efficiency

Renewables
Output-Based v. Historical Emissions
E&E’s POWER PLAN HUB

Supreme Court Stay Response

- Continuing Planning: 19 states
- Assessing Planning: 9 states
- Suspending Planning: 19 states
- Exempt: 4 states

Source: E&E News, Clean Power Plan Hub
Conclusions

- CHP and energy efficiency are a huge opportunity
- The CPP creates an even bigger opportunity
- CHP is treated well in the rule
- Potential for payment to manufacturers is big
- Biggest barrier is persuading states to move forward
Next Steps: Seize the Opportunity

- Invest in energy efficiency at your facilities
- Work with utilities to design programs that benefit your company
- Work with state air agencies to include efficiency in their state compliance plans
- Form a working group to engage in key states
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Appendix
Arkansas CHP Potential

Current: 560 MW
Potential: 1,795 MW

Source: “CHP Technical Potential In the United States”, DOE-ICF, March 2016
Energy Efficiency Helps Arkansas Achieve CPP Targets

Source: ACEEE’s SUPR-2 Calculator
Impacts of CHP on Arkansas’ CPP Targets

Source: ACEEE’s SUPR-2 Calculator
Texas CHP Potential

Source: “CHP Technical Potential In the United States”, DOE-ICF, March 2016
Energy Efficiency Helps Texas Achieve CPP Targets

Source: ACEEE’s SUPR-2 Calculator
Impact of CHP On Texas’ CPP Targets

Source: ACEEE’s SUPR-2 Calculator
“Despite the Supreme Court’s decision, National Grid still strongly supports EPA’s Clean Power Plan.”

Dean Seavers, President of National Grid

“While the Court’s temporary stay is disappointing, it does nothing to diminish our resolve in Minnesota to keep moving forward on clean energy initiatives, including the development of our state’s Clean Power Plan.”

Governor Dayton, Minnesota

“While we’re still reviewing the implications of the Supreme Court’s decision, we remain committed to having the cleanest air in the nation. We’ll continue to build upon the great strides we’ve made as a state....”

Governor Hickenlooper, Colorado