Federal Policy Support for CHP

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Where Are We Today?

- **82 GW** of installed CHP at 3,842 industrial and commercial facilities (2011)
- 87% of capacity in industrial applications
- 71% of capacity is natural gas fired
- Avoids more than **1.8 quadrillion Btus** of fuel consumption annually
- Avoids **241 million metric tons of CO₂** compared to separate production

Source: CHP Installation Database
CHP Annual Additions since 1960

Annual Capacity Additions by Size

Sites >100 MW
Sites <100 MW
CHP Additions 2006-2011 (3,442 MW)
CHP Market Activity

Capacity (MW)


0 1,000 2,000 3,000 4,000 5,000 6,000 7,000
Emerging Drivers for CHP

- Benefits of CHP recognized by policymakers
- Favorable outlook for natural gas supply and price in North America
- Opportunities created by environmental drivers
Federal Support for CHP

- Executive Order: “Coordinate and strongly encourage efforts to achieve a national goal of deploying 40 gigawatts of new, cost effective industrial CHP in the United States by the end of 2020”

- DOE focuses technology deployment support for CHP - Regional Clean Energy Application Centers and SEE Action – Regional meetings planned in support of Executive Order

- EPA recognizes CHP as an efficiency measure under developing greenhouse gas emission standards and promoting output-based options that recognize CHP benefits (ICI Boiler MACT and Utility MACT (MATS))

- FERC Notice of Interest for recognizing ancillary services from small generators
Pending Legislative Modifications to ITC

- **HR 2750** – Sponsor Jay Inslee (D-WA); 9 Cosponsors
  - Increases eligible equipment cap to 25 MW
  - Eliminates system wide cap of 50 MW
  - Includes waste heat to power

- **HR 2783** – Sponsor Paul Tonko (D-NY); 3 Cosponsors
  - Increases the investment tax credit to 30% for highly efficient CHP (70% efficient or greater)
  - Increases eligible equipment cap to 25 MW
  - Eliminates system wide cap of 50 MW

- **HR 2812** – Sponsor Paul Tonko (D-NY); 3 Cosponsors
  - Allows thermal only waste heat systems to qualify for a 30% investment tax credit

- **S 3352** - Bingaman-Snowe
  - Increases CHP ITC to 25 MW, eliminates system size cap
  - Adds Waste Heat to Power as eligible technology
Legislative Support for CHP

- **Clean Energy Standard Act of 2012 (S.2146)**
  - Recognizes the additional energy efficiency and greenhouse gas benefits of CHP
  - CES for utilities of 24% in 2015 up to 40% in 2035
  - CHP awarded additional partial credits to reflect utilization of heat
  - WER credited for electricity produced
  - CHP qualifies at 50% efficiency (20% electric and 20% thermal)

- **Shaheen-Portman (S.1000)**
  - Updates to building codes
  - DOE assessment of DG and RE for buildings
  - $400M lump sum for building EE retrofits
  - $400M annually for 2012-2021 (state revolving loan program)

- **Coons-Moran Master Limited Partnership Parity Act (S.3275)**
  - Clean energy investments qualify for access to lower cost capital with greater liquidity

- **Bass-Matheson (HR 4017)**
  - $400M lump sum for EE building retrofits for Federal facilities
  - Requires coordination of EE R&D
  - Requires DOE plan to produce 170 GW from CHP by 2020
Pending Federal Legislation

- Developing legislation from Sen. Shaheen:
  - DOE to develop and states to consider adoption of standard interconnection procedures and fees, and standard rules for standby power
  - Grant program for states to implement output-based standards
  - Add CHP and WHP to DOE Loan Guarantee Program
  - Promote rate-basing of behind the meter energy efficiency investments (including CHP) through increased tax incentives
Impact of Pending EPA Utility Regulations

- Utility Regulations
  - Mercury and Air Toxics Standards (MATS)
  - Cross-State Air Pollution Rule (CSAPR), formerly “Transport Rule” – (Vacated by the Court)
- Will require compliance investments and/or drive closings of some coal capacity
  - Estimates of shutdown coal capacity range from 20 to 50 GW
- Price impacts will be regional
- Closings could result in localized reliability concerns providing opportunities for CHP
ICI Boiler MACT

- ICI Boiler NESHAPS (National Emissions Standards for Hazardous Air Pollutants), aka “Boiler MACT”
  - Final rule forthcoming – expected in 2012

- Compliance with MACT limits will be expensive for many coal and oil users (standard compliance measures)

- May consider converting to natural gas
  - Conversion for some oil units, replacements for coal units?

- May consider moving to natural gas fueled CHP (trade off of benefits versus additional costs)
  - Represents a productive investment
  - Potential for lower steam costs due to generating own power
  - Higher overall efficiency and reduced emissions
  - Higher capital costs, but partially offset by required compliance costs or new gas boiler costs
ICI Boiler MACT - Potential CHP Capacity

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>Number of Facilities</th>
<th>Number of Affected Units</th>
<th>Boiler Capacity (MMBtu/hr)</th>
<th>CHP Potential (MW)</th>
<th>CO₂ Emissions Savings (MMT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>332</td>
<td>751</td>
<td>180,525</td>
<td>18,055</td>
<td>114.2</td>
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<tr>
<td>Heavy Liquid</td>
<td>170</td>
<td>367</td>
<td>48,296</td>
<td>4,830</td>
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<tr>
<td>Light Liquid</td>
<td>109</td>
<td>241</td>
<td>22,133</td>
<td>2,214</td>
<td>10.5</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>611</strong>*</td>
<td><strong>1,359</strong></td>
<td><strong>250,954</strong></td>
<td><strong>25,099</strong></td>
<td><strong>147.6</strong></td>
</tr>
</tbody>
</table>

*Some facilities are listed in multiple categories due to multiple fuel types; there are 567 ICI affected facilities*

- CHP potential based on average efficiency of affected boilers of 75%; Average annual load factor of 65%, and simple cycle gas turbine CHP performance (power to heat ratio = 0.7)
- GHG emissions savings based on 8000 operating hours for coal and 6000 hours for oil, with a CHP electric efficiency of 32%, and displacing average fossil fuel central station generation

The data on this chart is still being refined
Where is the Remaining Potential for CHP

Source: ICF internal estimates