

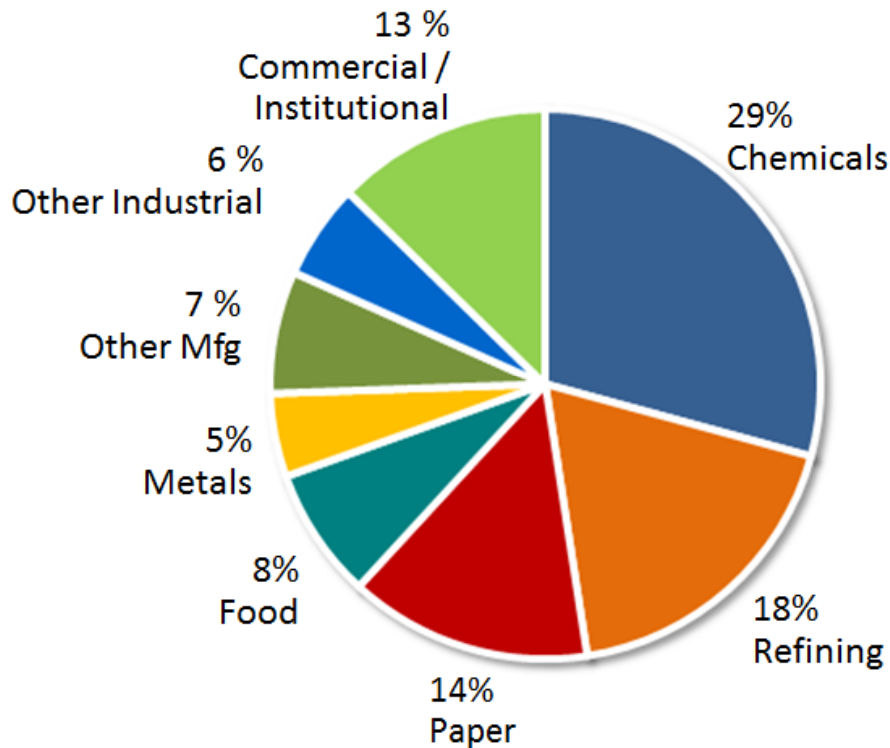


Federal Policy Support for CHP

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Climate Policy Initiative Dialogue Meeting
October 18, 2012

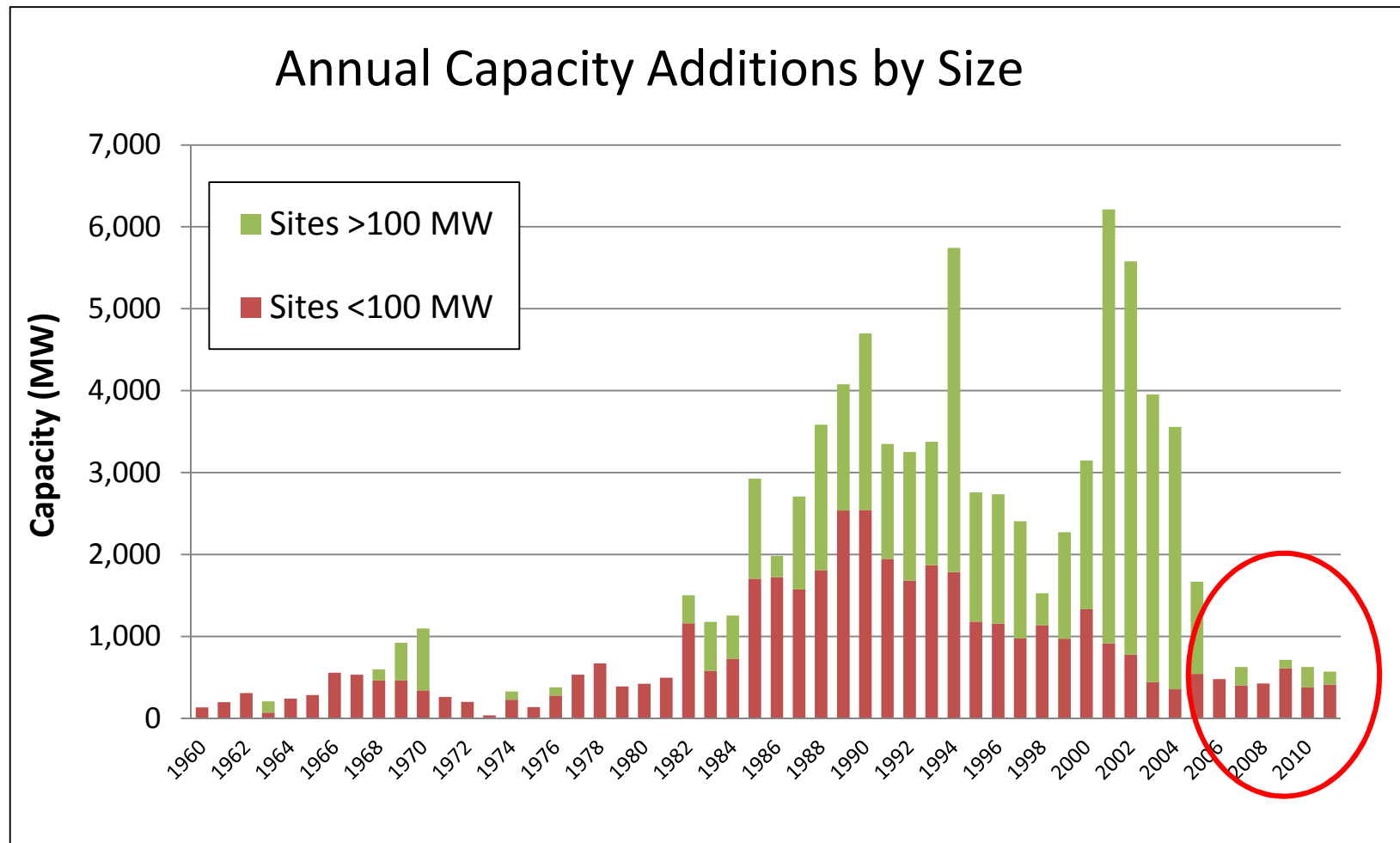
Where Are We Today?



Source: CHP Installation Database

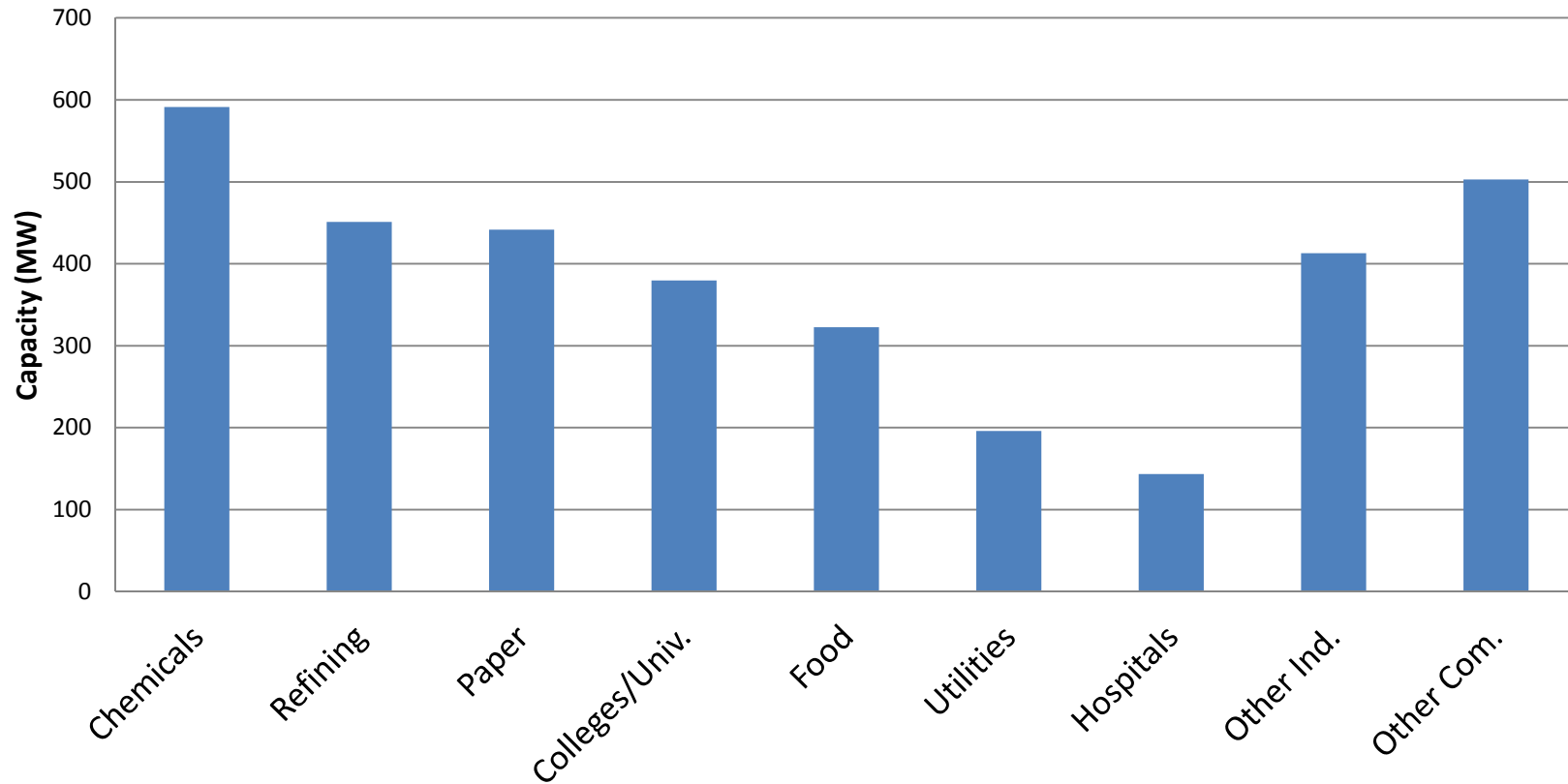
- **82 GW** of installed CHP at 3,842 industrial and commercial facilities (2011)
- 87% of capacity in industrial applications
- 71% of capacity is natural gas fired
- Avoids more than **1.8 quadrillion Btus** of fuel consumption annually
- Avoids **241 million metric tons of CO₂** compared to separate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

CHP Annual Additions since 1960

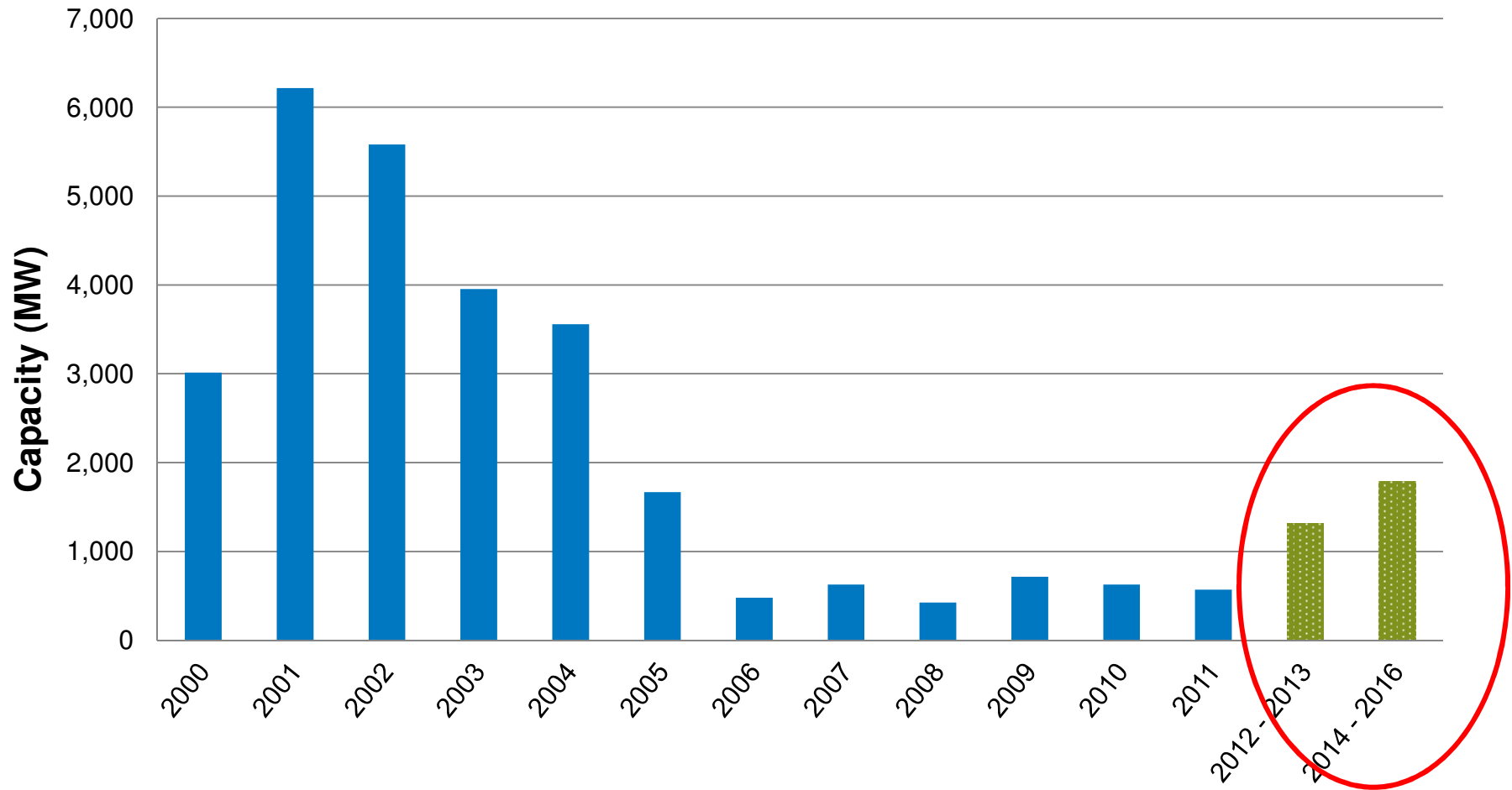


CHP Additions 2006-2011 (3,442 MW)

Capacity Additions by Application



CHP Market Activity



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

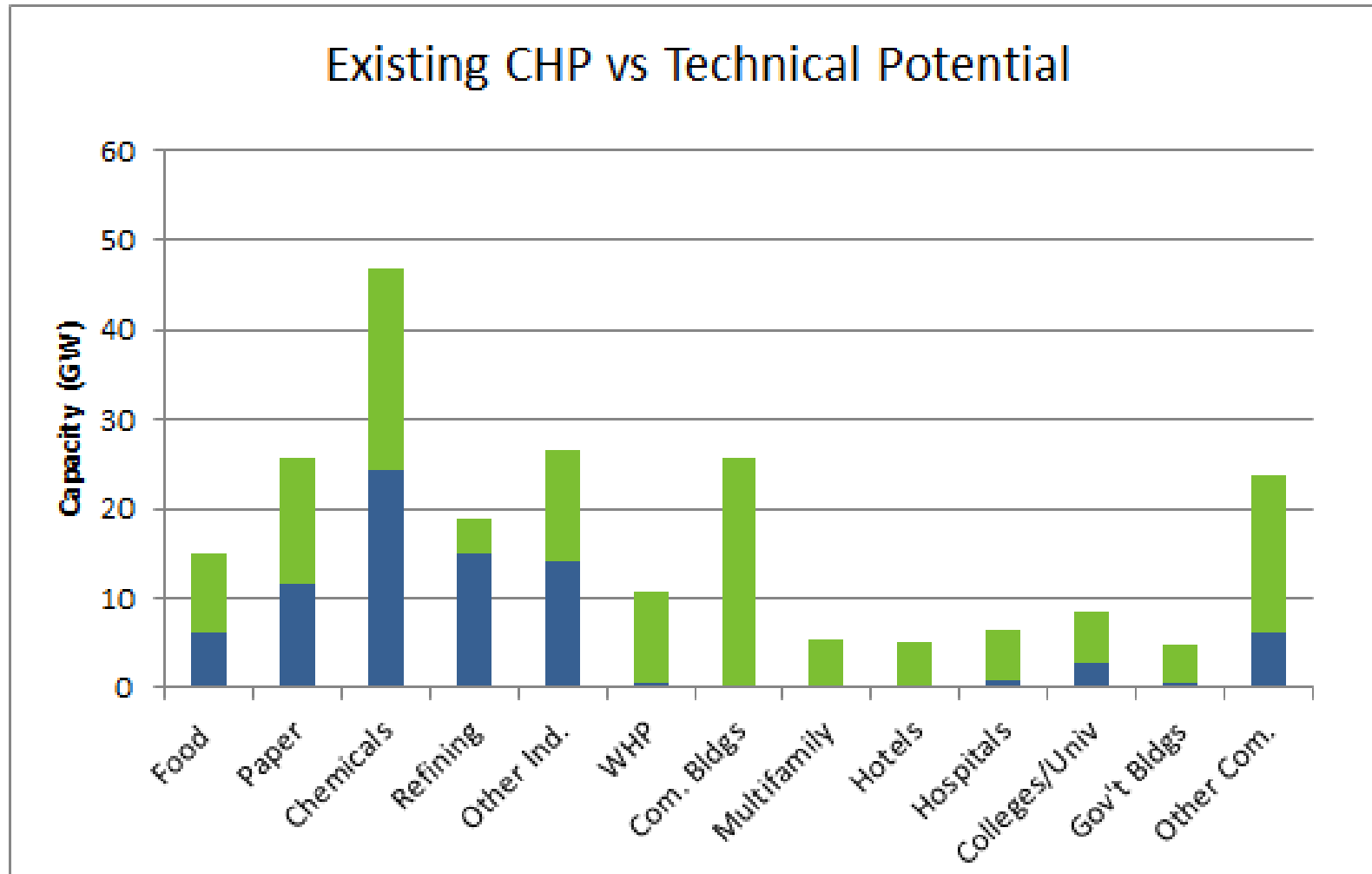
Fuel Type	Number of Facilities	Number of Affected Units	Boiler Capacity (MMBtu/hr)	CHP Potential (MW)	CO ₂ Emissions Savings (MMT)
Coal	332	751	180,525	18,055	114.2
Heavy Liquid	170	367	48,296	4,830	22.9
Light Liquid	109	241	22,133	2,214	10.5
Total	611*	1,359	250,954	25,099	147.6

The data on this chart is still being refined

*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

Where is the Remaining Potential for CHP



Source: ICF internal estimates