

# GHG Overview

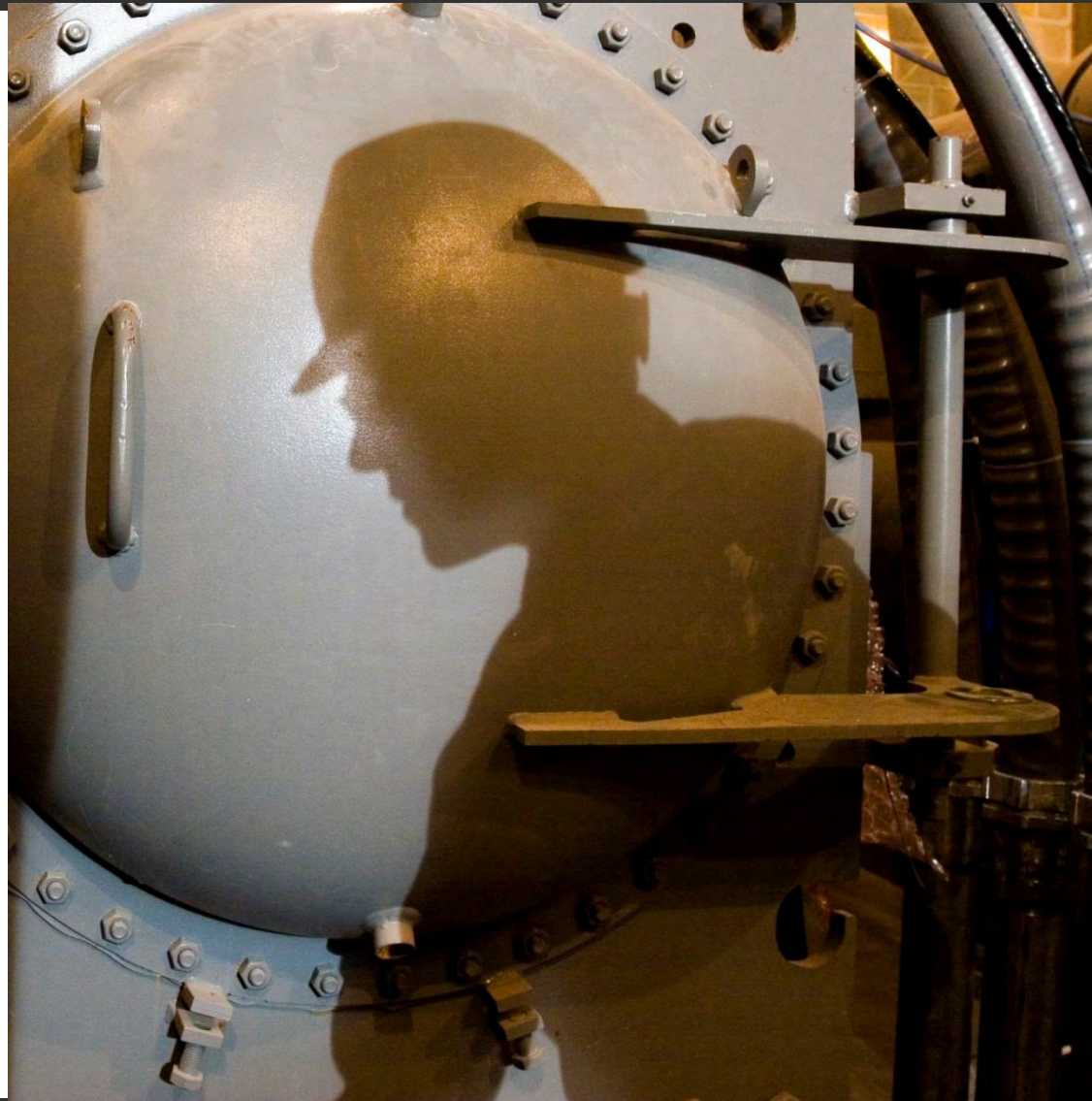
CIBO Environmental Committee Meeting  
Washington DC

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# What We Will Be Covering

- GHG - New EGU NSPS
  - CHP Facilities
  - Emission Rates
  - CCS Technology
  - Issues
- GHG - Existing EGU NSPS
  - EPA Building Blocks
  - Expected State Approaches
  - EPA Justifications ?
  - Need for Clarification



# GHG NEW Units

- April 2012 proposal rescinded after 2.5 million comments filed.
- New proposal for **new** fossil fuel-fired EGUs on September 20, 2013
- Regulates CO<sub>2</sub> only
- Sets standards for new Coal fired units and IGCC units
  - Requires CCS
  - BSER is a numerical emission limit 1,100 lb CO<sub>2</sub>/MWh averaged over a rolling 12 month period
- Sets standards for new natural gas fired combined cycle units
  - Requires Efficiency based on size
    - Design heat input greater than 73 MW (250 MMBtu/h) - 1,000 lb CO<sub>2</sub>/MWh
    - Design heat input greater than 73 MW (250 MMBtu/h) and less than 250 MW (850MMBtu/h) - 1,100 lb CO<sub>2</sub>/MWh
  - 1/3 of potential electric sales required to comply (Simple Cycle generally will not fit this criteria)

# CHP Facilities

- When both the host and the generator are under common ownership, the 1/3 power generated applicability rule is calculated by subtracting the power “sold” to the host thus reducing the potential for the unit to be applicable to the rule.
- If the generation plant is a third party, the power sold to the host cannot be deducted.



# Emission Rates

- Subcritical PC on coal 1,800 lb CO<sub>2</sub>/MWh
- Supercritical PC on coal 1,700 lb CO<sub>2</sub>/MWh
- IGCC on coal 1,450 lb CO<sub>2</sub>/MWh
- CC on natural gas 1,000 lb CO<sub>2</sub>/MWh



# CCS Technology

- Capture
  - Feasible technologies
  - Rule satisfied by capture quantity alone
- Compression
  - Cost the largest barrier
- Transport & Storage
  - Enhanced Oil Recovery (EOR) only viable option due to revenue
  - Underground Injection Control (UIC) – Deep well category (Class II or VI)
  - CO<sub>2</sub> pipeline cost
  - Site characterization issues
  - CO<sub>2</sub> monitoring and tracking issues
- Overall CCS causes an increase in capital and operating cost and a decrease in electrical output of unit.

# Issues



- Referenced projects to justify the rule received DOE funding for CCS
- No cost issue to regulation because coal plants will not be built
- Working to reduce cost of CCS
  - Only 30% increase in the cost of power from PCs
  - Only 10% increase in the cost of power from IGCC
- CCS justified for coal since the technology needs to be advanced
- EPA economic justifications are based on a short term view of gas pricing, current reserve margins and large renewable targets

# GHG – Existing EGUs

- Announced June 2, 2014 with full Press Marketing
- Structure
  - Under Section 111(d) CAA EPA identifies “best system of emission reduction” (BSER)
  - Limited to Electric Generating Utility (EGU) fleet
  - EPA sets 30% overall CO<sub>2</sub> reduction requirement from 2005 levels by 2030 for the US Power Fleet.
  - Details left up to the individual States to determine how to comply
  - SIP due June 30, 2016 with possible 1 year extension for single State Plan or 2 year for multi State Plan
  - 120 day comment period opening
  - Individual Carbon Intensity Rate (BSER) set for each State based on four Building Blocks



# EPA Building Blocks

1. Improve efficiency
  - heat rate improved by an average of 6% for all coal EGUs
2. Use Low-emitting power sources more
  - Dispatch all gas combine cycle units to a 70% capacity factor
3. Use Zero and low-emitting power sources more
  - Dispatch nuclear and new renewable generation
4. Use electricity more efficiently
  - Increase demand-side energy efficiency 1.5% annually



# Expected State Approaches

- Cap and Trade program or a Carbon Tax (Rate Based)
  - State sets CO<sub>2</sub> emission limits per megawatt hour generated. Improve efficiency or pay.
- Mass Based
  - States set limits on amount of CO<sub>2</sub> that can be produced by a plant. Improve efficiency or reduce run time to comply.
- State Driven Portfolio Approach – (aimed at wholesale electric markets)
  - Require the purchase of renewable power, add energy efficiency requirements or join cap and trade programs shared with other States.
- Utility Driven Portfolio Approach – (aimed at vertically integrated utilities)
  - Utility Commissions require reductions through various means. Must deal with municipally owned utilities, IPPs

# EPA Justification ?

- Health Benefits up to \$93B
  - Incidental reduction in soot and smog accounts for 2/3 of benefit
  - Don't current EPA rules provide this protection? Double Counting!
- Temperature Increases and Sea Level Rise
  - Immediate shutdown of all US coal plants would by 2050, reduce temperature by 1/20 °F and sea level by 1/25<sup>th</sup> of an inch
- Climate and Weather Disasters
  - Will this regulation reduce these effects?
- Reduced Electric Bills by 9% in 2030
  - Due to demand side management and everyone using less electricity!
- Create Jobs
  - Ignore job lose by higher energy cost, plant shutdowns and mine closures

# Need for Clarification and Other Thoughts

- EPA will allow efficiency improvements to be counted for first movers?
  - It appears that the emission rates in the regulation are based on 2012 numbers, so improvements prior to that time do not appear to be counted toward the 2030 goal.
  - On the EPA call, they stated that it was their intend to include efficiency gains from 2005.
- Plan will provide certainty for nuclear power development.



**Questions?**

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