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Greenhouse Gas-Specific BACT Considerations

March 14, 2011

Greenhouse Gas-Specific BACT Considerations:

Step 1: Identify all available control technologies.

Step 2: Eliminate technically infeasible options.

Step 3: Rank remaining control technologies by control effectiveness.

Step 4: Evaluate most effective controls and document results.

Step 5: Select BACT.

Greenhouse Gas-Specific BACT Considerations:

Step 1: Identify all available control technologies.

- energy efficiency
- lower-emitting processes
- include consideration of carbon capture and sequestration (CCS) for processes with relatively pure CO_2 waste gas streams
- biomass?

Greenhouse Gas-Specific BACT Considerations:

Step 2: Eliminate technically infeasible options.

- GHG controls still developing, keep in mind new developments that may make previously impractical controls technically feasible
- If CCS included in Step 1, often eliminated at Step 2
  - challenges of capture, transport, or storage

Greenhouse Gas-Specific BACT Considerations:

Step 3: Rank remaining control technologies by control effectiveness.

- focus on output-based measures to ensure efficiency (e.g. CO_2/ton of steel produced)
- rank based on CO_2e

Greenhouse Gas-Specific BACT Considerations:

Step 4: Evaluate most effective controls and document results.

- limited comparative cost/ton CO_2e reduced data currently exists
- because GHG impact is not localized, in the case of pollutant-reduction tradeoffs do not consider localized effects of other pollutants unless close to exceeding NAAQS, PSD increment, Class I impacts, etc.

Greenhouse Gas-Specific BACT Considerations:

Step 5: Select BACT

Example GHG BACT Analysis:

PurGen One IGCC Facility

- proposed 400MW integrated gasification combined cycle (IGCC) power plant & manufacturing facility
- revised permit application submitted to NJDEP Dec. 2010
- in addition to electricity generation would produce urea, ammonia, and sulfuric acid
- claims 90% CO_2 capture efficiency and storage in nearby deep sea geological formation
- ambitious
- realistic?

Example GHG BACT Analysis:

PurGen One IGCC Facility

- relatively pure CO_2 stream from acid gas recovery and urea processing, so includes consideration of CCS
- includes energy efficiency – IGCC
- proximity to nearby deep sea formation increases potential technical feasibility of GHG transport and sequestration
- claims ability to shift between electricity generation and chemical manufacturing increases cost-effectiveness

Example GHG BACT Analysis:

Nucor Steel Louisiana Facility

- ironmaking facility
- permit issued by LDEQ Jan. 2011
- GHG BACT is use of the direct reduced iron (DRI) process
- DRI is a lower-emitting process than traditional blast furnace iron making
    - more energy efficient
    - no coke
    - reducing gas retains heat value, Nucor Facility recycles as fuel gas.
- acid gas absorption produces pure CO2 stream
    - but no CCS requirement in final permit due to infeasibility of storage or transport
- CO2 CEM on main stacks

Questions?

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