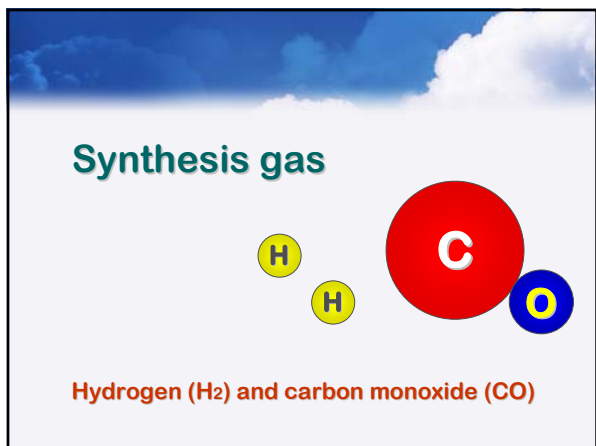
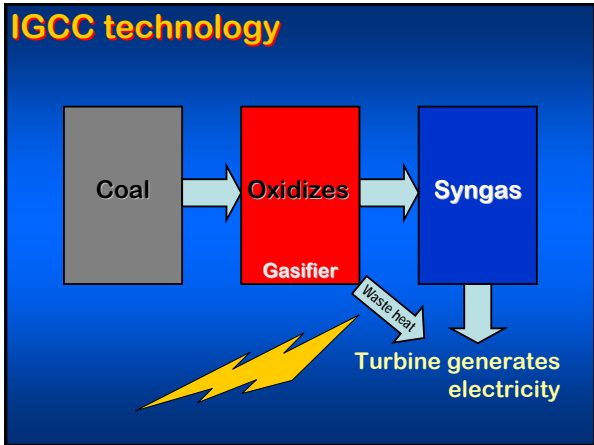


Gasification
Converts coal's hydrocarbons
into a *synthesis gas*

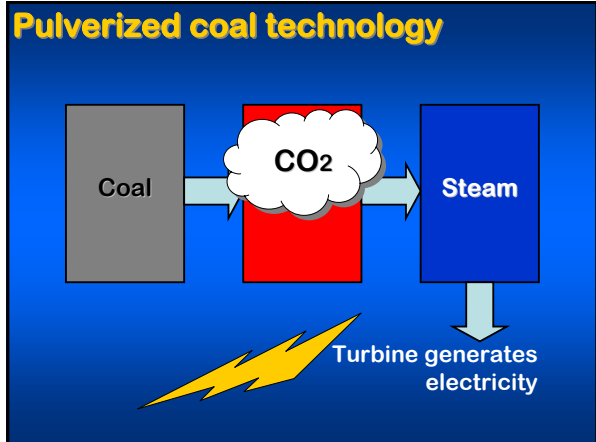


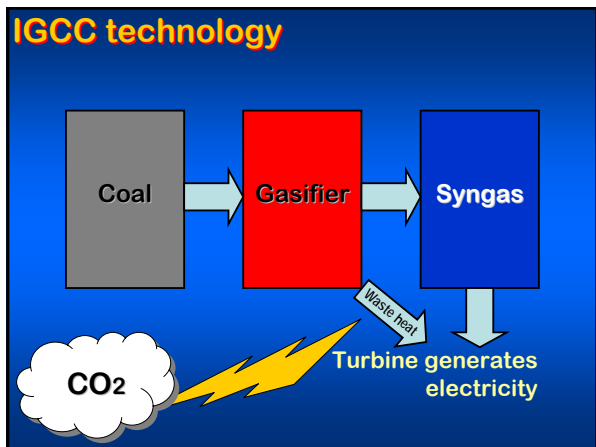
IGCC

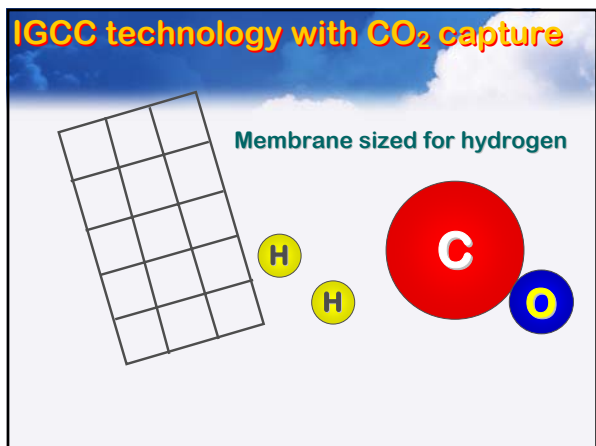
Integrates gasification and combined cycle technologies

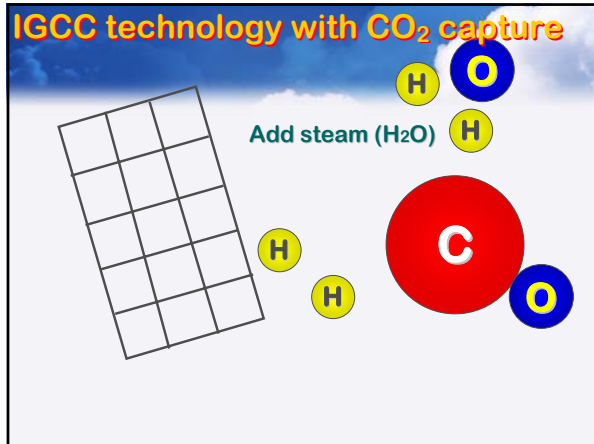


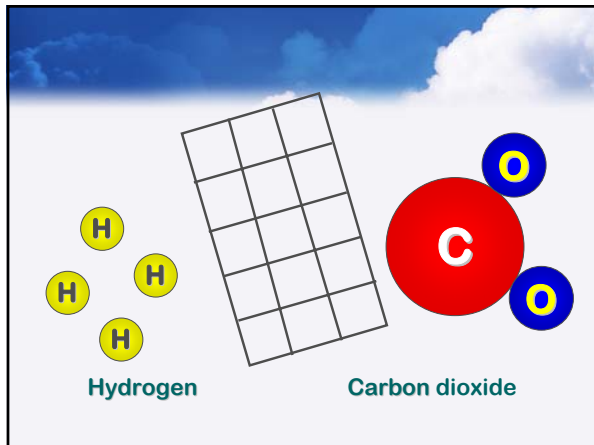
Absent carbon capture, there is **no significant difference** in the CO₂ emissions of IGCC and PC technologies.

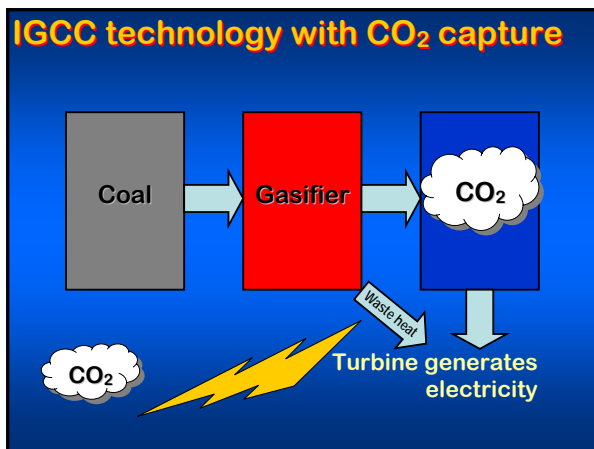








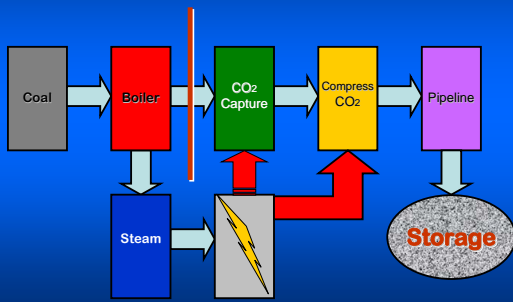




It's not quite this simple

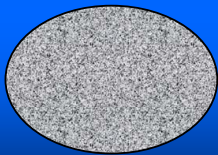


PC technology with CO₂ capture



Geologic what?

“Sequestration” or
Storage



Geologic storage utilizes...

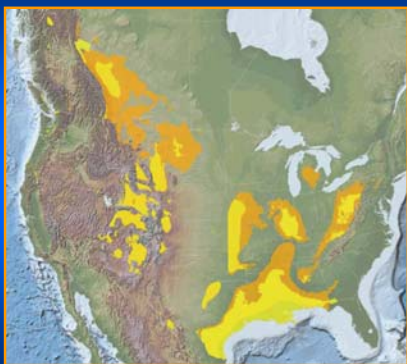


Enhanced oil & gas recovery



Carbon Sequestration Atlas of the United States and Canada
U.S. Department of Energy - Office of Fossil Energy - NETL

Unmineable coal seams



Carbon Sequestration Atlas of the United States and Canada
U.S. Department of Energy - Office of Fossil Energy - NETL

Deep saline formations



Carbon Sequestration Atlas of the United States and Canada
U.S. Department of Energy - Office of Fossil Energy - NETL

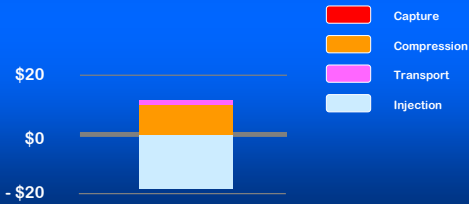


Cost of employing CCS

- Capture
- Compression
- Transport
- Injection

Example #1

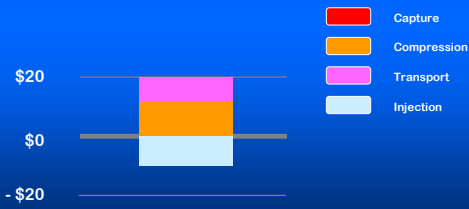
Ammonia plant w/ high purity CO₂ and nearby EOR opportunity



Carbon Dioxide Capture and Geologic Storage
Battelle, Joint Global Change Research Institute - April 2006

Example #2

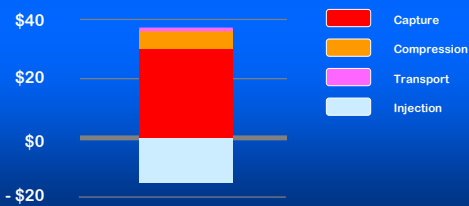
Natural gas processing w/ high purity CO₂ and moderately distant EOR



Carbon Dioxide Capture and Geologic Storage
Battelle, Joint Global Change Research Institute - April 2006

Example #3

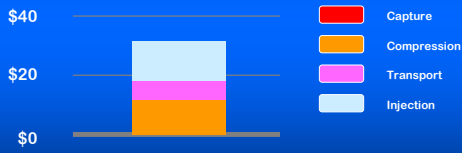
Large coal-fired power plant with nearby ECBM



Carbon Dioxide Capture and Geologic Storage
Battelle, Joint Global Change Research Institute - April 2006

Example #4

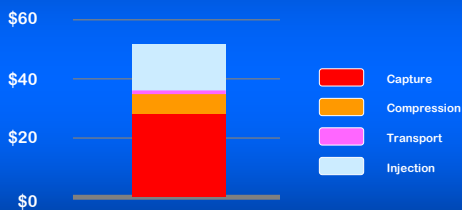
H₂ production facility w/ high purity CO₂ and nearby depleted gas field



Carbon Dioxide Capture and Geologic Storage
Battelle, Joint Global Change Research Institute - April 2006

Example #5

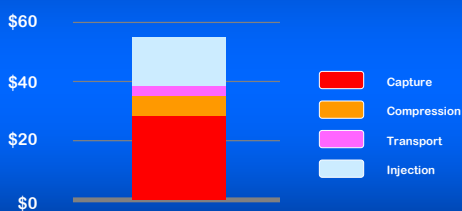
Large coal-fired power plant with nearby deep saline formation



Carbon Dioxide Capture and Geologic Storage
Battelle, Joint Global Change Research Institute - April 2006

Example #6

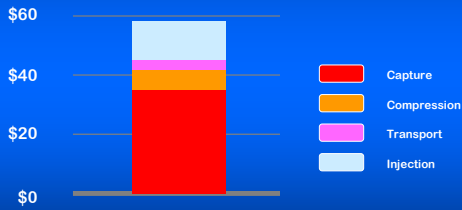
Coal-fired power plant with moderately distant depleted gas field



Carbon Dioxide Capture and Geologic Storage
Battelle, Joint Global Change Research Institute - April 2006

Example #7

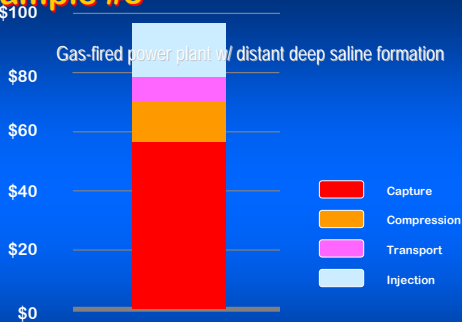
Smaller coal-fired power plant w/ nearby deep saline basalt formation



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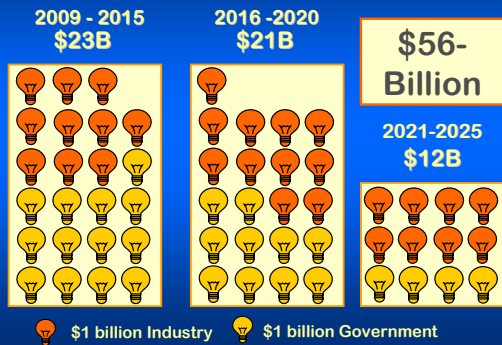
Example #8

Gas-fired power plant w/ distant deep saline formation



Carbon Dioxide Capture and Geologic Storage
Battelle, Joint Global Change Research Institute - April 2006

CURC/EPRI Roadmap - 2007



Producing energy in a CO₂-constrained world presents technology challenges.

U.S. has abundant CO₂ storage potential.

Cost of CO₂ capture and storage depends upon the coupling capture technology and available storage opportunities.

 cleancoalusa.org

 americaspower.org

 coal.org

pnl.gov/gtsp/docs/gtsp_reportfinal_2006.pdf




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