

FutureGen and Advanced Electric Generation Technologies

Global Energy Challenges
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Future Electric Generation Plans Must Consider Multiple Resources

- Pulverized Coal
- Natural Gas Combined Cycle
- Integrated Gasification Combined Cycle
- Nuclear Power
- Renewable Energy
- Efficiency and Conservation

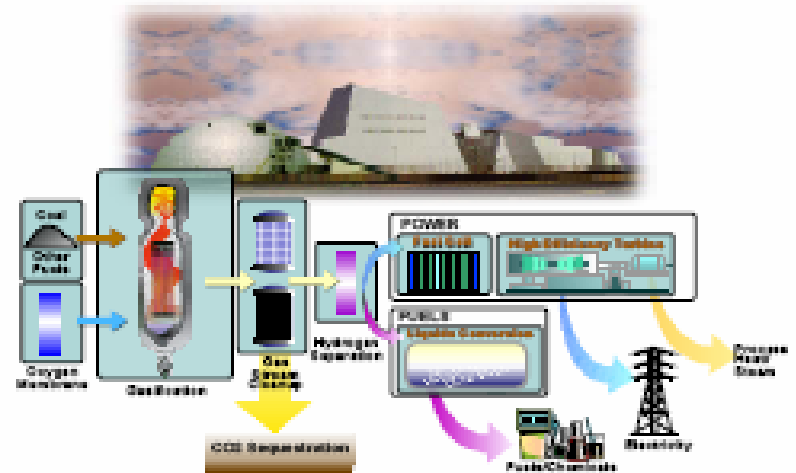


FutureGen

- A U.S.-led, 10-year, ≈\$1 billion effort to pioneer coal-to-hydrogen and carbon management technologies for coal.
- FutureGen will be the world's first zero-emission power plant and an international test facility that:



- ❖ Pioneers advanced hydrogen production from coal.
- ❖ Emits virtually no air pollutants.
- ❖ Captures and permanently sequesters carbon dioxide.



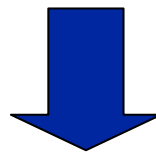
- DOE to share project costs with the private sector; FutureGen Alliance has pledged \$250MM.
- India first government to join partnership.

FutureGen Organizational Structure



U.S. DOE

Cooperative
Agreement



Competitive Opportunities

Technology
Vendors

A/Es

Advanced
Technology

Site Locations

FutureGen

Technology Goals

- Establish the technical, economic, and environmental viability of “zero-emission” coal plants by 2015; thus, creating the option for multiple commercial deployments by 2020
- Industry to validate DOE suggested goals:
 - Sequester >90% CO₂ with potential for ~100%
 - >99% sulfur removal
 - <0.05 lb/mmbtu NO_x
 - <0.005 lb/mmbtu PM
 - >90% Hg removal
 - >85% availability
 - With potential for a Nth plant commercial cost no more than 10% greater than that of a conventional power plant

Criteria for Technology Development and Deployment

– Performance

- Environmental
- Scale

– Reliability

- Utility metrics
- Flexible operations

– Cost

- Capital plus Operation and Maintenance
- Meets goals