



# IGCC Working Group

## New US IGCC Project Status

March 27, 2008



# US IGCC Projects under Development

- Some projects cancelled
- Other projects in various stages of development
- Coal projects under increasing negative pressures
  - Uncertainty over carbon emissions
  - Higher capital costs
    - Commodities
      - Steel / Copper
      - Equipment & lead times for equipment
    - Construction labor
    - EPC contracting not really available
- Three gasification projects applied for DOE ITC's by October 31, 2007 deadline – Awards expected 4/30/08.

# Categories

- Segregated the major IGCC projects (electricity as primary byproduct - not coal to liquids or SNG) into three categories:
  - **Dead** – official announcement by sponsor has been made
  - **Nearly Dead** – no official announcement but progress has either stopped or a significant recent negative issue is impacting the project feasibility
  - **Still Alive** – Recent activity to indicate progress continues

# Dead

- TECO Polk Power Station, Florida
  - 630 MW GE design
  - Awarded DOE grant of \$133 million in ITC
  - Officially cancelled by TECO 10/07 (NGCC)
- Southern Company – Stanton Energy Center, Florida
  - 285 MW Air blown transport gasifier (Southern Co. Design)
  - DOE awards of \$234 million in Clean Coal money in 2/06
  - Ground breaking ceremony in 9/07, Canceled 11/07
- Xcel Colorado IGCC
  - Postponed a minimum of 2 years as of 11/07
  - Xcel backing away from new coal

# Nearly Dead

- Excelsior Energy – Mesaba - Minnesota
  - 600 MW ConocoPhillips design
  - DOE award of \$36 million for initial studies in 1/06
  - Short list for loan guarantees
  - Recent cost quotes in the \$2.5 billion range (\$4,100/kW)
  - 8/07 Minnesota PUC denied approval for a PPA with Xcel citing costs and plant not being “innovative”
    - Denial confirmed in 11/07 after appeals
    - A final decision on the request for approval not issued - yet
    - PUC strongly suggested project must have carbon capture and sequestration to qualify as “innovative”
    - Project still trying to get legislative relief from PUC denials

# Nearly Dead

- FutureGen
  - DOE/Industry Project to demonstrate “zero emissions” coal plant
  - 275 MW IGCC (no technology chosen)
  - Capture and sequestration of CO<sub>2</sub>
  - Site chosen 11/07 - Mattoon, Illinois
  - 1/08 DOE reconfigures financial support to FutureGen
    - DOE share of costs increased from \$800 million to \$1,180 million cited as reason for change
    - DOE only willing to support CCS portion of the project ~ \$500 million
    - DOE prefers multiple project approach to support CCS
  - “public negotiations” occurring

# Nearly Dead

- Energy Northwest Energy Center - Washington
  - 600 MW ConocoPhillips design
  - Washington State rejection due to non-compliant CO<sub>2</sub> emissions with current state statutes and regulations (EFSEC)
  - May survive as a CCCT

# Nearly Dead

- BP Carson Refinery, California (renamed Hydrogen Energy)
  - 500 MW GE design – balance as hydrogen
  - Awarded \$90 million in DOE ITC's 11/06
  - Carbon capture design for use in EOR
  - Currently in FEED – little new public information
  - Investment decision scheduled for 2008 with an application to California regulators – earliest on line is 2012
  - Negative: CO<sub>2</sub> pipeline permitting through populated area and EOR liability risk



# Nearly Dead

- Global Energy – Lima, Ohio
  - 540 MW ConocoPhillips design
  - SNG and Hydrogen co-production
  - Construction and Air Permits issued
  - Construction started in 2005 – Fuel facility
  - 10/06 construction halted due to financing concerns
  - Revised air permit required due to requested extension
  - Sierra Club sued in 1/08 alleging Global Energy moving ahead without valid permits
  - Project on hold due to continuing financial concerns

# Still Alive

- Duke Energy – Edwardsport, Indiana
  - 620 MW GE design
  - Awarded \$133 million in DOE ITC's in 11/06
  - FEED complete 3/07
  - Cost as of 5/07 = \$1.985 billion (\$3,200/kW)
  - CPCN issued 11/07
    - Seek cost recovery above \$1.985 billion in separate proceeding
    - Early recovery of costs allowed
    - Semi-annual cost reviews
  - Air Permit approved 1/08
  - Construction began 3/08 with preliminary work

# Still Alive

- AEP Mountaineer West, West Virginia
  - 629 MW GE Design
  - FEED completed 11/06
  - 1/07 AEP announced a 6 month delay due to rising costs
  - 6/07 filed an application with the PSC in WV/VA for approval
    - Application states that costs have increased from \$1.2 billion to \$2.23 billion (\$3,550/kW) – direct costs without AFUDC
    - WV approved CPCN 3/6/08
      - AEP must file revised cost estimate by 1/09 and CPCN will be re-approved by the PSC – quarterly cost estimates thereafter
      - Approved a project surcharge approach to recover construction costs before project is in service (in place of AFUDC)
      - Pursue tax credits
    - VA expected to approve 4/18/08

# Still Alive

- AEP Miegs County, Ohio (Great Bend)
  - 629 MW GE design
  - FEED completed 12/06
  - 1/07 AEP announced a 6 month delay in IGCC projects due to rising cost estimates
  - Lawsuit filed 8/06 by Ohio Consumers Council against state approval of \$24 million development recovery.
  - Ohio Siting Board approves the IGCC plan 5/07
  - March 13, 2008 ruling from Ohio Supreme court on lawsuit upholding the appeal from the Ohio Consumers Council and remanded the \$24 million ruling back to the PUC. Timelines moving forward are uncertain based on this ruling.

# Still Alive

- Southern Company – Kemper County, Mississippi
  - 600 MW air-blown transport gasifier
  - Awarded \$133 million in DOE ITC's 11/06
  - Project budgeted at \$1.8 billion with an on-line date of 2013
  - Southern Co. indicates project proceeding:
    - Air Permit submitted 11/07
    - Invited to submit loan guarantee application 10/07
    - FEED Study in progress – complete 5/08
    - Internal financial review expected after FEED
    - Waiting on decision from the Mississippi PSC
  - Cancellation of Stanton a concern

# Still Alive

- **Tenaska (ERORA) – Taylorville, Illinois**
  - 630 MW GE design
  - Some plans for SNG co-production
  - Air Permit issued 1/08 after a Sierra Club appeal
  - Current cost estimate at \$2.5 billion (\$3,968/kW)
  - Recent (11/07) threats to move plant due to inaction from State Officials to modify utility rules to permit long-term contracts for power purchases
- **Tenaska (ERORA) – Cash Creek, Kentucky**
  - 630 MW GE design similar to Taylorville
  - 1/07 GE Financial obtains a 20% equity position in the project
  - Air Permit issued 11/07
  - Additional regulatory approval needed to move ahead in Kentucky

# Other Projects

- Projects not as far along as the previous projects and/or in the early study/development phase:
  - Eastman Chemical – LA (gasification to chemicals)
  - NRG – Huntley, NY (additional funding sought) – MHI design
  - Basin Electric Power – SD
  - Wallula Resource Recovery – WA
  - Luminant (TXU) – TX – RFP responses due 5/08
  - Buffalo Energy Partners – Wyoming
  - Midwest Generation (Edison International) – IL
  - SoCal Edison – CA – application for study money

# Summary

- IGCC Projects Still Alive
  - Duke Energy – Edwardsport, Indiana
  - AEP
    - Mountaineer, West Virginia
    - Great Bend, Meigs County, Ohio
  - Southern Company – Kemper – Mississippi
  - Tenaska (ERORA)
    - Taylorville, Illinois
    - Cash Creek, Kentucky



# Summary

- IGCC Projects in Trouble
  - Excelsior Energy – Mesaba - Minnesota
  - FutureGen – Illinois
  - Energy Northwest – Washington
  - BP Hydrogen Energy – Carson, California
  - Global Energy – Lima, Ohio
- IGCC Projects Cancelled
  - TECO – Polk - Florida
  - Southern Company – Stanton - Florida
  - Xcel Energy - Colorado