The Coal Industry Value Chain and Competitiveness

Duke University

Gary Gereffi, CGGC Director
ggere@soc.cggc.duke.edu

Ghada Ahmed, CGGC Senior Research Analyst
Ghada.ahmed@duke.edu

Ajmal Abdulesamad, CGGC Research Analyst
Ajmal.abdulsamad@duke.edu

July 17, 2012
Coal Value Chain: 2010 Employment Data

**Transport**

- **212111**: Surface Mining & Processing: Bituminous & Lignite Coal
  - Establishments: 699
  - Employees: 35,633
  - Annual Salary: $73,832

- **212112**: Underground Mining & Processing: Bituminous coal
  - Establishments: 513
  - Employees: 44,440
  - Annual Salary: $80,990

- **212113**: Anthracite Coal Mining and Processing
  - Establishments: 65
  - Employees: 1,053
  - Annual Salary: $51,703

- **213113**: Supporting Activities for Coal Mining
  - Establishments: 451
  - Employees: 8,123
  - Annual Salary: $62,496

**End market**

- **221112**: Electric Power Generation
  - Establishments: 1,942
  - Employees: 119,178
  - Annual Salary: $83,093

- **324199**: Coke Ovens
  - Establishments: 113
  - Employees: 5,321
  - Annual Salary: $66,264

**Source**: CGGC, Quarterly Census of Employment and Wages Program, Bureau of Labor Statistics (www.bls.gov)
Selected Value Chain Dynamics

**Coal Producers**
- Fairly Consolidated
- Long term contracts
- Increased costs
- Loosing market share in electric power
- Top 5 firms control about 55% of production
- Top firms:
  - Peabody Energy
  - Alpha Natural Resources
  - CloudPeak Energy

**Electric Power Generation**
- Increasing market deregulation
- Shifting to shorter contracts
- Aging infrastructure
- Shifting to low cost natural gas
- Many large firms are vertically integrated
- Top firms:
  - AEP
  - Southern Company
  - Duke Energy
  - NextEra Energy
  - Exelon

Source: CGGC
Unprecedented Shift by U.S. Utilities to Natural Gas

April 2010 Electric Power Generation

- Coal 44%
- Nat Gas 22%
- Nuclear 20%
- Hydro 7%
- Other 7%

April 2012 Electric Power Generation

- Coal 32%
- Nat Gas 32%
- Nuclear 19%
- Hydro 9%
- Other 7%

(Source: CGGC; EIA, 2010 & 2012)
Coal Scenarios

Market Pressure

- Low priced natural gas
- Utilities retiring coal fired power plants
- Exports are not a substitute for US market share
- Limited & costly CO2 reducing technologies

Scenario 1
Status Quo
Low Technology

- Loss of coal market share
- Lack of end market opportunities
- Missing global market opportunities in CO2 reducing technologies

Scenario 2
Technology Investment Path

- Accelerate development & adoption of CO2 reducing technologies
- Development of new products & end markets for coal
- Meeting growing global demand for clean technologies

Source: CGGC
Technology Investment Path

Strategic Collaboration → Innovation

- Coal
- Conversion/Gasification
- Steel
- Electricity
- Industrial Gas
- Pipeline Syngas
- Specialty Chemicals
- Ethanol
- Diesel
- Hydrogen
- Jet Fuel
- CO₂ Capture
- Sequestration
- and Re-use

Source: http://www.coalcandothat.com/
Thank You!