Coal and the Economy

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Coal, Steel and the Industrial Economy
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Forward-Looking Information

This presentation contains “forward-looking statements” – that is, statements related to future, not past, events. In this context, forward-looking statements often address our expected future business and financial performance, and often contain words such as “expects,” “anticipates,” “intends,” “plans,” “believes,” “seeks,” or “will.” Forward-looking statements by their nature address matters that are, to different degrees, uncertain. For us, particular uncertainties arise from changes in the demand for our coal by the domestic electric generation industry; from legislation and regulations relating to the Clean Air Act and other environmental initiatives; from operational, geological, permit, labor and weather-related factors; from fluctuations in the amount of cash we generate from operations; from future integration of acquired businesses; and from numerous other matters of national, regional and global scale, including those of a political, economic, business, competitive or regulatory nature. These uncertainties may cause our actual future results to be materially different than those expressed in our forward-looking statements. We do not undertake to update our forward-looking statements, whether as a result of new information, future events or otherwise, except as may be required by law. For a description of some of the risks and uncertainties that may affect our future results, you should see the risk factors described from time to time in the reports we file with the Securities and Exchange Commission.
Arch Coal is a leader in the energy industry

- One of the **largest** U.S. coal producers with 2007 revenues of $2.4 billion
- Core business is **providing U.S. power generators** with cleaner-burning, low-sulfur coal for electric generation
  - Supplies roughly 12% of U.S. coal needs
  - Provides source fuel for roughly 6% of U.S. electricity
- Talented 4,000-strong **workforce** operates large, modern mines
- Industry **leader** in mine safety, productivity and reclamation

Source: ACI
Arch’s national scope of operations and reserve base includes presence in four major U.S. coal basins:

**Powder River Basin**
1. Coal Creek
2. Black Thunder

**Western Bituminous**
1. Skyline
2. Dugout
3. Sufco
4. West Elk

**Illinois Basin**
Knight Hawk

**Central Appalachia**
1. Mountain Laurel
2. Coal-Mac
3. Cumberland River
4. Lone Mountain

2.9-Billion Ton Reserve Base

- Compliance: **PRB** (1,753)
- Low-sulfur: **WBIT** (460)
- High-sulfur: **ILB** (376)
- **CAPP** (338)

Source: ACI at 12/31/07
Arch’s future success hinges on three key pillars of performance

Operating the world’s safest coal mines
• Awarded MSHA’s Sentinels of Safety honor for operating the nation’s safest underground coal mines in 2006 and 2007
• Ranked first among coal industry peers for safety performance last year
• 2007 was second-best year on record for total incident rate

Acting as responsible citizens and good environmental stewards
• 2007 was best year for compliance in Arch history and best among peers
• Earned five National Good Neighbor Awards in past five years
• U.S. Department of Interior Award in 2007 for best surface reclamation

Achieving superior financial results
• 2007 was Arch’s second-best financial performance on record
• Operated three of top eight most productive longwall mines last year
• Forbes named Arch among America’s most trustworthy U.S. companies of 2008

Source: ACI and Public Sources
Coal is the dominant fuel source for electricity generation in the United States and around the world.

**U.S. Net Electricity Generation by Source**
(2006, per billion KwH)

- Coal: 49%
- Natural gas: 20%
- Nuclear: 19%
- Hydro: 7%
- Other Renewables: 3%
- Oil: 2%

**Worldwide Net Electricity Generation by Source**
(2006, per billion KwH)

- Coal: 41%
- Natural gas: 20%
- Nuclear: 15%
- Hydro: 16%
- Other Renewables: 2%
- Oil: 6%

Sources: EIA, IEA World Energy Outlook 2008
Coal is a major component in steel production

Blast Furnace Iron Production & Metallurgical Coal Consumption
(in millions of metric tons per year)

Source: McCloskey Metallurgical Coal Quarterly 2Q08
Potential resurgence in American integrated steel production

- Following the collapse of the U.S. steel industry in the 1970s and 80s, many coke ovens were idled and domestic metallurgical coal consumption plummeted.

- The 1990 amendments to the Clear Air Act required expensive upgrades to meet MACT requirements; as a result, additional plants closed and consumption declined further.

- This year, a new coke oven opened in the U.S. and three more are scheduled to open by 2013.

- Resurgence in integrated steel mill production could drive U.S. demand for metallurgical coal up by 1-4 million tons per year based on 2007 met consumption rate.

Source: International Iron & Steel Institute
Coal is abundant, secure and widely dispersed

Based on current production levels and proven reserves, coal should outlast gas supplies and oil reserves by more than 2x and 4x, respectively.

Source: Bank of America, BP Statistical Review and Blackwell Energy Research
Coal has a vital role in America’s energy future

**U.S. Energy Reserves**
(in trillion Btu)
- Coal: 94%

**U.S. Petroleum Supply**
(million barrels per day)
- OPEC 35%
- Other Imports 30%
- Domestic 35%

**U.S. Fuel Prices**
($/million Btu at 11/21/08)
- PRB 8800 FOB rail (2009)
- Natural Gas Wellhead (Jan. 2009)
- Crude Oil

Coal Natural Gas Oil

Source: EIA, Platts, Argus Coal Daily and NYMEX
Coal has been the world’s fastest-growing fuel source in the past seven years

*Cumulative Percent Change in Global Energy Consumption 2000 – 2007 (in million tonnes of oil equivalent)*

- **Coal**: 35%
- **Hydro**: 16%
- **Natural Gas**: 20%
- **Oil**: 11%
- **Nuclear**: 6%

- Since 2000, **global coal use has grown by 35%**, roughly double the consumption growth in natural gas.
- **Growth in coal demand** will continue to be driven by consumption in the developing world, with gains in the developed world as well.
- **Fossil fuels** are expected to remain dominant global energy sources through 2030.

The EIA predicts coal consumption will grow on a global scale for decades to come.

World Coal Consumption
(in millions of short tons)

Source: 2008 EIA, IEO Table A7
Low-cost electricity enhances America’s standard of living and global competitiveness

U.S. Total Average Price per Kilowatthour in 2006 = 8.90 cents

Source: Energy Information Administration’s Electric Power Annual 2006 (published October 2007) and International Electricity Prices for Households
Low-cost electricity allows countries to compete on a global scale

**International Power Costs**
*(U.S. cents per kilowatthour)*

- **USA** 8.9¢
- **France** 15.8¢
- **Japan** 17.8¢
- **UK** 21.9¢
- **Taiwan** 7.9¢
- **India** 4.7¢
- **S.Korea** 10.2¢
- **New Zealand** 16.1¢
- **Mexico** 9.3¢
- **Chile** 13.6¢
- **Brazil** 19.0¢
- **Australia** 9.8¢
- **S.Africa** 6.1¢
- **Indonesia** 6.2¢
- **Denmark** 32.2¢

Source: EIA International Electricity Prices for Households 2006-2007
The world’s population is expected to grow

Electricity demand in developing nations will grow at nearly triple the rate of developed nations by 2030, as defined by membership in the Organization for Economic Cooperation and Development (OECD)

Source: 2008 EIA, International Energy Outlook
Economic growth, especially in developing countries, will continue to put pressure on global energy supply.

**Gross Domestic Product**
*(in billions of U.S. dollars)*

- **United States**
- **OECD Europe**
- **China**
- **India**
- **Russia**

*Source: 2008 EIA, IEO Table A3, PIRA*
A press release does not guarantee a new coal-fueled power plant will be built

**Status of Proposed U.S. Coal Plants**
*(in megawatts, at 11-25-08 for 2009-2017)*

- **20,720** will be completed
- **31,742** at-risk
- **61,223** cancelled/postponed

Source: Ventyx Energy Velocity database
Despite news coverage of cancellations, U.S. is experiencing largest coal plant build-out since 1980

- America has long had one of world’s most reliable power systems but investment must be made
- Build-out of 15.5 GW equates to 55 million tons of new coal demand annually over next four years
- Study estimates that the U.S. needs 120 GW of new generation just to maintain the 15 percent capacity margin required for grid reliability
  - Need all resources including coal, natural gas, nuclear, renewables and energy efficiency to accomplish goal

Anticipated Demand for Coal Plants Under Construction
(in millions of tons)

Source: Platts, ACI and NextGen Energy Council
Reserve margins for the U.S. power grid will fall below target levels without adequate investment

Year when reserve margin is expected to fall below target level, by region

America has long had one of the world’s most reliable power systems. Without investment, that could soon change.

Source: NERC 2007 Long-Term Reliability Assessment
Supply constraints in traditional coal export nations are shifting global seaborne coal flows

Key Trends in Asia-Pacific Coal Markets

- **Australia**: severe port and rail bottlenecks may mask underlying labor and mine challenges; expanded capacity still may undershoot growing Asian demand
- **Indonesia**: increasing domestic demand; export capacity dependent on congested river system
- **China**: substantial growth in domestic demand will push country to a net importer status of coal as early as 2008
- **Vietnam**: growing domestic demand expected to reduce export supply
- **India**: imported coal needs projected to rise meaningfully; will pull available supply from Atlantic Basin markets
- **Russia**: production challenges; growing domestic coal consumption; exports increasingly shifting to Asia-Pacific market
- **South Africa**: domestic power shortage; reserve degradation; exports increasingly shifting to Asia-Pacific market

Source: ACI
Asian demand pull could create future opportunities for the United States in seaborne coal export markets

Key Trends in Atlantic Basin Coal Markets

- **South America**: port infrastructure constraints; political instability; resource nationalism; growing regional coal burn
- **USA**: swing supplier to Atlantic basin market; available coal export capacity; imports into country declining
- **Europe**: coal production declining; growing coal burn in eastern Europe; traditional import supply avenues waning

2007 seaborne total trade: 900 million metric tons

Source: ACI
Since 1970, coal has been used in increasingly clean ways in the United States.

- Electricity from coal +187%
- GDP +207%
- US population +47%
- NOx -37%
- SO2 -58%
- PM10 -83%

Higher efficiency rates and carbon capture technologies create opportunities for reducing carbon intensity as well.

Source: NMA, EPA

NOx (Nitrogen Oxide), SO2 (Sulfur Dioxide), PM10 (Particulate Matter)
Investment in clean coal technologies is essential in addressing climate concerns

- The most promising way forward is via many separate paths. There is no “one-size-fits-all” solution that will meet the specific needs and requirements of every situation, or locale, or country.

- For technologies in development, pursuing a portfolio approach is almost certain to be advantageous to lower the risk associated with any single technology – and reduce the likelihood that an even better solution isn’t left on the drawing board.

Source: ACI and public sources
Carbon capture and storage technology is proven; the challenge is one of scale

- Simply put, CCS involves capturing carbon dioxide either pre- or post-combustion, transporting, applying or injecting, monitoring storage and long-term stewardship.

- Real-world demonstrations of multiple technologies will avoid technical and business risk of relying on one process.

- Currently field demonstrations to test CO$_2$ capture and storage on a mid-sized scale are:

<table>
<thead>
<tr>
<th>Demonstration Project</th>
<th>Size</th>
<th>Cost estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-Combustion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• AEP: Chilled ammonia with CCS</td>
<td>20MW to 200MW</td>
<td>$130mm</td>
</tr>
<tr>
<td>• Southern Co: Adv. amine with CCS</td>
<td>25MW</td>
<td>$150mm</td>
</tr>
<tr>
<td>Pre-Combustion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Three IGCC with CCS</td>
<td>Up to 600MW</td>
<td>$450mm</td>
</tr>
</tbody>
</table>

- The next step is large-scale testing and validation for safe, environmentally and economically viable technologies.

Source: Electric Power Research Institute
There are many strategies for sequestering CO$_2$

**Injection Processes**
- Unmineable Coal Seams
- Deep Ocean Aquifers
- EOR & Depleted Oil / Gas Wells, Saline Reservoirs

**Enhance Natural Processes**
- Forestation
- Enhanced Photosynthesis
- Iron or Nitrogen Fertilization of Ocean
- Mineral Carbonation

Source: DOE and CICCS
One of the principal priorities of the Obama Administration includes creating millions of new green jobs through the development and deployment of clean coal technologies.

Obama’s Department of Energy will enter into public-private partnerships to develop five “first-of-a-kind” commercial scale coal-fueled plants with carbon capture and sequestration technology.

"I am a big proponent of clean coal technology.”

U.S. President-Elect Barack Obama
Coal is indispensable to America’s energy mix

- Nearly half of electric generation and growing
- Coal conversion technologies will help satisfy America’s oil addiction and provide greater U.S. energy security
- Coal has an economic advantage versus competing fuels, and it has been proven more reliable
- Technology is enabling increasingly clean and carbon-friendly uses of coal
- America has well-developed and reliable infrastructure in place to produce and transport coal—expansion is possible albeit with significant levels of investment

Source: ACI