Unconventional Gas & the Rail Industry

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Agenda

- Inputs to the Shale Plays
- Outputs – Realized and Anticipated
- Impact on Coal
Inputs to the Shale Plays – No Pipe Dream

- On average, a standard drill pad, with six vertical wells, each with horizontal wells, consumes approximately 114,000 feet of pipe or 15 rail cars worth.
Inputs to the Shale Plays – No Sandbagging

• By comparison, that same standard drill pad, with six vertical wells, consumes 150 rail cars of sand.
Outputs – Realized and Anticipated

- Small market in waste streams
  - Drill cuttings (mud), brine water
- Rich gas areas of the Utica shale play in eastern Ohio and western Pennsylvania are next on deck.
- Biggest boom today for rail is from the Bakken oil fields of North Dakota and from the Alberta Tar Sands of Canada.
  - Bakken: 700,000 bpd and climbing
  - Rail accounts for approximately 46% of outbound transportation
Impact on the US Coal Industry

Mild 2011/2012 Winter

Friends of Coal

Natural Gas Prices

Regulation
Impact on the US Coal Industry

Assumes all coal plants must have either a Flue Gas Desulfurization (FGD) system or Direct Sorbent Injection system installed by 2015 in order to continue operation in compliance with environmental rules. Currently, over half of the coal plants in the nation have FGD systems.
Impact on the US Coal Industry

• Haven’t we seen cheap natural gas before?
  – Yes, in 2000, we had $2 / Mcf, but…
    • Coal was cheaper
      – Cost of labor dramatically increased over last decade+
      – We’ve gotten the “easy stuff”
    • We didn’t know about the vast U.S. reserves
    • Technology advances cresting
    • Changing regulatory environment
Impact on the US Coal Industry

• Coal Industry Today
  – ~10 gigawatts (GW) of capacity has already been retired, and ~20 GW have been announced for retirement
  • The U.S. uses ~300 GW of operating US coal capacity
  • Thus this represents 10% of US’ utility generating capacity
  – Older, “baby boom” plants are the ones being shut down
Impact on the US Coal Industry

• Can’t we all just get along?
  – “Sweet spot” of equilibrium estimates at $4/Mcf
  – Economic estimates are in line with that figure as soon as 2013

• Global Markets
  – Thermal vs. Metallurgical
  – China & India demand opens opportunities in Europe
Thank you!