REINHOLD ENVIRONMENTAL Ltd.

2012 Coal to Gas Conversion Round Table & Expo Presentation

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COAL FREE
COLUMBIA
#stopcoalexports
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IF YOU CAN READ THIS
YOU ARE BREATHING
COAL POLLUTION
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NO COAL ON OUR
COLUMBIA
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Power Plants Around the World


DEPARTMENT OF ENERGY


TIME'S UP
CLIMATE JUSTICE
STOP BLACK MESA PROJECT!
COAL IS Dirty!
POWER PAST COAL
STOP COAL.
» Solve Global Warming. »
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Sign the Petition

Economics – The Good

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- Coal production is up 7% since 2008. and jobs have increased 10%
- The best coal in the world comes from the US. Great for making steel.
- Coal is the most abundant fuel for generating power.
- After the nuclear disaster at Fukishima, Germany increased use of coal by 13% and is shutting down its nuclear plants.
- Increased gas usage will cause gas prices to rise = good for coal.
- Gas to generate electricity accounts for 24% of the total US gas usage.
- Coal is the cheapest source of energy behind hydro. No one is going to allow a new dam to be built in the US. Hydro is somewhat unreliable due to dry rivers in the summer and frozen rivers in the winter.
- Coal reduces dependence on foreign oil. Provides good high paying jobs. Coal is an abundant natural resource. The US produces 35% of the world's coal (second to China). Coal deposits in the US contain more energy than all the world's oil reserves. There is a 250 year supply of coal.
- Coal is a "place holder" until viable alternative energy sources can be found.

Economics – The Bad

- Administration points to 31% increase in coal exports. They say this is good.
- In 2012, gas production has exceeded coal for the first time in 20 years.
- US coal is the best for making steel. The steel market is down in China.
- Electricity generated by coal dropped to 36% in the US (down 19%) in 2012.
- Gas is plentiful and cheap. Now is 2nd lowest price average since 2002 .
- Utilities use about 90% of the total coal consumed in the US.
- Over 100 coal plants have been defeated by activists.
- EPA regulations have been cited as a factor in the announced closure of 205 coal units, representing more than 31,250 megawatts (MW) of coal-fueled generating capacity in 26 states.
- The Mercury and Air Toxics Standards (MATS) rule is responsible for most of these closures.
- These closures are current as of the end of September. These coal plant shutdowns will cause the loss of 13,000 – 17,000 jobs.

Economics – The Bad

- Most of these plant shutdowns are expected to occur by 2015 and will result in a loss of direct, indirect and induced jobs.
- Direct jobs are jobs at the plant.
- Indirect jobs are those that support the power plant, such as equipment suppliers.
- Induced jobs are jobs that are associated with the payroll spending of the direct and indirect jobs, such as jobs at grocery stores.
- In addition, EPA policies appear to have played a role in over 4,800 MW of other announced shutdowns. If these are added together, the closures total over 36,000 MW and represent approximately 11 percent of U.S. coal electric generating capacity.
- The US DOE and Ventyx (ABB) have established “coal factors” are 0.12 – 0.22 employee per MW. For example, the shutdown of a 100 MW coal plant would result in an estimated 12 – 22 lost jobs.

Economics – The Bad

- Where coal units are being converted to natural gas, or natural gas units are to remain in operation at a site, estimated employment to operate the gas units is subtracted from the estimated job losses due to closing coal units at the same site using a "gas factor" of 0.06 employee per MW. These factors are derived in the same manner as the coal factors above. Thus, a 100 MW gas unit is estimated to require six employees.
- Where very small coal units are closing at a plant where one or more large coal units will remain in operation, we assume no job losses at the plant.
- Where coal units are converting to biomass, we also assume no job losses at the plant in order to be conservative.
- States with the most job losses are Ohio and Pennsylvania, each with about 3,000 jobs lost; Virginia and North Carolina with as many as 1,300 job losses; and Illinois, West Virginia, Indiana, and Texas with as many as 1,000 job losses each.
- 13 other states suffer job losses as well. Several states will have no net job losses, because smaller units are closing or converting at sites where larger coal units will remain in operation.

Economics – The Ugly

- EPA regulations have been cited as a factor in the announced closure of 205 coal units, representing more than 31,250 megawatts (MW) of coal-fueled generating capacity in 26 states.
- The Mercury and Air Toxics Standards (MATS) rule is responsible for most of these closures.
- These closures are current as of the end of September. These coal plant shutdowns will cause the loss of 13,000 – 17,000 jobs.
- The US exports of coal to China, India, Korea, Japan, England and the Netherlands are at the highest levels in 20 years.
- Green states like Oregon and Washington are approving permits to send PRB coal overseas.
- The economics overrule the environment.
- Plants are aging and parts are more expensive. Utility cannot cut coal plants without cutting profits. This limits the amount of cash available for new assets.

Environmental - Good

- The United Nations has developed a CDM (Clean Development Mechanism). This is a program whereby "green" energy projects earn "credits".
- There are 4200 projects worldwide that have a total value of 600 Million "Credits".
- GE Sargas has technology that will capture and inject CO2 into the ground in 2016. This represents 90% capture.
- CO2 capture injected into the ground in oil fields may enhance production. 2,000,000 acres of mined lands have been reclaimed over the past 20 years. This is larger than the state of Delaware. Montana has about 120,000,000,000 tons in reserves. Wyoming is the largest coal producing state. Texas is the top state in consuming coal. (100,000,000 tons/year.)
- Mountaintop removal mining can create valuable useable land. Federal law requires that after a surface mining project, the land has to be returned to an equal or better state than before mining began.
- With back end equipment in place, emissions can be reduced in excess of 90% in coal firing applications.

Environmental - Bad

- The United Nations plans to set binding emissions targets in 2020.
- The UN targets will be politically and not scientifically driven.
- The United Nations CDM program also has an offset market. This market allows richer countries to pay for projects in poorer countries in exchange for tradeable credits, aka Certtified Emission Reductions.
- The EPA is supposed to have a CO2 limit published in 2012.
- Burying CO2 is difficult in practice and no one has really established the long term effects.
- Coal produces 2.5 lb of CO2 for each pound of coal burned. Black lung among miners is increasing. Since 2005, there has been about a 9% increase. In the 1990's, the number was 4%.

Environmental - Bad

- CCS (Carbon Capture Sequestration) works by forcing exhaust from the plant through a liquid solvent that absorbs CO2. The liquid is heated, the CO2 is released, captured and compressed to about 100 times atmospheric pressure and sent away for storage.
- CCS consumes a LOT of energy. A power plant would have to burn 25% more coal to handle the CCS load while producing the same amount of electricity.
- Because the US power plants produce 1.5 billion tons of CO2 per year, it would require filling 30,000,000 barrels of CO2 per day is CCS is law. This is 1.5 times more than the amount of crude oil consumed every day in the US.

Environmental - Ugly

- Coal emits 90 times as much SO2, 5 times NOx and 2 times as much CO2 as Natural Gas.
- Coal plants emit more hazardous pollutants than any other industrial source. Coal is one of the dirtiest fuels.
- Coal gassification creates twice the amount of CO2 as does burning coal.
- Gassification process: Cook coal with water added and the H2 in the water bonds to carbon to form hydrocarbons such as octane. This is also call the Fisher-Tropsch process.
- South Africa produces 160,000 barrels per day of coal gassified fuel.
- Coal contains sulfur and notrogen compounds, mercury and other toxic metals. A 500MW unit produces 10,000 tons of CO2 daily. US power plants generate 1.5 billion tons of CO2 per year.

Political - Good

- The UMW has refused to back Obama although they did in 2008. The union is not backing either candidate.
- This will be the first time the UMW has not backed a Democratic presidential candidate since FDR.
- Because of the volatile economic and environmental issues surrounding coal, candidates are having to take a stand on coal. While they may renege on promises, they will have to at least address this most important issue during the campaign.
- Voters are now beginning to ask politicians to explain the math behind either supporting coal or opposing coal.
- Although the subject is volatile, coal usage is drawing many people into the discussion who never considered energy a critical issue.

Political - Bad

- EPA rulings over the past 18 months have stymied the coal industry.
- The EPA and the courts are exacting laws that Congress should control. According to legislators, the EPA has no business regulating carbon but Congress cannot agree enough to decide any question.
- The Supreme Court in 2007 said the EPA has the authority to regulate greenhouse gases. Science seems to be a minor part in legislation. The government/EPA is moving in a benign manner.
- The DOE has followed the need to develop sustainable energy.
- Legislature to cut greenhouse gases by 20% by 2020 "IF" sufficient commercial scale CCT (carbon capture technology) is available.
- Carbon capture is politically motivated and has a very high price tag.
- The United States refused to sign the pact because the limits defined in the document only applied to "industrialized" nations. The USA would not sign also because China would not commit to binding reductions.

Political - Ugly

- Current administration now claims to support coal as opposed to the rhetoric during the last campaign and actions during the past few years.
- Administration states EPA will have greater flexibility in enforcing new standards.
- Questions: 1. How can you have flexibility in enforcing standards?
  2. If they are standards, how can they be flexible?
- Legislation is politically motivated. The EPA has no clear path because the EPA directors change with each new administration.
- The lack of a clear cut policy and direction handcuffs coal users from making any investment decisions until legislation is finalized. This creates “catch up” construction which effectively increases prices for labor and materials.
- Obama stated it would be OK for companies to build coal plants but "it will bankrupt them"

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Coal is mined in 25 U.S. states and is responsible for over 550,000 U.S. jobs.

Wyoming is the largest coal-producing state, followed by West Virginia, Kentucky, Pennsylvania, and Montana.

Of the nearly 1.1 billion tons of coal mined in the U.S. in 2010, over 638 million tons were mined West of the Mississippi River, and over 444 million tons were mined in the East.

According to a study by PricewaterhouseCoopers based on U.S. Bureau of Economic Analysis data, U.S. coal mining was responsible for 154,000 direct jobs and over 400,000 indirect jobs in 2008.