

Engineered Coal Fuels

A MATS and CAIR emissions reduction alternative

The Engineered Coal Fuels & Technology Opportunity

Opportunities exist today to generate economically viable and environmentally sound electricity from coal, using Engineered Coal Fuels. Numerous processes are in operation or under development to treat coal and reduce the operational impact of MATS (Mercury & Air Toxics Standard) and CAIR (Clean Air Interstate Rule) and other similar emissions reduction directives.

Engineered Coal Fuels can provide an answer for all or part of the requirements and, at a minimum, reduce the O&M cost and impacts of mercury, acid gas, and hazardous metal control. They do so by drying, refining or other methods of cleaning the fuel prior to entering the combustion chamber. These technologies serve to reduce undesirable substances in the exiting flue gas.

Using Engineered Coal Fuels Yields Benefits

- **R**educed Fuel Consumption – Increasing energy content by 30% (vs. lower rank feedstock) results in less coal used
- **I**mproved environmental performance – reductions of Hg (15-99%), NO_x (10-50%), SO_x (10-80%) and Cl (0-99%)
- **G**reenhouse Gas (GHG) Reductions – studies show that a 1% increase in combustion efficiency leads to a 2.5% reduction in CO₂ emissions from power plants. Combustion tests indicate that Engineered Coal Fuels can increase combustion efficiency by 2-4%, resulting in a 5-10% reduction in CO₂ emissions
- **I**ncreased Capacity – increased power output and improved heat rate, enable higher capacity utilization and efficiency at the point of combustion
- **L**ower Risk of Spontaneous Combustion – improved physical and chemical stability enhances handling, storage and transportation options
- **E**nhanced Transport Efficiency – reduced moisture content lowers load volumes and transportation costs by up to 30%
- **R**educed Maintenance/Increased Plant Availability – reduced mill wear rates and reduced boiler corrosion from acid gases result in reduced maintenance and plant forced outages
- **R**educed Tonnage of Ash – power plant efficiency improvements also result in reduced ash waste on a kWh basis when compared to the parent coal



Engineered Coal Fuels

America is developing new innovative technologies focused on reducing the impact of emissions from electricity generation. Part of our clean energy future must include continued, responsible use of our existing fleet of coal-fueled power plants. Coal 2.0 Alliance members provide cost-effective solutions for improving the environmental performance of these power plants, preserving a low cost source of electricity — a vital bridge to a clean, reliable, and affordable energy future.

Engineered Coal Fuels are **available to be used today on the existing coal fleet.**

Engineered Coal Fuels and technologies represent a **low capital cost option** of treating and **enhancing coal prior to combustion**, resulting in improved energy conversion efficiency and environmental performance.

The environmental benefits of engineered coal fuels and technologies can be further enhanced if other combustion (oxy-coal combustion) or post-combustion technologies (fabric filters, electrostatic precipitation, scrubbers, etc.) are also used.

The Coal 2.0 Alliance is an ACC Committee



American Coal Council
1101 Pennsylvania Ave. NW
Suite 600
Washington, DC 20004
Ph: (202) 756-4540
www.americancoalcouncil.org

Coal Preparation Technologies

Coal preparation is the most widely used prior-to-combustion technology. It involves cleaning the coal, to remove ash, before combustion. Lower ash levels result in decreased SO₂, chlorine, and Hg emissions. Washing also allows coal-fueled boilers to operate more efficiently as there are fewer impurities and other chemicals that can decrease heat and combustion rates. More efficient combustion reduces NO_x and CO₂ emissions.

Cleaning technologies also encourage the use and recycling of other coals that might previously have been abandoned because of lower Btu values and higher levels of impurities, rock, or dirt.

There are three coal preparation technologies used to improve coal before combustion
Wet Cleaning Dry Cleaning
Chemical or Microbial Cleaning

Coal Upgrading Technologies

Coal upgrading technologies increase the Btu content of lower-ranked coals by removing water (dewatering or drying). Dewatering uses four different technologies – three thermal and one non-thermal.

Dewatering and upgrading help to reduce emissions. Sulfur and Hg are reduced with water removal. NO_x emissions are reduced as higher Btu values result in more complete combustion. Increased fuel and boiler efficiency leads to lower CO₂ emissions per kilowatt hour generated.

Coal Treatment Technologies

Coal treatment technologies use additives to alter the coal's combustion characteristics. These technologies generally use metallic or mineral reagents or sorbents to change the way the coal burns. These technologies can capture sulfur and Hg in solid byproducts from the generating process rather than allowing them to be emitted in power plant exhaust gases. In addition, combustion efficiency improvements result in lower NO_x and CO₂ emissions per kilowatt hour generated.



Coal Biomass Fuels & Co-firing Options

New offerings from Coal 2.0 Alliance members will also aid in meeting state and federal renewable portfolio standards and provide the positive aspects of biomass co-firing, including reduced greenhouse gas emissions. These co-firing options offer utilities a workable renewable baseload solution. They offer utilities the option of meeting renewable electricity standards with their existing baseload fleet.

Engineered coal fuels now offer coal and biomass briquette/pellet options; homogeneous coal "look alike" products that improve the energy density and reduce the grindability, supply, and handling challenges typically associated with biomass. Additionally, purpose-grown biomass can be tailored with low alkali levels to mitigate typical biomass boiler slagging concerns.

Engineered Coal Fuels technologies represent an excellent opportunity to use coal – our most abundant/secure and affordable energy resource – in an environmentally sound manner. By applying these technologies along with combustion and post-combustion stage technologies our coal use will help to power us well into the future.

Primary Members **HEADWATERS** ENERGY SERVICES



Affiliate Members



Coal 2.0 Contacts

Great River Energy
www.greenergy.com
(701) 250-2162

GTL Energy, Ltd.
www.gtlenergy.com.au
(801) 871-0303

Headwaters, Inc.
www.headwaters.com
(770) 330-0689

MacArthur Energy
www.macarthurenergy.com
(347) 414-9267

New World Coal Mgmt., Inc.
www.wpgresources.com.au
(301) 570-6582

Roberts & Schaefer
www.r-s.com
(801) 984-0900

Taggart Global, LLC
www.taggl.com
(843) 412-4609

White Energy Coal NA
www.whitecoal.com
(301) 917-6700

Arizona Public Service
www.aps.com
(602) 250-3032

Storm Technologies
www.stormeng.com
(704) 983-2040

ACC Staff
Betsy Monseu, CEO
(202) 805-2310
bmonseu@americancoalcoal.org

Jason Hayes, M.E.Des.
(602) 769-3872
jhayes@americancoalcoal.org