

# Reshaping Coal as a Fuel Source

The 2016 Spring Meeting  
Charlotte, North Carolina  
April 13 , 2016



**THE COAL INSTITUTE**

# ERP Compliant Fuels, LLC

## Key Statistics

- ▶ Revenues of \$575+ million.
- ▶ 1,560 employees.
- ▶ Separate entity (ERP Environmental Fund, Inc.) employees 28 salaried people and 72 hourly employees, solely dedicated to mine reclamation and water management.
- ▶ Owns 100,000+ acres of land, including the *Boden Creek Ecological Preserve*, which is projected to produce 1.3+ million carbon credits over the project life.
- ▶ Run-Rate annual coal/coke production of 11.5 million ST.

# December 2015 U.S. Power Generation By Fuel Source

Fuel Source	Billion kWh	Percentage
Natural Gas	109.6	33.8
Coal	89.6	27.6
Nuclear	69.6	21.5
Renewables (Including Hydroelectricity)	55.6	17.1
Total	324.4	100.0



U.S. Energy Information  
Administration

# Carbon Dioxide Emissions By Fuel Source

Fuel Source	Kg CO <sub>2</sub> /MMBtu
Coal (bituminous)	205.7
Oil	161.30
Natural Gas	117.0
Nuclear	Non-carbon
Renewables (Including Hydroelectricity)	Minimal



U.S. Energy Information  
Administration

# Percentage of Power Generation By Fuel Source

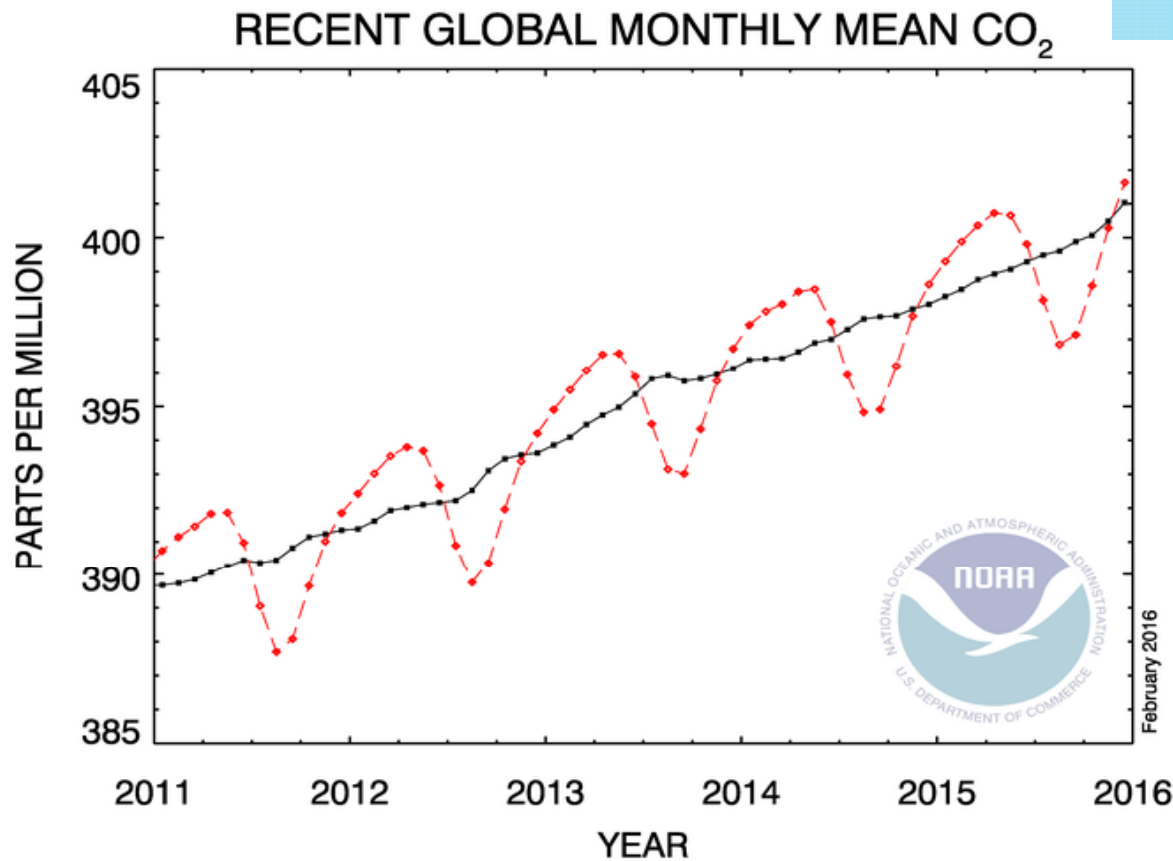
Fuel Source	China (Population 1,367,000,000)	India (Population 1,252,000,000)	United States (Population 323,000,000)
Coal	66	56	28
Petroleum	18	28	0
Natural Gas	6	7	34
Nuclear	1	1	22
Renewables (Including Hydroelectricity)	8	7	17

*Note: Percentages may not add up to exactly 100 due to rounding.*

# Atmospheric Carbon Dioxide Levels

**December 2015: 401.62 ppm**

**December 2014: 398.62 ppm**



# The Role of Forestry in Removing Excess Atmospheric Carbon Dioxide



# Global Potential for Forestry

- ▶ Reforestation and improved forest management have the potential at scale to reduce global emissions by 5.5 gigatons of CO<sub>2</sub> per year.
- ▶ This equates to 15 percent of the world's current global emissions.
- ▶ The planet's estimated 3.1 trillion trees are currently believed to offset approximately 50 percent of all carbon dioxide emissions.
- ▶ “Land management approaches such as forest restoration and low-till agriculture are mature, readily deployable technologies with well-known environmental consequences.”

*U.S. National Academy of Sciences: February 10<sup>th</sup>, 2015*





# GreenTrees® : ERP Forest Restoration Partner

- ▶ Manages over 100,000 acres of bottomland reforestation in the Mississippi Alluvial Valley (MAV).
- ▶ Together with over 400 landowners, GreenTrees® has planted over 36 million trees to date.
- ▶ Has transacted over 2.5 million metric tons of reforestation carbon removal, in sales with Duke Energy, Norfolk Southern, United Airlines, and others.
- ▶ GreenTrees® expects to restore 1 million acres of forest in the MAV.
- ▶ The current GreenTrees® portfolio of land is projected to deliver 40 million metric tons of carbon removal over the next 70 years.



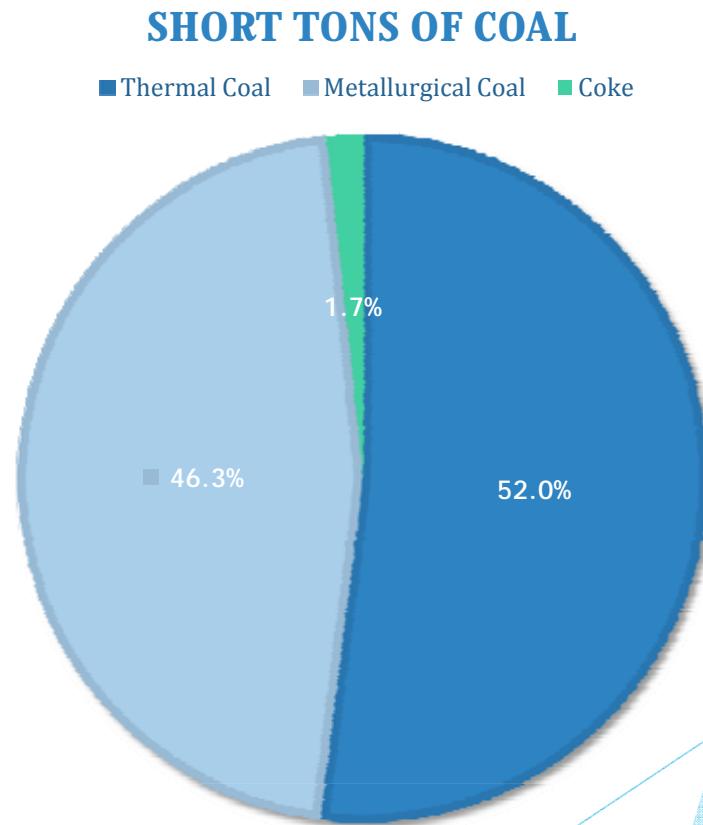
# Compliant Fuel (“ Thermal”) Price Structure

Product Grade	“SPOT” Price Per Short Ton of Coal	“SPOT” Price (\$5.00/MT) of Carbon credits	Total Price	Metric Tons of Carbon Removed per Short Ton of Coal	Percent of CO <sub>2</sub> Neutralized
CF-30	\$40.00	\$3.90	\$43.90	0.78	30%
CF-50	\$40.00	\$6.50	\$46.50	1.30	50%
CF-100	\$40.00	\$12.95	\$52.95	2.59	100%



ERP has offset 1.0 – 10.0 percent of the carbon dioxide emissions on all of its 166 shipments of coal (10/27/15 – 03/05/16).

Thermal: 782,518.0 ST  
Metallurgical: 697,208.2 ST  
Coke: 26,300.0 ST



# Coal and Emission Trends

- ▶ Coal will continue to grow as a global fuel source while declining in the U.S. and Europe.
- ▶ Coal and petroleum will drive growth in less developed countries.
- ▶ Increased levels of atmospheric carbon dioxide will ultimately demand low-cost carbon removal and/or capture solutions.
- ▶ Current technological solutions are unproven and/or cost prohibitive.
- ▶ Reforestation carbon credits bundled with coal sales are a proven low-cost global solution to reducing the rate of growth in excess atmospheric carbon dioxide.