

REINHOLD ENVIRONMENTAL[®]



2026 Reinhold/PCUG Round Table Presentation

Hosted by TVA, Southern Company and Vistra
in the Sonesta Nashville Airport Hotel, Nashville, TN
on June 22-23, 2026

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Reinhold Training Coal

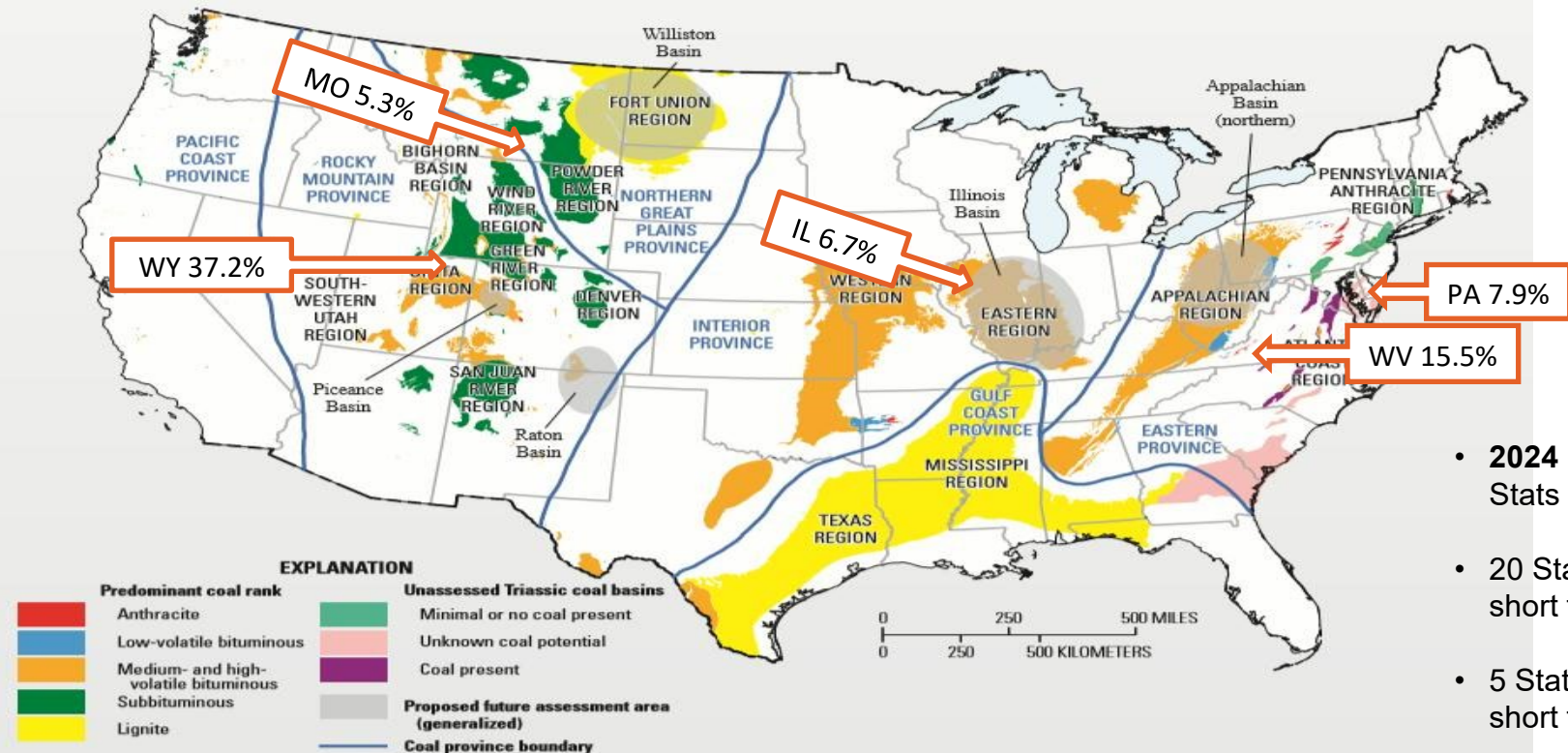
Rev 3 – June 22, 2026. Updated for Reinhold 2026 in Nashville, TN

Package assembled by: K.Flanagan, Senior Manager Fuels Assurance & M.Wilson, Pollution Controls Engineer

Introduction

- “The wonderful thing about knowledge is that you can give it away and still have it.” (Taylor, Dennis E. *Heaven’s River*, 2020).
- Matthew Wilson – TVA Pollution Controls Engineer
- Kelly Flanagan – TVA Fuels Assurance Senior Manager

Coal fields of the conterminous United States—National Coal Resource Assessment updated version



- 2024 Mined Coal Stats
- 20 States, 513M short tons
- 5 States, 373M short tons (72%)

Figure 1. Coal fields of the conterminous United States from the National Coal Resource Assessment updated version (modified from East, 2013).

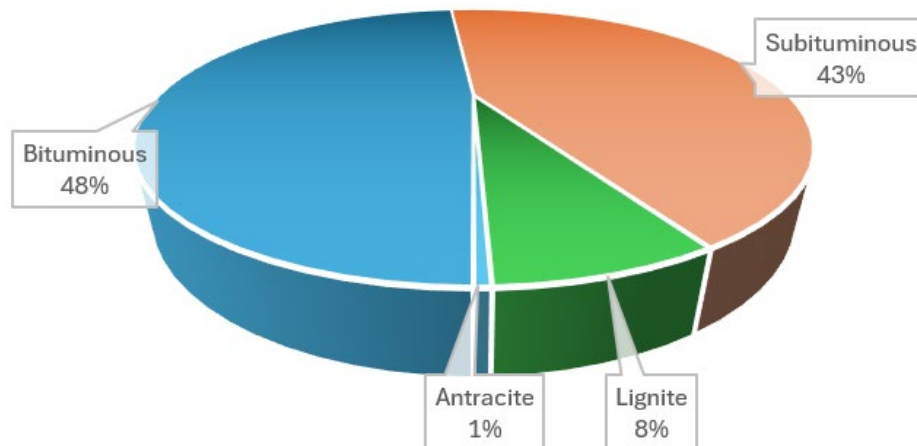
Coal Classification

- Ranked Classification by:
carbon and heat energy

- Highest to Lowest:

- Anthracite – Metals & Domestic
- Bituminous – Thermal (electricity) & Coke (Metallurgical)
- Sub-bituminous – Thermal (electricity)
- Lignite – Thermal (electricity)

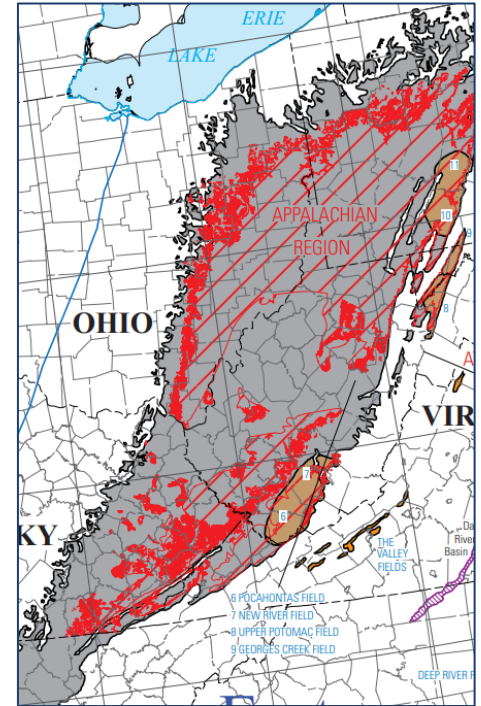
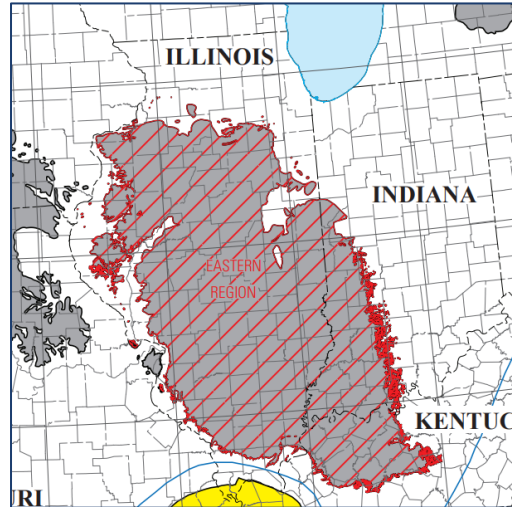
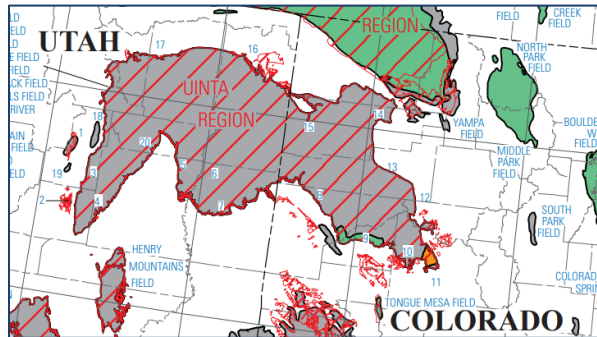
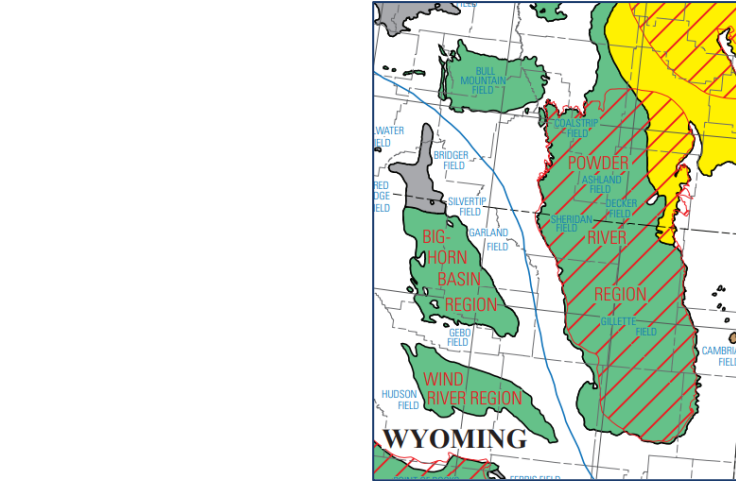
2024 U.S. Coal Production By Rank and Vol (%) of 512M Short Tons



Common Challenges

- Non-coal energy sources
- Viability of suppliers
- Shrinking mine options - 2017: 680, 2024: 560
- Transportation
- Stricter environmental regulations (mines and power plants)

TVA Focus Coal Basins – Advantages & Disadvantages



Coal Selection Criteria

- Coal Price
- Transportation Cost and Reliability
- Coal Combustion Characteristics
- Coal Quality Constituents
- Unit Capacity Considerations
- Current Plant Pollution Controls
- Coal By-Products
- Preparation differences – Subbituminous versus Bituminous

TVA Fuel Blend Coordination



- TVA Lab and Third-party Labs
- Monthly Fuels Meeting
- Coal Blend and Review Process
- Test burn / Reagent trial - contractual out option if unable

Coal Quality and Constituent Testing

- ASTM – standardized procedures for sample preparation and analysis
- Certified Labs in North America adhere to ASTM standards, requiring regular equipment check, standard samples, and interlaboratory comparative testing.
- Proximate Analysis % (As Received) – **Moisture**, Ash, **Sulfur**, **BTU**, **SO2 Lbs/MMBtu**, Ash Lbs/MMBtu, Volatile Matter, Fixed Carbon
- Ultimate Analysis % (Dry Basis) – **Ash**, Hydrogen, Carbon, Nitrogen, Sulfur, Oxygen
- Ash Mineral Analysis % (Ignited Basis) – Many oxides. Highlights: **Calcium Oxide**, **Iron Oxide**
- Ash Fusion Temperatures (Fahrenheit) – Reducing, Oxidizing with Highlight of **Softening Temp.**
- Trace Elements (Dry Basis PPM) – Highlights: **Arsenic**, **Chlorine**, **Mercury**, **Selenium**, **Fluorine**
- Other Info – Highlights: **Hard Grove Grindability Index**, **Volatile Matter (Dry Basis %)**, & **Chlorine (Dry Basis %)**

Pollution Control Equipment Considerations

- SCRs – Arsenic, Ash, Calcium Oxide, Sulfur
 - Catalyst Supplier Fuel Impact Chart
 - Arsenic impacts increase with elevated sulfur %. Months to Years less catalyst life
 - High calcium oxide can negatively impact catalyst life. Pluggage and blinding.
- NOX and Good Neighbor Regulations
- Particulate controls & Ash handling – Ash / Byproduct volume
 - Precipitators - Ash resistivity
 - Fabric Filters – Filter cake
 - Ash flow

Pollution Control Equipment Considerations

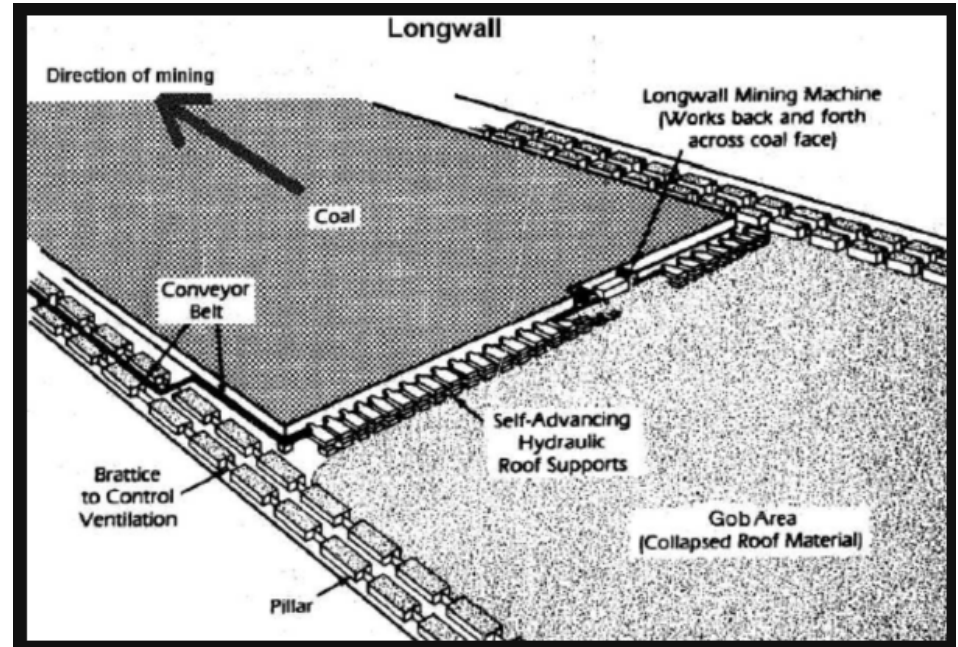
- Mercury Air Toxics Standard (MATS) – Sulfur
 - Scrubber Designs, HCl Surrogate of SO₂, dry or wet scrubber consideration
 - Reagent demand – dry scrubbers especially.
 - Fuel blend changes, reagent ordering and onsite alkali storage
 - Byproduct transport and storage
 - Coal Combustion Residuals (CCR)

Pollution Control Equipment Considerations

- MATS – Cl, BTU, Ash % and Ash Split
 - Without a scrubber, Cl drives dry sorbent injection (DSI). <30 dry Cl ppm proven on both Pptr and RGFF equipped units without DSI.
 - BTU, Ash, and flue gas volume: Decreasing BTU = more flue gas volume for same boiler heat input. Ash *generally* comes with higher BTU and Sulfur.
 - All major Pollution Controls – strong performance function actual gas velocity; hi and lo ends
 - Ash split with Bituminous Fuel generally 80% bottom ash and 20% flyash. Sub-bituminous Opposite – Impacts: bottom ash equipment systems, dry flyash particulate removal systems

Learn More About Coal Mining

- Search some of these methods for explanations, pictures, and graphics
 - **Surface Mining:** Strip Mining, Open-Pit Mining, Mountaintop Removal
 - **Underground Mining:** Room and Pillar Mining, Longwall Mining
- www.eia.gov U.S. Energy Information Administration





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