



Platt's 22nd Annual Coal Properties And Investment

**Demand and Production of
Thermal and Met Coal**

Palm Beach Gardens, Florida
March 17 – 18, 2014

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U.S Metallurgical Coal – An Industry Sector In Transition

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Background

- ◆ All That Glitters Is Not Gold



Background

- ◆ **All That's Black Is Not Met Coal**



Background

- ◆ **Two Basic Types of Coal**
 - **Agglomerating**
 - **Non-Agglomerating**



Background

◆ Agglomerating

- “Coal that, during volatile matter determinations, produces either an agglomerate button capable of supporting a 500-gram weight without pulverizing, or a button showing swelling or cell structure.”
(USGS Circular 891)



Background

- ◆ **Coking coals are thus those that pass through a plastic state when heated and fuse into an amorphous material that is predominantly carbon.**



Background

- ◆ **Resultant coke requires certain characteristics for use in blast furnaces**
 - **Strength (resists crushing)**
 - **Lack of impurities**



Background

- ◆ **These characteristics are, in large part, a function of the coal's rank.**



Background

- ◆ **Specific characteristics of individual coals affect the blending and coking process**



Background

- ◆ Coal's rank is basically defined by carbon and heat content.
- ◆ As rank increases, carbon content increases and volatile matter content decreases.



Background

◆ Ranking System

- Lignite (non-agglomerating)
- Subbituminous (non-agglomerating)
- Bituminous (agglomerating)
- Anthracite (non-agglomerating)



Background

- ◆ **Bituminous**
 - **High-volatile**
 - **Medium-volatile**
 - **Low-volatile**

- **Subcategories and grades occur within these broad categories.**



Background

- ◆ **Key determinants in establishing rank**
 - **Temperature**
 - **Pressure**

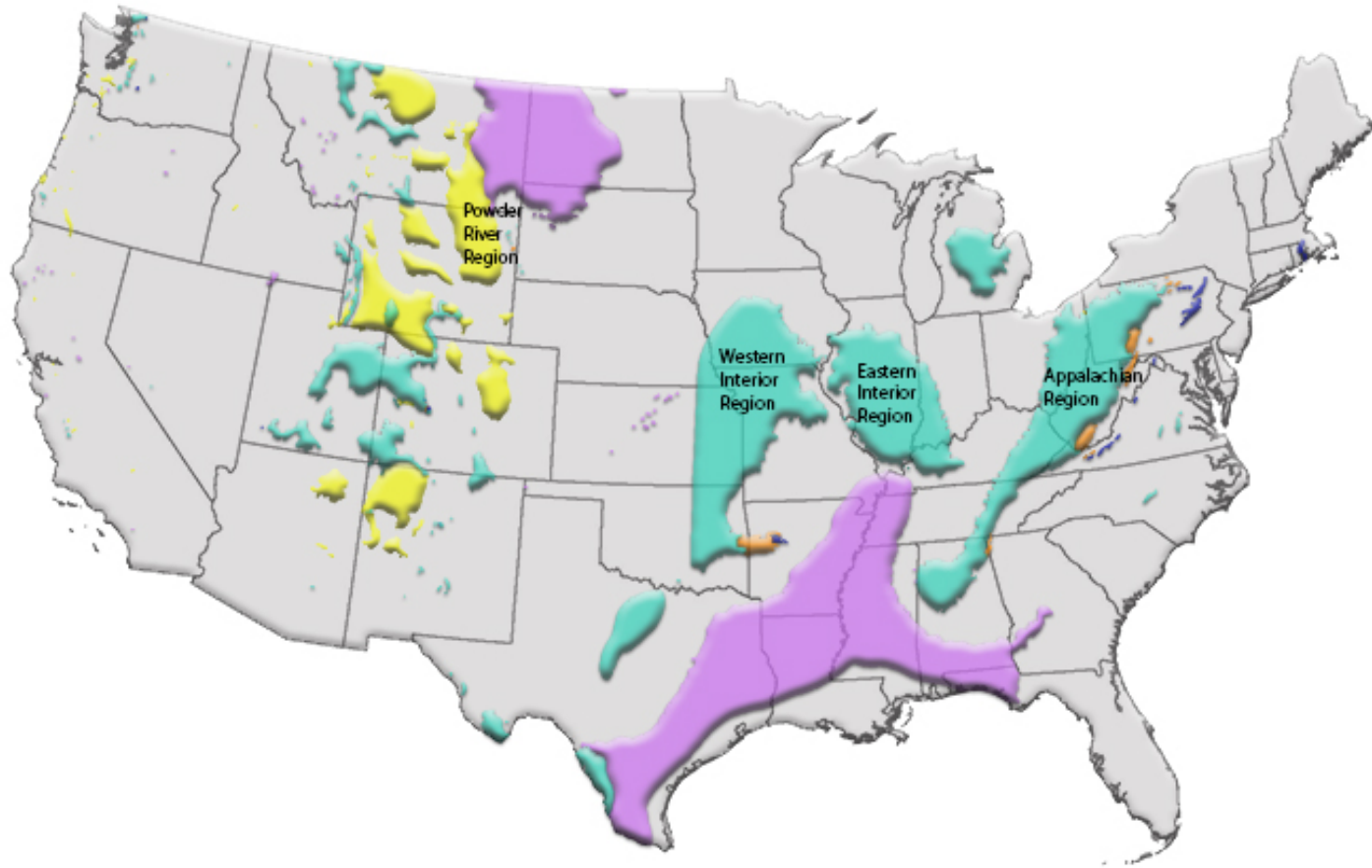


Background

- ◆ **Key drivers influencing these determinants**
 - **Depth of burial**
 - **Age**



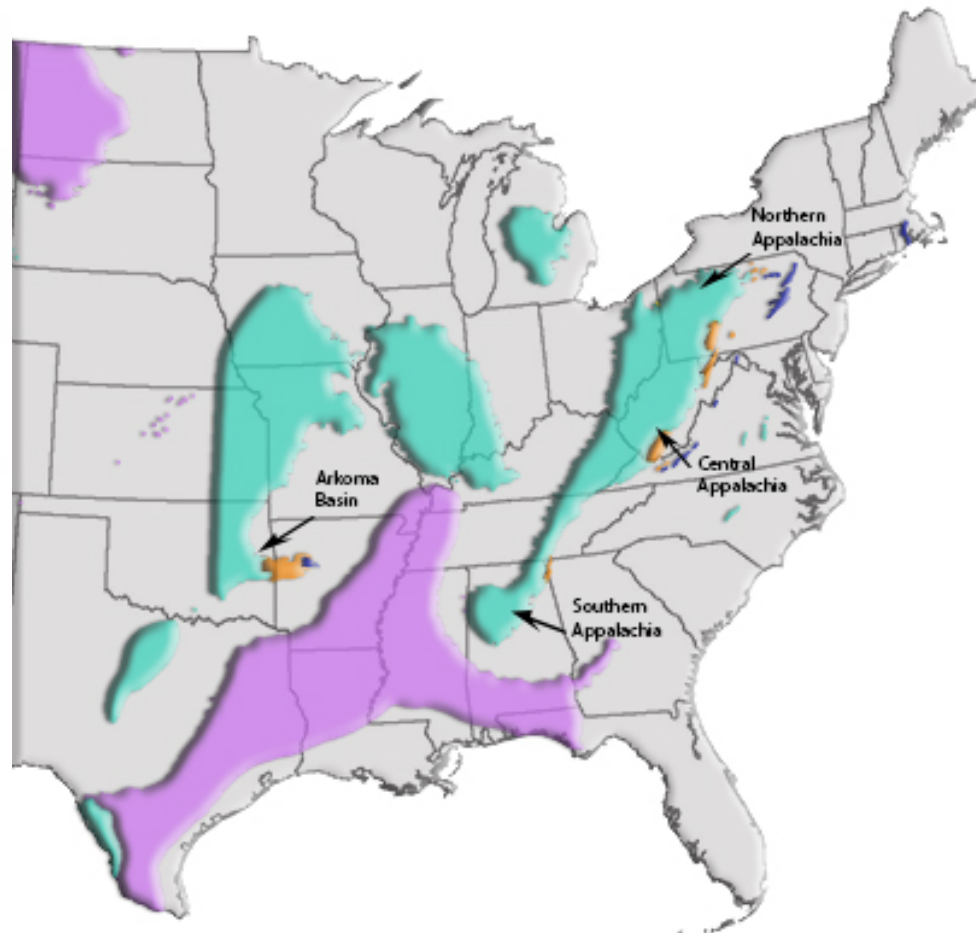
UNITED STATES COAL FIELDS





Where The Coal Is

(Agglomerating, That Is)



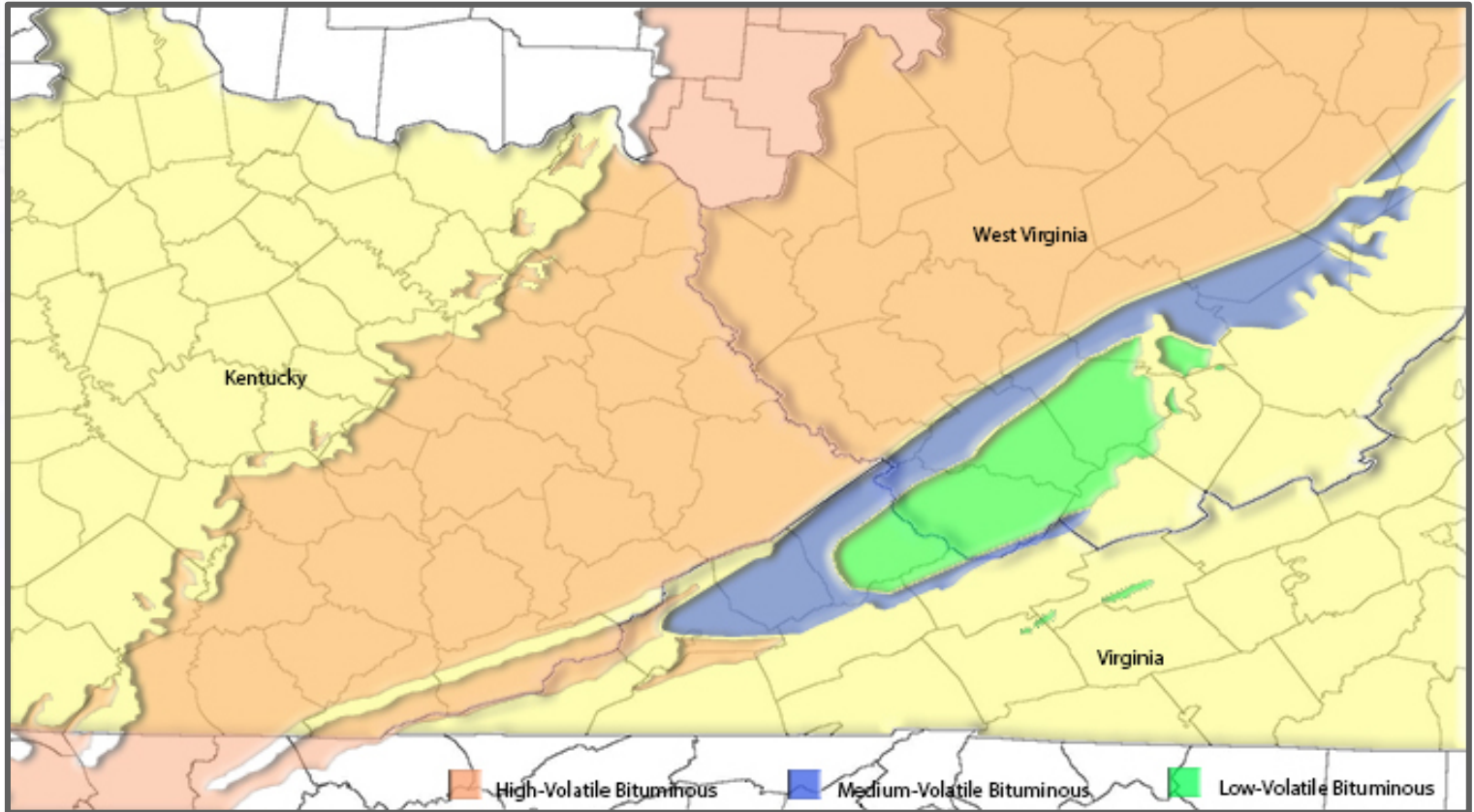


Regional Overview

- ◆ **Central Appalachian Region**
- ◆ **Northern Appalachian Region**
- ◆ **Southern Appalachian Region**
- ◆ **Western Interior Region**



Central Appalachian Region





Central Appalachian Region

- ◆ **Good news – well established source of high-quality metallurgical coal with long mining history.**



Central Appalachian Region

- ◆ **Bad news – well established source of high-quality metallurgical coal with long mining history.**



Central Appalachian Region

◆ As a result -

- Surface and near-subsurface reserves heavily mined.
- Both surface and underground mining methods.
- Result - scattered smaller blocks left for the most part.



Central Appalachian Region

- ◆ **Summing it up – two types of coal remain –**
 - **Thin and clean**
 - **Thick and dirty**



Central Appalachian Region

◆ Other factors -

- Substantial portion of production requires long transportation distances to reach preparation plant
- Geology increasingly becoming an issue



Central Appalachian Region

- ◆ **Low-Vol Belt – West Virginia**
 - Relatively narrow belt at surface and in near-subsurface.
 - Pocahontas Formation pinches out to northwest – no deep potential.
 - No substantial new production likely.



Central Appalachian Region

◆ Low-Vol Belt - Virginia

- Deep reserves remain in Buchanan and Tazewell Counties.
- Primary Producer is CONSOL Energy's Buchanan Mine.



Central Appalachian Region

◆ Mid-Vol Belt –

- Substantial reserve depletion in both West Virginia and Virginia.
- Production used to “sweeten” high-vol coals, bring volatile matter content down.
- No substantial new production likely.



Central Appalachian Region

◆ High-Vol Belt –

- Production historically able to move between met coal and high-quality thermal coal in both West Virginia and Virginia, dependent on market conditions.
- High mining costs and low thermal coal prices precluding this as an option.



Central Appalachian Region

◆ High-Vol Belt –

- Significant reserve depletion in both West Virginia and Virginia.
- Has experienced substantial mine idling and closure.
- No substantial new production likely.



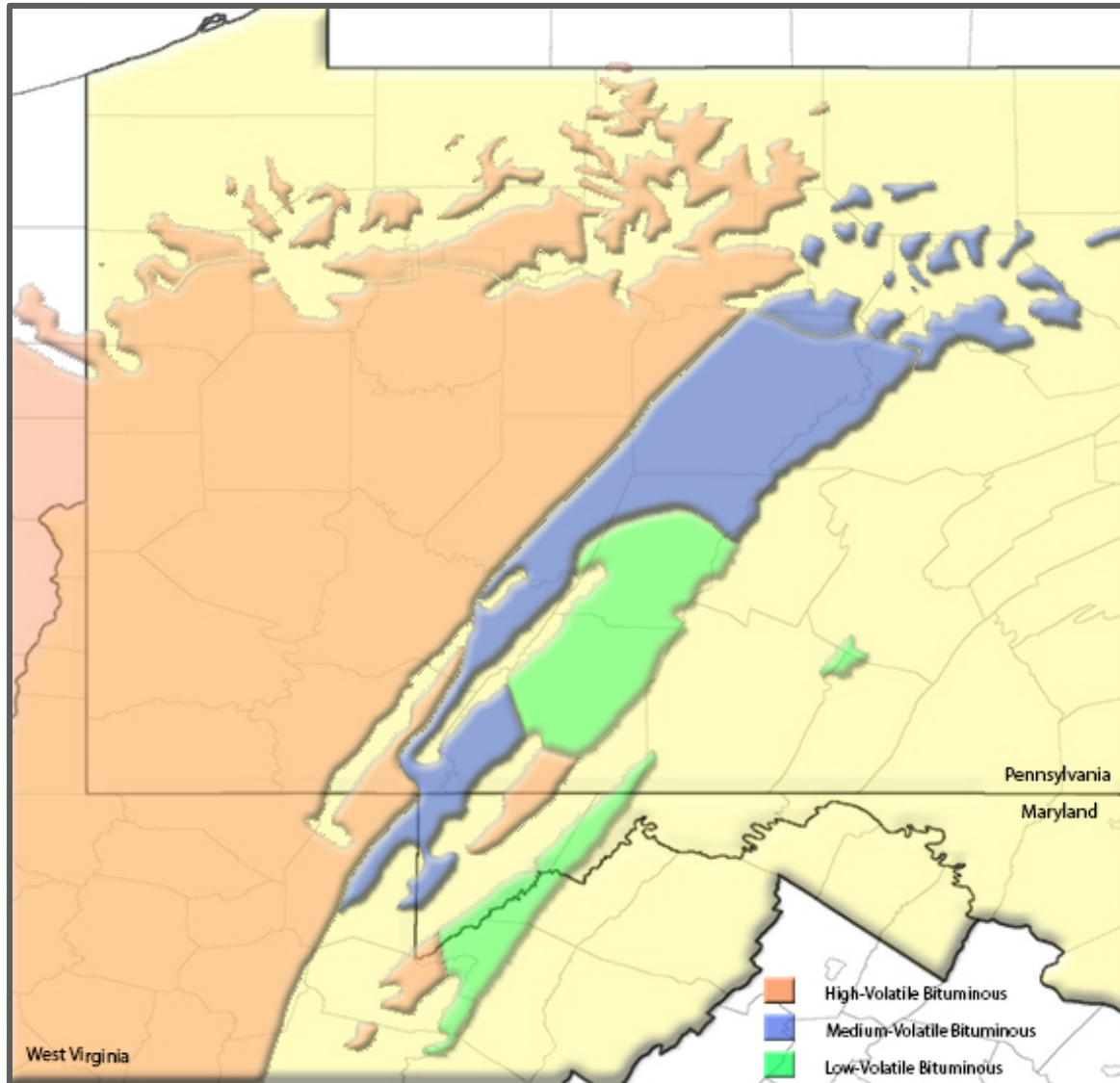
Central Appalachian Region

◆ High-Vol Belt – Kentucky

- Marginal met coal along much of southeastern edge of coal field within the state.
- No substantial new production likely.



Northern Appalachian Region





Northern Appalachian Region

- ◆ Region contains much thinner section of coal beds than in Central App.



Northern Appalachian Region

- ◆ Deposited on broad shelf area and did not have deep burial as in Central App.



Northern Appalachian Region

- ◆ **Generally higher sulfur coals, which affects use in coke making.**



Northern Appalachian Region

- ◆ Area has history of met coal production, particularly from Pittsburgh bed in western Pennsylvania.
- ◆ In recent decades dominant use has been as thermal coal.



Northern Appalachian Region

- ◆ **Mid and low-vol belt -**
 - **Relatively narrow.**
 - **Increased rank a function of location along eastern margin of coal field adjacent to Ridge and Valley province.**
 - **Several producers but no significant increase in production likely.**



Northern Appalachian Region

- ◆ **High-vol belt –**
 - Modest production from existing producers.



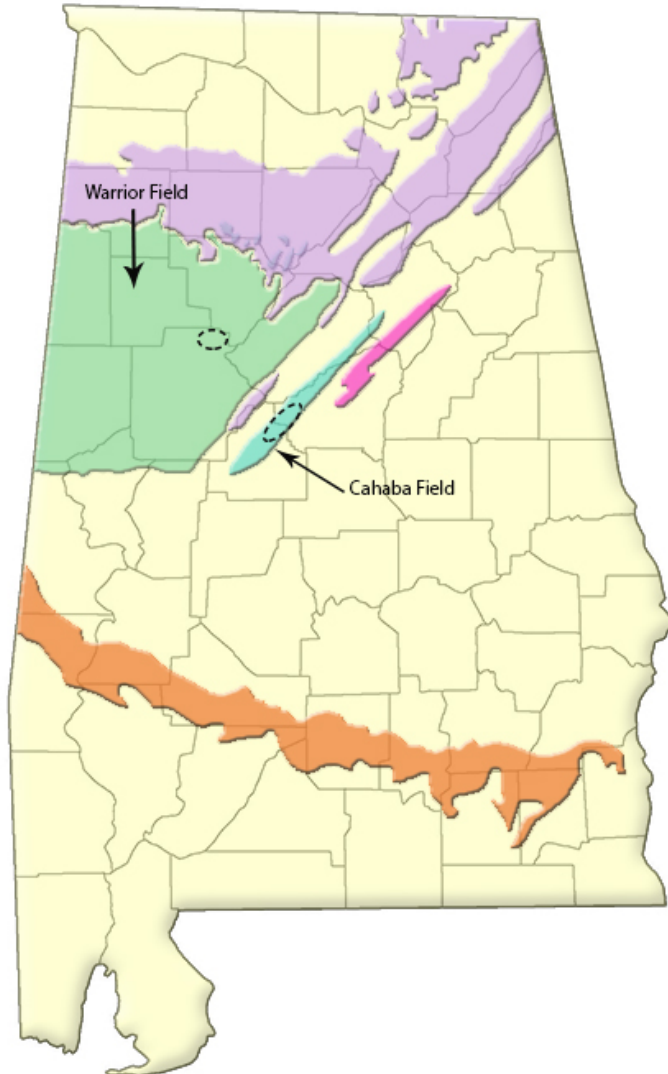
Northern Appalachian Region

◆ High-vol belt –

- New high-vol production –
 - Pittsburgh coal – CONSOL Energy's Bailey Mine in western Pennsylvania.
 - Lower Kittanning coal - Arch Coal's Leer Mine in northern West Virginia.



Southern Appalachian Region





Southern Appalachian Region

◆ Warrior Field

- Long history of mining by both surface and underground methods.
- Coal ranges from low- to high-volatile.
- Significant reserve depletion because of extensive mining history.



Southern Appalachian Region

◆ Warrior Field

- Significant metallurgical coal production currently from Walter Energy's Blue Creek Mines and from Cliff's Natural Resources' Oak Grove Mine.
- Both produce a low- to medium-volatile product.



Southern Appalachian Region

◆ Warrior Field

- New production planned from Walter Energy's Blue Creek Energy project north of its existing mine complex.
- Likely will produce a medium-volatile product from longwall operation at depth.
- Development currently curtailed because of market conditions.



Southern Appalachian Region

◆ Cahaba Field

- Long history of mining dating back to Civil War days.
- Underground mining in early to mid-Twentieth Century.



Southern Appalachian Region

◆ Cahaba Field

- Extensive surface mining in 1960's.
- Underground mining in 1990's for thermal coal.
- Renewed interest in high-vol metallurgical potential.



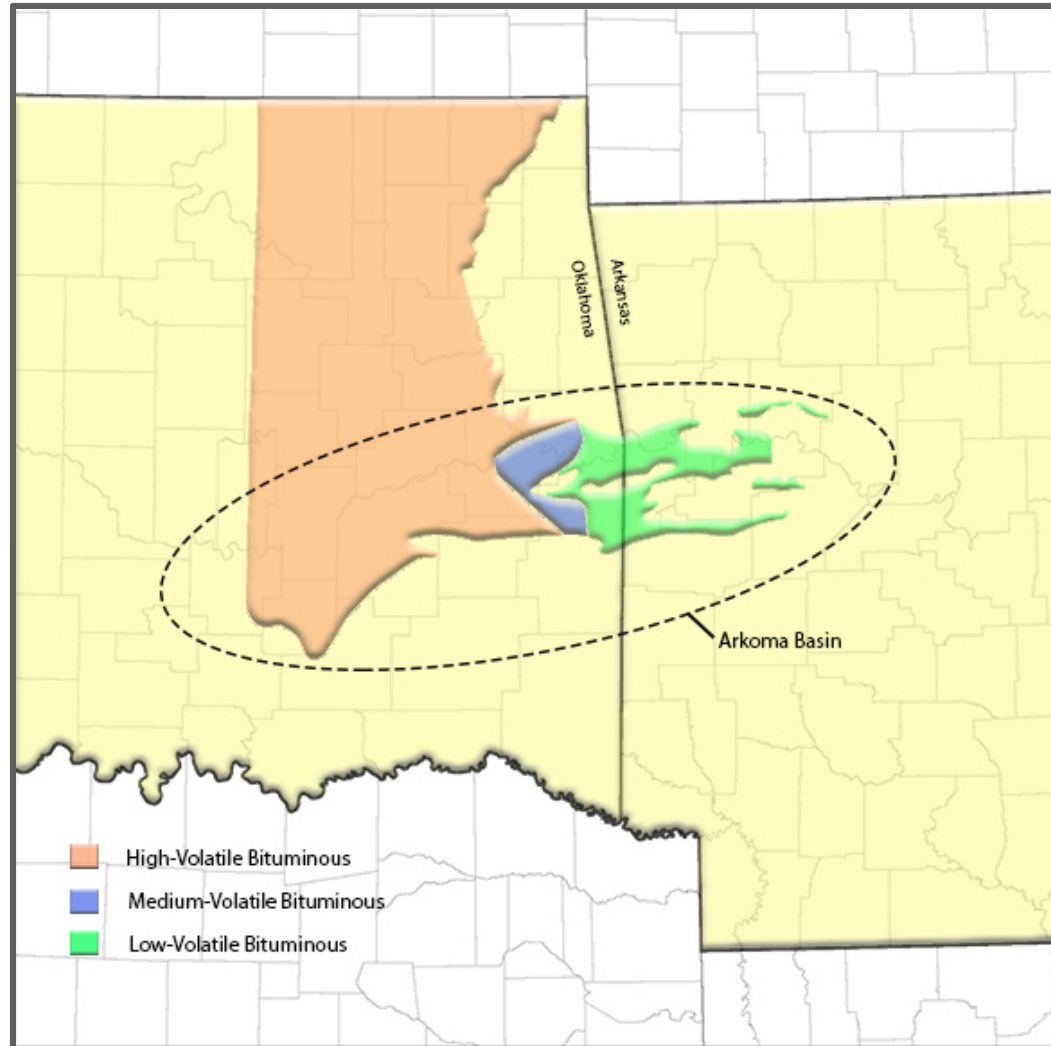
Southern Appalachian Region

◆ Cahaba Field

- New production currently in development phase.
- Underground and highwall mining at Jessie Creek Mining's operations.
- Extensive exploration program and feasibility studies being conducted at Kodiak Mining Company's holdings.



Western Interior Region





Western Interior Region

- ◆ **Arkoma Basin – Oklahoma and Arkansas**
 - Deep structural basin.
 - Target coal bed is Hartshorne.
 - Produces low- to medium-volatile product.



Western Interior Region

- ◆ **Arkoma Basin – Oklahoma and Arkansas**
 - **Geologically complex**
 - **High methane content.**



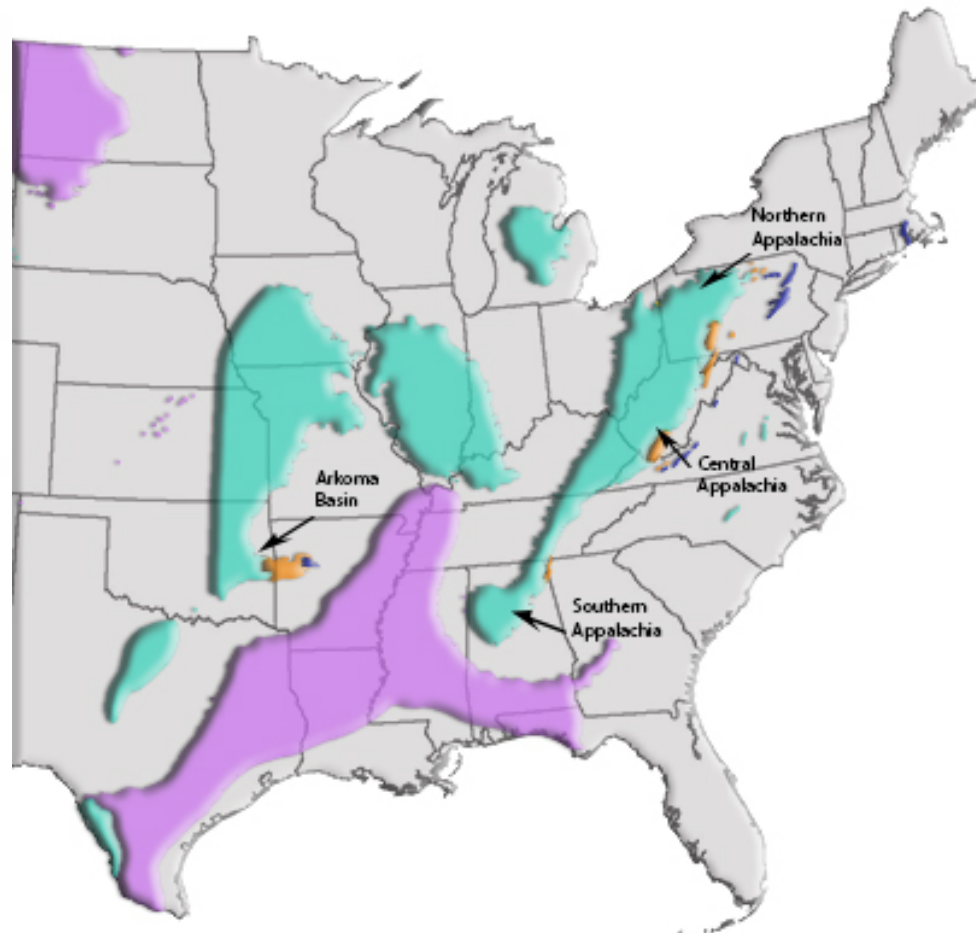
Western Interior Region

◆ Arkoma Basin – Oklahoma and Arkansas

- New production in development / planning stage.
- Ouro Mining, Inc.
- Paringa Resources, Limited
- Texas & Oklahoma Coal Company



New Production Recap





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