



Domestic Coal Basin Outlooks — Powder River Basin, Illinois Basin, NAPP, and CAPP

Presentation to:

Platts 37th Annual Coal Marketing Days Conference

Pittsburgh, Pennsylvania
September 22, 2014

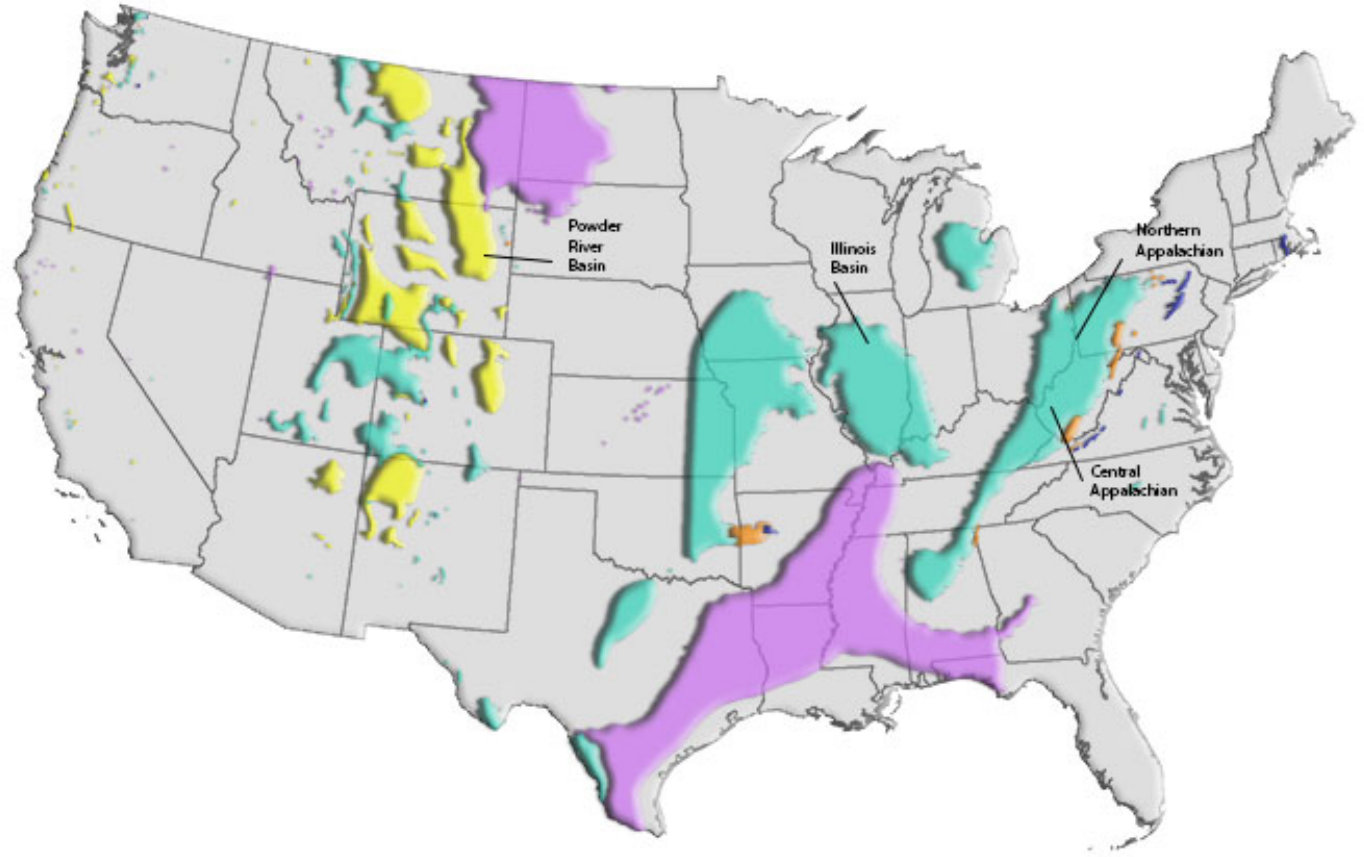
**Nick Bradley
Alan K. Stagg**

Stagg Resource Consultants, Inc.





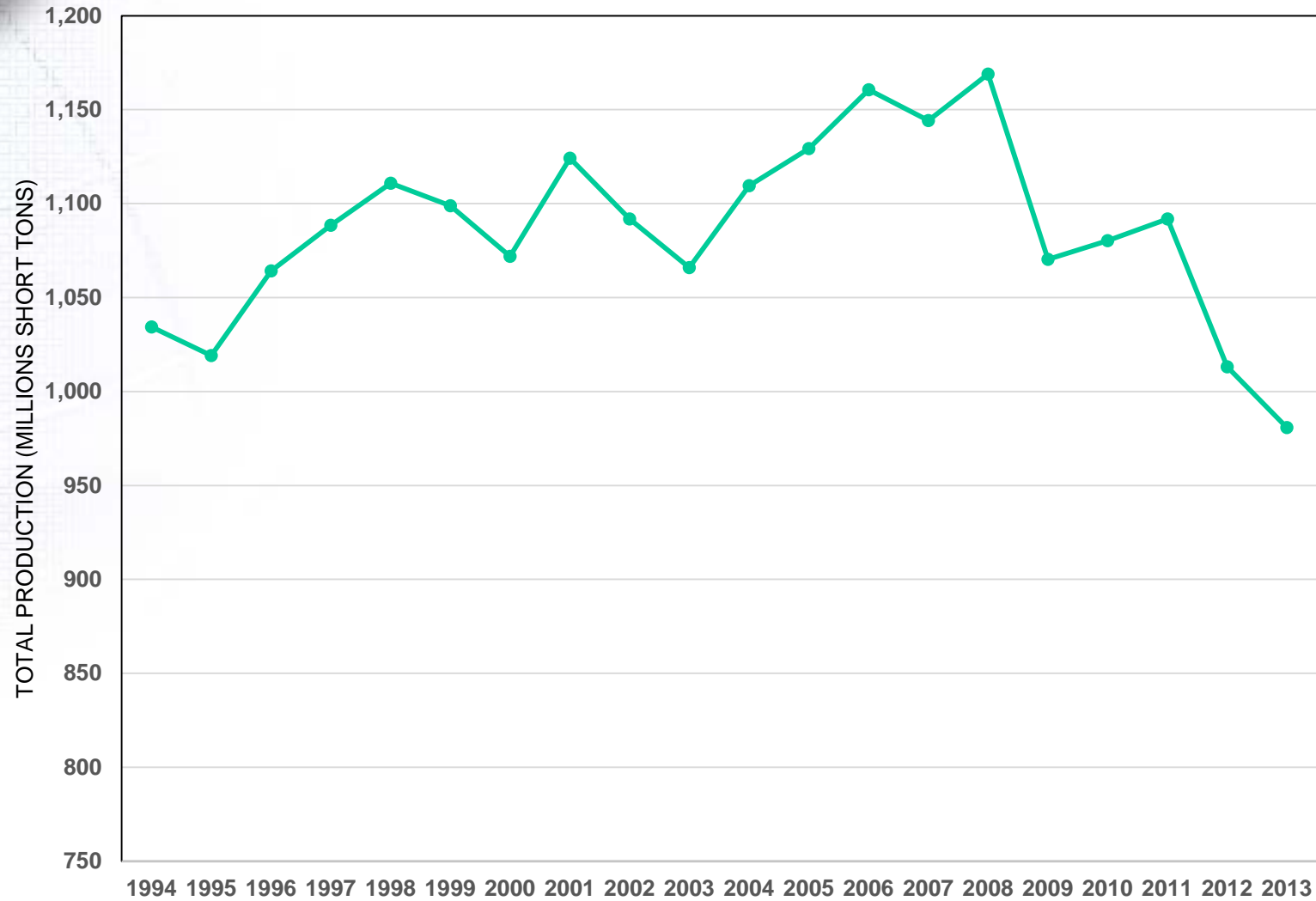
UNITED STATES COAL FIELDS





HISTORIC COAL PRODUCTION UNITED STATES

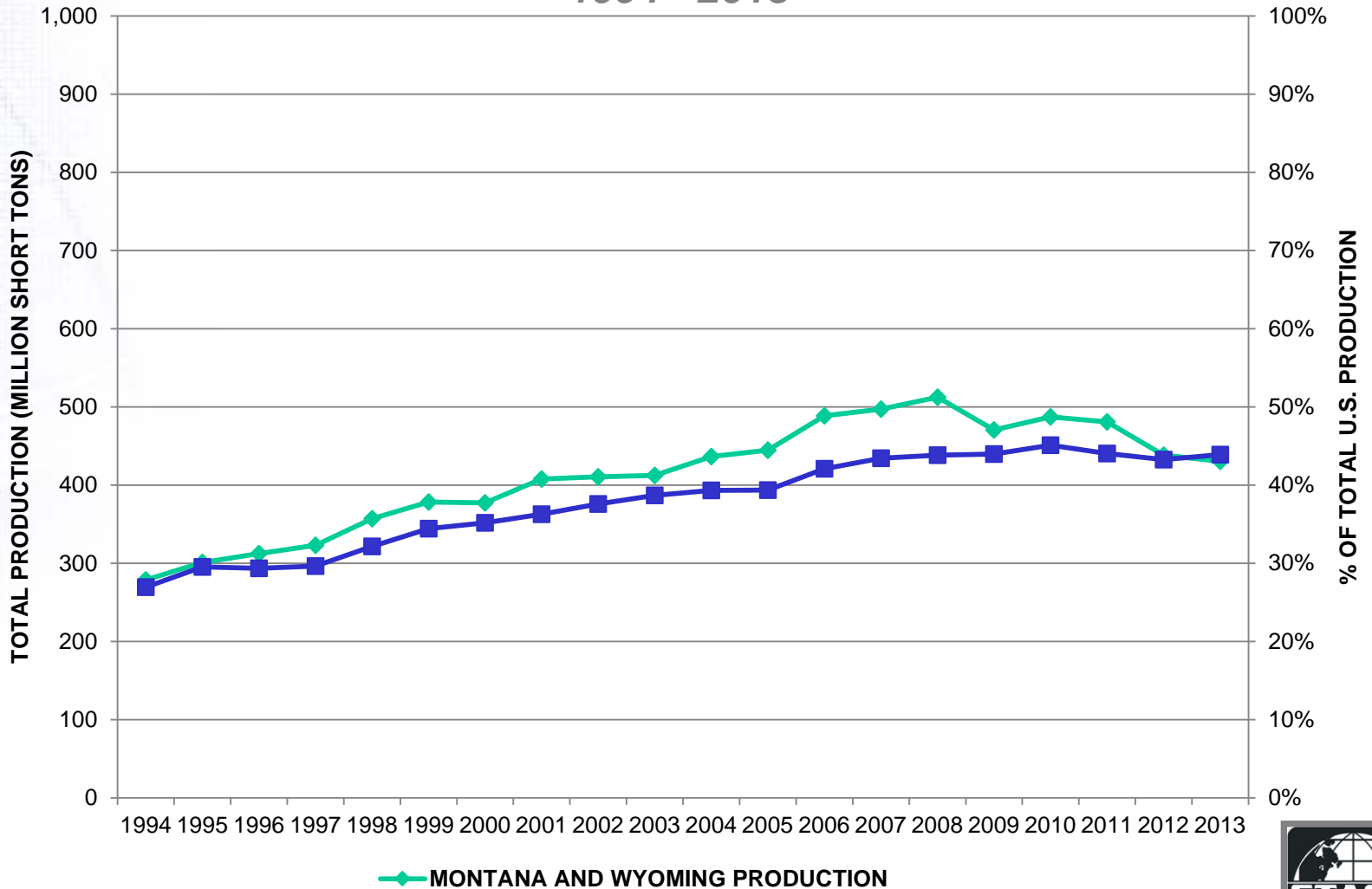
1994 - 2013





HISTORIC COAL PRODUCTION POWDER RIVER BASIN

1994 - 2013



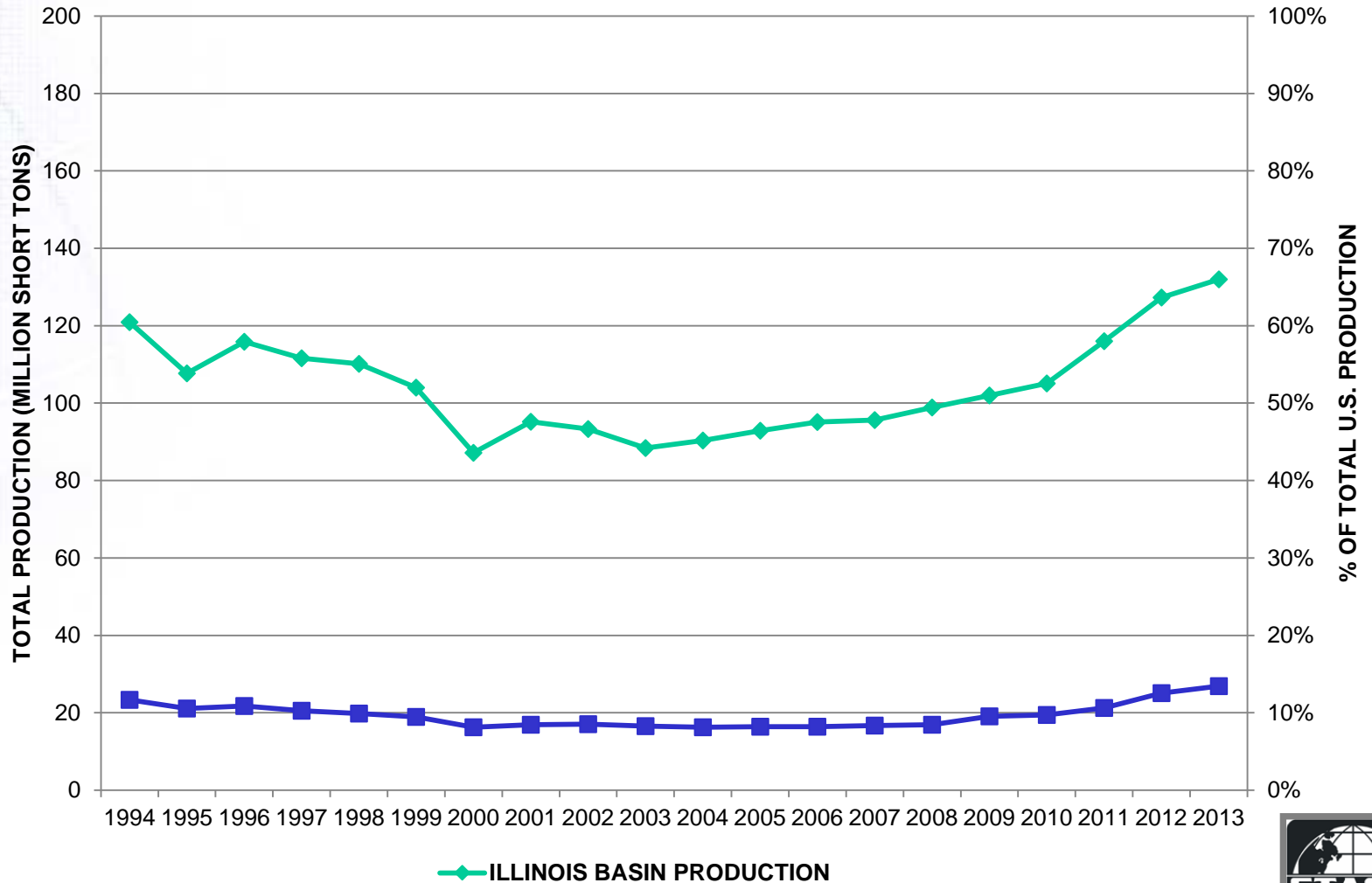
Source: Energy Information Administration





HISTORIC COAL PRODUCTION ILLINOIS BASIN REGION

1994 - 2013



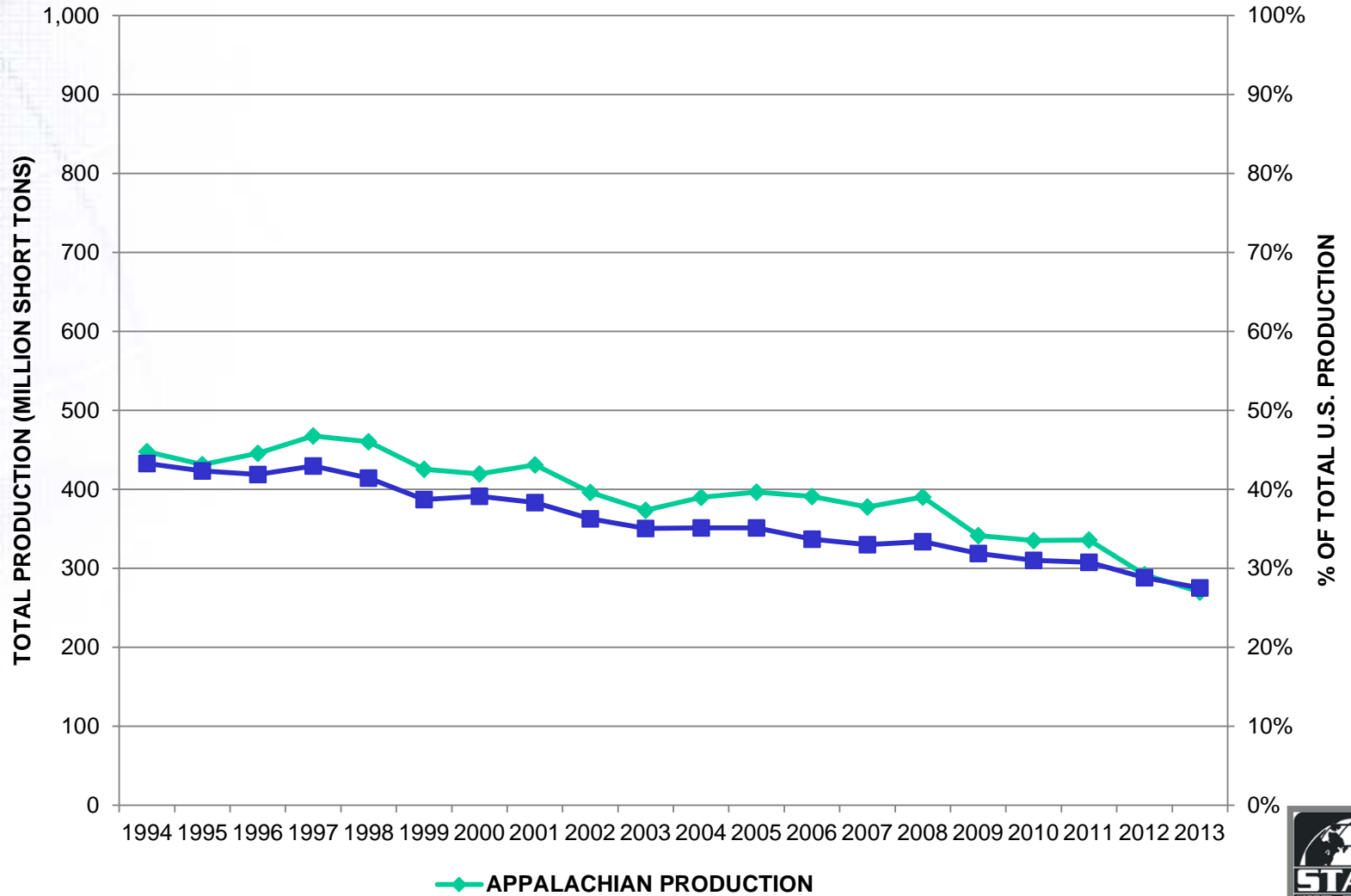
Source: Energy Information Administration





HISTORIC COAL PRODUCTION APPALACHIAN REGION

1994 - 2013



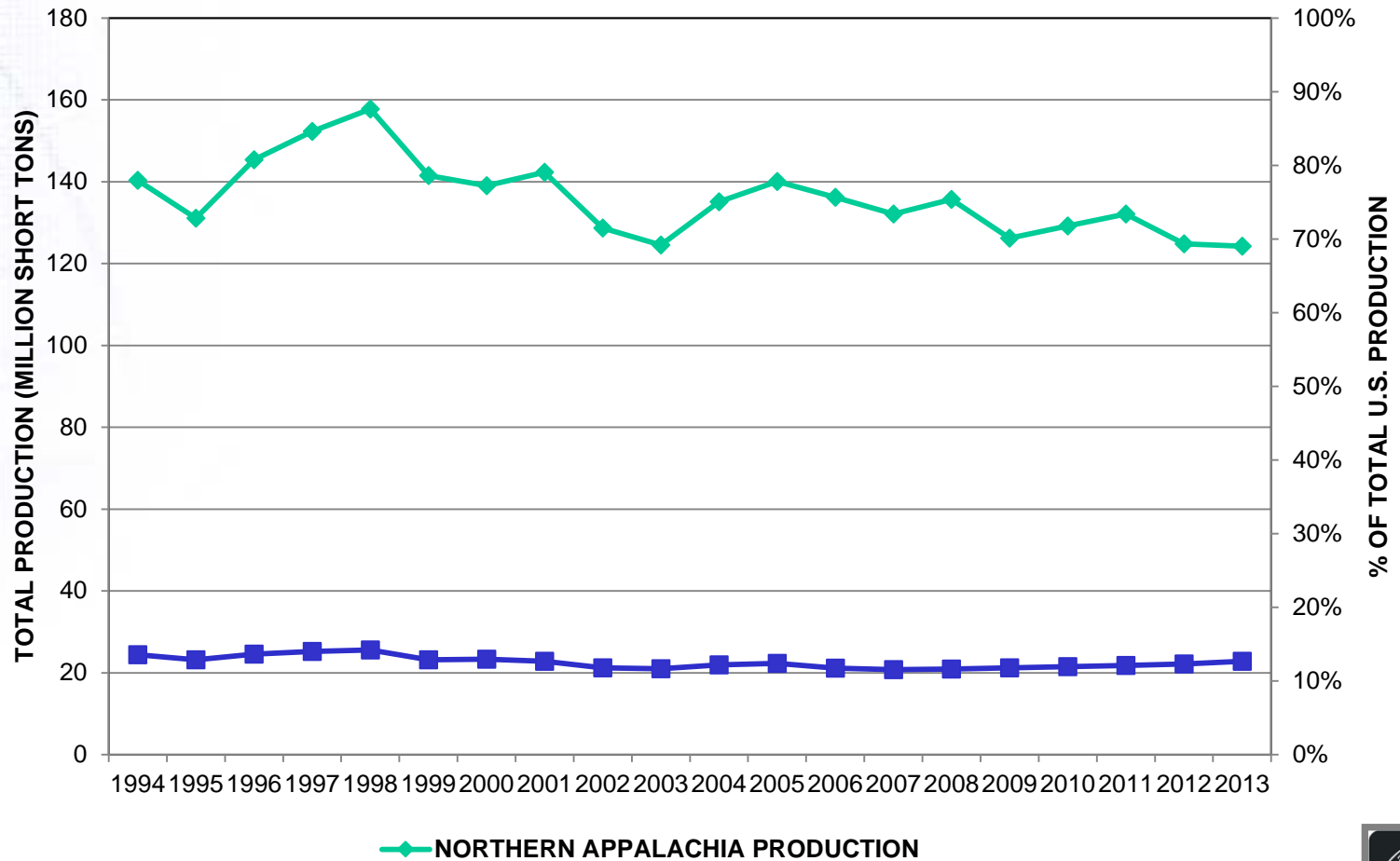
Source: Energy Information Administration





HISTORIC COAL PRODUCTION NORTHERN APPALACHIAN REGION

1994 - 2013



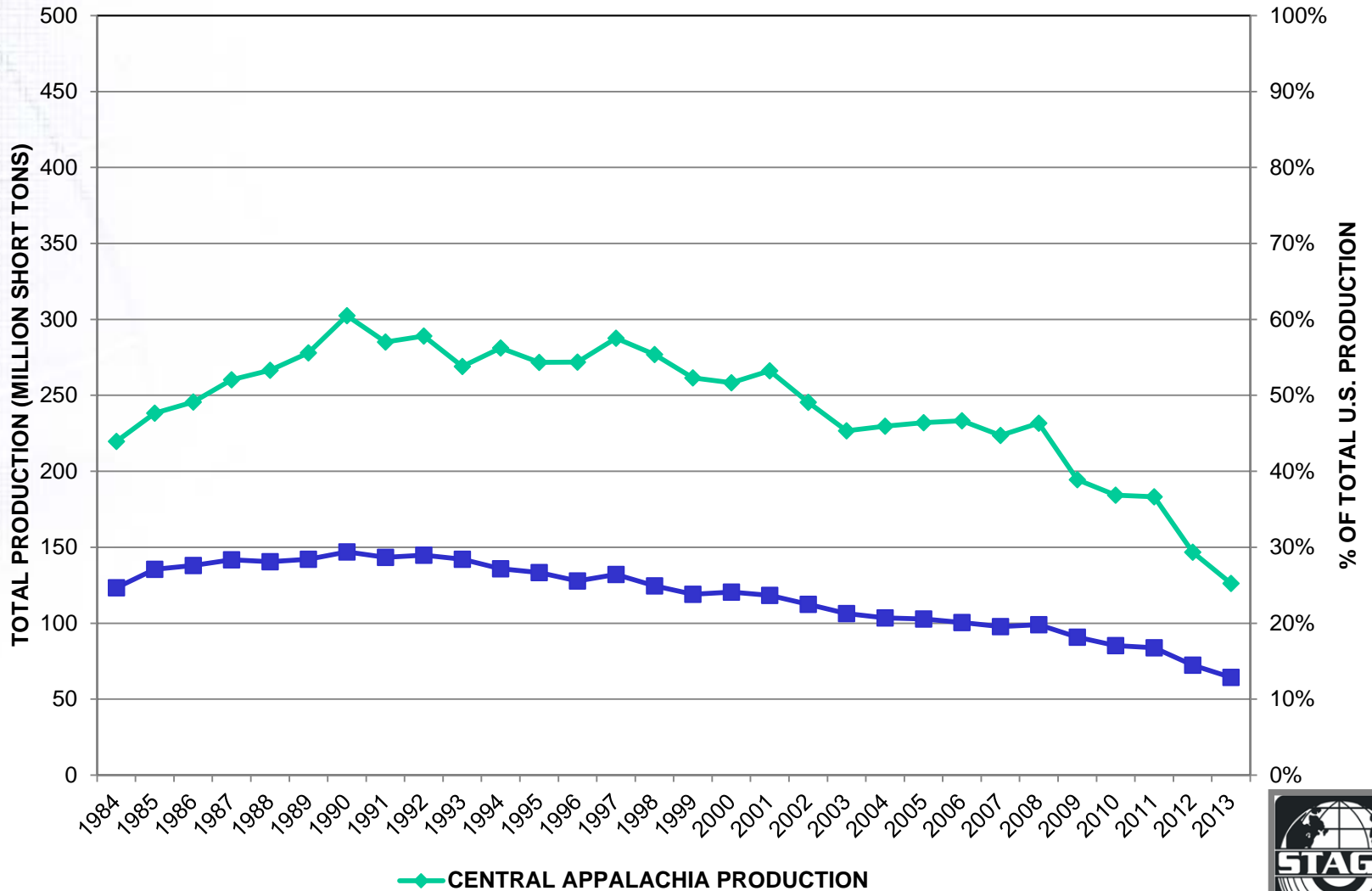
Source: Energy Information Administration





HISTORIC COAL PRODUCTION CENTRAL APPALACHIAN REGION

1994 - 2013



Source: Energy Information Administration





Introduction

<u>Percentage Change in Production</u> <u>Selected U.S. Coal Regions</u>		
<u>Region</u>	<u>2008 – 2013</u> (Annual)	<u>2013 – 2014</u> (YTD)
U.S.	-16	-1.2
PRB	-16	-1.6
ILB	+33	+4
APP	-31	-1.4
NAPP	-8	+1.8
CAPP	-46	-4.5

Source: U.S. Energy Information Administration



Introduction

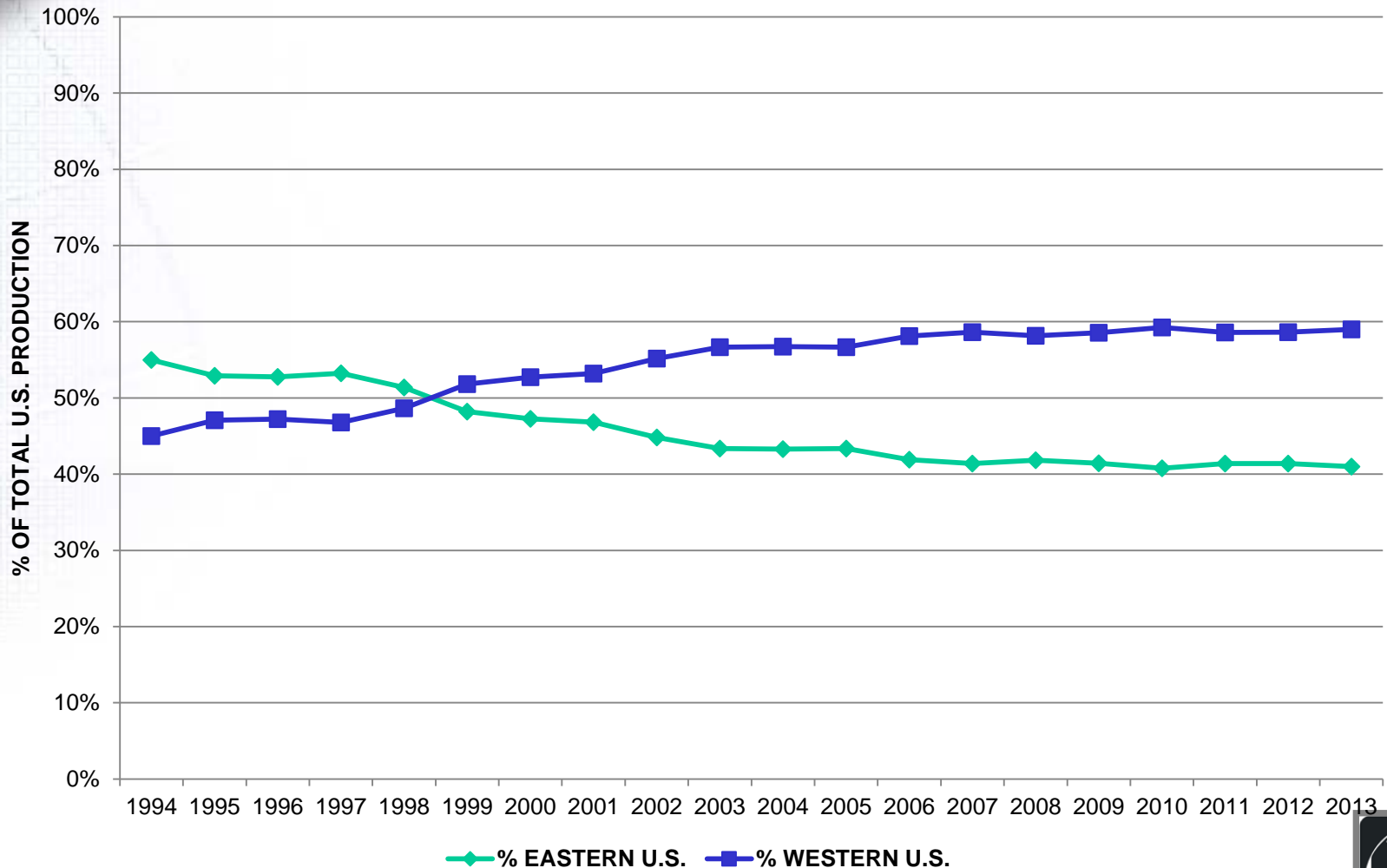
<u>Tonnage Change in Production</u> <u>Selected U.S. Coal Regions</u>		
<u>Region</u>	<u>2008 – 2013</u> (Annual)	<u>2013 – 2014</u> (YTD)
U.S.	-188.1	-8.7
PRB	-81.9	-1.9
ILB	+33.1	+4.0
APP	-120.1	-2.7
NAPP	-11.4	-2.7
CAPP	-105.4	+1.6

Source: U.S. Energy Information Administration



HISTORIC PRODUCTION RELATIONSHIP EASTERN AND WESTERN UNITED STATES

1994 - 2013



Source: Energy Information Administration; Mine, Safety, and Health Administration





Southern Powder River Basin

- Southern PRB –
 - ❖ Mines in three groups
 - Northern Area
 - Central Area
 - Southern Area



Southern Powder River Basin

- Northern Area Mines –
 - ❖ Buckskin (Kiewit)
 - ❖ Rawhide (Peabody Energy)
 - ❖ Eagle Butte (Alpha Natural Resources)
 - ❖ Dry Fork (Western Fuels Association)
 - ❖ Wyodak (Black Hills Corporation)



Southern Powder River Basin

- Central Area Mines –
 - ❖ Caballo (Peabody Energy)
 - ❖ Belle Ayr (Alpha Natural Resources)
 - ❖ Cordero Rojo (Cloud Peak)
 - ❖ Coal Creek (Alpha Natural Resources)



Southern Powder River Basin

- Southern Area Mines –
 - ❖ Black Thunder (Arch Minerals)
 - ❖ School Creek (Peabody Energy)
 - ❖ North Antelope/Rochelle (Peabody Energy)
 - ❖ Antelope (Cloud Peak)



Southern Powder River Basin

<u>Typical Shipped Quality Ranges by Area</u> <u>Southern Powder River Basin</u>		
<u>Area</u>	<u>Sulfur</u> (%)	<u>Heat Content</u> (Btu's/Lb.)
Northern	0.27 – 0.45	7,800 – 8,400
Central	0.25 – 0.32	8,300 – 8,600
Southern	0.20 – 0.30	8,700 – 8,900

Source: Federal Energy Regulatory Commission



Southern Powder River Basin

<u>SPRB Production – Northern Area</u> (millions short tons)			
<u>Mine</u>	<u>2014)</u> (1 st Half)	<u>2014</u> (Annualized)	<u>2013</u> (Full Year)
Buckskin	7,553	15,106	15,024
Rawhide	7,524	15,048	14,246
Eagle Butte	10,335	20,670	19,904
Dry Fork (Captive)	2,546	5,092	5,434
Wyodak (Captive)	<u>2,150</u>	<u>4,300</u>	<u>4,285</u>
Total	30,107	60,214	58,894
Source: U.S. Department of Labor, Mine Safety & Health Administration			



Southern Powder River Basin

<u>SPRB Production – Central Area</u> (millions short tons)			
<u>Mine</u>	<u>2014</u> (1 st Half)	<u>2014</u> (Annualized)	<u>2013</u> (Full Year)
Caballo	3,459	6,918	8,979
Belle Ayr	7,022	14,043	18,259
Cordero Rojo	16,998	33,996	36,670
Coal Creek	<u>4,405</u>	<u>8,810</u>	<u>8,522</u>
Total	31,883	63,765	72,431
Source: U.S. Department of Labor, Mine Safety & Health Administration			



Southern Powder River Basin

<u>SPRB Production – Southern Area</u> (millions short tons)			
<u>Mine</u>	<u>2014</u> (1 st Half)	<u>2014</u> (Annualized)	<u>2013</u> (Full Year)
Black Thunder	48,035	96,071	100,688
School Creek	(1)	(1)	(1)
North Antelope/Rochelle	58,355	116,710	111,006
Antelope	<u>16,388</u>	<u>32,776</u>	<u>31,354</u>
Total	122,779	245,557	243,048

(¹) Included with North Antelope/Rochelle
Source: U.S. Department of Labor, Mine Safety & Health Administration



Northern Powder River Basin

➤ Producing Mines –

- ❖ Absaloka (Westmoreland Resources)
- ❖ Colstrip (Westmoreland Resources)
- ❖ Spring Creek (Cloud Peak)
- ❖ Decker (Ambre Energy)

Bull Mountain Field

- ❖ Signal Peak (Global Mining Group)



Northern Powder River Basin

<u>Northern Powder River Production By Mine</u> (millions short tons)			
<u>Mine</u>	<u>2014</u> (1 st Half)	<u>2014</u> (Annualized)	<u>2013</u> (Full Year)
Absaloka	3,237	6,474	4,169
Colstrip (Captive)	3,826	7,652	8,234
Decker	1,312	2,624	3,122
Spring Creek	<u>7,656</u>	<u>15,312</u>	<u>17,670</u>
Subtotal	16,031	32,062	33,195
Signal Peak	<u>3,724</u>	<u>7,448</u>	<u>8,683</u>
Grand Total	19,755	39,510	41,878
Source: U.S. Department of Labor, Mine Safety & Health Administration			



Illinois Basin

<u>Illinois Basin Production By State</u> (millions short tons)			
<u>State</u>	<u>2014</u> (YTD 09-13)	<u>2013</u> (YTD 09-13)	<u>2013</u> (Full Year)
Illinois	38,682	37,847	52,124
Indiana	28,392	27,481	38,945
Kentucky (West)	<u>31,416</u>	<u>29,152</u>	<u>40,901</u>
Total	98,490	94,480	131,970
Source: U.S. Energy Information Administration			



Illinois Basin

Illinois Basin Longwall Production by Operator

Selected Years

(000's short tons)

<u>Operator</u>	<u>2009</u>	<u>2011</u>	<u>2013</u>	<u>2014</u> (1 st Half)
Alliance Resource Partners	0	0	186	554
Foresight Energy	5,921	8,574	18,033	10,242
Murray Energy	<u>6,267</u>	<u>6,746</u>	<u>9,870</u>	<u>5,309</u>
Total	12,188	15,320	28,289	16,105
Longwall as % ILB	12	13	21	23

Sources: U.S. Department of Labor, Mine Safety & Health Administration, U.S. Energy Information Administration



Northern Appalachian Region

<u>Northern Appalachia Longwall Production by Operator</u>				
<u>Selected Years</u>				
(000's short tons)				
<u>Operator</u>	<u>2009</u>	<u>2011</u>	<u>2013</u>	<u>2014</u> (1 st Half)
Alliance Resource Partners	2,215	2,593	6,023	3,683
Alpha Natural Resources	12,377	9,898	9,161	5,704
Arch Coal, Inc.	0	10	569	1,269
CONSOL Energy	44,453	51,365	49,349	13,259
Murray Energy	12,766	13,496	13,590	23,502
Patriot Coal Corporation	<u>3,810</u>	<u>3,745</u>	<u>3,363</u>	<u>1,615</u>
Total	75,622	81,107	82,055	49,031
Longwall as % NAPP	60	61	66	75

Sources: U.S. Department of Labor, Mine Safety & Health Administration, U.S. Energy Information Administration



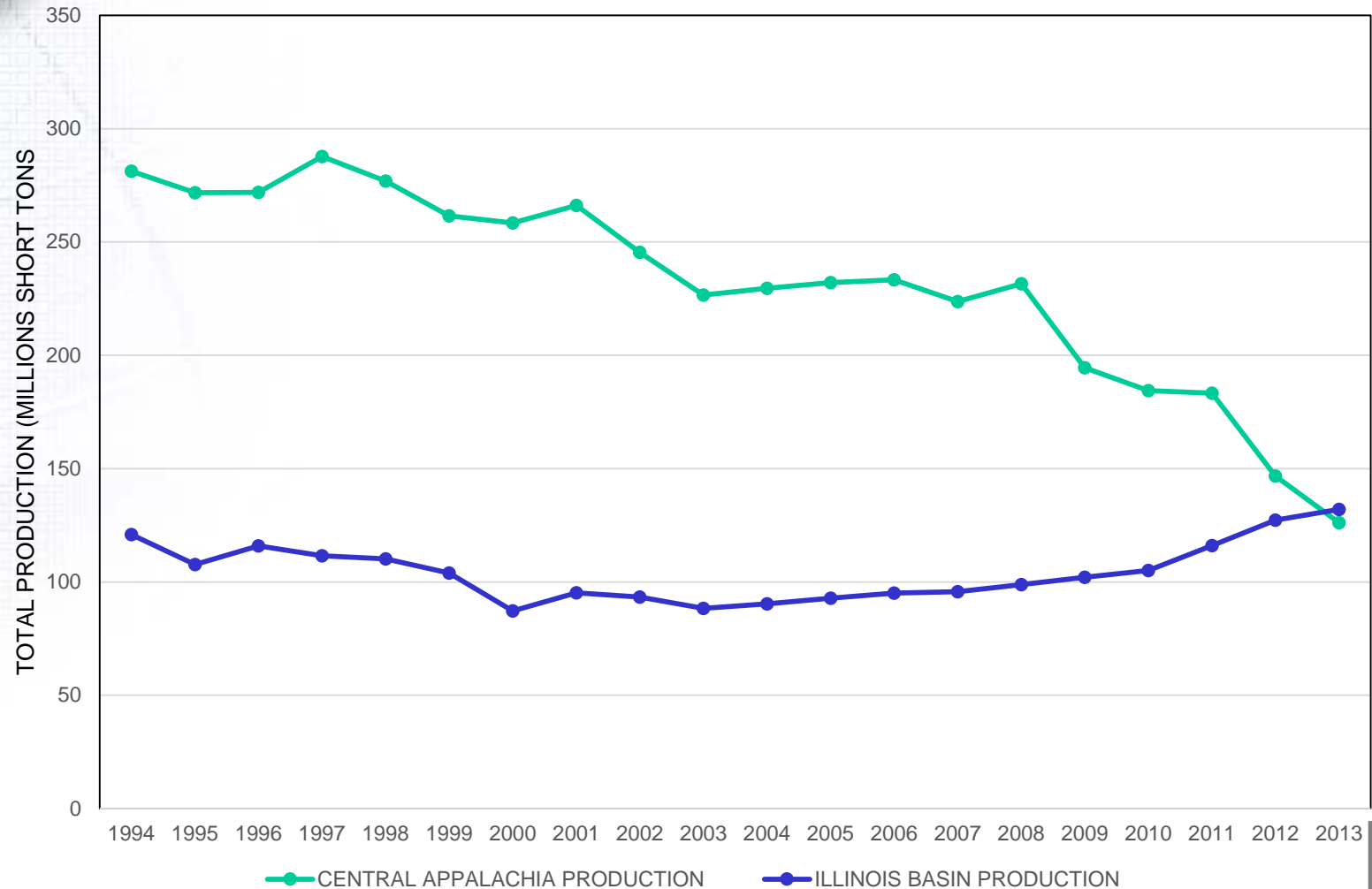
Central Appalachian Region

<u>Central Appalachia Production by State</u>				
(000's short tons)				
<u>State</u>	<u>2009</u>	<u>2011</u>	<u>2013</u>	<u>2014</u> (1 st Half)
Kentucky (East)	74,719	67,930	39,048	17,777
Virginia	21,019	22,523	16,170	32,845
West Virginia (Southern)	<u>98,732</u>	<u>92,813</u>	<u>70,442</u>	<u>7,256</u>
Total	194,470	183,266	126,200	57,878
Source: U.S. Energy Information Administration				



HISTORIC PRODUCTION RELATIONSHIP CENTRAL APPALACHIAN REGION AND ILLINOIS BASIN

1994 - 2013





Geology

➤ Illinois Basin –

- ❖ Moderately thick coal beds in context of underground mining.
- ❖ Generally favorable mining conditions.
- ❖ Large blocks of undeveloped reserves remain – particularly in Illinois.
- ❖ Amenable to use of longwalls in Illinois.
- ❖ Result – productive to highly productive and low to moderate cost underground producer.



Geology

- Northern Appalachia –
 - ❖ Moderately thick to thick coal beds in context of underground mining.
 - ❖ Generally favorable mining conditions.
 - ❖ Amenable to use of longwalls (Pittsburgh).
 - ❖ Blocks remain that can effectively be mined by room-and-pillar methods.
 - ❖ Result – productive to highly productive and low to moderate cost underground producer.



Geology

- Central Appalachia –
 - ❖ Two types of coal beds remain –
 - ☐ Thick and dirty
 - ☐ Thin and clean
 - ❖ Frequently complex geology –
 - ❖ Remaining blocks highly fragmented in many instances.
 - ❖ Result – generally moderately productive and moderate to high cost underground producer.



Transportation

- Powder River Basin –
 - ❖ Mine to rail car –
 - ❑ Relatively flat haul routes
 - ❑ Large off-road trucks
 - ❑ Overland conveyors
 - ❖ Rail car to market –
 - ❑ Rail system in place
 - ❑ Lacking substantial port capability if to export



Transportation

➤ Illinois Basin

❖ Mine to rail car –

- Large blocks of coal support preparation plant at mine mouth in many instances.
- Major portion of transportation to plant occurs underground.
- If highway trucking, generally over moderate terrain.

❖ Rail car to market –

- Rail system in place.
- Has port capacity if to export.



Transportation

- Northern Appalachia –
 - ❖ Mine to rail car –
 - ❑ Large blocks of coal support preparation plant at mine mouth in many instances.
 - ❑ Major portion of transportation to preparation plant occurs underground.
 - ❑ Highway trucking over generally moderate terrain.
 - ❖ Rail car to market –
 - ❑ Rail system in place.
 - ❑ Has port capacity if to export.



Transportation

- Central Appalachia –
 - ❖ Mine to rail car –
 - ❑ Fragmented blocks of coal require trucking over public roads to preparation plant.
 - ❑ Rugged and highly incised terrain results in circuitous routes and long uphill grades.
 - ❑ Some larger complexes use underground conveyors through non-producing mines to avoid overland truck hauls.
 - ❖ Rail car to market –
 - ❑ Rail system in place.
 - ❑ Has port capacity if to export.



Markets

- Two broad types of markets –
 - ❖ Thermal
 - ❖ Metallurgical

- Regional profiles
 - ❖ Powder River Basin – Thermal
 - ❖ Illinois Basin – Thermal
 - ❖ Northern Appalachia – Thermal, slight metallurgical
 - ❖ Central Appalachia – Thermal, modest metallurgical



Markets

- Thermal markets –
 - ❖ Two issues affecting U.S. coal industry –
 - General decline in demand in response to economy, both domestically and internationally.
 - Low natural gas prices and resulting increase in market share at expense of coal.
 - ❖ Affects all supply regions.



Natural Gas

- Has its own critical issues –
 - ❖ Hydraulic fracturing.
 - ❑ Truck traffic, impact on residents/communities.
 - ❑ Potential impact on groundwater.
 - ❑ Potential methane emissions.
 - ❑ Disposal issues – deep wells.
 - Potential for earthquakes
 - ❑ Public pushback.



Natural Gas

- Should not necessarily underestimate the potential adverse impact the hydraulic fracturing issue could have on future gas development and production costs.



Markets

- Metallurgical markets –
 - ❖ Impacts Central Appalachia the most, particularly Southern West Virginia and Virginia.
 - ❖ Requires not only increase in demand, but substantial increases in price.



Regulatory

- US EPA New Source Carbon Emission Standards
 - ❖ Affects all supply regions, but how much impact will it have in the near- to medium-term?



Regulatory

- Waiting for the other shoe to fall –
 - ❖ Anticipated carbon emissions standards on existing plants.



Wrap Up

- Powder River Basin –
 - ❖ Substantial reserves, favorable geology.
 - ❖ Although modest increases in overburden-to-coal ratios will continue, does not affect its competitiveness to a significant extent.
 - ❖ Transportation systems favorable except to export markets – this is the wild card if markets develop.
 - ❖ Markets –
 - ❑ Domestic – depends on economic growth, how natural gas issues play out, and pending carbon emissions standards on existing plants.
 - ❑ Export – jury still out.



Wrap Up

- Illinois Basin
 - ❖ Substantial reserves, favorable geology.
 - ❖ Overall, will be a moderate cost producer, with longwall systems being low cost producers.
 - ❖ Transportation systems generally favorable.
 - ❖ Markets –
 - ❖ Domestic – depends on economic growth, how natural gas issues play out, and pending carbon emission standards on existing plants.
 - ❖ Export – jury still out.



Wrap Up

- Northern Appalachia
 - ❖ Moderate to substantial reserves, favorable geology.
 - ❖ Overall, will be a moderate cost producer, with longwall systems being low cost producers.
 - ❖ Transportation systems generally favorable.
 - ❖ Markets –
 - ❑ Domestic – depends on economic growth, how natural gas issues play out, and pending carbon emission standards for existing plants.
 - ❑ Export – jury still out.



Wrap Up

- Central Appalachia
 - ❖ Seriously reserve constrained, geology an issue.
 - ❖ Overall, will be a high cost producer. Surface mining will play less of a role given permitting and societal issues.
 - ❖ Transportation systems from mine to rail car disadvantaged; systems from rail car to market in place.



Wrap Up

- Central Appalachia (continued)
 - ❖ Metallurgical – will be a high cost producer but has the capability of supplying very high quality coal. Pricing will be the issue.
 - ❖ Thermal – will be a moderate to high cost producer but, as in other regions, depends on economic growth, how natural gas issues play out, and on pending carbon emission standards for existing plants.



The Thought For The Day

“In business – things are never as bad as they seem. Or as good.”

Harold U. Zerbe





Alan K. Stagg, PG, CMA
Stagg Resource Consultants, Inc.
5457 Big Tyler Road
Cross Lanes, WV 25313

(304) 776-6660

astagg@staggconsultants.com

