



SEAP Product

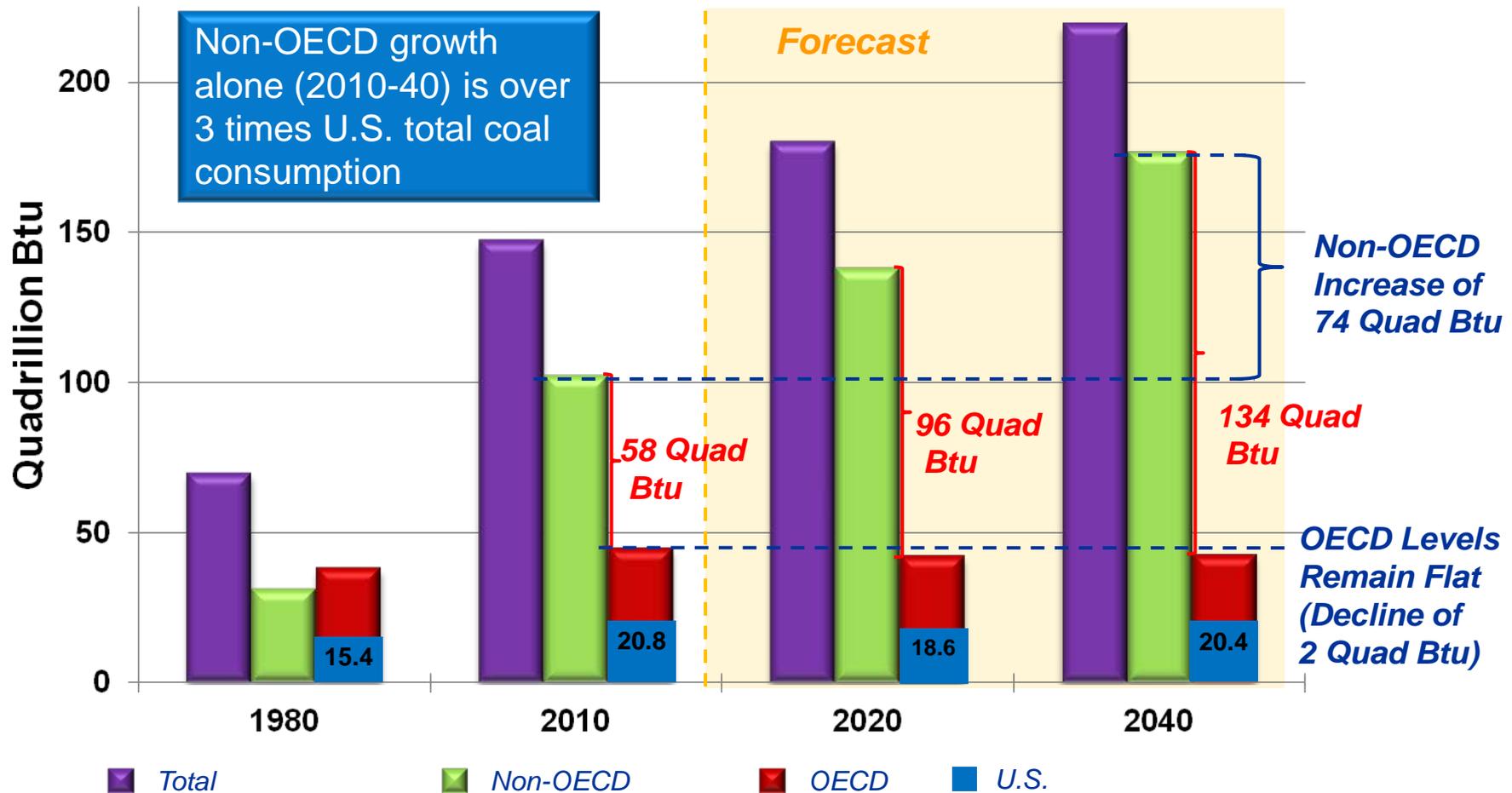
Perspective on the U.S. Coal Industry

December 2013

NETL Contact: Gavin Pickenpaugh

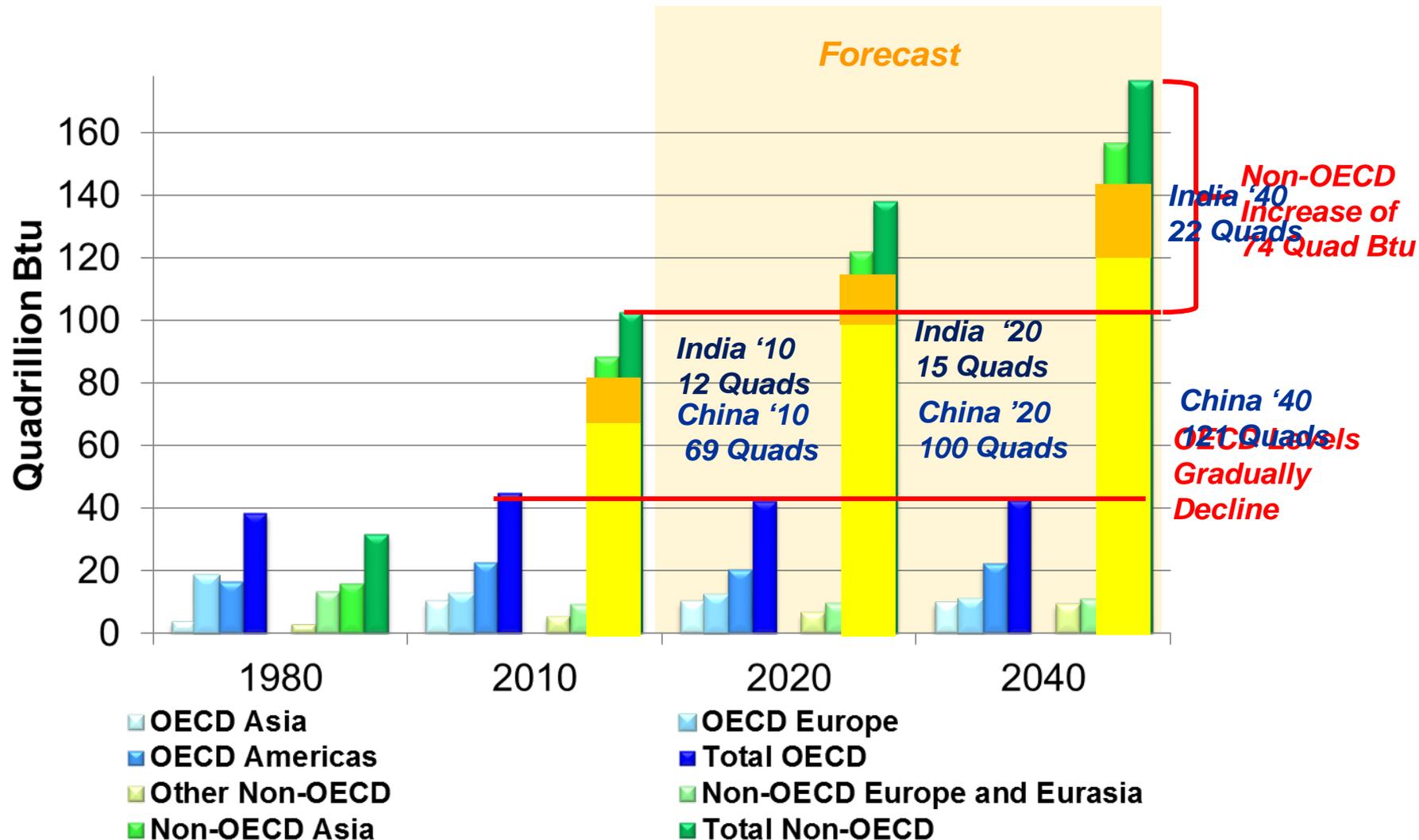
This presentation provides an overview of the coal industry, focusing on the United States, but within a global context. Areas covered include coal prices, consumption, production, imports, exports, reserves, productivity measures, and more. Juxtapositions between the U.S. and other countries' coal industries are provided. In addition to providing a current snapshot of the U.S. coal industry, this work portrays both historical and projected aspects of the coal industry.

World Coal Consumption 1980 - 2040

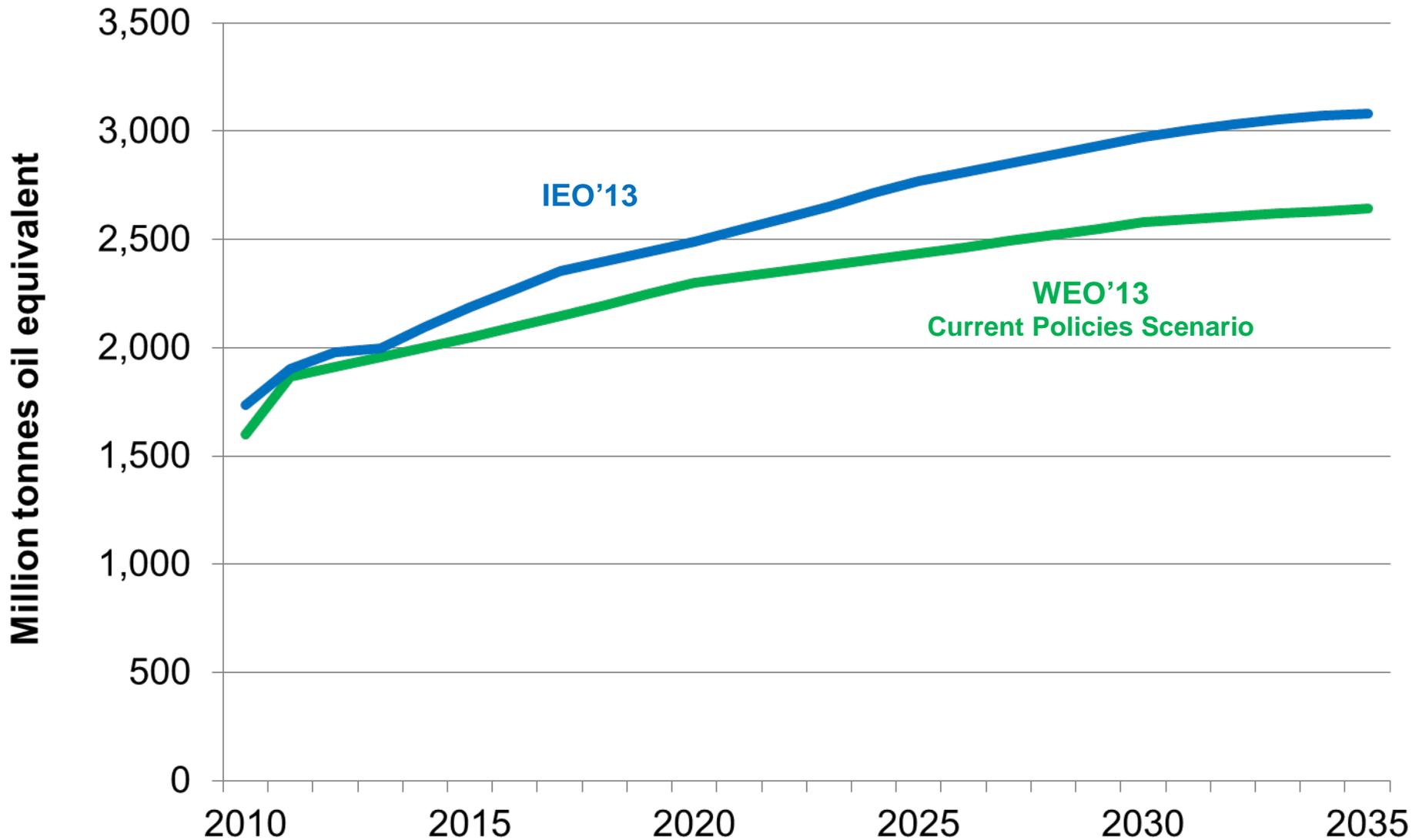


OECD: Organization for Economic Cooperation and Development. Its 34 member countries include the U.S., Canada, Mexico, Japan and numerous European countries.

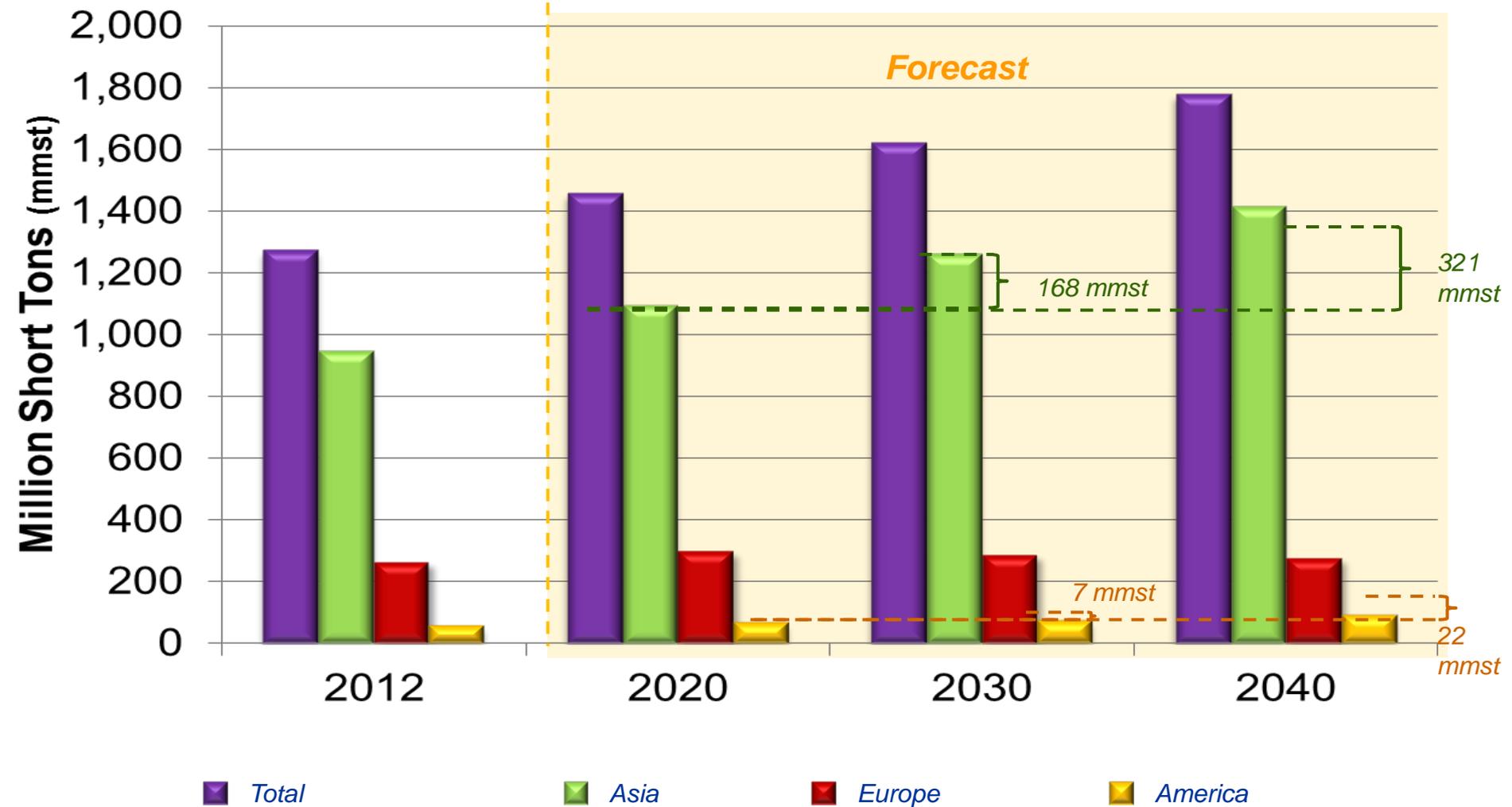
World Coal Consumption by Region



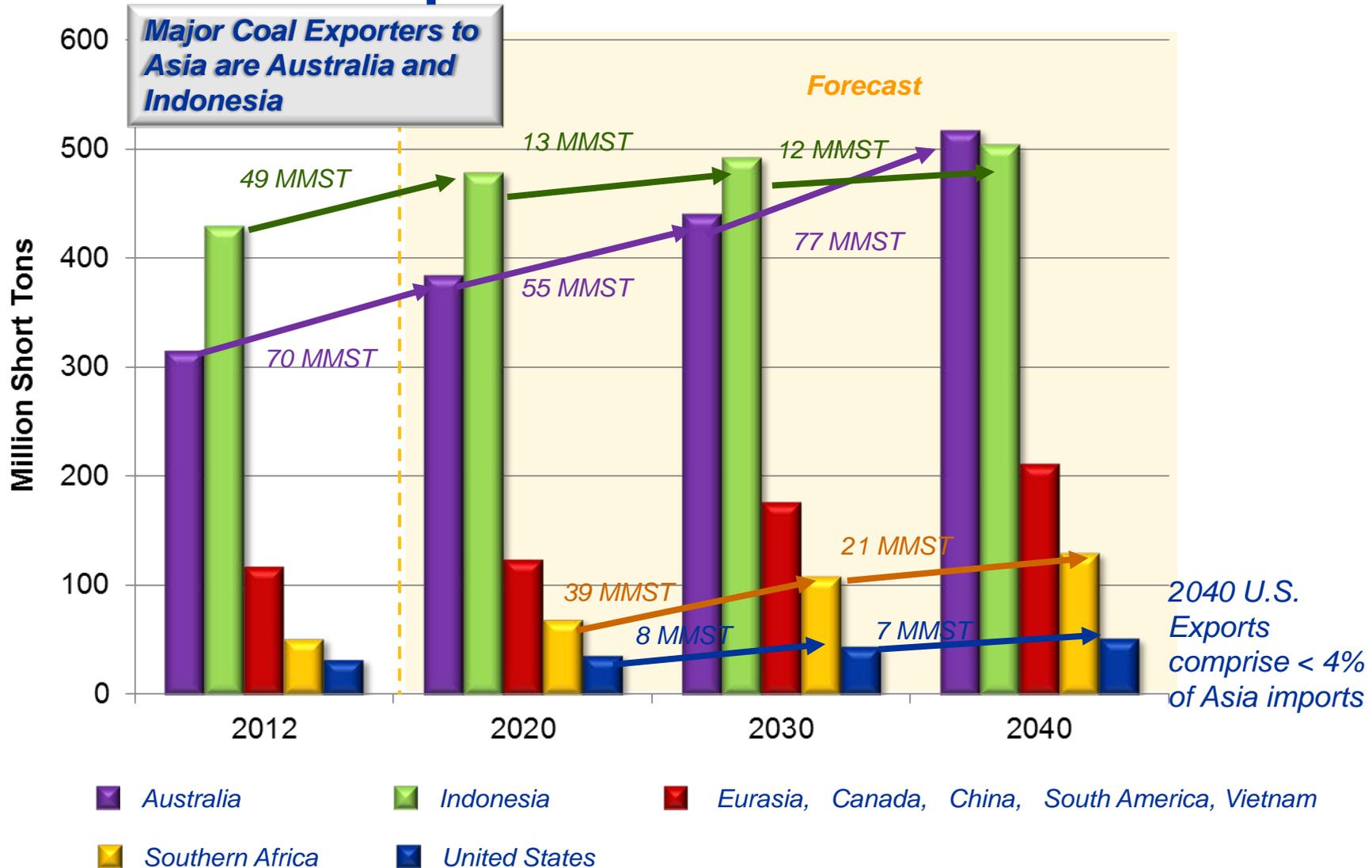
China Coal Consumption Projections



World Coal Imports by Region

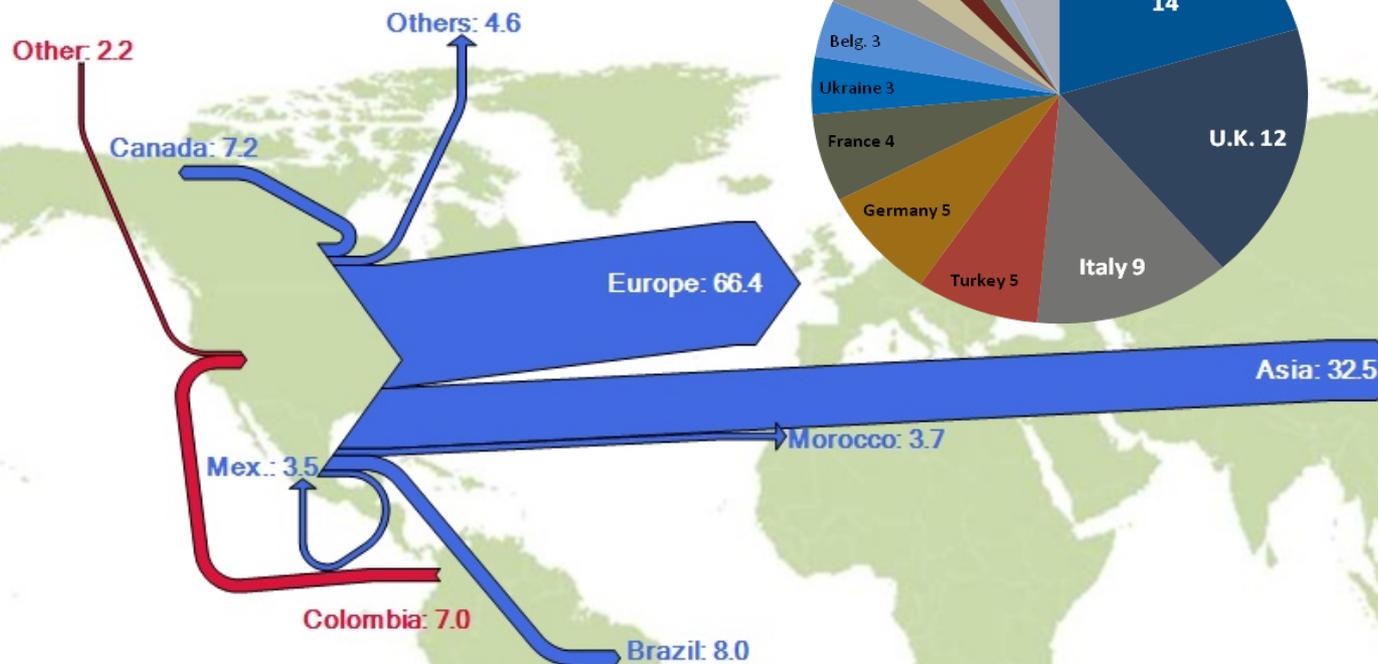
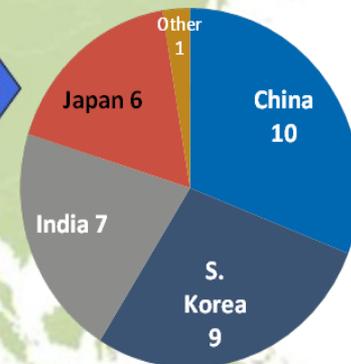
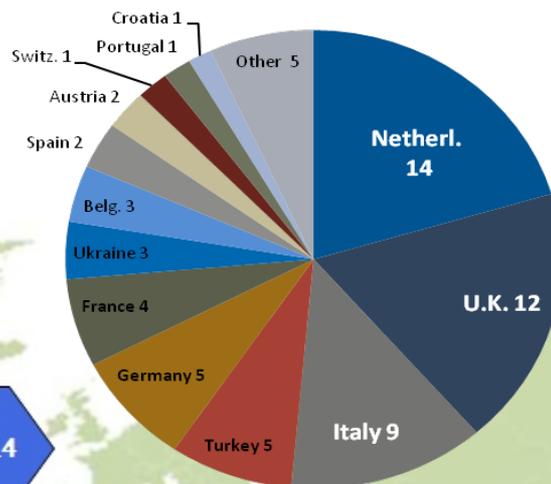


Coal Exports to or within Asia



2012 U.S. Coal Trade (million short tons)

U.S. exports are dispersed to various European and Asian countries



■ Exports ■ Imports

Imports: 9.2

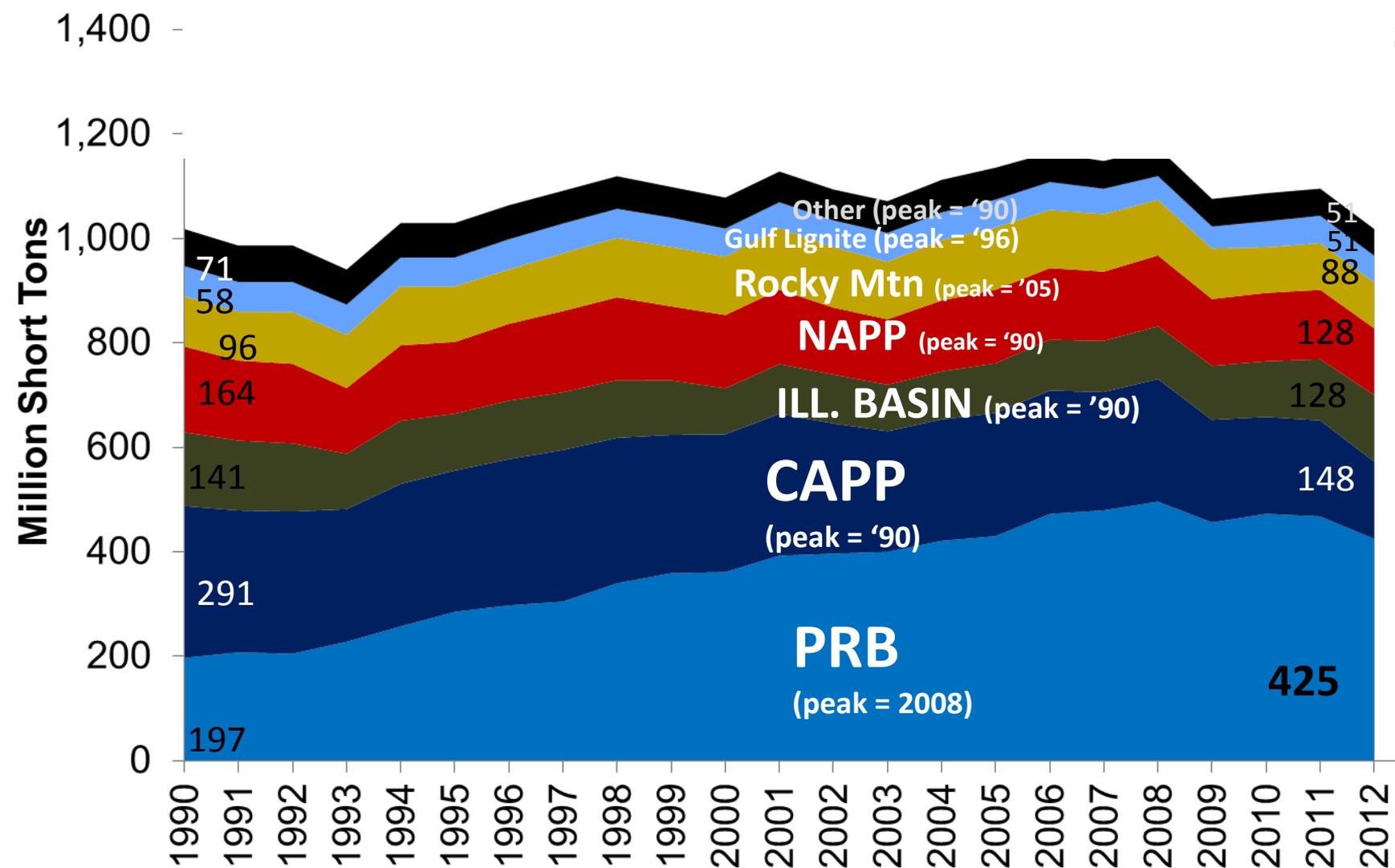
U.S. Production
1016.4

U.S. Consumption
890.5

Exports: 125.7

U.S. gross exports are projected to increase 36 mmst from 2012 to 2040, while gross imports fall 6 mmst

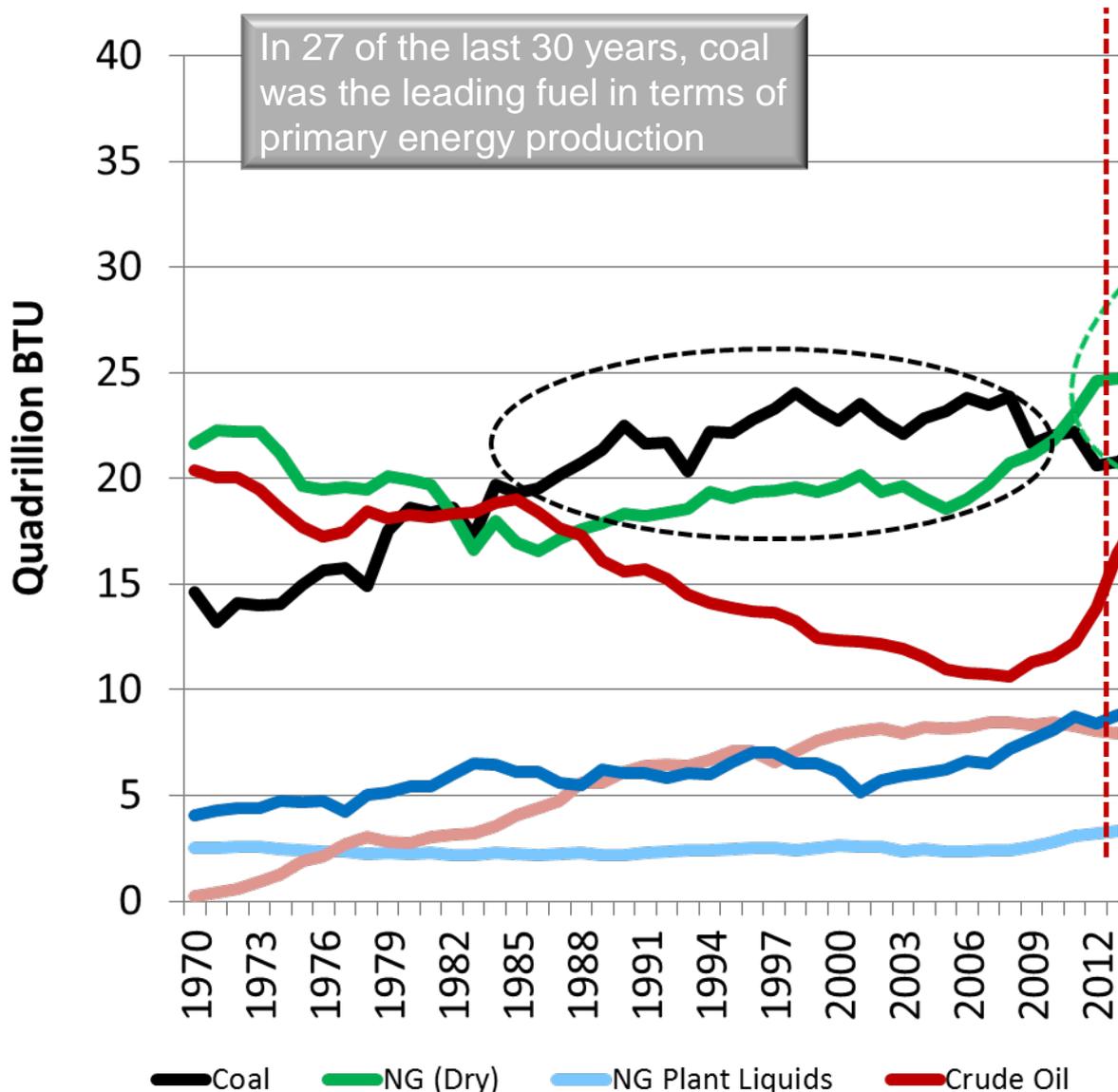
U.S. Coal Production (1990-2012)



U.S. Primary Energy Production

From 2011 onward, NG is projected to be the dominant fuel

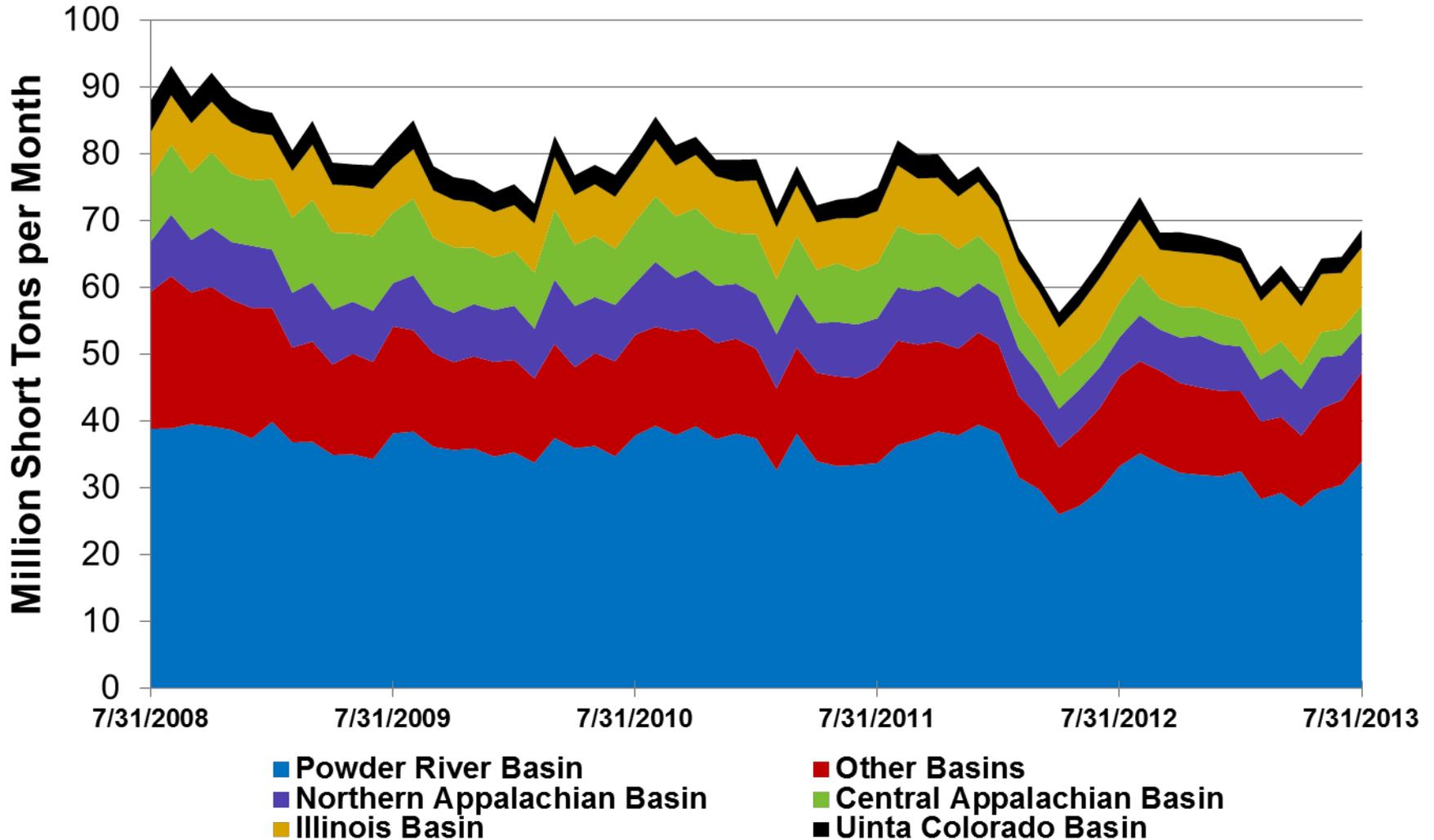
In 27 of the last 30 years, coal was the leading fuel in terms of primary energy production



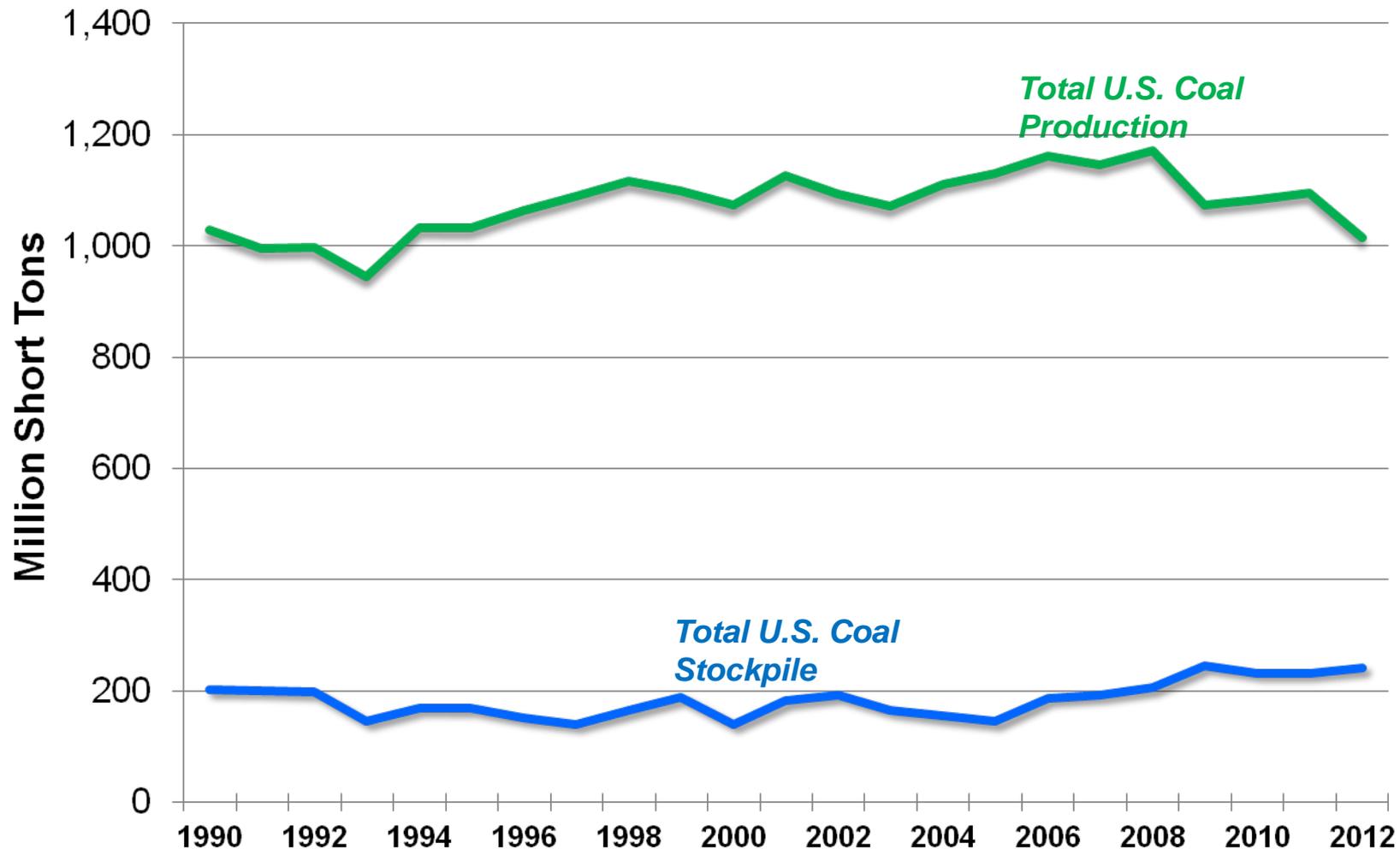
U.S. Coal production projected to increase 104 million short tons from 2012 to 2040

Coal NG (Dry) NG Plant Liquids Crude Oil Nuclear Electric Renewables

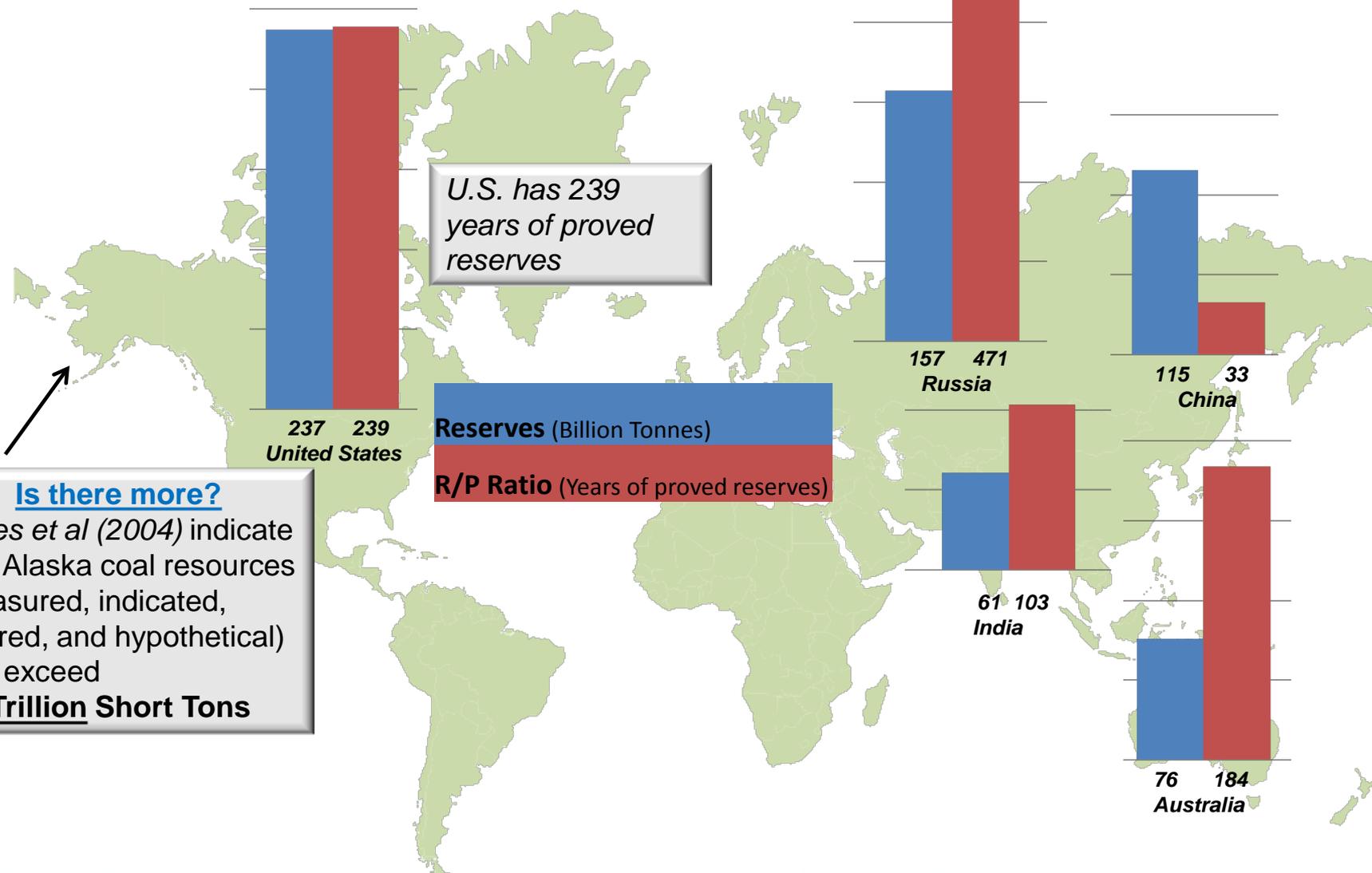
Recent Coal Purchases by Supply Region (Monthly)



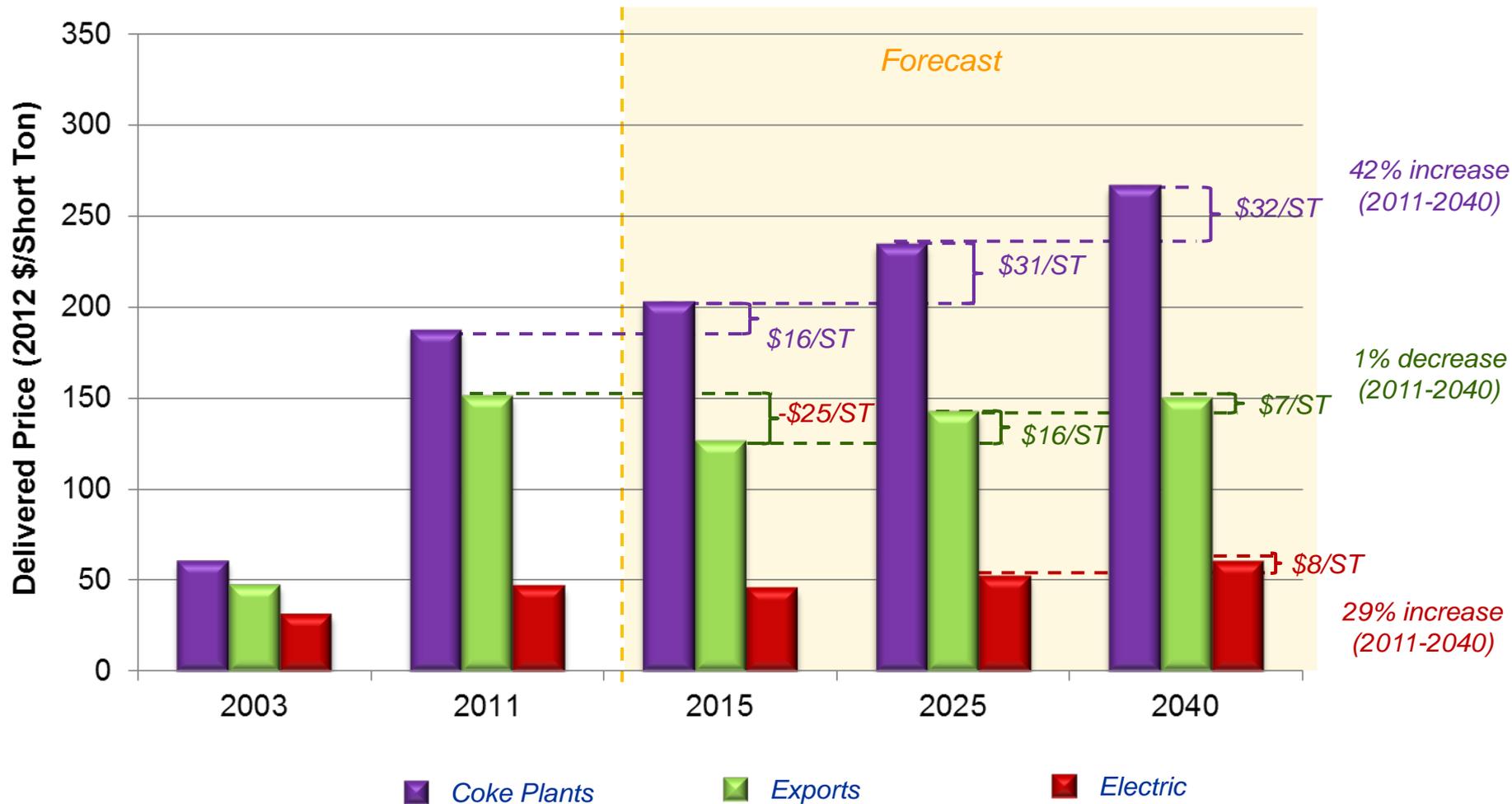
U.S. Coal Production and Stockpiles 1990-2012



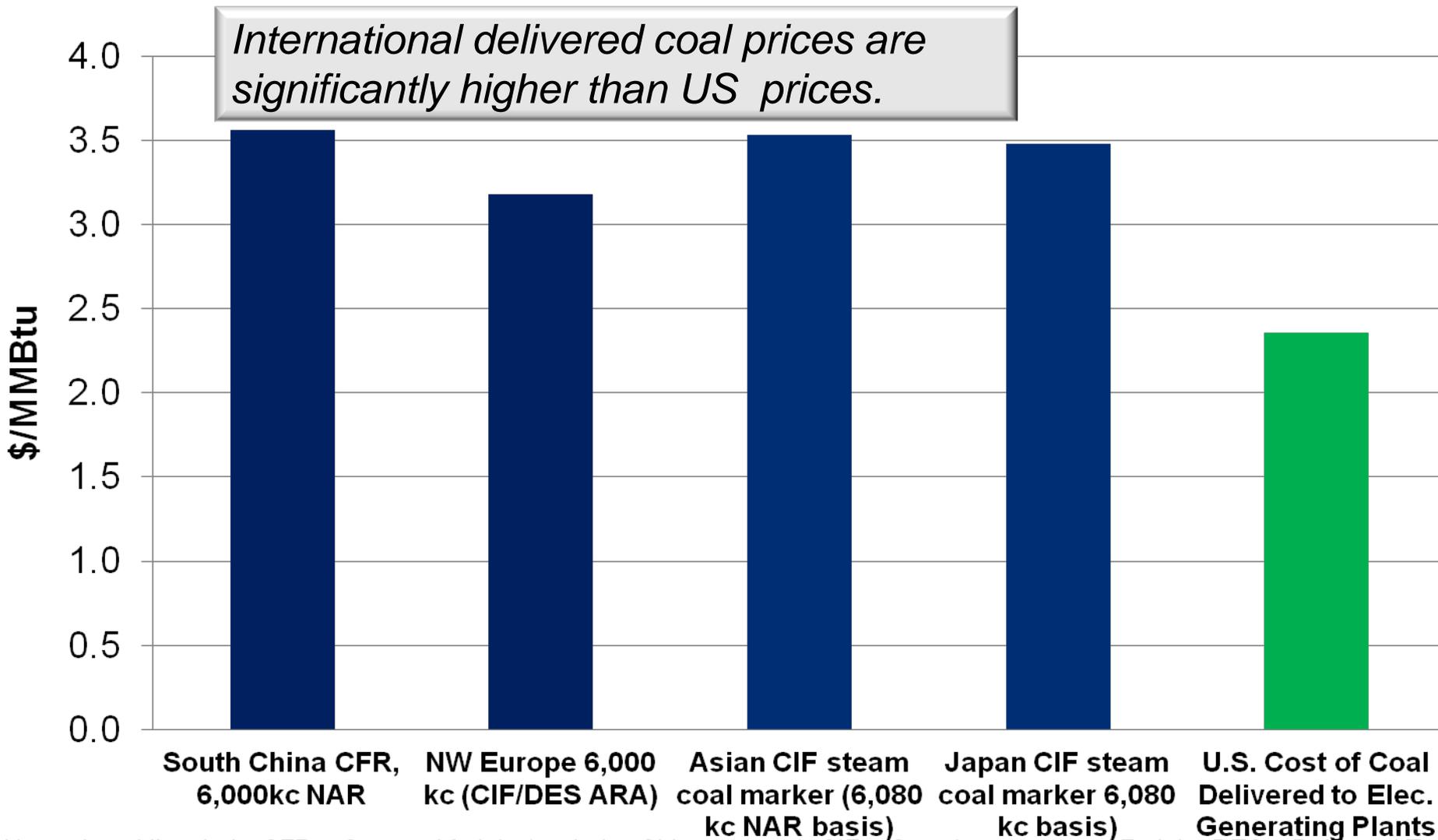
Proved Coal Reserves (Top 5 Countries)



U.S. Coal Delivered Price by Sector 2003-2040

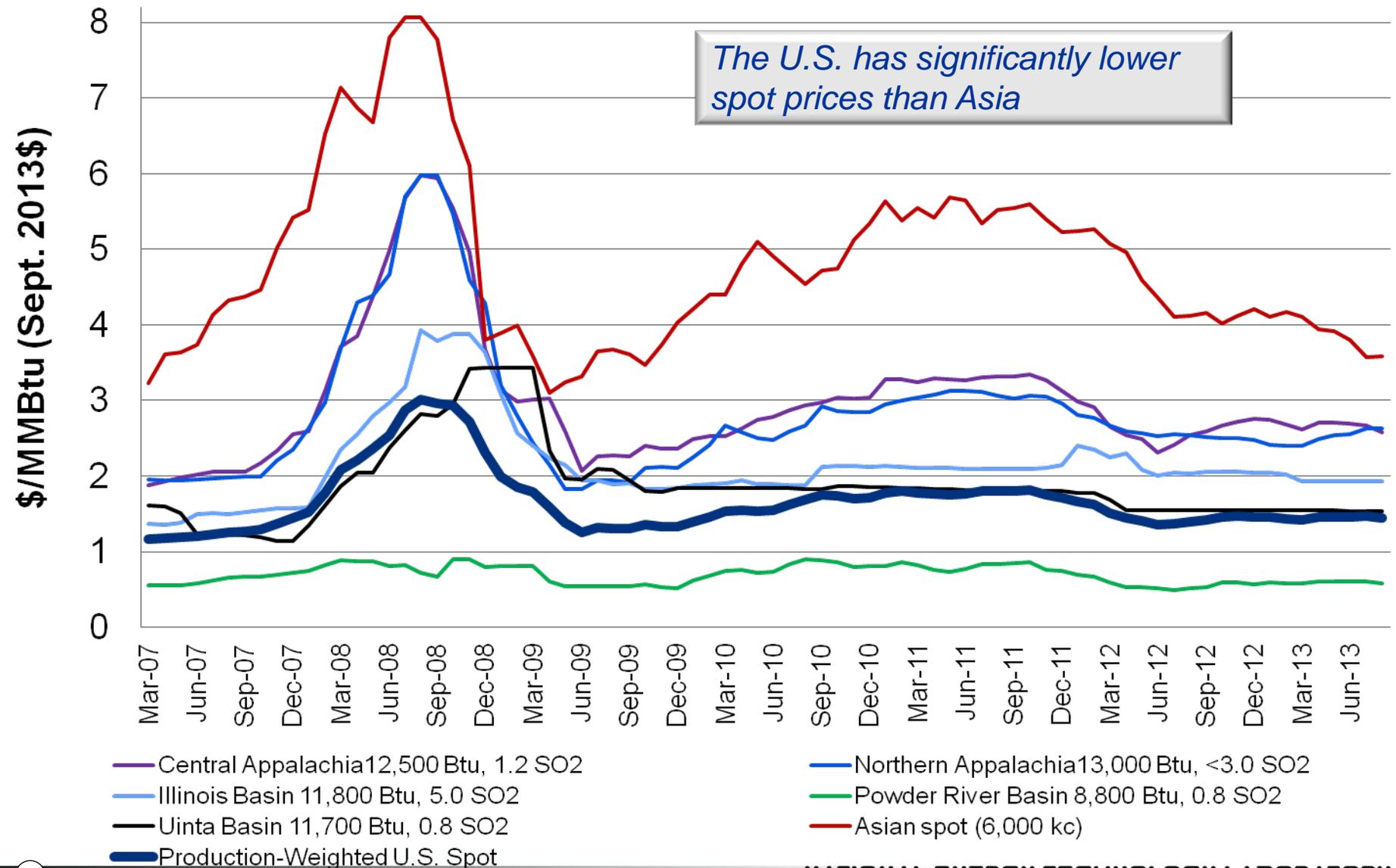


Delivered Steam Coal Prices (September 2013)

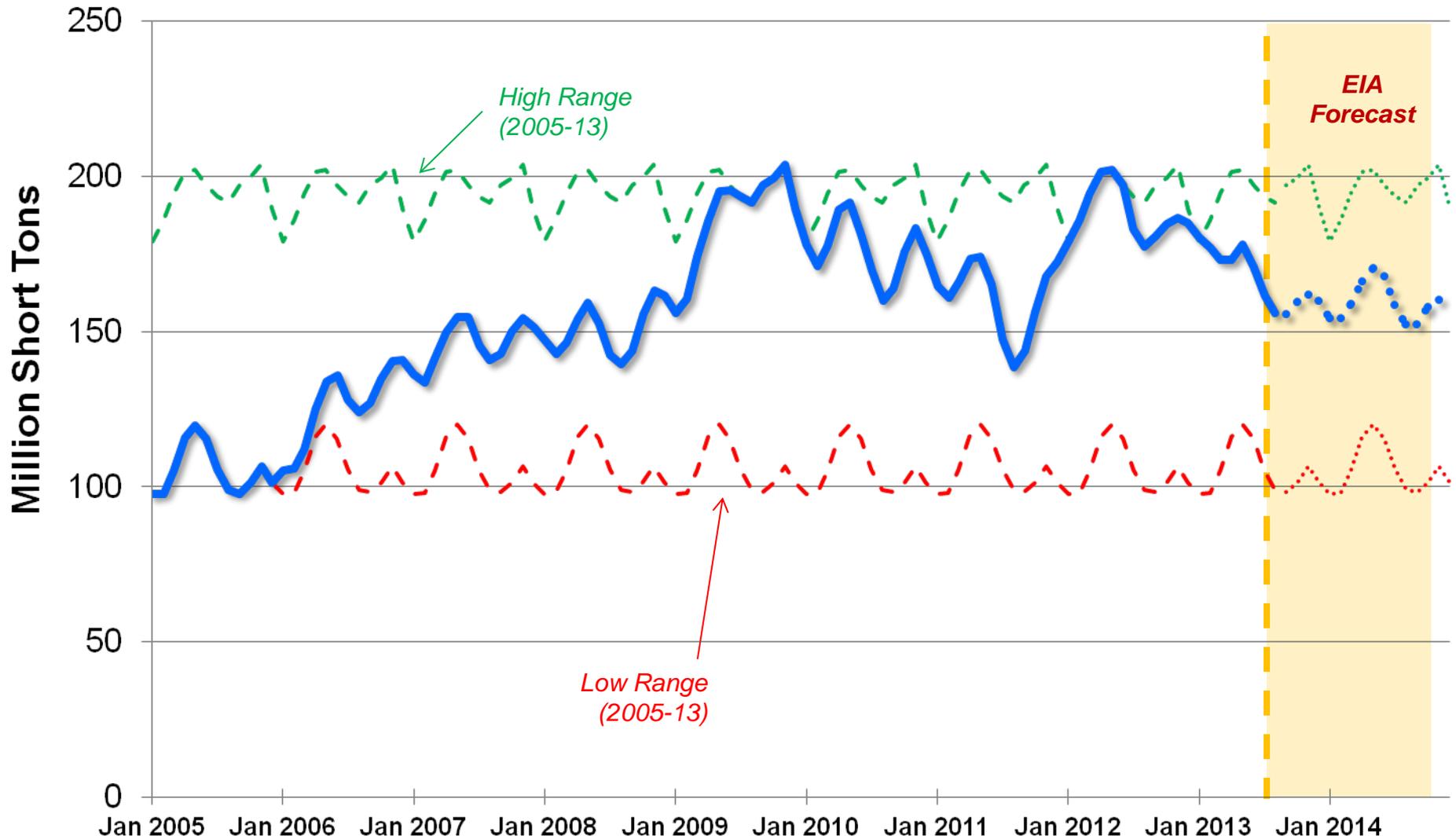


Notes: kc = kilocalorie; CFR = Cost and freight (excludes Chinese taxes); CIF = Cost, Insurance and Freight; DES = Delivered Ex Ship; ARA = Antwerp/Rotterdam/Amsterdam; NAR = Net As Received

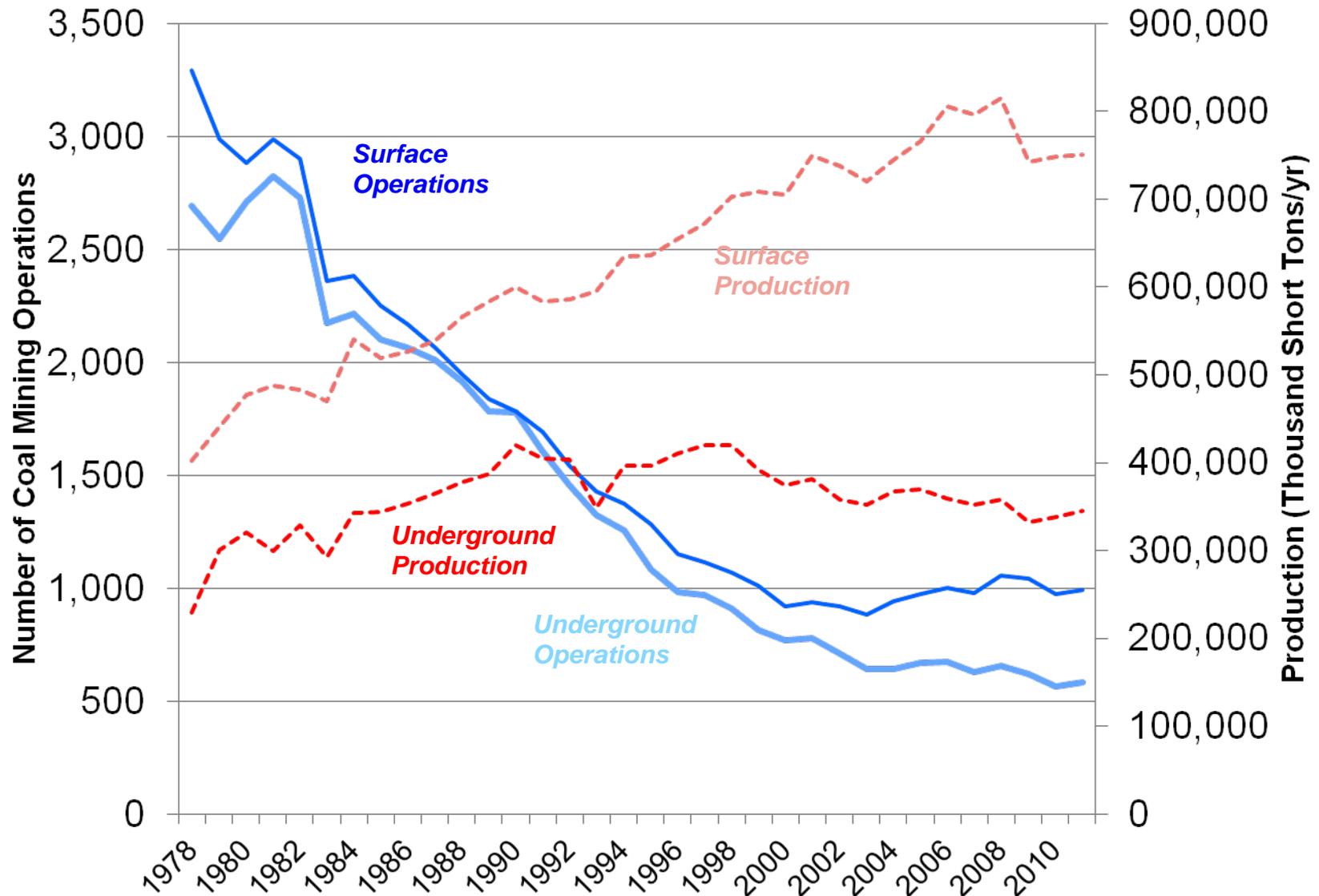
U.S./Asia Coal Spot Price Comparison (March 2007-August 2013)



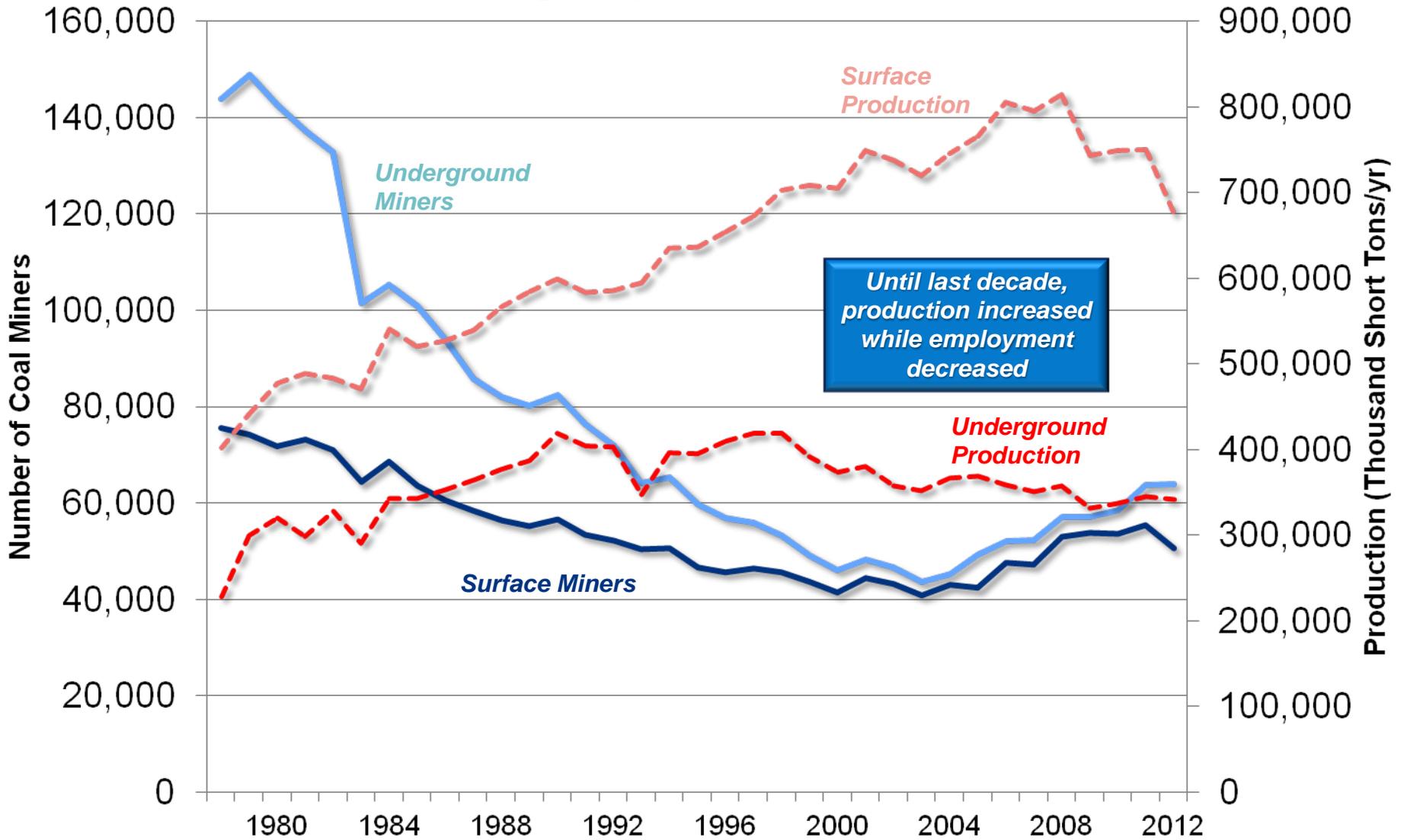
U.S. Electric Coal Stockpiles



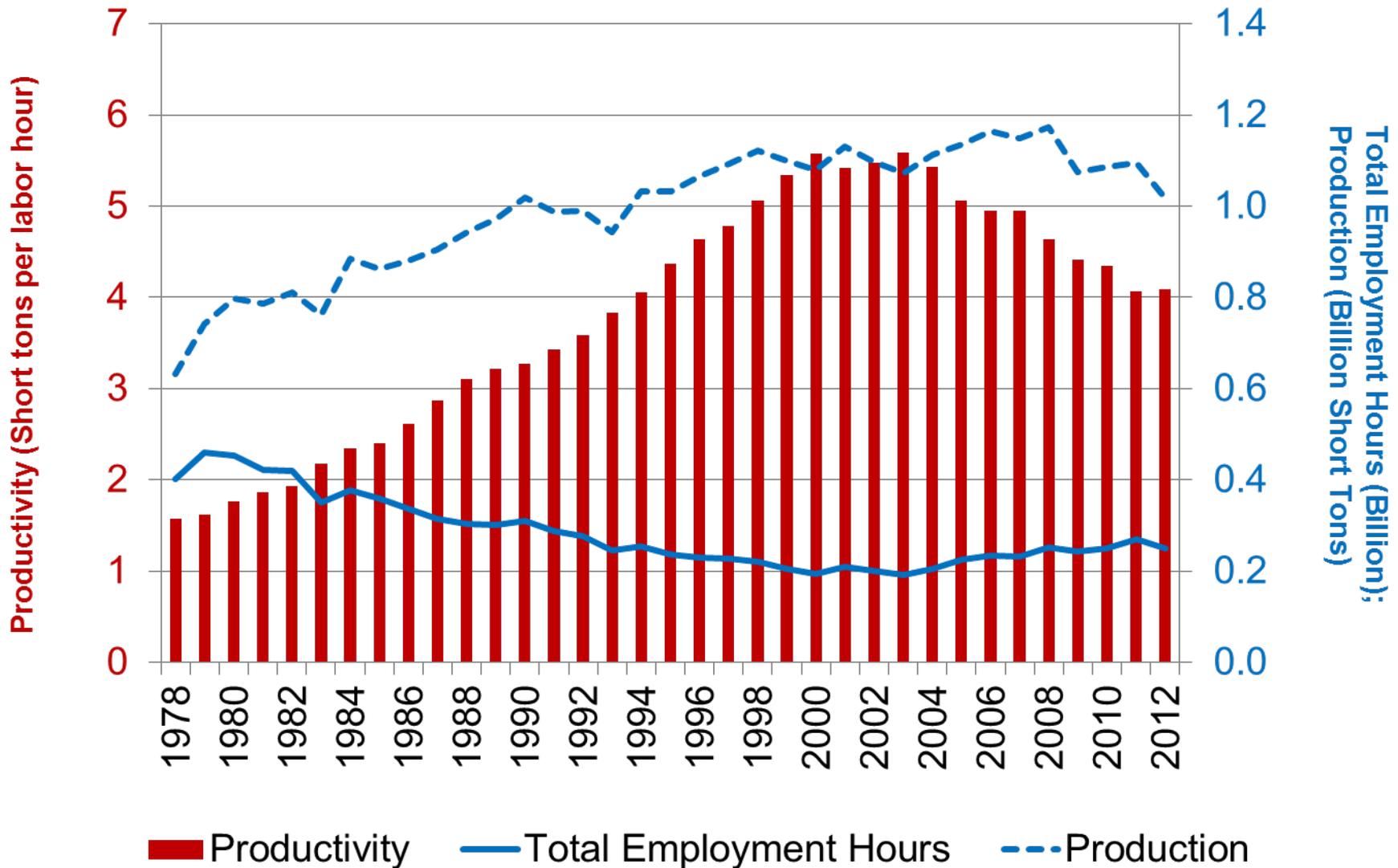
U.S. Coal Operations and Production



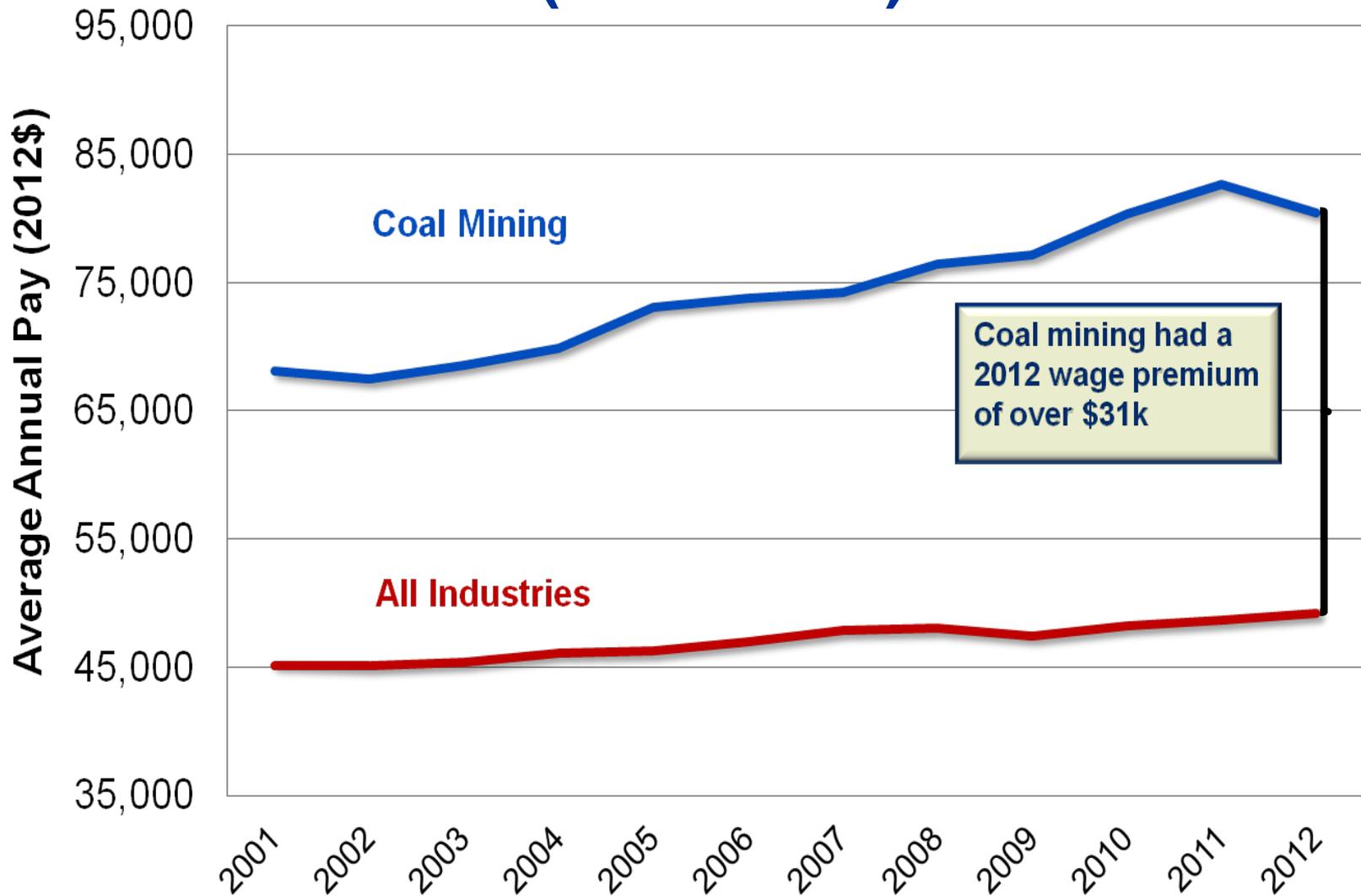
U.S. Coal Employment and Production



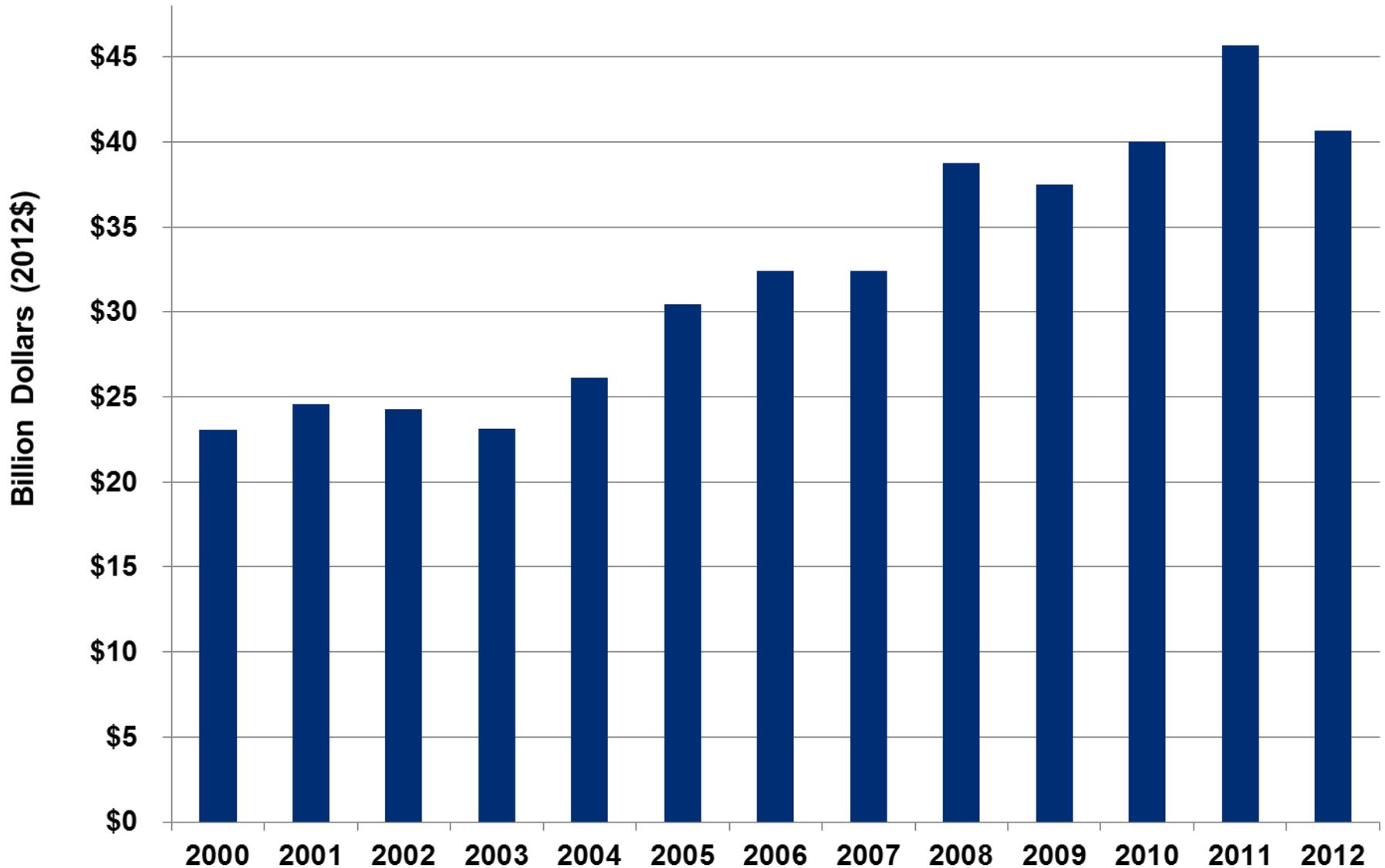
Coal Labor Productivity (1978-2012)



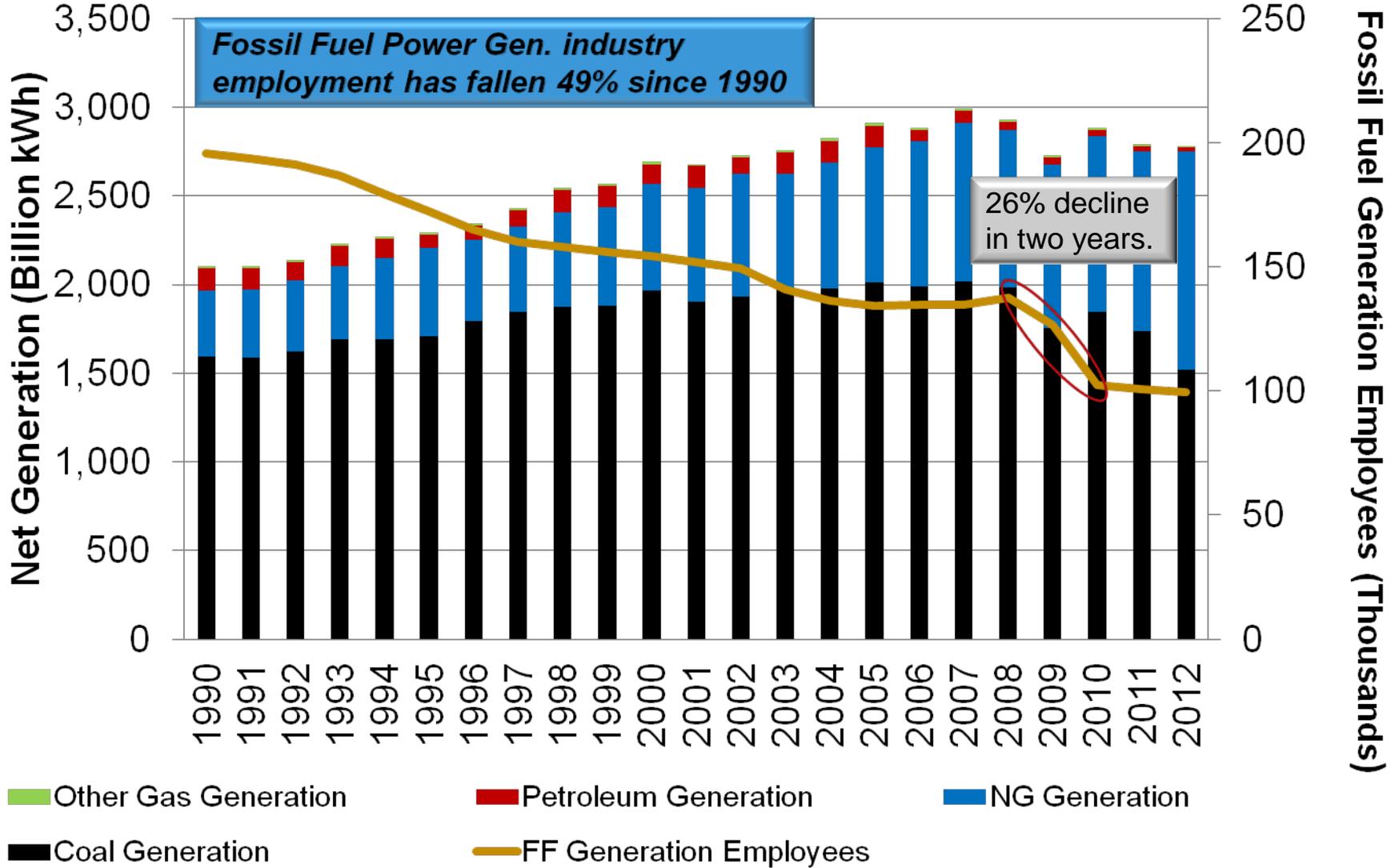
Coal Mining* Pay Versus Other Industries (2001-2012)



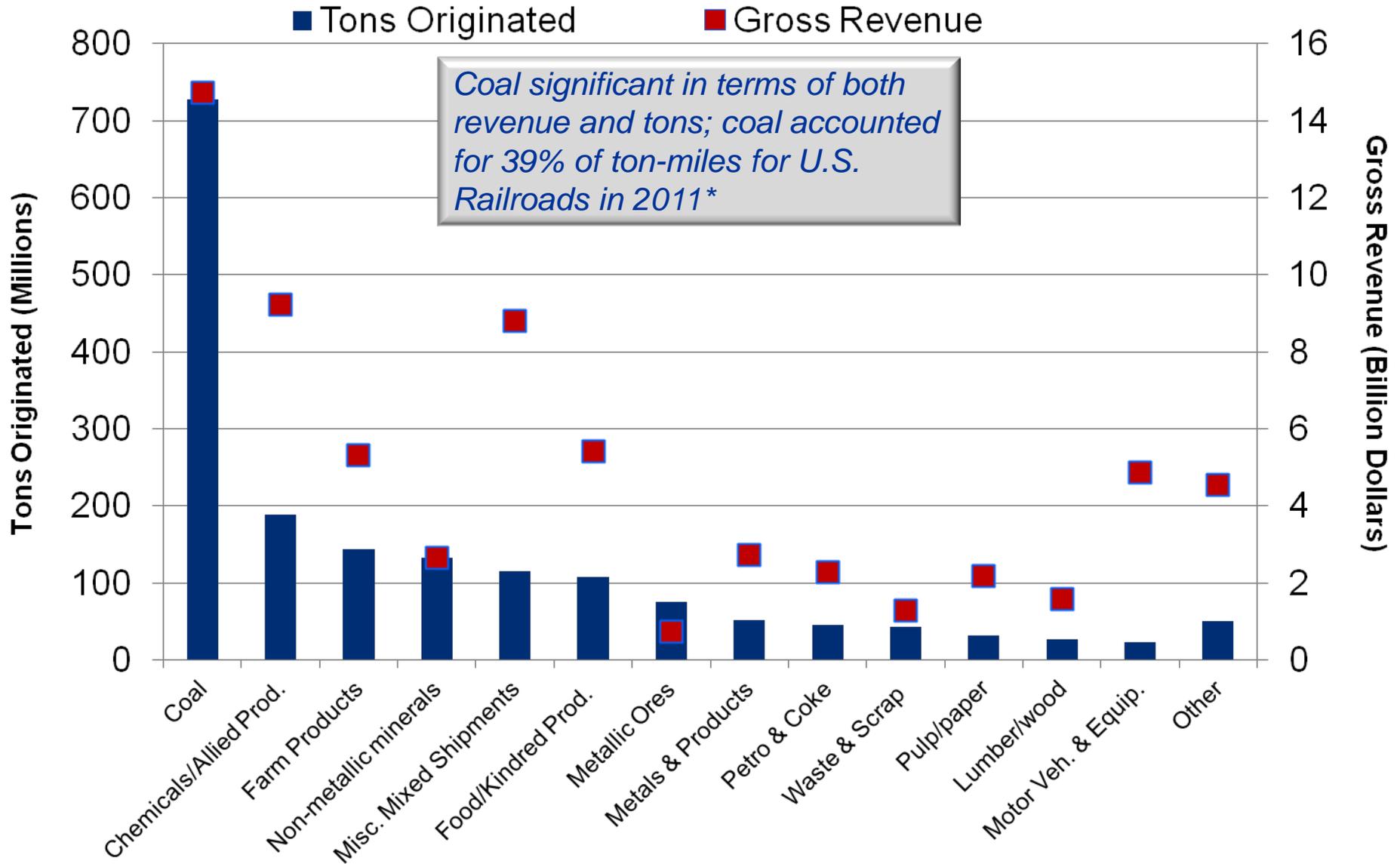
Coal Mining Revenue



Fossil Fuel Power Generation and Employment (1990-2012)

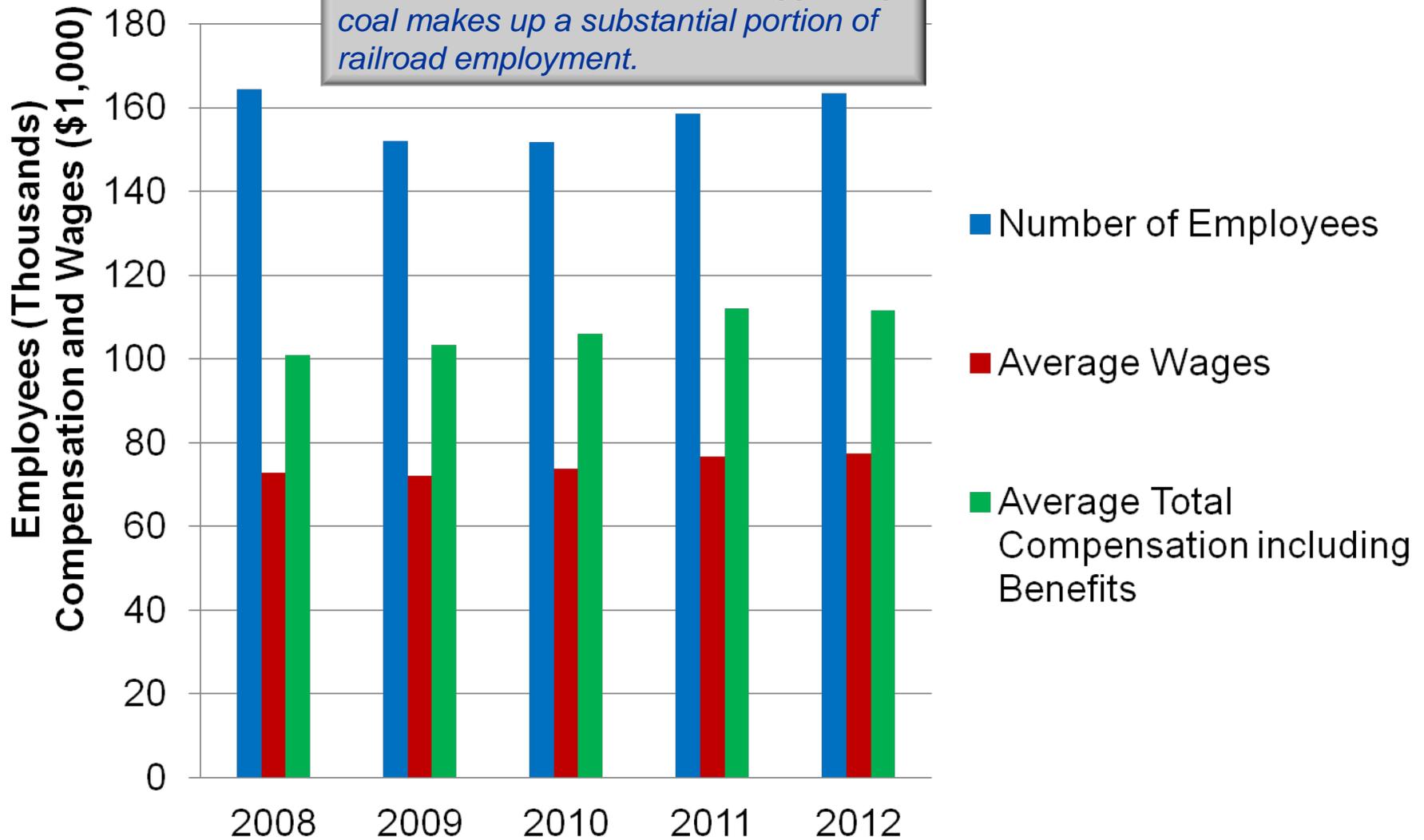


2012 Class I Railroad Statistics

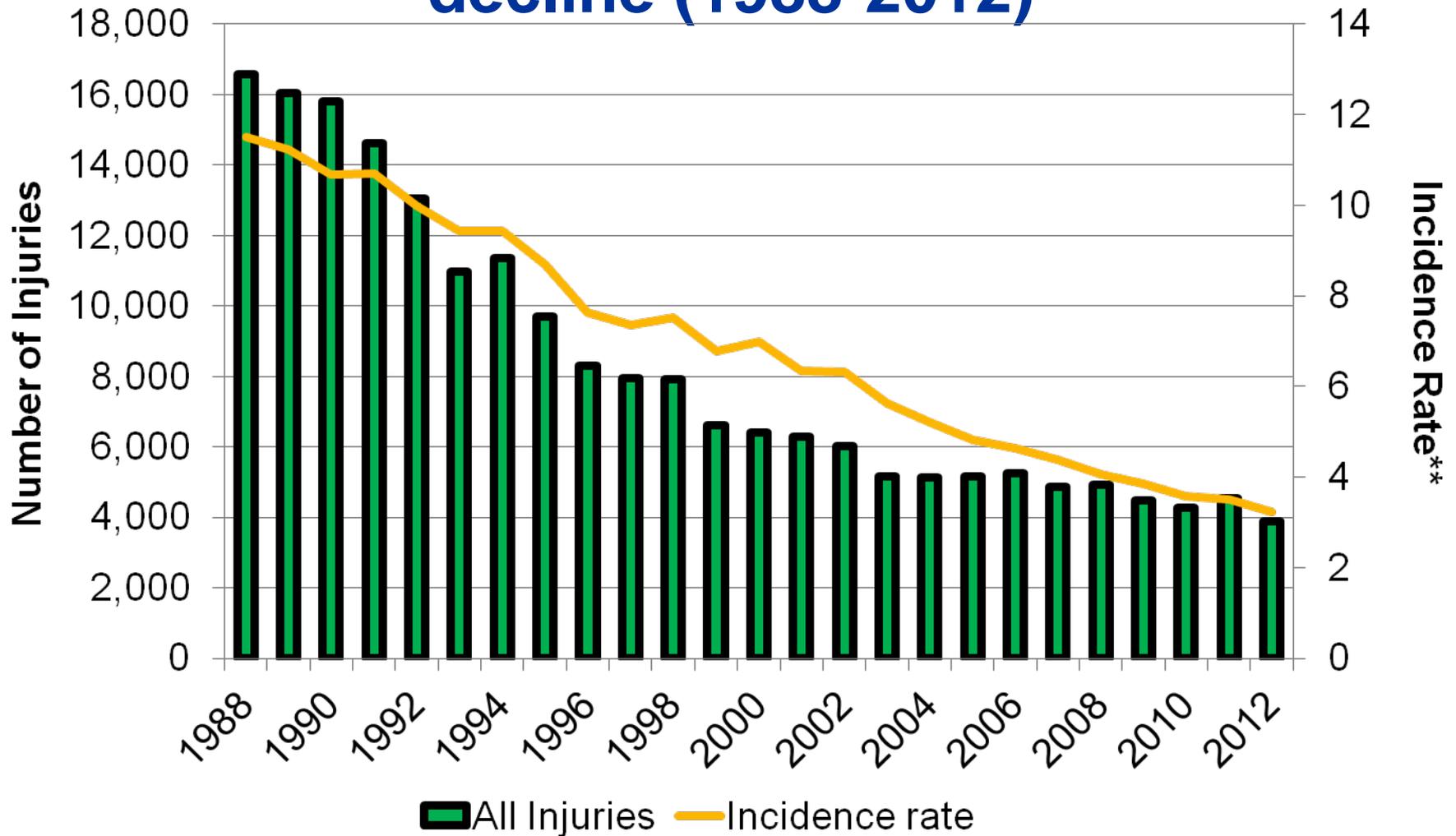


U.S. Class I Railroad Employment

Coal accounted for 39 percent of U.S. Railroad ton-miles in 2011, suggesting coal makes up a substantial portion of railroad employment.*



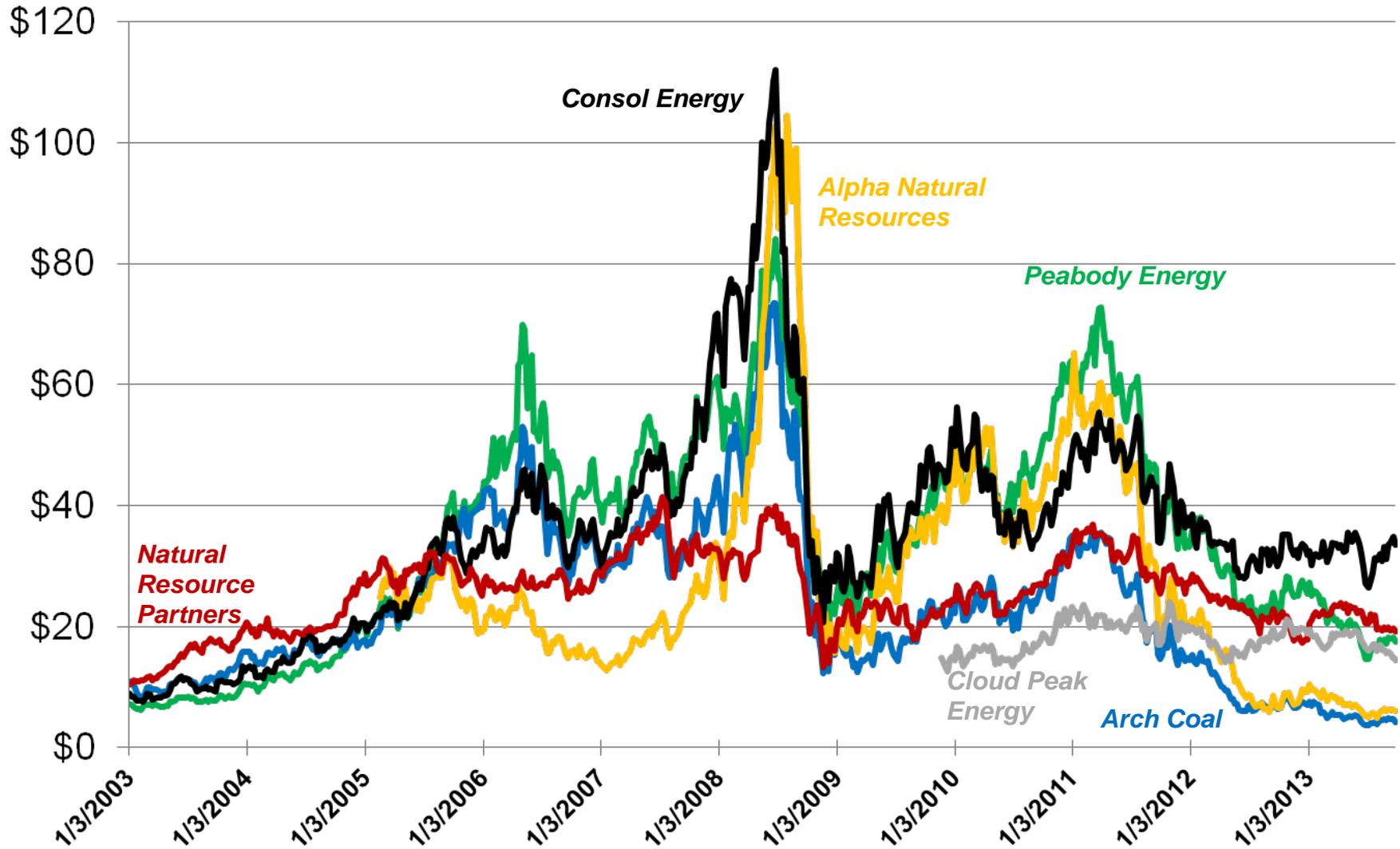
Mining Industry (non-office) Injuries* on the decline (1988-2012)



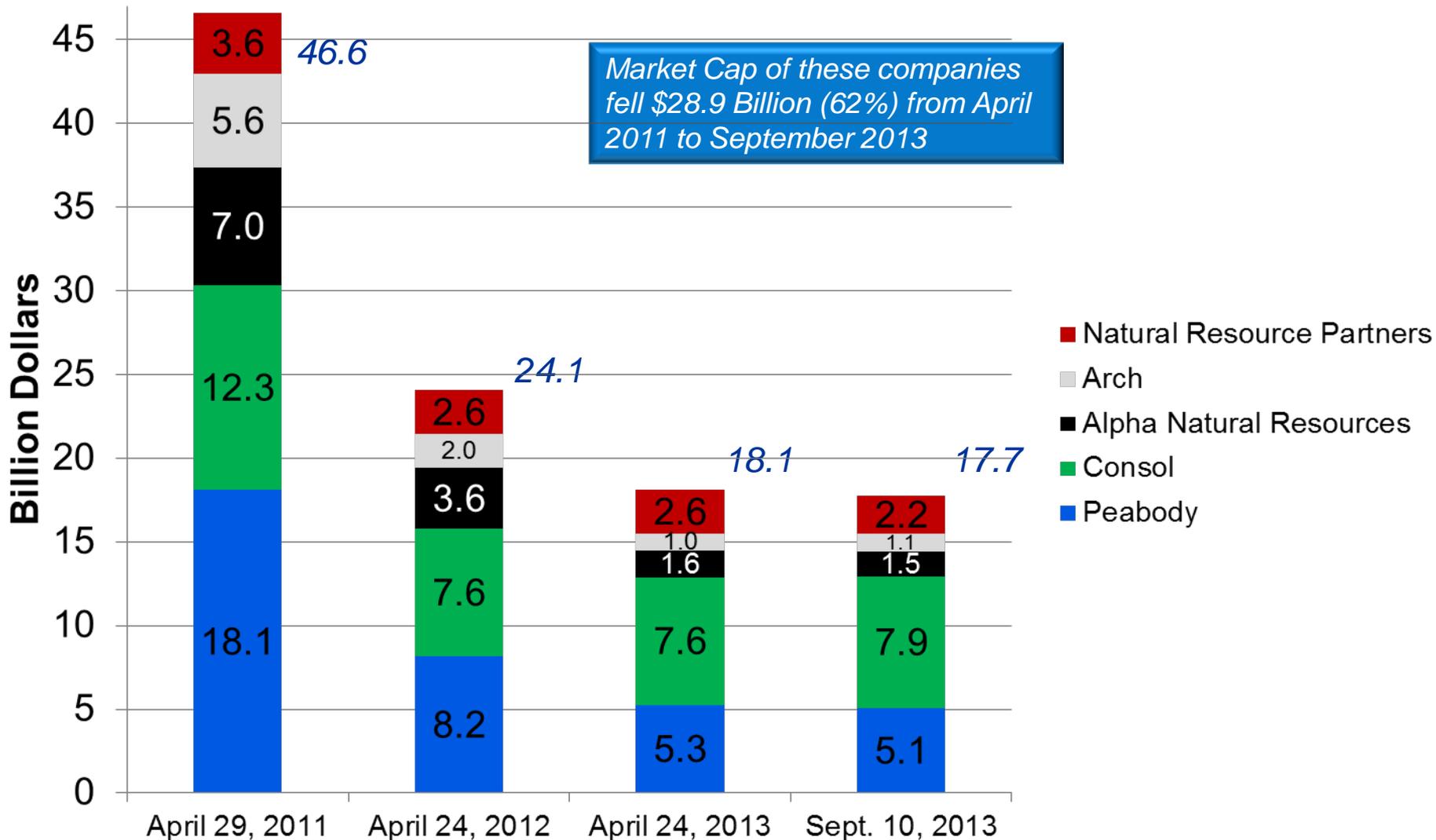
*Number of injuries includes mining, indep shops/prep plants for operators and contractors

**Incidence Rate = (Number of Injuries/Employment Hours) x 200,000

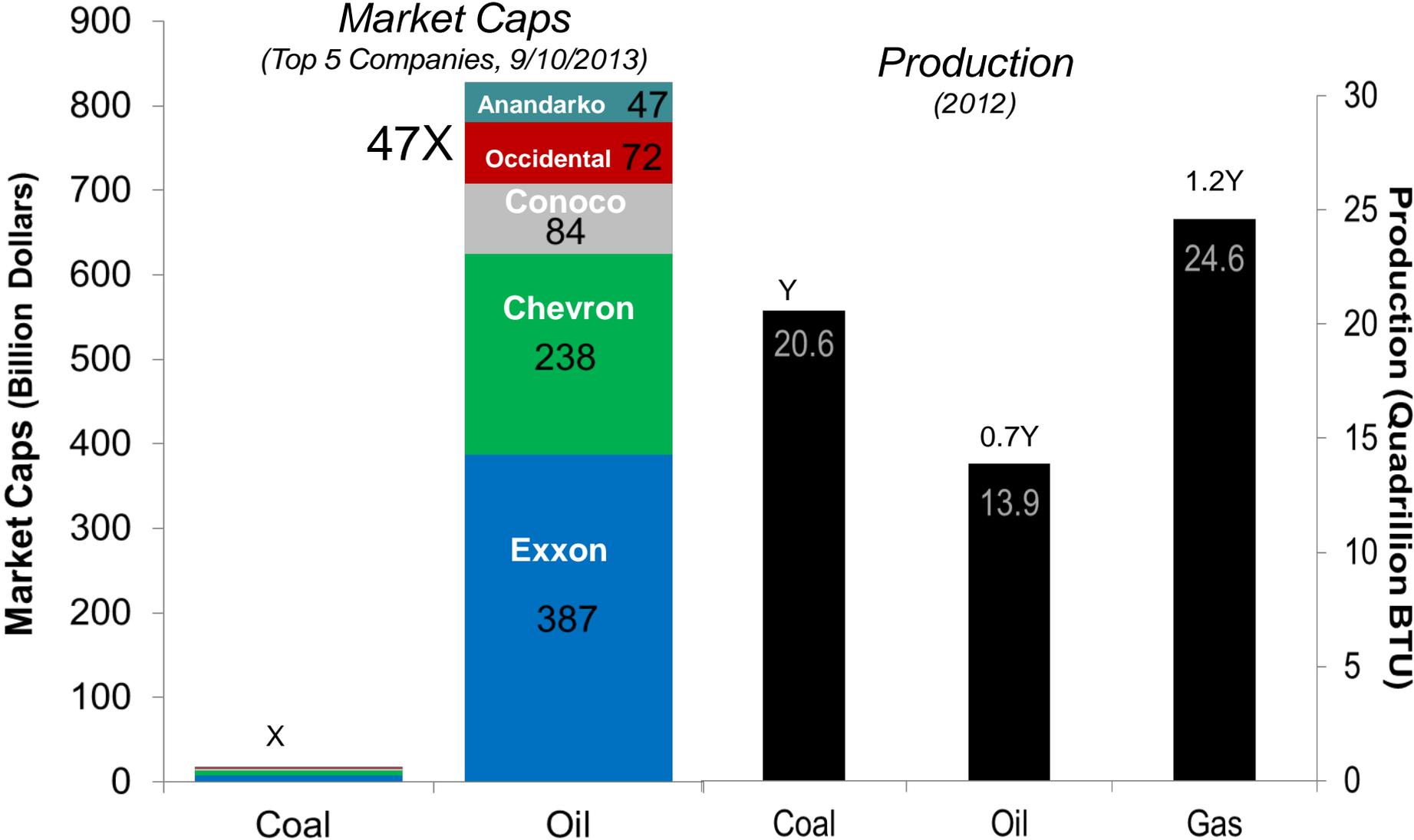
Select Coal Company Stock Prices (Weekly)



U.S. Coal Company Market Capitalization



Coal vs. Oil & Gas Market Caps & Domestic Production



Key Takeaways

- **Delivered coal prices are significantly lower in U.S. than other countries; significant competitive advantage accrues to the U.S. economy**
- **World coal consumption forecasted to increase 72 quadrillion Btu through 2040 (4X total U.S. total use in 2040), driven by non-OECD countries, which accounts for all of the increase (IEO'13)**
- **Forecasted U.S. Coal Production increase of 104 million tons from 2012 to 2040 due to higher utilization rate, as well as increased net exports (+42 mmst)**
- **U.S. proved coal reserves estimate: 239 years, at current production levels**
 - **If 10% of Alaska's hypothetical reserves end up become proved reserves, total proved reserves would triple**
 - **Coal responsible for 39% of U.S. railroad ton-miles**
- **Mining labor productivity improved from 1980-2000, then declined**

Key Takeaways (Continued)

- **Wages**
 - **Fossil fuel power plant employees make ~64% higher wages than other industries**
 - **Coal mining employees earn ~\$31,000 more/year than the national average**
- **Mining industry injuries declined ~77% from 1988 to 2012**
- **Energy from domestic coal production contributes 48% more energy (mmbtu) than domestic oil production**
- **Wall Street view of coal and willingness to carry coal is shown in the disconnect between production and market capitalization (market cap)**
- **From April 2011 to September 2013, the market capitalization of the top 5 U.S. coal companies fell 62% and experienced a loss of \$1 Billion per month in market cap**