

Global coal markets and their impacts on the US

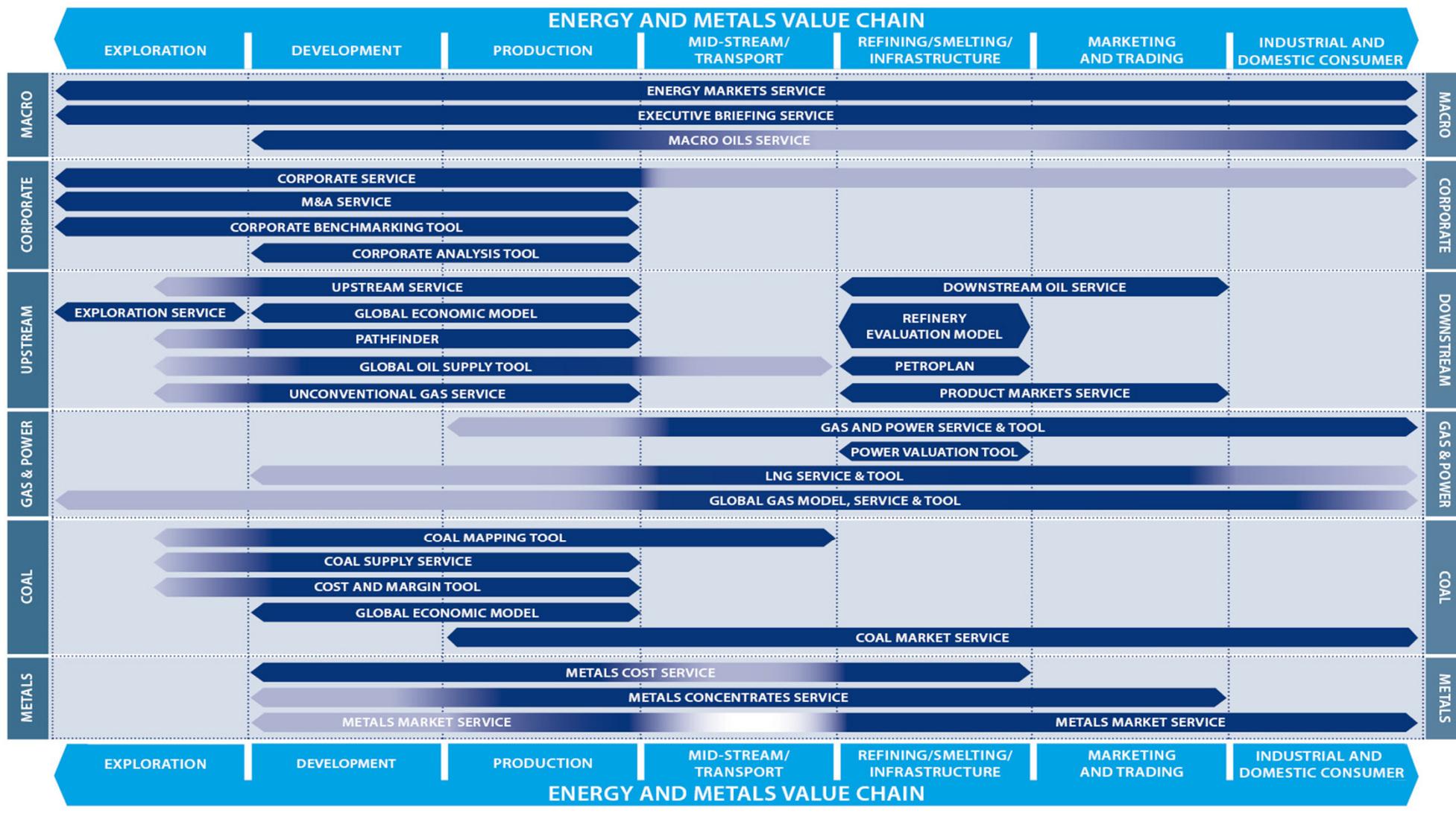
14 March 2013

Jonny Sultoon

Lead Analyst – Atlantic Coal Markets

Wood Mackenzie

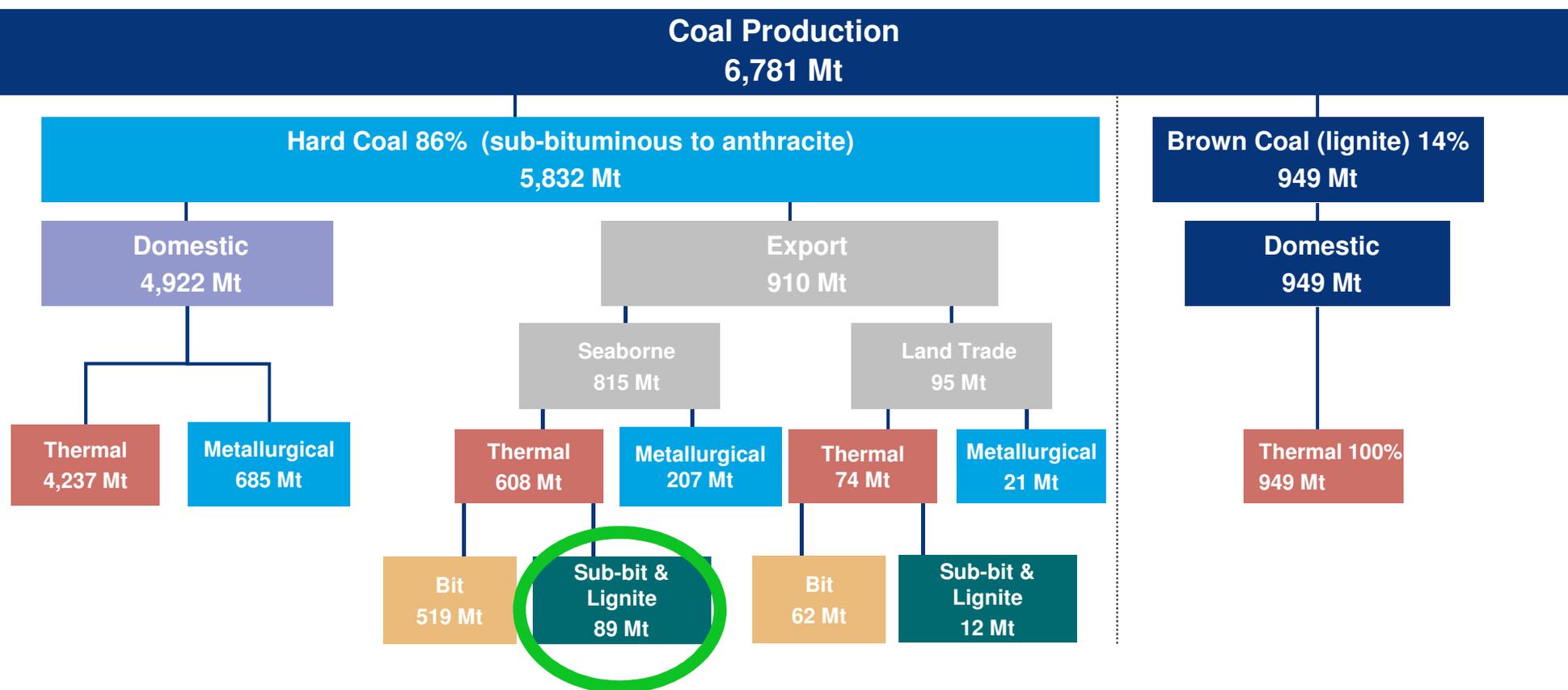
Wood Mackenzie: Research Coverage Across The Value Chain



Agenda

- 1** The global trade of coal
- 2 Where are the markets for coal demand (Thermal and Metallurgical)?
- 3 How will the US participate?

The Global Coal Trade – 2008

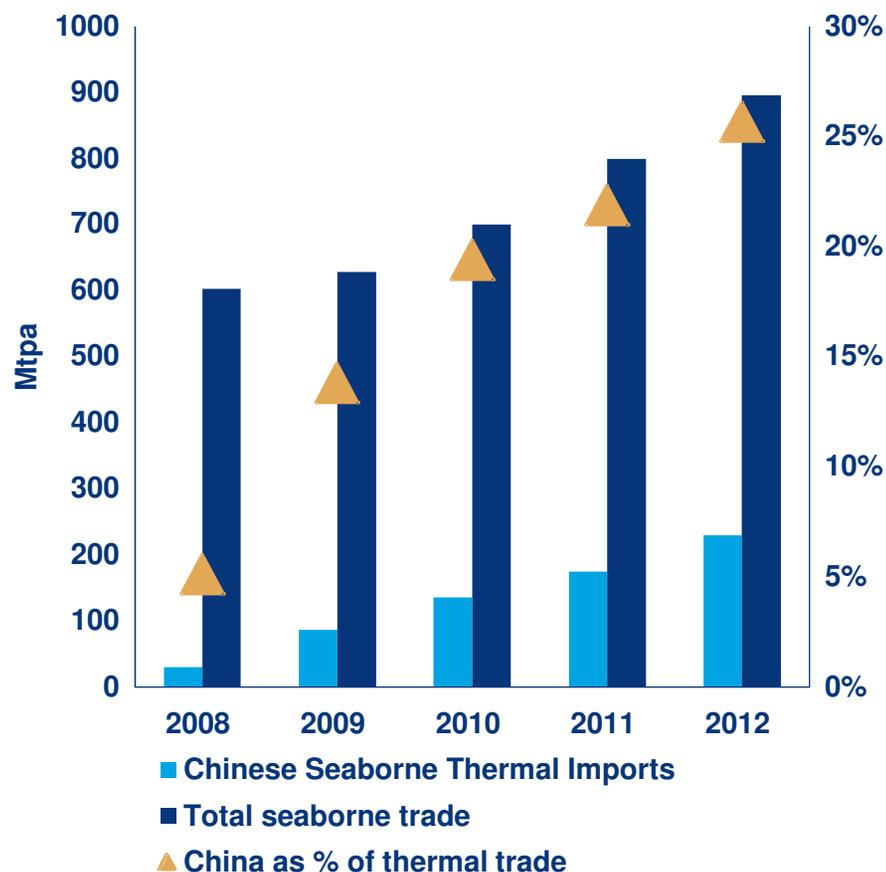


Significant growth in sub-bituminous and lignite coal exports in recent years, primarily from Indonesia

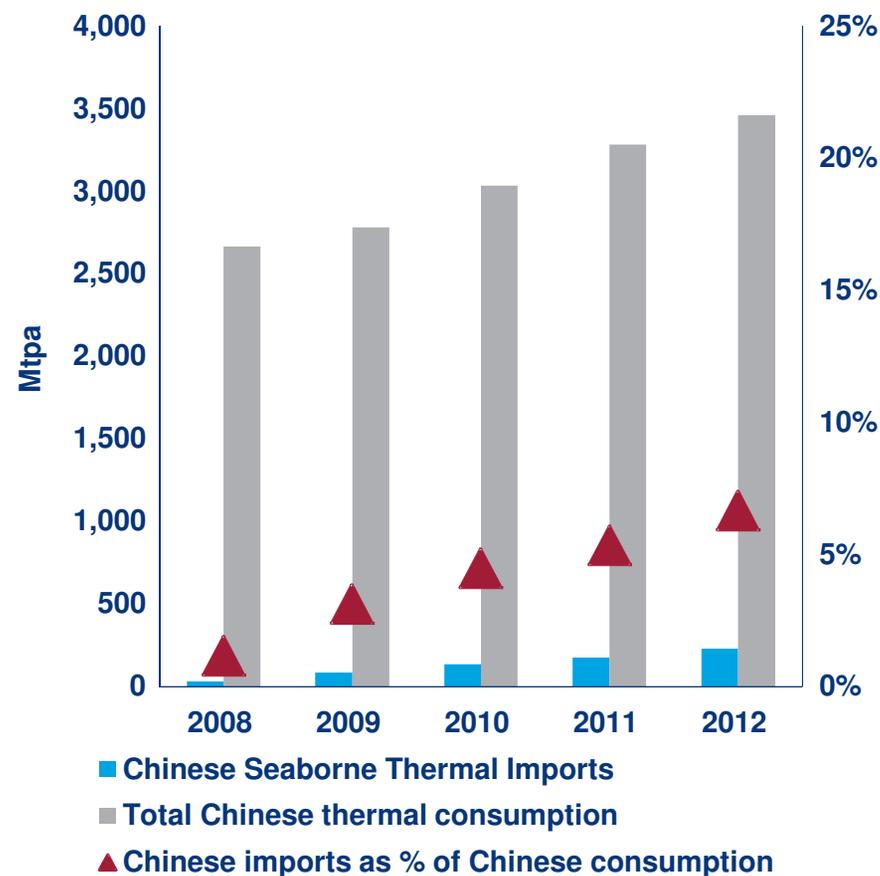
Source: Wood Mackenzie Coal Market & Coal Supply Service

China Thermal in context: record breaking 2012 imports... but still only represent 7% of domestic demand

China vs. Seaborne Market



China vs. China

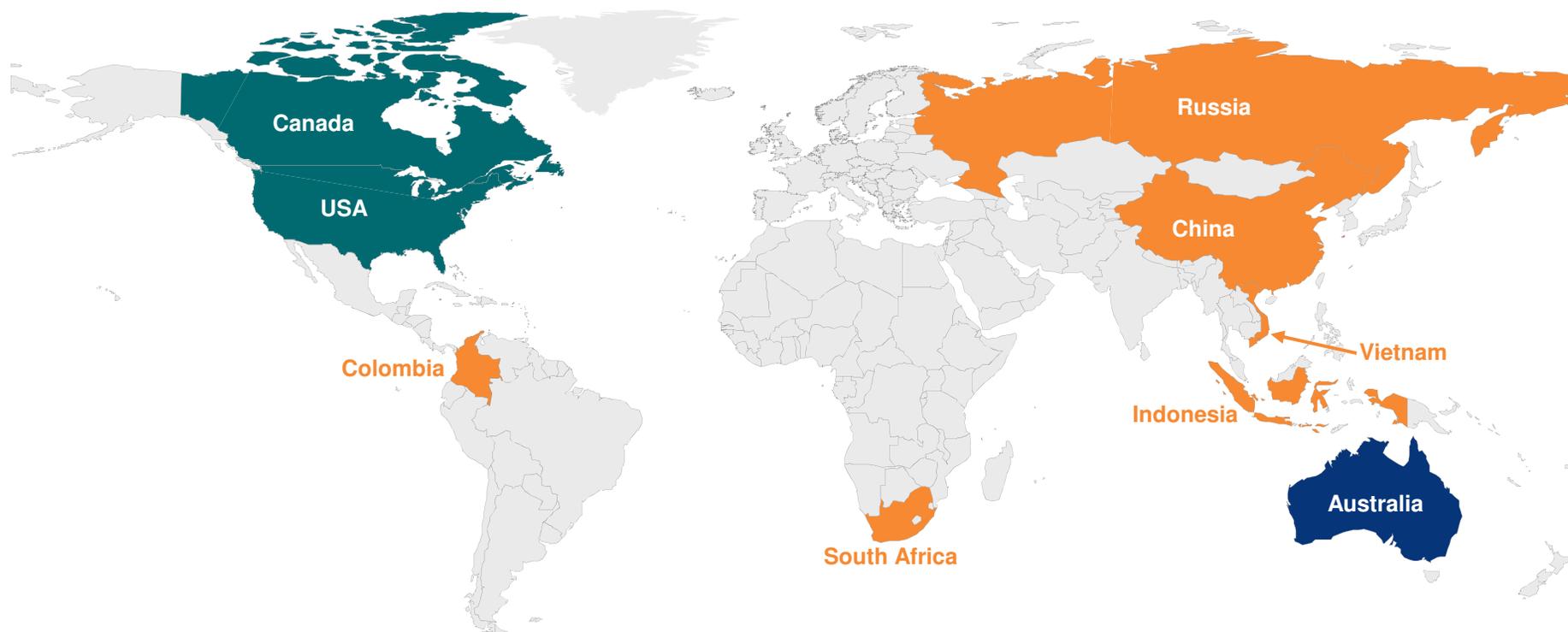


Source: Wood Mackenzie Coal Market Service

Agenda

- 1 China in context and 2012 summary
- 2 Where are the markets for coal demand (Thermal and Metallurgical)?**
- 3 How will the US participate?

Historically, the majority of global exports have come from just a few major exporting countries



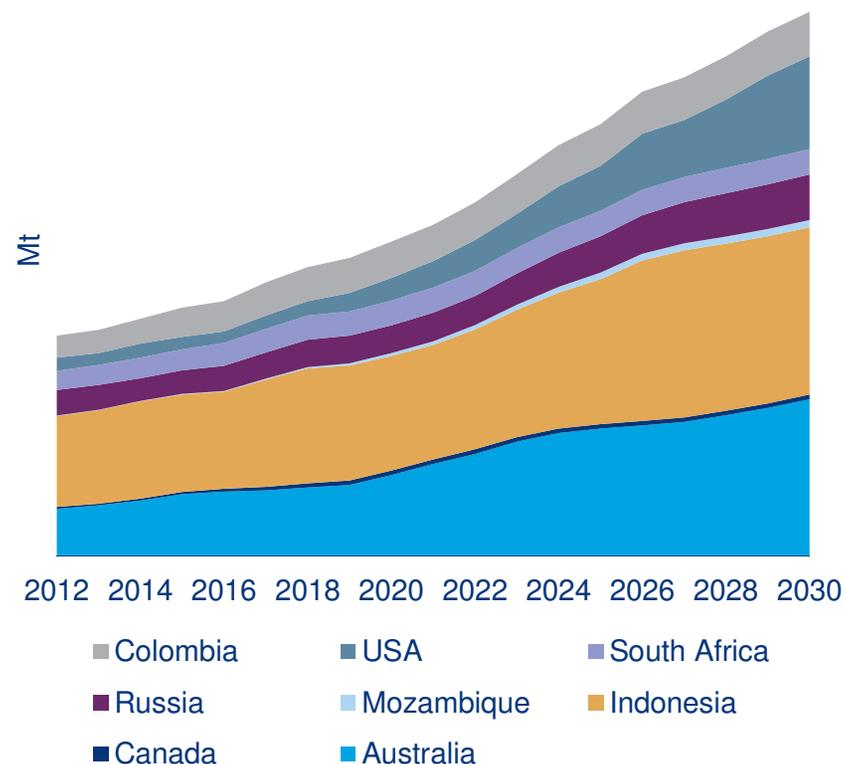
- Key thermal exporting countries
- Key metallurgical exporting countries
- Key thermal and met exporting countries

Source : Wood Mackenzie Coal Supply Service

Global thermal coal supply will continue to be dominated by Indonesia and Australia

- › Wood Mackenzie forecasts global coal supply will continue expanding to meet demand throughout the forecast period
- › Chinese and Indian demand growth are the key market drivers in this forecast
- › Global seaborne thermal coal supply is expected to increase by 1.3 billion tonnes (Bt) to 2.2 Bt by 2030
- › Wood Mackenzie's analysis suggests that the Pacific Basin will supply 86% of the total increase and the Atlantic will supply 14%

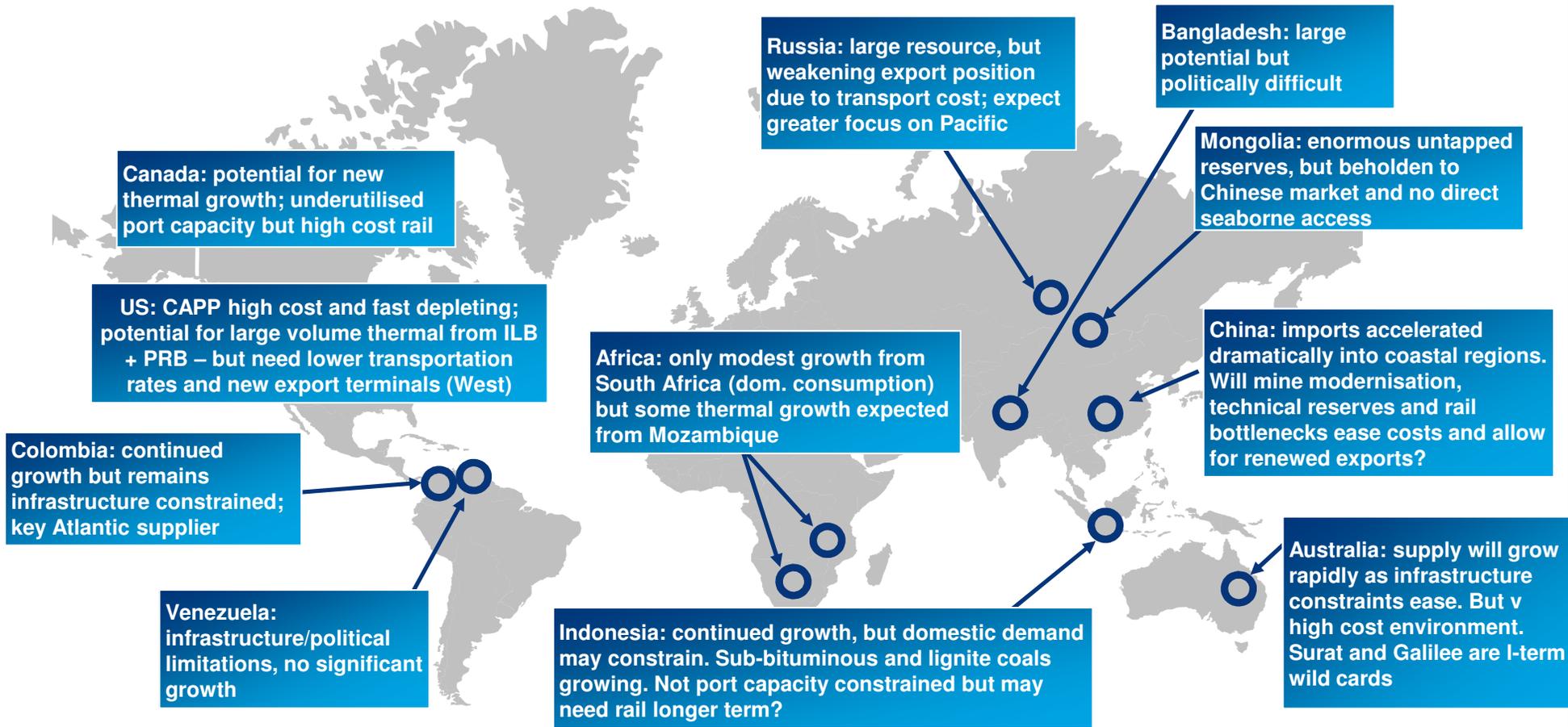
Global thermal coal supply



Source : Wood Mackenzie Coal Market Service

Where will new supply come from?

New Thermal Coal Supply Sources

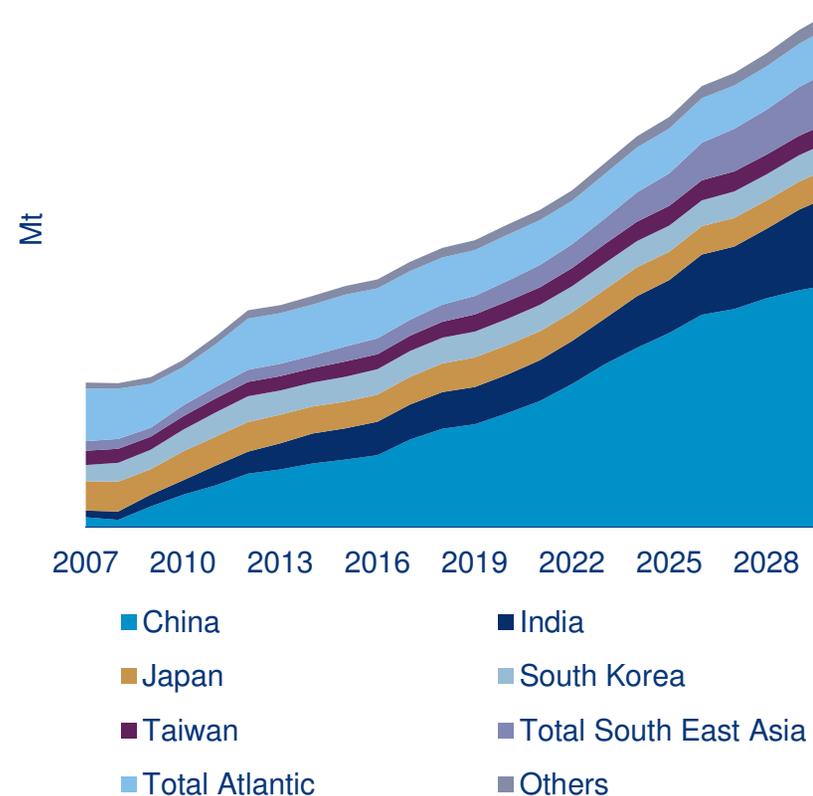


Source : Wood Mackenzie

Global thermal coal demand growth will be driven by China and India

- › Seaborne demand for thermal coal is forecast to grow to 2.2 billion tonnes (Bt) in 2030, increasing from 909 million tonnes (Mt) in 2010
- › China will drive the large import growth – from 227 Mt in 2012 to 1 Bt by 2030 – domestic supply will not keep up with demand
- › In 2010, China's demand exceeded that of Japan, which has been the primary destination for seaborne thermal coal since the market developed

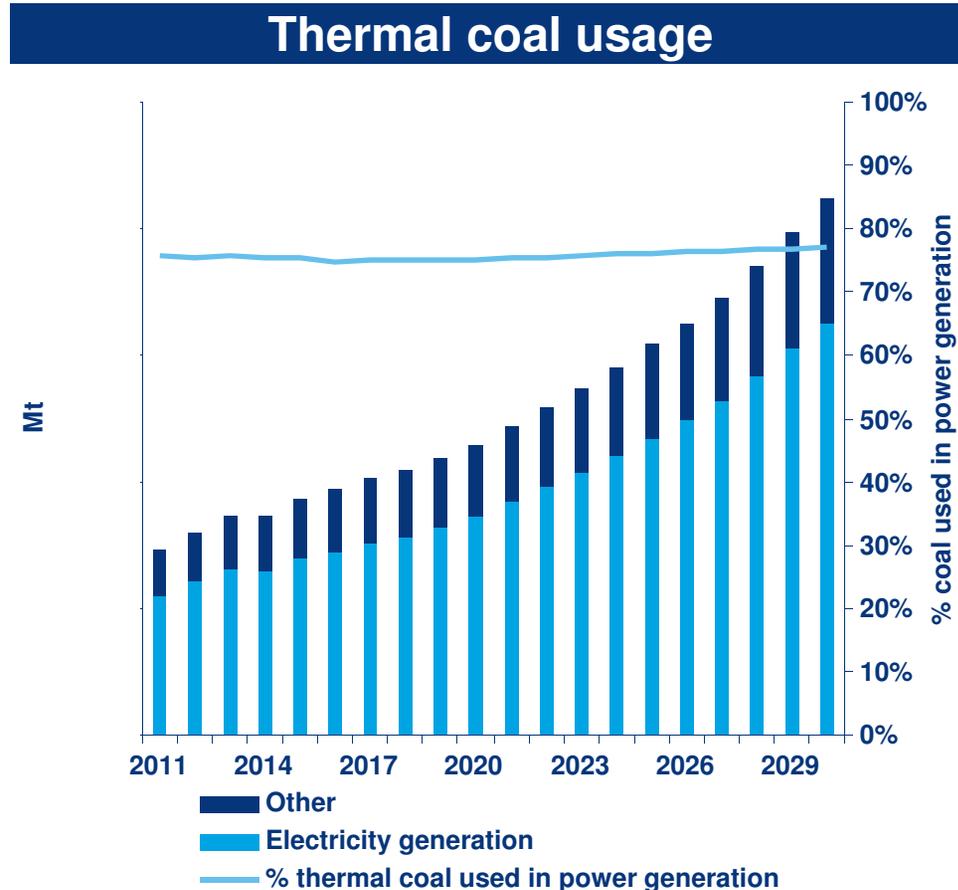
Global thermal coal demand



Source : Wood Mackenzie Coal Market Service

Global demand for thermal coal is driven by power generation

- › Around 75% of seaborne thermal coal demand is used for power generation
- › Thermal coal is also used in other industries, however these are not expected to drive demand
- › It is therefore expected that developments in global power generation mix will drive demand for thermal coal going forward

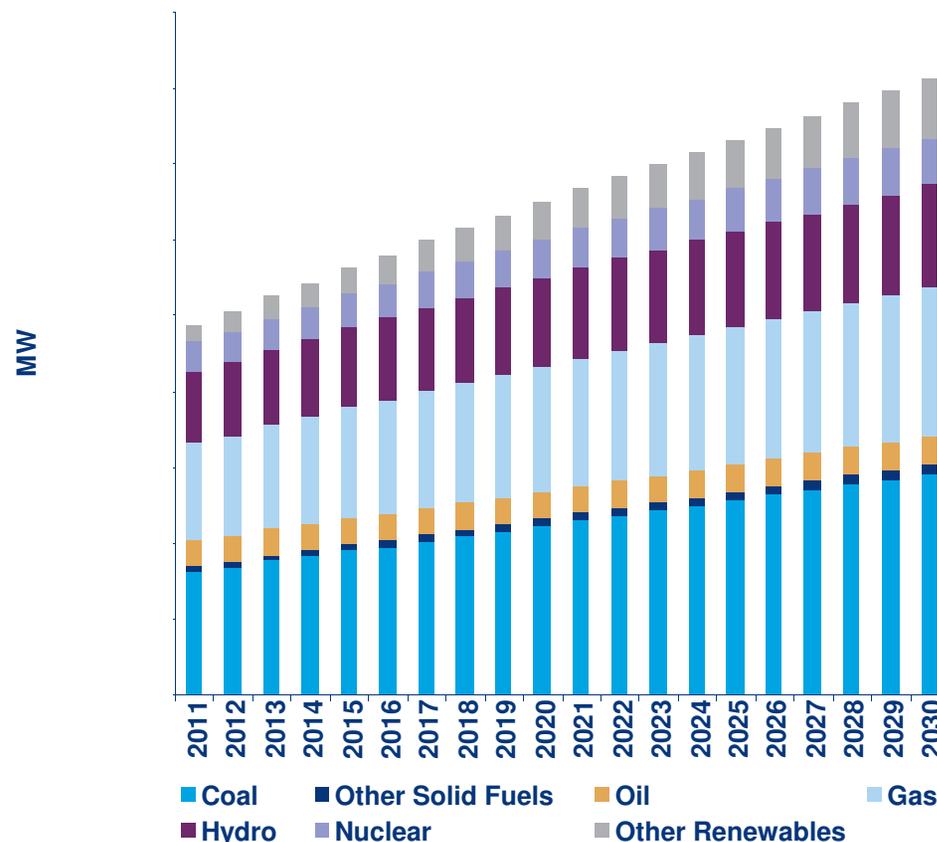


Source : Wood Mackenzie Coal Market Service

Generation capacity mix going forward is going to be dominated by coal and gas

- › Almost 3 TW of new power capacity is expected to be commissioned worldwide by 2030
- › Coal and gas-fired capacity will account for over half of all additions but growth is strongest in renewables
- › The overwhelming majority of coal additions are in Asia Pacific (60% of which are in China) whereas gas additions are more evenly spread across the regions.
- › Nuclear additions are also dominated by China which accounts for 45%. The strong growth in renewables is being led by the more developed markets of North America and Europe

Global power generation capacity

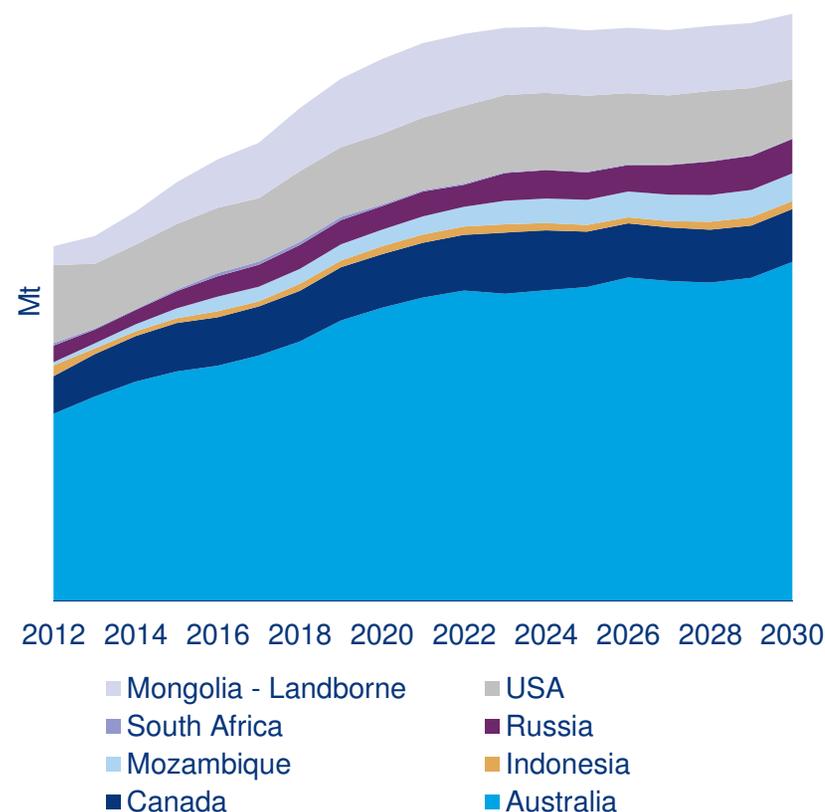


Source : Wood Mackenzie Energy Market Service

Global metallurgical coal supply will remain primarily an Australia story

- › Metallurgical coal prices have come down from historic highs and global steel demand was in the doldrums through 2012, but producers are still active and emerging supply regions are planning expansions to meet the burgeoning demand for metallurgical coal.
- › Asian demand growth provided impetus to the expansion of global seaborne metallurgical coal supply in 2010, despite the worldwide economic slowdown. That pattern of growth has continued through 2011 and through most of 2012.
- › Traditional supply regions, primarily Australia, will provide the majority of the expansion, but new growth areas such as Mongolia and Mozambique will become increasingly important
- › We forecast seaborne supply of metallurgical coal will increase by 60% over the next 18 years, from a 2012 level of 245 Mt to 391 Mt in 2030

Global metallurgical coal supply



Source : Wood Mackenzie Coal Market Service

Where will new supply come from?

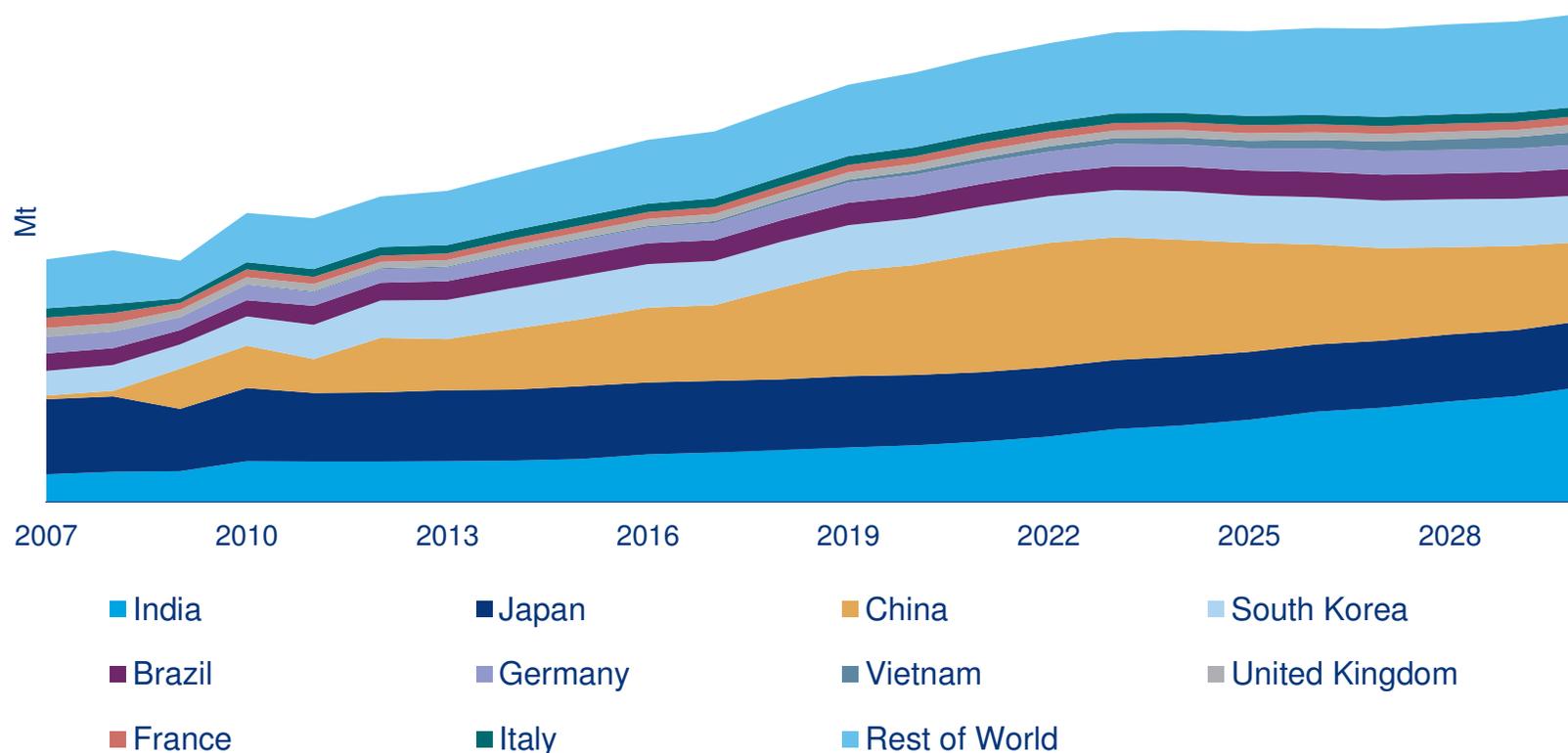
New Metallurgical Coal Supply Sources



Source : Wood Mackenzie

Global metallurgical coal demand will be dominated by Japan, China and India

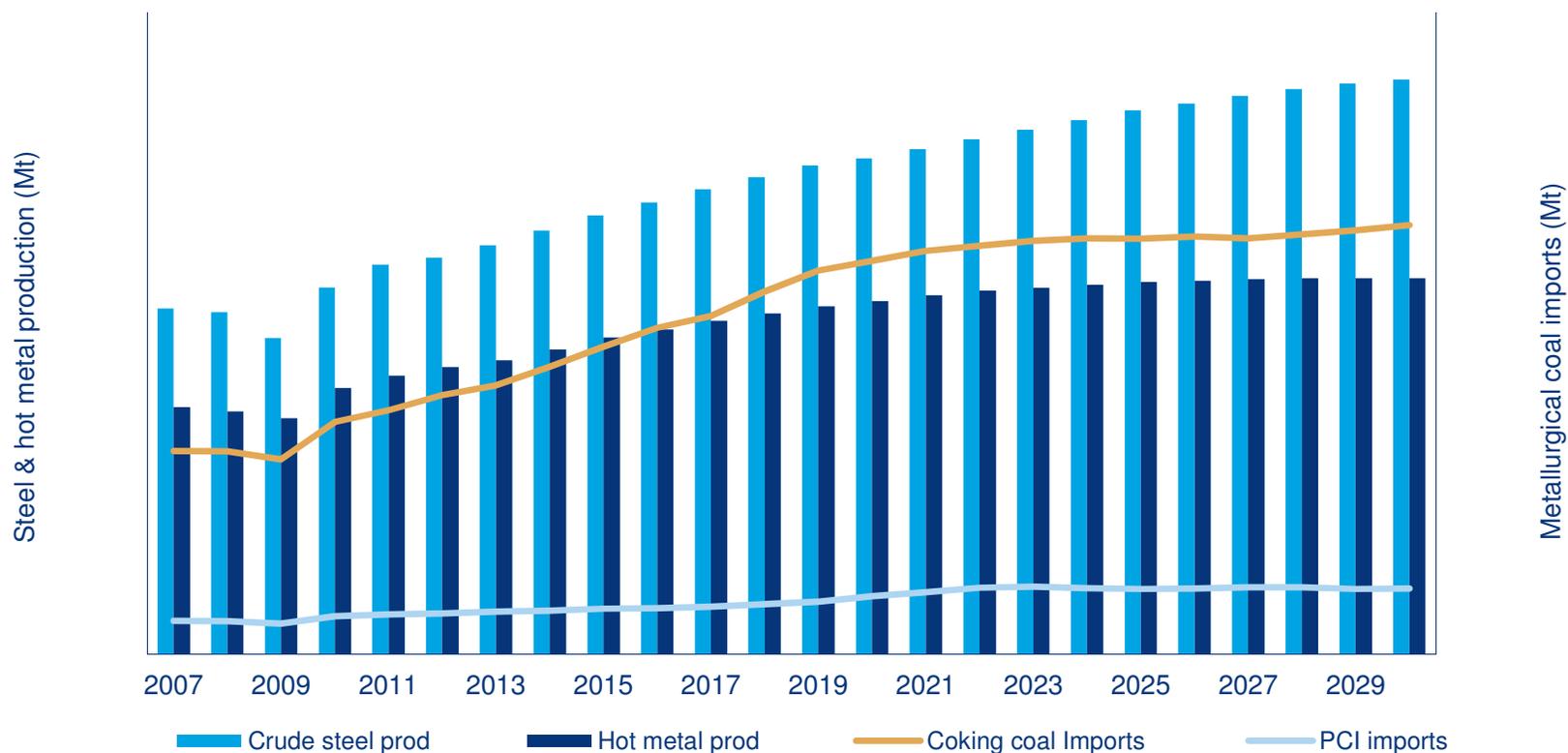
Global metallurgical coal demand



Source : Wood Mackenzie Coal Market Service

Metallurgical coal demand growth will be driven by upward trend in steel production

Global steel production and metallurgical coal imports



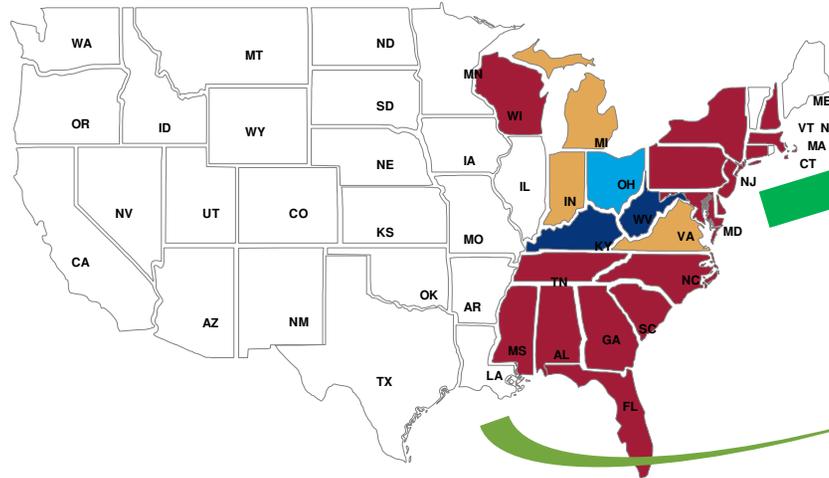
Source : Wood Mackenzie Coal Market Service, Steel Market Service

Agenda

- 1 China in context and 2012 summary
- 2 Where are the markets for coal demand (Thermal and Metallurgical)?
- 3 How will the US participate?

2012: Delivered coal prices were too expensive vs. natural gas in key regions, leading to extra supply availability onto global markets

Eastern coal deliveries by destination



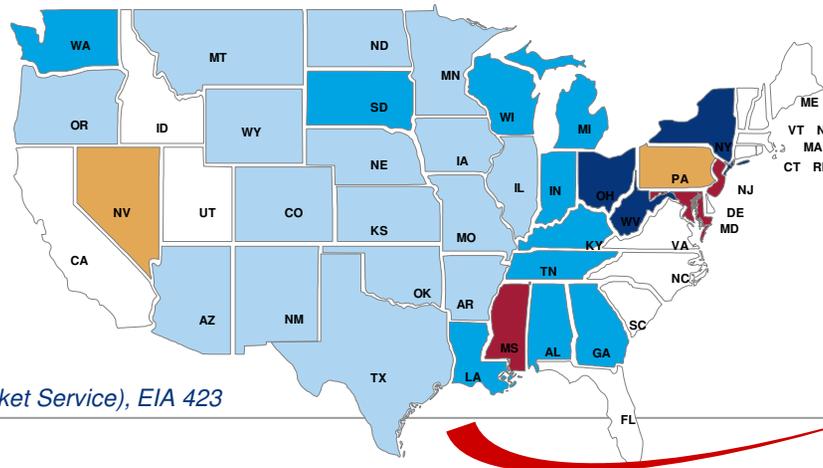
+8 Mt exports

+6 Mt exports

Total Exports = 128 Mst

Delivered costs
>\$3.50/mmbtu
\$3-3.49/mmbtu
\$2.50-2.99/mmbtu
\$2-2.49/mmbtu
<\$1.99/mmbtu

Western (PRB) coal deliveries by destination

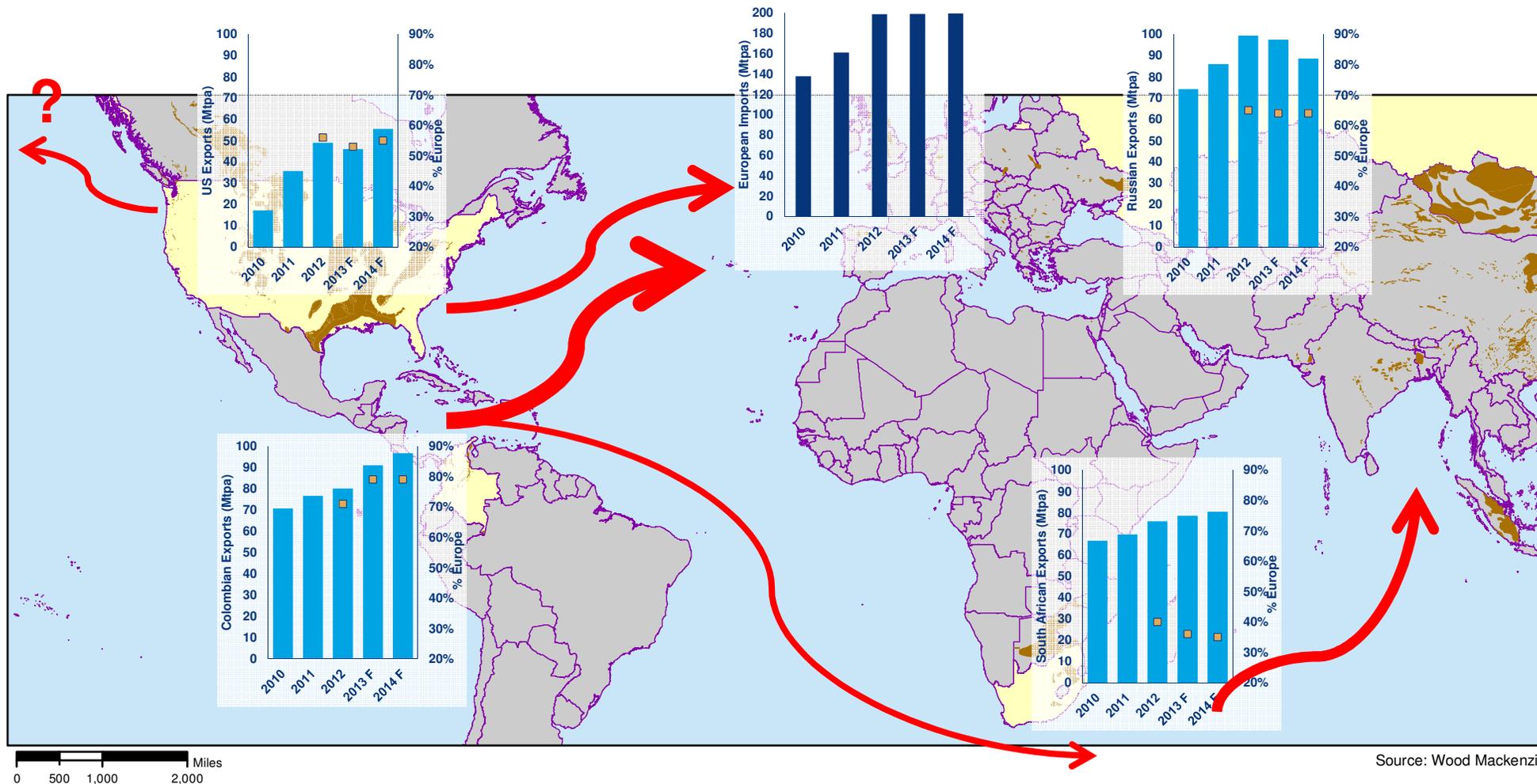


No relief valve: too costly / uncompetitive

No relief valve: no extra terminal capacity / uncompetitive to ship additional tonnage y-o-y

Sources: Wood Mackenzie (North America Coal Market Service), EIA 423

Sources of European thermal supply: where will they make largest return?

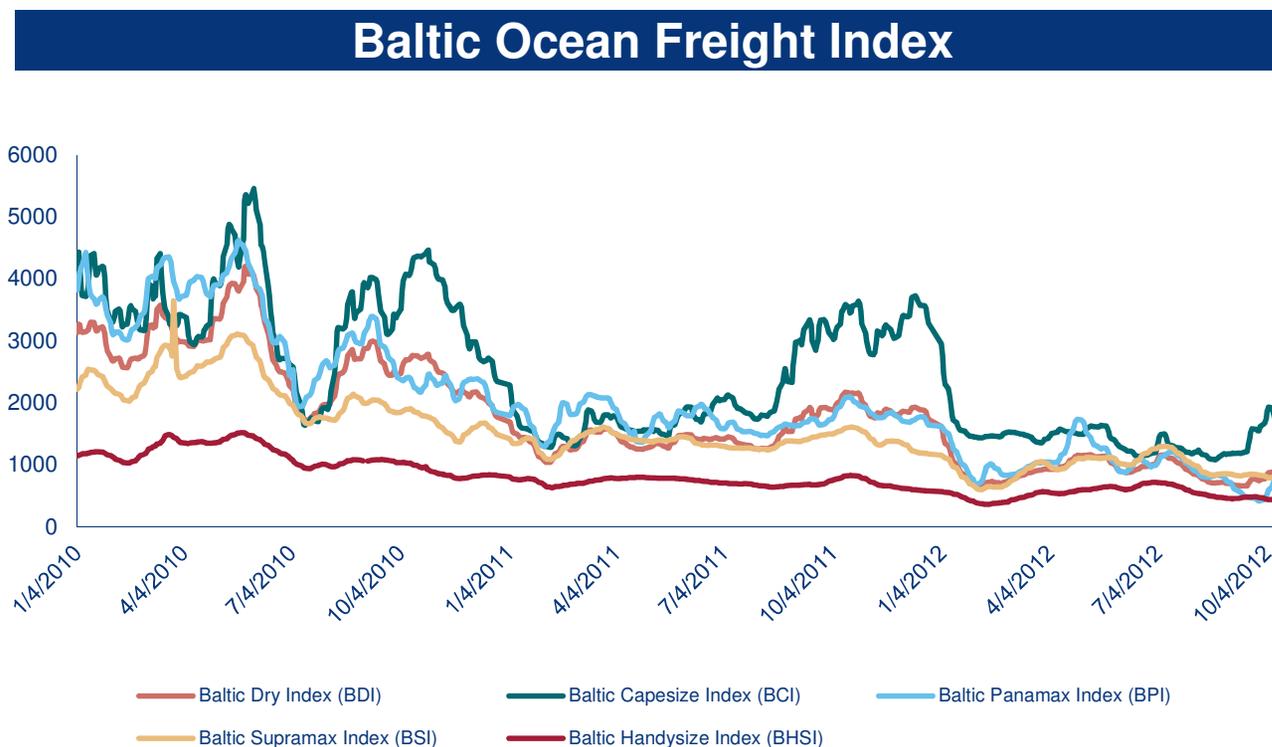


Source: Wood Mackenzie

Source: Wood Mackenzie Coal Market and Coal Supply Service

Ocean freight rates are at historical lows – new ship orders in response to the 2008 commodity bubble has over-supplied the market for some considerable time

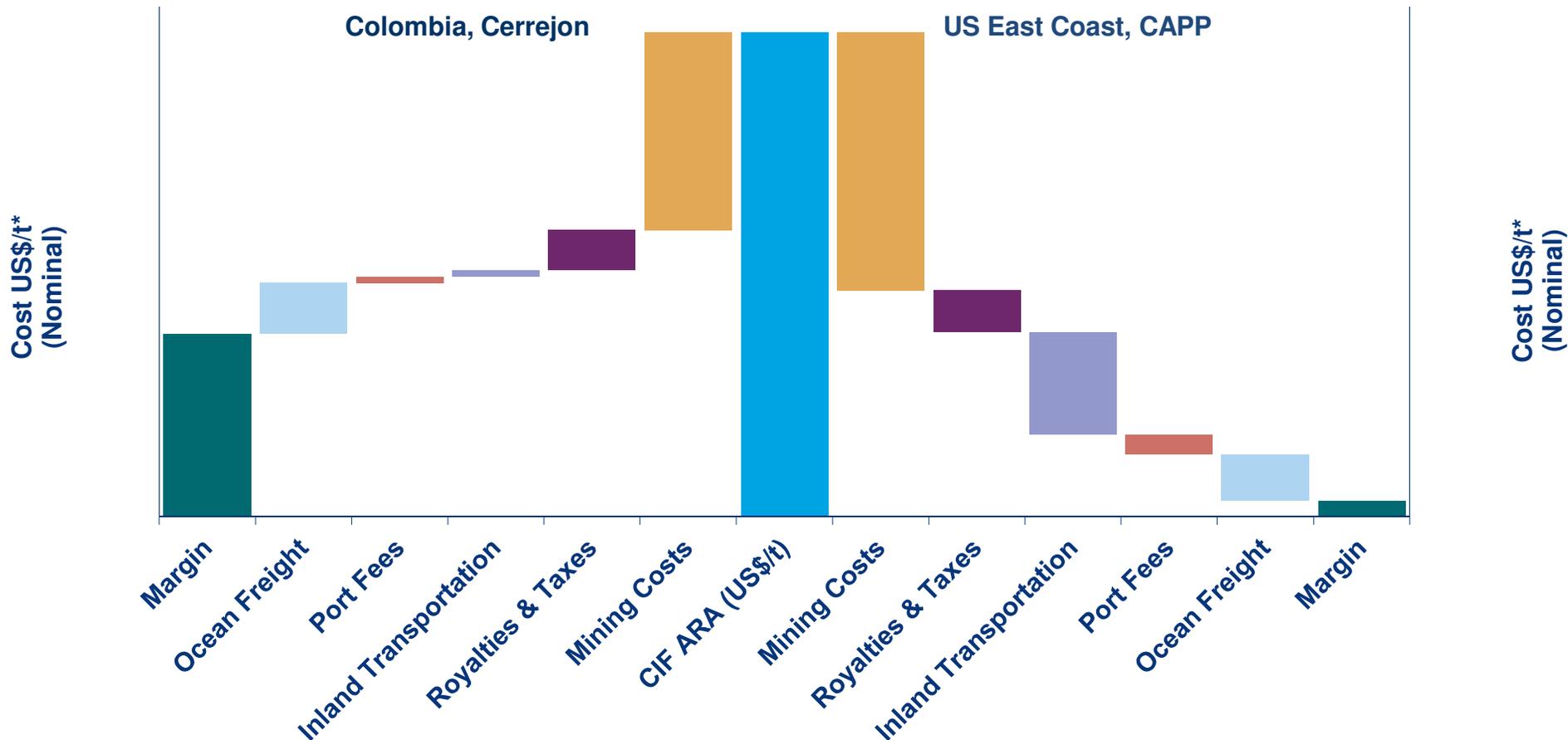
- › The 2013 vessel fleet will show a net increase of about 38 MDWT
- › This will continue to exert downward pressure on ocean freight rates through 2013
- › Severe weather and natural disasters can disrupt shipping schedules and cargos causing temporary volatility in freight rates



Source: The Baltic exchange index

Thermal: Colombia will always be the most competitive supply source into Europe

Stylized margin comparison (\$/t, 6,322 kcal/kg coal)



Source: Wood Mackenzie Coal Supply and Coal Market Service

Will we see re-positioning of domestic assets to export exposure? Many challenges remain

Gateway Pacific

- SSA Marine, Peabody partnership (26 Mtpa) – recently CLD
- Cherry Point, WA
- Permitting underway, environmental delay?

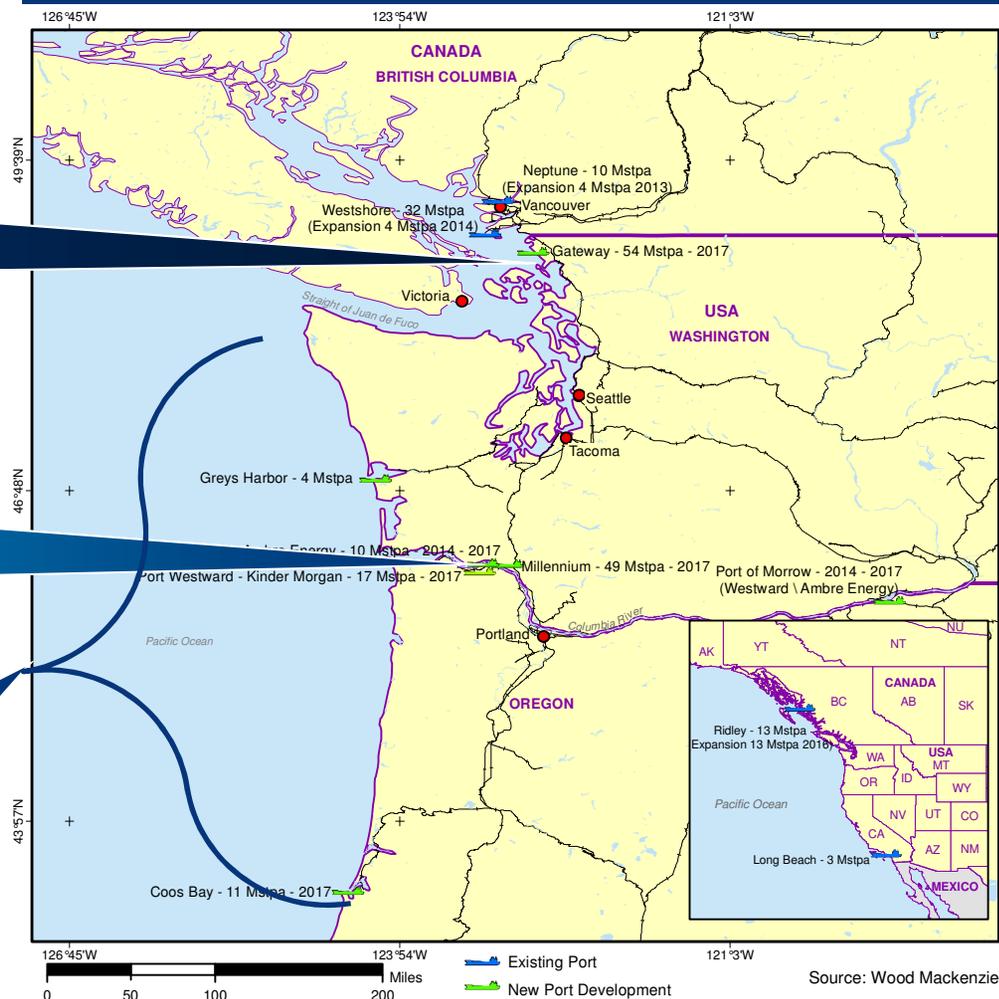
Millenium Bulk Terminals

- Ambre Energy/Arch Coal (25-44 Mtpa) – recently CLD
- Longview, WA
- Brownfield renovation of Alcoa site
- Mid-streaming option

Others

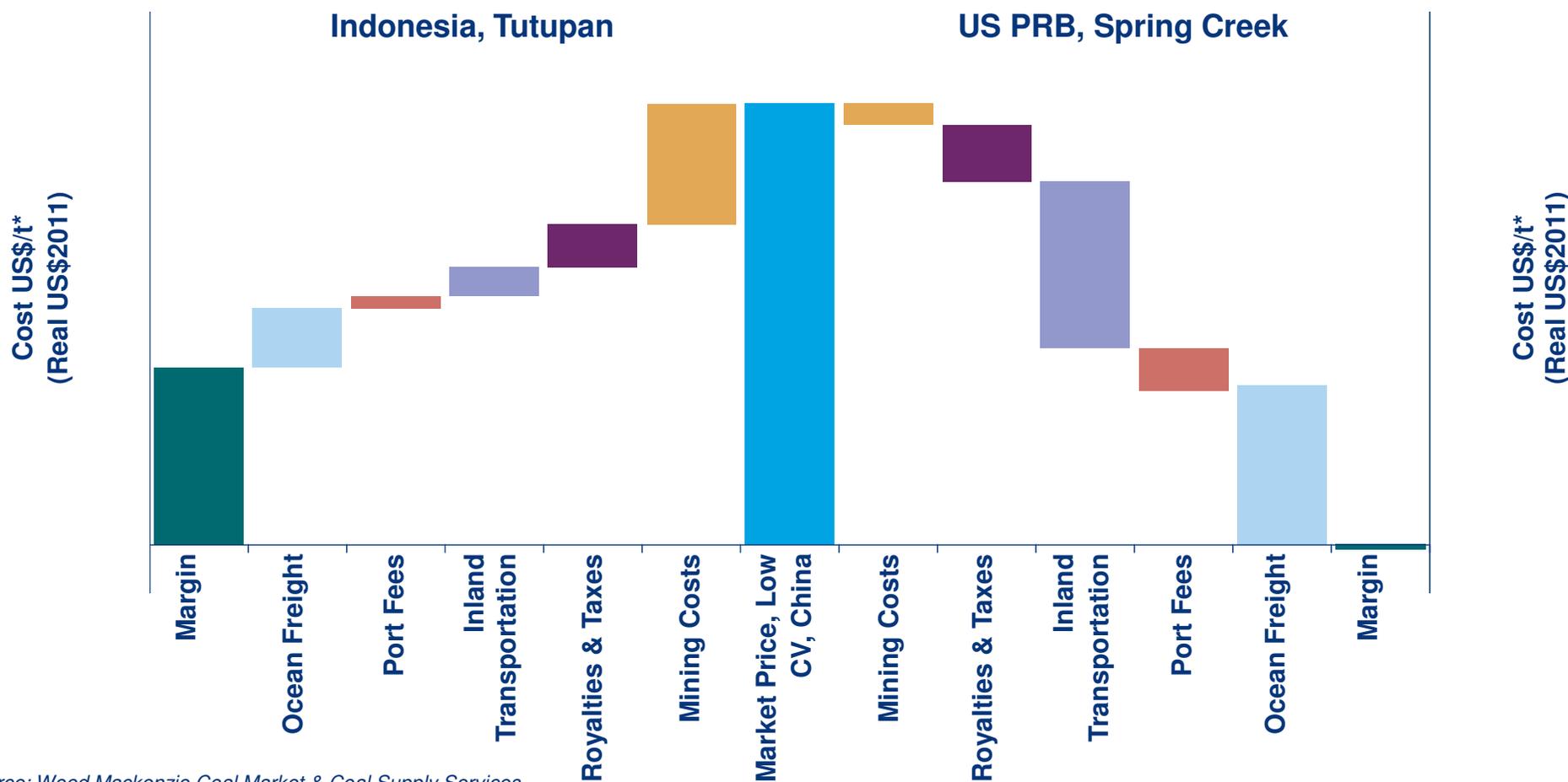
- Portland: closed
- LAXT: small potential
- Richmond: small potential
- Morrow: gaining traction
- St. Helens (Port Westward), Coos Bay: step backwards

US West Coast Coal Ports



... and the near term will be testing for PRB exports, with ramifications for export terminals

Stylized margin comparison (\$/t, 5,000 kcal/kg coal)



Source: Wood Mackenzie Coal Market & Coal Supply Services

Wood Mackenzie Disclaimer

- › **Strictly Private & Confidential**

- › **This report has been prepared by Wood Mackenzie Limited. The report is intended solely for the benefit of RETAC and its contents and conclusions are confidential and may not be disclosed to any other persons or companies without Wood Mackenzie's prior written permission.**

- › **The information upon which this report is based has either been supplied to us by 14 March 2013 or comes from our own experience, knowledge and databases. The opinions expressed in this report are those of Wood Mackenzie. They have been arrived at following careful consideration and enquiry but we do not guarantee their fairness, completeness or accuracy. The opinions, as of this date, are subject to change. We do not accept any liability for your reliance upon them.**

Jonny Sultoon

Lead Analyst – Atlantic Coal Markets

T +1 410 295 4233

E jonny.sultoon@woodmac.com



- › Jonny currently fronts analysis and research for the Atlantic Coal Markets, both thermal and metallurgical. His areas of expertise are in short and long-term demand forecasting for the international coal markets, competition between multi-fuels in the power generation sector, corporate analyses of the major producers and utilities, and fundamentals-based price forecasting for the coal market. Prior to joining the Coal Markets Research team in 2008, Jonny fulfilled a similar role as a member of the European Gas and Power Research team in Wood Mackenzie's London office. He drove short and long-term European gas market fundamentals and provided expert support on bespoke consulting projects in the European Gas and Power arena.
- › Before joining Wood Mackenzie in 2006, Jonny spent five years at Gas Strategies Consulting. He managed their European Gas supply and demand service and also project managed a number of consulting assignments, including; market entry and pricing strategy into Europe for an integrated major, project due diligence for a consortium operating an LNG liquefaction project in West Africa, and a pipeline monetization strategy routing into the Indian Subcontinent. He also provided expert support for QG2 and RG2 LNG liquefaction projects.
- › Jonny holds a BA (Hons) and MA (Hons) in Physics from the University of Oxford, UK.

Global Contact Details

Europe +44 (0)131 243 4400
Americas +1 713 470 1600
Asia Pacific +65 6518 0800
Email energy@woodmac.com
Website www.woodmac.com

Global Offices

Australia	Indonesia	South Korea
Brazil	Japan	United Arab Emirates
Canada	Malaysia	United Kingdom
China	Russia	United States
India	Singapore	



Wood Mackenzie is the most comprehensive source of knowledge about the world's energy and metals industries. We analyse and advise on every stage along the value chain - from discovery to delivery, and beyond - to provide clients with the commercial insight that makes them stronger. For more information visit: www.woodmac.com