

Trends in Global Coal Markets

Meet Alaska 2012

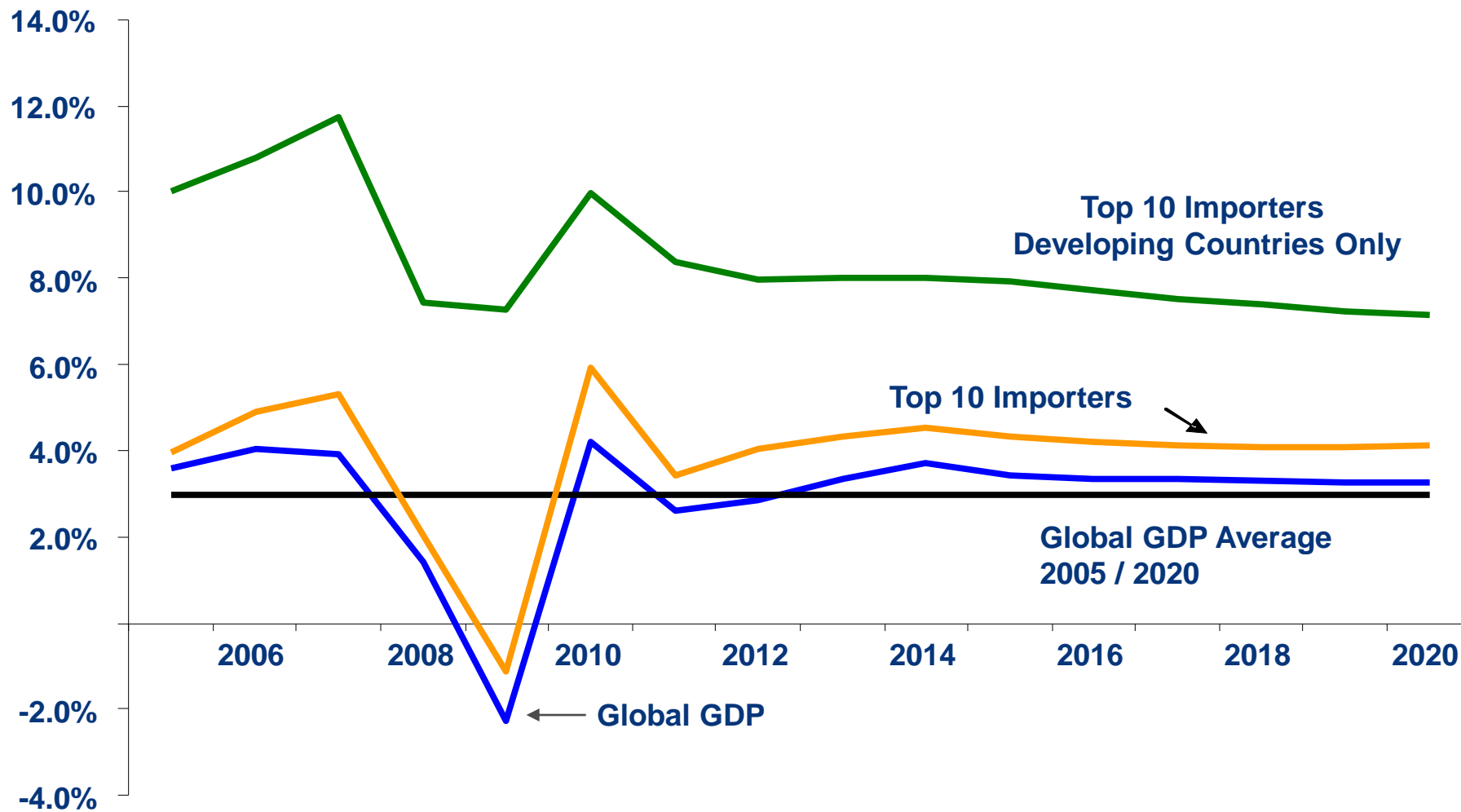
*Jeff Watkins
Chairman of Coal
January 2012*



Agenda

1	GDP Growth Forecast
2	Global Energy Demand
3	Alaska's Coal Resources

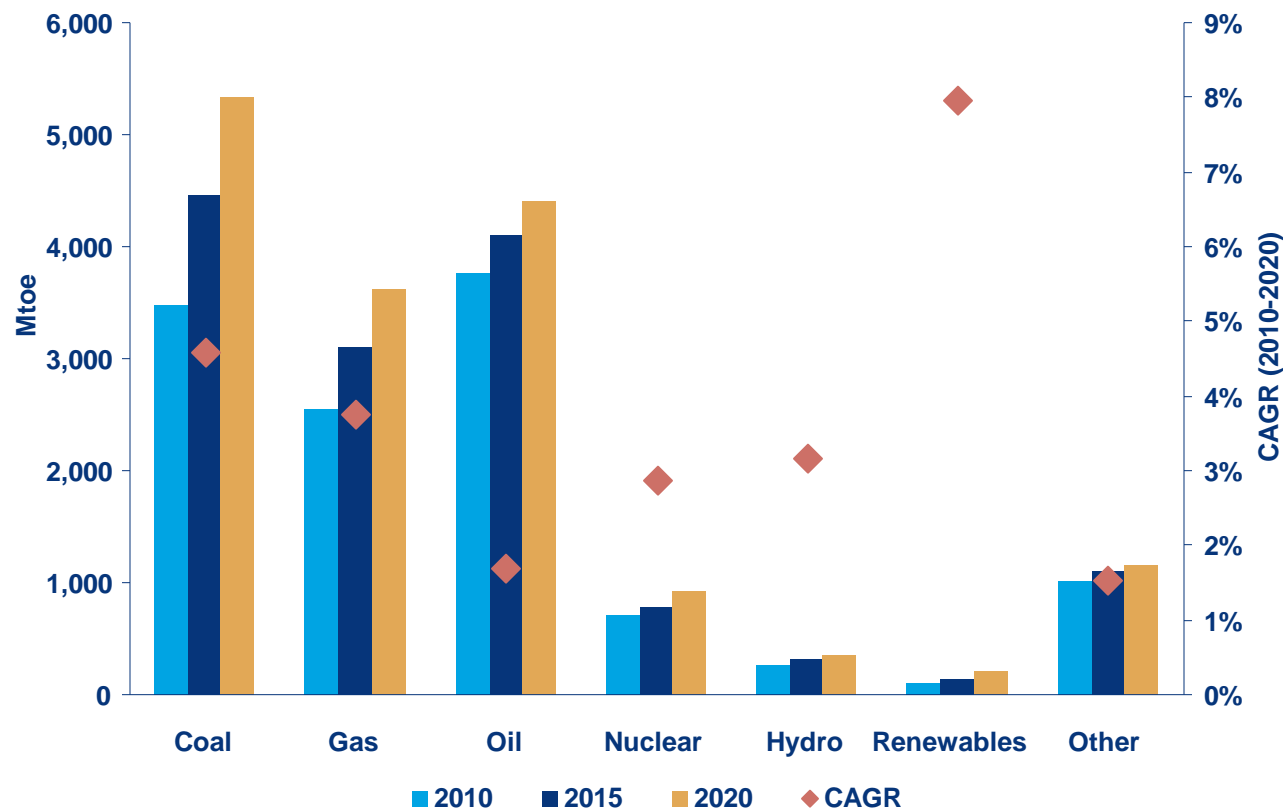
World GDP Forecast to Average 3.0%: Developing Countries Lead Demand Growth



Source: Wood Mackenzie Coal Market Service

...and despite strong growth from renewables, traditional fuels continue to dominate

Global Energy Demand by Fuel



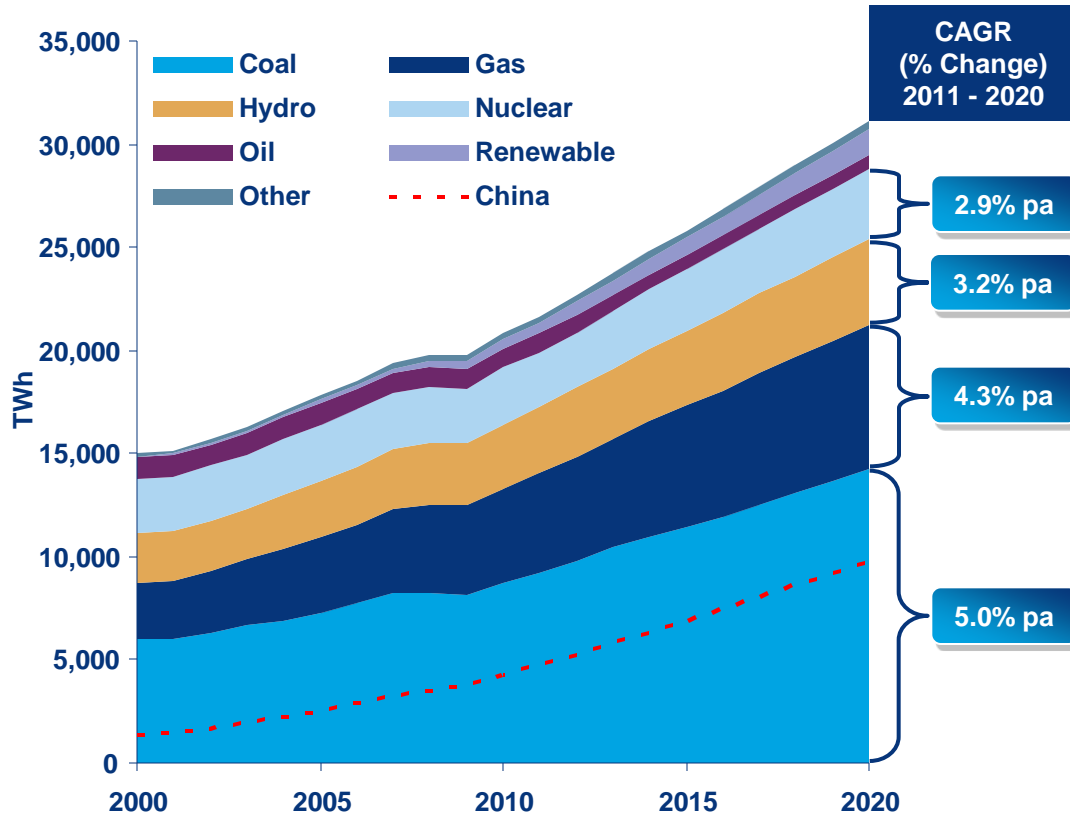
Drivers and Risks

- Economic growth
- Environmental objectives
- Security of supply
- Inter-fuel competition
- Price manipulation
- Energy Efficiency

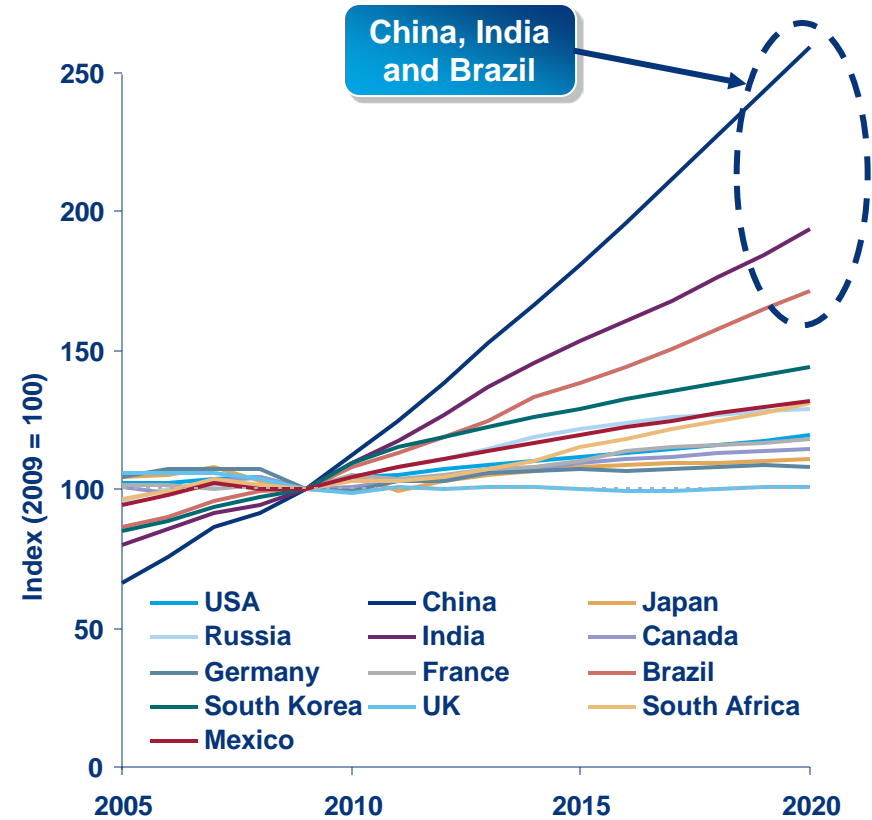
Source: Wood Mackenzie Energy Markets Service

Coal will support strong electricity growth in emerging markets

Global Electricity Output by Fuel



Electricity Demand (indexed to 2009)

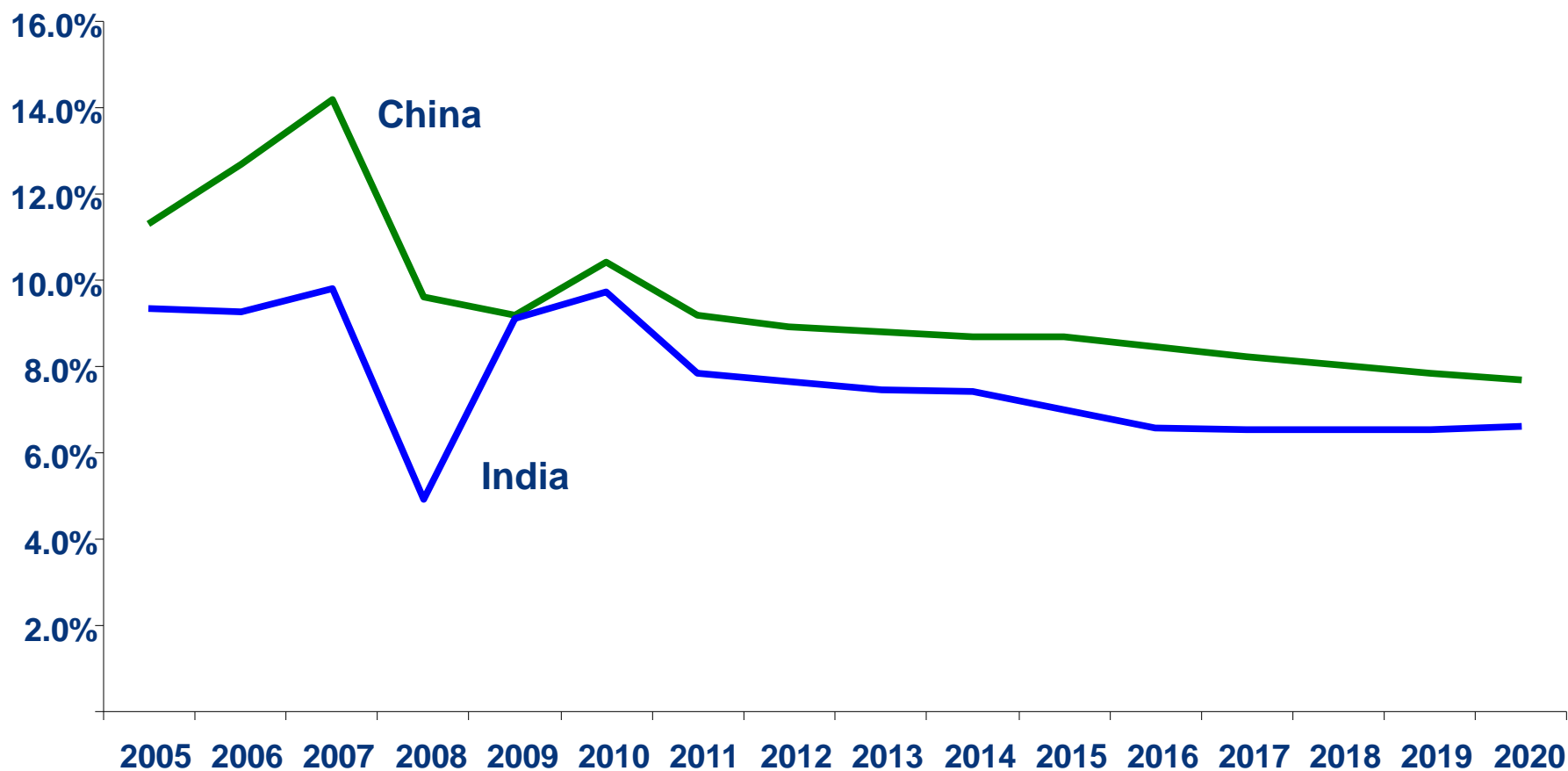


Source: Wood Mackenzie Energy Markets Service

Long-Term Thermal Market Outlook

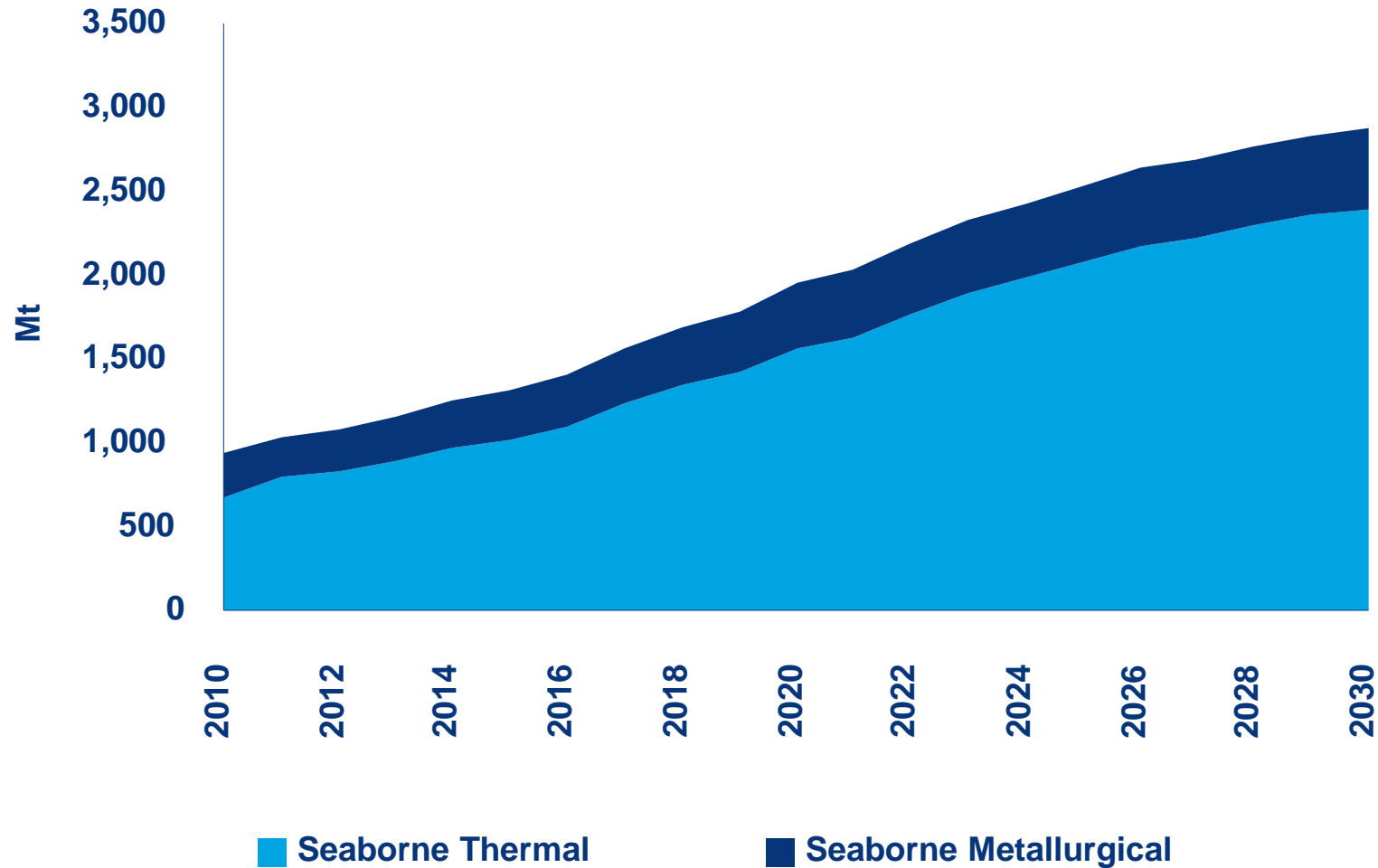


GDP Forecast for India and China is Robust Through 2020



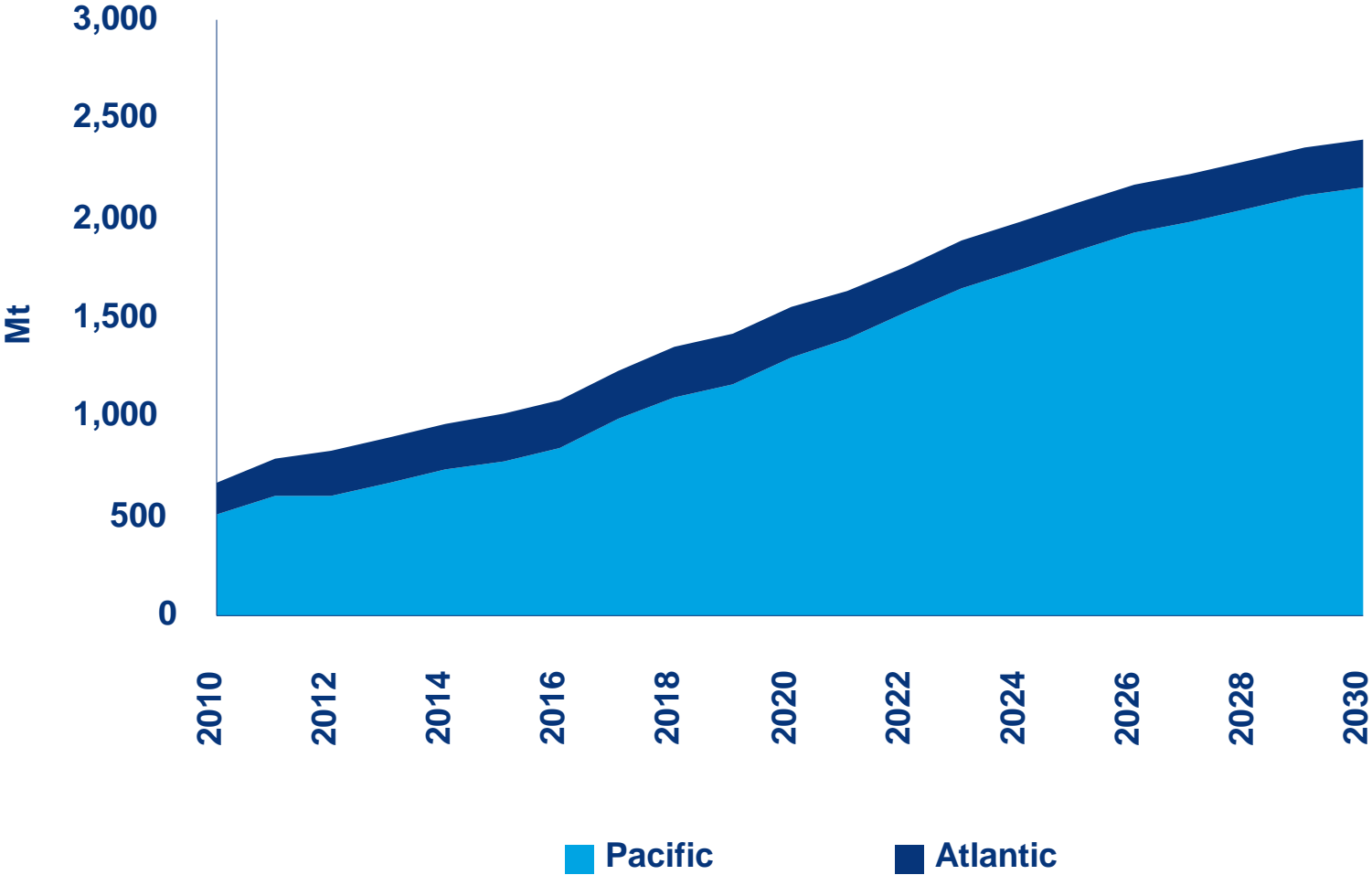
Source: Wood Mackenzie Coal Market Service

Thermal volumes account for nearly three-quarters of seaborne coal trade



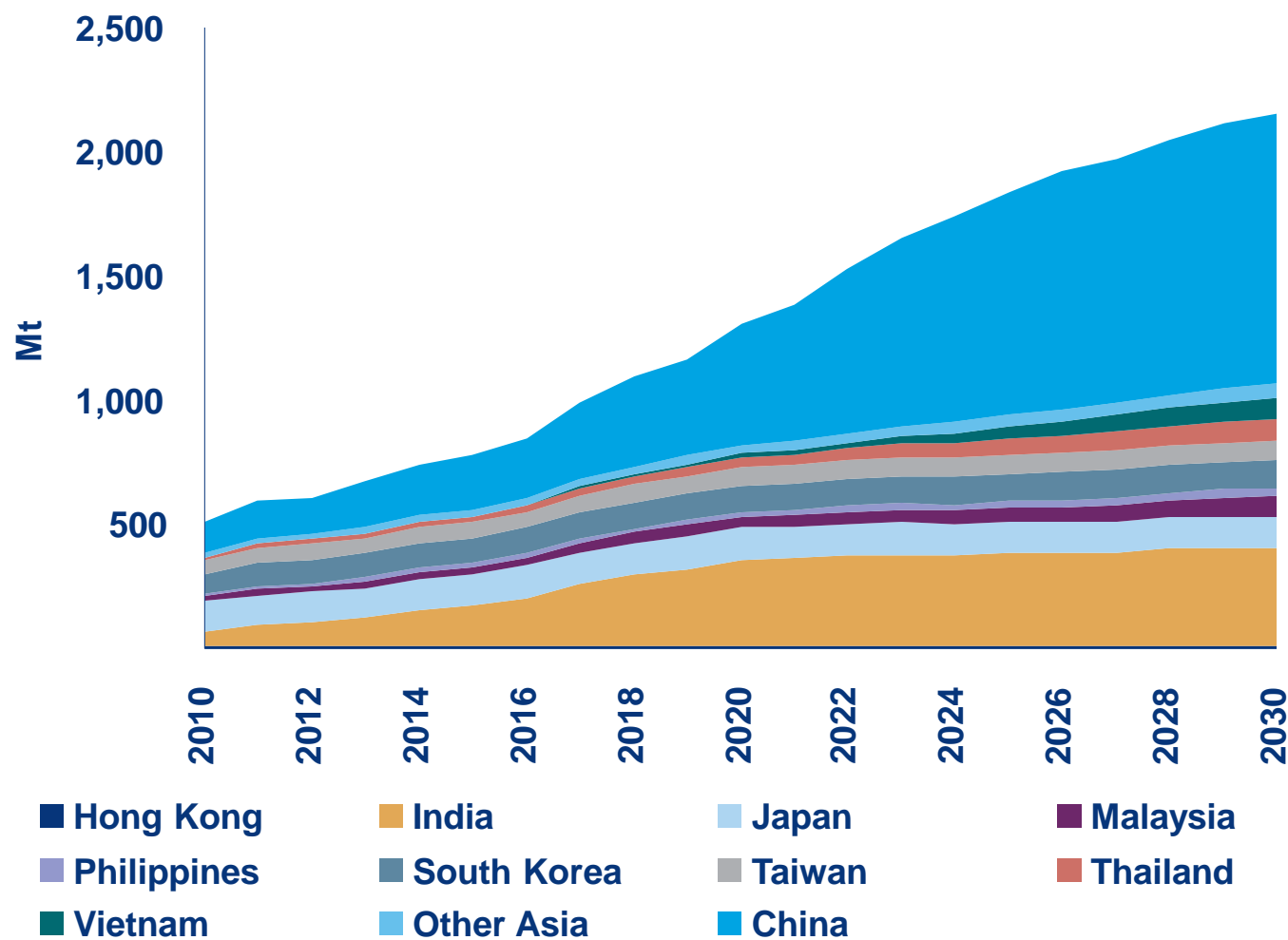
Source: Wood Mackenzie Coal Market Service

The Pacific basin dominates thermal seaborne trade...



Source: wood mackenzie Coal Market Service

...and China and India dominate the Pacific, accounting for nearly 70% of the basin total by 2030

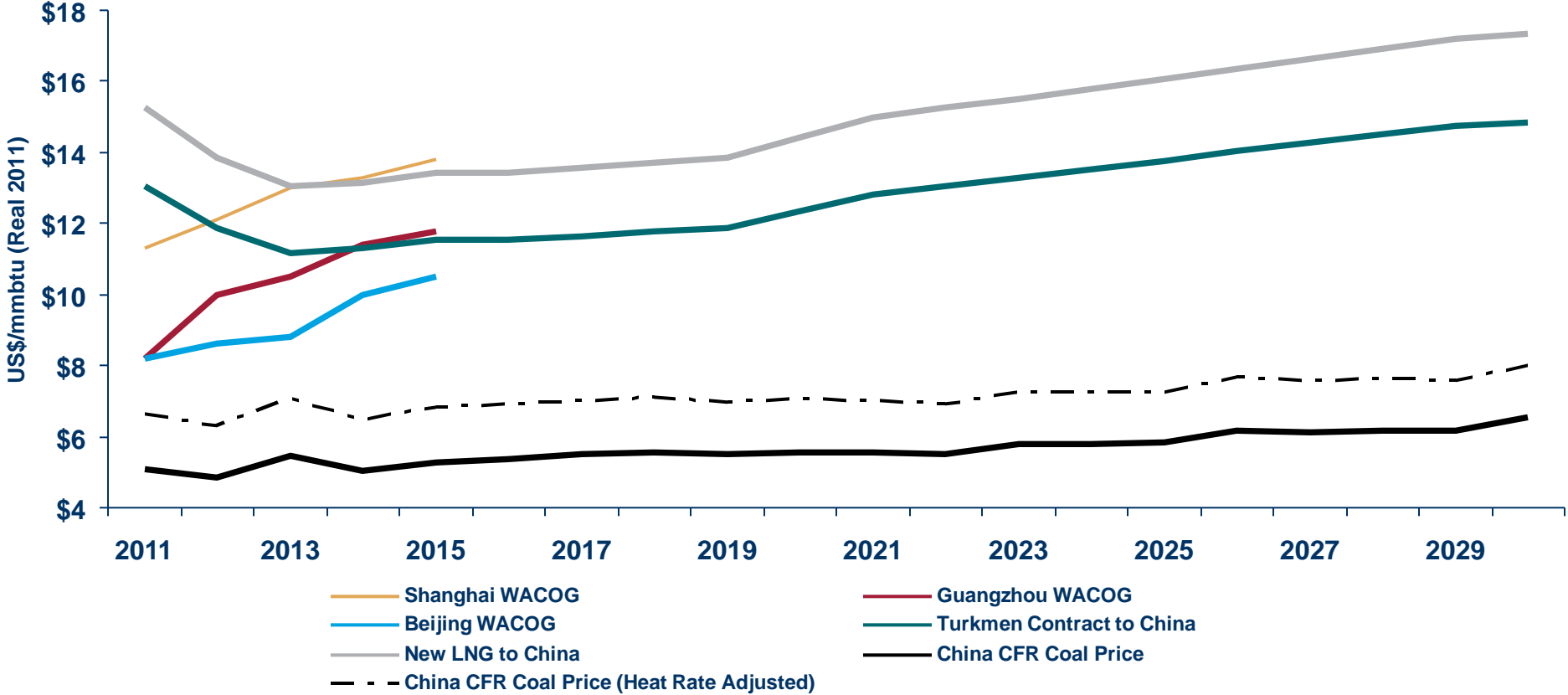


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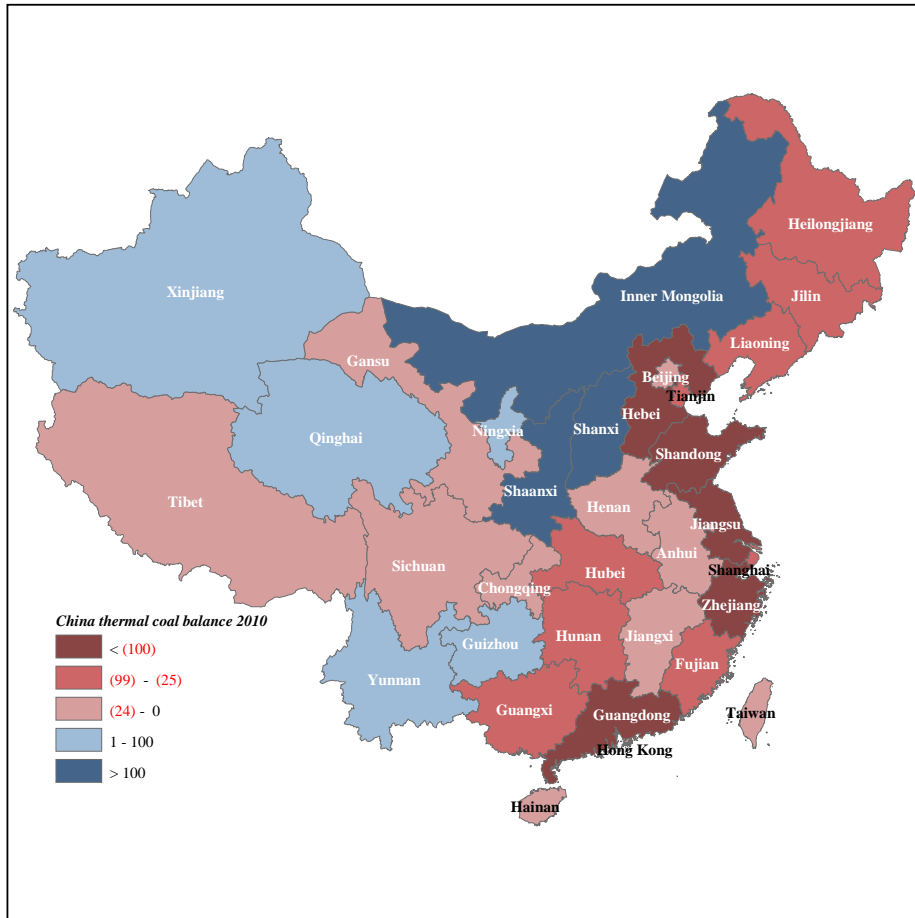
Strategy with substance

Coal Price is Competitive with Natural Gas

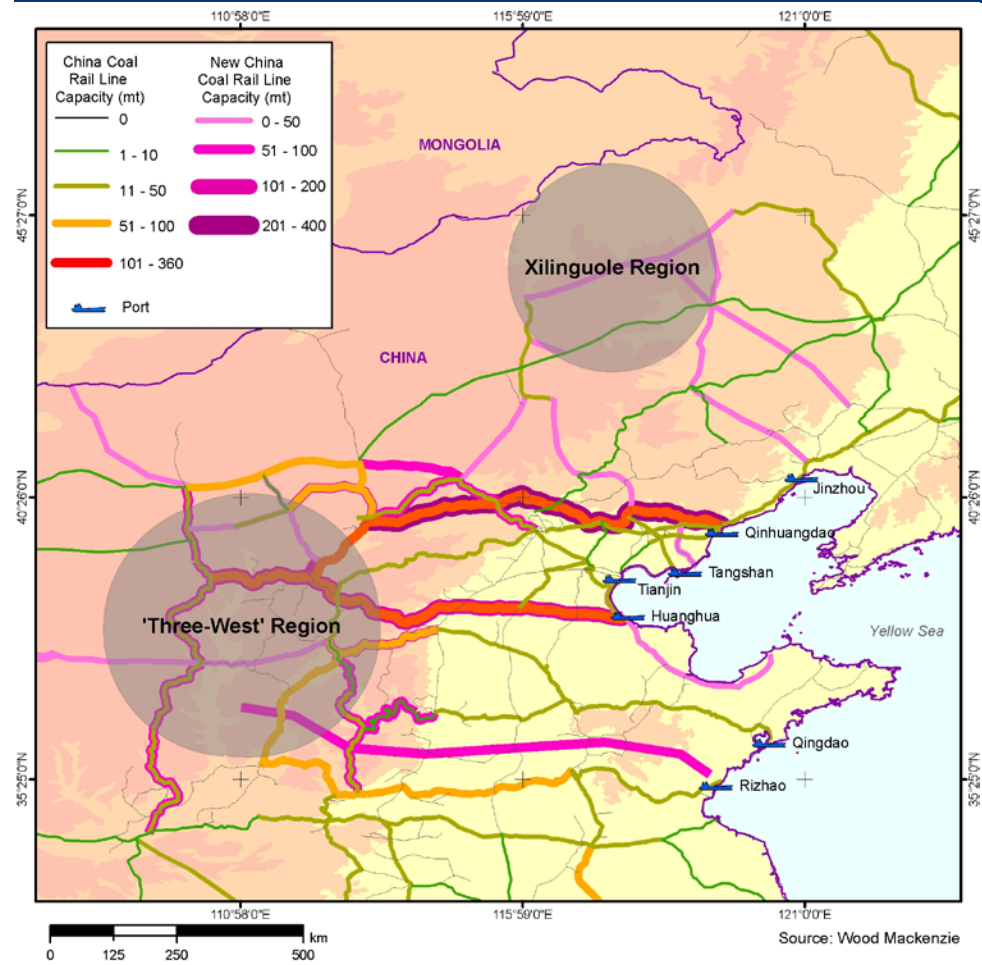


Transportation infrastructure is key driver for expansion of domestic supply

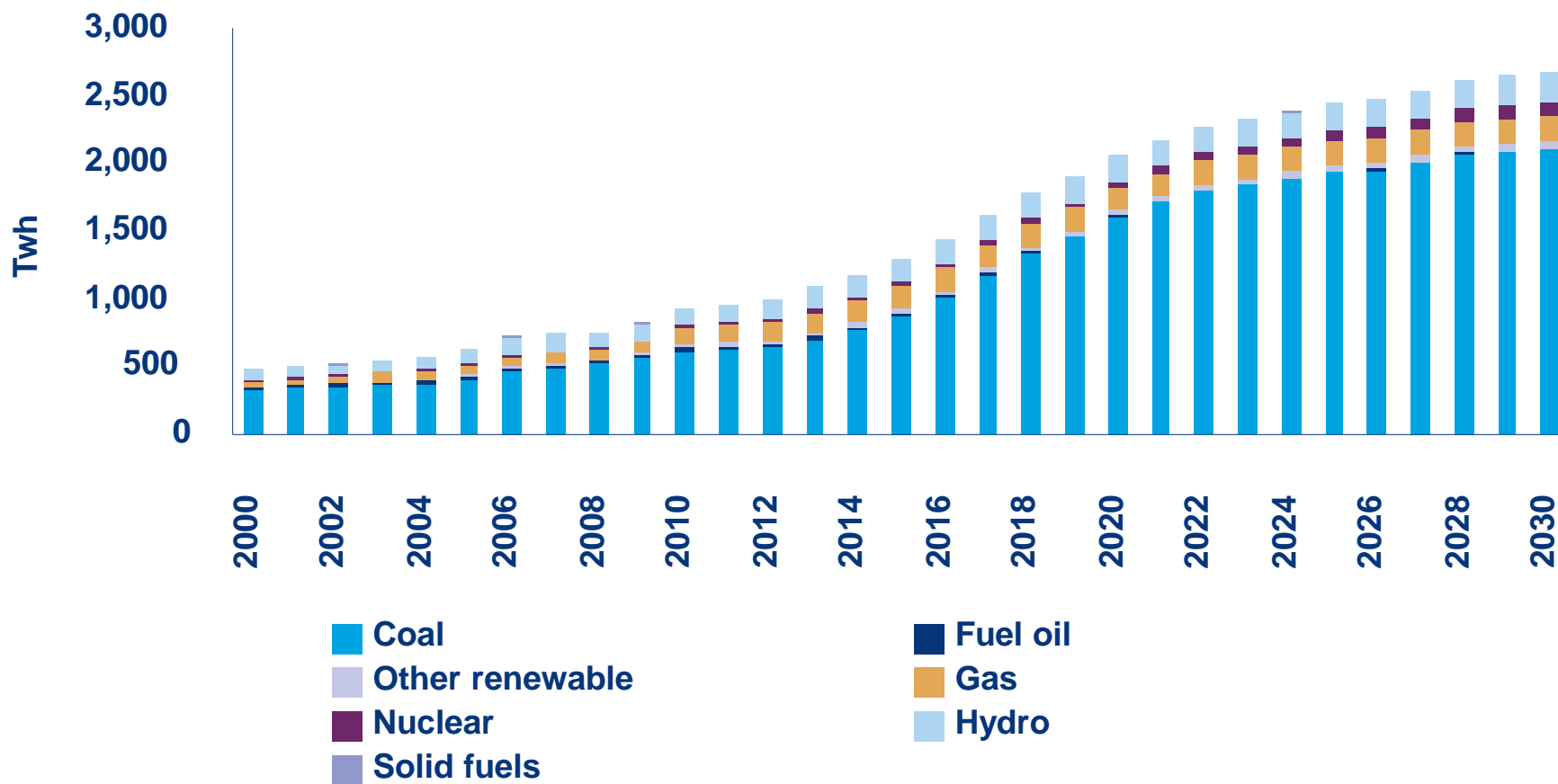
Thermal Supply/Demand Balance - 2010



Current and Future Rail Capacity



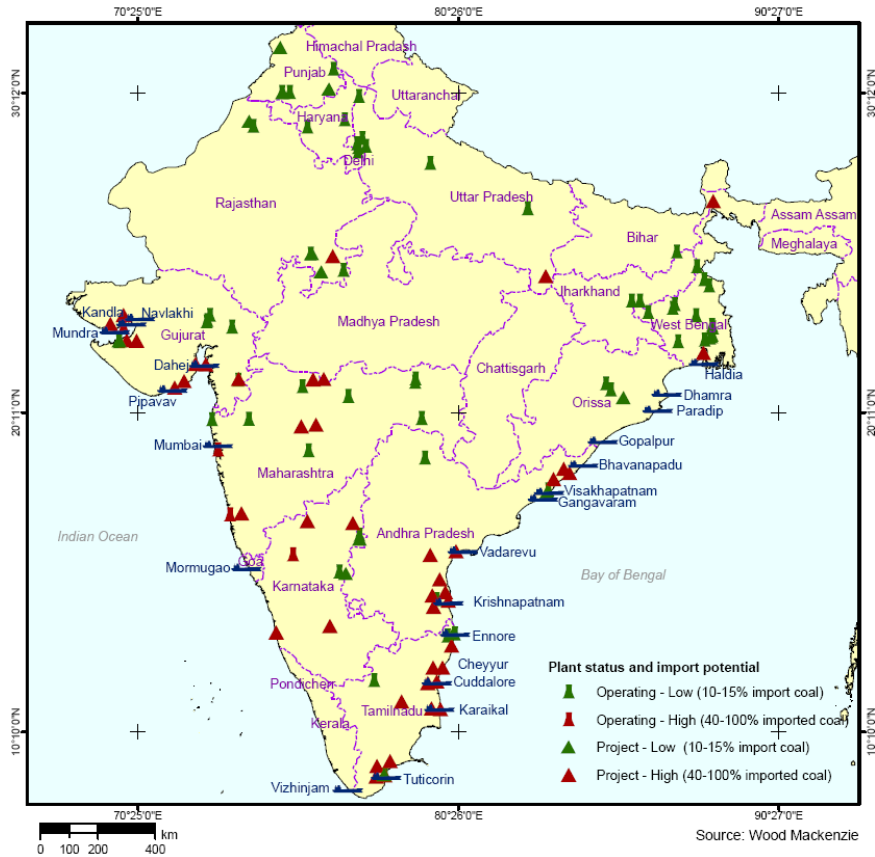
India's fuel mix is also driven by coal...



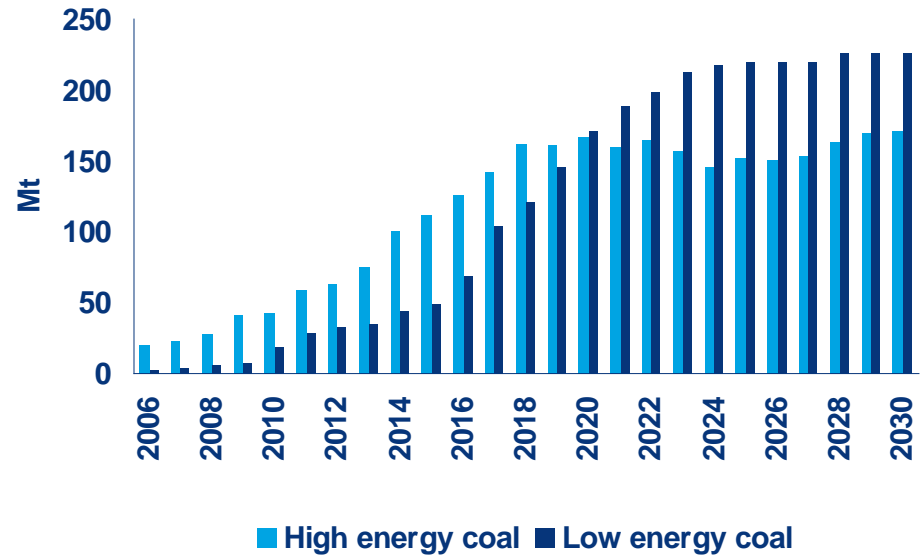
Source: Wood Mackenzie Coal Market Service

Growth dependent on coastal UMPPs – many of which rely much more on imported than domestic coal

UMPP growth is around coast

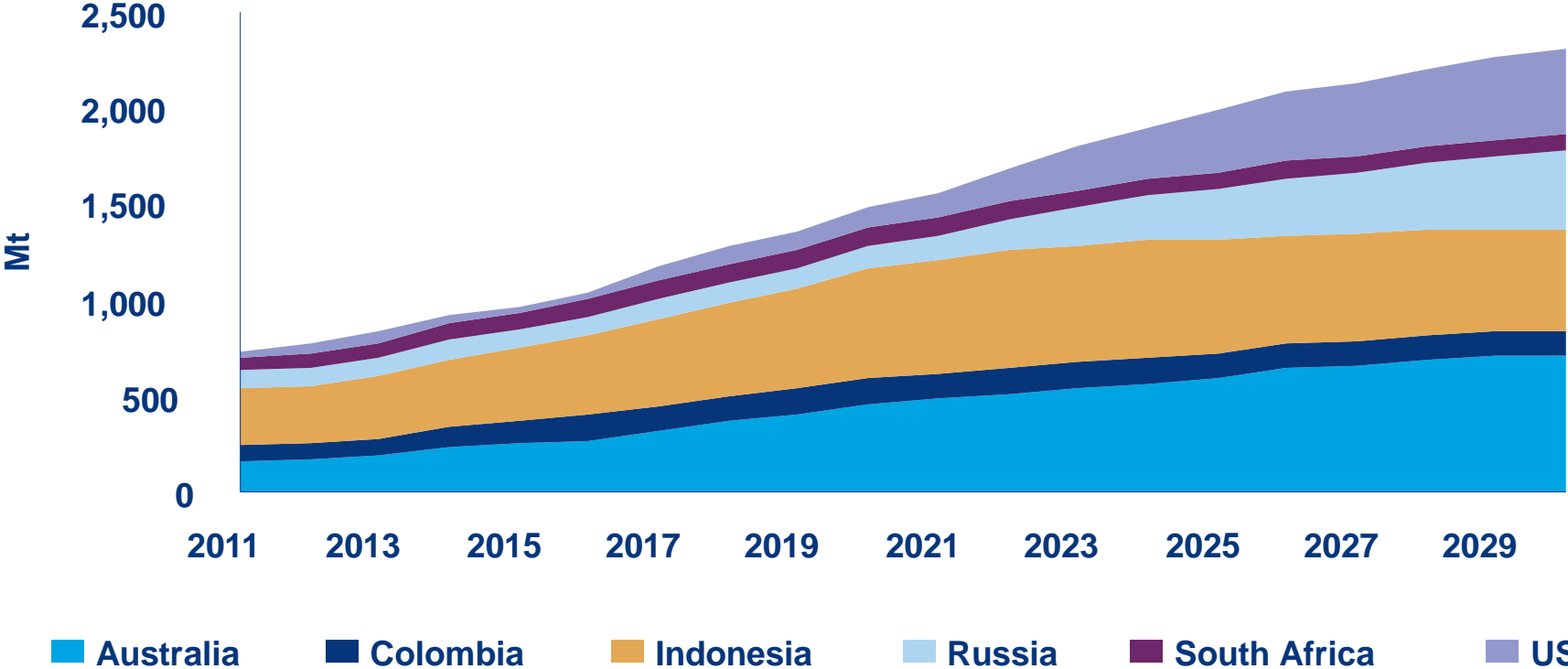


And imports for new projects expected to be weighted to lower cv coals



Source: Wood Mackenzie Coal Market Service

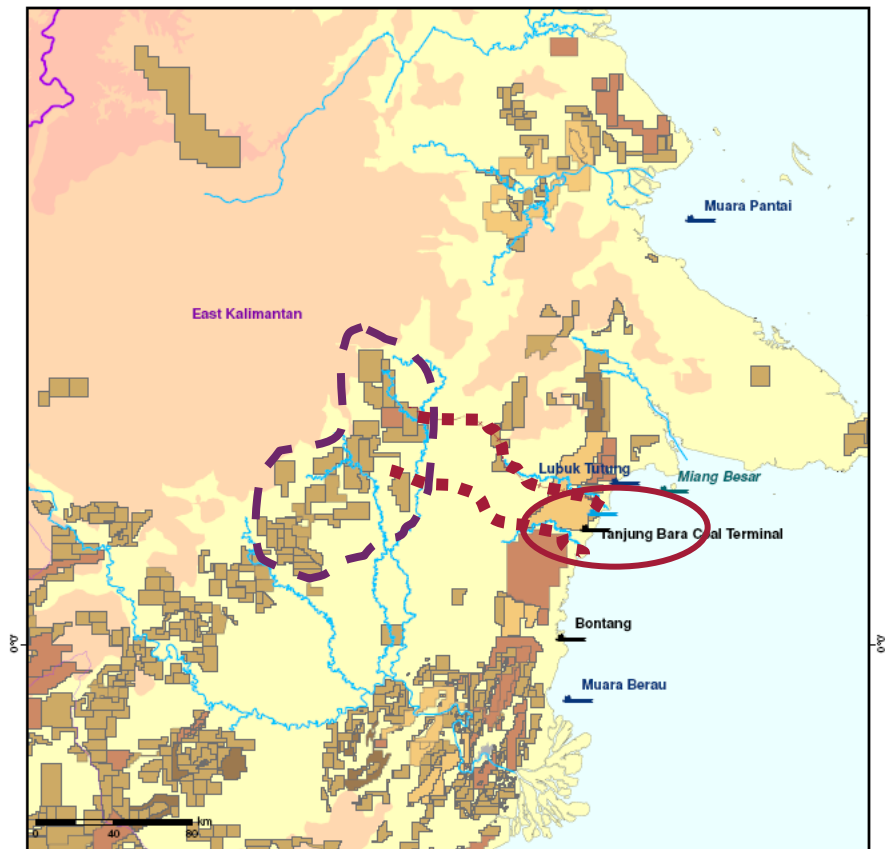
Major suppliers – great expansion required



Source: Wood Mackenzie Coal Market Service

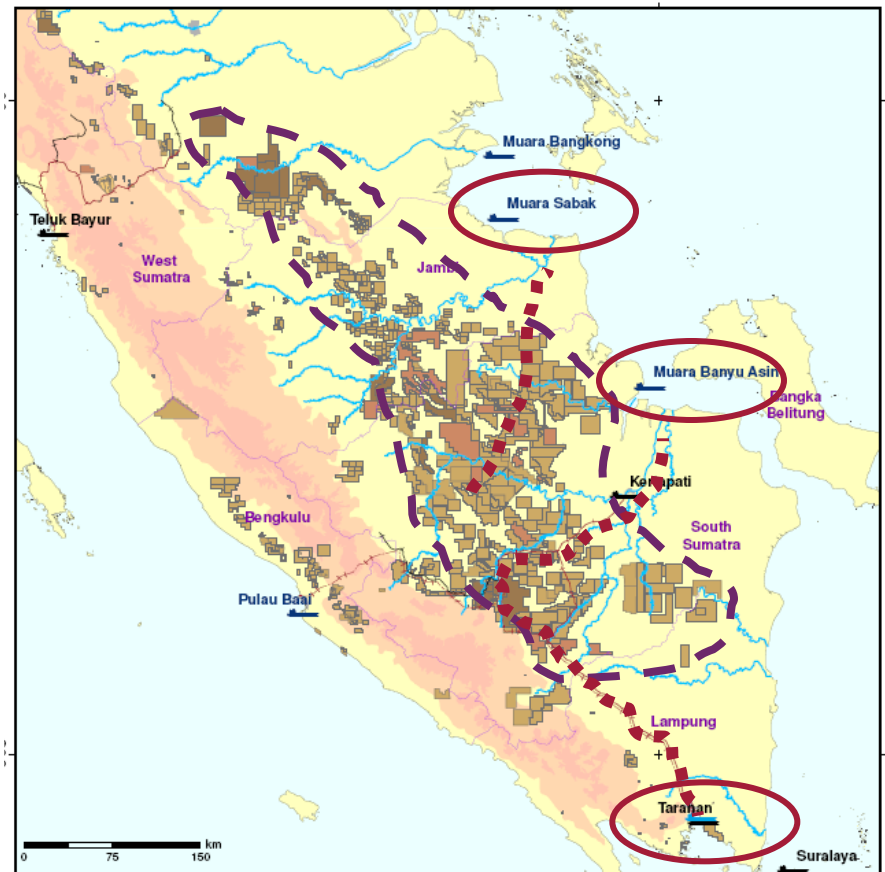
New transport infrastructure is required – even in Indonesia

East Kutai



Source: Wood Mackenzie's Coal Mapping Tool

Sumatra

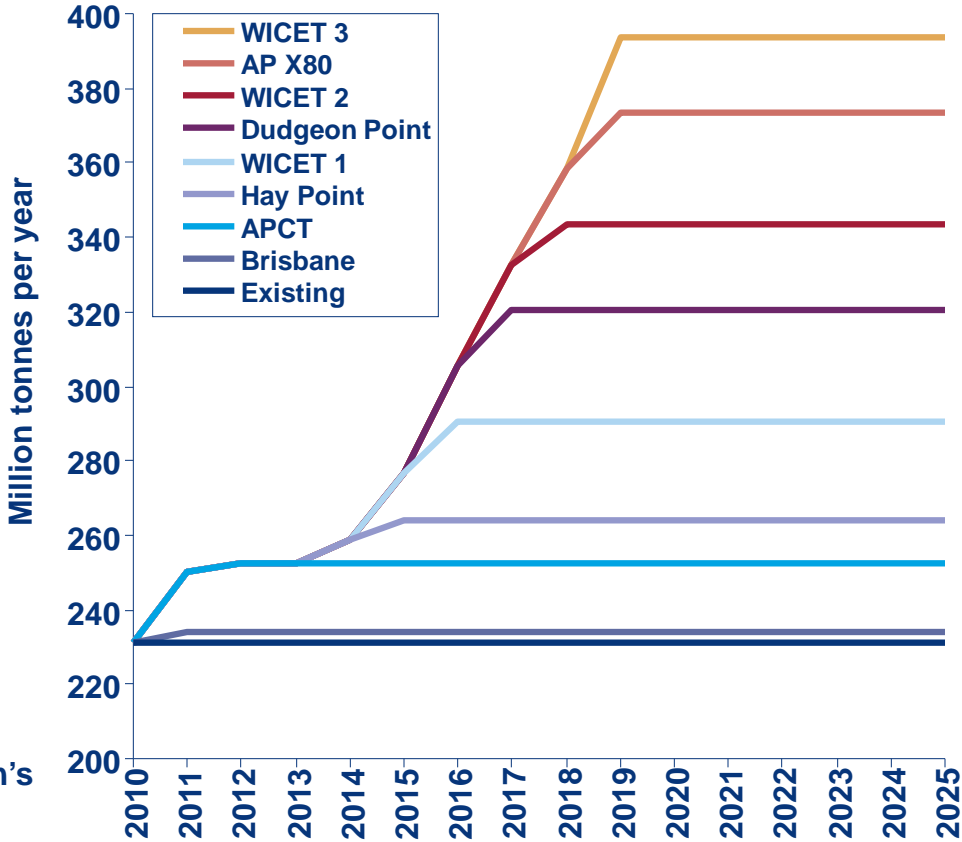
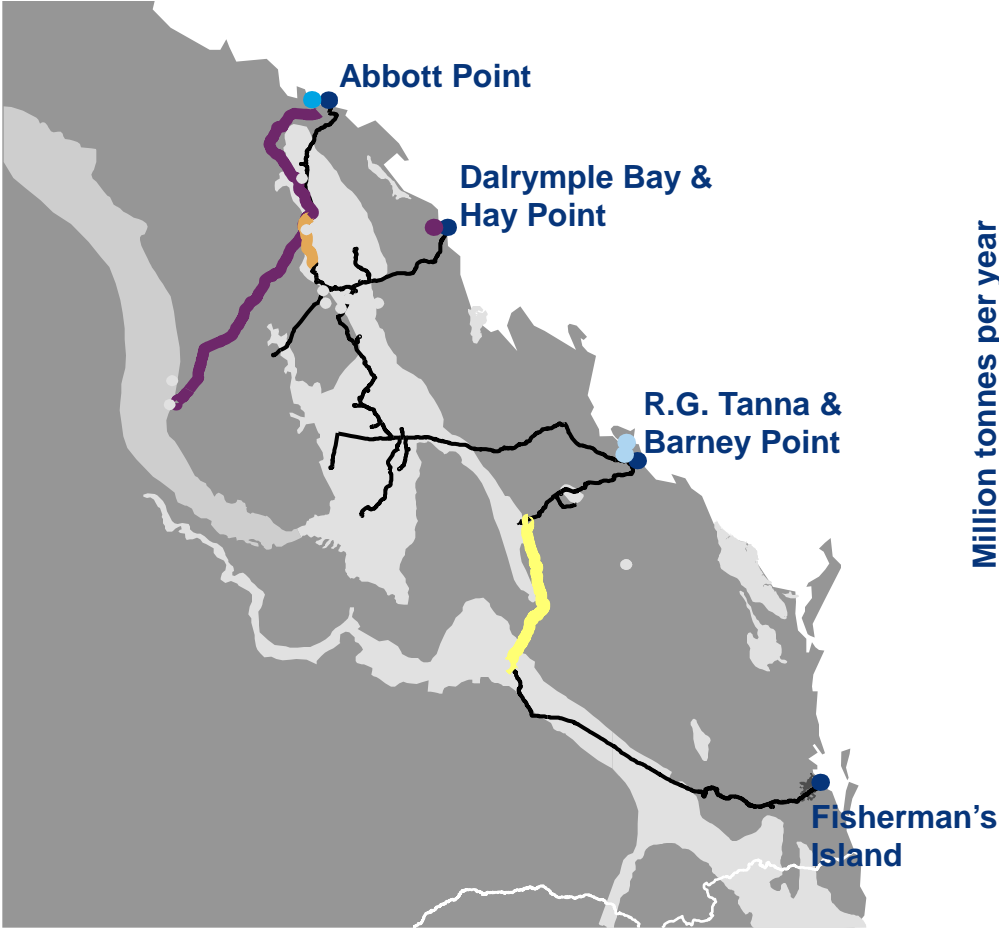


Source: Wood Mackenzie's Coal Mapping Tool

Source: Wood Mackenzie Coal Supply Service

Australian export infrastructure is being transformed

Major port and rail developments in Queensland



Source: Wood Mackenzie Coal Supply Service Australasia

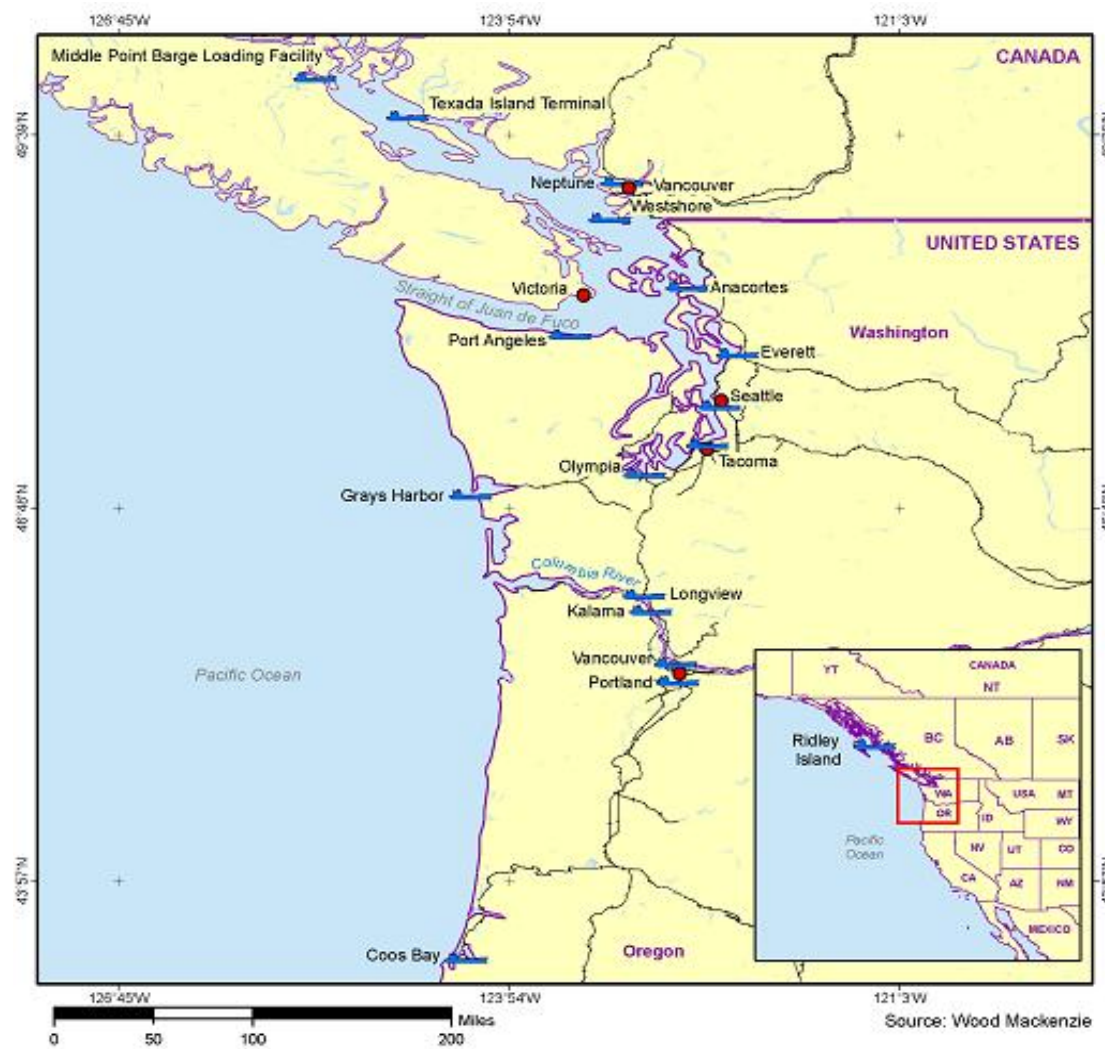
US West Coast Export Potential

> Vancouver has provided hope for PRB exporters:

- Montana PRB has seen most benefit
- Approximately 10 Mt to be exported in 2011

> Future potential?

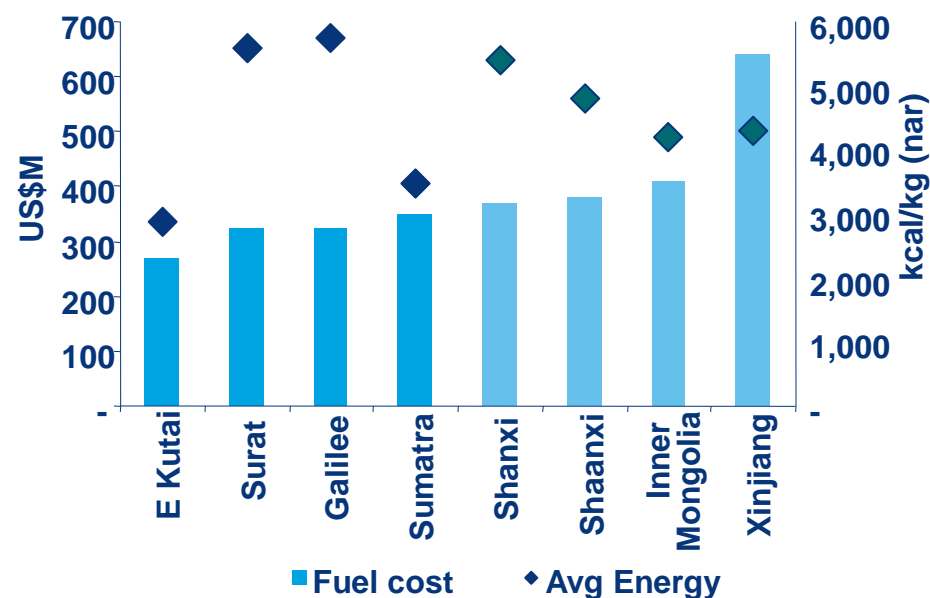
- Coalspur -Ridley
- Millennium Bulk Terminal at Longview
- Further possible locations in Puget Sound or along Columbia River – target 25-30 Mtpa
- Environmental opposition will be strong



All emerging thermal coal basins are cost competitive into southern China

Fuel cost comparison to coastal southern China (in 2010 terms)

	Mtpa	Cash Cost US\$/t	Shipping US\$/t	CIF US\$/t	US\$M
East Kutai	10.0	18.7	8.4	27.1	270
Surat	5.1	49.3	13.8	63.1	323
Galilee	5.0	50.8	13.8	64.6	323
Sumatra	8.2	34.0	8.4	42.3	349
Shanxi	5.3	59.9	9.6	69.5	370
Shaanxi	6.0	54.1	9.6	63.7	381
Inner Mongolia	6.8	49.5	10.3	59.9	408
Xinjiang	6.7	86.2	9.6	95.8	642

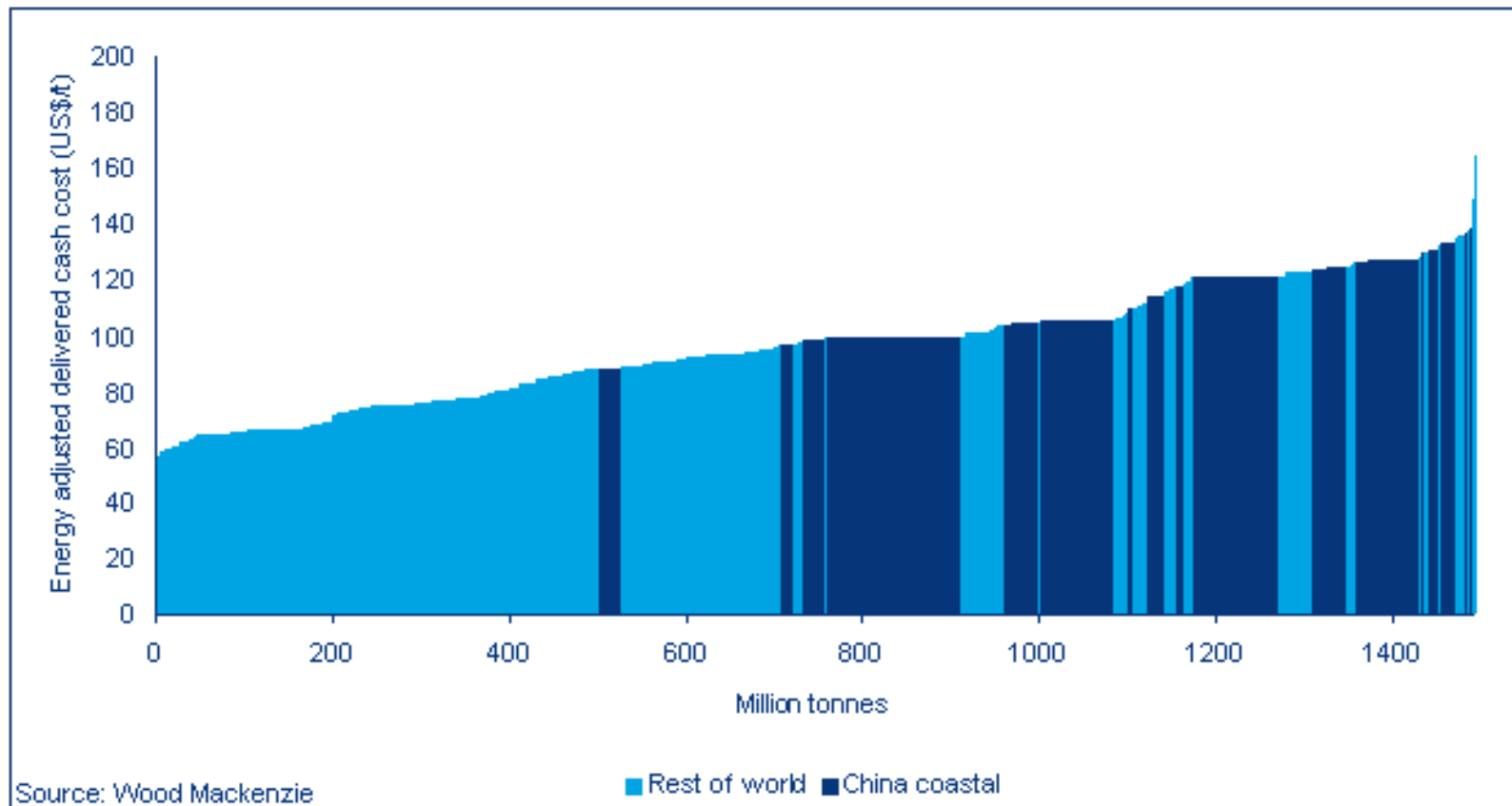


Costs in 2010 terms
 US\$1 = 6.77 CNY
 US\$1 = 1.3 AUD

Source: Wood Mackenzie

Even Chinese coastal supply at high-end of cost curve – driven by RMB appreciation

2015 energy adjusted thermal cash costs – delivered to southern coastal China (US\$/t)



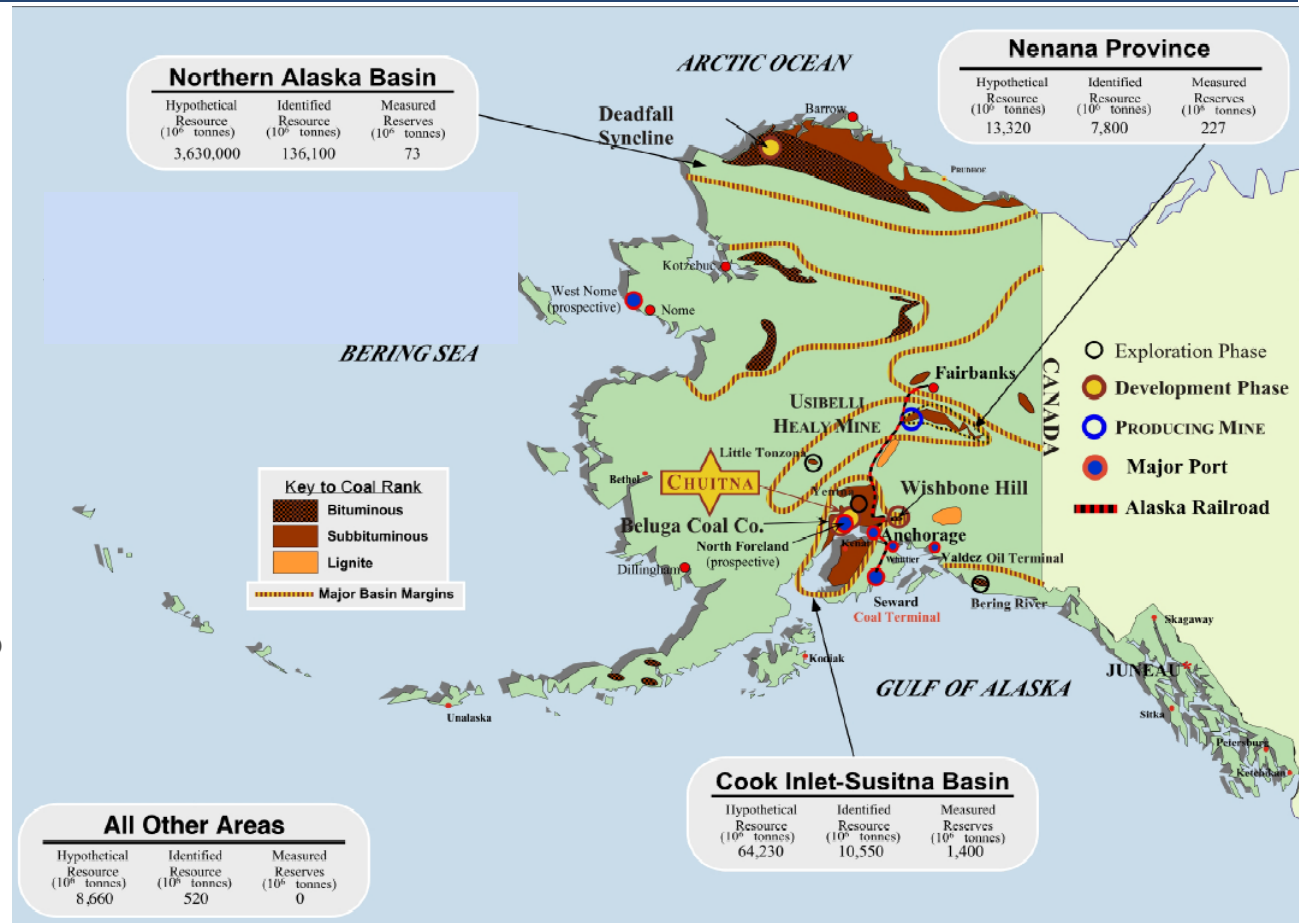
Alaska's Coal Resources



Alaska's coal resources are vast and widely distributed...

Alaska Coal Resources

- > The total identified coal resource base of Alaska has been estimated in excess of 150,000 Mt, which is dwarfed by a hypothetical resource conservatively estimated at nearly 4,000,000 Mt.
- > Coal resources are largely distributed in three major provinces: Northern Alaska - Slope, Central Alaska – Nenana, and Southern Alaska – Cook Inlet.
- > Coal quality varies from primarily bituminous coal and lignite in the Northern Alaska-Slope province to primarily lignite to sub-bituminous coals in the other two provinces.
- > Substantial reserves of low rank coal are available to support both coal gasification and exports



Source: Usibelli Coal Mine, US Geological Survey

...but mining has been limited by lack of infrastructure and ready markets.

Alaska Coal Resources

- › Coal mining has occurred intermittently in the Central Alaska – Nenana and Southern Alaska – Cook Inlet coal provinces.
- › Smaller mines have opened and closed in these regions over the last hundred years
- › Typical coal quality limits Alaskan coal to use in electricity generation and industrial applications. Local markets are generally small and have not supported large-scale expansion. Export opportunities in Asia and South America, while promising, have been limited by lower cost competition in the global thermal market .
- › Currently, only one mine in the Central Alaska – Usibelli’s Healy Mine—is active, producing approximately 1.2 Mtpa of sub-bituminous coal for the domestic and export markets. Expansion potential exists at this mine.
- › Other projects are in various stages of development, including
 - Chuitna Mine – primarily for export market (most likely project to be developed).
 - Beluga Mine – proposed, export and/or gasification.
 - Jonesville Coal Project – proposed, export.
 - Arctic Slope Project – exploration phase.

Source: Wood Mackenzie

Coal quality from Alaska's low-rank mines vs. PRB Montana quality

Proximate Analysis (As-Received Basis)

	Usibelli – Two Bull Ridge	Usibelli – Jumbo Dome	Chuitna	Montana PRB
Total Moisture (%)	27.0	26.0	27.1	24
Inherent Moisture (%)	-	-	16.0	
Ash (%)	8.5	9.0	10.1	5
Volatile Matter (%)	37.6	-	34.8	
Fixed Carbon (%)	27.0	-	27.9	
Sulfur (%)	0.2	0.17	0.16	0.3
Calorific Value (Btu/lb)	7,650	8,000	7,500	9,000

Source: Wood Mackenzie

Ocean freight rates to Japan will be lower than rates from Vancouver but higher than from Indonesia

Export Port	Nautical Miles	Steaming Days
Seward	3,400	10.1
Vancouver	4,306	12.5
Kalimantan (Indonesia)	2,637	8.2

Summary and conclusions

Summary plus risks and challenges

- › Emerging basins will be major sources of future global coal supply
- › Transport infrastructure development is critical - timing and capital cost are key risks
- › Local challenges surrounding mining, transport and environment/regulatory will impact timing of development
- › New supply sources are very competitive, particularly into China and India
- › Major upside potential exists in new areas – including US west coast and Alaska export growth

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- › Jeff Watkins is a consultant with more than 30 years of experience in the coal, utility and energy industries. Formally Head of Coal Consulting for Wood Mackenzie, he was recently appointed Chairman of Coal.
- › Jeff was President of Hill & Associates prior to their acquisition by Wood Mackenzie. Jeff began his career as an exploration geologist for AMAX Coal Company. While there, he evaluated acquisition prospects throughout the US and South Africa. As Vice President of BXG, Inc. from 1980 to 1986, he managed the firm's international coal supply studies and consulted on numerous domestic and international coal development and utility marketing projects.
- › Jeff received a BA in Geology from Wittenberg University in 1969 and an MS in Geology from Duke University in 1971.

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