What lies ahead for global coal?

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Why Wood Mackenzie?

Greater granularity
Our valuation, costs and markets analysis deliver data on the full coal value chain in its most detailed and comprehensive form.

Robust data
Our proprietary data is subject to rigorous internal and external examination to help provide an independent and objective view.

Macroeconomics
We use a set of detailed proprietary models to project economic development to 2035, drawing on our commodity outlook, demographic projections and investment and productivity analysis on each major economy.

Forward-thinking
The bottom-up approach we apply to our analysis lets us spot trends, risks and opportunities before anyone else so you can forecast in context. Our long-term reports look to 2035 so you can identify opportunities and risks as part of your planning process.

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Maximise current and future investments with our analysis of costs, reserves, production, infrastructure, coal quality and mine valuations.

- **Corporate Analysis**
  - Launching our new M&A deal pipeline

- **Cost Drivers**
  - COST CURVES by geographical area and coal product types
  - COST DRIVERS and industry performance trends

- **Forecasts to 2064**
  - IN-DEPTH MINE ASSET REPORTS
  - Detailed OPERATING and CAPITAL cost estimates – past, present & future

- **Forecast for Life of the Mine**
  - 15 countries
  - 8 regions
  - >1,400 assets, including 400+ greenfield projects
  - Topical issues and key industry events

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With this single online resource, you can:

- Understand the full value chain, from project appraisal, mining and processing, through to transport, port infrastructure and fiscal frameworks
- Identify commercial opportunities by analysing sources and costs of supply in coal-producing regions
- Screen and identify growth opportunities, including new production expansions and M&A
- Evaluate competitive positions by benchmarking individual mines and company portfolios
- Carry out strategic planning by reviewing production and cost forecasts
- Get comprehensive analysis on emergent trends globally

Wood Mackenzie
Coal Market Service
Further your strategic planning with our in-depth analysis and forecasts of coal market fundamentals at the global and regional level.

This content is available to purchase. Your company can opt to subscribe to this content for individual regions, or coal types.

With this single online resource, you can:
- Analyse supply, demand and price fundamentals by coal type, within and between markets
- Identify shifts in trade patterns and potential implications for regional and global coal markets
- Understand market dynamics including revenue and demand potential for different coals
- Estimate how future coal trade flows and prices unfold on the basis of fundamental supply and demand conditions
- Present market demand and supply views to assist with business planning
- Analyse demand, supply and price issues on a global and country level

Coverage:
- North America: Plant-level coal prices and coal purchases
- China & India: Regional-level demand & supply analysis
- Ocean freight forecast
- Global and country-level supply-demand balances
- Outlook for infrastructure
- Seaborne, thermal & metallurgical trade
- Forecasting:
  - Short-term supply, demand & price forecasts Out 18-24 months
  - Updated monthly
  - Updated bi-annually

Wood Mackenzie
Agenda

1. A brief history of time (the last 15 years)
2. The state of today’s coal markets: where next for China?
3. Looking ahead: when does demand return, and where?
4. What do these trends mean for costs and prices
Coal prices traditionally supported by marginal cost of production…

…but these are non-traditional times for metallurgical and thermal coal markets
Seaborne coal trade ground to a halt in 2014, with China turning negative for the first time since becoming a net importer

Total met and thermal imports: 2015 demand continues to look weak

And yet, supply overcapacity is still a chronic problem

Source: Wood Mackenzie Coal Market Service
China – coal’s largest growth engine – is undergoing a major restructure in politics and economics

Environment, energy, and anti-corruption are three focus areas

**Energy**
- APPCAP policies
- Ultra low emissions
- NEA re structure

**Market**
- Steel/coal overcapacity
- Price reform
- 4th Plenum

**Anti - Corruption**
- Policy shift
- ‘Tigers and flies’
- Energy sector ‘freeze’

*Source: Wood Mackenzie Energy Markets Service*
And Chinese coal markets were rocked by uncertainty in 2014

Six distinct policies/edicts affecting Chinese and global coal markets, now and into l-term
All impact thermal coal, some impact metallurgical coal

Environmental Policy

01. APPCAP evolution
02a. Coal quality standards
02b. Trace elements

Domestic Protectionism

03. Import Tariffs - FTA
04. Domestic production reform
05. NDRC import cuts
06. Export tax reduction
Significant crude steel and hot metal production growth still promises an improved mid-to-long term outlook

The recovery should begin in 2016, but will not gather pace until 2018

- Urbanisation and industrialisation in China and India remain the key facilitators of crude steel, hot metal and coke production growth
- Chinese peak steel and hot metal continues to reside in late-2020 timeframe
- Attention moves to India as quantity/quality of domestic production and maturation of industry far behind that of China

Global steel, hot metal production & coal import demand

Net change in hot metal production 2014 to 2035 (Mt)

Source: Wood Mackenzie Steel Market and Coal Market Services
In China: new energy policies have already accelerated the shift of energy-intensive industries from eastern to western provinces

% of China total

Source: China National Bureau of Statistics, Wood Mackenzie
Coastal China saturation a key threat, but stronger growth in coal fired capacity in Western provinces

Coal’s contribution to power sector falls to 60% with downside risk

Power generation by fuel-type (TWh)

Thermal demand by region (Mt)

Source: Wood Mackenzie
Supply: Debottlenecking through the northern routes allows for additional volume to reach coastal provinces

Room for both domestic supply and imports: Seaborne imports reach 680 Mt by 2035

Timely development of India’s infrastructure capacity and monetizing coal assets will be crucial to meet domestic production targets.

Rapidly increasing thermal demand in coastal locations will support imports.

**Coal transport infrastructure (now and into future)**

- Seaborne imports reach 550 Mt by 2035
- Washing capacity to expand by ~300 Mtpa to overcome high ash levels

**Source:** Wood Mackenzie

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Washing capacity to expand by ~300 Mtpa to overcome high ash levels.
EMEA* coal plant retirements arrive in two waves.
LCPD (40 GW – majority has passed), IED comes next (40 GW)

Almost all new named plants beyond 2016 are in Poland and Turkey.

Coal’s share of the power sector plummets to 10% after the IED.

*EMEA: Europe, EU accession + MENA
Source: IEA & Wood Mackenzie
Suppliers: Indonesia / US benefit from growing low-rank coal demand, and Australia dominates bituminous and met markets

But not without key risks

- “Illegal” mining in Indonesia being addressed
  - ET Batabura
  - Royalty payments slip, now LoC draft
  - Fewer surveyors

- US PRB faces growth but some key risks
  - Port construction / permitting
  - Declining domestic demand
  - Lack of appetite for financing at current prices
  - Royalty revision

- Australian expansion in met markets
  - Focused on winning back market share from US/Canadian exporters
  - Laser focus on cost reductions and assistance from FX

Cost evolution: FX is and will have significant impact on the US, providing relief on tight margins, especially in Russia

Operating margins –
Russian export thermal coal (US$/t)

Operating margins –
Russian export metallurgical coal (US$/t)

Source: Wood Mackenzie Coal Supply Service

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…plus the impact of the oil price slide (as it translates through to diesel costs)

Largest impact is in Indonesia where reduction in cash costs could be up to US$8/t

**Source:** Wood Mackenzie Coal Supply Service

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Will 2015 finally provide the floor for prices in the coal market? And how do US coal exports fare in the new environment?

Critical market risks centered around the pace of industrialisation, structure of Asian s/d, and penetration of meaningful, scalable alternatives in power markets.

Prices – only recover meaningfully when excess supply capacity wound down

US exports – languish before growth (although PRB risks well established)

Source: globalCOAL and Various Pricing Surveys (History), Wood Mackenzie Coal Market Service (Forecasts)
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- Jonathan has 14 years experience analysing energy markets: including coal, gas, LNG and power. He currently directs 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, Jonathan 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, Jonathan 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.

- Jonathan holds a BA (Hons) and MA (Hons) in Physics from the University of Oxford, UK.
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