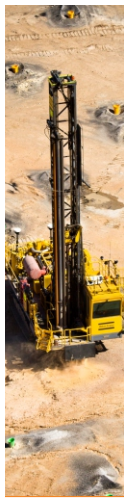
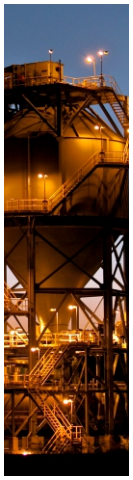
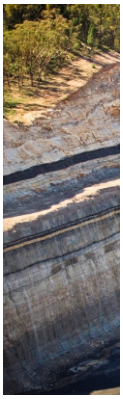
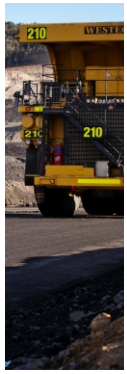

MOOLARBEN COAL COMPLEX
OC3 EXTENSION PROJECT

SECOND AMENDMENT REPORT

APPENDIX E

MOOLARBEN EXTENSION MARKET ANALYSIS

YANCOAL
兖煤澳大利亚有限公司
MOOLARBEN COAL

APRIL 2026

Moolarben Extension Market Analysis

Prepared for Yancoal

November 2025

Who we are

Wood Mackenzie is the global insight business for renewables, energy and natural resources. Driven by data. Powered by people.

In the middle of an energy revolution, businesses and governments need reliable and actionable insight to lead the transition to a sustainable future. That's why we cover the entire supply chain with unparalleled breadth and depth, backed by over 50 years' experience in natural resources. Today, our team of over 2,100 experts operate across 30 global locations, inspiring customers' decisions through real-time analytics, consultancy, events and thought leadership. Together, we deliver the insight they need to separate risk from opportunity and make bold decisions when it matters most.

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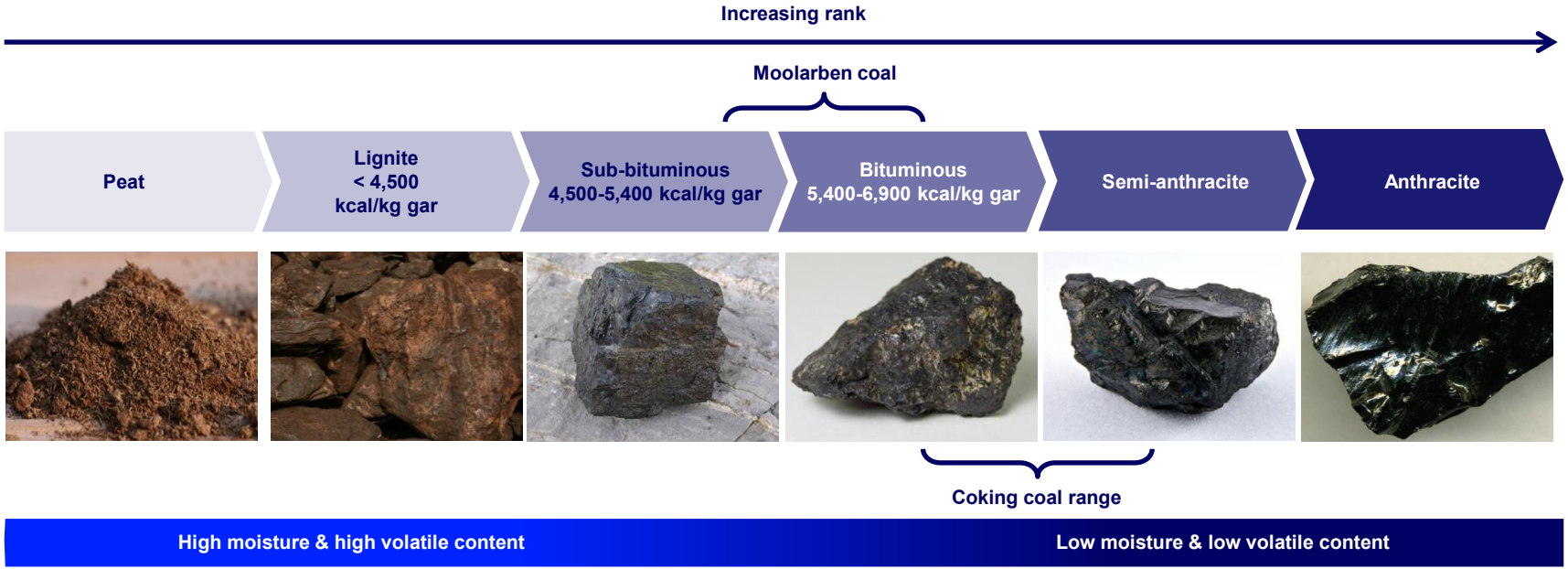
Coal is a varied product with a wide range of quality specifications which impact its end use, pricing, and emissions.

Thermal coal from Australia is high quality, high energy bituminous coal, and product from Moolarben is high ash bituminous coal with an energy content of 5,500 kcal/kg (nar), useable in a wide range of power stations.

Thermal coal quality

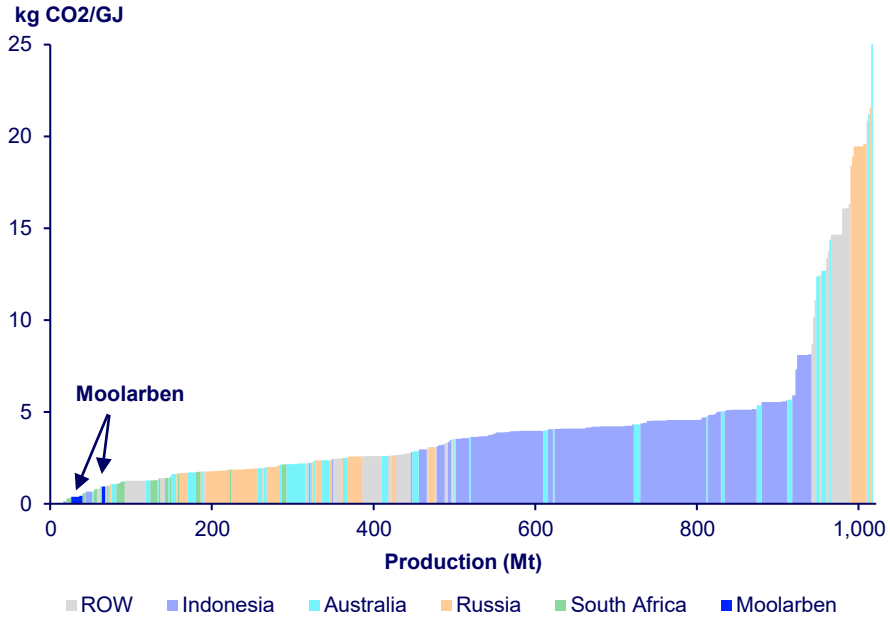


Source: Wood Mackenzie

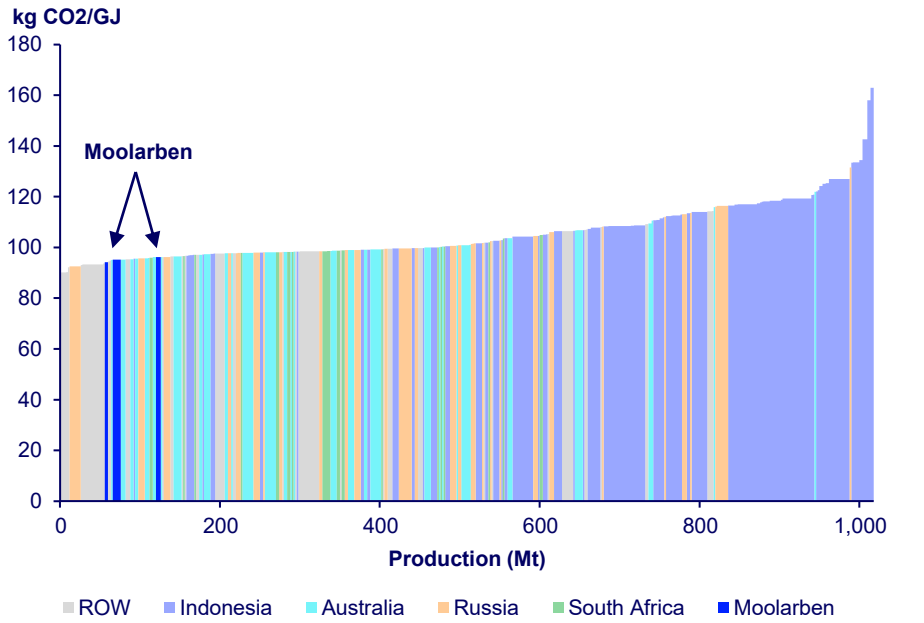
Moolarben has amongst the lowest Scope 1 and 2 emissions for seaborne suppliers globally and is one of the lowest emissions intensity coal mines in Australia.

Moolarben has low fugitive emissions and good productivity due to a low strip ratio, thick single coal seam, and modern and efficient mining methods, while its high quality results in low Scope 3 emissions.

2030 seaborne thermal coal emissions curve – Scope 1 & 2

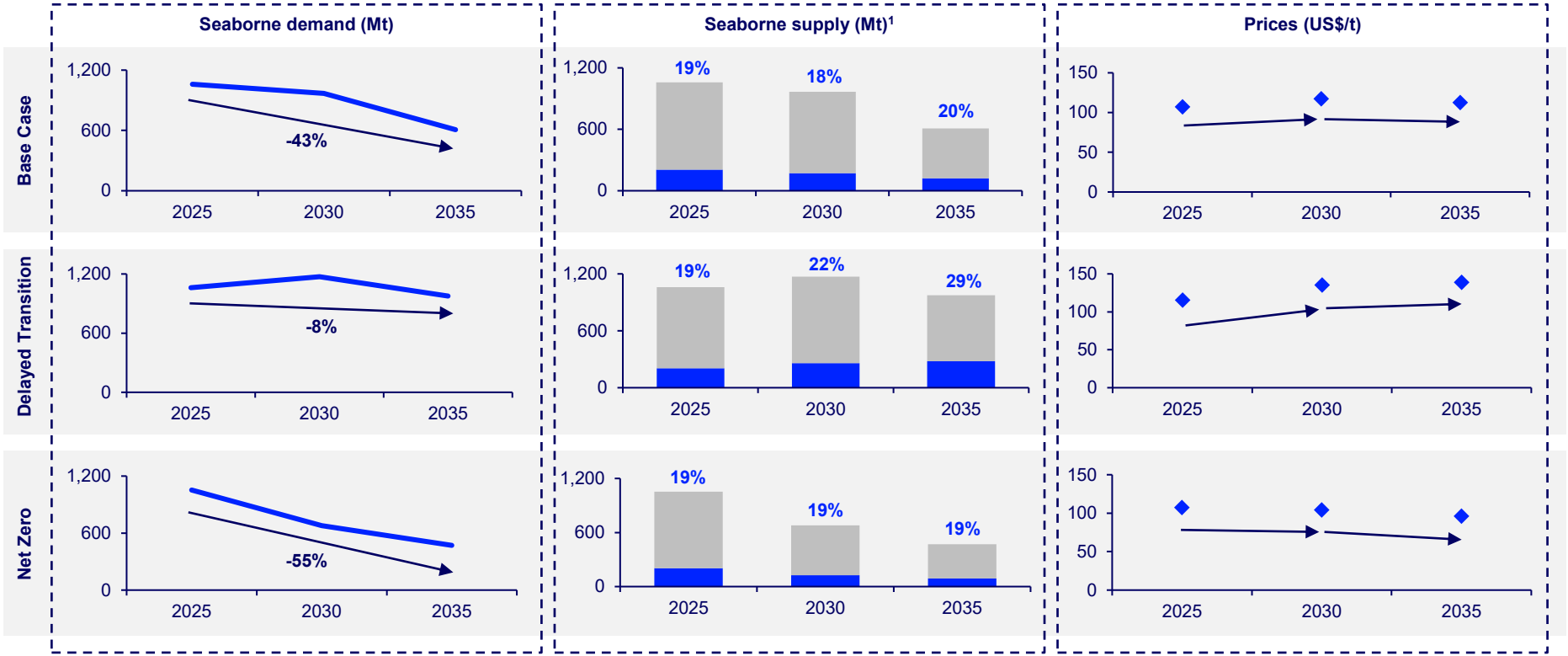


2030 seaborne thermal coal emissions curve – Scope 1-3



Source: Wood Mackenzie

Seaborne thermal coal demand will continue with an ongoing need for Australian coal despite a decline driven by decarbonisation and increased domestic coal use in China.

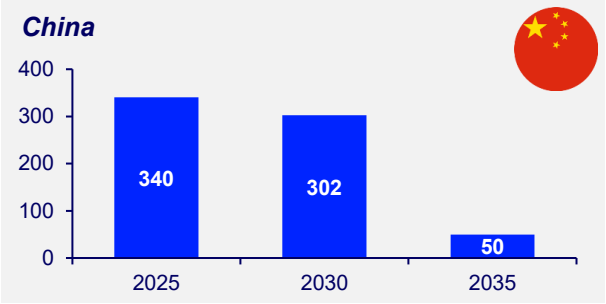


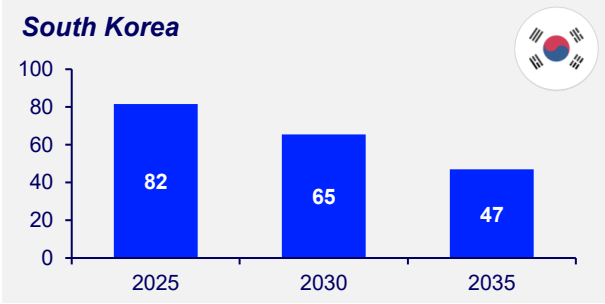
Notes: (1) The supply stack includes a range of mine extensions.
Source: Wood Mackenzie

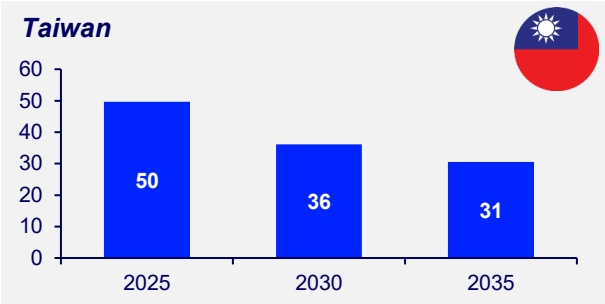
Many of the key markets Moolarben serves will have resilient coal demand, with a combined 290 Mt of demand in 2035, of which 38% will come from Australia.

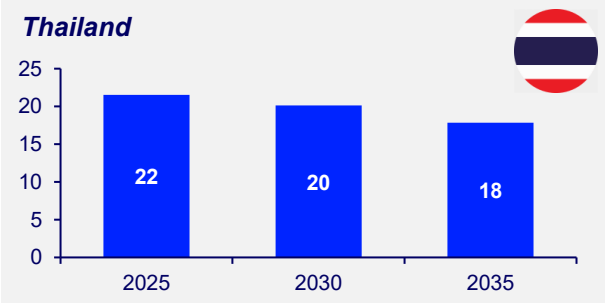
Demand in these markets will remain resilient through to 2035 under all scenarios, and these markets will continue to prioritise the use of low emission, high energy coal.

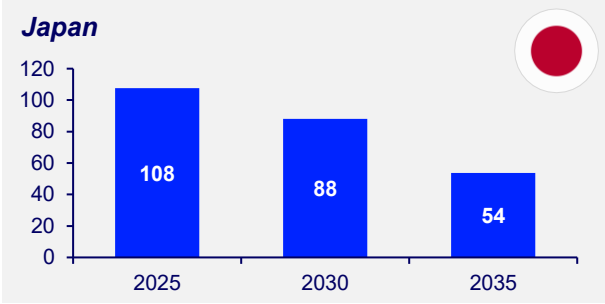
Seaborne thermal coal demand – key markets (Mt)

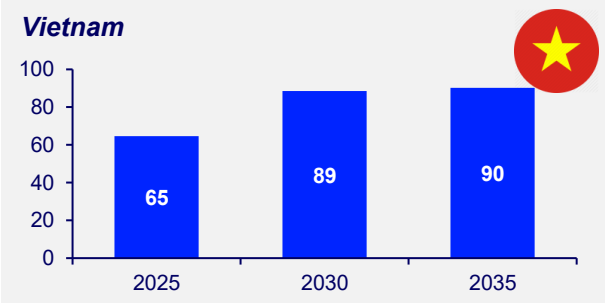








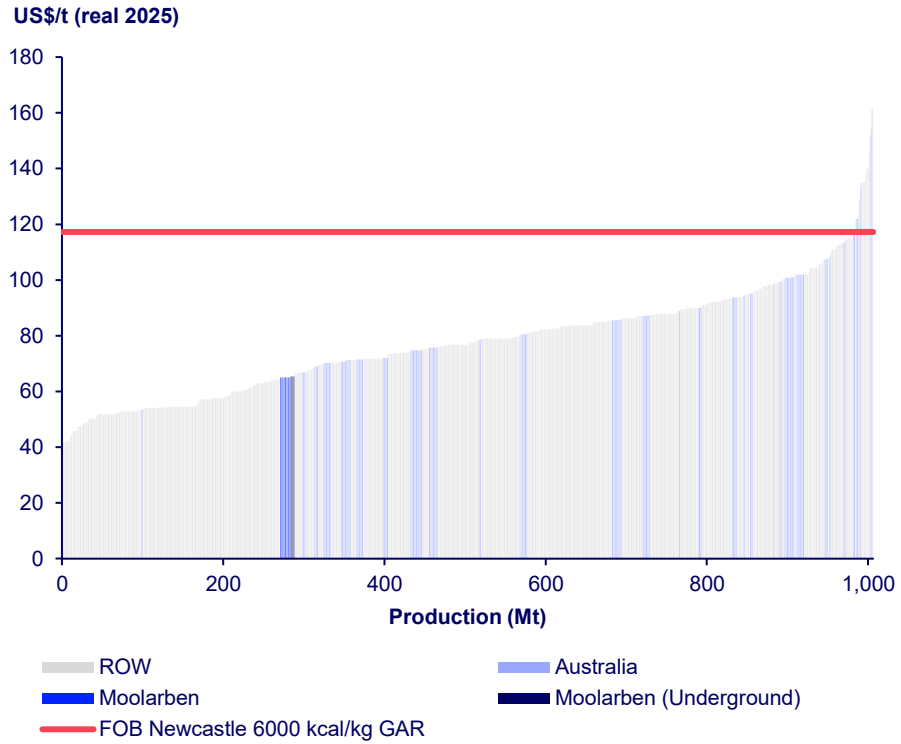




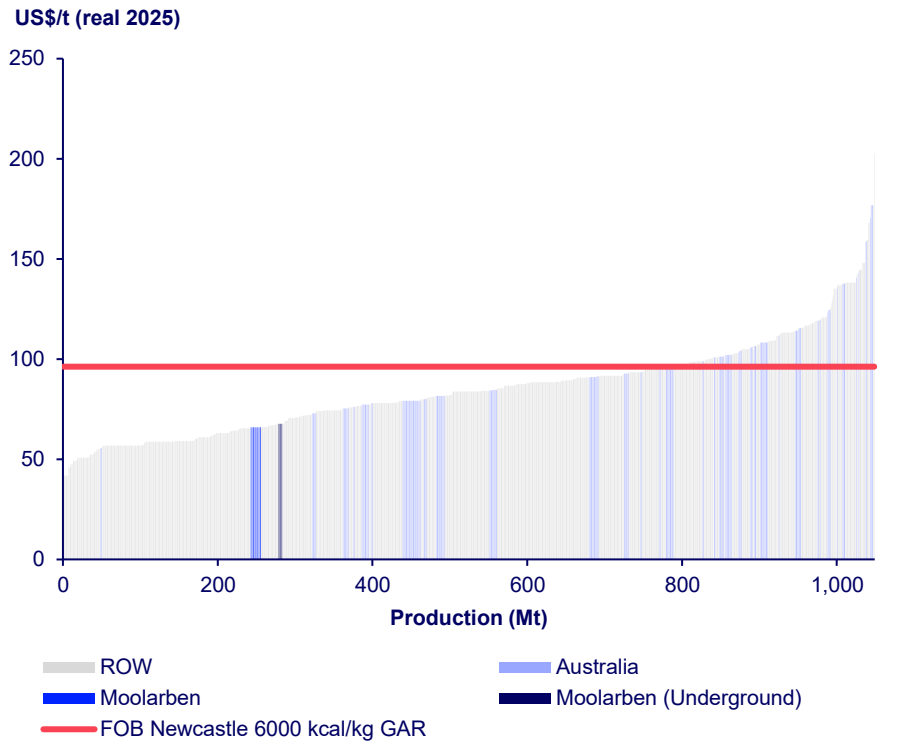
Source: Wood Mackenzie

As a low-cost producer, Moolarben is expected to remain competitive even under lower demand, lower price environments.

Seaborne thermal coal cost curve (energy adjusted, 2030, Base Case)



Seaborne thermal coal cost curve (energy adjusted, 2030, Net Zero)

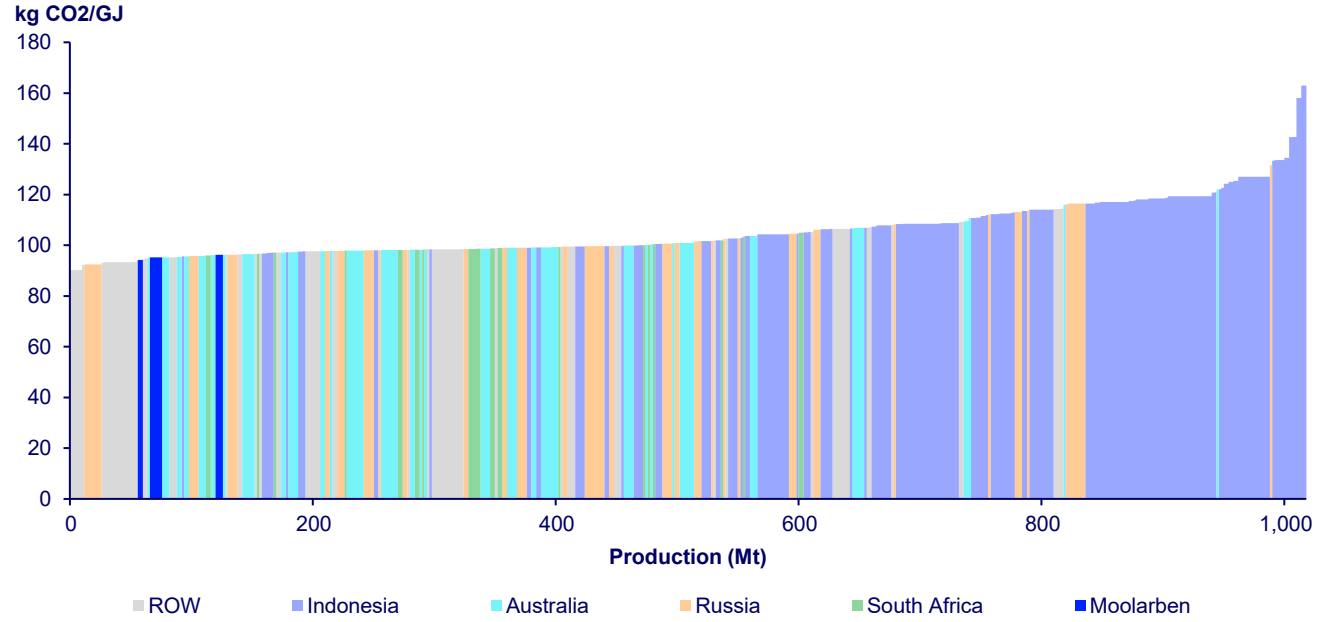


Note: Includes carbon pricing
Source: Wood Mackenzie

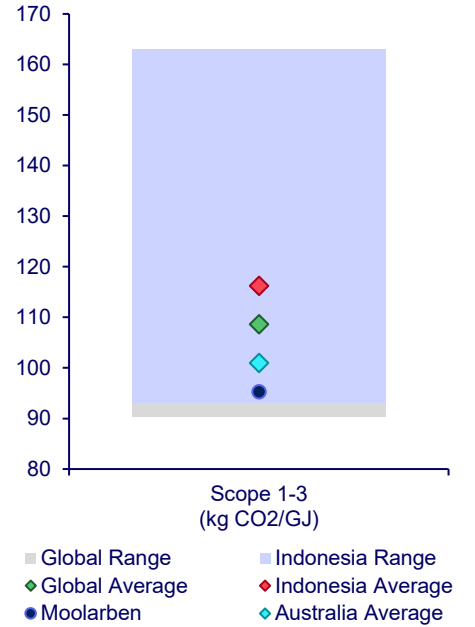
The seaborne thermal coal market is demand driven, meaning that if Moolarben were not to proceed the supply gap would likely be filled by another thermal coal producer.

Given Moolarben is one of the lowest emissions intensity coal mines globally, this would likely result in supply coming from a more emissions-intensive producer.

Seaborne thermal coal emissions curve 2030 – Scope 1-3



Emissions benchmark – Scope 1-3



Source: Wood Mackenzie

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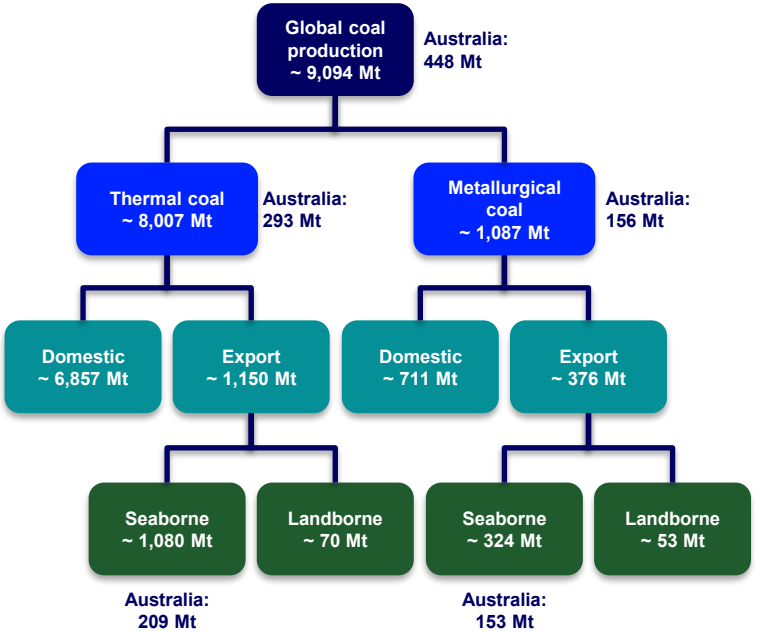
While coal is an abundant resource, occurring on every continent, not all coals are of sufficient quality for seaborne trade.

Yancoal produces high quality seaborne thermal coal.

- The three largest producers are China (2024: 4,787 Mt), India (1,064 Mt), and Indonesia (804 Mt), with the largest seaborne suppliers being Australia (2024 exports: 361 Mt), Indonesia (563 Mt) and Russia (206 Mt).
- A significant volume of coal is consumed in its country of origin and in 2024, only 17% of coal produced was traded on the seaborne market, with 1% being landborne trade and the remainder domestic production.
- There are two main end uses for coal – either making steam for electricity generation (referred to as thermal coal) of using the carbon content in the coal for reducing metal ore to metal (metallurgical coal). In the seaborne market thermal is primarily classified based on its energy content with higher energy coals commanding a market premium. Energy content is driven by the geological processes which form the coal and coals are described by their position on the coalification scale with lignite/ low-rank coals being the lowest in energy followed by sub-bituminous, bituminous and anthracite.
- Apart from the energy content, coal is also classified by contaminants that occur naturally through the formation process. Ash content (which is mineral matter within the seam) is non-combustible and both lowers the energy content and can cause issues during and after combustion. Coal can be washed to remove ash or sold as a high ash product to consumers who are price sensitive and more tolerant of ash after combustion. Moolarben produces both high energy coal and higher ash high energy coal.
- Coal is produced either by surface or underground methods. Surface mining involves removing the overburden layers to expose the seam with rehabilitation taking place after mining. Underground methods access the seam through tunnelling or shafts and typically produce from deeper seams. Open cut methods are typically lower in emissions than underground mining.

Coal production by use (2024)



Source: Wood Mackenzie

The seaborne market for coal can be divided into two sub-markets geographically; the Atlantic and Pacific basins.

Yancoal is a major participant in the thermal coal trade and is a trusted supplier for many of Australia's trade partners.

- The seaborne market for coal can also be divided into two sub-markets geographically, based around the Atlantic and Pacific basins. The two markets are relatively segregated, primarily due to the relative cost of shipping between them. However, some inter-basin trade does occur, either due to quality considerations or when freight and price differentials allow exporters to compete in non-traditional markets.
- Pacific Basin trade accounts for over 85% of the seaborne market, with Indonesia and Australia being the largest suppliers. The developed Asian economies of Japan, South Korea, and Taiwan (JKT) have traditionally been the principal Pacific Basin importers, however demand from these markets has declined in recent years. Previously the most significant driver of growth in the region, China's demand for imported coal is slowing as it focuses inward on domestic production and maintains its protectionist policies. Demand growth will instead be concentrated in the developing economies of India and Southeast Asia (SEA).
- Russia was previously a large exporter, but its exports have fallen as a result of sanctions following the invasion of Ukraine. Wood Mackenzie expects Russia's exports to be redirected to Asia, particularly China and India, although eastbound rail capacity constraints will limit upside in the near term.
- SEA countries with seaborne coal demand are Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam.

Like most markets coal buyers make purchases based on price, volume and product quality requirements although there are some specific drivers for thermal coal.

Coal quality: Thermal coal, used in power stations, is procured based on the boiler design of the power plant. Not all types of coal available in the market can be used by an individual power plant. For example, China prefers bituminous and sub-bituminous coal based on the boiler design of the power plants for which coal is imported. India generally imports low- to mid-calorific value coal as power plants in India are designed to burn sub-bituminous coal similar to that produced domestically. Japan prefers higher energy low ash coals as ash disposal is expensive in Japan due to competing land use requirements.

Price: The price of coal is usually a factor of the spending power of electricity consumers in the country. Generally, wherever the fuel price is passed on to end consumers, the price of coal is not considered a major factor. In cases where the government subsidises power, the coal price becomes a critical factor.

Supply security: Energy security is increasingly a focus for governments. Countries with domestic supply tend to purchase seaborne coal to supplement their needs while countries such as Japan, South Korea and Taiwan require long term secure supply.

International trade: Trade disputes and sanctions can also impact and distort the seaborne thermal coal market.

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Source: Wood Mackenzie

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Carbon emissions can be divided into Scopes 1, 2, and 3 depending on their source.

For coal miners, the vast majority of value chain emissions are Scope 3 emissions related to the use of coal in power generation or other industrial activities.

Scope	Definition	Components – thermal coal mining
Scope 1	Scope 1 emissions are direct greenhouse gas (GHG) emissions from sources directly owned and controlled by the entity, such as emissions from combustion in stationary and mobile installations, and industrial processes. Scope 1 also includes fugitive emissions.	 Onsite vehicles  Fugitive emissions  Explosive use and mine fires  Onsite machinery
Scope 2	Scope 2 emissions refer to indirect GHG emissions that occur during the generation of electricity used to power an operation.	 Purchased electricity
Scope 3	Scope 3 emissions refer to other indirect GHG emissions that are the consequences of an entity's activities but occur at sources not owned or controlled by the entity, such as emissions from the production and transportation of purchased materials, as well as the transportation and end-use of products.	 Purchased goods & services  Business travel  Employee commutes  Product transport  Product shipping  Employee housing  Transport & distribution  Leased assets  Power generation  Other industry*

Source: Wood Mackenzie

There are a wide range of quality specifications that impact the use, pricing, and emissions of a specific coal…

Coal quality parameters

Parameter	Definition	Significance	Directional preference
Specific energy (SE)	SE is the energy in kilocalories released when a kilogram of coal is burned.	SE is the key quality parameter for pricing purposes. It defines the energy a coal can produce.	Higher
Total (TM) and inherent (IM) moisture	TM is the moisture in the coal as sampled and removable under standard conditions and comprises both inherent and free moisture; IM is the moisture bound within the coal pores or chemically attached to the organic coal matter.	Moisture is a costly dilutant, as it consumes heat from the furnace during combustion, and increases freight costs per unit of energy; high moisture levels may also result in handling problems.	Lower
Volatile matter (VM)	VM is the gaseous component of the coal (excluding moisture) that is released when the coal is combusted; it comprises mainly methane and other light hydrocarbons.	Coals with a higher VM content are easier to ignite and burn out well, so are generally preferred for power generation, however if VM is too high it can cause issues such as spontaneous combustion.	Within a range
Ash	Ash is the inorganic residue remaining after the coal has been combusted.	High ash coals lead to higher ash disposal and maintenance requirements; depending on the chemical composition of the ash, the potential for fouling and slagging in the boiler may be increased.	Lower
Fixed carbon (FC)	FC is the solid residue (excluding ash) remaining after the volatile matter has been expelled from the coal.	FC content gives a rough estimate of coke or char yield.	Higher
Total sulphur (TS)	TS comprises both an organic component that is part of the carbonaceous material, and an inorganic component that is part of the mineral matter; forms sulphur oxides (SO_X) during coal combustion.	Sulphur is an unwanted contaminant as it forms SO_X. Most countries regulate SO_X emissions, with some power utilities required to install sulphur scrubbers to stay below emission limits.	Lower
Hardgrove Grindability Index (HGI)	HGI is a measure of hardness that indicates a coal's relative grindability or ease of pulverisation (relative to standard reference coals); a high HGI indicates that a coal is easy to grind and vice versa.	Low HGI (hard) coals are more difficult to mill to the size required by the boiler, increasing milling energy requirements (and costs). High HGI (soft) coals may generate excess fines, resulting in handling and moisture absorption problems.	Within a range
Ash Fusion Temperature (AFT)	These are the temperatures at which various stages of melting (from initial deformation to 'flow') of the ash produced by a coal occur.	AFT indicates whether or not the ash produced will cause slagging in the boiler during combustion, so coals with higher AFT are preferred.	Higher

Source: Wood Mackenzie

…which vary significantly across different coal types, driving differences in value-in-use pricing and Scope 3 emissions profiles.

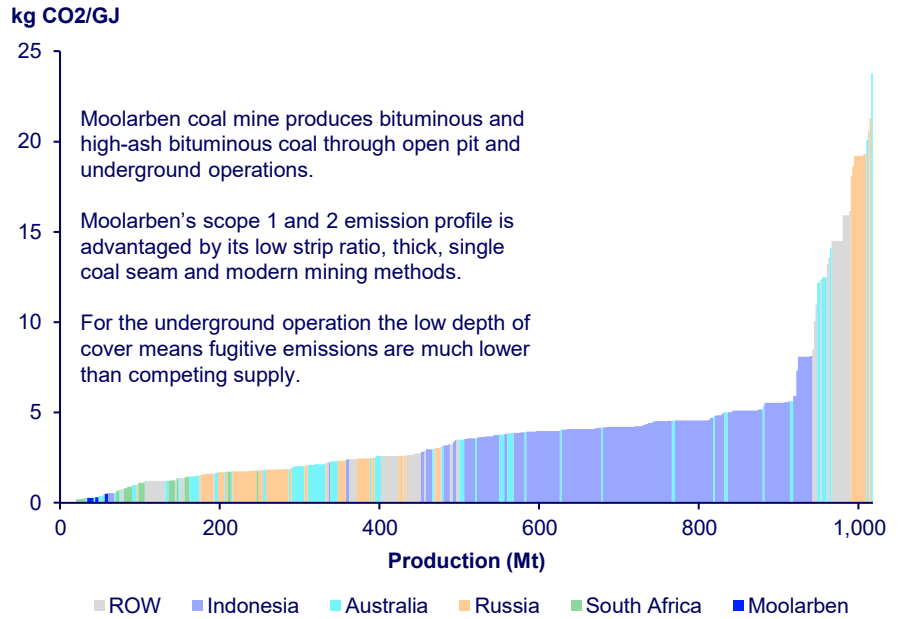
Coal type	Country	Benchmark coal brand	Specific energy (basis, kcal/kg, nar)	Ash (max %, ar)	Total moisture (max %, ar)	Volatile matter (%, ar)	Sulphur (max %, ar)	HGI	Approx. Scope 3 emissions intensity (t CO_{2e}/t)	Scope 3 emissions intensity (t CO_{2e}/GJ)
Bituminous	Australia	NEWC 6000	6,000	14%	15%	27% – 35%	0.75%	45 – 70	2.35	93.35
Bituminous	South Africa	RB1	6,000	15%	12%	22% Min	1.00%	45 – 70	2.37	94.42
Bituminous high-ash	Australia	Australian High-Ash	5,500	23%	15%	23% – 32%	1.00%	45 – 70	2.12	91.97
Bituminous high-ash	South Africa	RB3	5,500	23%	14%	20% Min	1.00%	45 – 70	2.14	92.85
Bituminous	Indonesia	ICI2	5,500	10%	18%		1.00%		2.18	94.61
Sub-bituminous	Indonesia	ICI3	4,600	8%	30%		1.00%		1.93	100.16
Lignite	Indonesia	ICI4	3,800	6%	40%		0.40%		1.77	111.26

Source: Wood Mackenzie, globalCOAL, Argus Media

Miners with the highest emissions are typically underground operators with high fugitive emissions; many of these are located in Russia and the USA.

Moolarben has very low Scope 1 and 2 emissions compared to seaborne suppliers globally, having low fugitive emissions and good productivity.

2030 seaborne thermal coal emissions curve – Scope 1

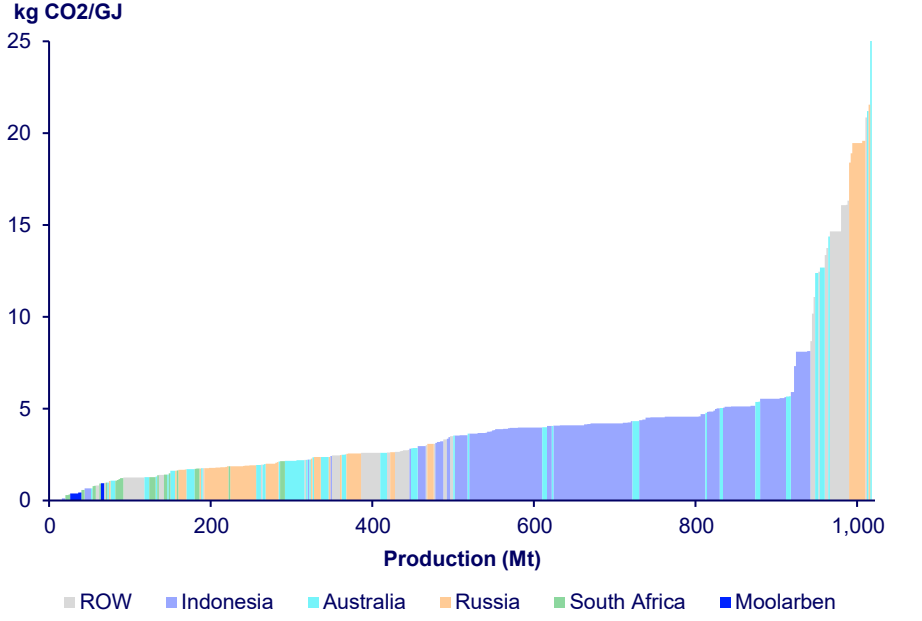


Moolarben coal mine produces bituminous and high-ash bituminous coal through open pit and underground operations.

Moolarben's scope 1 and 2 emission profile is advantaged by its low strip ratio, thick, single coal seam and modern mining methods.

For the underground operation the low depth of cover means fugitive emissions are much lower than competing supply.

2030 seaborne thermal coal emissions curve – Scope 1 & 2

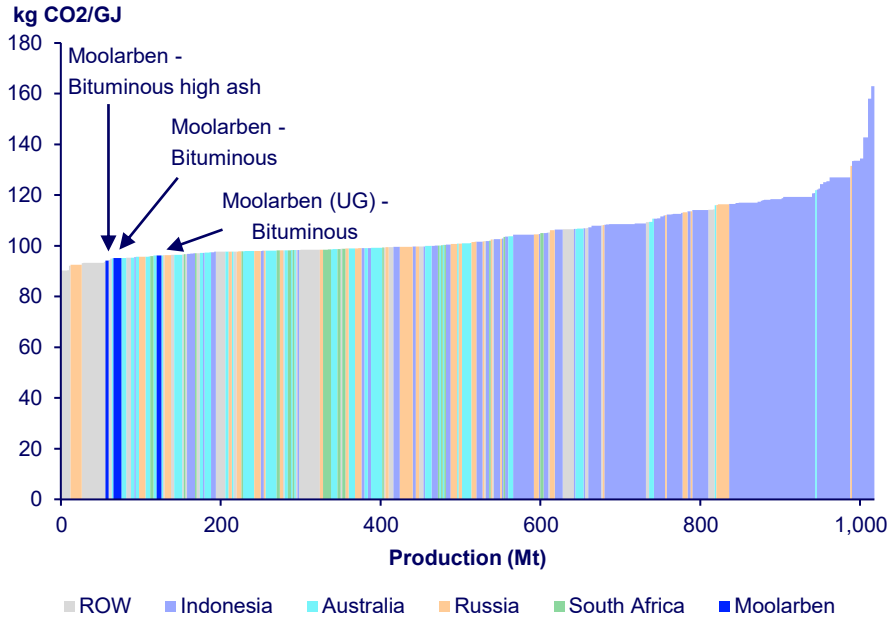


Source: Wood Mackenzie

Total thermal coal emissions tend to increase with decreasing quality of coal, making anthracite the lowest emissions intensity coal and lignite the highest.

Moolarben has amongst the lowest emissions of coal available on the seaborne market, driven by its high quality and low direct emissions.

2030 seaborne thermal coal emissions curve – Scope 1-3



- Thermal coal emissions and coal quality generally have an inversely proportional relationship: the higher the rank of coal, the lower the emissions during combustion on an energy basis.
- Combustion of coal falls under the Scope 3 category of emissions calculation, causing Scope 3 emissions to be by far the highest of the three emission scopes. There are a range of other sources of emissions in the coal value chain
- During coal mining, the trapped methane gas in the coal seam escapes into the atmosphere. Such emissions are categorised as fugitive emissions. Fugitive emissions account for the majority of Scope 1 emissions for underground mines. Other Scope 1 emissions come from the combustion of diesel in the operation of trucks and other machinery, and in the use of explosives.
- Scope 2 emissions refer to the emissions that occur in the generation of electricity that is purchased for use at the coal mining operation. Scope 2 emissions tend to be the lowest of the three categories of emissions in coal mining given the relatively low amount of electricity required.
- Total thermal coal emissions from the Moolarben mine are expected to be in the lower end of the first quartile of the total seaborne emissions curve for 2030.

Wood Mackenzie

Source: Wood Mackenzie

Agenda

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The pace of policy, investment, and technology adoption determines the outcome for each energy transition scenario.

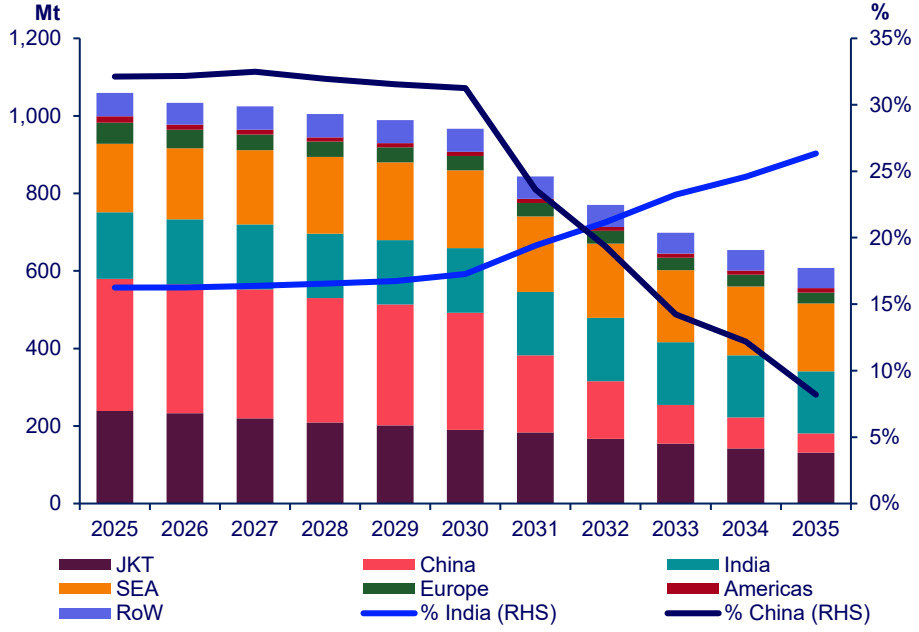
	Delayed Energy Transition	Base Case	Country Pledges	Net Zero
	Limited policy action with slower adoption of clean technologies. Assumes a five-year delay to global decarbonisation.	Current policy trajectories and announced commitments. Represents the most likely outcome for the energy and resources world.	Full (but slightly delayed) implementation of national climate pledges and net zero targets.	Aggressive decarbonisation aligned with 1.5°C warming limits. Assumes immediate action at the required pace and scale.
	Warming Trajectory: 3°C	Warming Trajectory: 2.5°C	Warming Trajectory: 2°C	Warming Trajectory: 1.5°C
	Governments choose protectionism and domestic supply security over global cooperation.	Incorporates the evolution of current policies and technology advancements.	Incentive-based policies drive competition, technology advancement, and innovation.	Driven by new technologies and global cooperation.
	Global emissions peak in the early 2030s.	Global emissions peak in 2027.	Emissions remain flat to the end of the 2030s and then decline.	Emissions have peaked and immediately begin to decline.
	Carbon prices remain fragmented and regional, reaching an average US$75/t by 2050.	Global average carbon prices reach US$90/t by 2050.	Global average carbon prices reach US$140/t by 2050.	Global average carbon prices reach US$165/t by 2050.
	N/A	Current Policies Scenario (CPS)	Stated Policies Scenario (STEPS)	Net Zero Emissions by 2050 (NZE)

Source: Wood Mackenzie

Seaborne thermal coal faces structural decline driven by global decarbonisation efforts and increasing protectionism in key consuming countries.

China's pivot to domestic supply drives a decline in imports after 2030, however India and SEA will become key demand countries as they remain dependent on cheap coal to fuel growing economies.

Seaborne thermal coal demand – Base Case



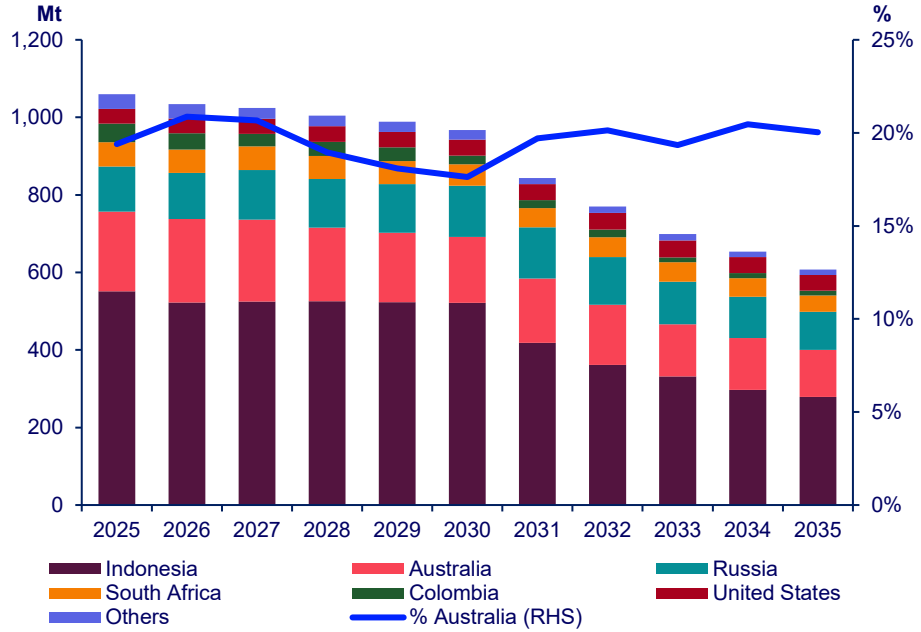
- Wood Mackenzie expects the seaborne thermal coal demand to have peaked in 2024 at 1,076 Mt, falling to 1,060 Mt in 2025. Demand is expected to decline going forward, at a CAGR of -5.4% to reach 387 Mt by 2050.
- Most of the seaborne demand decline is expected to occur in China. This will be driven by the expected overall decline in thermal coal demand due to decarbonisation efforts while domestic production is maintained as a strategic priority related to reducing import dependence, with imports falling to 50 Mt in 2035.
- Seaborne thermal coal demand from the JKT region is expected to decline at -5.8% CAGR, falling from 239 Mt in 2025 to 131 Mt in 2035. The decline in demand is expected due to increasing carbon costs and other emissions reduction efforts, which will lead to faster penetration of renewables in the region while power demand flattens due to demographics and stagnating economies. Additionally, nuclear power output is expected to increase in Japan and South Korea in the future.
- India and SEA are expected to be the most resilient importers and are expected to account for over half of total seaborne thermal coal demand by 2035. Both regions are expected to see rapid economic growth, with coal being the cheapest source of electricity generation to meet growing power demand.
  - Seaborne imports to India will decline slowly throughout the forecast despite growing demand as domestic production increases.
  - In SEA, imports will increase from 176 Mt in 2025 to a peak of 201 Mt in 2029 before beginning to decline, reaching 175 Mt in 2035.

Source: Wood Mackenzie

Australian thermal coal supply to the seaborne market will increase its share over the forecast period as demand for high-grade coal remains more resilient.

Indonesia retains a significant share of the market with a cheaper supply base, although exports will reduce significantly as importers prioritise lower emission, higher energy coal and domestic protectionism occurs.

Seaborne thermal coal supply – Base Case[1]



Notes: (1) The supply stack includes a range of mine extensions.
Source: Wood Mackenzie

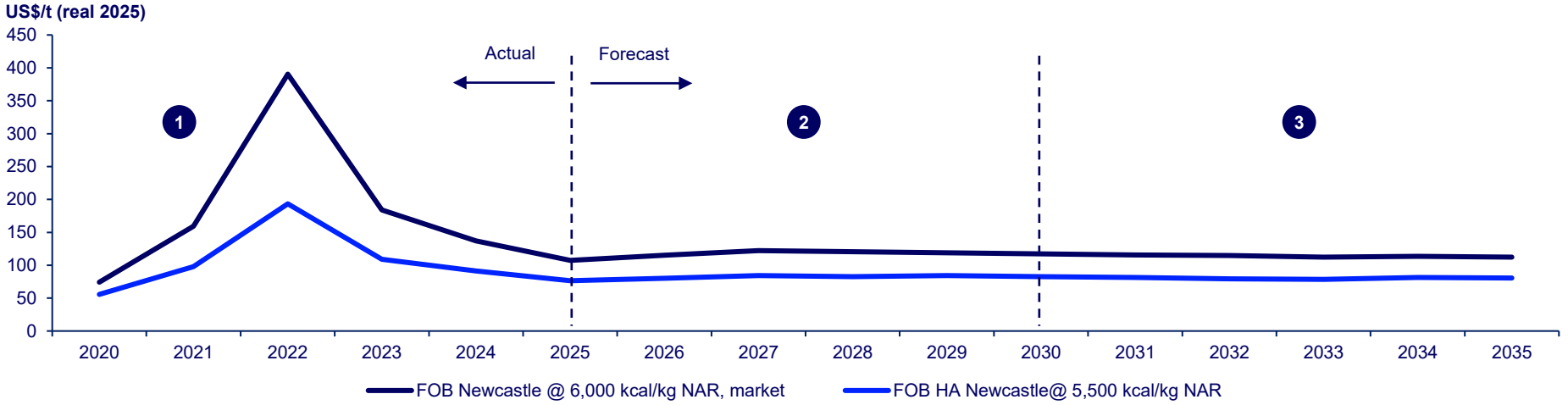
- Total seaborne thermal coal supply declines demand to reach 608 Mt in 2035.
- Indonesia accounted for most supply growth in the seaborne market over the past two decades, as Indonesian coal generally has lower production costs and is delivered with a cheaper freight to Asian consumers due to Indonesia's proximity to the major demand countries. However, Indonesian supply is expected to peak at 551 Mt in 2025, remaining at about 525 Mtpa through to 2030, before declining to reach 279 Mt by 2035. The major consumers of Indonesian coal, China and India, are expected to move towards increasing domestic supply and limiting imports.
- Seaborne thermal coal supply from Australia is expected to peak at 216 Mt in 2026 and decline to 122 Mt by 2035. The decline in Australian thermal coal supply is not expected to be as pronounced as in some other countries, as the majority of Australian supply is of high-grade coal, demand for which is expected to decline at a slower pace than that of low-grade coal.
- Russian thermal coal supply dropped significantly after sanctions imposed over the invasion of Ukraine. Wood Mackenzie expects trade sanctions on Russia to ease before the end of this decade, leading Russian supply increasing from 116 Mt in 2025 to 132 Mt in 2030 before dropping to 98 Mt in 2035 as the overall seaborne market declines.
- Thermal coal supply from South Africa, Colombia and the United States remains limited due to their long distance from Asian markets. However, demand from South and Southeast Asia, particularly India, continues to provide an outlet for high-grade coal from these countries throughout the forecast period.

Thermal coal prices are thought to have overcorrected, with a modest increase in benchmark prices expected in the near-term.

Prices will remain at marginal cost levels through the forecast as declining demand drives an oversupply in the seaborne market.

Thermal coal benchmark prices – Base Case

1. Thermal coal prices spiked to unprecedented levels in 2022 due to the post-Covid rebound and the energy crisis triggered by Russia's invasion of Ukraine. Since 2022, prices have gradually fallen back to historical norms.
2. Prices push higher as the market works past low prices from high stockpiles, economic concerns and supply rebalancing. Seaborne demand remains over 1 Bt until 2030, while costs remain high.
3. Oversupply gathers pace and deepens over the 2030s as demand declines, pushing prices towards marginal costs with periods falling below cost levels.

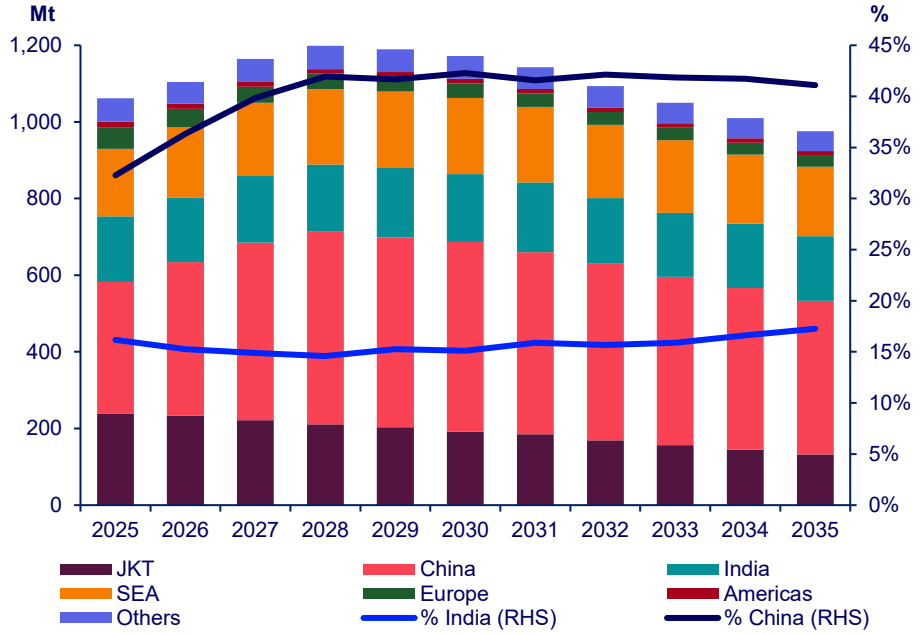


Source: Wood Mackenzie

The peak in seaborne thermal coal demand is delayed to 2028 as policy fragmentation sustains consumption compared to the immediate decline seen in the Base Case…

This extended period of high demand is driven by temporary surges in China and consistently higher demand across India and Southeast Asia, while mature markets remain insulated by firm phase-out policies.

Seaborne thermal coal demand – Delayed Energy Transition Scenario



- Global seaborne demand is projected to reach a later peak of 1,199 Mt in 2028 (compared to immediate decline in the Base Case) as policy fragmentation and energy security concerns postpone the adoption of alternative energies, sustaining coal consumption.
- China's imports rise in the short term, peaking at over 500 Mt in 2028, as the delayed peak in coal demand necessitates higher seaborne supply to meet consumption before the country executes its long-term pivot to increase renewable output and prioritise domestic production, which brings seaborne demand back to 401 Mt by 2035.
- Demand from JKT remains largely unchanged with firm closure plans for many ageing coal-fired generators.
- Southeast Asian imports increase from 176 Mt in 2025 to a peak of 199 Mt in 2029, before declining to 181 Mt by 2035. The forecast beyond 2030 remains on average around 2 Mtpa higher than the Base Case due to nascent carbon policies and infrastructure bottlenecks slowing renewables deployment, forcing these rapidly growing economies to rely on more reliable, affordable coal for longer.
- India's imports remain elevated through the forecast period at around 165 to 180 Mt. Seaborne demand remains higher through this period as domestic coal is unable to meet higher demand, however the use of domestic material remains a key focus.
- Imports to Europe and the Americas remain largely unchanged as firm regulations, climate policies, and ageing plants lock in an early phase-out of coal-fired generation.

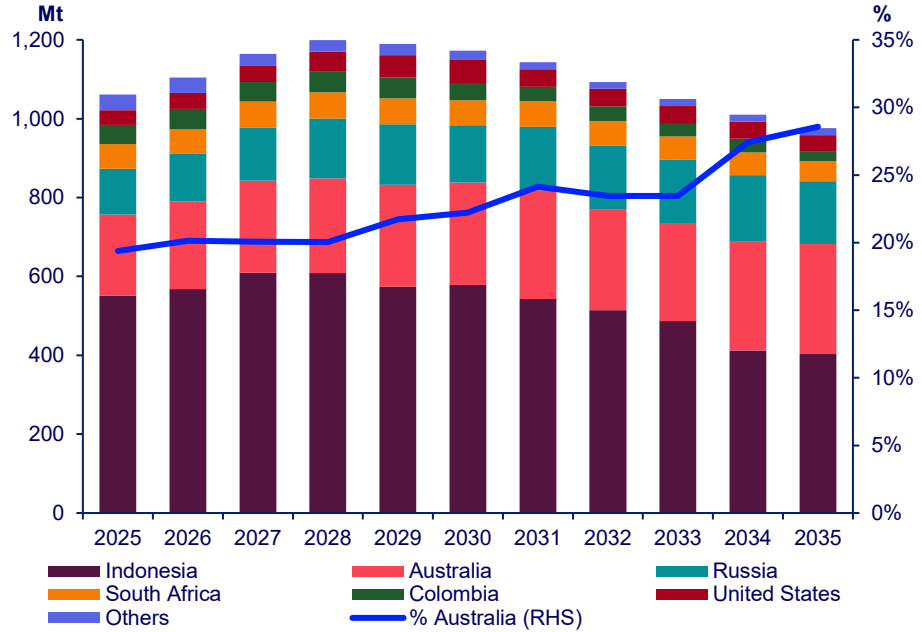
Wood Mackenzie

Source: Wood Mackenzie

…which drives an increase in seaborne thermal coal imports in the near-term to meet increasing demand.

Indonesia and Australia expand supply in the short term to meet extended demand for coal while capitalising on higher global prices for high-calorific value coal.

Seaborne thermal coal supply – Delayed Energy Transition Scenario[1]



- Global seaborne thermal coal exports increase from 1,061 Mt in 2025 to a peak of 1,199 Mt in 2028, before falling to 976 Mt by 2050, following seaborne demand. The forecast reaches a peak differential from the Base Case of 369 Mt in 2035, matching thermal coal demand.
- Indonesian supply increases to a peak of 608 Mt in 2028 from 551 Mt in 2025 and remains higher than the Base Case until 2035, as Indonesia is required to significantly increase production capacity to meet the additional demand for low-energy coal from India and Southeast Asia, along with an extended period of high imports from China.
- Australian supply increases from 206 Mt in 2025 to 279 Mt in 2035. Higher global prices and extended demand for high-calorific coal enable Australia to sustain output for longer, directing exports to Asian markets.
- Russian seaborne supply rises from 116 Mt in 2025 to a peak of 167 Mt in 2034 following the removal of sanctions and remains above base case levels throughout the forecast period.
- Other major suppliers including South Africa, Colombia, and the United States also maintain higher export volumes between 2025 and 2035, because the extended period of global market undersupply ensures most available seaborne thermal coal finds a willing buyer.

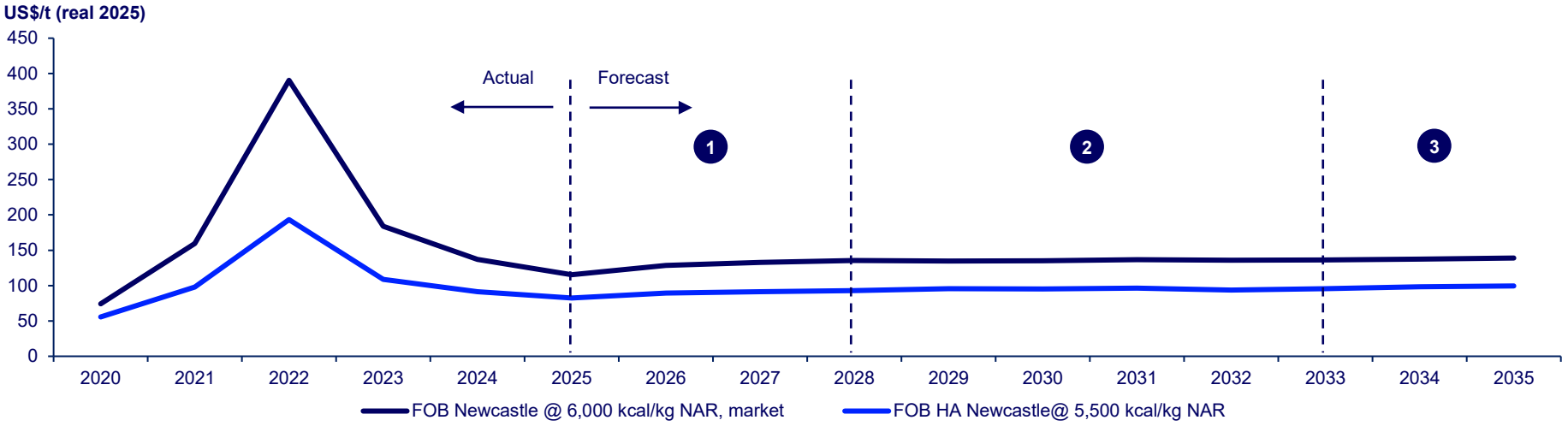
Notes: (1) The supply stack includes a range of mine extensions.
Source: Wood Mackenzie

Thermal coal prices are driven above the Base Case plateau in the short term due to increased demand and an undersupplied market in the Delayed Transition scenario.

Increased supply requirements as existing mines deplete keep prices above Base Case levels towards 2035 despite demand beginning to decline.

Benchmark thermal coal prices – Delayed Energy Transition Scenario

1. Prices reach a low in 2025 and then rebound as demand continues to grow, requiring more supply from all regions. Prices reach US$136/t in 2028.
2. Demand begins to stagnate and then decline, keeping the market in balance and leading to prices remaining flat between US$134/t and US$136/t for several years.
3. Demand continues to decline, however prices start to rise again as reserves at existing minesites deplete, requiring new projects to come online. Prices reach US$139/t in 2035.

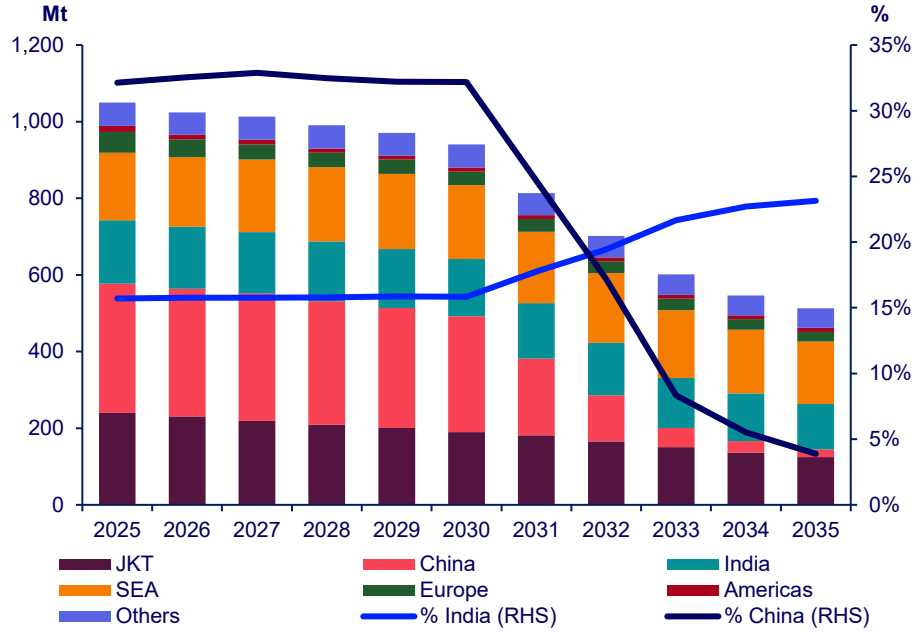


Source: Wood Mackenzie

In the Country Pledges Scenario, global seaborne thermal coal demand declines at an accelerated pace compared to the Base Case…

A significant phase-down of coal-fired generation is required for countries meet their stated emissions reduction targets.

Seaborne thermal coal demand – Country Pledges Scenario



- Global seaborne thermal coal imports decline at an accelerated pace, falling from 1,050 Mt in 2025 to 513 Mt in 2035 (95 Mt lower than the Base Case), driven by the commitment to national climate pledges, causing coal-fired power generation to shrink significantly.
- Thermal coal imports in the JKT region remain similar to the Base Case until 2030 but then decline faster to 125 Mt by 2035 (6 Mt lower than the Base Case). This is driven by coordinated efforts to maximise renewables and retain and accelerate output from nuclear capacity. It is expected that in JKT coal generation will be maintained through the use of co-firing and carbon capture retrofits.
- China's imports decline quicker than the Base Case post-2030, reaching 20 Mt in 2035, primarily driven by domestic policy shift to prioritise domestic coal production over imported supplies alongside declining total demand.
- India's seaborne imports are lower throughout the forecast, falling from 173 Mt to 119 Mt in 2035, with the gap widening to 13 Mt from the base case by 2035 as India is more able to fill its lower thermal coal demand requirements using domestic coal.
- Southeast Asia imports show a short-term increase but peak at a lower level than in the Base Case at 196 Mt in 2029 before falling to 163 Mt in 2035 as other forms of energy are prioritised.

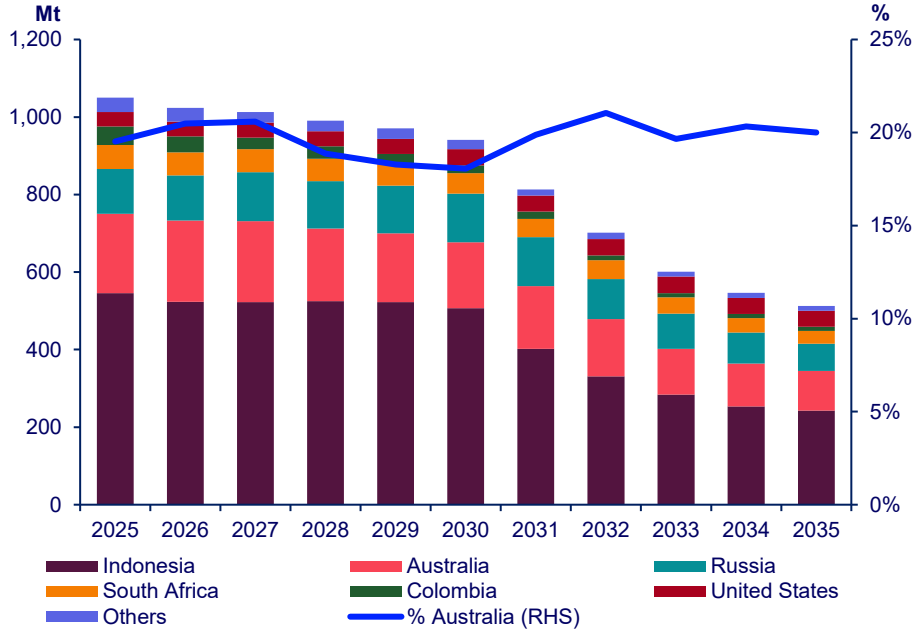
Wood Mackenzie

Source: Wood Mackenzie

…resulting in a rapid and structural decline in global seaborne coal supply, restructuring the market to half its current size.

Low-cost Pacific Basin coal suppliers including Australia are positioned to dominate the contracted market, while high-cost producers and those geographically challenged face near-total market exit.

Seaborne thermal coal supply – Country Pledges Scenario[1]



Notes: (1) The supply stack includes a range of mine extensions.
Source: Wood Mackenzie

- In the Country Pledges Scenario, global seaborne exports face a faster structural decline than in the Base Case, falling from 1,050 Mt in 2025 to 513 Mt in 2035. This reduction is driven by the accelerating energy transition and declining demand, forcing the supply chain to restructure for a market half the size of that in 2025.
- Indonesian exports decline sharply from 546 Mt in 2025 to 243 Mt in 2035. While Indonesia dominates the remaining seaborne trade alongside Australia (due to the geographic edge in supplying Asian markets), the drastic global market contraction and low quality of Indonesian coal forces a steep absolute reduction, accelerating the divergence from the base case post-2030.
- Australian supply declines from 205 Mt in 2025 to 103 Mt by 2035 but maintains its market share at 20%. Australia remains a leading exporter, supported by robust capacity serving Asian demand centers, but the overall global market shrinkage results in this steep decline in absolute levels, with the divergence from the Base Case accelerating after 2030.
- Russian exports decline sharply from 119 Mt in 2024 to 69 Mt in 2050 despite a near-term recovery following removal of sanctions. Rapid global decarbonisation and demand decline severely pressures Russia's exports to key markets such as the JKT region given high delivered costs.
- South African exports decline from 62 Mt in 2025 to 34 Mt by 2035. This significant reduction is driven by dwindling reserves, high costs and more competition in the Pacific Basin.

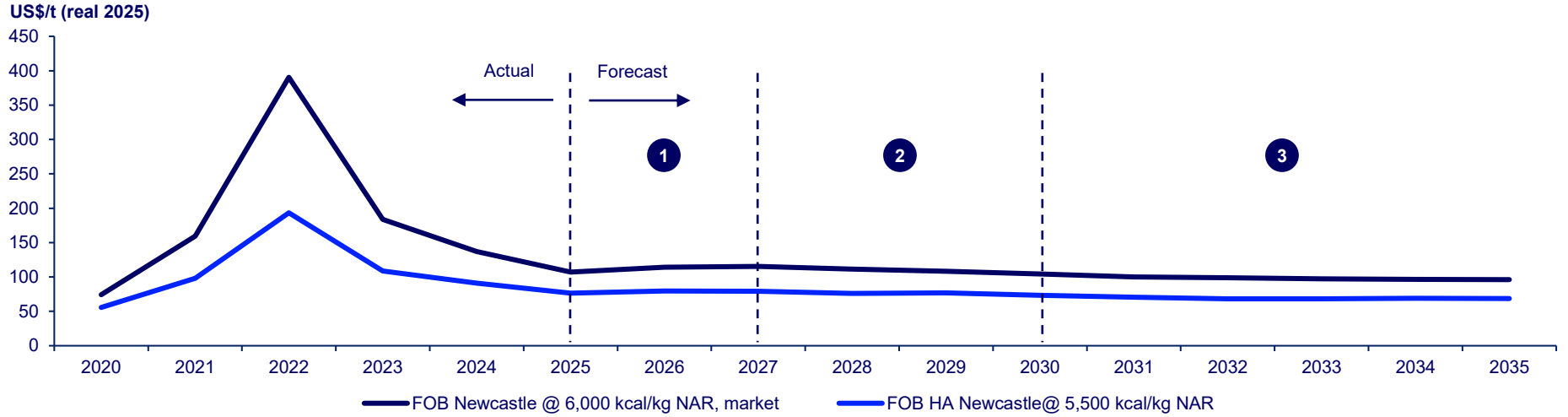
2.3 Background – Scenario outlook

Prices remain supported through to 2030 but begin a slow decline beyond that point, driven by the steady reduction in seaborne demand.

In the long term, the significant contraction in market size pushes prices to stabilise at the operational cost floor, marking a clear divergence from Base Case price levels.

Benchmark thermal coal prices – Country Pledges Scenario

1. Prices increase from their current lows to a peak of US$115/t in 2027 as near-term demand remains resilient, requiring supply to remain high.
2. A relatively slow decline in demand paired with a decline in operating supply causes prices to remain supported at over US$100/t until 2030.
3. As global coal plant retirements accelerate post-2030, outpacing supply declines, the price declines, reaching $96/t by 2035.

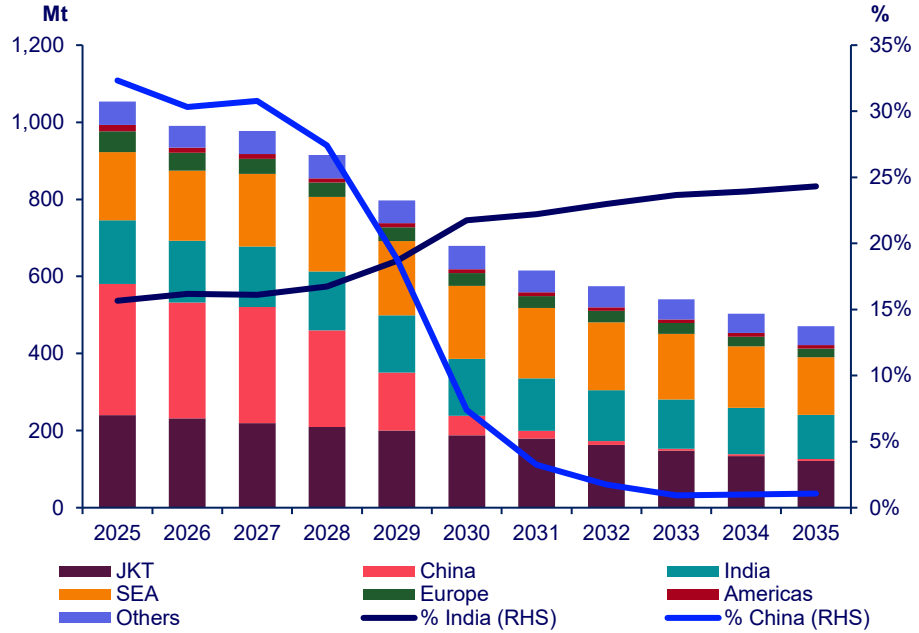


Source: Wood Mackenzie

The pursuit of net zero targets drives a structural contraction in global demand, transforming coal from a primary energy source to an intermittent reliability asset…

China and developed Asia lead the demand collapse through rapid decarbonisation, while India and Southeast Asia face a growing struggle to balance soaring power needs against net zero commitments.

Seaborne thermal coal demand – Net Zero Scenario



- In the Net Zero scenario, global seaborne thermal coal demand will face an 45% decline, dropping from 1,053 Mt in 2025 to 471 Mt by 2035 (137 Mt lower than in the Base Case). Coal will progressively transition from a primary energy source towards an intermittent system reliability asset that complements variable renewables.
- Under the Net Zero Scenario China's imports decline more rapidly from 341 Mt in 2025 to 5 Mt by 2033, after which levels remain similar to base case. This is driven by China's aggressive net zero by 2060 goal, which would cause coal users to reduce production and prioritise domestic production over imports for remaining requirements.
- The JKT region reduces imports, dropping from 240 Mt in 2024 to 121 Mt in 2035 (10 Mt lower than Base Case). This steeper decline is caused by all three nations pursuing net zero by maximising renewables, nuclear capacity utilisation, and carbon capture retrofits and co-firing for the remaining coal fleet, although the near-term impact will be muted by the lack of alternate energy options.
- In the Net Zero Scenario, India's imports fall significantly more than in the Base Case, dropping from 173 Mt in 2024 to 114 Mt in 2035 (46 Mt lower than Base Case). This reduction is driven by India's climate commitments and a strategic shift to domestic coal production to meet energy security.
- SEA imports show initial resilience, peaking at 193 Mt in 2028 from 177 Mt in 2025 before declining to 149 Mt by 2035. This trajectory reflects the region's challenge in balancing surging power demand with net zero commitments.

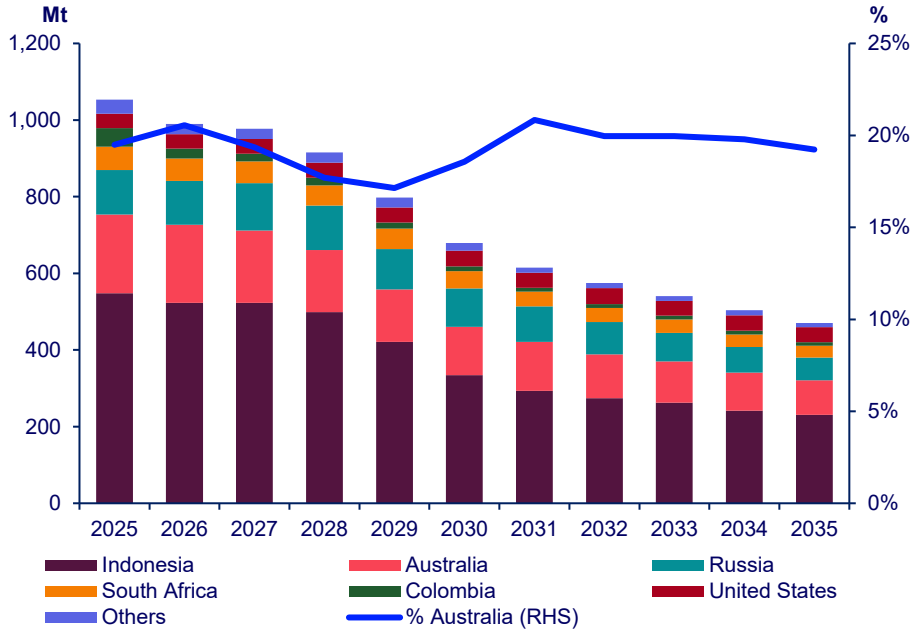
Wood Mackenzie

Source: Wood Mackenzie

…reducing thermal coal requirements to only the most cost-competitive, high-quality assets.

Indonesian supply is disproportionately affected by the collapse of low-rank demand, while less competitive, long-haul exporters are eliminated in favor of low cost, high-CV suppliers.

Seaborne thermal coal supply – Net Zero Scenario



- Under the Net Zero Scenario, global seaborne supply declines rapidly throughout the forecast, dropping from 1,053 Mt in 2025 to 471 Mt by 2050 (137 Mt below Base Case levels). This decline shrinks the market to under half of its current size, ensuring only the highest-quality, lowest-cost thermal coal assets survive.
- Indonesian supply is drastically cut, falling from 548 Mt in 2025 to 231 Mt by 2050 (48 Mt below base case). This reflects Indonesia's role as the main supplier of low-CV coal, a category facing a 9% annual demand decline, rapidly accelerating its phase-out.
- Australian supply shrinks from 205 Mt in 2025 to 91 Mt in 2035 (31 Mt below the Base Case). Australia remains a key exporter because the Net Zero market focuses on high-CV coal, allowing Australia to gain market share in the small remaining trade.
- Russian supply faces a significant reduction, dropping from 116 Mt in 2025 to 59 Mt by 2050 (39 Mt below the base case). This decline is driven by the disappearance of high-volume demand centers, challenging Russia as a less competitive, long-haul exporter, to sustain remaining operations.
- South African and Colombian supply face becoming minor suppliers (dropping to 30 Mt and 10 Mt, respectively), while United States supply (falling to 39 Mt by 2035) is more resilient, retaining a larger share to support niche industrial users.

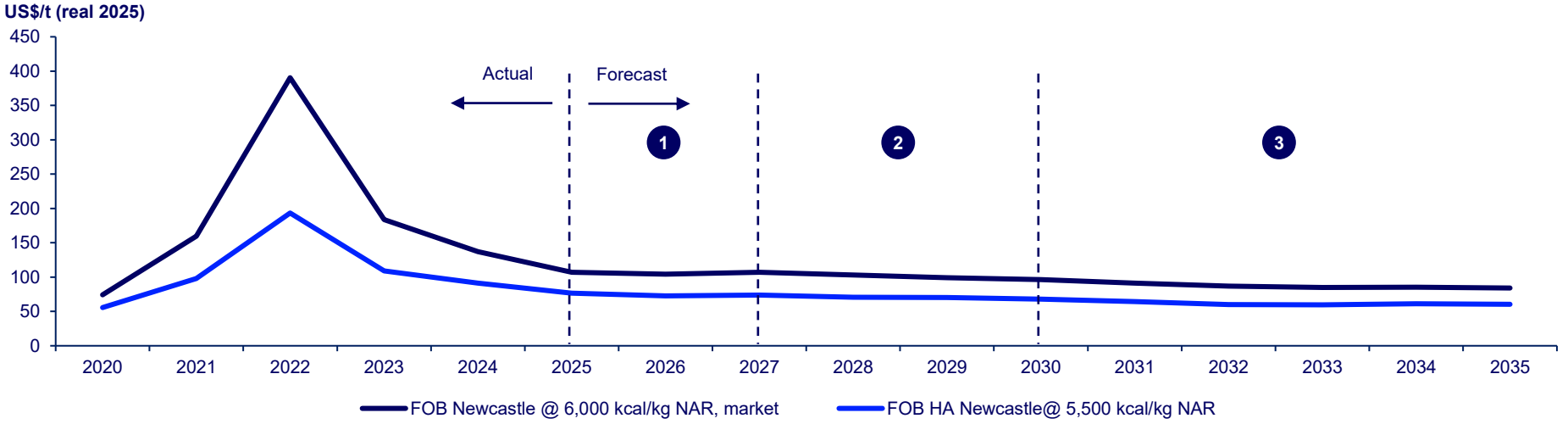
Notes: (1) The supply stack includes a range of mine extensions.
Source: Wood Mackenzie

Thermal coal prices would fall immediately in the Net Zero Scenario, with less mines required to meet declining demand.

Prices remain supported by reserve depletion and the cost of production at remaining minesites. However, as the price falls, higher cost mines will be forced to exit the market as margins decline.

Benchmark thermal coal prices – Net Zero Scenario

1. Thermal coal prices remain flat at US$107/t in the very near-term despite demand beginning to decline as supply remains somewhat constrained.
2. Demand begins to decline as key countries, particularly China, start to reduce imports, and prices start to fall, reaching US$96/t in 2030.
3. As the demand decline accelerates, prices start to fall significantly beginning at the end of the 2020s, reaching US$84/t by 2035.



Source: Wood Mackenzie

Agenda

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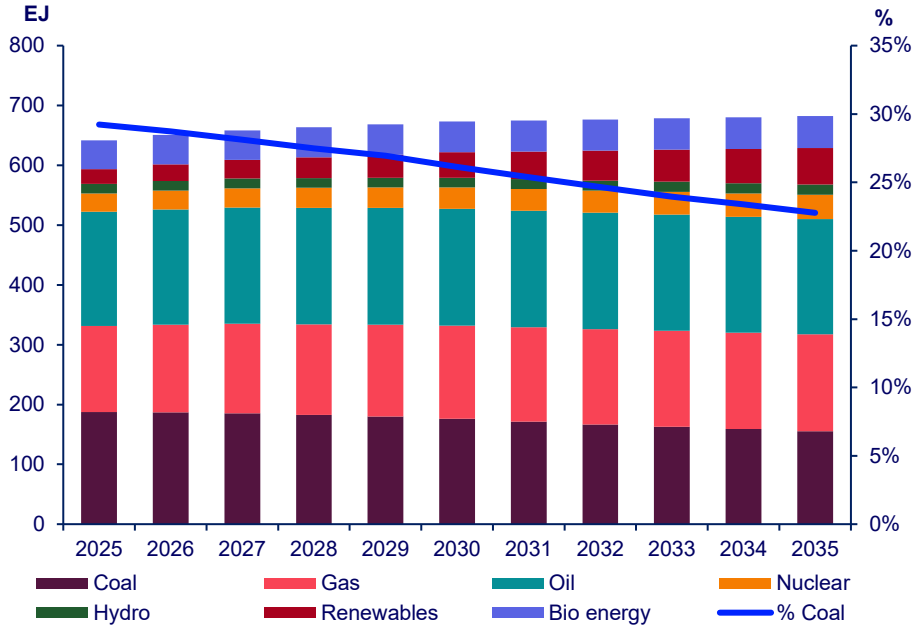
Increasing energy demand will come from alternate energy sources, with the share from fossil fuels declining over time.

This trend will be caused by decarbonisation efforts by governments, along with the declining cost of renewable energy.

Global primary energy demand by fuel – Base Case



Source: Wood Mackenzie

- Global primary energy demand is expected to increase from 642 EJ in 2025 to 682 EJ in 2035 as energy demand from developing regions, notably India and SEA, increases.
- Fossil fuels will remain the dominant source of energy throughout the forecast period, although the combined share will drop from 81% to 75% as other forms of energy are prioritised due to emissions reduction efforts.
  - Coal will be the largest contributor to this reduction with its share in primary energy demand falling from 29% to 23% between 2025 and 2035. Coal will be more significantly impacted due to its perceived place as the most polluting fuel. In addition, it's largest use is in the relatively easy-to-decarbonise power sector.
  - The share of oil will also decline, however demand will remain flat in absolute terms as it is more difficult to substitute in its key sectors – transport and industry.
  - The share of gas will increase from 22% to 24%. Gas is expected to be used as a transition fuel to support variable renewable power, and is perceived to be a less emissions intensive option compared to other fossil fuels.
- The use of alternative fuel options will increase between 2025 and 2035, with particularly notable growth for renewables.
  - Increasing renewable penetration is supported by government and corporate policy supporting zero emissions options, along with the falling cost of renewable power.
  - Use of nuclear is also expected to increase, but this growth will be almost completely from China.

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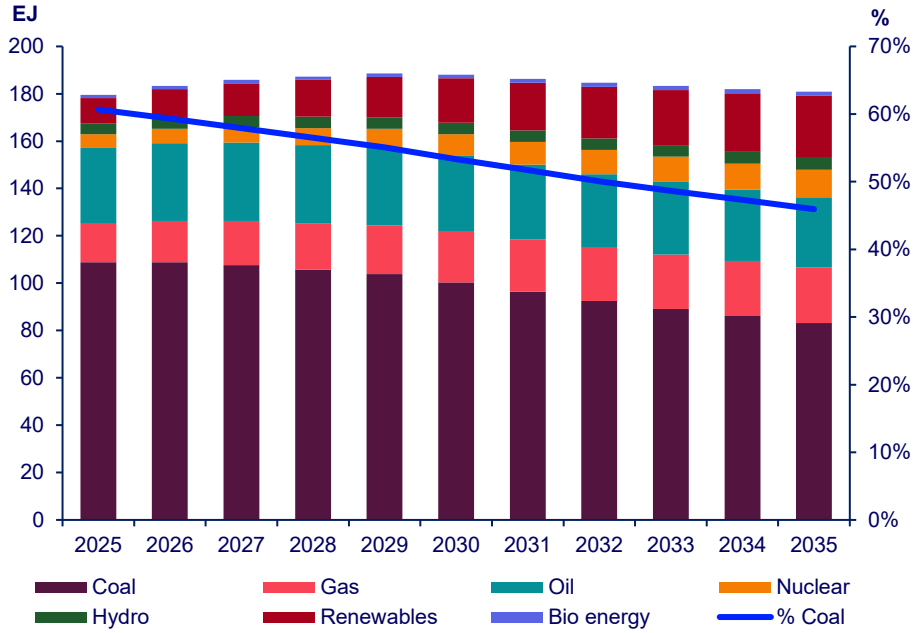
Coal's declining share in China's primary energy demand is expected to be offset by increasing output from nuclear and renewables.

Despite a steep decline, coal is expected to continue to be a major source of energy in China throughout the forecast period, meeting almost half of China's total primary energy demand by 2035.

China primary energy demand by fuel – Base Case



- China's primary energy demand will continue to grow to reach a peak of 187 EJ in 2029 from 180 EJ in 2025. After reaching its peak, energy demand will begin a decline due to a slowing economic growth rate and improving energy efficiency to fall back to 181 EJ by 2050.
- As of 2025, fossil fuels constitute 88% of China's total primary energy demand, with coal making up 61%, followed by oil and gas at 18% and 9%, respectively. The shares of coal and oil will fall to 46% and 16%, respectively, by 2035, while the share of gas will increase to 13% by 2050.
  - Declining use of fossil fuels will be driven by China's emissions reduction efforts. China is targeting a 7-10% reduction in emissions from their peak level by 2035, and net zero by 2060.
  - The use of gas as a transition fuel supporting variable renewable power will support higher demand going forward.
- China's coal demand is thought to have peaked in 2024 at 109 EJ and is forecast to decline 4.2% CAGR to reach 83 EJ in 2050. Coal use in power generation will be the most impacted, with industrial uses including in cement and steel production seeing more long-term demand, being harder to replace.
- Renewable and nuclear output will increase significantly, with China already leading global additions of solar power, in particular. China surpassed its renewable energy target for 2030 in 2024. Nuclear energy is expected to grow from 6 EJ in 2025 to 12 EJ in 2035, while renewable energy will grow from 11 EJ in 2025 to 26 EJ by 2035.

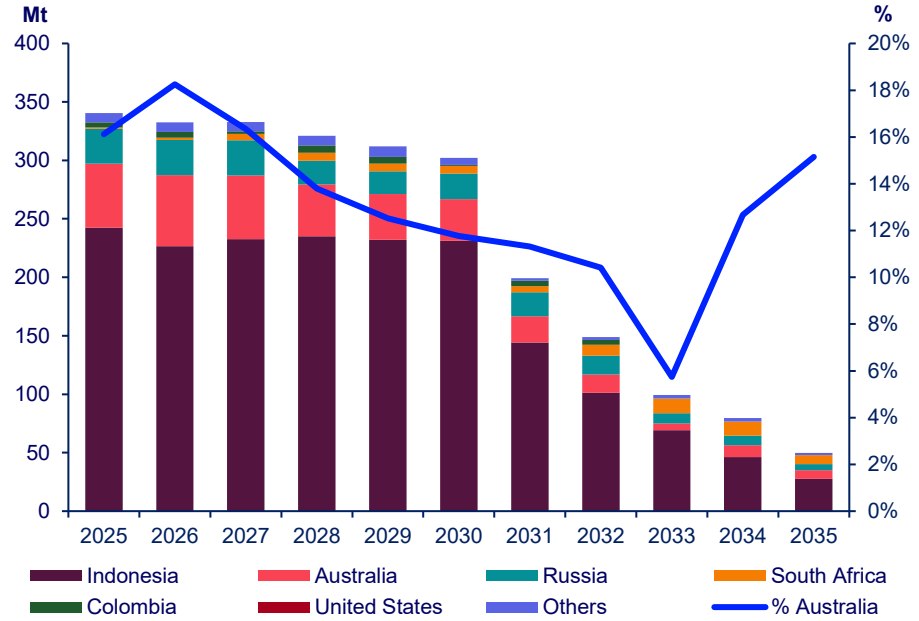
Wood Mackenzie

Source: Wood Mackenzie

The reduction in coal consumption alongside increased domestic production will result in a steep decline in seaborne imports after 2030.

Australia will maintain significant market share in China, however total volumes will decline significantly as the overall market size reduces.

China seaborne thermal coal demand by source – Base Case



- Seaborne thermal coal demand in China is expected to decline at 17.5% CAGR between 2025 and 2035, falling from 340 Mt in 2025 to 50 Mt in 2035. Seaborne imports peaked at 365 Mt in 2024 and are forecast to decline rapidly after 2030 as Chinese domestic coal policies and decarbonisation measures take effect.
- China's overall thermal coal demand will fall from 4,595 Mt in 2025 to 4,003 Mt by 2035. The primary driver is ongoing efforts to increase the share of renewable energy. After 2030, China's and carbon neutrality commitment cuts the share of coal in power generation from 49% in 2025 to 24% by 2035 while renewables surge to 48%. However, non-power sectors such as cement will continue to support demand, as coal remains difficult to replace in these industrial processes.
- China is actively prioritising domestic coal production to reduce energy import dependence. As the thermal coal demand declines, domestic supply will increasingly meet the remaining needs, though any production shortfalls would drive imports higher. This is the key factor driving the steepness of the decline in imports after 2030.
- Indonesia dominates near term supply to China, but exports fall over 88% by 2035 as low rank coal supply falls post 2030 when Chinese demand starts to decline and supply pivots to domestic sources. Wood Mackenzie's analysis indicates seaborne coal from Indonesia and Australia will remain more competitive than domestic coal in coastal China, providing upside risk to import levels without government intervention.

Source: Wood Mackenzie

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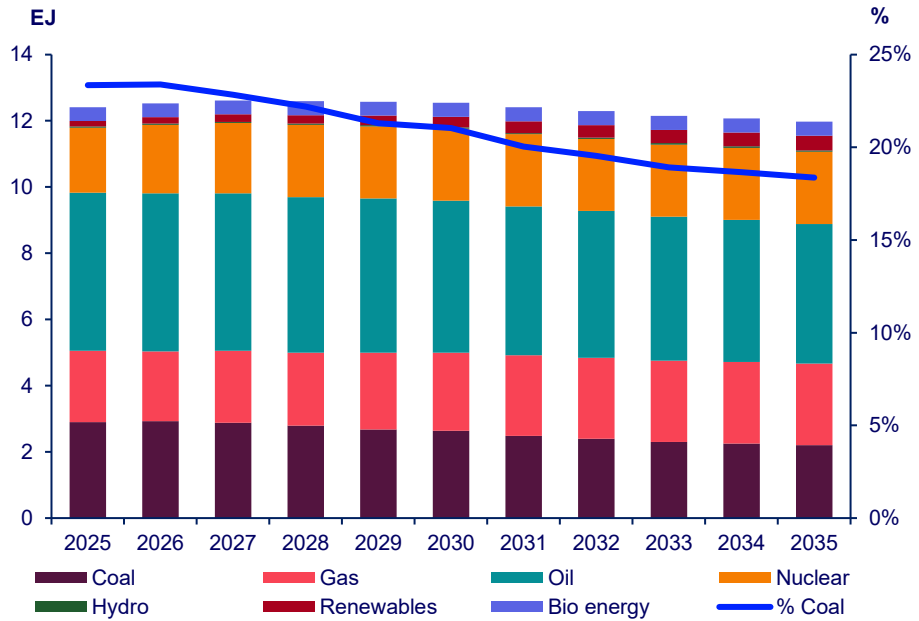
Wood Mackenzie

Despite emissions reduction efforts, the South Korean economy is expected to maintain coal and oil due to the high cost of renewables and gas…

However, renewables, nuclear, and gas will still increase their share as electrification of energy demand and decarbonisation of the power grid progress.

South Korea primary energy demand by fuel – Base Case



- South Korea's primary energy demand is expected to peak in 2027 at 12.6 EJ before commencing a decline caused by increasing energy efficiency and plateauing energy demand to reach 12.0 EJ by 2035 (-0.4% CAGR).
- As of 2025, fossil fuels make up 88% of South Korea's primary energy demand, with oil being the highest at 39% followed by coal and gas at 23% and 17%, respectively. The share of fossil fuels in total primary energy demand is expected to decline to 74% by 2050 (35% oil; 18% coal; and 21% gas) as carbon reduction efforts continue.
  - South Korea has set an emissions reduction goal of 53-61% by 2035 compared to 2018 levels, along with a net zero target of 2050, however in the Base Case these goals are not expected to be achieved.
  - Oil, in particular, is expected to be difficult to phase out.
- Coal use in South Korea is expected to peak in 2026 at 2.9 EJ before declining to 2.2 EJ in 2035. Coal use in power will account for most of the decline; no new coal plants are being built, and mandatory 30-year retirement limits have been applied to existing plants. Coal use will be supported by industrial applications including cement and steel.
- Renewable energy currently makes up 1% of South Korea's total primary energy demand. This share is expected to grow to 4% by 2035 with the high cost of renewables limiting growth.
- Nuclear energy is expected to grow from 2.0 EJ in 2025 to a peak of 2.2 EJ 2028 as increasing utilisation of existing plants is prioritised. Similar levels will be maintained until the end of the forecast period.

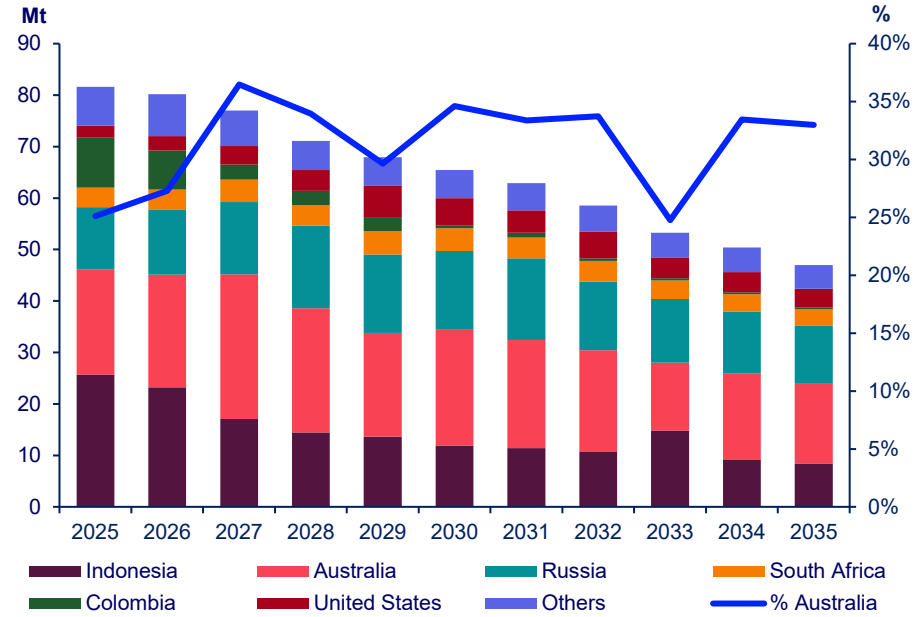
Wood Mackenzie

Source: Wood Mackenzie

…however the volume of coal will decline, particularly in power generation, leading to a consistent decline in thermal coal demand in South Korea.

Recent capacity additions will sustain near-term coal demand above policy targets, however in the long-term mandatory 30-year retirements will result in declining demand.

South Korea seaborne thermal coal demand by source – Base Case



- Seaborne thermal coal demand in South Korea is expected to fall from 82 Mt in 2025 to 47 Mt by 2035 (-5.4% CAGR). Seaborne imports peaked at 113 Mt in 2018. There is almost no coal production in South Korea, and so seaborne imports will broadly match total demand.
- The Tenth Basic Plan targets coal to be below 20% of the generation mix by 2030, but Wood Mackenzie expects this to remain at 22%, reflecting lower renewable deployment than planned. Recent coal capacity additions support demand in the near-term, but no new builds post-2022 and mandatory 30-year retirement schedules drive structural decline after 2035.
- In the near-term, the prioritisation of nuclear power along with transmission constraints is expected to limit coal-fired generation, causing a reduction in demand. From the 2030s, an acceleration in solar capacity additions will continue this trend. South Korea will also continue to rely on LNG.
- Australia remains South Korea's dominant thermal coal supplier throughout the forecast. Wood Mackenzie anticipates sanctions on Russian coal will be lifted in 2026, increasing Russian flows near-term and offering more competitive pricing. However, this will not reverse the structural decline in overall import volumes.

Source: Wood Mackenzie

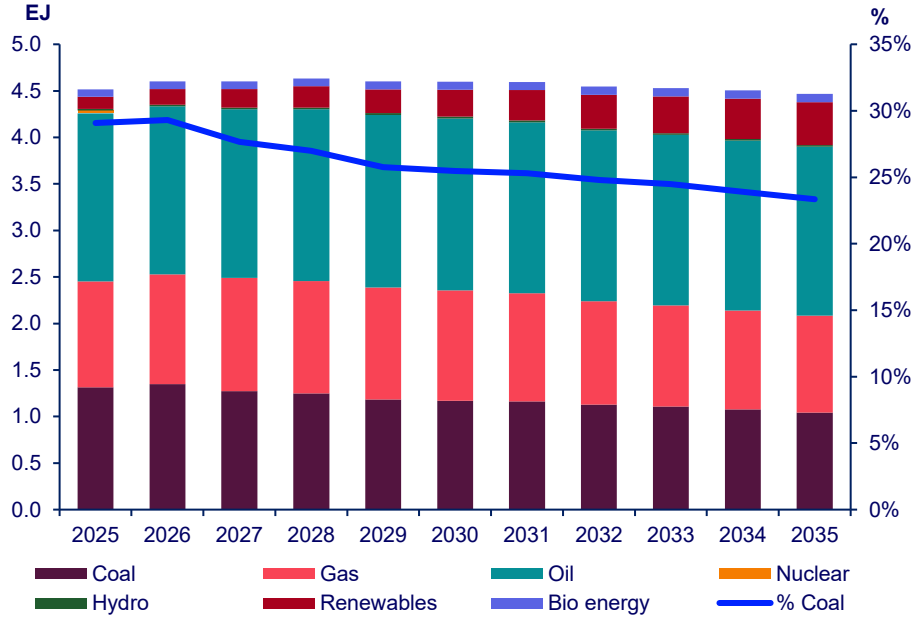
Agenda

Wood Mackenzie

Taiwan's goals to reduce the use of baseload fossil fuels is expected to be challenged by the phase-out of nuclear power but coal use will still decline.

Use of gas and coal will increase in the near-term to offset the loss of nuclear power, but all fossil fuels will decline in the long-term, to be replaced by renewables.

Taiwan primary energy demand by fuel – Base Case



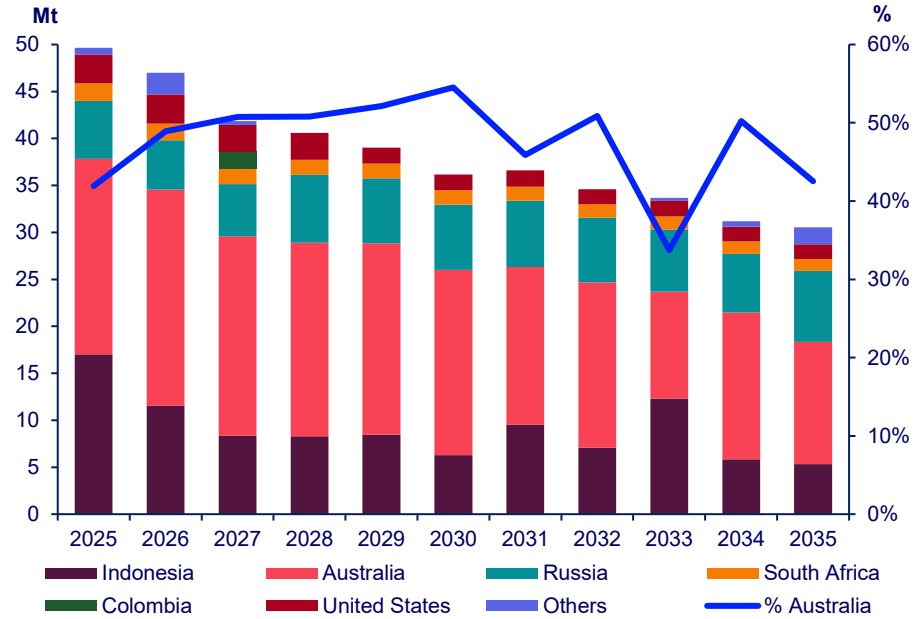
- Taiwan's primary energy demand is expected to continue to grow to reach 4.6 EJ in 2028 from 4.5 EJ in 2025 before commencing a decline back to 4.5 EJ by 2035. The decline can be attributed to the country's increasing energy efficiency and plateauing energy demand.
- As of 2025, fossil fuels constitute 93% of Taiwan's total primary energy demand, with oil being the highest at 40% followed by coal and gas at 30% and 23%, respectively. The share of fossil fuels in total primary energy demand is expected to decline to 87% by 2035, with a significant decrease in coal, while oil and gas demand maintain shares despite declining total volumes.
  - Taiwan has an emissions reduction goal of 38% by 2035 and net zero by 2050. It is not expected that these will be achieved in the base case.
- Coal demand in Taiwan is expected to grow in 2026 to reach 1.4 EJ before commencing a decline to reach 1.0 EJ by 2035. Taiwan has ambitious targets with respect to the use of coal, however these are expected to be challenging to achieve with the removal of nuclear from its fuel mix after 2025.
- Growth in Taiwan's energy mix will come from renewable energy, which is expected to increase at a CAGR of 13.3% to reach 0.5 EJ by 2035 from 0.1 EJ in 2025, making renewables the third largest energy source to meet demand. Taiwan is targeting an increase in energy consumption from "low-carbon sources" from 40% to 55%.

Source: Wood Mackenzie

The reduction in coal-fired power and renewable expansion will drive a decline in thermal coal demand throughout the forecast.

The decommissioning of all nuclear power in 2025 provides some upside risk to the near-term forecast, particularly if new LNG terminal construction is delayed.

Taiwan seaborne thermal coal demand by source – Base Case



- Seaborne thermal coal demand in Taiwan is expected to decline at 4.7% CAGR to 2035, falling from 50 Mt in 2025 to 31 Mt by 2035. Seaborne imports are expected to contract steadily as coal plant decommissioning progresses alongside aggressive renewable expansion, pursuing the goal of net zero by 2050 and full coal phase-out by 2060.
- Nuclear decommissioning in 2025 has created a baseload gap that can only be met by coal and gas, limiting near-term coal retirement. Delays in new LNG terminal commissioning and higher GDP growth pose upside risk to coal demand through the late 2020s. Wood Mackenzie expects that Taiwan's policy target of 30% coal in the generation mix by 2025 will be missed, although plant closures are expected to accelerate post-2035, driving declines in coal power generation beyond that point.
- Taiwan's supply mix increasingly favours Australian high-grade bituminous coal, with Australia's share exceeding 80% by 2050. Indonesia provides lower-cost sub-bituminous coal for blending optimisation. The anticipated lifting of restrictions on Russian coal in 2026 will provide more stability in supply of Russian coal, however Australia maintains long-term dominance.

Source: Wood Mackenzie

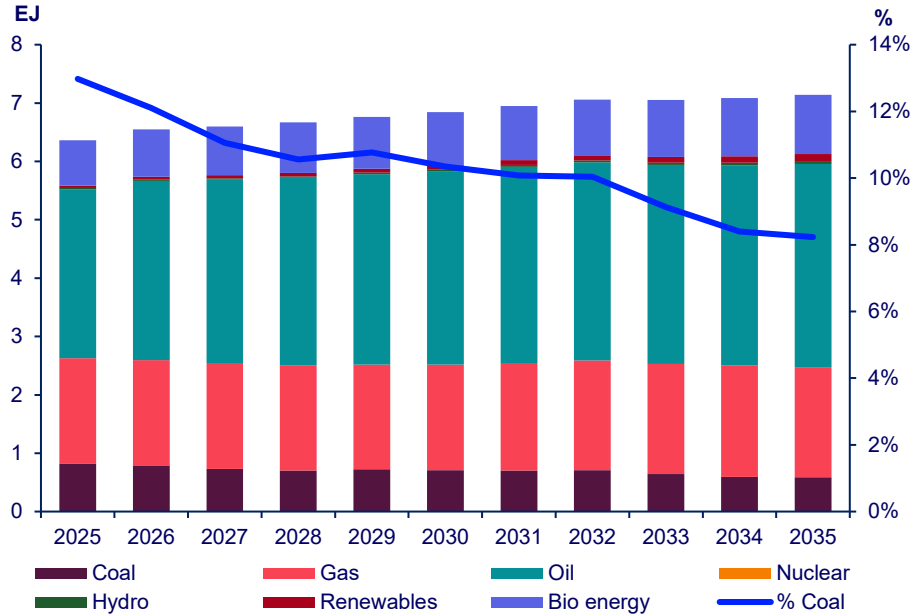
Agenda

Wood Mackenzie

Thailand's primary energy demand will continue to grow through most of the forecast, driven by ongoing economic growth.

The role of coal in the fuel mix will remain limited, particularly in the power sector, due to strong local opposition; however demand will be supported by industrial uses.

Thailand energy demand by fuel – Base Case



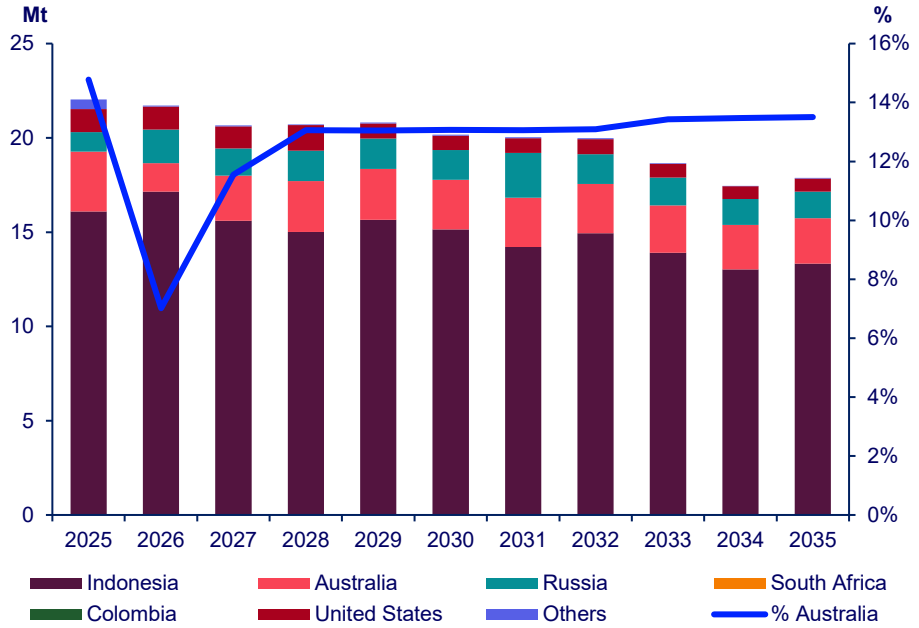
- Thailand's primary energy demand is expected to grow modestly from 6.4 EJ in 2025 to 7.1 EJ in 2035. The gradual increase in demand is supported by economic growth and rising industrial activity, while efficiency improvements and clean energy adoption limit faster growth.
- As of 2025, fossil fuels dominate Thailand's energy mix, accounting for nearly 87% of total primary energy demand. Oil holds the largest share at 45%, followed by gas at 28% and coal at 13%. By 2035, the share of carbon-intensive fuels is expected to decline to around 83%, with oil at 49%, gas at 26%, and coal at 8%, signaling Thailand's move toward cleaner energy sources.
  - Thailand aims to reach net zero emissions by 2065.
  - Strong local opposition to coal is expected to restrict its use in power, causing overall coal use to remain on a flat to declining trajectory throughout the forecast period. Coal will continue to be used in industrial sectors.
  - Thailand has a high reliance on gas, however depletion of domestic supply is expected to increase the reliance on more expensive imported LNG.
- Gradual diversification of Thailand's energy mix will be supported by renewables and bioenergy. Renewable energy is projected to grow from 0.04 EJ in 2025 to 0.12 EJ by 2035, at a CAGR of 12.0%, while the use of bioenergy (from agricultural waste) increases from 0.8 EJ to 1.0 EJ at 2.7% CAGR, reinforcing Thailand's efforts to diversify supply and reduce emissions.

Source: Wood Mackenzie

While the use of coal in power will decline, Thailand's thermal coal imports will be supported by non-power uses and declining domestic production.

Indonesian low-CV coal leads near-term imported supply, while higher-quality Australian coal gains share in the long-term.

Thailand seaborne thermal coal demand by source – Base Case



- Seaborne thermal coal demand in Thailand is projected to decline by 2050, falling from 22 Mt in 2025 to 18 Mt by 2035. This decline will be driven by coal-fired capacity retirements and accelerating renewables penetration, though the decline is moderated by sustained non-power sector demand.
- Thailand's total thermal coal demand will decline from 35 Mt in 2025 to 22 Mt by 2035. This decline is driven by renewables increasing generation share from 6% in 2025 to 14% by 2035, while the share for coal falls from 17% to 6%. Gas will remain an important component of the fuel mix.
- Coal-fired capacity peaks at 5.4 GW, declining to 2.2 GW by 2035 with no new plants expected due to strong local opposition. However, non-power demand will contribute over 40% of Thailand's coal demand (rising to 59% by 2035), with sectors like cement remaining harder to decarbonise, sustaining seaborne imports.
- Domestic coal production will decline throughout the forecast due to reserve depletion and the unsuitability of domestic coal for cement production, significantly increasing reliance on imported material by the end of the forecast period.
- Indonesia remains Thailand's dominant thermal coal supplier throughout the forecast, accounting for 70% of total imports. However, anticipated increasing demand for higher CV coal is expected to maintain the share of Australian coal.

Wood Mackenzie

Source: Wood Mackenzie

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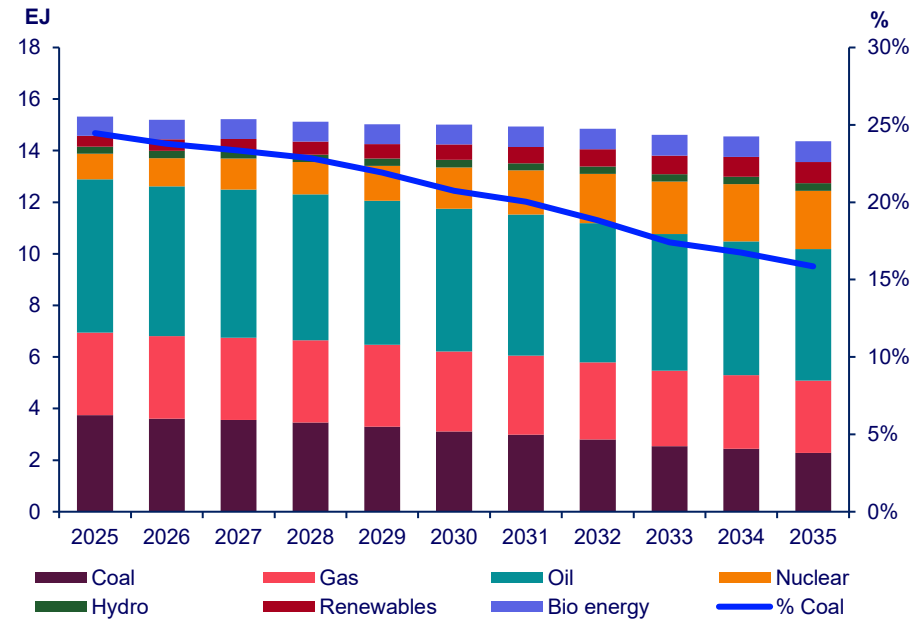
Wood Mackenzie

Japan's energy demand will shrink due to demographic pressures, while coal use will decline as nuclear and renewables gradually displace fossil fuels.

Risks related to nuclear restart delays and cost inflation in renewables due to local component requirements provides some upside to coal in power.

Japan primary energy demand by fuel – Base Case



- Japan's primary energy demand is expected to decline steadily at a CAGR of -0.6% to reach 14.4 EJ in 2035 from 15.4 EJ in 2025. The fall in demand is due to demographic changes, economic stagnation, improved energy efficiency, and Japan's carbon reduction efforts.
- As of 2025, Japan's energy mix is 85% fossil fuels comprising of oil at 39%, coal at 25%, and gas at 21%. By 2050, the share of carbon-intensive fuels in Japan's total primary energy demand is expected to decrease to approximately 71%, with oil at 36%, gas at 20%, and coal at 16%, reflecting Japan's shift toward cleaner energy sources.
  - Japan is targeting a 46% reduction in emissions by 2030 and net zero by 2050.
  - Increases in carbon pricing with the imminent implementation of the ETS will impact all fossil fuels, improving the relative competitiveness of low carbon energy sources.
- Japan's energy transition goals rely on strong growth in nuclear and renewables.
  - Nuclear output is expected to rise from 1.0 EJ in 2025 to 2.3 EJ by 2035. This growth will strengthen baseload power availability, ensuring grid stability and reducing dependence on imported fuels, however delays in reactor restarts remain a risk.
  - Renewable energy is forecast to increase from 0.4 EJ in 2025 to 0.8 EJ by 2035, driven by investments in solar and wind capacity and advancements in storage technologies. These sources will play an important role in reducing emissions and complementing fossil fuel reductions, however the cost in Japan remains high.

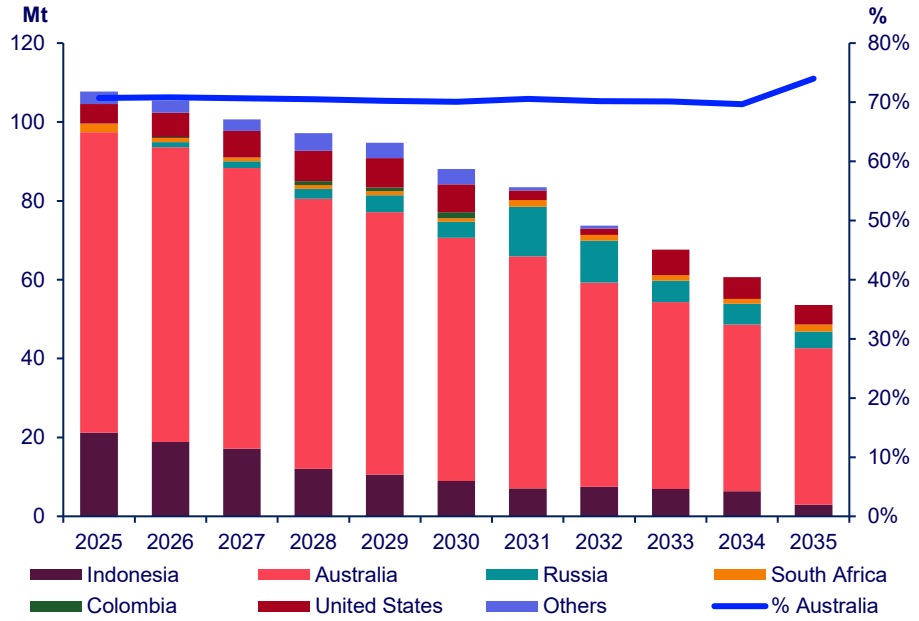
Wood Mackenzie

Source: Wood Mackenzie

Japan's seaborne thermal coal demand will decline significantly with increasing nuclear output, renewables penetration, and higher carbon prices.

Australia retains its dominant position supplying to high-efficiency coal plants, however supply for all sources will decline throughout the forecast as demand declines.

Japan seaborne thermal coal demand by source – Base Case



- Seaborne thermal coal demand in Japan peaked at 134 Mt in 2015 and has declined since, reaching 108 Mt in 2025. Imports will continue to fall throughout the forecast period, reaching 54 Mt in 2035.
- The decline in thermal coal demand will be caused by a range of factors including the declining and ageing population, plateauing economy, carbon reduction targets, nuclear restarts, and the increasing share of gas and renewables in power generation. However, coal will remain important due to the high cost of renewables and the existing fleet of newer coal-fired power. Japan is expected to continue using coal and nuclear as baseload power sources for the foreseeable future.
- Coal-fired power generation will decline sharply after 2035 as carbon prices increase. Modern, high-efficiency coal plants provide baseload support through the 2030s, though capacity factors decrease steadily as renewables increase. Longer-term decarbonisation relies on green co-firing and CCUS, though investment timelines remain uncertain.
- Australia remains Japan's dominant thermal coal supplier throughout the forecast period, providing high-quality bituminous coal for high-efficiency generation. The expected lifting of sanctions on Russian coal in 2026 will provide Japan with increased supply optionality and competitive pricing in the near-term.

Wood Mackenzie

Source: Wood Mackenzie

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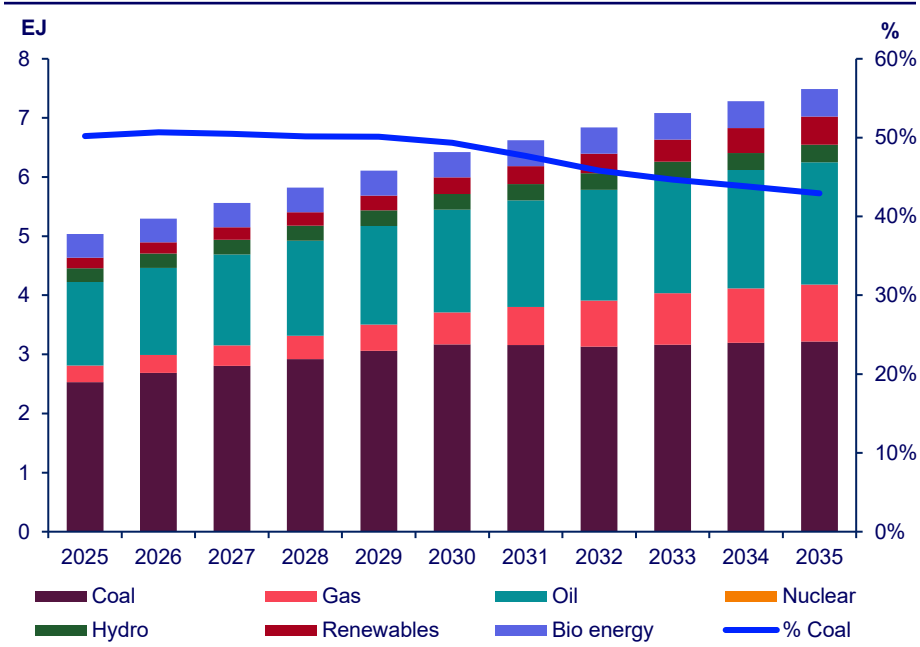
Wood Mackenzie

Vietnam's energy demand will almost double by 2050 driven by industrialisation, while coal plays a critical role due to its low cost.

Vietnam has ambitious energy transition goals, however these are not expected to be achieved alongside rapid growth in energy markets.

Vietnam primary energy demand by fuel – Base Case



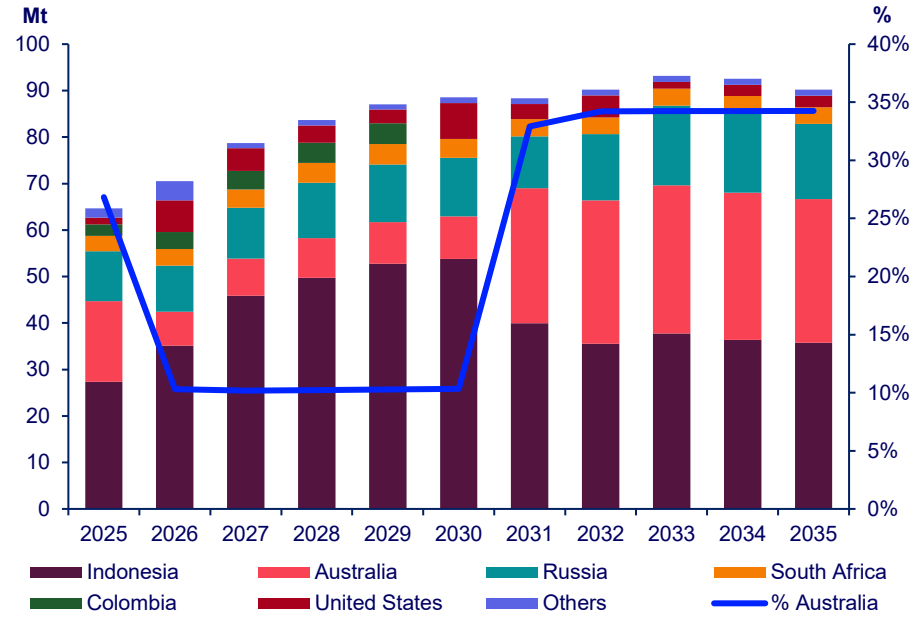
- Vietnam’s primary energy demand is expected to rise consistently from 5.0 EJ in 2025 to 7.5 EJ by 2035, at a CAGR of 4.1%. The increase is fueled by manufacturing and data centre growth, urban expansion, and increasing power requirements.
- Fossil fuels currently represent 85% of Vietnam’s primary energy demand, with coal contributing 50%, oil 28%, and gas 6% in 2025. This share is expected to decline slightly to 83% by 2050, as coal reduces to 43%, oil to 28%, and gas expands to 13%.
  - Vietnam has a stated target of net zero by 2050, and a 15.8% cut on business-as-usual levels by 2030.
- Vietnam’s coal demand is expected to rise to 3.2 EJ by 2035. Coal remains a significant part of the fuel mix due to its affordability and reliability, with several plants designed for 100% imported coal, ensuring stable supply during the transition to cleaner energy. Vietnam’s PDP8 outlines a full transition of coal plants to biomass and ammonia by 2050. However, our outlook anticipates 37 GW of coal capacity still operating in 2035.
- Gas and renewables are set to drive Vietnam’s energy diversification. Gas demand is projected to grow from 0.3 EJ in 2025 to 1.0 EJ in 2035 (13.0% CAGR), while renewables surge from 0.2 EJ to 0.5 EJ (10.4% CAGR), supported by strong policy incentives and investments in solar and wind capacity.

Source: Wood Mackenzie

Seaborne thermal coal demand in Vietnam will continue to grow for the next decade as coal plant additions continue.

From the mid-2030s, demand will start to decline as other power generation sources increase, however the impact on seaborne imports will be muted by declining domestic production.

Vietnam seaborne thermal coal demand by source – Base Case



- Seaborne thermal coal demand in Vietnam is expected to increase from 65 Mt in 2025 to a peak of 93 Mt in 2033 before declining slightly to 90 Mt in 2035. Growth in demand will be driven by coal's position as the cheapest form of baseload power amid a rapidly expanding power requirement, supporting sustained demand for coal despite increasing renewables penetration.
- Vietnam's total thermal coal demand will similarly grow from 108 Mt in 2025 to a peak of 135 Mt in 2033, before declining to 130 Mt in 2035. This decline is driven by coal-fired capacity growing from 28 GW in 2025 to 38 GW by 2030 before plateauing, as strong electricity demand growth from manufacturing and data centers supports coal use. Vietnam targets net zero by 2050, though achieving this faces significant challenges.
- Nearly half of new capacity is in southern Vietnam, tailored for 100% imported coal, sustaining seaborne demand. Domestic anthracite production remains flat at around 40 Mtpa throughout the forecast. Domestic coal supplies older northern power stations.
- Indonesia dominates Vietnam's thermal coal supply throughout the forecast, providing low-CV coal to southern plants. Australia's share is expected fall and then increase beyond 2030 as demand for higher-quality coal grows, though Indonesia remains the primary supplier given its proximity and quality suitability for Vietnam's import-dependent infrastructure.

Wood Mackenzie

Source: Wood Mackenzie

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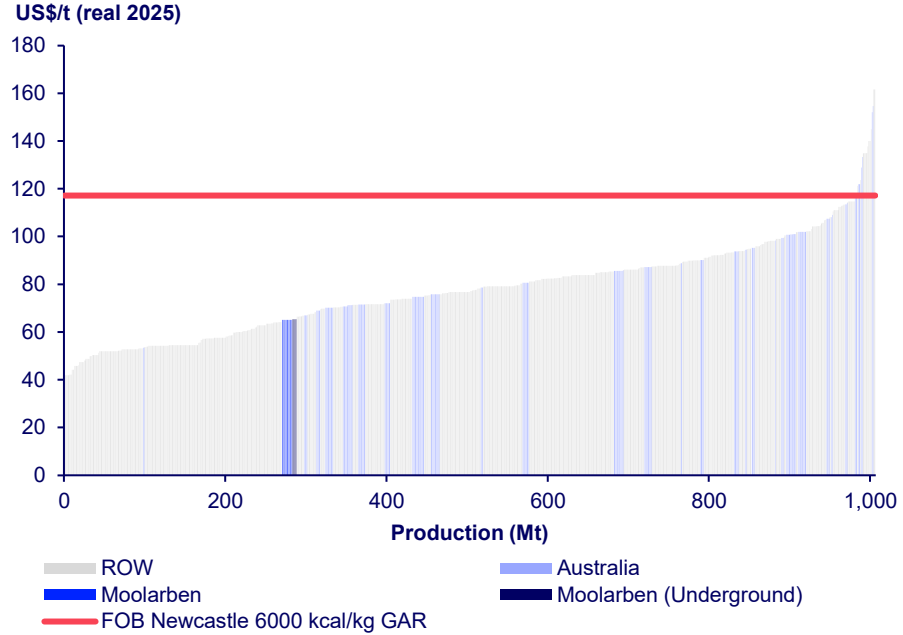
Wood Mackenzie

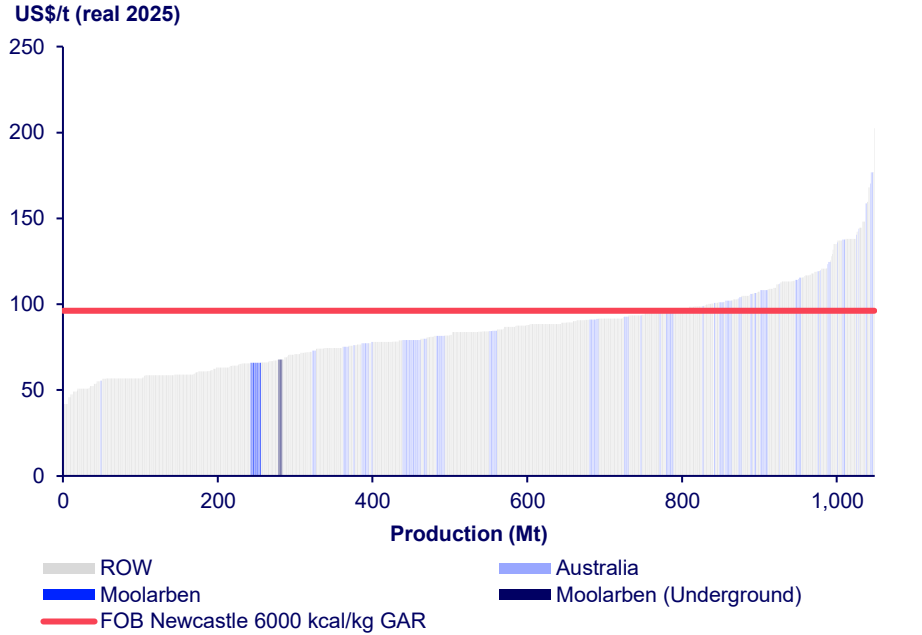
Moolarben's costs remain well below benchmark prices in 2030 under both the Base Case and Net Zero scenarios…

This analysis considers the impact of carbon pricing on Scope 1 and 2 emissions under each scenario, as well as the royalty impact of lower prices.

Seaborne thermal coal cost curve (energy adjusted, 2030, Base Case)



Seaborne thermal coal cost curve (energy adjusted, 2030, Net Zero)

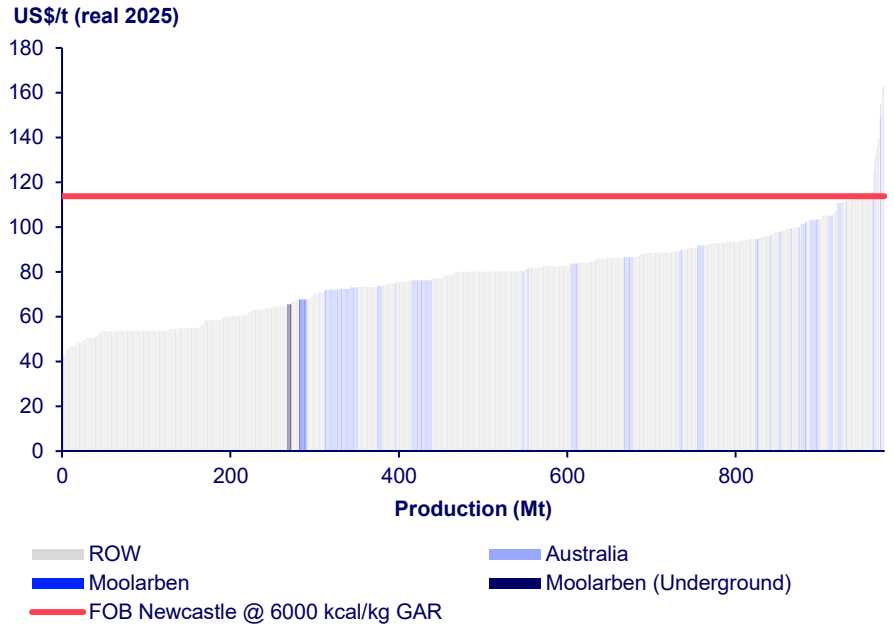


Note: Includes carbon pricing
Source: Wood Mackenzie

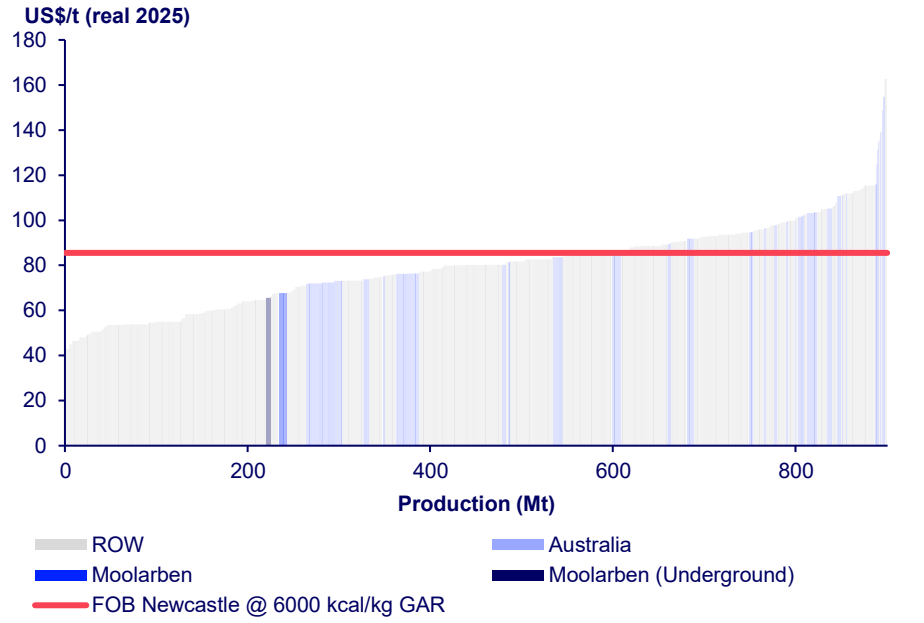
…and it is able to maintain profitability across all scenarios analysed by Wood Mackenzie due to its high quality and low operating cost.

Costs remain well below benchmark prices throughout the mine life.

Seaborne thermal coal cost curve (energy adjusted, 2034, Base Case)



Seaborne thermal coal cost curve (energy adjusted, 2034, Net Zero)



Note: Includes carbon pricing
Source: Wood Mackenzie

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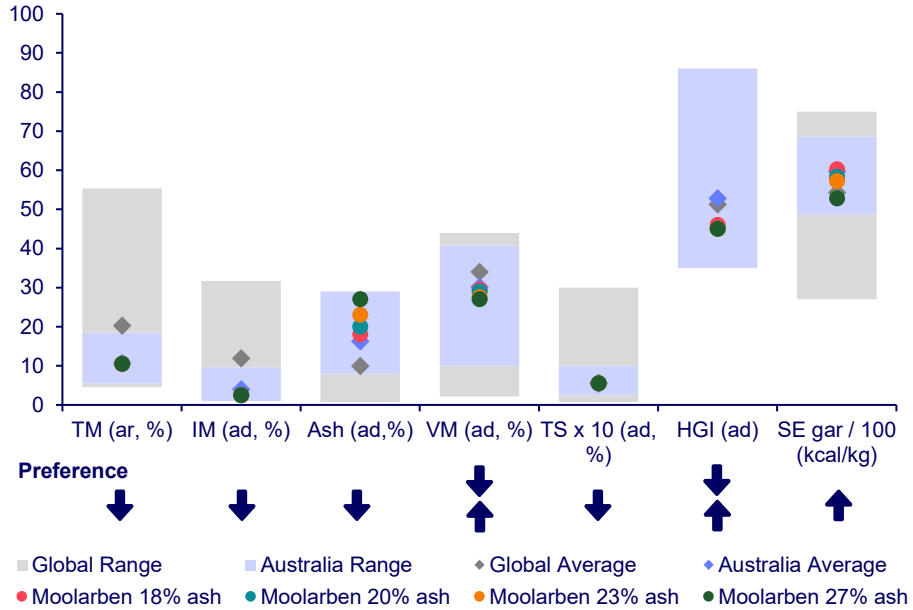
Wood Mackenzie

Moolarben coal quality generally ranks close to the global and Australian average for bituminous and bituminous high ash coals.

Moolarben coal performs particularly well on sulphur and moisture, while also having a high energy content compared to other traded coals.

Seaborne thermal coal quality specifications



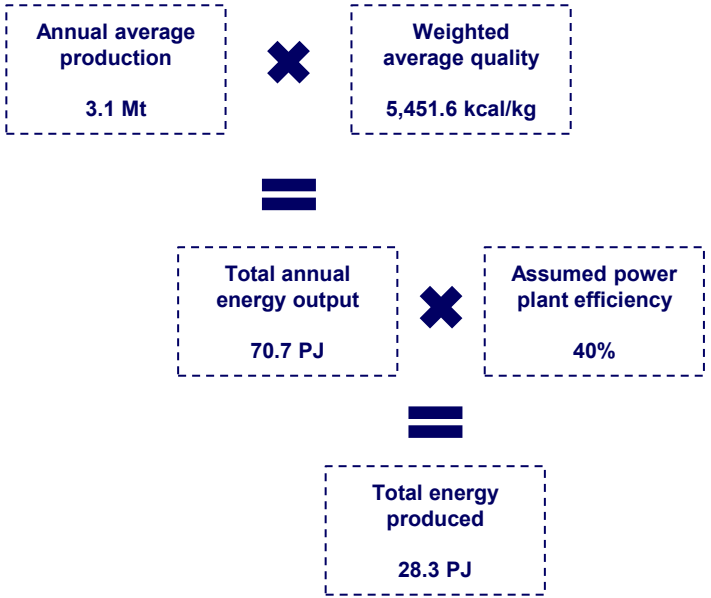
- For thermal coal, coal quality tends to be better if attributes such as total moisture (TM), inherent moisture (IM), ash and total sulphur (TS) are as low as possible, while Hardgrove Grindability Index (HGI) and specific energy (SE) are as high as possible, and the volatile matter (VM) content remains balanced.
- The most important metric is the specific energy which dictates how much energy is produced through burning the coal. The specific energy for Moolarben's coals range between 5,280 and 6,030 kcal/kg (gar), higher than the global average.
- Moolarben coal is reported to have slightly lesser total moisture content at 10.5% compared to the global and Australian averages of 10.7% and 20.3%, respectively. Similarly, coal produced at Moolarben has a lower inherent moisture content of 2.5% compared to the global and Australian averages of 4.0% and 11.9%, respectively. This is a benefit as moisture consumes heat during coal combustion.
- Moolarben coal has an ash content of between 18% and 27% depending on the brand, which is relatively high. High ash content leads to higher ash disposal and maintenance requirements.
- The VM and sulphur content is within a typical range for Australian coals.

Note: Arrows indicate which direction is a positive attribute for coal.
Source: Wood Mackenzie

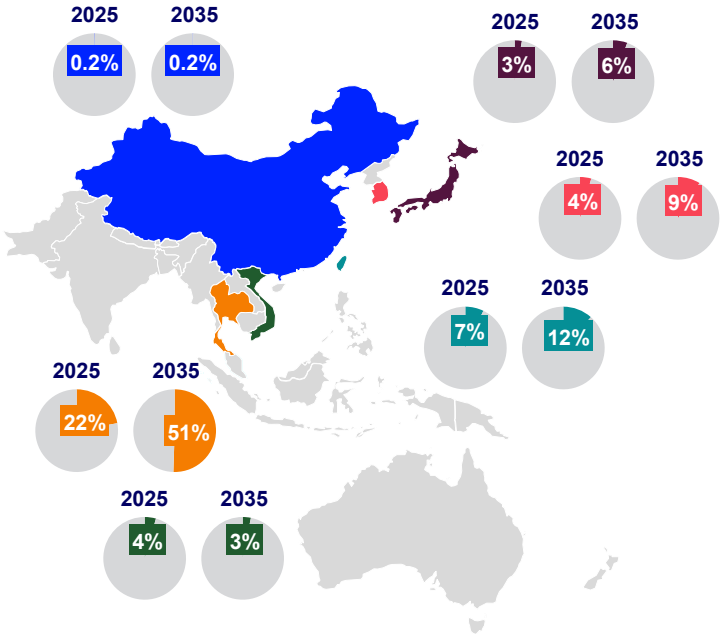
The OC3 expansion at Moolarben can produce, on average, 28.3 PJ of energy per year, supplying power for up to 2.7 million people per year.

This makes up a small, although not insignificant proportion of the coal requirement for most of the countries it proposes to supply.

Moolarben OC3 energy conversion assessment



Moolarben OC3 coal as a proportion of total country coal requirement for power generation[1]

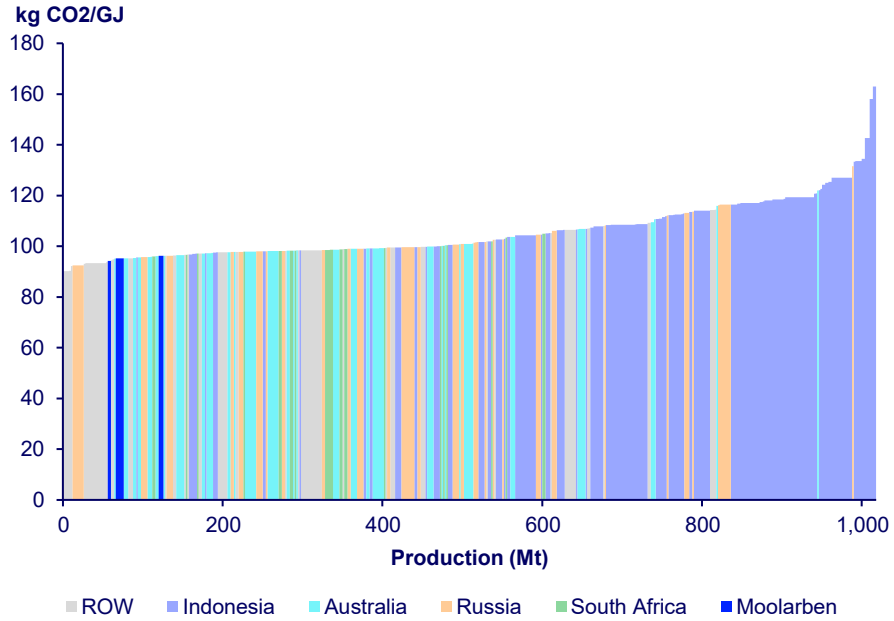


Notes: (1) The proportions here show how the share of demand if 100% of Project coal was sent to each country, not distributed between each country.
Source: Wood Mackenzie

Moolarben has among the lowest emissions of coals available to the seaborne market, falling well below the global and Australian average.

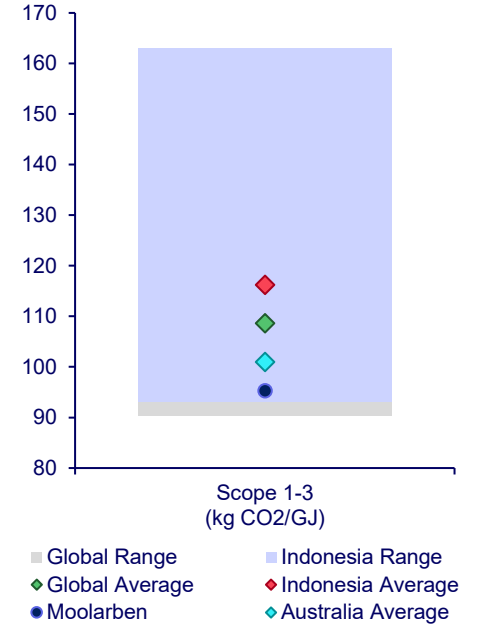
Should the OC3 project not go ahead, emissions from an alternate source would be (on average) 765 ktpa higher.

Seaborne thermal coal emissions curve 2030 – Scope 1-3



- Moolarben exports bituminous and bituminous high ash coal to the seaborne market.
- Moolarben coal, when compared to coals of the same category from other origins, has lower total emissions than the global average.
- The average total emissions of Moolarben coal is 95.3 kg CO2/GJ. This is at the low end of the range of coal emissions, with weighed average emissions for seaborne coal at 108.6 kg CO2/GJ, and Indonesian coal at 116.2 kg CO2/GJ.
- This means that if coal from the OC3 development at Moolarben was replaced with other coal, it would result in 765 ktpa higher emissions (based on average global coal emissions).

Emissions benchmark – Scope 1-3

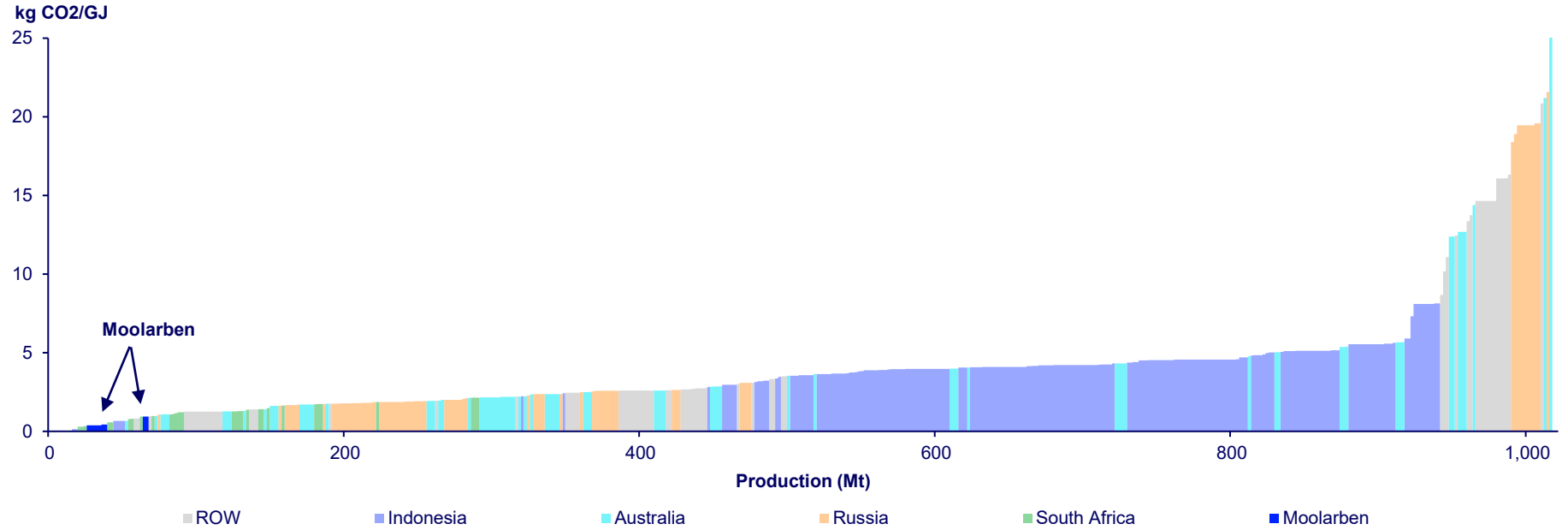


Source: Wood Mackenzie

Moolarben has amongst the lowest Scope 1 and 2 emissions for seaborne suppliers globally and is one of the lowest emissions intensity coal mines in Australia.

Moolarben has low fugitive emissions and good productivity due to a low strip ratio, thick single coal seam, and modern and efficient mining methods.

2030 seaborne thermal coal emissions curve – Scope 1 & 2



Source: Wood Mackenzie

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