Wood Mackenzie

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Weighted Average Mine Life for Blackwater and Moura Coal Systems

Prepared for Aurizon Network

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The Queensland Coal Industry

Coal mining in Queensland, Australia, began in the 1840s. Since then, the industry has grown to a become a world leading supply source. Thermal coal produced in Queensland helps power the region as well as other Asia Pacific countries such as Japan, South Korea, Taiwan, India, etc. Whereas metallurgical coal exports from Queensland have aided steel production in major economies of the world, including China, Japan, South Korea and India. Some metallurgical coals produced in Queensland are considered to be amongst, if not the highest quality available to the market and quality benchmarks used for price setting are based off Queensland metallurgical coals.

Key facts

- Queensland is the **highest coal producing region in Australia**, contributing 56% to Australia's total coal production in 2024.
- **Most of the coal produced in Queensland is of metallurgical grade**. In 2024, met coal constituted 61% of Queensland's total coal output.
- On a national level, Queensland produced 88% of Australia's total met coal and 35% of Australia's total thermal coal in 2024.
- **89% of Australia's met coal exports** came from Queensland in 2024. Whereas Queensland's met coal constituted **42% of the global seaborne met coal supply** in 2024.
- **Queensland's coal exports generated AUD 570 billion** for the country in 2024, of which 82% was through met coal sales.
- In terms of economic contribution, being the largest contributor (71%) in Queensland's resources industry's Gross Regional Product (GRP), the **coal industry in Queensland contributed AUD 85.3 billion to the region's GRP** in fiscal year 2023-24, constituting 17% of Queensland's total GRP in fiscal year 2023-24.
- In FY 2023-24, the coal industry in Queensland spent **AUD 40.1 billion in direct expenditures.** Of this, AUD 25.7 billion was spent on local businesses and charities, AUD 10.6 billion on royalties to the government and AUD 4.5 billion on wages and salaries.
- In FY 2023-24, the coal industry in Queensland **generated employment for 387,253 individuals**, both directly and indirectly. Thereby, contributing to 14% of the region's total employment.

Regulatory environment

Queensland government: The state government plays a key role in planning and implementing policies and regulations governing the coal industry. It is the authority approving mine licenses and various permits required for operations. The state government leads the coal industry while focusing on the industry's regulatory, environmental and economic impacts in the region, including sustainable project development and operations, environmental preservation, job creation and allied infrastructure development, such as railways and ports. The state government is also entitled to collect royalties from mines operating in the region.

Commonwealth government: The Commonwealth government of Australia plays a supporting role by overseeing the regional coal mining industries in areas of national importance, such as the environment, global trade and taxation. It does not govern the day-to-day operations of the Queensland coal industry.

Table 1: Key regulations and reforms

Key legislation/reform	Government involved	Description
Mineral Resources Act 1989	State	The act regulates the assessment, development and extraction of mineral resources in the state. It also provides the framework for granting mining leases, land access and conducting mining operations, while stating the respective responsibilities of the mining company and the state. It also lays out the royalty structure associated with the mining operation.
Environmental Protection Act 1994	State	The act lays out responsibilities to prevent or mitigate environmental harm by regulating operational activities. It also provides the framework for reporting operations that might cause harm to the environment and highlights the duty of the individual/business to restore the environment, i.e. mine closure and rehabilitation responsibilities for miners.
Environment Protection and Biodiversity Conservation Act 1999	Federal	The act calls for federal involvement if any project impacts the Matter of National Environmental Significance (MNES), such as threats to endangered species, water resources and world heritage sites.
National Greenhouse and Energy Reporting Act 2007	Federal	The act established a framework for companies to report greenhouse gas emissions, energy production and consumption. Its aim was to help the government make informed policy decisions and support Australia's international reporting requirements.
Fair Work Act 2009	Federal	This act ensures employee safety by providing a safety net of minimum entitlements such as working hours, wages, leaves, etc., while promoting and enabling flexible working arrangements. The act also helps prevent workplace discrimination.
Regional Planning Interests Act 2014	State	The act aims to manage and protect land use rights by identifying and protecting areas of regional interest by categorizing them based on use cases, such as agricultural, mining or urban development. Thus, it helps resolve land use disputes.
Resources Safety and Health Act 2020	State	The primary purpose of this act is to establish Resources Safety and Health Queensland (RSHQ) as an independent body to ensure the health and safety of workers in the Queensland resource industry.
Progressive Coal Royalty Regime 2022	State	Implemented as part of the 2022 state budget, the new royalty regime introduced tiered royalty rates based on coal prices in the export market. The payable royalty would increase with increasing export coal prices.
Safeguard Mechanism 2016 (reformed 2023)	Federal	The policy lays out the framework for reducing the greenhouse gas emissions of Australia's large-scale operations emitting over 100 $ktCO_2e$ annually, including coal mines. It requires large-scale industrial operations to reduce emissions by 4.5% annually.

Source: Wood Mackenzie

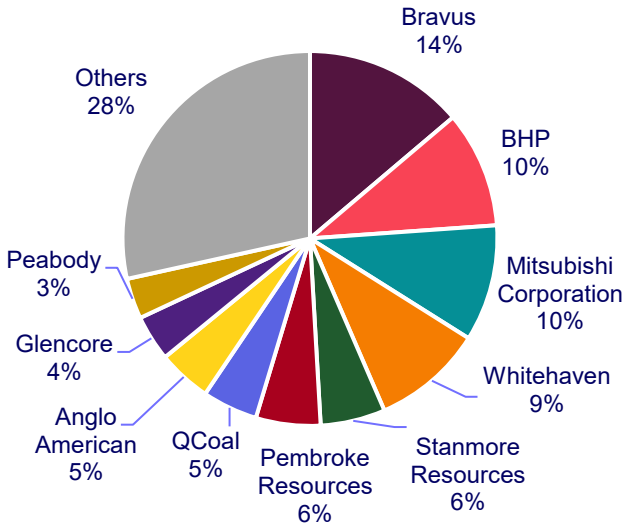
Reserves

As of 2025, Queensland has about 8,905 Mt of total coal reserves, most of it being metallurgical coal reserves. Bowen basin, the largest coal basin in Queensland, constitutes about 80% of the total coal reserves in the region, 100% of the met coal reserves in Queensland and 40% of Queensland's thermal coal reserves. Followed by the Galilee basin, which makes up another 40% of Queensland's thermal coal reserves while accounting for about 14% of Queensland's total coal reserves.

In terms of metallurgical coal quality, HCC forms about three-quarters of the total metallurgical coal reserve in Queensland, followed by PCI at 21% and SSCC making up the remainder. Currently operating mines constitute about 72% of the total metallurgical coal reserves in Queensland, with 19% of the reserves are in projects categorised as possible[1]. All the metallurgical coal reserves in Queensland are expected to cater to the seaborne market.

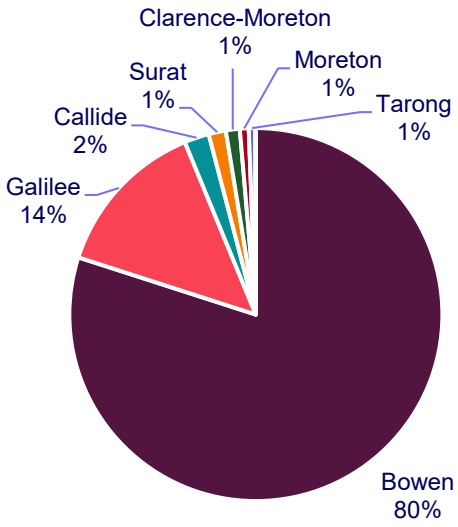
In the case of thermal coal, 69% of total thermal coal reserves in Queensland are High-Ash Bituminous coal, 25% are Bituminous coal, and just 6% are Sub-bituminous coal. Operating thermal coal mines in Queensland make up 74% of the total thermal coal reserves in the region, followed by 21% tagged as possible projects. Out of the total thermal coal reserves of 2,989 Mt, only 3% is expected to cater to the domestic demand, with the rest being supplied to the seaborne market.

Figure 1: Queensland's coal reserves by company (Mt)



Source: Wood Mackenzie

Figure 2: Queensland's coal reserves by basin (Mt)



Source: Wood Mackenzie

Coal Infrastructure

Queensland exports coal through six major port terminals located at four key ports in the region, three of which service the Central Queensland Coal Network. The Hay Point port precinct exports more than half of Queensland's total coal exports and is expected to maintain its dominance into the first half of the next decade. However, due to the closures of the Clermont thermal coal mine and the Oaky North metallurgical coal mine, it is expected to see a significant decline in volumes from 2028. Volumes recover as exports increase before dipping again in 2032 as German Creek Aquila, Poitrel and Blair Athol mines are anticipated to suspend operations by the end of 2031. Volumes thereafter are expected to be stable at around 104 Mt per year, on average, until the end of the forecast period.

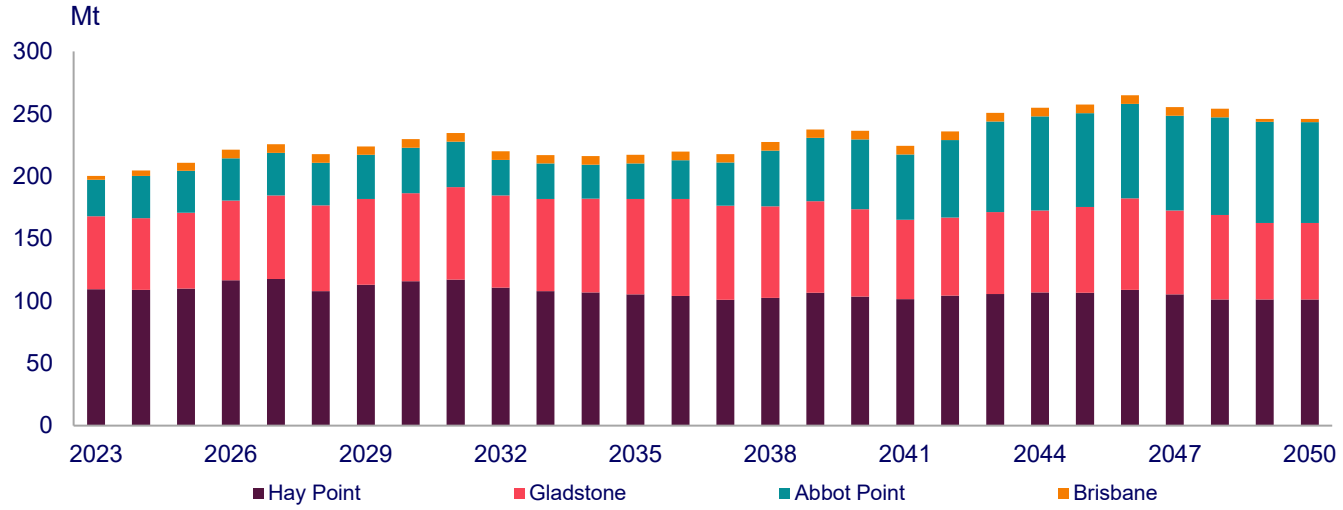
[1] Wood Mackenzie classifies projects as highly probable (under construction or funding arrangements sorted), probable (undergoing definitive feasibility studies) or possible (undergoing pre-feasibility studies).

Exports through Gladstone are expected to increase until 2036, reaching a total throughput of 78 Mt, before commencing a decline.

Of the four major ports, only the Abbot Point port is expected to increase exports throughout the forecast period. The output from the Carmichael thermal coal mine is expected to predominantly account for the increasing export volumes.

In terms of port and rail infrastructure expansions, based on Wood Mackenzie's coal export forecast, we do not expect most of the expansion projects, including DBCT 8X, to go through due to limited growth in the export market. Wood Mackenzie excepts only the Abbot Point Port and related rail infrastructure expansion to go through, as the expected increase in volumes is anticipated to cross capacity by the end of the next decade.

Figure 3: Queensland Coal Exports by Port



Source: Wood Mackenzie Global Coal Supply Tool H1 2025

Table 2: Queensland's port projects

Project name	Ownership	Capacity (Mtpa)	Commencement date
DBCT 8X Phase 1	Dalrymple Bay Infrastructure (DBI)	4.4 Mtpa	2032
DBCT 8X Phase 2	Dalrymple Bay Infrastructure (DBI)	4.1 Mtpa	2033
DBCT 8X Phase 3	Dalrymple Bay Infrastructure (DBI)	6.4 Mtpa	-
DBCT 8X Phase 4	Dalrymple Bay Infrastructure (DBI)	3.2 Mtpa	-
DBCT 9X	Dalrymple Bay Infrastructure (DBI)	35 Mtpa	-
Abbot Point Terminal 0	Bravus; Other	40 Mtpa	2032
Abbot Point Terminal 3	GVK; Aurizon; Other	60 Mtpa	-
Wiggins Island Coal Export Terminal Expansion	Multiple	32 Mtpa	-

Source: Wood Mackenzie

Table 3: Queensland's railway projects

Rail project	State	Participants	Capacity (Mtpa)	Distance (km)	Commencement date
Carmichael Rail Network Expansion	Queensland	Bravus; Other	5 Mtpa	-	2044
Surat Basin Rail	Queensland	Aurizon; Glencore; ATEC	30 Mtpa	214	-
Surat Basin Rail Expansion	Queensland	TBC	20 Mtpa	214	-
Galilee Link - Phase 1	Queensland	GVK; Aurizon	30 Mtpa	455	-
Galilee Link - Phase 2	Queensland	GVK; Aurizon	95 Mtpa	495	-

Source: Wood Mackenzie

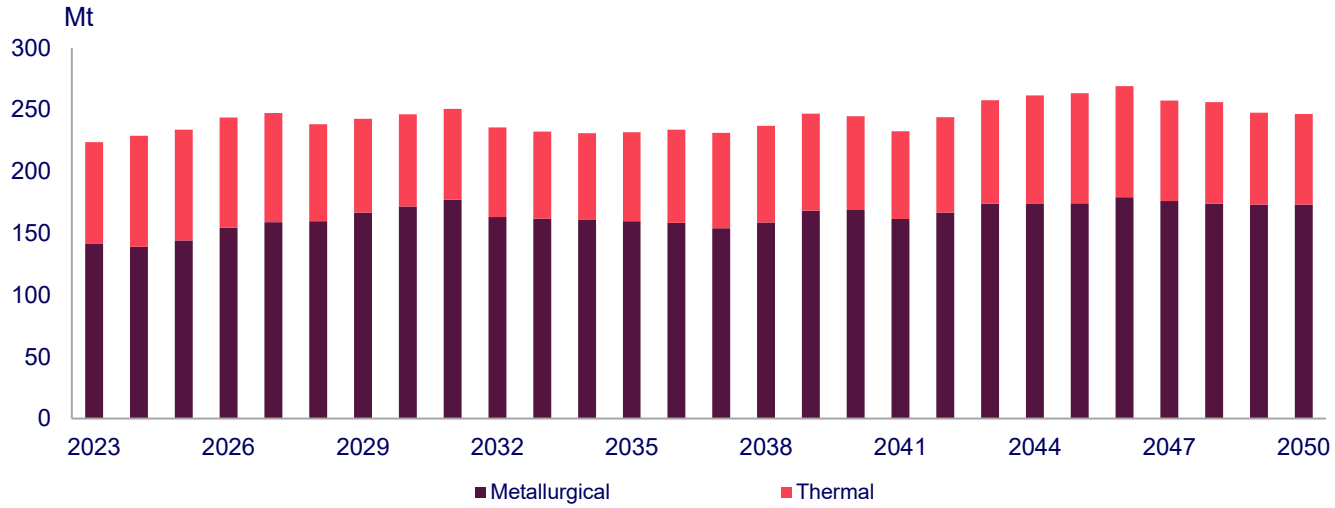
Queensland Coal Production Forecast

Queensland produced 229 Mt of coal in 2024. Of this, 139 Mt (61%) was metallurgical coal, with thermal coal being the rest. Coal production in Queensland is expected to grow at about 0.7% per year to reach a peak of 269 Mt by 2046, before declining to 2050.

Breaking down metallurgical coal production by type, HCC is expected to grow throughout the forecast period to 128 Mt by 2050 from about 99 Mt in 2024. Whereas Pulverised Coal Injection (PCI) and Semi-soft coking coal (SCC) volumes are expected to be at similar levels throughout the forecast period.

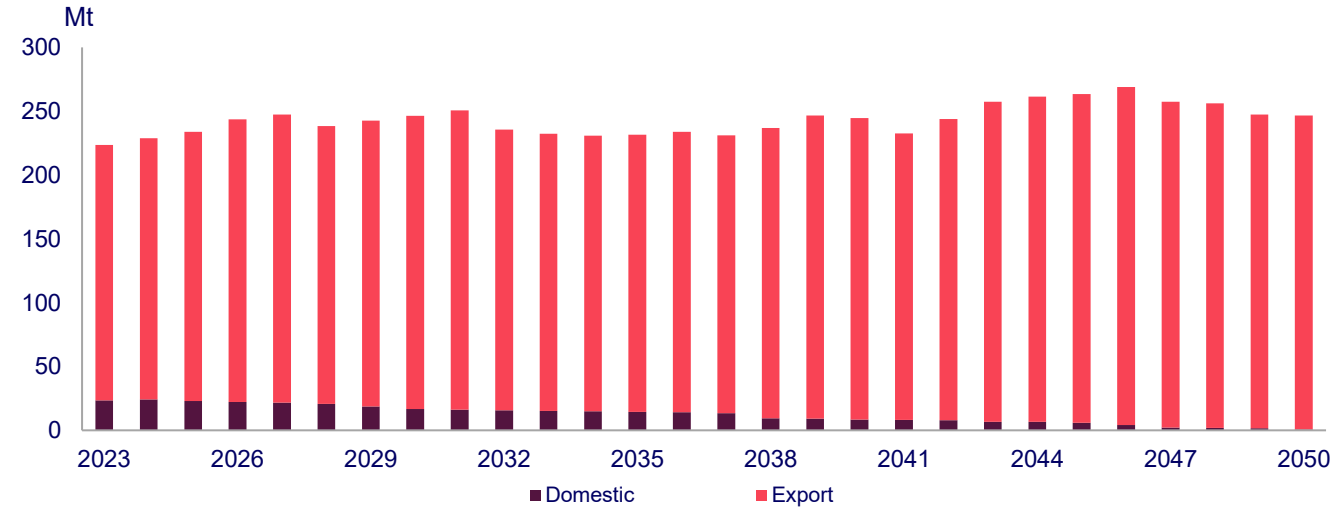
Thermal coal production is expected to decline in the long term. However, Wood Mackenzie expects a short-lived rise in the 2040s due to increased volumes of High-ash Bituminous coal post-2040. However, the decline in Bituminous and Sub-bituminous coal is expected to offset most of the increased volumes of the High-ash Bituminous coal.

Figure 4: Queensland Coal Production by Type



Source: Wood Mackenzie Global Coal Supply Tool H1 2025

Figure 5: Queensland Coal Production by Market



Source: Wood Mackenzie Global Coal Supply Tool H1 2025

Catchment Analysis

Overview of the Gladstone coal terminal network

The Gladstone coal network has 27 mines and projects. Of those, sixteen are currently operating, seven are expected to come online during the forecast period, and the remaining four have suspended operations. In the catchment analysis, we have only considered the operating mines and the probable and possible projects.

Coal asset list

Table 4: Operating mines

Asset	Operator	Port	Coal type
Baralaba	Baralaba Coal Company	RG Tanna & Barney Point	PCI, Bituminous
Blackwater	Whitehaven	RG Tanna & Barney Point	HCC, SCC, Bituminous
Callide	Batchfire Resources	RG Tanna & Barney Point	Sub-bituminous
Cook	QCoal	RG Tanna & Barney Point	HCC, Bituminous
Crinum	Sojitz	RG Tanna & Barney Point	HCC
Curragh	Coronado	RG Tanna & Barney Point	HCC, PCI, Bituminous, Bituminous high ash
Dawson Complex	Anglo American	RG Tanna & Barney Point	HCC, SCC, Bituminous, Bituminous high ash
Ensham (Underground)	Thungela Resources	RG Tanna & Barney Point	Bituminous
Gregory	Sojitz	RG Tanna & Barney Point	HCC
Jellinbah East	Jellinbah Group	RG Tanna & Barney Point	PCI, Bituminous
Kestrel	EMR Capital/Adaro Energy	RG Tanna & Barney Point	HCC, Bituminous
Meteor Downs South	U&D Mining	Wiggins Island	Bituminous high ash
Rolleston	Glencore	RG Tanna & Barney Point	Bituminous, Bituminous high ash
Wilton	Futura Resources	Dalrymple Bay Coal Terminal	HCC, Bituminous high ash
Yarrabee	Yancoal	RG Tanna & Barney Point	PCI, Bituminous
Fairhill	Futura Resources	RG Tanna & Barney Point	HCC, Bituminous high ash

Source: Wood Mackenzie

Table 5: Probable mines

Asset	Operator	Port	Coal type
Andromeda	Adamelia Resources	RG Tanna & Barney Point	Bituminous high ash
Baralaba South	Baralaba Coal Company	RG Tanna & Barney Point	PCI

Source: Wood Mackenzie

Table 6: Possible mines

Asset	Operator	Port	Coal type
Comet Ridge	Bowen Coking Coal	Wiggins Island	SCC
Dingo West	Magnetic South	RG Tanna & Barney Point	PCI
Minyango	QCoal	Wiggins Island	HCC, Bituminous
Springsure Creek	Adamelia Resources	Wiggins Island	Bituminous high ash
Wilpeena	Baoshan Iron & Steel Co	Wiggins Island	PCI

Source: Wood Mackenzie

Table 7: Suspended mines

Asset	Operator	Port	Coal type
Ensham	Idemitsu/LG	RG Tanna & Barney Point	Bituminous
Laleham (S Blackwater No 1)	QCT Resources	RG Tanna & Barney Point	SCC
Minerva	Sojitz/Kores	RG Tanna & Barney Point	PCI, Bituminous
Bluff	Bowen Coking Coal	RG Tanna & Barney Point	PCI

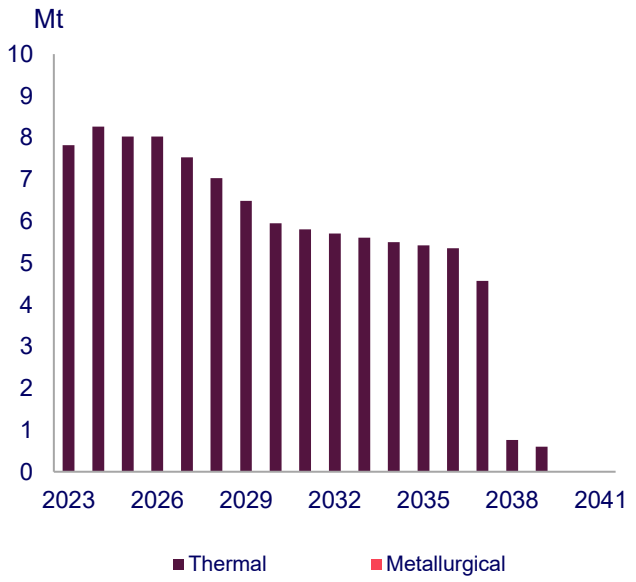
Source: Wood Mackenzie

Throughput forecast

Four thermal coal mines in the Gladstone catchment supply coal to the domestic market. Marketable coal production from these four mines is expected to decline going forward. The sudden decline in output in 2037 is expected due to the closing of the Curragh and Rolleston coal mines. We expect the domestic coal supply through the Callide coal mine via rail to come to a halt by 2039 as the Gladstone power station ceases operations.

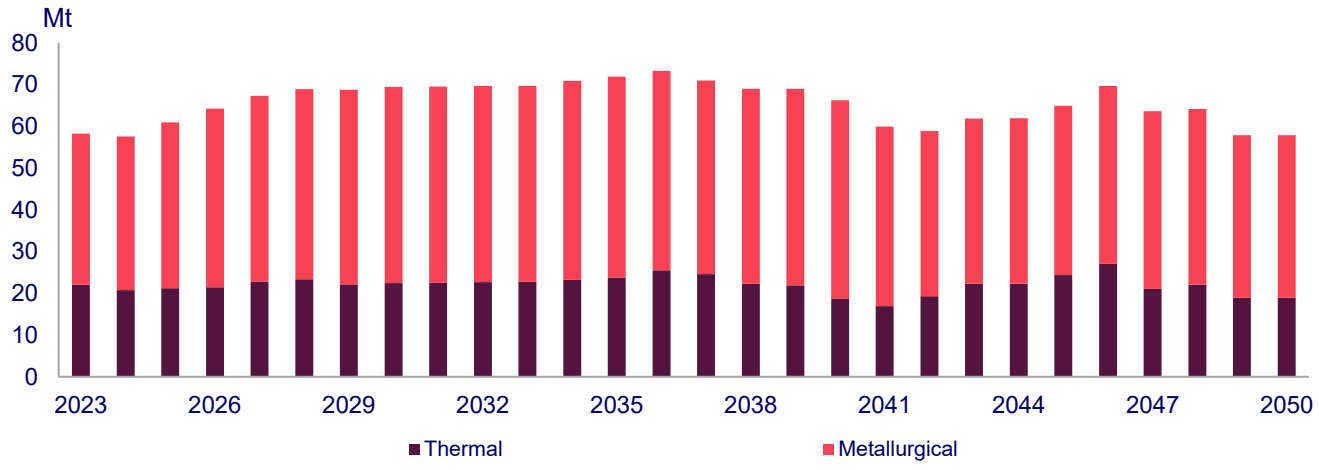
Throughput volumes of export coal under the Gladstone catchment are expected to increase from 58 Mt in 2024 to 73 Mt in 2036, growing at a CAGR of 2.2%, and then decline at a CAGR of -1.4% to reach 2024 levels of 58 Mt by 2050. Closure of the Curragh coal mine is expected to cause a dip in throughput volumes in 2041-42, taking out about 14 Mt of coal from the market. However, majority of this decline is expected to be offset by the ramping up of the Springsure Creek mine.

Figure 6: Catchment Domestic Coal Supply by type



Source: Wood Mackenzie

Figure 7: Catchment Export Coal Supply by Type

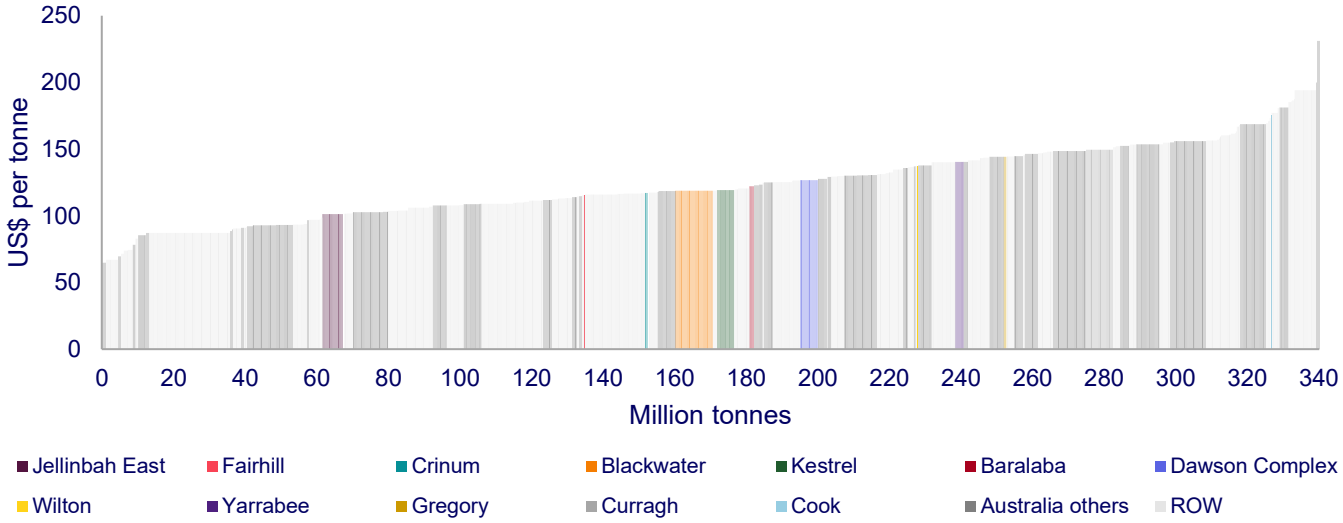


Source: Wood Mackenzie Global Coal Supply Data Tool H1 2025

Metallurgical coal cost curves

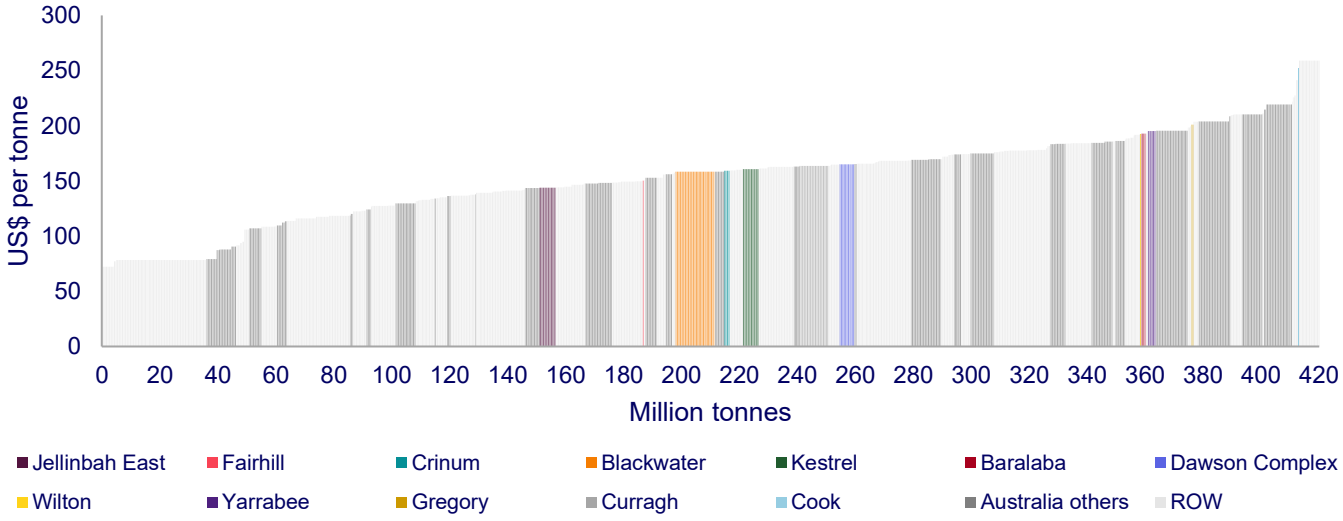
The following charts compare the total cash costs of export metallurgical coal mines in the Gladstone catchment with those of other export metallurgical coal mines worldwide for the years 2025 and 2035, respectively. No new capacity is expected to come online under the Gladstone catchment in this timeframe.

Figure 8: Metallurgical Coal Cost Curve 2025



Source: Wood Mackenzie Global Coal Supply Data Tool H1 2025

Figure 9: Metallurgical Coal Cost Curve 2035



Source: Wood Mackenzie Global Coal Supply Data Tool H1 2025

Mine and Project Overview

Table 8: Operating coal mines in the Gladstone system

Asset	Operator	Rail network
Baralaba	Baralaba Coal Company	Moura
Blackwater	Whitehaven	Blackwater
Callide	Batchfire Resources	Moura
Cook	QCoal	Blackwater
Crinum	Sojitz	Blackwater
Curragh	Coronado	Blackwater
Dawson Complex	Anglo American	Moura
Ensham (Underground)	Thungela Resources	Blackwater
Gregory	Sojitz	Blackwater
Jellinbah East	Jellinbah Group	Blackwater
Kestrel	EMR Capital; Adaro Energy	Blackwater
Meteor Downs South	U&D Mining	Blackwater
Rolleston	Glencore	Blackwater
Wilton	Futura Resources	Blackwater
Yarrabee	Yancoal	Blackwater
Fairhill	Futura Resources	Blackwater

Source: Wood Mackenzie

Table 9: Coal projects in the Gladstone system

Asset	Operator	Rail network	Expected commissioning date
Andromeda	Adamelia Resources	Blackwater	2036
Baralaba South	Baralaba Coal Company	Moura	2036
Comet Ridge	Bowen Coking Coal	Blackwater	2038
Dingo West	Magnetic South	Blackwater	2038
Minyango	QCoal	Blackwater	2039
Springsure Creek	Adamelia Resources	Blackwater	2041
Wilpeena	Baoshan Iron & Steel Co	Blackwater	2043

Source: Wood Mackenzie

The following table sets out three forecasts for reserves at each mine or project within the Gladstone rail and port system:

- Company published JORC Reserves and Resources.
- Wood Mackenzie's published Marketable Reserve which incorporates JORC estimates and where required adds additional Reserves based on company published mine life estimates (for example where the company has mine life estimates that exceed the published JORC Reserve Wood Mackenzie estimates a Marketable Reserve based on the annual production rate and the number of years the company reports it will produce)[2].

[2] Where possible the Wood Mackenzie research team verifies these estimates with mining companies.

- An upside case that where we have considered a summation of 75% of the reported measured resource, 50% of the indicative resource and 25% of the inferred resource, while factoring in the change in the average benchmark price to calculate total additional reserves. Then, considering Wood Mackenzie's average mine yield expectation, we calculate the additional marketable reserves. In a few cases, where there is no public information about a mine's resources and reserves, we have directly used Wood Mackenzie research estimates for marketable reserves.

It should be noted that this analysis provides a theoretical upside. It does not account for permits, geological, geographical or other constraints.

Table 10: Resource to reserves conversion for coal mines in the Gladstone system

Mine	Company reported							Marketable reserves	
	Marketable JORC Reserves	Measured	Indicated	Inferred	Year	Price differential	Yield (%)	Calculated Upside	Base case	Upside case
Baralaba	33.3	26.4	39.9	30.5	2016	1.8	98%	-	19.4	25.0
Blackwater	176.0	296.0	528.0	1,001.0	2024	0.9	86%	399.5	575.5	575.5
Callide	194.3	73.5	188.7	77.6	2015	1.7	100%	285.9	191.4	399.5
Cook	7.3	15.0	155.0	40.0	2019	0.9	85%	68.5	7.1	75.5
Crinum									50.0	50.0
Curragh	213.0	552.0	214.0	158.0	2024	0.9	78%	176.2	213.0	389.2
Dawson Complex	168.9	297.3	457.3	253.2	2024	0.8	76%	329.3	168.9	498.2
Ensham (UG)	68.8	4.5	465.4	193.8	2024	0.9	100%	269.4	63.0	338.2
Gregory									12.6	12.6
Jellinbah East									167.8	167.8
Kestrel	165.5	107.5	286.5	22.3	2024	0.9	77%	-	164.3	165.5
Meteor Downs South	13.0	13.3	3.5	-	2019	1.5	90%	3.4	6.0	8.1
Rolleston	150.0	210.0	350.0	500.0	2024	1.1	100%	336.6	146.6	486.6
Wilton	-	200.0	643.0	1,434.0	2024	0.9	37%	278.2	9.5	278.2
Yarrabee	55.0	50.0	60.0	13.0	2024	0.9			54.0	55.0
Fairhill	-	-	-	337.0	2024	0.9	50%	39.0	22.6	39.0
Andromeda									29.0	29.0
Baralaba South	36.0	22.6	36.4	51.0	2017	1.8	89%	40.8	63.4	76.8
Comet Ridge		8.0	9.0	43.0	2024	0.7	75%	11.9	8.0	11.9
Dingo West					2012		71%	38.5	26.0	38.5
Minyango									106.0	106.0
Springsure Creek		52.8	222.3	268.6	2012	1.4	99%	291.9	267.5	291.9
Wilpeena									60.0	60.0

Source: Wood Mackenzie

The following table shows the production forecast for each mine. The cells highlighted in green depict the mine's extended life based on additional reserves calculated by Wood Mackenzie. Where additional potential production has been delineated, we have kept the same production rate.

Table 11: Production forecast and mine life

Mine Name	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2055	2060	2065	2070	2100	Mine Closure
Blackwater	10.8	11.6	12.2	12.2	12.6	13.0	13.0	13.0	13.0	14.1	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	-	-	-	2064
Cook	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3								2302
Crinum	1.1	1.1	1.5	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	-	-	-	-	-	2050
Curragh	10.5	11.2	12.3	12.8	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5										-	-	-	-	-	2054
Ensham (UG)	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3																	2104
Gregory	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2038
Jellinbah East	5.8	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	-	-	-	-	-	2052
Kestrel	5.3	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	-	-	-	-	-	2053
Meteor Downs South	1.5	1.5	1.5	1.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2030
Rolleston	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7																	-	-	2066
Wilton	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4						2300
Yarrabee	2.6	2.8	2.8	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.0	-	-	-	-	-	-	-	-	-	-	-	-	2043
Fairhill	0.5	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9					-	2071
Andromeda	-	-	-	-	-	-	-	-	-	-	-	1.0	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	-	-	-	-	2056
Comet Ridge	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5			-	-	2065
Dingo West	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.7	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0			-	2077
Minyango	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	1.0	3.5	3.5	3.5	4.5	4.5	7.0	7.0	7.0	7.0	7.0	4.5	1.0	-	-	-	2063
Springsure Creek	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	3.5	6.5	6.5	8.0	10.0	11.5	13.0	13.0	13.0	13.0	13.0		-	-	2066
Wilpeena	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	-	-	-	2063
Total (Blackwater system)	**55.4**	**58.5**	**60.7**	**61.8**	**62.9**	**62.4**	**61.8**	**61.8**	**61.7**	**62.8**	**63.7**	**64.7**	**64.6**	**65.1**	**65.7**	**66.2**	**69.2**	**72.2**	**75.3**	**75.3**	**77.8**	**82.3**	**83.8**	**85.3**	**85.3**	**85.3**	**55.8**	**50.9**	**31.6**	**6.8**	**4.9**	-
Baralaba	1.6	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2038
Callide*	3.7	3.7	3.8	3.9	3.7	3.5	3.6	3.7	3.8	3.9	4.0	5.0	6.1	6.5	6.6	6.7	6.7	6.8	6.7	6.8	7.3	7.5								-	-	2068
Dawson Complex	6.8	7.0	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0							-	2095
Baralaba South	-	-	-	-	-	-	-	-	-	-	-	1.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2			-	2070
Total (Moura System)	**12.0**	**12.3**	**12.8**	**12.9**	**12.7**	**12.5**	**12.6**	**12.7**	**12.8**	**12.9**	**13.0**	**15.2**	**17.1**	**17.6**	**15.8**	**15.9**	**15.9**	**16.0**	**15.9**	**16.0**	**16.5**	**16.7**	**16.7**	**16.7**	**16.7**	**16.7**	**16.7**	**16.7**	**9.2**	**-**	**-**	-
Grand Total	**67.4**	**70.8**	**73.5**	**74.7**	**75.6**	**74.9**	**74.4**	**74.5**	**74.5**	**75.7**	**76.7**	**79.9**	**81.7**	**82.7**	**81.5**	**82.1**	**85.1**	**88.2**	**91.2**	**91.3**	**94.3**	**99.0**	**101**	**102**	**102**	**102**	**72.5**	**67.6**	**48.4**	**16.0**	**4.9**	-
System-wise Rail Capacity Utilisation (Based on committed capacity)																																
Blackwater	71%	74%	77%	79%	80%	79%	79%	79%	79%	80%	81%	82%	82%	83%	84%	84%	88%	92%	96%	96%	99%	105%	107%	108%	108%	108%	71%	65%	40%	9%	6%	
Moura	77%	80%	83%	84%	82%	81%	81%	82%	83%	83%	84%	98%	110%	113%	102%	103%	103%	103%	103%	103%	107%	108%	108%	108%	108%	108%	108%	108%	108%	60%	0%	

Source: Wood Mackenzie

**Production forecast for the Callide mine includes just the volumes that are expected to utilise the Moura System and are less than the mine's total output, as Callide supplies a significant amount of coal (~3-5 Mt a year) to the neighbouring Callide Power Station via a conveyor system.*

Table 12: Risks to the production forecast and expected mine life

Mine name	Risks
Baralaba	Despite the potential upside to reserves, we do not expect an increase in mine life as the company has decided to move operations to the Baralaba South mine and is not likely to undertake further exploration in the existing lease required to access the resource.
Blackwater	Mine life extension is backed by Whitehaven's plan to increase production by tapping into the vast pool of resources. Thereby, increasing mine life beyond the current marketable reserves. Wood Mackenzie expects Blackwater mine's C1 cash costs to come down going forward with decreasing royalty rates and strip ratio for the mine. Considering the strong demand for both metallurgical and high rank thermal coal, there are no significant risks associated with the forecast.
Callide	Domestic demand for coal might linger a bit longer due to slower renewable penetration in Australia, posing an upside risk. However, declining seaborne demand for sub-bituminous coal poses a downside risk to the forecast.
Cook	The mine faces various operational challenges that have led to mine closures in the past and are also responsible for limited growth in production. Thereby, causing a downside risk to the forecast.
Curragh	Wood Mackenzie expects the mine's total cash costs to decline after 2027, which poses an upside risk to the forecast.
Dawson Complex	Decreasing coal quality and a change in the metallurgical to thermal ratio in overall production could pose a downside risk in the longer term.
Ensham (Underground)	The mine, which is in the third quartile of the thermal coal cost curve, has a moderate cost structure. In the long run, a major dip in seaborne thermal coal prices could pose a downside risk to the expected resource to reserve conversion.
Meteor Downs South	The mine’s strip ratio is expected to increase as the mine progresses, thereby increasing costs. Therefore, a significant dip in high ash seaborne thermal coal prices in the longer term could pose a downside risk to the expected resource-to-reserve conversion.
Wilton	Relatively newer operation, with limited information available in public sources. Therefore, the mine has a higher level of uncertainty associated with the forecast.
Yarrabee	Higher production costs and lower margins pose a downward risk to the forecast.
Fairhill	Relatively newer operation, with limited information available in public sources. Therefore, the mine has a higher level of uncertainty associated with the forecast.
Baralaba South	Declining hot metal production and limited growth in seaborne demand for PCI pose a downside risk to the forecast.
Comet Ridge	The project is at an early stage of planning and discussion.
Dingo West	The Environmental Impact Assessment study has not yet been submitted. The project has also faced opposition from the local community.
Minyango	The project is at an early stage of planning and discussion.
Springsure Creek	The project is at an early stage of planning and discussion.
Wilpeena	The project is at an early stage of planning and discussion.

Source: Wood Mackenzie

Coal Mines In The Moura System

There are four coal mines in the Moura system. Three of these are operational: Baralaba, Callide, and Dawson Complex. One mine, Baralaba South, is expected to come online by 2036 based on the expected demand in the seaborne market.

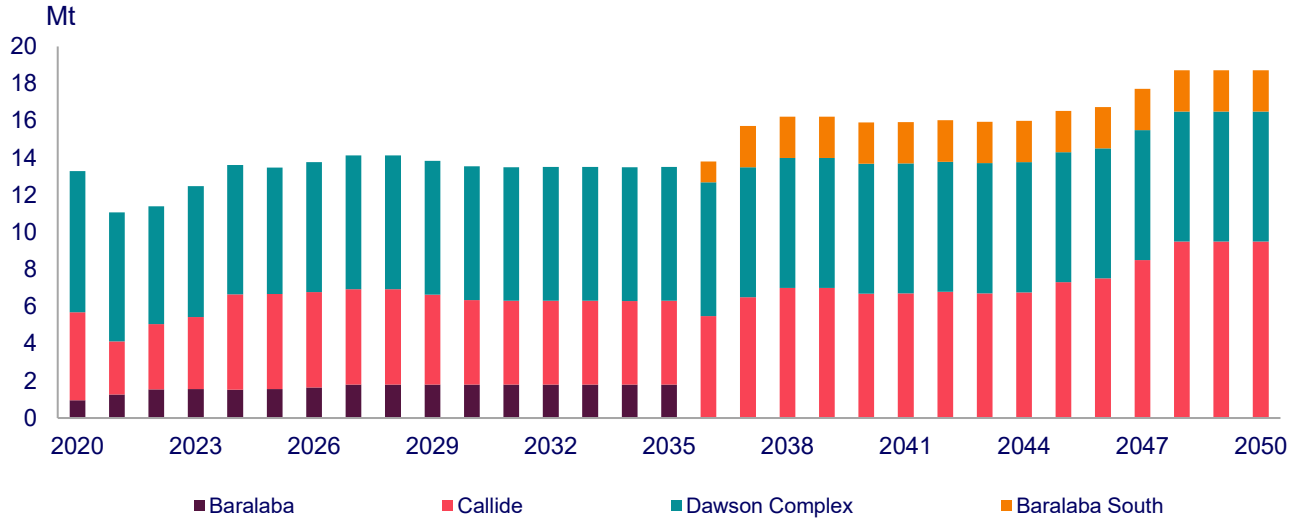
The Baralaba coal mine mostly produces low-volatile matter PCI coal and smaller volumes of good-quality bituminous coal. The mine exports its entire production to the seaborne market through the Port of Gladstone, commanding near benchmark prices for both its products. Even though there is a significant upside potential in the currently producing Baralaba North pit, the Baralaba Coal Company aims to move operations to the Baralaba South pit once it exhausts current reserves. Therefore, Wood Mackenzie does not expect further exploration and resource to reserve conversion in the Baralaba North pit. Once the operations move to the Baralaba South pit (considered as a separate project by Wood Mackenzie research), we expect operations to be focused on that region and therefore have modelled an upside reserve case for Baralaba South. Wood Mackenzie expects Baralaba South to only produce low-volatile matter PCI coal throughout the life of the mine.

The Callide coal mine supplies sub-bituminous coal to the domestic market, having a calorific value of 4,650 kcal/kg GAR, and exports about a third of its total annual production to the seaborne market. The share of exports is expected to grow in the longer term when domestic demand declines. Callide, the only sub-bituminous coal mine in the Gladstone catchment rail system, is exposed to significant risk related to the energy transition because of the quality of coal produced. However, Wood Mackenzie in its AET scenario, expects seaborne demand for Low-rank coal (sub-bituminous and lignite) to decline at a 9% CAGR from 475 Mt in 2025 to 42 Mt in 2050. The majority of low-rank coal demand by 2050 is expected to be for sub-bituminous coal. The demand is expected to come from India and Southeast Asian countries, where newly constructed power plants with supercritical and ultra-supercritical boilers are designed to burn bituminous as well as sub-bituminous coal. Callide could be well-positioned to supply these markets, considering its lower production costs and proximity to the demand centres. Also, Wood Mackenzie expects Callide to make margins of about USD 8.7/t in 2030, making it a profitable operation. However, the ever-changing geopolitical landscape poses a downside risk to these expectations.

The Dawson coal mine produces both thermal and metallurgical coal and supplies the entire volume to the seaborne market. In terms of product portfolio, Dawson offers bituminous and bituminous high-ash coal to the thermal coal market and semi-hard and semi-soft coking coal to the metallurgical coal market. As of 2025, Dawson mostly produces metallurgical coal while thermal coal makes up about one-fourth of the mine's total output. However, as mining progresses, Wood Mackenzie expects the share of thermal coal production to increase in Dawson's total coal production as the mine's coal quality declines. The mine is expected to become a predominant thermal coal (51%) mine by 2037 and will continue to produce more volumes of thermal coal than metallurgical till the end of its life.

Coal from the Dawson coal mine makes up about 40% of the total throughput of coal through the Moura system. The Dawson coal mine is expected to have the longest mine life among all coal mines in the Moura system based on Wood Mackenzie's expectation for resource to reserve conversion. The mine produces high-rank coal, demand for which is expected to remain strong in the longer term. However, the increasing share of thermal coal production and the decline in the share of metallurgical coal in total output from the mine could pose as a downside risk in the longer term.

Figure 10: Production Of Coal Mines In The Moura System



Source: Wood Mackenzie

Weighted Average Mine Life Calculations

The mine life analysis considers 23 mines in the Gladstone catchment. Of these, 16 are operating mines, and 7 are projects. Four of these 23 mines (Baralaba, Callide, Dawson Complex and Baralaba South) are part of the Moura system, and the rest utilise the Blackwater system.

The weighted average mine life is calculated using four different methods. The first scenario uses company-reported marketable JORC reserves. This is followed by a couple of scenarios that use Wood Mackenzie's Coal Supply Service data for marketable production and marketable reserves, respectively. The fourth scenario depicts the upside case by considering the extended mine life based on the estimated resource to reserve conversion, resulting in the highest weighted average mine life among all four scenarios.

Mine life calculation using JORC marketable reserves

Table 13 uses company-reported JORC marketable reserves and the corresponding base year to calculate mine life for individual mines based on the production rate expected by Wood Mackenzie's research. The weighted average mine life of the system is calculated using the following formula that yields the least value for mine life at about 21 years.

$$\frac{\Sigma(Mine\ Life\ x\ Total\ Marketable\ Reserves)}{\Sigma(Total\ Marketable\ Reserves)} = \frac{44{,}218}{1{,}942} = 21$$

Table 13: Mine life calculation using JORC marketable reserves

Mine	JORC marketable reserves	JORC year	Production (JORC year to 2024)	Marketable reserves - Net	Base Year	Close year	Mine life	Mine life x Marketable reserves-net
Baralaba	33.3	2016	8.31	25.0	2024	2038	14	766
Blackwater	176.0	2024	-	176.0	2024	2038	14	2,464
Callide	194.3	2015	80.7	113.6	2024	2038	14	4,663
Cook	7.3	2019	0.3	7.0	2024	2048	24	190
Crinum	50.0*	2024	-	50.0	2024	2050	26	1,299
Curragh	213.0	2024	-	213.0	2024	2041	17	3,621
Dawson Complex	168.9	2024	-	168.9	2024	2048	24	4,054
Ensham (UG)	68.8	2024	-	68.8	2024	2040	16	1,101
Gregory	12.6*	2024	-	12.6	2024	2038	14	176
Jellinbah East	167.8*	2024	-	167.8	2024	2052	28	4,698
Kestrel	165.5	2024	-	165.5	2024	2053	29	4,800
Meteor Downs South	13.0	2019	8.3	4.7	2024	2028	4	130
Rolleston	150.0	2024	-	150.0	2024	2037	13	1,950
Wilton	9.5*	2024	-	9.5	2024	2050	26	248
Yarrabee	55.0	2024		55.0	2024	2043	19	1,045
Fairhill	22.6*	2024	-	22.6	2024	2051	27	609
Andromeda	29.0*	2024	-	29.0	2036	2056	21	609
Baralaba South	36.0	2017	-	36.0	2036	2052	17	612
Comet Ridge	8.0*	2024	-	8.0	2038	2056	19	152
Dingo West	26.0*	2012	-	26.0	2038	2064	27	702
Minyango	106.0*	2024		106.0	2039	2063	25	2,650
Springsure Creek	267.5*	2012	-	267.5	2041	2064	24	6,420
Wilpeena	60.0*	2024	-	60.0	2043	2063	21	1,260
Total	**2,040**			**1,942**			**21**	**44,218**
Blackwater system mines				***1,599***			***21***	***34,123***
Moura system mines				***343***			***19***	***10,095***

Source: Wood Mackenzie

**We have used marketable reserve number from Wood Mackenzie's Research Service, where there is no company-reported number.*

Mine life calculation using Wood Mackenzie's marketable production

Table 14 takes the average of the next five years' annual production forecast for each mine by Wood Mackenzie and the expected mine life using the data from Wood Mackenzie's Coal Supply Service and calculates the weighted average mine life of about 23 years, using the following formula.

$$\frac{\Sigma(Mine\ Life\ x\ Average\ Production_{2025-2029})}{\Sigma(Average\ Production_{2025-2029})} = \frac{1{,}777}{78} = 23$$

Table 14: Mine life calculation using Wood Mackenzie's marketable production

Mine	Marketable Production						Close year	Mine life	Mine life x Average Production
	2025	2026	2027	2028	2029	Average Production			
Baralaba	1.6	1.7	1.8	1.8	1.8	1.7	2035	11	19
Blackwater	10.8	11.6	12.2	12.2	12.6	11.9	2064	40	475
Callide	9.6	9.6	9.6	9.6	8.3	9.4	2046	22	206
Cook	0.3	0.3	0.3	0.3	0.3	0.3	2048	24	7
Crinum	1.1	1.1	1.5	2.1	2.1	1.6	2050	26	41
Curragh	10.5	11.2	12.3	12.8	13.5	12.1	2041	17	205
Dawson Complex	6.8	7.0	7.2	7.2	7.2	7.1	2048	24	170
Ensham (Underground)	4.3	4.3	4.3	4.3	4.3	4.3	2039	15	64
Gregory	0.9	0.9	0.9	0.9	0.9	0.9	2038	14	13
Jellinbah East	5.8	6.0	6.0	6.0	6.0	6.0	2052	28	167
Kestrel	5.3	6.0	6.0	6.0	6.0	5.9	2053	29	170
Meteor Downs South	1.5	1.5	1.5	1.5	1.5	1.5	2028	4	6
Rolleston	11.7	11.7	11.7	11.7	11.7	11.7	2037	13	152
Wilton	0.3	0.4	0.4	0.4	0.4	0.4	2050	26	9
Yarrabee	2.6	2.8	2.8	2.9	2.9	2.8	2043	19	53
Fairhill	0.5	0.9	0.9	0.9	0.9	0.8	2051	27	21
Andromeda	-	-	-	-	-	-	2056	21	-
Baralaba South	-	-	-	-	-	-	2064	29	-
Comet Ridge	-	-	-	-	-	-	2056	19	-
Dingo West	-	-	-	-	-	-	2064	27	-
Minyango	-	-	-	-	-	-	2063	25	-
Springsure Creek	-	-	-	-	-	-	2064	24	-
Wilpeena	-	-	-	-	-	-	2063	21	-
Total						**78**		**23**	**1,777**
Blackwater system mines						***60***		***23***	***1,382***
Moura system mines						***18***		***22***	***395***

Source: Wood Mackenzie

Mine life calculation using Wood Mackenzie's marketable reserves

Table 15 uses Wood Mackenzie's marketable reserve estimates for each mine and the expected mine life to calculate the weighted average mine life of 27 years, using the following formula.

$$\frac{\Sigma(Mine\ Life\ x\ Total\ Marketable\ Reserves)}{\Sigma(Total\ Marketable\ Reserves)} = \frac{64{,}617}{2{,}432} = 27$$

Table 15: Mine life calculation using Wood Mackenzie's marketable reserves

Mine	Wood Mackenzie's marketable reserves	Close year	Mine life	Mine life x Marketable reserves
Baralaba	19.4	2035	11	213
Blackwater	575.5	2064	40	23,020
Callide	191.4	2046	22	4,212
Cook	7.1	2048	24	170
Crinum	50.0	2050	26	1,299
Curragh	213.0	2041	17	3,621
Dawson Complex	168.9	2048	24	4,054
Ensham (Underground)	63.0	2039	15	945
Gregory	12.6	2038	14	176
Jellinbah East	167.8	2052	28	4,698
Kestrel	164.3	2053	29	4,765
Meteor Downs South	6.0	2028	4	24
Rolleston	146.6	2037	13	1,906
Wilton	9.5	2050	26	248
Yarrabee	54.0	2043	19	1,025
Fairhill	22.6	2051	27	609
Andromeda	29.0	2056	21	609
Baralaba South	63.4	2064	29	1,839
Comet Ridge	8.0	2056	19	152
Dingo West	26.0	2064	27	702
Minyango	106.0	2063	25	2,650
Springsure Creek	267.5	2064	24	6,420
Wilpeena	60.0	2063	21	1,260
Total	**2,432**		**27**	**64,617**
Blackwater system mines	***1,988***		***27***	***54,300***
Moura system mines	***443***		***23***	***10,318***

Source: Wood Mackenzie

Mine life calculation using the modelled upside case for marketable reserves

Table 16 uses Wood Mackenzie's marketable reserve estimates, modelled for the upside case in this report. This scenario yields the maximum mine life of about 64 years. The weighted average mine life in this case is calculated using the following formula.

$$\frac{\Sigma(Mine\ Life\ x\ Total\ Marketable\ Reserves)}{\Sigma(Total\ Marketable\ Reserves)} = \frac{266{,}175}{4{,}178} = 64$$

Table 16: Mine life calculation using Wood Mackenzie's upside reserves case

Mine	Wood Mackenzie's marketable reserves	Close year	Mine life	Mine life x Marketable reserves
Baralaba	25.0	2038	14	350
Blackwater	575.5	2064	40	23,021
Callide	399.5	2068	44	17,579
Cook	75.5	2302	278	20,978
Crinum	50.0	2050	26	1,299
Curragh	389.2	2054	30	11,675
Dawson Complex	498.2	2095	71	35,375
Ensham (Underground)	338.2	2104	80	27,060
Gregory	12.6	2038	14	176
Jellinbah East	167.8	2052	28	4,698
Kestrel	165.5	2053	29	4,800
Meteor Downs South	8.1	2030	6	49
Rolleston	486.6	2066	42	20,437
Wilton	278.2	2300	276	76,792
Yarrabee	55.0	2043	19	1,045
Fairhill	39.0	2071	47	1,835
Andromeda	29.0	2056	21	609
Baralaba South	76.8	2070	35	2,688
Comet Ridge	11.9	2065	28	333
Dingo West	38.5	2077	40	1,540
Minyango	106.0	2063	25	2,650
Springsure Creek	291.9	2074	34	9,926
Wilpeena	60.0	2063	21	1,260
Total	**4,178**		**64**	**266,175**
Blackwater system mines	***3,179***		***66***	***210,183***
Moura system mines	***1,000***		***56***	***55,992***

Source: Wood Mackenzie

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