

Briefing report

October 2023

Money for nothing: Australia coal mines under the reformed safeguard mechanism

Key findings

- The impact of the safeguard mechanism reforms will be uneven across the Australian coal sector. A number of large Australian mines will be able to significantly increase their emissions this decade under the reformed scheme. Rather than reducing emissions, one-in-five mines will be permitted to *increase* emissions compared to the most recent financial year.
- For most of these mines, their emissions limit in 2029-30 will be more than 15% higher than it is in the first year of the safeguard mechanism reforms. For several, their emissions limit will more than double over this time.
- For those mines without a declining emissions limit the reforms will represent an overall financial benefit that will see them issued with 6 million tonnes worth of mitigation credits – at a potential commercial value of \$180 million dollars – without taking any measures to reduce emissions.
- The mines that lack a declining emissions limit this decade are among Australia’s largest coal mines. Those mines that are likely to receive a large automatic emissions credit under the scheme without taking any abatement action were responsible for more than one-third of the run-of-mine coal production at covered facilities in 2021-22.
- Most of the mines with baselines that allow emissions to increase have significant expansion plans. Because the safeguard mechanism is an emissions intensity scheme, increasing coal production at these mines or maintaining it at current levels in accordance with these plans would likely be rewarded.
- The increasing financialisation of the market for emissions avoidance at Australia’s most heavily emitting coal mines highlights the need to move to direct measurement of emissions in Australia’s open cut coal mines.

Results and discussion

- The impact of the safeguard mechanism reforms will be uneven across the Australian coal sector. A number of large Australian mines will be able to significantly increase their emissions this decade under the reformed scheme. Rather than reducing emissions, one-in-five mines will be permitted to *increase* emissions compared to the most recent financial year.
 - The reformed safeguard mechanism sees all facilities transition over this decade from “production variables” based on each site’s historical emissions intensity toward a scheme based on the average intensity of each sector. For the coal mining sector, unlike every other sector, this transition will be only partial – facility specific emissions intensities will still play a role in the calculation of baselines in 2030.

- For a significant cohort of Australia’s open cut mines, because they have reported emissions intensities less than half of the industry average, this transition from site-specific to industry average values will see their emissions baselines dramatically increase even after factoring in the safeguard mechanism’s 4.9% annual baseline decline rate.
- A smaller number of mines will have baselines that effectively do not decline, with their emissions limit in 2029-30 being only one or two percent below the level where it is set for 2023-24. A table of these facilities is included at the end of this report.
- The aggregate emissions limit of these facilities in 2029-30 – being the sum of each facility’s baseline in that year – is 40% higher than their reported emissions in the 2021-22 financial year. This is shown below in Figure 1.

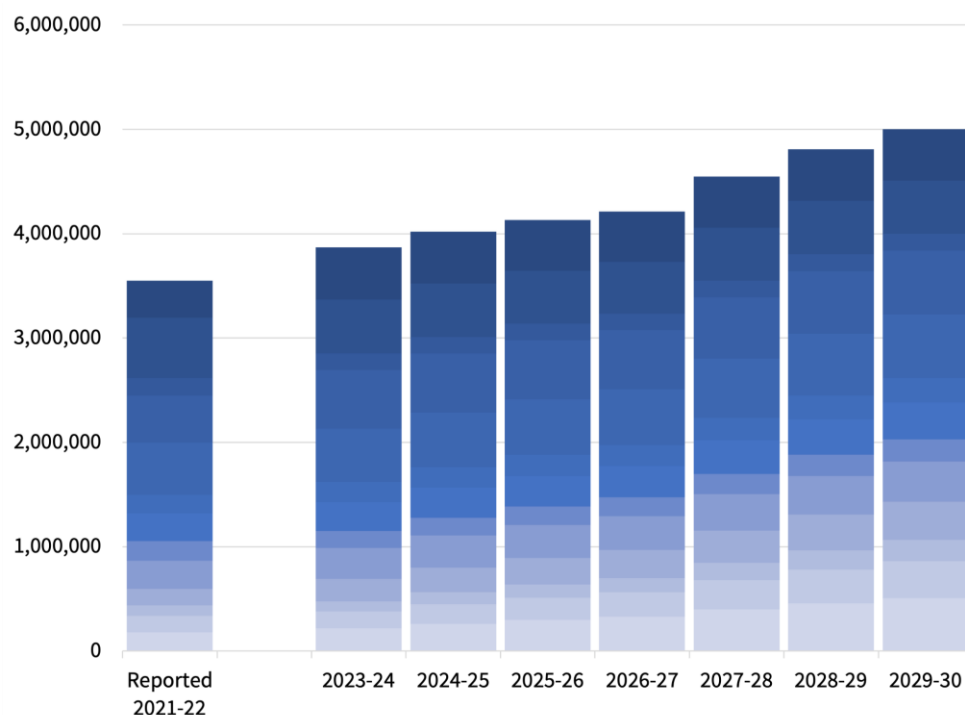


Figure 1: Reported emissions in 2021-22 and aggregate baselines from coal mines with increasing emissions limits between 2023-24 and 2029-30.

- **For most of these mines, their emissions limit in 2029-30 will be more than 15% higher than it is in the first year of the safeguard mechanism reforms. For several, their emissions limit will more than double over this time.**
 - Of those mines with increasing baselines, many see their baseline increase very significantly this decade. Three Australian coal facilities covered by the safeguard mechanism will have emissions limits in 2029-30 that are more than double initial allocation in 2023-24. These are Moolarben (+131%), Wilpinjong (+119%) and Mangoola (+111%).
 - Another six mines will see their emissions limits increase by more than 15%. These are Rolleston (+69%), Ravensworth Operations (+32%), Callide (+29%), Mount Owen Glendell (+28%), Boggabri (+22%) and Mt Arthur (+18%).
 - The emissions limit for Peak Downs increases 10% over the decade

- Three mines have emissions limits that are essentially unchanged at the end of the decade: Liddell (+2%), Hunter Valley Operations (-1%) and Saraji (-2%)
- **For those mines without a declining emissions limit the reforms will represent an overall financial benefit that will see them issued with 6 million tonnes worth of mitigation credits – at a potential commercial value of at least \$180 million dollars – without taking any measures to reduce emissions.**
 - If these thirteen facilities hold their emissions intensity at the historical level determined by the safeguard mechanism rules, and maintain coal production at current levels, they would undershoot their baselines significantly, entitling them to be issued safeguard mechanism credits (SMCs). SMCs represent tradable credits that can be used as offsets within the scheme.
 - Even if production is held at the levels seen in 2021-22 – which is unlikely for several reasons – then the 6 million tonnes of abatement credit created for these facilities this decade will have a total value of at least \$180 million this decade, granted to these facilities for doing nothing at all to reduce emissions. The value of these credits could reach up to \$450 million if the price of abatement approached the price cap set out in legislation.
 - For Moolarben, this would result in a windfall of between \$40 million and \$100 million. Again, this is issued without any need for the operator to mitigate emissions at all.
- **The mines that lack a declining emissions limit this decade tend to be among Australia’s largest mines. Those mines that are likely to receive a large automatic emissions credit under the scheme without taking any abatement action were responsible for more than one-third of the run-of-mine coal production that occurred at covered facilities in 2021-22.**
 - Those mines that have been granted access to this loophole by the scheme rules tend to be large open cut mines, with 9 in NSW and 4 in Queensland.
 - A far greater share (89%) of coal production covered by the safeguard mechanism occurs at open cut mines because these mines are most often larger than underground mines.
 - Six mines with no effective emissions limit – Moolarben, Mt Arthur, Peak Downs, Hunter Valley Operations, Saraji and Wilpinjong – are in the top ten largest mines covered by the safeguard mechanism.
 - Cumulatively, those mines with no effective emissions limit account for 36% of coal produced at Australian covered facilities.
- **Most of the mines with baselines that allow emissions to increase have significant expansion plans. Because the safeguard mechanism is an emissions intensity scheme, increasing coal production at these mines in accordance with these plans would likely be rewarded.**
 - While most expansion plans are still subject to state and federal approvals all 13 of the mines without an effective emissions limit this decade are planning or have recently undertaken significant expansions. One mine – Mt Owen Glendell – had its

expansion plan rejected by the New South Wales Independent Planning Commission late in 2022.¹

- Presuming that the expanded component of the mine is capable of operating at the same emissions intensity as the existing component, then this would see Australia's flagship climate policy for the industrial sector paying mine operators to extract more coal.

- **The increasing financialisation of the market for emissions avoidance at Australia's most heavily emitting coal mines highlights the need to move to direct measurement of emissions in Australia's open cut coal mines.**
 - Despite relevant technologies existing today, current reporting rules do not require direct measurement of emissions from open cut mines, which account for around 85% of annual production at facilities covered by the safeguard mechanism. In Queensland's Bowen Basin, most miners simply apply a state-wide emissions factor to determine their fugitive methane emissions with no effort to assess emissions coming from the mine.²
 - Peer-reviewed research based on satellite observations have found that mines in that region are likely emitting significantly more methane than is reported through this means.³ While this is a common problem across the Bowen Basin, this includes Glencore's Hail Creek Mine which could single-handedly be emitting up to 6.4 million tonnes (CO₂e, NGER Act GWP) of fugitive methane per year.
 - In 2021-22, under the current rules Hail Creek was permitted to report that its total scope 1 emissions were just 544 thousand tonnes. While fugitive methane emissions are not the only component of the scope 1 emissions of a coal mine, they are usually the most significant.
 - If the satellite observations are correct, this implies that Hail Creek is only reporting around 5.5% of its actual fugitive methane emissions. Accurate methane reporting would increase the facility's scope 1 emissions intensity by a factor of 13.
 - This would take its emissions very far above the industry-average emissions intensity. Over the remainder of this decade, Hail Creek will likely be required to deliver in the order of 710,000 tonnes on abatement under default settings. Accurate reporting could increase this amount 85 times over.

Report methodology and limitations

The analysis sets out to provide an estimate of how many Safeguard Mechanism Credits ('SMCs') would be created at and surrendered by each Australian coal facility covered by the safeguard mechanism if production and emissions intensity were held static through this decade. Care was taken in developing the necessary assumptions at each stage to ensure that the model was far more likely to underestimate the scale of the problem than it was to overestimate it.

The facility-specific emissions intensity number – which represents each mine's site-specific emissions intensity for the purpose of the reformed safeguard mechanism – for each facility was calculated following the steps in the *National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015* (Cth) ('safeguard rule'). Queensland run-of-mine coal production data were obtained from the state government's open data portal.⁴ New South Wales run-of-mine production data was obtained from Coal Services Pty Ltd. Reported scope 1 emissions data were obtained from the Clean Energy Regulator's publicly available safeguard mechanism data.⁵

Data matching, to attribute production data to safeguard mechanism facilities was performed by Energy and Resource Insights. Mines that did not produce any coal in 2021-22, but that did report emissions – such as Ravensworth Underground, which has been required to report under the safeguard mechanism despite being in care-and-maintenance for several years – were excluded from this analysis. Similarly, mines that had reported within the past five years, but that did not report in 2021-22 were likewise excluded. Due to difficulties attributing production to a facility, one significant mine – the United Wambo Joint Venture in the Hunter Valley – was also excluded.

Emissions from Queensland's open cut mines were revised upward to account for recent changes to the *National Greenhouse and Energy Reporting (Measurement) Determination 2008* (Cth).⁶ This revision, which took effect on 1 July 2023 sees the Method 1 state-based emissions factor for fugitive emissions from open cut coal in Queensland – used by most Queensland facilities – revised up by 34.8%. As the breakdown of sources is not available in the publicly available scope 1 emissions data provided by the Clean Energy Regulator, it was assumed that fugitive emissions make up 65% of the total scope 1 emissions from open cut mines, with the remaining emissions being released from on-site diesel use. This is a conservative assumption for the purposes of this work. If a lower share of fugitive emissions from open cut coal mines had been assumed, then the historical emissions intensity for Queensland open cut coal mines would also be lower, tending to exaggerate the problem this report is attempting to highlight.

The corollary of these assumptions is that historical emissions – and so emissions intensities – for Queensland open cut coal mines were revised up by 22.6%. Not all Queensland open cut miners use method 1, with coal mines in the Surat Basin most often using methods 2 or 3 instead. However, information detailing which mines do or do not use the state based emissions factor is not publicly available. Applying this revision to all Queensland open cut coal facilities – and lifting all emissions intensities – is the first means through which conservatism is assured.

Four Queensland facilities contain both open cut and underground components. Again noting that the emissions data publicly disclosed by the Clean Energy Regulator only include a single figure for scope 1 emissions without the possibility of disaggregating the share of emissions coming from each component, it was not possible to make a corresponding adjustment to these facilities' emissions. However, all four of these mines were relatively emissions intensive, and all four have declining baselines. An upward adjustment would increase the baseline decline rate for these facilities.

Due to data limitations – particularly the lack of accurate time series data that reflect any reporting methodology changes that have occurred at individual facilities – the emissions

intensities for individual facilities that are derived from this process may not precisely match those contained in information held by the Regulator and Department. Nonetheless, the production weighted emissions intensity of the sector according to data compiled for this analysis was exceptionally close to figures calculated by the Department: 0.0654 tonnes of carbon dioxide equivalent greenhouse gas per tonne of run-of-mine coal rather than the Department’s calculated average of 0.0653.

Figure 2, below, shows the marginal spread of facility-specific emissions intensity numbers for each increase in cumulative production at these facilities in the 2021-22 financial year. This has been overlaid with the production weighted industry average that has been nominated by the Department of Climate Change, Energy, Environment and Water. Those facilities that produce coal at a below average emissions intensity were responsible for 347 million tonnes of run-of-mine coal in 2021-22, or 79% of the total in that year.

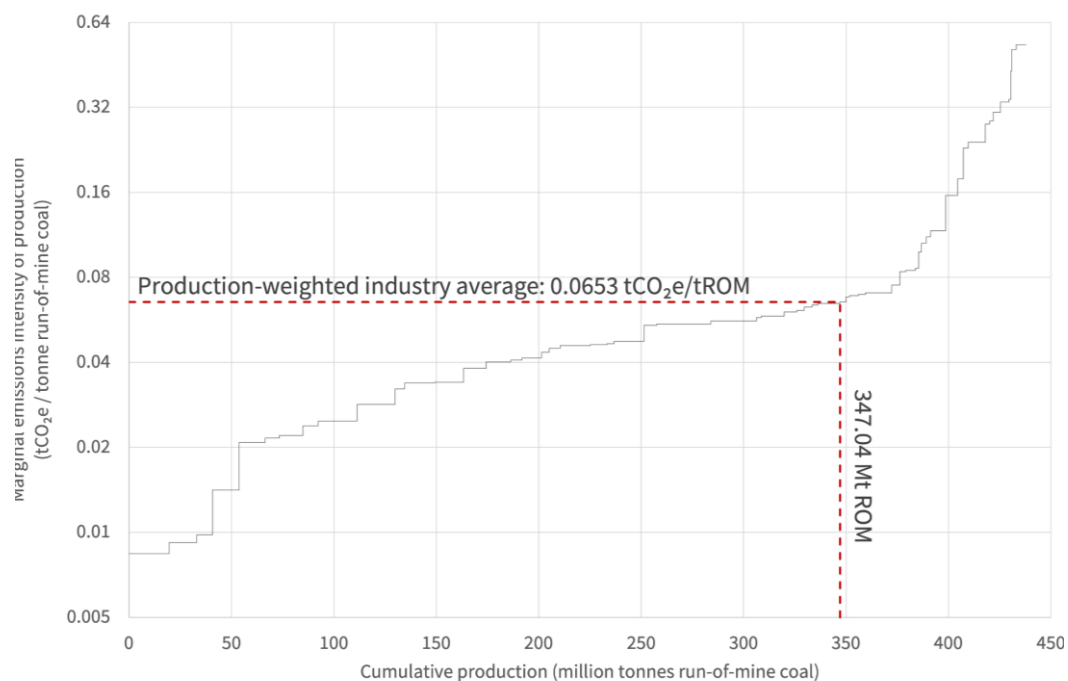


Figure 2: Marginal emissions intensity versus production at facilities in 2021-22. Note: the y-axis is on a logarithmic scale to better display the data. The most emissions intensive facility shown on this chart emits 60 times more greenhouse gas per tonne of run-of-mine coal than the least.

All facilities moved on to production adjusted baselines for the 2022-23 financial year, making the safeguard mechanism an emissions intensity scheme first and foremost. In the preceding year, 2021-23, just eight included facilities used production adjusted baselines. The baselines for these facilities were set very significantly higher than the reported emissions. Baselines were a mean of 58.0% higher than reported emissions with a median gap of 44.7%. However, fewer than one-in-eight facilities were using these baselines in years where data are publicly available.

To resolve the significant historical issue of excessive headroom under the safeguard mechanism, the Department has proposed a new hybrid-approach to baseline setting. At the start of the reformed scheme, facility baselines will predominantly be set using the historical emissions intensity of existing facilities. Over the decade, facilities will progressively move away from site-specific baselines toward using baselines set in accordance with the industry average emissions intensity. The original intent of this shift was that by 2029-30, facilities would no longer be using

site specific baselines, with baselines for existing facilities being solely determined by industry averages.

Recent proposed changes from the department mean that this transition will be delayed for Australian coal mines bound by the safeguard mechanism. Under these changes, the baselines for Australian coal mines covered by the safeguard mechanism will be dominated by site-specific determinations for the remainder of this decade. The proposed transition schedule, as set out in advice provided to the coal industry on 7 July 2023, is shown below in Table 1.

	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Standard	10:90	20:80	30:70	40:60	60:40	80:20	100:0
Coal	5:95	10:90	15:85	20:80	30:70	40:60	50:50

Table 1: Transition schedule indicating the ratio of reliance on industry average and site-specific emissions production variables for baseline setting to 2030.

The net effect of this delay is to very slightly reduce the ambition of the scheme and to significantly reduce reliance on SMCs. The revised proposal sees 64% fewer SMCs issued across the decade, but also reduces the need for facilities to rely on SMCs by an equivalent amount. The aggregate of all baselines in 2029-30 – which represent the total net emissions of covered facilities in that year after allowing for trade in SMCs – will be 0.5% higher under the revised plan.

This analysis relies exclusively on historical data and does not consider the impact of either new projects or closures. Of those mine closures that are likely this decade – such as some underground components of the Capcoal complex which are scheduled to close late this decade – these are more often at underground mines with relatively high emissions intensity. As a result, the fact that closures are not considered means that this analysis is more likely to understate the total impact of SMCs issued to the coal sector.

A core limitation of this analysis is that we could not account for the impact of the various flexibility measures that are included in the reformed safeguard mechanism. These mechanisms – such as multi-year monitoring periods and the ability to have a facility’s baseline decline rate lowered – will generally act to lower the relative ambition of the scheme. Application of these measures may increase the number of facilities that will receive a net financial benefit from the scheme.

This will be offset to some degree by the commencement of operations at any new facilities that commence operations between now and 2030. The government has committed to holding new entrants to emissions intensities that represent “international best practice”. Guidelines for determining international best practice in the safeguard mechanism are currently under consultation. As such, no specific emissions factor has been proposed. Any new facilities will be held to higher emissions standards than existing facilities, and new facilities will soak up some of the excess SMCs in the industry. Given the inherent uncertainty around this process, around precisely which new facilities will commence operations this decade and about whether – and what on-site abatement these new mines might employ given the higher standards they are being held to – it is too early to guess at how much new entrants will affect the market for SMCs.

Alongside the question of new entrants, the safeguard mechanism reforms have granted the Clean Energy Regulator new powers to break up schemes where facilities have been aggregated to avoid binding requirements under the safeguard mechanism. Historically, some coal mines have been coupled with electricity generating infrastructure in ways that may trigger this power. It is unclear

how the Regulator intends to use its new power in these instances, and there is little guidance available to indicate the emissions intensities of these mines. On first principles some such mines – such as Loy Yang in Victoria – are likely to have very low scope 1 emissions and be net SMC beneficiaries if they meet 100 ktCO₂e per year threshold required of the safeguard mechanism.

External references

- (1) Independent Planning Commission (NSW). *Glendell Continued Operations*; 2022. <https://www.ipcn.nsw.gov.au/cases/2022/02/glendell-continued-operations-project-ssd-9349>.
- (2) Energy and Resource Insights. *Monitoring, Reporting and Verification of Fossil Methane in Australia*; 2023. <https://energyresourceinsights.com/wp-content/uploads/2023/03/FossilMethaneInAustralia.pdf> (accessed 2023-06-16).
- (3) Sadavarte, P.; Pandey, S.; Maasackers, J. D.; Lorente, A.; Borsdorff, T.; Denier van der Gon, H.; Houweling, S.; Aben, I. Methane Emissions from Superemitting Coal Mines in Australia Quantified Using TROPOMI Satellite Observations. *Environ. Sci. Technol.* **2021**, *55* (24), 16573–16580. <https://doi.org/10.1021/acs.est.1c03976>.
- (4) Queensland Government. *Production by Individual Mines*; Dataset; corporateName=The State of Queensland; jurisdiction=Queensland, 2022. https://www.data.qld.gov.au/dataset/coal-industry-review-statistical-tables/resource/9c3c1aaf-0afa-4e58-b67c-75c0d3574abd?inner_span=True (accessed 2023-08-07).
- (5) Clean Energy Regulator. *Safeguard Data*; 2023. <https://www.cleanenergyregulator.gov.au/NGER/The-Safeguard-Mechanism/safeguard-data>.
- (6) *National Greenhouse and Energy Reporting (Measurement) Amendment (2023 Update) Determination 2023* (Cth).

Table of facilities with no declining emissions limit

Facility name	State	ROM FY22	FY22 Emissions	Change in baseline (FY24–FY30)	Credits issued	Cost estimate
Moolarben	NSW	19,523,032	181,893	+131.3%	1,327,695	\$39,830,848
Wilpinjong	NSW	13,517,830	154,554	+119.4%	894,449	\$26,833,482
Mangoola	NSW	7,656,694	100,044	+110.6%	494,949	\$14,848,462
Rolleston	Qld	13,016,972	160,537	+68.5%	710,157	\$21,304,698
Ravensworth Operations	NSW	12,756,449	268,698	+32.2%	492,986	\$14,789,571
Callide	Qld	6,904,985	188,124	+29.0%	252,998	\$7,589,946
Mt Owen Glendell	NSW	11,497,827	264,736	+27.6%	410,759	\$12,322,783
Boggabri	NSW	7,430,036	177,437	+21.6%	233,478	\$7,004,343
Mt Arthur	NSW	19,059,688	503,403	+18.5%	552,085	\$16,562,550
Peak Downs	Qld	18,543,975	448,708	+9.5%	381,747	\$11,452,400
Liddell Coal	NSW	4,696,866	168,363	+1.7%	54,023	\$1,620,680
Hunter Valley Operations	NSW	14,604,719	577,874	-1.1%	111,184	\$3,335,517
Saraji	Qld	13,995,076	355,882	-1.5%	99,273	\$2,978,203

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