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July 2025

More cost, less benefit: Hunter Valley coal mine analysis

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More cost, less benefit for NSW: the flawed rationale for the Hunter Valley coal mine expansion

A review of the 2024 cost-benefit analysis submitted as part of the Hunter Valley Operations Continuation Project Economic Impact Assessment

July 2025

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About ACCR

The Australasian Centre for Corporate Responsibility (ACCR) is a not-for-profit, philanthropically-funded shareholder advocacy and research organisation that engages with listed companies and investors globally, enabling and facilitating active stewardship. Our research team undertakes company-focused research into the climate transition plans of listed companies, offering analysis, research and insights to assist global institutional capital understand investment risks and opportunities during the energy transition. For more information, follow ACCR on LinkedIn.

1. Executive Summary

1.1 Introduction

The proposed Hunter Valley Operations (HVO) Continuation Project is the largest coal expansion project under NSW Government assessment. The HVO Joint Venture (51% Yancoal, 49% Glencore) is seeking to expand existing mine operations to 2045 and extract an additional hundreds of millions of tonnes of run-of-mine coal (ROM) over the coming decades.

HVO Joint Venture's original proposal sought to extract an additional 684 million tonnes (Mt) of ROM coal, which would have resulted in an estimated 32 Mt of CO_2-equivalent ($MtCO_2e$) direct emissions within NSW, and nearly 1 gigatonne of CO_2-equivalent ($GtCO_2e$) from end-use combustion of coal in export markets. Following concerns raised by the NSW Government about the project's significant fugitive methane emissions and impact on the State's legislated emissions reduction targets,[1] the joint venture is revising the application – reducing the mine size by 35%,[2] resulting in 40% less scope 1 emissions[3] relative to the original proposal. The revised proposal is expected in mid-2025.

Even with a reduced size, the HVO Continuation Project represents almost 40% of emissions in the NSW Government's coal project approval pipeline. With existing coal mining projects already straining the ability of NSW to meet its legislated emissions reduction targets, if HVO is approved it will further strain the state's ability to meet its targets and shift the burden onto other sectors to make deeper emissions reductions.

[1] NSW DPHI, Consideration of Climate Change (Net Zero Future) Act 2023, Scope 3 Emissions and Mining Panel Advice, letter to HVO Pty Ltd, July 2024.
[2] ACCR estimate based on a reduction of ~220 Mt ROM coal relative to the original proposal. HVO Pty Ltd, Response to RFI and Proposed Project Amendments, letter submitted to the NSW DPHI, March 2025, p. 4.
[3] HVO Pty Ltd, Response to RFI and Proposed Project Amendments, letter submitted to the NSW DPHI, March 2025, p. 5.

A critical component of the assessment process will be consideration of the economic costs and benefits to NSW. ACCR has undertaken a detailed review of the cost-benefit analysis (CBA) [4] the HVO Joint Venture provided in 2024 as part of its original proposal. We found this 2024 CBA significantly understates the cost of emissions from the project, meaning it overstates its net economic benefits to the state.

When we applied the latest NSW Treasury guidance to the 2024 CBA, and considered the full scope of relevant emissions in NSW, the estimated net benefits to the NSW community reduced by 88% – from $7.84 billion to $0.94 billion.[5] Further, when we used a coal price forecast more aligned with federal and state commitments to the Paris Agreement, the project's net benefits to the NSW community dropped below zero.

The insights gleaned from this analysis aim to inform a more robust and credible CBA for the upcoming revised application. A CBA which uses the most up-to-date guidance, includes all relevant emissions, and considers coal price assumptions consistent with government commitments to the Paris Agreement will provide the NSW Government a more credible basis for decision-making.

1.2 Key Findings

1. **The 2024 cost-benefit analysis (CBA) undertaken for the proposed HVO Continuation Project significantly understates the cost of emissions to NSW, due to its reliance on an outdated framework. When the current Treasury framework is applied the cost of emissions is 1700 times higher, rising from $3.7 million to $6.34 billion. This sees the project's net benefits to NSW reduce by 81%, from $7.84 billion to $1.50 billion. See Chart 1.1 – (1).**

The 2024 CBA uses NSW Treasury Guidance TPP17-03 as a framework to quantify the cost of carbon emissions of the project. This is in line with 2018 guidance from the Department of Planning, Housing and Infrastructure (DPHI). However, TPP17-03 has since been superseded by TPG23-08, which uses a NSW-specific Marginal Abatement Cost (MAC) and aligns emissions valuation with the state's legislated emissions targets.

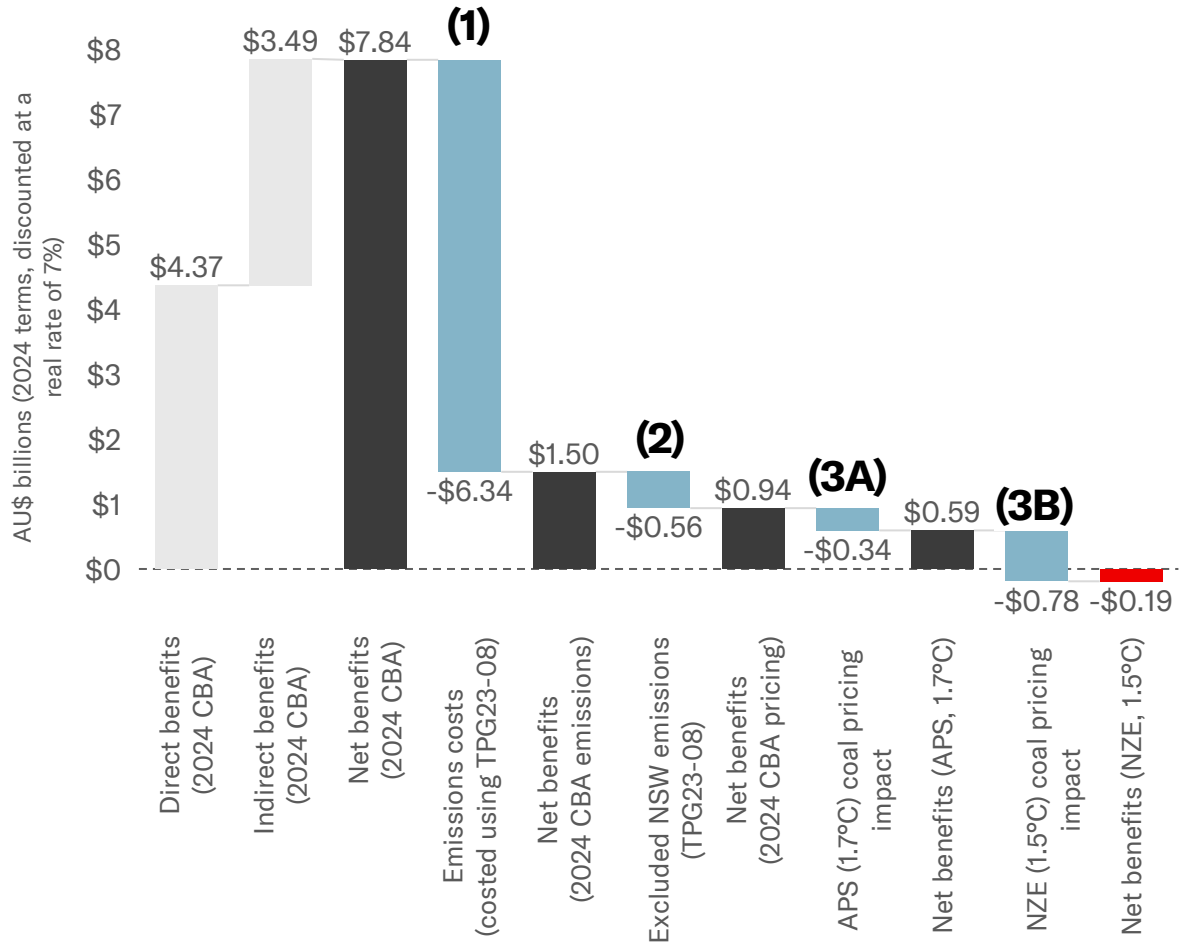
2. **The emissions estimate in the 2024 CBA excludes emissions from intrastate rail transport.[6] When these are included total emissions are 9% higher, resulting in an additional $0.56 billion in costs. When the current Treasury framework is applied to the full scope of emissions, the project's net benefits to NSW are reduced by 88% compared to the 2024 CBA, falling from $7.84 billion to $0.94 billion. See Chart 1.1 – (2).**

[4] Ernst and Young (EY) published a revised Economic Impact Assessment in May 2024 which included the cost-benefit analysis of the project to the NSW community.
[5] Unless otherwise stated, all monetary values in this report are expressed in Australian dollars (AUD).
[6] Under current NSW Treasury guidance all emissions that occur within NSW should be included in a cost-benefit analysis.

3. **The 2024 CBA relies on a coal price forecast that is considerably higher than the International Energy Agency's (IEA) Announced Pledges Scenario (APS) and Net Zero Emissions (NZE) scenario. When the project's benefits are modelled in line with the APS and NZE its direct benefits decline by 8% and 26% respectively. When the current Treasury framework is applied, and the full scope of NSW emissions is included, a Paris-aligned coal pricing forecast results in the project's net benefit to NSW falling below zero, which means it becomes a social cost to the state. See Chart 1.1 – (3A) and (3B).**

The APS reflects the global policy direction based on announced government commitments, while the NZE scenario aligns with NSW and Federal commitments to the Paris Agreement.

Chart 1.1: Analysis of the 2024 CBA using the current Treasury Framework, the full scope of NSW emissions, and APS and NZE pricing shows a significant reduction in the project's net benefits to NSW[7]



Source: 2024 CBA, TPG23-08, NSW Treasury Carbon values report, IEA WEO 2024 extended dataset, ACCR modelling

[7] Numbered labels in the chart correspond to the key findings and recommendations.

4. **If HVO is approved, it would materially affect the state's ability to meet its legislated emissions reduction targets - including imposing a burden on other sectors to compensate with deeper cuts - yet the 2024 CBA does not account for this. Coal mining accounts for around 15% of total NSW emissions, which would increase to over 20% by 2035 if all proposed coal mining expansions are approved. The HVO Continuation Project accounts for almost 40% of coal expansion emissions in NSW under consideration.**

1.3 Recommendations

ACCR recommends that any future application for the HVO Continuation Project must include a cost-benefit analysis that incorporates:

1. **The latest NSW Treasury guidance, TPG23-08, to ensure emissions are costed appropriately and the State's emissions targets are reflected in the assessment.**

The NSW Government should assess all projects – public and private – using consistent methodologies. TPG23-08 is mandatory for assessing public investments and should be applied to private investments to ensure the consistency and integrity of planning processes. Project assessments should be based on sound economic analysis and not subject to differential treatment based on ownership.

2. **The full scope of emissions occurring within NSW, including intrastate rail emissions.**
3. **The project's direct benefits under future energy scenarios, consistent with federal and state commitments to the Paris Agreement and aligned with the expected policy direction.**

The impact of each recommendation on project value to NSW has been modelled by ACCR and is labelled accordingly in Chart 1.1.

2. Understating costs, overstating benefits – flaws in the 2024 cost-benefit analysis

Our review of the 2024 cost-benefit analysis (CBA) submitted for the HVO Continuation Project finds it significantly understates the project's emissions costs,[8] meaning the project's net benefits to the state are overstated.

2.1 Understating the cost of emissions

The 2024 CBA estimate of emissions costs to NSW of $3.7 million is significantly understated, due to its reliance on an outdated methodology. ACCR's analysis, using current NSW Treasury guidance Marginal Abatement Cost (MAC) framework estimates the emissions cost to NSW is $6.34 billion – 1,700 times higher than the 2024 CBA estimate. This reduces the project's net benefit to NSW from $7.84 billion to $1.50 billion.

The 2024 CBA estimates the net benefits of the project to the NSW community at $7.84 billion, which includes $3.7 million for emissions costs. The framework it uses to quantify the cost of carbon emissions is NSW Treasury Guidance TPP17-03.[9] While the use of TPP17-03 is suggested by the Department of Planning, Housing and Infrastructure (DPHI) for mining and coal seam gas proposals,[10] this framework is outdated, having been superseded in 2023 by new Treasury guidance, TPG23-08.[11]

TPG23-08 improves upon previous guidance by using a NSW-specific Marginal Abatement Cost (MAC) to value the cost of greenhouse gas emissions (Refer to Appendix 5.2 for further detail). This approach more accurately evaluates the costs of meeting NSW emissions targets, including considering the abatement opportunities available to NSW.[12]

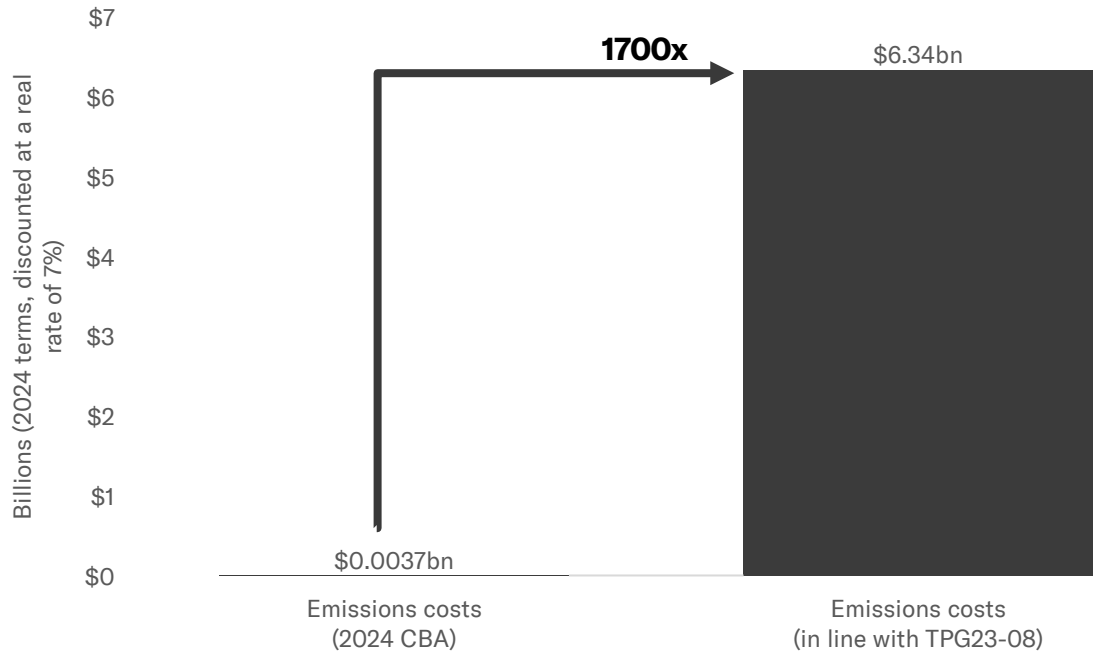
TPG23-08 has been mandatory for public sector investment decisions since 2023. It offers a consistent framework for assessing emissions impacts across both public and private projects and applying it across both would ensure comparability and policy alignment. Using an outdated method

[8] These are classified as indirect costs in the 2024 CBA.
[9] NSW Treasury, NSW Government Guide to Cost-Benefit Analysis TPP17-03. Archived and replaced by TPG23-08.
[10] DPHI, Technical Notes supporting the Guidelines for the Economic Assessment of Mining and Coal Seam Gas Proposals, pp. 48-49.
[11] NSW Treasury, TPG23-08 NSW Government Guide to Cost-Benefit Analysis. Current as of 2nd March 2023.
[12] NSW Treasury, NSW Government Guide to Cost-Benefit Analysis TPG23-08. p. 67. States that shadow carbon prices should be applied "in the absence of a comprehensive Australian emissions market or modelled target-consistent marginal abatement cost." This gap is now addressed by Carbon emissions in the Investment Framework TPG24-34, which introduces carbon values based on a NSW-specific marginal abatement cost approach aligned with the state's legislated climate targets. These values replace the interim prices previously set out in the TPG23-08.

in the CBA for the upcoming revised HVO application would risk undermining the integrity of the planning process and enabling differential treatment based on ownership.

When using adjusted MAC emissions costs[13] - in line with TPG23-08 - we estimate that the emissions cost of the original HVO proposal is $6.34 billion, which is 1,700 times greater than the $3.7 million costs in the 2024 CBA (see Chart 2.1). This reduces net project benefits to NSW from $7.84 billion to $1.50 billion (see Chart 2.2).

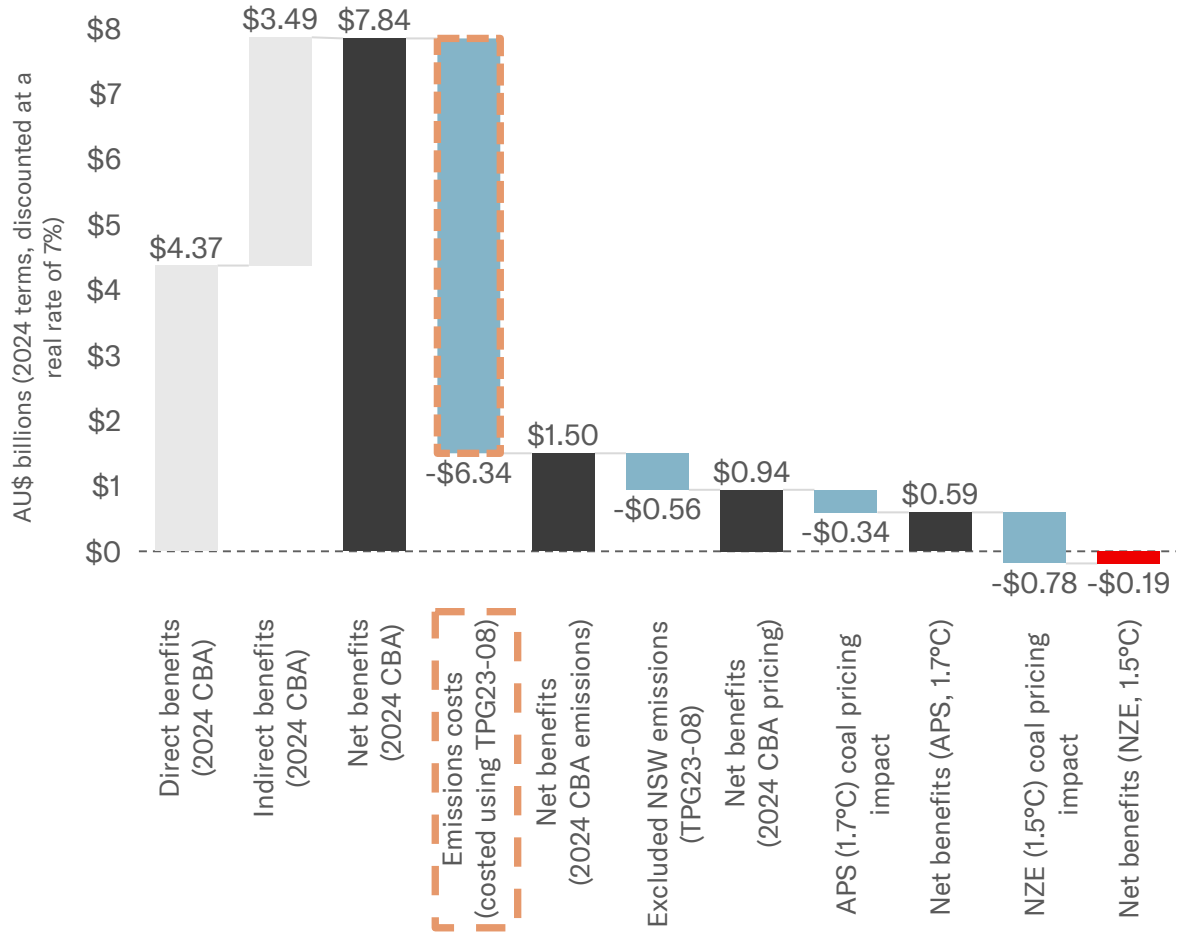
Chart 2.1: The current NSW Treasury guidance (TPG23-08) puts the emissions cost at $6.34 billion – 1,700 times the 2024 CBA's $3.7 million figure



Source: 2024 CBA, ACCR modelling

[13] The NSW Treasury calculates carbon values using a 5% discount rate, consistent with the updated social discount rate (NSW Carbon Values Report, p. 9). However, since the CBA was conducted at a 7% discount rate, we have adjusted the carbon values accordingly to ensure a like-for-like comparison.

Chart 2.2: ACCR modelling of the 2024 CBA, in line with current Treasury guidance (TPG23-08), reduces project net benefits to NSW to $1.50 billion



Source: 2024 CBA, TPG23-08, NSW Treasury Carbon values report, IEA WEO 2024 extended dataset, ACCR modelling

2.2 Incomplete emissions figures

The 2024 CBA relies on an emissions estimate of 29.59 MtCO2e. However, this estimate excludes intrastate rail emissions. When included:

- **Total emissions rise by at least 9% to 32.2 $MtCO_2e$, resulting in an additional $0.56 billion in emissions costs.**
- This adjustment, along with application of TPG23-08 (see section 2.1), **results in the project's net benefits to the state reducing by 88% – from $7.84 billion to $0.94 billion.**

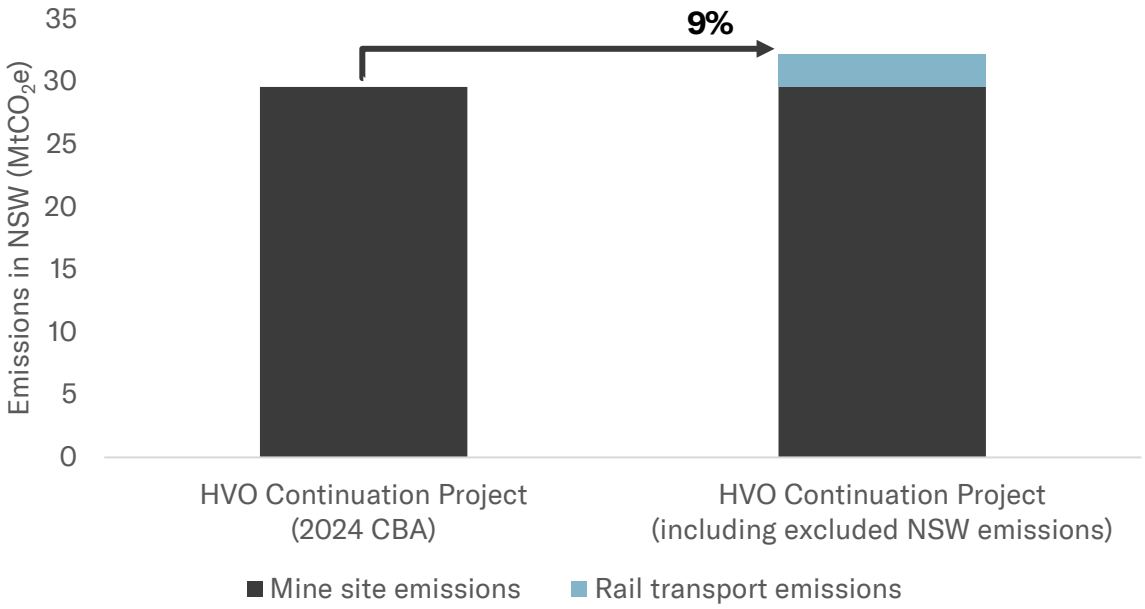
Under current NSW Treasury guidance, all emissions that occur within NSW should be included in a CBA.[14] However, the 2024 CBA excludes intrastate rail emissions, incorrectly classifying them as scope 3 emissions for the state.

By limiting its calculations to Scope 1 and 2 emissions at the mine site only, the 2024 CBA does not capture the project's full emissions costs within NSW. The CBA should include all emissions within NSW that result from the project, regardless of where they occur in the supply chain.

When intrastate rail emissions are included, the total NSW emissions of the HVO Continuation Project rise by 9% (see Chart 2.3), adding $0.56 billion in emissions costs. The cumulative impact, including cost identified in Section 2.1, is that the project's net benefits to NSW reduce by 88% compared to the 2024 CBA, falling from $7.84 billion to $0.94 billion (see Chart 2.4).

Other NSW-based emissions are also likely understated in the 2024 CBA, such as upstream emissions from suppliers – 84% of whom are NSW-based.[15] This is not included in the scope of our analysis but should be factored in for emissions estimates for the revised HVO Continuation Project.

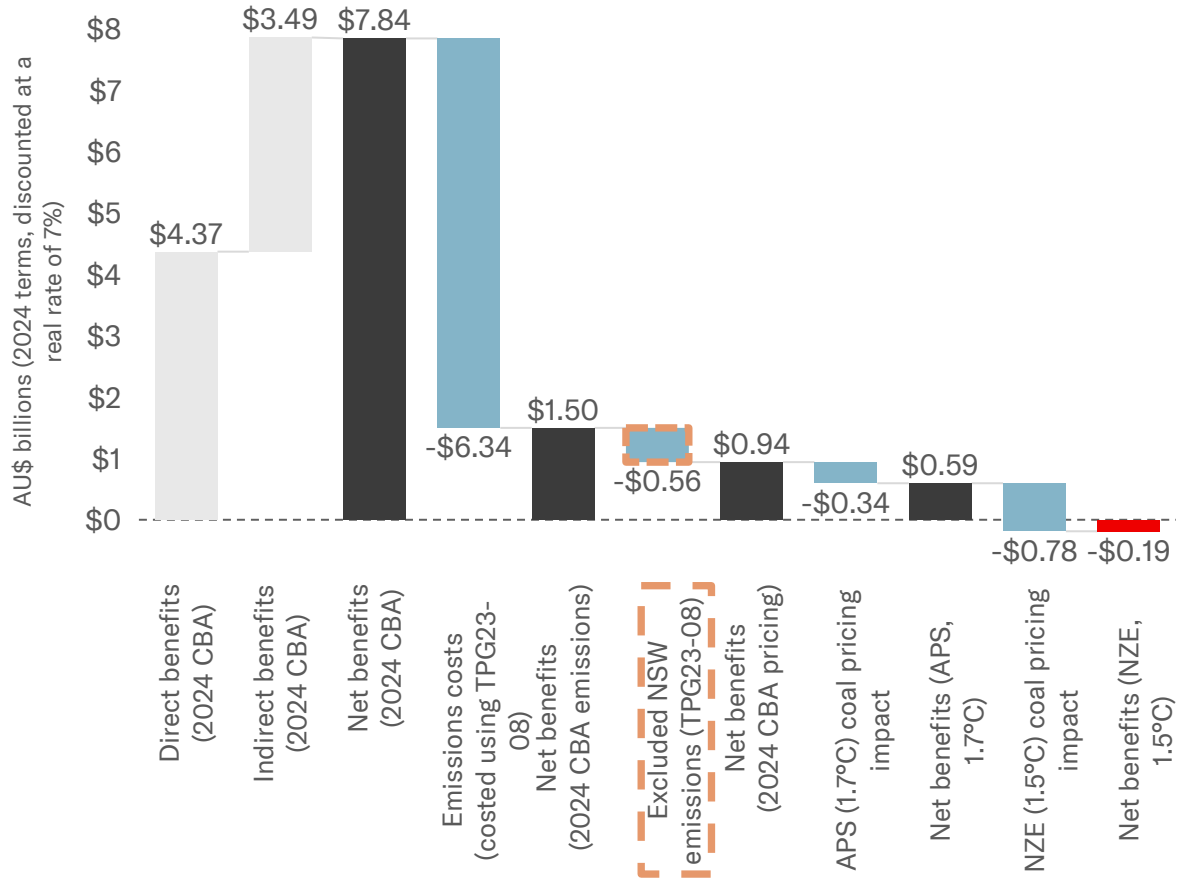
Chart 2.3: Including intrastate rail emissions in NSW from the HVO Continuation Project means emissions are 9% higher than the emissions input in the 2024 CBA



Source: 2024 CBA, HVO Continuation Project emissions modelling

[14] NSW Treasury, NSW Government Guide to Cost-Benefit Analysis TPG23-08, p. 68. "The emissions impacts given standing in a CBA should include the emissions that occur within New South Wales. Each tonne of carbon that occurs in New South Wales should be counted as a whole and not pro-rated by population or any other factor."
[15] EY, Economic Impact Assessment of the Hunter Valley Operations continuation project (revised 2024), p. 32.

Chart 2.4: Including intrastate rail emissions increases emissions costs by $0.56 billion



Source: 2024 CBA, TPG23-08, NSW Treasury Carbon values report, IEA WEO 2024 extended dataset, ACCR modelling

2.3 Net economic benefits to NSW turn negative under IEA NZE coal pricing

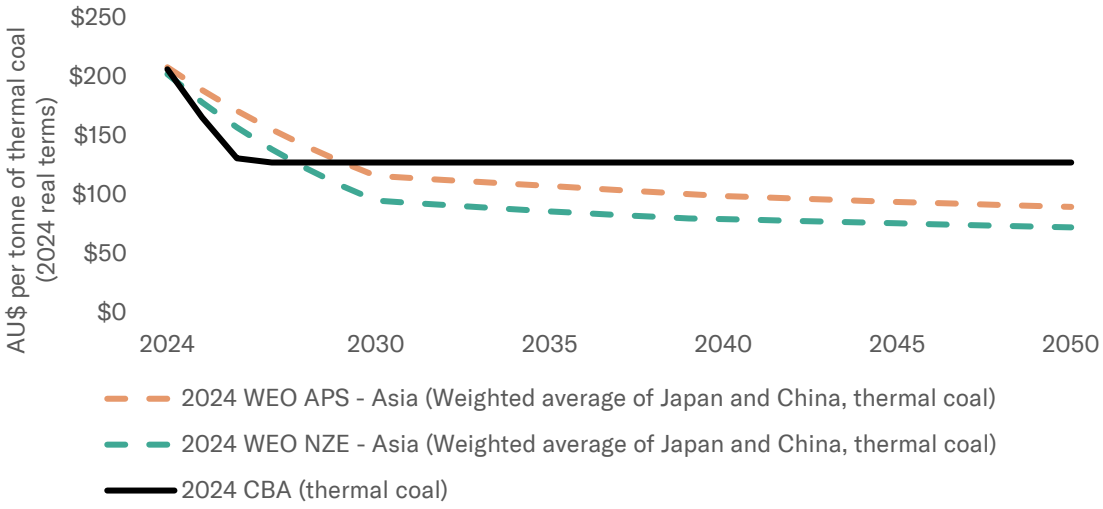
The 2024 CBA assumes flat real coal prices from 2028 onward. However, when coal price trajectories consistent with state and federal commitments to the Paris Agreement are applied, along with the latest NSW Treasury Guidelines (see sections 2.1 and 2.2), **the modelled net benefits to NSW falls from $7.84 billion to below-zero – representing a net social cost to the NSW community.**

The primary source (95%) of the proposed HVO Continuation Project's direct economic benefits to NSW are company taxes and royalties, which are both highly sensitive to assumed coal price forecasts.

The 2024 CBA assumes a flat real coal price from 2028 onwards, which is a considerably higher projection than prices in the International Energy Agency's (IEA) Announced Pledges Scenario (APS)

and Net Zero Emissions (NZE) scenario[16] (see Chart 2.5). When comparing average thermal coal prices from 2024 to 2050, the 2024 CBA price was 14% higher than the APS and 36% higher than the NZE scenario (see Chart 2.6).

Chart 2.5: The long-term flat real thermal coal price assumed in the 2024 CBA is more optimistic than the projections outlined in the IEA's APS and NZE scenarios[17,18]



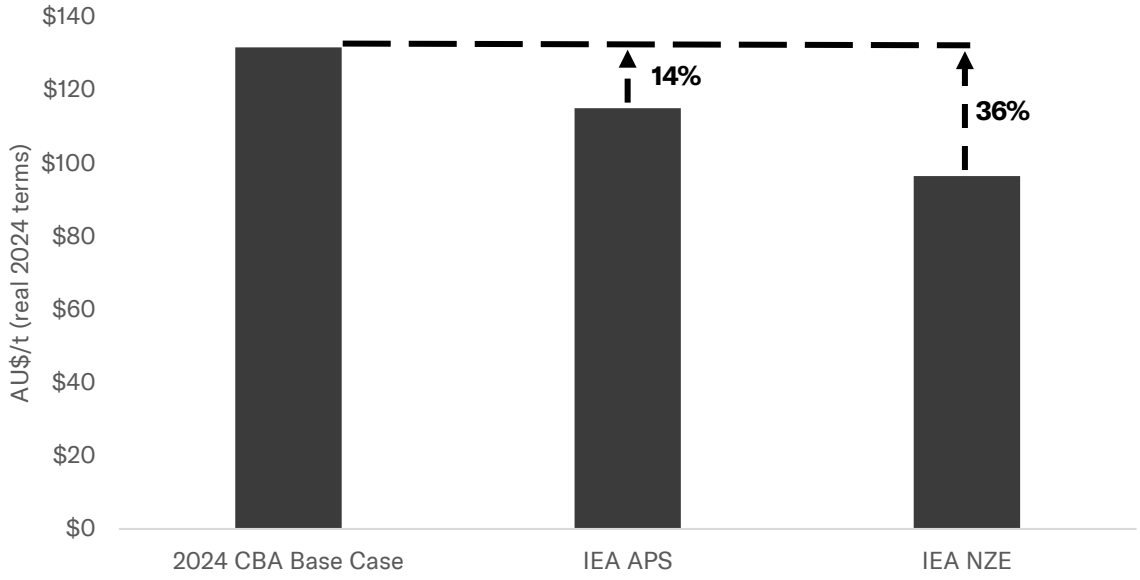
Source: 2024 CBA, IEA WEO 2024 extended dataset

[16] The IEA's NZE scenario is a normative scenario showing the IEA's view of the most cost effective, equitable and technically feasible path to reach net zero CO_2 by 2050, aligned with a global average temperature 1.5°C above pre-industrial levels in 2100. The APS is a formative scenario that assumes announced pledges by nations are met on time and in full, but that there is no further increase in ambition. The APS leads to a global average temperature around 1.7–1.8°C above pre-industrial levels by 2100.

[17] 2024 CBA and IEA WEO 2024 extended datasets. 2024 thermal coal imported volumes for China and Japan are used to calculate the weighted averages of coal prices; IEA, Coal 2024, pp. 114-115.

[18] In the absence of publicly available data on HVO's export volumes by country, we apply a weighted average of import prices from China and Japan – its primary export markets – as a proxy for Newcastle coal prices.

Chart 2.6: The 2024 CBA's assumed average thermal coal price from 2024-2050 is 14% and 36% higher than IEA APS and NZE prices respectively



Source: 2024 CBA, IEA WEO 2024 extended dataset

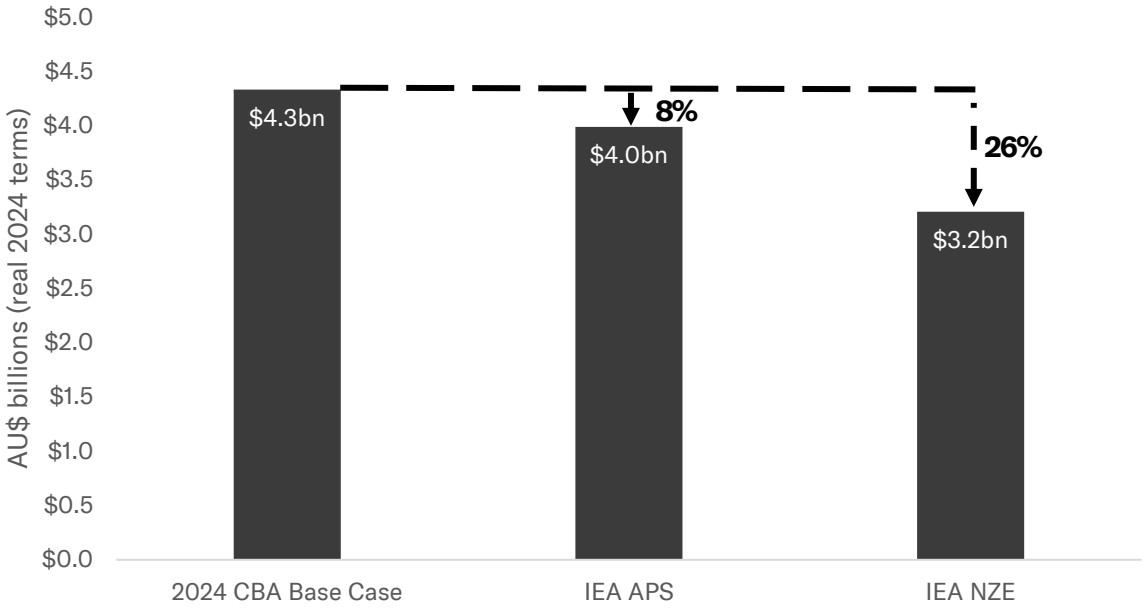
Using the APS would help the government understand how already announced global ambitions and targets towards emissions reductions may affect long-term coal prices - and thus the project's benefits to NSW. The NZE scenario aligns with NSW state[19] and federal[20] commitments to the Paris Agreement and net zero by 2050.

Our modelling highlights the impact of coal price assumptions on the HVO project's economic benefits - demonstrating the high sensitivity of royalties and tax revenues to lower coal price forecasts.[21] While the 2024 CBA estimates $4.3 billion of direct benefits to NSW, we found when coal price inputs are modelled in line with the APS and NZE, the project's direct benefits decline by:

- 8% under the APS
- 26% under the NZE. When applied with current NSW Treasury guidance (see sections 2.1 and 2.2), this Paris-aligned coal pricing forecast results in the HVO project's net benefit to NSW falling below zero, becoming a social cost to the state (see Chart 2.8).

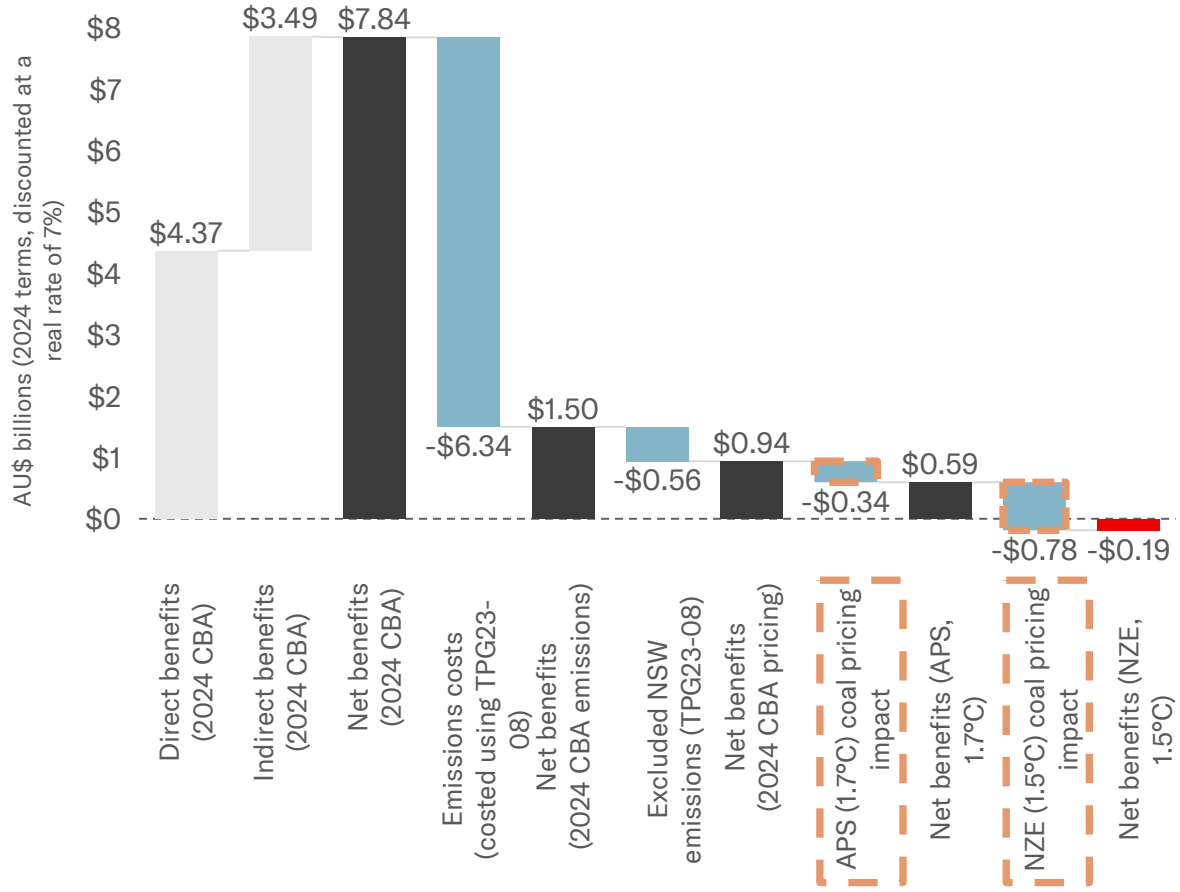
[19] NSW legislation, Climate Change (Net Zero Future) Act 2023 No 48. "The purpose of this Act is to give effect to the international commitment established through the 2015 Paris Agreement to (a) hold the increase in the global average temperature to well below 2°C above pre-industrial levels, and (b) pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels.
[20] Australian Department of Climate Change, Energy, the Environment and Water, International climate action.
[21] See Appendix 5.3 for detailed breakdown.

Chart 2.7: Direct benefits to NSW from the HVO Continuation Project are 8% less under the APS and 26% lower under the NZE scenario



Source: 2024 CBA, IEA WEO 2024 extended dataset, ACCR modelling

Chart 2.8: Project net benefits to NSW are reduced by 92% (IEA APS pricing) and 102% (IEA NZE pricing)



Source: 2024 CBA, TPG23-08, NSW Treasury Carbon values report, IEA WEO 2024 extended dataset, ACCR modelling

3. Further room for improvement on the 2024 CBA

ACCR recommends that decision-makers also consider three other issues in the 2024 CBA.

3.1 Employment benefits may be overstated

The 2024 CBA assumes a constant "net economic benefit to local workers" of $1.3 billion across all price sensitivities. However, historical data between 1990 and 2020 shows a positive correlation between coal prices and coal mining employment in Australia. While future price impacts are uncertain, assuming there is no employment change under lower prices risks overstating indirect benefits.

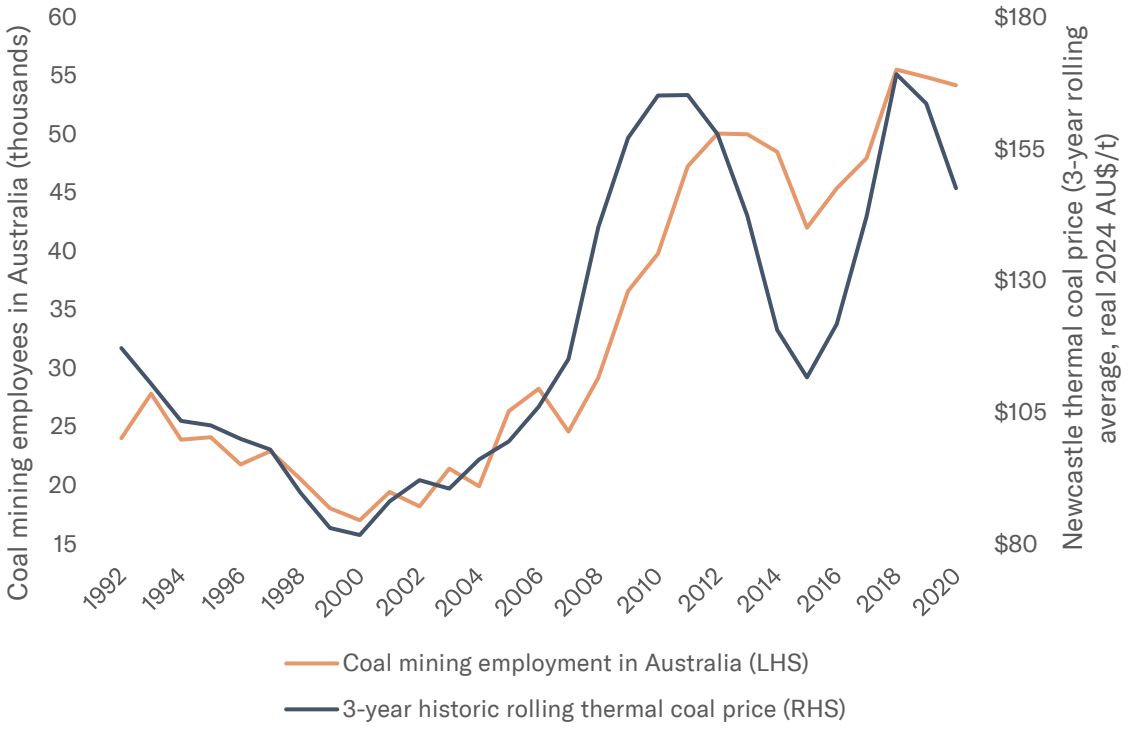
The 2024 CBA does not account for any employment changes that may flow from a material coal price decline. It does conduct coal price sensitivity analyses to evaluate the impact on project net benefits, considering a base case pricing forecast and varied coal prices ±25%. While these changes influenced direct benefits – such as royalties and company taxes – they did not affect indirect benefits, including the "net economic benefit to local workers". [22]

Our analysis shows a strong positive correlation between Newcastle coal prices and employment levels in the Australian coal mining sector, [23] indicating that price trends have historically[24] impacted employment and economic outcomes to local workers (see Chart 3.1). Regression analysis shows that each $1 per tonne decrease in coal price is associated with approximately 400 fewer coal mining jobs in Australia (see Chart 3.2).

Although precise impacts at the individual project level are difficult to estimate, this strong relationship highlights the need to carefully evaluate "indirect benefits to local workers" in low-price scenarios, such as those more consistent with global policy direction (APS) and commitments to the Paris Agreement (NZE) (see Section 2.3), to avoid overstating benefits to decision-makers.

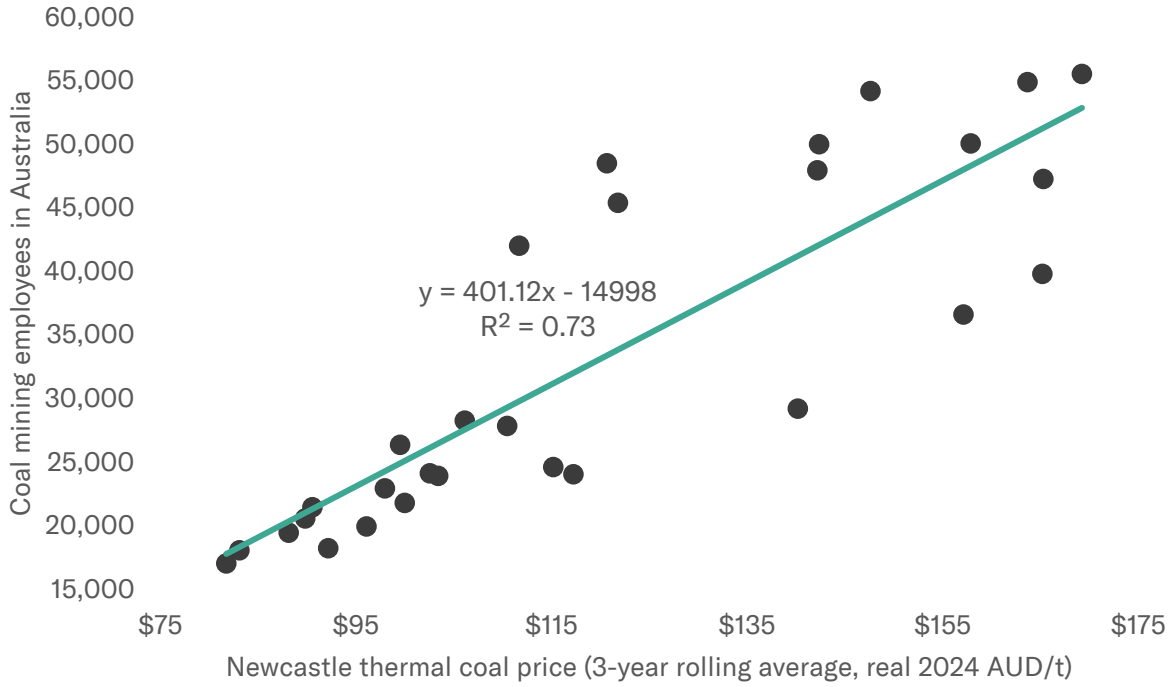
[22] EY, Economic Impact Assessment of the Hunter Valley Operations continuation project (revised 2024), p. 67.
[23] This analysis uses a 3-year trailing rolling average of coal prices to represent the longer-term signals firms respond to, while keeping raw employment data to reflect actual observed employment outcomes. Prices have been converted from nominal to real terms using historical US consumer price index (U.S. Bureau of Labor Statistics, Consumer Price Index) and to AUD using historical annual average exchange rate (Federal Reserve Bank of St. Louis, U.S. Dollars to Australian Dollar Spot Exchange Rate).
[24] The earliest year with available data for both International Monetary Fund coal prices (IMF Primary Commodity Prices) and Australian Bureau of Statistics coal employment (Labour Force, Australia, Detailed) is 1990. As the analysis uses a 3-year trailing rolling average for coal prices, the first modelled year is 1992. Data following the COVID-19 pandemic and the Russian invasion of Ukraine have been excluded due to extreme volatility in coal markets, which introduces significant outliers that could distort the results.

Chart 3.1: Newcastle thermal coal prices trends are closely linked with coal mining employment in Australia



Source: IMF primary commodity prices, ABS coal employment (Labour Force, Australia, Detailed)

Chart 3.2: Regression analysis shows that a $1/t decrease in coal price is historically associated with 400 fewer coal mining employees in Australia



Source: ACCR modelling

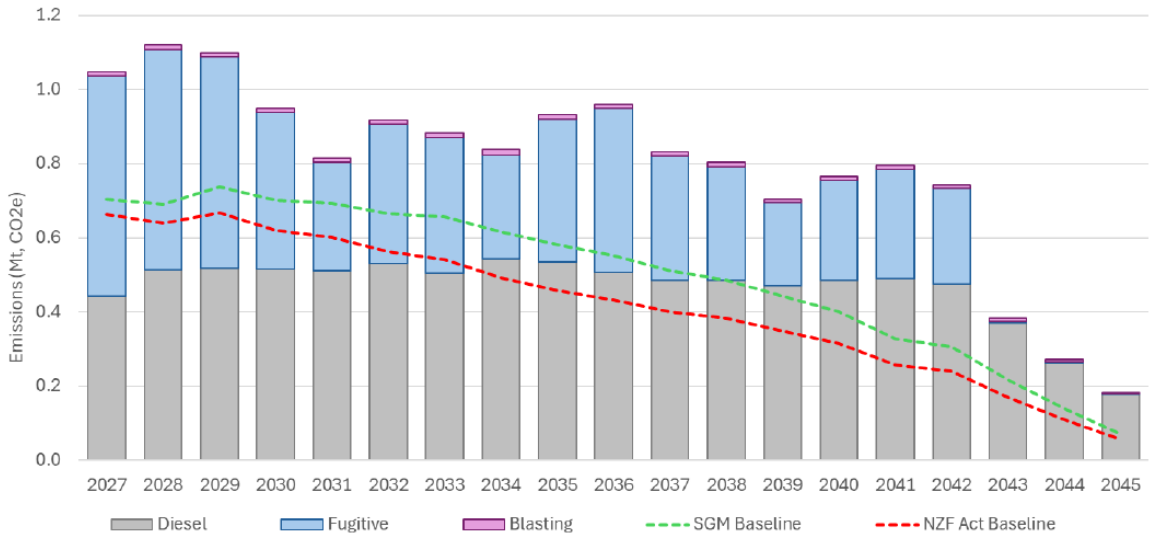
3.2 Heavy reliance on offsets

The revised HVO Continuation Project is expected to exceed its Safeguard Mechanism (SGM) baseline every year, meaning it must offset exceedances using Australian Carbon Credit Units (ACCUs) or Safeguard Mechanism Credits (SMCs). If the project's SGM obligations are met predominantly through ACCUs, this raises concerns about integrity, particularly as over 90% issued since 2019 have been nature-based, despite concerns about their scientific effectiveness. A heavy dependence on offsets introduces potential liabilities for the proposed project and the NSW Government.

The revised HVO Continuation Project is likely to emit around 800,000 tCO_2e per year on average, [25] placing it under the SGM, which requires large industrial facilities to reduce emissions annually or offset exceedances using ACCUs or SMCs to offset the excess.

The HVO Continuation Project's emissions will consistently exceed its SGM baseline (see Chart 3.3), requiring the purchase of 5.5 $MtCO_2e$ in offsets to comply.[26] In the 2024 CBA, SGM obligations are costed using ACCUs.[27]

Chart 3.3: The revised HVO Continuation Project will exceed its SGM baseline every year

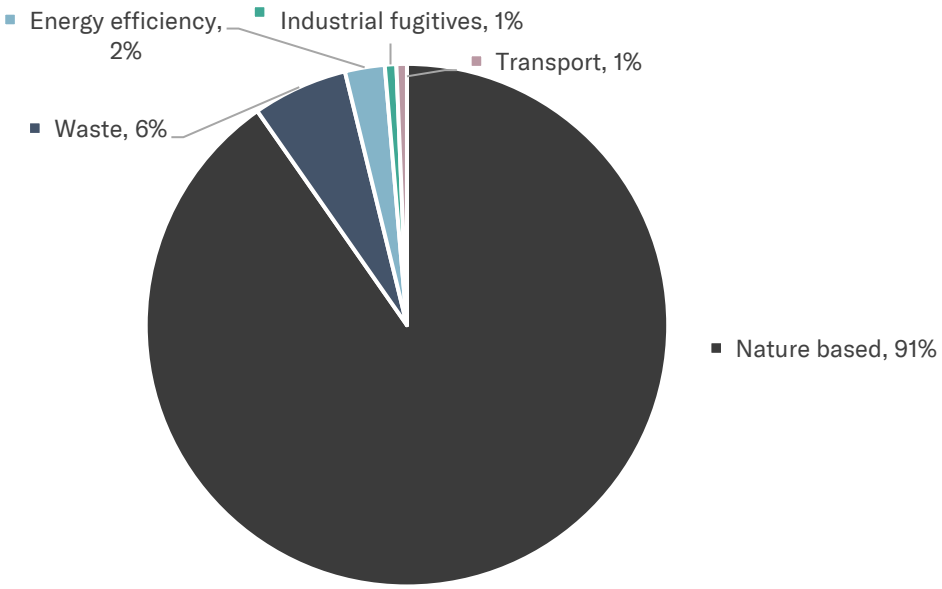


Source: HVO Continuation Project (revised mine plan) – Preliminary Analysis of Greenhouse Gas Impacts

[25] EPBC Portal, HVO Continuation Project – Preliminary Analysis of Greenhouse Gas Impacts, p. 7.
[26] EPBC Portal, HVO Continuation Project – Preliminary Analysis of Greenhouse Gas Impacts, p. 9.
[27] EY, Economic Impact Assessment of the Hunter Valley Operations continuation project (revised 2024), pp. 42-44. Although safeguard exceedances can be covered using a mix of SMCs and ACCUs, the 2024 CBA models exceedances as entirely met by ACCUs based on pricing (footnote 93).

If the project's SGM obligations are met predominantly through ACCUs, this raises concerns about integrity, particularly as over 90% issued since 2019 have been nature-based[28] (see Chart 3.4). While ACCUs offer a market-based emissions reduction tool, the voluntary carbon market has been plagued with unresolved integrity challenges, including a lack of real, additional emissions reductions. Nature-based methods like reforestation and soil carbon are not a permanent form of CO_2 storage, and cannot be used to neutralise or offset CO_2 emissions generated through the consumption or production of coal, oil or gas.

Chart 3.4: ACCUs issued since 2019 by project type



Source: Clean Energy Regulator (Quarterly Carbon Market Report December Quarter 2024)

A heavy dependence on offsets introduces potential liabilities for the proposed project. Key risks include:

- Permanence Risks: CO_2 storage in vegetation, soils and sediments through Nature-Based Solutions can only offset fossil CO_2 emissions if preserved and managed for at least 1,000 years, a timescale broadly understood to be extremely unlikely given a range of factors – including our current warming trajectory.[29]
- Ineffective Emissions Abatement: If offsets do not represent genuine emissions reductions, companies may face reputational, regulatory and financial risks as stakeholders demand higher integrity in climate commitments. Even if the ACCUs or SMCs are of credible

[28] Clean Energy Regulator, Quarterly Carbon Market Report December Quarter 2024.
[29] ACCR, 2025, Injecting integrity: aligning the use of offsets in company transition plans with science.

integrity, if they are sourced from outside New South Wales, they would not contribute to achieving NSW's emissions targets, as noted by the EPA.[30]

- Regulatory Uncertainty: Governments and regulatory bodies are increasingly scrutinising the validity of offsets, which could lead to stricter compliance requirements, re-evaluations of offset methodologies, or even the invalidation of certain projects.

3.3 Incorrect apportionment of the Social Cost of Carbon

The method that the 2024 CBA uses to calculate emissions costs to NSW, based on the Social Cost of Carbon (SCC), is outdated. It would be better to instead reflect total emissions costs using the updated MAC methodology (Section 1.1). However, if a SCC-based approach is used it must not apportion emissions costs to NSW based on its 0.1% share of global population, as the 2024 CBA does. To do so is inconsistent with current NSW Treasury guidance and the OECD Polluter Pays Principle. The CBA should reflect the full cost of emissions – not a population-based share.

The 2024 CBA assessment calculates emissions costs using the US Environmental Protection Agency's Social Cost of Carbon, but attributes only $3.7 million to NSW by distributing total costs across the global population, in line with NSW's 0.1% share. This approach contradicts NSW Treasury guidance, which states that:

> "…each tonne of carbon that occurs in New South Wales should be counted as a whole and not pro-rated by population or any other factor…"[31]

In addition, the OECD Polluter Pays Principle requires polluters to bear the full cost of their emissions.[32]

While the NSW Treasury's current MAC-based approach is superior (Section 2.1 and Appendix 5.2), if an SCC-based method is applied, the full cost of emissions should still be assigned to NSW. Population-based apportionment significantly understates NSW's financial responsibility and weakens the integrity of the project's economic assessment.

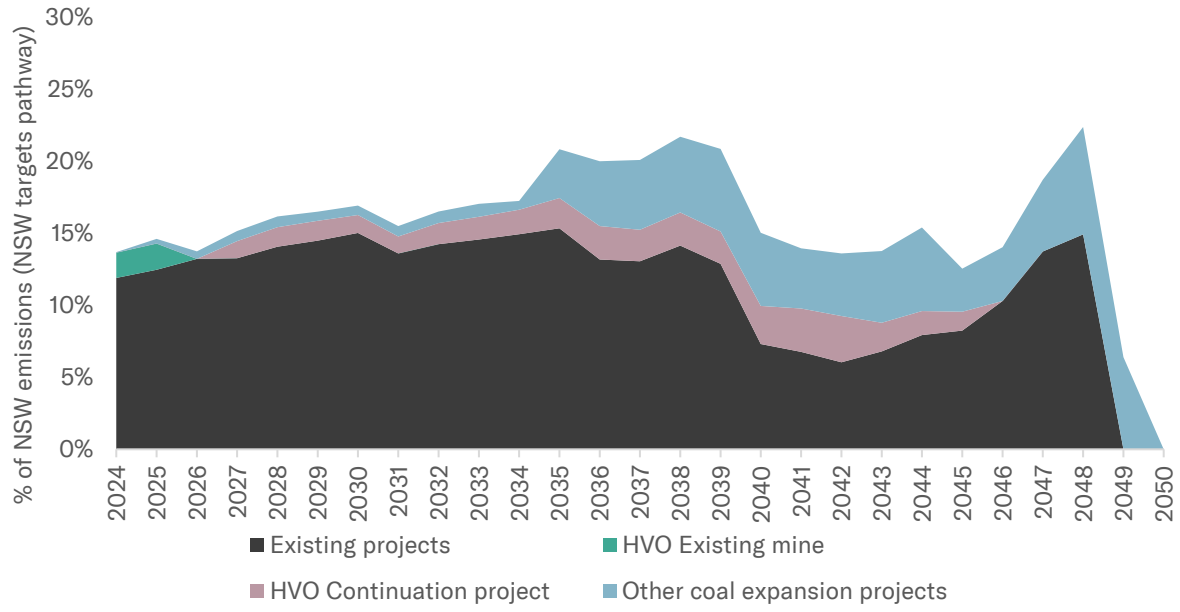
[30] NSW EPA, Second Submission - HVO North and South Open Cut Coal Continuation Projects (SSD-11826681 and SSD-11826621) - EPA Comments to Response to Submissions, p. 2.
[31] NSW Treasury, NSW Government Guide to Cost-Benefit Analysis TPG23-08, p. 68.
[32] OECD Legal Instruments, Recommendation of the Council on the Implementation of the Polluter-Pays Principle. "The Polluter-Pays Principle constitutes for Member countries a fundamental principle for allocating costs of pollution prevention and control measures introduced by public authorities." (Section I, Paragraph 1). "The polluter should bear the expenses of carrying out the measures […] to ensure that the environment is in an acceptable state. In other words, the cost of these measures should be reflected in the cost of goods and services which cause pollution in production and/or consumption." (Section I, Paragraph 2).

4. Straining NSW emissions targets

The 2024 CBA does not account for the impact of the project on NSW's ability to meet its legislated emissions reductions targets. Coal mining accounts for around 15% of total NSW emissions, which would increase to over 20% by 2035 if all proposed coal mining expansions are approved (see Chart 4.1).

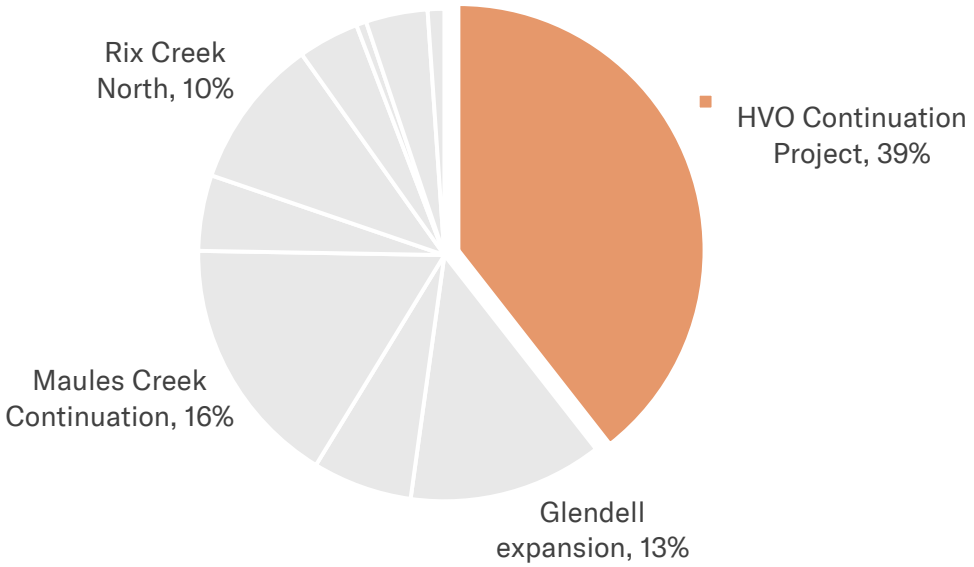
Under the revised scope, our analysis shows that the HVO Continuation Project accounts for almost 40% of these coal expansion emissions in NSW under consideration (see Chart 4.2). This would materially affect the state's ability to meet its emissions reduction targets, and among other concerns, impose a burden on other sectors to compensate with deeper cuts. Hence, it is crucially important to embed legislated targets in the CBA and assessment of this project.

Chart 4.1: Coal mining accounts for a material share of total NSW emissions, which is projected to increase if proposed expansion projects proceed



Source: ACCR modelling

Chart 4.2: Even under revised scope, the HVO Continuation Project makes up nearly 40% of emissions in the NSW coal expansion pipeline



Source: ACCR modelling

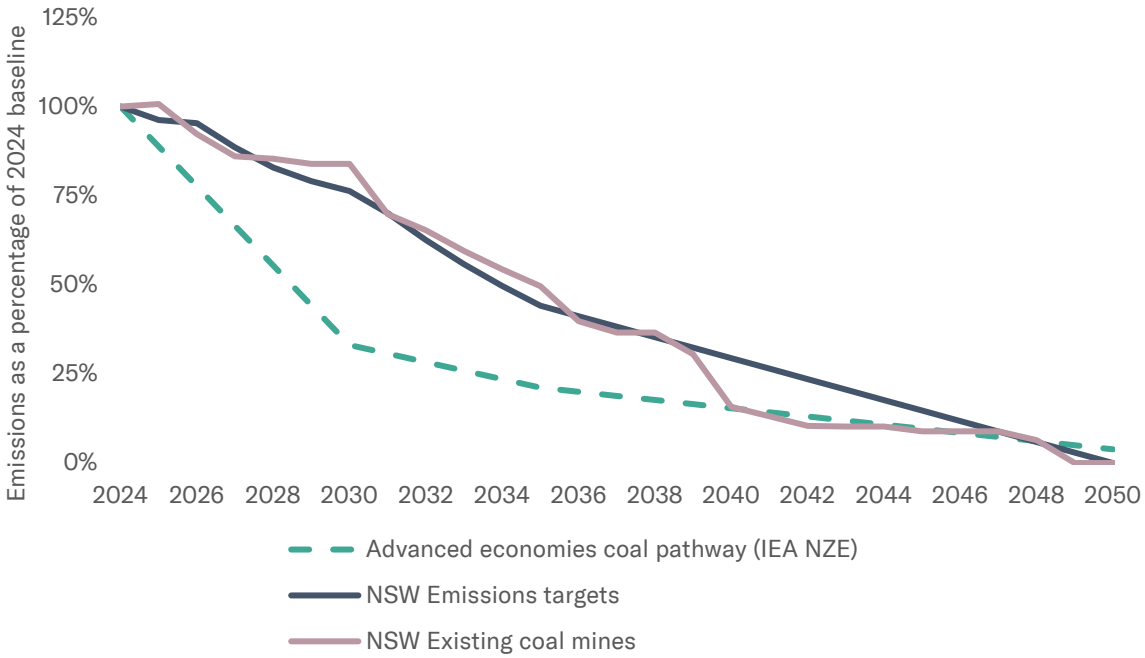
NSW has set emissions reduction targets of 50% by 2030, 70% by 2035 and net zero by 2050, relative to a 2005 base year. NSW is already struggling to meet its 2030 emissions target,[33] with many sectors behind the required decline rate.

Sectors such as transport, land use, housing and infrastructure will face additional challenges to reduce emissions as they expand to meet demand from population growth – estimated at over 20% by 2050.[34] If a single sector reduces emissions more slowly than required under NSW's emissions pathway, other sectors must compensate by cutting emissions more rapidly.

The IEA NZE coal pathway for advanced economies implies there is a strong case for the coal mining sector to reduce emissions more rapidly than the NSW emissions pathway to meet NSW's targets (see Chart 4.3). Emissions from existing coal operations in NSW are projected to decline broadly in line with the state's overall emissions pathway, but the decline rate is already slower than the IEA's NZE advanced economies pathway.

[33] NSW Net Zero Commission, 2024 Annual Report. "Unless action is accelerated, NSW may not reach net zero by 2050 and we will fail to meet our nearer term targets" (p. 9). "There are pressures for increased emissions associated with new coal mining projects (extensions and expansions of existing mines) ... Any emissions increases associated with extended or expanded projects would require all other sectors to make greater emissions reductions if the state is to meet its emissions reduction targets" (p. 12).
[34] NSW Treasury, NSW Common Planning Assumptions (population and housing).

Chart 4.3: Scope 1 and 2 emissions from coal in advanced economies need to decline faster than the NSW emissions pathway for net zero by 2050



Source: IEA WEO 2024 extended dataset, NSW emissions targets, ACCR modelling

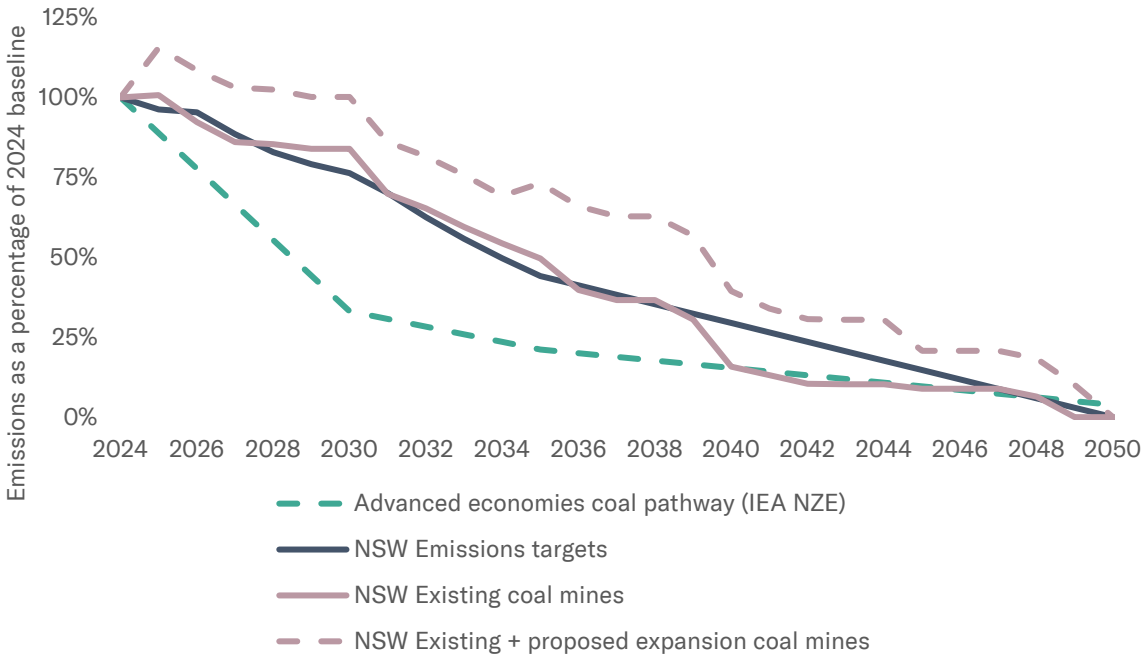
However, at a time when the coordinated and gradual closure of existing coal mines in NSW should be occurring in line with the IEA's NZE advanced economy coal pathway, the NSW Government continues to approve new mine expansions:

- The Mount Pleasant Optimisation Project, approved by the state in 2022[35] and federally in 2024,[36] extended operations by 22 years and is expected to generate 16.3 $MtCO_2e$.[37]
- The Narrabri Underground Extension Project, approved by the state in 2022[38] and federally in 2024,[39] also extended operations by 22 years, with projected emissions of 18.4 $MtCO_2e$.[40]
- The Ashton-Ravensworth extension, approved by the state in 2022[41] and federally in 2024,[42] added 8 years of operation and is expected to generate 6 $MtCO_2e$.[43]

There are currently 10 proposed coal expansion projects under assessment in NSW. If approved, this would contribute to a slower rate of emissions decline in the state's coal sector (see Chart 4.4).

[35] NSW Government Planning Portal, Mount Pleasant Optimisation Project.
[36] ABC News, Government green-lights three NSW coal mine extensions, angering environmental groups.
[37] AnalytEcon, Mount Pleasant Optimisation Project Economic Assessment, p. 3.
[38] NSW Government Planning Portal, Narrabri Underground Mine Stage 3 Extension Project.
[39] Whitehaven Coal, Federal Government approves Narrabri Stage 3 Extension Project.
[40] Whitehaven Coal, Narrabri Underground Mine Stage 3 Extension Project Amendment Report, p. 23.
[41] NSW Government Planning Portal, Ravensworth UG (Mod 10) - Ashton Integration.
[42] ABC News, Government green-lights three NSW coal mine extensions, angering environmental groups.
[43] Ashton Coal Operations Pty Limited, Ashton-Ravensworth Underground Mine Integration Modification, p. 30.

Chart 4.4: Scope 1 & 2 emissions if existing and proposed mines are approved by the NSW Government



Source: IEA WEO 2024 extended dataset, NSW emissions targets, ACCR modelling

5. Appendices

5.1 Coal mining sector in NSW

ACCR modelling of coal mining in NSW

To support analysis of the coal sector in NSW, ACCR has compiled data from multiple documents available through the NSW Planning Portal. The total approved maximum ROM coal production capacity in NSW is approximately 380 Mt/year.[44] In practice, actual production is considerably lower, with 2023 output recorded at 221 Mt[45] – equivalent to around 60% of approved capacity. While this represents average utilisation across all mines, individual mine performance varies – many operate below this average.

For modelling purposes, a linear production forecast was applied based on each mine's remaining marketable reserves, wash yields and approved mine life. Where this forecast materially exceeded either the approved maximum capacity or a reasonable utilisation benchmark, mine-level capacity was capped at 70% of the approved limit. This adjustment, applied to 23 mines, ensures that aggregated mine outputs reconcile with total observed ROM production, while allowing for variation in utilisation rates across the sector. Following these adjustments, the weighted average modelled production across all NSW mines was estimated at 58% of approved ROM capacity. The same methodology was applied to the pipeline of expansion coal projects currently seeking approval.

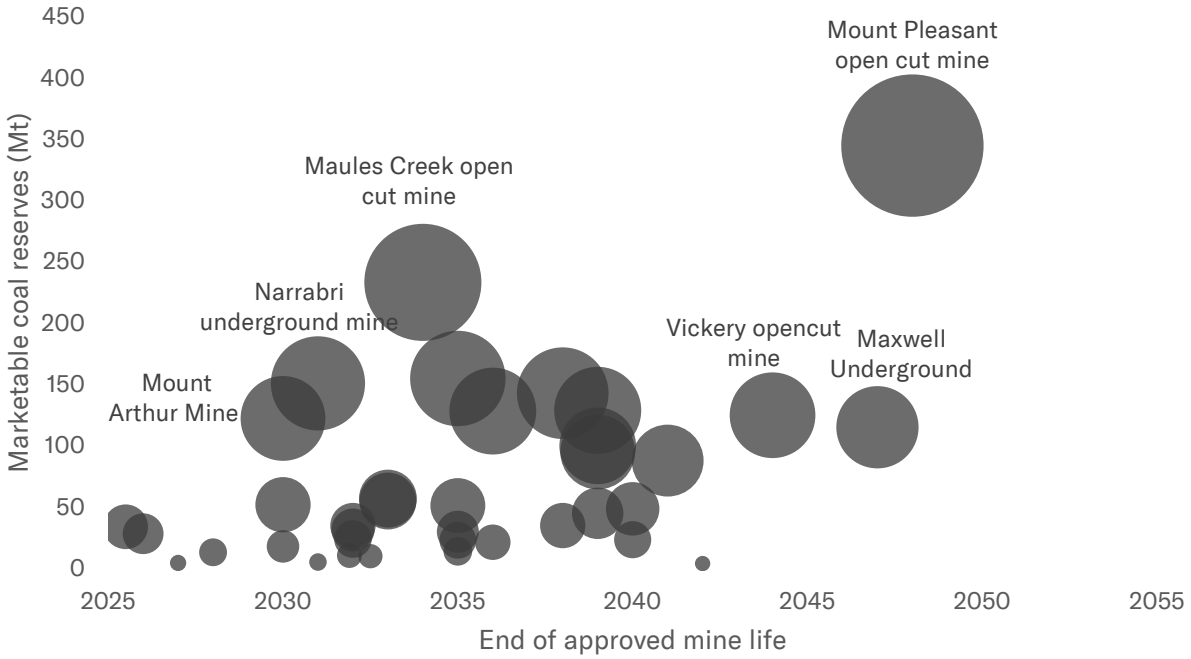
Emissions are forecast based on the production volumes of these projects. Direct emissions are calculated by applying the default safeguard emissions intensity of 0.065 tCO_2e per tonne of ROM.[46] Scope 3 emissions are forecast using the National Greenhouse and Energy Reporting (NGER) emissions factors, corresponding to the specific coal types produced.

Coal mining sector in NSW

There are currently 36 operating coal mines in NSW, with an average approved mine life of 13 years (see Chart 5.1). These mines will produce approximately 1800 Mt of product coal (90% thermal coal and 10% metallurgical coal). This will result nearly 4.5 $GtCO_2e$ of emissions, of which 160 $MtCO_2e$ will be direct emissions in NSW from mining (see Chart 5.2).

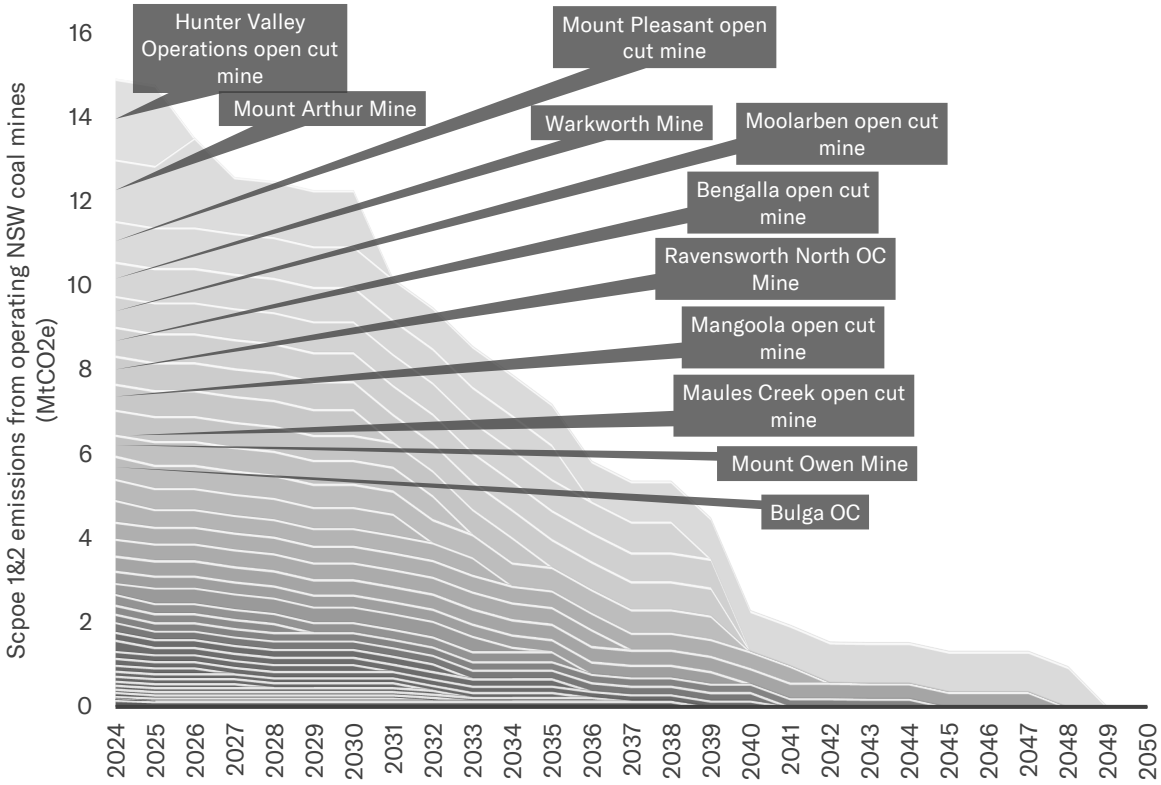
[44] ACCR analysis based on project-level data sourced from the NSW Planning Portal.
[45] NSW Coal Services, 2023 Annual Report, p. 34.
[46] Department of Climate Change, Energy, the Environment and Water, Safeguard Mechanism: Prescribed production variables and default emissions intensities, p. 8.

Chart 5.1: Operating mines in NSW by end of approved mine life and marketable reserves



Source: ACCR modelling

Chart 5.2: Scope 1 & 2 emissions from operating NSW coal mines



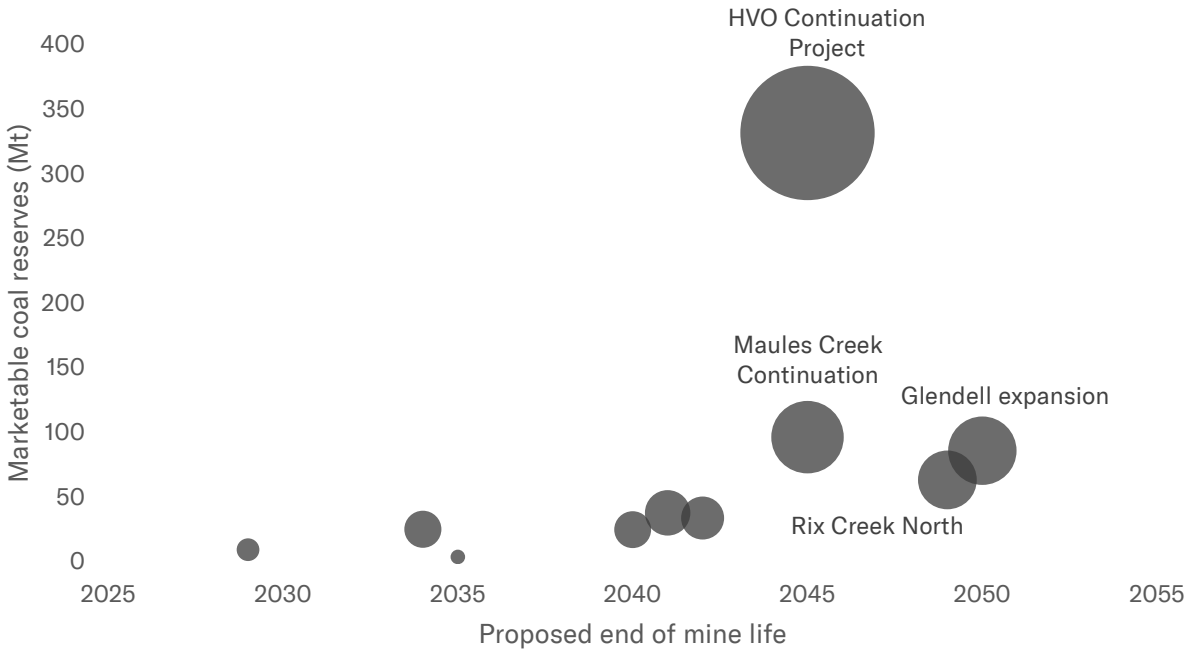
Source: ACCR modelling

The NSW Department of Planning, Housing and Infrastructure is currently assessing 10 projects for an expansion of operations beyond their currently approved end of life (see Chart 5.3). If approved, these projects will generate around 1.5 $GtCO_2e$, of which 40 $MtCO_2e$ will be direct emissions in NSW

(Chart 5.4). Projects seeking approval vary considerably in size (see Chart 5.3) and timelines (see Chart 5.5).

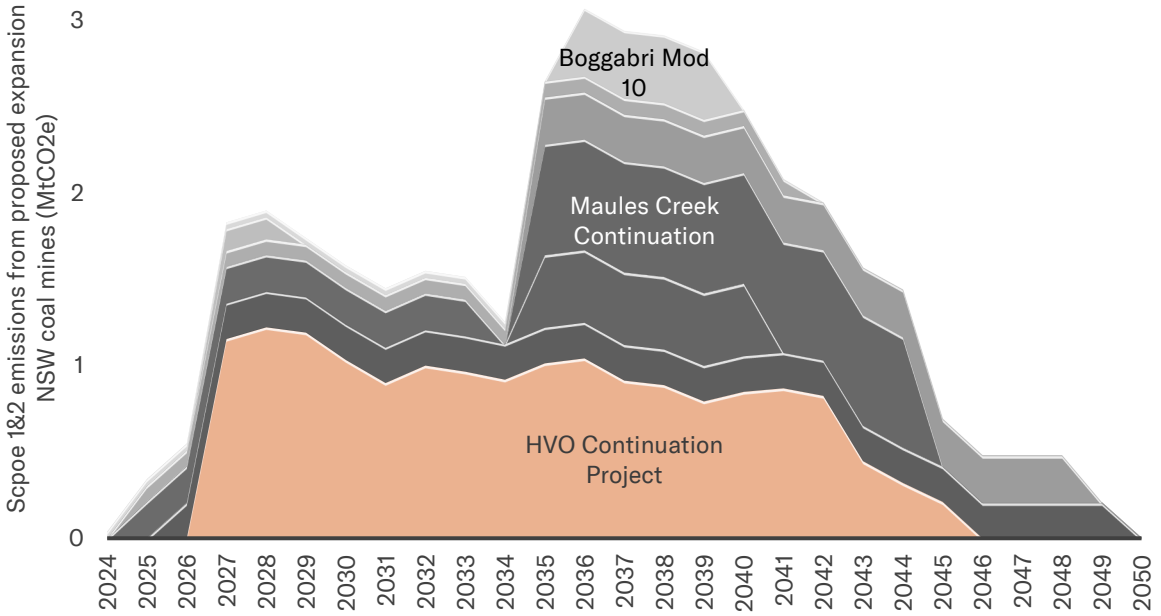
Five large mines account for 85% of the proposed expansions under assessment. The largest by far is the HVO Continuation Project, which accounts for almost 40% of the 10 coal mines seeking approval in NSW (see Chart 4.1).

Chart 5.3: Proposed approved coal mine life expansions and marketable reserves



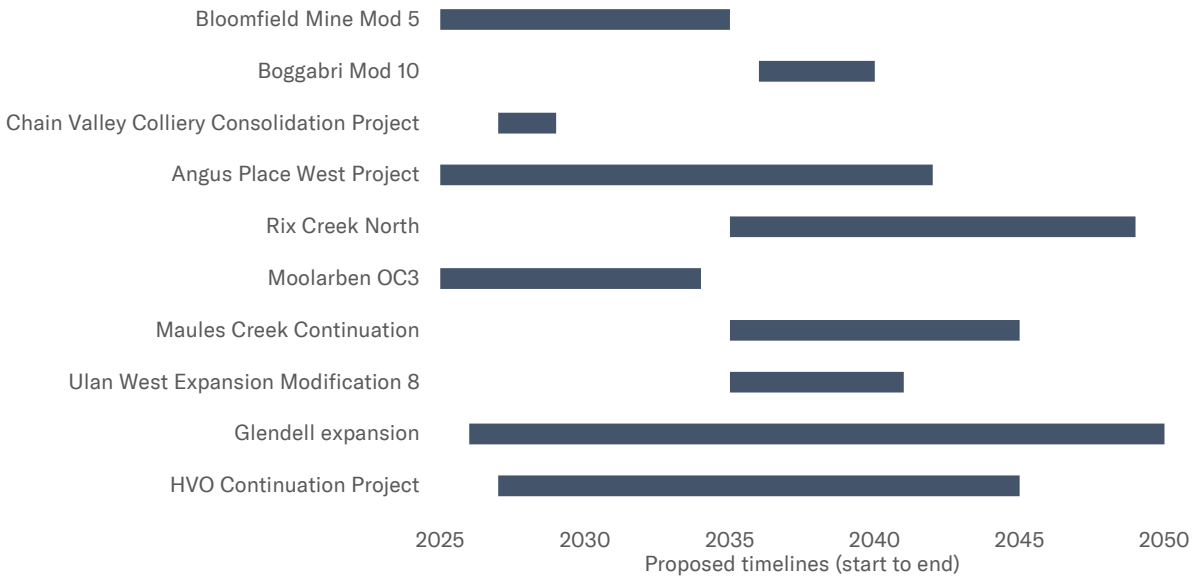
Source: ACCR modelling

Chart 5.4: Scope 1 & 2 emissions from proposed expansion coal mines in NSW



Source: ACCR modelling

Chart 5.5: Proposed timelines for expansionary coal projects currently seeking approval

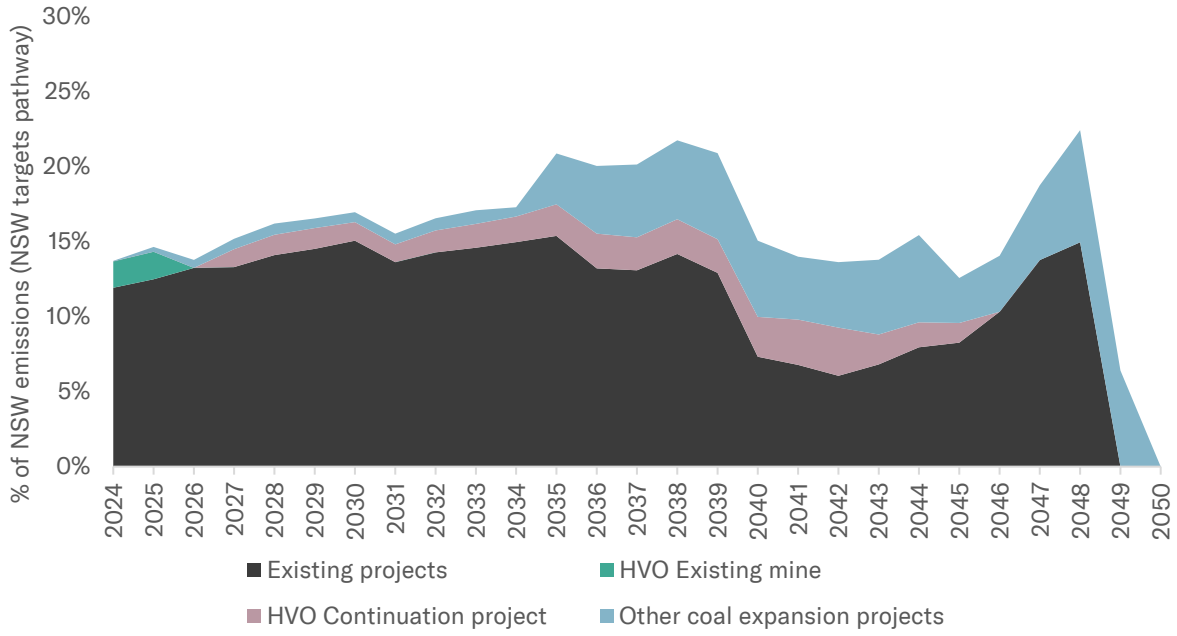


Source: ACCR modelling

Coal mining accounts for around 15 percent of total NSW emissions (see Chart 5.6). While emissions from existing mines are projected to decline, primarily due to closures, the share of coal mining in total state emissions is expected to remain steady as overall NSW emissions fall in line with state targets. However, with several coal expansion projects currently under assessment, coal mining's share of NSW's emissions could increase and exceed 20 percent by 2035 if these projects proceed.

This presents a structural challenge for managing the state's emissions budget. As coal mining holds a stubborn and potentially increasing share of total emissions, other sectors – many of which are essential, hard-to-abate and expected to grow, such as agriculture, infrastructure, housing and technology (including data centres) – will face greater pressure to reduce emissions.

Chart 5.6: Coal mining accounts for a material share of total NSW emissions, which is projected to increase if proposed expansion projects proceed



Source: ACCR modelling

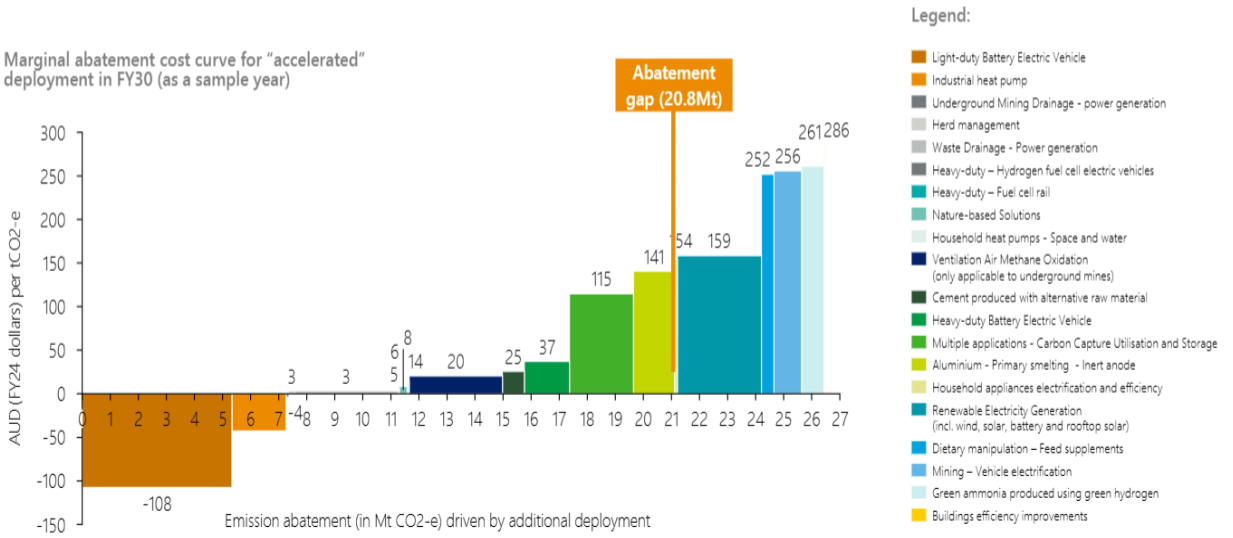
5.2 NSW Treasury directive to use MAC for emissions costs

The 2024 CBA is based on *TPP17-03: NSW Government Guide to Cost-Benefit Analysis*,[47] which has since been replaced by *TPG23-08*. [48] Under *TPG23-08*,[49] greenhouse gas emissions must be costed using NSW-specific cost of emissions.[50] This requirement is reinforced by *TPG24-34: Carbon Emissions in the Investment Framework*,[51] which presents the updated emissions costs – based on a NSW-specific Marginal Abatement Cost (MAC) approach – that must be used in CBAs prepared under *TPG23-08*, in line with the state's legislated climate targets.

[47] EY, Economic Impact Assessment of the Hunter Valley Operations continuation project, May 2024, p. 39.
[48] NSW Treasury, NSW Government Guide to Cost-Benefit Analysis TPP17-03. The status of this guide is listed as "archived" and it has been replaced by TPG23-08, indicating that it is outdated and no longer applicable for use in current assessments.
[49] NSW Treasury, NSW Government Guide to Cost-Benefit Analysis TPG23-08.
[50] NSW Treasury, NSW Government Guide to Cost-Benefit Analysis TPG23-08. p. 67. States that shadow carbon prices should be applied "in the absence of a comprehensive Australian emissions market or modelled target-consistent marginal abatement cost." This gap is now addressed by TPG24-34, which introduces carbon values based on a NSW-specific marginal abatement cost approach aligned with the state's legislated climate targets. These values replace the interim prices previously set out in the TPG23-08 Technical Note.
[51] NSW Treasury, Carbon emissions in the Investment Framework TPG24-34. "The carbon value estimates in the technical note [Technical note to NSW Government Guide to Cost-Benefit Analysis TPG23-08]... was [sic] an interim measure applied in the absence of a marginal abatement cost model specific to New South Wales and does not reflect the state's emissions reduction targets." (p. 10).

Chart 5.7 presents a simplified MAC curve, showing how the required abatement volume determines the MAC. The MAC is calculated annually by assessing the least-cost deployment of decarbonisation solutions needed to meet NSW targets.

Chart 5.7: Marginal abatement cost curve for FY30 ("accelerated deployment")[52]



Source: NSW Carbon Values Final report

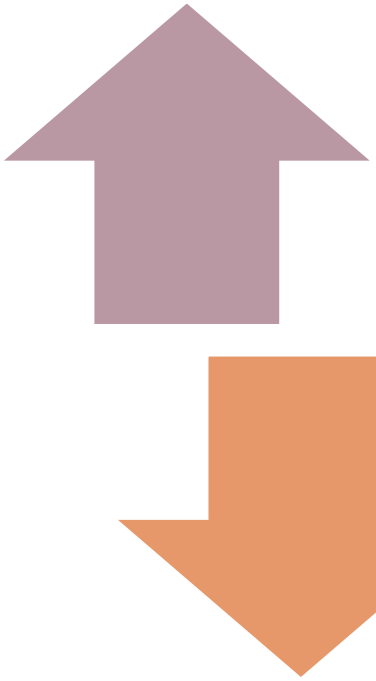
The current MAC uses the latest publicly available scientific research and market data as of September 2023. Cost curves are to be updated every two years.

Several factors could influence the MAC in future years (see Chart 5.8). NSW's slow emissions reduction progress, the approval of emissions-intensive projects in 2024, limited decarbonisation solutions and additional high-emissions projects in the pipeline are likely to widen the gap between the state's emissions and its targets, increasing the need for abatement.

As lower-cost abatement options are depleted, costs are expected to rise along the MAC curve, driving up carbon values. While advancements in decarbonisation technologies could improve efficiency and reduce costs over time, current constraints suggest that abatement costs are more likely to increase in the near future.

[52] NSW Treasury and Deloitte, NSW Carbon Values Final report, p. 19.

Chart 5.8: Factors that can change MAC



Increase in MAC

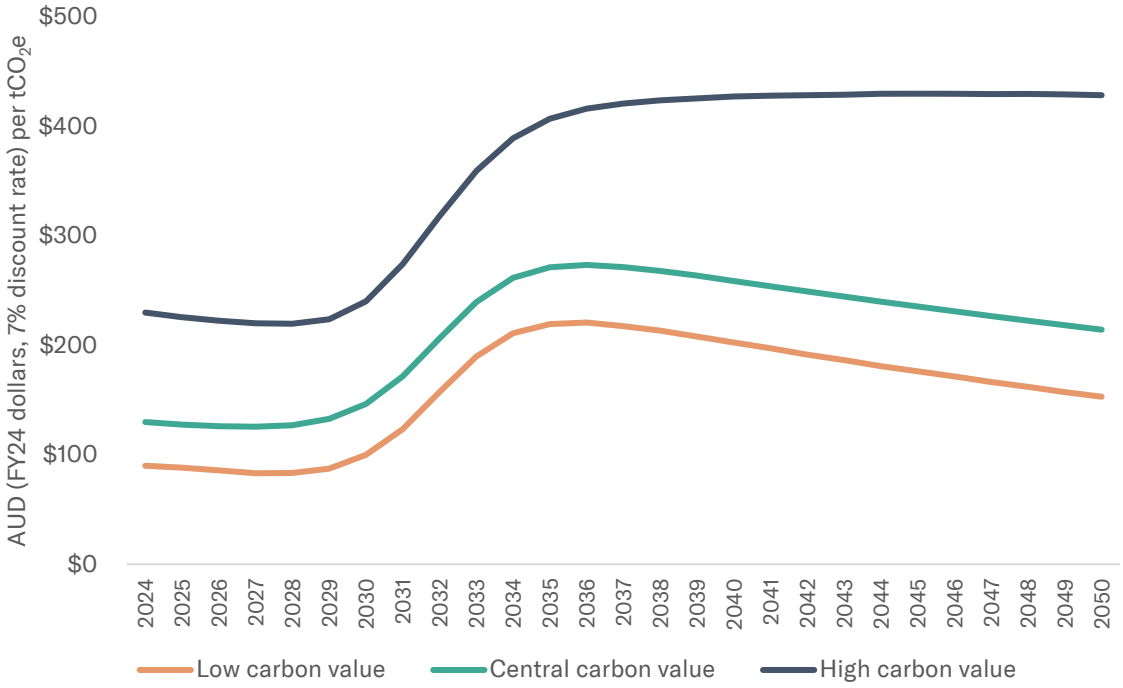
- Slower-than-required emissions reduction
- Approval of emissions-intensive projects, increasing total abatement required
- Limited advancements or investment in decarbonisation technologies
- More ambitous targets

Decrease in MAC

- Faster-than-required emissions reduction
- Rapid advancements in or deployment of decarbonisation technologies
- Economic slowdown or structural shift away from emissions-intensive industries

The emissions costs presented by the NSW Treasury are based on the updated Social Discount Rate (SDR) of 5%. However, the 2024 CBA was conducted using a 7% discount rate. As a result, we have adjusted the carbon values accordingly to ensure a like-for-like comparison (see Chart 5.9).

Chart 5.9: Adjusted carbon values (7% discount rate) in alignment with the NSW Government's guide to cost-benefit analysis



Source: NSW Carbon Values Final report, ACCR modelling

5.3 Breakdown of coal price forecast assumptions on the project's benefits to NSW

Table 5.1: Impact of coal price forecast assumptions on project economic benefits[53]

Scenario	Avg. Thermal Coal Price ($/t)	Revenue ($m)	Royalties ($m)	Corporate Tax ($m)	Direct Benefits to NSW ($m)	Project NPV ($m)	Profit After Tax ($m)
2024 CBA base case	$132	$30,800	$3,240	$898	$4,340	$5,500	$6,370
IEA APS 2024	$115	$29,000	$3,050	$744	$3,920	$4,360	$5,280
IEA NZE 2024	$96	$25,000	$2,620	$394	$3,210	$1,880	$2,800

Source: ACCR modelling

[53] Minor differences between the 2024 CBA base case and this table are due to variations in modelling configuration or input data. These differences are not material and do not affect the overall conclusions. All figures in the table are in AUD 2024 real terms.

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