Environmental Defenders Office

Improving Regulation of Coal Mine Methane in NSW

May 2025

About EDO

EDO is a community legal centre specialising in public interest environmental law. We help people who want to protect the environment through law. Our reputation is built on:

Successful environmental outcomes using the law. With over 30 years' experience in environmental law, EDO has a proven track record in achieving positive environmental outcomes for the community.

Broad environmental expertise. EDO is the acknowledged expert when it comes to the law and how it applies to the environment. We help the community to solve environmental issues by providing legal and scientific advice, community legal education and proposals for better laws.

Independent and accessible services. As a non-government and not-for-profit legal centre, our services are provided without fear or favour. Anyone can contact us to get free initial legal advice about an environmental problem, with many of our services targeted at rural and regional communities.

www.edo.org.au

For further information on this report, please contact:

Rachael Chick
Senior Solicitor
Policy and Law Reform
T: 1800 626 239
E: rachael.chick@edo.org.au

Revel Pointon
Managing Lawyer
Policy and Law Reform
T: 1800 626 239
E: revel.pointon@edo.org.au

Acknowledgement of Country

EDO recognises and pays respect to the First Nations peoples of the lands, seas and rivers of Australia. We pay our respects to the First Nations Elders past, present and emerging, and aspire to learn from traditional knowledges and customs that exist from and within First Laws so that together, we can protect our environment and First Nations cultural heritage through both First and Western laws. We recognise that First Nations Countries were never ceded and express our remorse for the injustices and inequities that have been and continue to be endured by the First Nations of Australia and the Torres Strait Islands since the beginning of colonisation.

EDO recognises self-determination as a person's right to freely determine their own political status and freely pursue their economic, social and cultural development. EDO respects all First Nations' right to be self-determined, which extends to recognising the many different First Nations within Australia and the Torres Strait Islands, as well as the multitude of languages, cultures, protocols and First Laws.

First Laws are the laws that existed prior to colonisation and continue to exist today within all First Nations. It refers to the learning and transmission of customs, traditions, kinship and heritage. First Laws are a way of living and interacting with Country that balances human needs and environmental needs to ensure the environment and ecosystems that nurture, support, and sustain human life are also nurtured, supported, and sustained. Country is sacred and spiritual, with culture, First Laws, spirituality, social obligations and kinship all stemming from relationships to and with the land.

Contents

I. Executive Summary

While this report was being finalised in May 2025, NSW was in the grip of a one-in-500-year[1] flooding disaster. The areas most affected have, since 2019, experienced a succession of unprecedented natural disasters, including ex-Tropical Cyclone Alfred in March 2025, extreme flooding events across 2020-2022; and the devastating Black Summer bushfires of 2019-2020.[2] Tragically, many people have lost their lives, many more have lost homes and businesses, and millions of animals have perished. Insurance premiums are becoming unaffordable, and some areas are beginning to be considered uninsurable. [3]

Climate change is increasing the frequency and intensity of natural disasters. The May 2025 NSW floods have been found to be "driven by very rare exceptional meteorological conditions whose characteristics can mostly be ascribed to human driven climate change."[4] The frequency and severity of the natural disasters NSW has experienced since 2019 are a stark warning for the future. With increasing global temperatures extreme weather in Australia will continue to escalate.[5]

Climate change is largely the result of the extraction and combustion of fossil fuels, and the consequent release of greenhouse gases (**GHGs**), since the industrial revolution. 2024 was the hottest year on record globally, eclipsing the previous record-holder, 2023.[6] It is clear that GHG emissions must be decreased urgently and rapidly.

The single most effective measure that can be taken now to mitigate the impacts of climate change in the near and medium term is to reduce methane emissions. [7] Methane is a potent GHG released as a fugitive emission from the extraction and distribution of fossil fuels, waste facilities, and agriculture.

---

[1] Natural Hazards Research Australia, *Taree floods show why we must future-proof volunteer the disaster response workforce*, 25 May 2025, available at: <https://www.naturalhazards.com.au/news-and-events/news-and-views/taree-floods-show-why-we-must-future-proof-volunteer-disaster>.

[2] Climate Council, *Climate Council Statement on NSW Floods: More Destructive Due to Climate Change*, 23 May 2025, available at: <https://www.climatecouncil.org.au/climate-council-statement-on-nsw-floods-more-destructive-due-to-climate-change/>.

[3] D Richardson, S Long, R Campbell, *Premium price The impact of climate change on insurance costs*, The Australia Institute, November 2024, available at: https://australiainstitute.org.au/wp-content/uploads/2024/11/P1707-Climate-change-and-insurance-Web.pdf; Climate Council and Climate Valuation, At Our Front Door: Escalating Climate Risks For Aussie Homes, 15 April 2025, available at <https://www.climatecouncil.org.au/wp-content/uploads/2025/04/CC_CV-Report-At-Our-Front-Door-2025_Final.pdf>.

[4] Alberti, T., & Faranda, D. (2025). *Heavy rain in May 2025 New South Wales floods locally intensified by human-driven climate change*, ClimaMeter, Institut Pierre Simon Laplace, CNRS, May 2025, available at: < https://www.climameter.org/20250520-new-south-wales-floods>. https://doi.org/10.5281/zenodo.15489583.

[5] Bureau of Meteorology, *State of the Climate 2024*, November 2022, available at: <bom.gov.au/state-of-the-climate/2024/documents/2024-state-of-the-climate.pdf> , p 2.

[6] World Meteorological Organisation, *WMO confirms 2024 as warmest year on record at about 1.55°C above pre-industrial level*, 10 January 2025, available at: <https://wmo.int/news/media-centre/wmo-confirms-2024-warmest-year-record-about-155degc-above-pre-industrial-level>.

[7] International Energy Agency, *Global Methane Tracker 2025*, May 2025, available at: <https://www.iea.org/reports/global-methane-tracker-2025> (**IEA Global Methane Tracker 2025**), p 16.

Methane's 20-year period global warming potential is 84 times that of CO_2, and on an instantaneous basis its global warming potential is 120 times higher than CO_2.[8]

NSW is not on track to meet the emissions reduction targets set out in the *Climate Change (Net Zero Future) Act 2023* (NSW) (**Net Zero Act**) without immediate and concerted change.[9]

Coal mining is a significant source of methane emissions, and a substantial proportion of NSW's methane emissions, but methane emissions from coal mines are barely regulated in NSW. Currently, methane emissions from NSW coal mines are not controlled at all under environmental protection licences (**EPLs**), and are only regulated on paper under development consents.

A business-as-usual approach to the regulation of existing, proposed, and decommissioned coal mines is incompatible with legislated emissions reduction targets and with the NSW Government policy that all sectors ratchet down emissions to meet those targets.

There are however a number of actions that regulators can take right now, under the existing regulatory framework, to materially reduce the emission of coal mine methane, therefore making a significant contribution to meeting NSW legislated emissions reduction targets.

This report sets out a number of recommendations for the regulation of methane emissions from existing coal mines in NSW. Most of these recommendations can be implemented without any legislative change using statutory powers and the legal framework that is currently in place.

Part II sets out the impact of methane on climate change and the significant near-term climate benefit of focusing on methane reduction. It then provides an overview of NSW's resources sector methane emissions (the bulk of which are from coal mining), and how coal mine methane can be abated using commercially available and proven techniques. It sets out NSW and Commonwealth legislation relating to climate change, and advice provided by independent statutory expert bodies with respect to achieving emissions reduction targets, as relates to coal mine methane.

Part III discusses how coal mine methane is currently regulated in NSW, on paper and in practice.

Part IV makes a series of recommendations as to how methane emissions from coal mines in NSW can be rapidly reduced under the existing regulatory framework, as well as legislative amendments to further support the effective regulation and reduction of coal mine methane in NSW.

Except insofar as it recommends the refusal of any applications for new or expanded coal mines, this report does not discuss the current framework relating to assessment and approvals of coal mines in NSW, nor does it consider the issue of indirect (or Scope 3) emissions. Its focus is the reduction of direct coal mine methane emissions that can be achieved from existing coal mines.

---

[8] United Nations Economic Commission for Europe, *Best Practice Guide for Effective Management of Coal Mine Methane at a National Level: Monitoring, Reporting, Verification, Mitigation*, 2021, available at: <https://unece.org/sites/default/files/2022-07/2119167_E_ECE_ENERGY_139_WEB.pdf> (**UNECE Best Practice Guide**).

[9] Net Zero Commission, *2024 Annual Report*, December 2024, available at <https://www.netzerocommission.nsw.gov.au/2024-annual-report> (**NZC 2024 Annual Report**), p 10.

i. Summary of recommendations

The NSW Government has an opportunity to take a material step towards meeting the state's legislated GHG reduction targets, while reaping ancillary social, economic and environmental benefits, through more effective regulation of fugitive methane emissions from coal mines.

Rapid and decisive action to minimise methane emissions from coal mines is a crucial way for the NSW Government to give effect to its commitment to take effective action on climate change to ensure a sustainable and fair future for the people, economy and environment of NSW, and to keep its legislated emissions reduction targets within reach.

In the short term, a significant reduction in current and future fugitive methane emissions can be achieved by NSW regulators and decision-makers under the existing legislative and policy framework. These recommendations, set out at **Recommendations 1-4** should be implemented immediately, recognising the urgency of the methane problem and the opportunities arising from available solutions.

However, some legislative change is also required to ensure fugitive methane emissions are addressed rigorously and so as to ensure the coal industry plays its part in NSW achieving its statutory emissions reduction targets for 2030, 2035, and ultimately net zero by 2050. **Recommendations 5-8** discuss these amendments, which should be prepared immediately, for enactment and commencement as soon as possible.

Actions that can be implemented immediately without legislative change

1. Refuse any applications for new or expanded coal or other fossil fuel projects

The NSW Net Zero Commission has highlighted the significant risk that further approvals of new or expanded coal mines pose to NSW being able to meet its legislated, mandatory, net zero targets.[10] It observed that "[a]ny 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. The emissions increases pose a major challenge for the state's regulatory arrangements."[11]

The most effective measure to reduce coal mine methane emissions in NSW is to stop approving new or expanded coal mines.

Scientific evidence, the public interest,[12] NSW's emissions reduction targets and the guiding principles of the Net Zero Act necessitate the refusal of any applications for new or expanded coal and gas projects. These projects can and must be refused development consent under the planning framework as currently exists.

---

[10] NZC 2024 Annual Report, p 43.

[11] NZC 2024 Annual Report, p 12. Footnotes omitted.

[12] In making decisions under the EP&A Act, the public interest includes consideration of the principles of ecologically sustainable development, which include the consideration of the impacts of a development on climate change, and the impact of climate change on a development: See for example *Minister for Planning v Walker* (2008) 161 LGERA 423; [2008] NSWCA 224; *Aldous v Greater Taree City Council* (2009) 167 LGERA 13; [2009] NSWLEC 17; *Gloucester Resources Limited v Minister for Planning* [2019] NSWLEC 7.

Refusal of new or expanded coal mines is warranted also due to the indirect GHG emissions of such projects, which are overwhelmingly larger than their direct emissions. Whether or not these indirect emissions are being released in NSW (and therefore included under the NSW emission reduction target), they add to the atmospheric concentration of GHGs and consequent catastrophic climate change impacts on the environment, people, and economy of NSW and must be considered by all decision makers under the EP&A Act framework[13] and the Net Zero Act.

The guiding principles of the Net Zero Act acknowledge that climate change is a serious threat to the social, economic and environmental wellbeing of NSW. The Net Zero Act requires early action to address climate change to minimise the cost and adverse impacts and consider economic risk of delaying action to address climate change is identified. These are not limited to direct emissions. Continued approvals of fossil fuel projects which will, through both direct and significant indirect emissions of GHG pollutants, contribute to and exacerbate climate change and the consequential impacts on NSW, is inconsistent with these principles.

2. **Develop and impose strong and consistent standard methane mitigation requirements for addition to existing environment protection licences and integration into management plans under development consents**

These requirements should be imposed, where available (see also **Recommendation 5**), on all EPLs and development consents authorising coal mining. These requirements must be clear, objective, and enforceable. They should include numeric limits on methane emissions; require best available technology to be utilised onsite to mitigate methane emissions; require best practice monitoring, measurement, reporting and verification of methane emissions and publication of data (including post-closure); and should prohibit venting and non-emergency flaring of methane.

3. **Resource and empower regulators to enforce new and existing conditions that regulate methane**

Conditions of authorisations and other regulatory requirements are only as effective as their enforcement. It is essential that relevant enforcement teams in the Department of Planning, Housing and Infrastructure (**Planning Department**), NSW Environment Protection Authority (**EPA**), and Resources Regulator are provided with increased resourcing and specialist staff with capacity to schedule audits and receive and scrutinize monitoring data to ensure compliance. It must be made clear to the regulated community that this is an area of focus for regulators and there must be significant institutional, governmental, and Ministerial support for this enforcement.

4. **Ensure that management of mines in care and maintenance and rehabilitation of closing coal mines minimises the risk of abandoned mine methane**

Ongoing methane monitoring must be carried out at abandoned sites and required at sites in care and maintenance, with immediate rectification of methane leaks or seepages. An independent audit of all coal mines in care and maintenance and all abandoned coal mines for methane seepages and leakages

[13] By way of *State Environmental Planning Policy (Resources and Energy) 2021* (NSW), cl 2.20(2).

should be undertaken, along with necessary rectification. Rehabilitation requirements must be strictly enforced by all regulators.

Actions that require legislative change

5. Legislate power for consent authorities to vary conditions of development consents

Currently, consent authorities such as the Planning Department are unable to vary conditions of development consents, in contrast to EPLs, which can be varied by the EPA unilaterally, at any time, for any reason.[14] Requirements under development consents are only variable if they are contained in management plans or if the proponent makes an application to modify the development.

Amendments should be made to the *Environmental Planning and Assessment Act 1979* (NSW) (**EP&A Act**) to enable the variation of conditions of development consents. This would mean consents can be varied to include explicit requirements relating to fugitive methane on the face of the consent (as well as allowing for consents to be amended to properly address other emerging environmental, technological, and legal circumstances), not only in amended management plans.

6. Implement the polluter pays principle through a levy on methane emissions

The polluter pays principle, that those who generate pollution and waste should bear the cost of containment, avoidance or abatement, is a fundamental underpinning of the planning and environmental protection framework in NSW.[15]

The *Protection of the Environment Operations Act 1997* (NSW) (**POEO Act**) explicitly provides mechanisms by which the polluter pays principle can be implemented. These mechanisms are used for a range of pollutants and waste products produced by activities in NSW, but not for GHGs and, in particular, methane.

The EPA should introduce a price per tonne of methane which could be implemented through the existing Load Based Licensing Scheme. This would go to recognising the social and environmental cost to methane emissions, assist in disincentivizing polluting, and would drive innovation and support the achievement of NSW's emissions reduction targets.

7. Reduce regulatory buck-passing and improve monitoring and enforcement through clear allocation of regulatory functions

In EDO's experience, uncertainty between regulators about responsibility for mine regulation, for example, when mines are in care and maintenance, means that issues such as ongoing significant methane emissions from the Appin Mine (See **Case Study 2**) are simply not addressed. This is a significant problem, and should be addressed through clear statutory allocation of regulatory responsibilities to a single regulator, such as is the case for coal seam gas.[16]

---

[14] For State Significant Developments, this only applies after the first licence review period (5 years after the granting of the EPL): EP&A Act, s 4.42(2)(c).

[15] *Protection of the Environment Administration Act 1991* (NSW) (**POEA Act**), s 6(2)(d)(i).

[16] See *Protection of the Environment Operations Act 1997* (NSW) (**POEO Act**), Sch 2A; *Environmental Planning and Assessment Act 1979* (NSW) (**EP&A Act**), s 9.4; *Petroleum (Onshore) Act 1991* (NSW), s 136B.

Legislative change may also be required to support additional investigative powers and compliance and enforcement options (such as civil penalty provisions).

8. Operationalise the Net Zero Act in planning, pollution, and mining laws

The EP&A Act, POEO Act, *Mining Act 1992* (NSW) (**Mining Act**), other relevant legislation [17] and subordinate instruments must be amended to facilitate the emissions reduction targets and guiding principles of the Net Zero Act and its whole-of-government obligations to reduce emissions of GHGs including methane. Amendments should include:

- prohibiting the approval of new or expanded coal mines or gas projects in NSW;
- explicitly requiring decision-makers in relation to applications for development consent, EPL, or mining lease, to consider whether an application is consistent with achieving the purpose, guiding principles, targets and objectives of the Net Zero Act; [18]
- prohibiting the granting of applications for development consent, EPL, or mining lease if the development is not consistent with the emissions reduction targets set out in the Net Zero Act;[19] and
- duties on decision-makers, and in particular consent authorities and appropriate regulatory authorities, to give effect to the purpose of the Net Zero Act, and to take all reasonable steps to exercise their functions in accordance with, and to promote, the purpose, guiding principles, targets, and objectives of the Net Zero Act.

Additionally, for clarity, the Strategic Statement on Coal and the Future of Gas Statement must be formally rescinded as (amongst other things) incompatible with the purpose, guiding principles, targets and objectives of the Net Zero Act. This does not require legislative amendment.

[17] Such as the *Petroleum (Onshore) Act 1991* (NSW).
[18] For example, amending s 4.15 of the EP&A Act, s 45 of the POEO Act, and s 63 of the *Mining Act 1992* (NSW) (**Mining Act**).
[19] Set out at s 9(1) of the Net Zero Act.

II. Background

i. Rapidly reducing methane emissions is crucial to limiting temperature rises to 1.5

2024 was the hottest calendar year in recorded history, with data showing that it was about 1.55°C above pre-industrial temperatures- the first year on record that global temperatures were higher than 1.5 °C.[20] Although this single year does not mean that the goal of keeping the temperature rise limited to 1.5°C above pre-industrial levels is out of reach, it does mean action must be taken urgently to cut GHG emissions.[21]

Methane is a potent GHG and has more than 28 times the warming potential of carbon dioxide over a 100-year period, when measured over a 20-year period its global warming potential rises to 84 times that of CO_2, and on an instantaneous basis its global warming potential is 120 times higher than CO_2.[22] This contrasts with the persistent problem caused by carbon dioxide, which has an atmospheric lifetime between 300 to 1,000 years.

Methane is responsible for around 30% of the rise in global temperatures since the industrial revolution.[23] The concentration of methane in the atmosphere is increasing at a rate faster than in any period since record-keeping began.[24]

Given its short atmospheric lifetime, acting now to rapidly reduce methane emissions will result in rapid reduction of warming, making the reduction of methane emissions one of the best ways of limiting warming in this and future decades.[25] The United Nations Environmental Program's 2021 Global Methane Assessment (**GMA**) found that "mitigation of methane is very likely the strategy with the greatest potential to decrease warming over the next 20 years."[26] This view is supported by the International Energy Agency (**IEA**) which has stated that rapid and sustained reductions in methane emissions is critical to limiting near-term warming.[27]

---

[20] World Meteorological Organisation, *WMO confirms 2024 as warmest year on record at about 1.55°C above pre-industrial level*, 10 January 2025, available at: <https://wmo.int/news/media-centre/wmo-confirms-2024-warmest-year-record-about-155degc-above-pre-industrial-level>.

[21] A. Guterres, *Secretary-General's Statement on Official Confirmation of 2024 as the Hottest Year*, United Nations Secretary-General, 10 January 2025, available at: <https://www.un.org/sg/en/content/sg/statement/2025-01-10/secretary-generals-statement-official-confirmation-of-2024-the-hottest-year>.

[22] UNECE Best Practice Guide.

[23] IEA Global Methane Tracker 2025, p 16; Intergovernmental Panel on Climate Change, *Chapter 02 Changing State of the Climate System*, in *Climate Change 2021: The Physical Science Basis, Contribution of the Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, 2021, Gulev, S.K., et al. (eds). Table 2.2 p. 302

[24] IEA Global Methane Tracker 2025, p 16.

[25] United Nations Environment Programme & Climate & Clean Air Coalition, *Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions*, 6 May 2021, available at: <https://www.unep.org/resources/report/global-methane-assessment-benefits-and-costs-mitigating-methane-emissions> (**2021 Global Methane Assessment**) p. 21.

[26] 2021 Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions, p.17; IEA Global Methane Tracker 2025.

[27] IEA Global Methane Tracker 2025, p 16.

If currently available technologies were used to cut global methane emissions by 50% by the end of this decade, the rate of warming being experienced now could be slowed by 30%,[28] keeping the window open to prevent average global temperature rise above 1.5 degrees.

In 2022, Australia recognised the significant contribution of methane to climate change and became a signatory to the Global Methane Pledge, which committed to cut global methane emissions by 30% by 2030.[29]

Methane is a significant contributor to Australia's GHG emissions, contributing approximately 29% of total reported emissions in Australia,[30] with fugitive emissions accounting for 10.9% of Australia's national inventory.[31] In trend terms, reported fugitive emissions increased 0.6% in trend terms over the September 2024 quarter, driven by an increase in NSW coal production.[32]

The Federal Climate Change Authority's Sector Pathway Review found that reported fugitive emissions from coal mining in Australia are predominantly methane emissions (95%), and that fugitive emissions account for almost half of the resources sector's reported emissions, with 25% from coal mining.[33]

This data is based on Australia's National Greenhouse Gas Inventory, which includes proponent estimates reported under the National Greenhouse and Energy Reporting Scheme (**NGER Scheme**) under the *National Greenhouse and Energy Reporting Act 2007* (Cth) (**NGER Act**). Recent studies have shown that it is likely that actual fugitive emissions are significantly higher and could be double those being reported.[34]

---

[28] Ilissa B Ocko et al, *Acting rapidly to deploy readily available methane mitigation measures by sector can immediately slow global warmin*g, (2021) 16 *Environmental Research Letters*, 5, 16 054042, available at: <https://iopscience.iop.org/article/10.1088/1748-9326/abf9c8>.

[29] The Hon Chris Bowen MP, Minister for Climate Change and Energy, *Australia joins Global Methane Pledge* 23 October 2022, available at: <https://minister.dcceew.gov.au/bowen/media-releases/australia-joins-global-methane-pledge>.

[30] Australian Government, *Quarterly Update of Australia's National Greenhouse Gas Inventory: September 2024*, available at <https://www.dcceew.gov.au/sites/default/files/documents/nggi-quarterly-update-september-2024.pdf>, (**National GHG Inventory September 2024**), p 8.

[31] National GHG Inventory September 2024, p 19.

[32] National GHG Inventory September 2024, p 19.

[33] Climate Change Authority, *Sector Pathways Review 2024*, 2024, available at: <https://www.climatechangeauthority.gov.au/sites/default/files/documents/2024-09/2024SectorPathwaysReview.pdf>, (**CCA Sector Pathways Review 2024**), p 4.

[34] A. Reynolds and C. Yeman, *Not Measured, Not Managed: Australia remains ignorant of its coal mine methane problem*, Ember, 2023 https://ember-climate.org/insights/commentary/australia-coal-mine-methane-problem/ (**Ember Report 2023**); P. Rayner and A. Grant, *Open Methane's First Results Build the Urgent Case for Improved Emissions Measurement,* Open Methane, 2024, Available at <https://openmethane.org/analysis/open-methane-first-result-builds-case-for-improved-measurement> (**Open Methane Results 2024**); A. Denis-Ryan, *Fugitive methane emissions cast dark cloud over Australia's Net Zero ambitions*, Institute for Energy Economics and Financial Analysis, 2023, < https://ieefa.org/articles/fugitive-methane-emissions-cast-dark-cloud-over-australias-net-zero-ambitions> (**IEFFA Report 2023**); see also IEA methane tracker 2025 interactive tool, Australian emissions; comparison with other estimates, available at https://www.iea.org/data-and-statistics/data-tools/methane-tracker.

ii. Sources of fossil methane in NSW

The source of fossil methane in NSW informs possible avoidance and mitigation measures, and therefore the reforms required to implement those measures.

In NSW, 72.7% of the resources sector's direct GHG emissions are fugitive emissions from coal mining.[35] Coal associated methane derives from both open cut and underground mining.

In 2022, fugitive emissions from underground coal mines were estimated at 8.1 Mt CO2-e, while open cut coal mining contributed a reported 2 Mt CO2-e.[36] However, we note that (as discussed below in relation to the National Greenhouse and Energy Reporting Scheme), these figures are likely to significantly underestimate fugitive emissions from open cut coal mining.[37]

Open cut coal mine methane seeps from pits as coal seams are broken up and coal is extracted for processing and can continue to seep after mining.[38] Smaller amounts of methane occur from post-mining activities (handling, processing and transportation).[39] Open cut coal mines can also be pre-drained, although this is not common practice.[40]

Underground mine methane arises from:[41]

- pre-drainage, which is required for worker safety due to the explosive risk of methane;
- ventilation air methane (**VAM**), which is a process of flushing methane out of underground tunnels with air throughout the lifetime of the project to maintain safe working conditions in the body of the mine;[42]
- post-mining methane (handling, processing and transportation); and
- abandoned mine methane leakages.

Gas and oil production associated methane arises from:[43]

- leaking and malfunctioning equipment;
- normal operation of emissions-intensive equipment such as compressors or pneumatic devices; and

[35] NZC Annual Report 2024, p 47.
[36] NZC Annual Report 2024, p 47.
[37] Climate Change Authority, *2023 Review of the National Greenhouse and Energy Reporting Legislation*, December 2023, available at: <https://www.climatechangeauthority.gov.au/sites/default/files/documents/2023-12/2023%20NGER%20Review%20-%20for%20publication.pdf> (**CCA 2023 NGER Review**).
[38] S. Assan, *Australia's coal mines can deliver two thirds of methane cuts*, Ember, 2022, available at: <https://ember-climate.org/app/uploads/2022/10/Report-Australias-coal-mines-can-deliver-two-thirds-of-methane-cuts.pdf> (**Ember Report 2022**), p 9.
[39] Ember Report 2022, pp 8-9.
[40] Ember Report 2022, p 10.
[41] Ember Report 2022, 9.
[42] Intergovernmental Panel on Climate Change, *2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories*, 2019, available at: <https://www.ipcc.ch/report/2019-refinement-to-the-2006-ipcc-guidelines-for-national-greenhouse-gas-inventories/>, 4.11.
[43] International Energy Agency, *Curtailing Methane Emissions from Fossil Fuel Operations: Pathways to a 75% Cut by 2030*, 2022, available at: <https://ww.iea.org/reports/curtailing-methane-emissions-from-fossil-fuel-operations> (**IEA Methane Pathways Report**), p 25.

- intentional release of associated gas not intended for sale.

The quantity of methane that is emitted from each of these processes depends on the fugitive emissions management of operators, or lack thereof. For example, vented emissions are unabated methane emissions, whereas flaring methane has the effect of converting it to carbon and water vapour,[44] resulting in lower emissions due to carbon dioxide's lower global warming potential in the short term. While VAM has too low a methane content to effectively flare, its impacts can be reduced by passing it through a flameless oxidiser for a similar effect to flaring.[45] Methane can also be utilised onsite or sold as a byproduct, which can supplement the need for other sources of energy to run operations and therefore reduce overall emissions.[46]

Effective methane regulation must address all the major sources of methane with the goal to transition the highest emitting sources to the lowest emitting alternatives as efficiently as possible, without reliance on offsets.

Abatement of coal mine methane

The issue of mitigation and abatement of coal mine methane differs significantly between underground and open cut mining. Australia is the fourth largest coal mine methane emitter in the world, and operates 75% of its coal mining by purely open cut, or surface methods; only 16% of coal mines in Australia are purely underground mines.[47] Therefore, methane emissions from both underground and open cut mines will require regulation to achieve meaningful reductions.

Methane, in suitable circumstances, can be captured before and after mining by pre- or post-drainage. Pre-drainage is particularly important where the coal seam to be mined is the main source of gas emissions. Post-drainage captures methane released from areas that have been disturbed by mining. The purpose of methane drainage is to capture gas at high purity from its source.[48]

Underground mines

The NSW Resources Regulator requires, for work health and safety reasons, that the mine operator of an underground coal mine ensures the concentration of methane in the general body of air is as low as reasonably practicable and not greater than 2% by volume.[49] To address this requirement, most underground mines carry out gas drainage via a gas drainage plant consisting of vacuum pumps attached to an underground gas pipe reticulation system via boreholes. The gas is removed to the

[44] NSW Environmental Protection Authority, *Flaring of Gas Factsheet*, available at: <https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/epa/2564-gas-flaring-fact-sheet.pdf>.
[45] Ember Report 2022, p 32.
[46] IEA Global Methane Tracker 2025, 29.
[47] Institute for Energy Economics and Financial Analysis, *Growth in Australian open-cut coalmining raises urgency of methane abatement*, February 2024, available at: <https://ieefa.org/resources/growth-australian-open-cut-coalmining-raises-urgency-methane-abatement>
[48] UNECE Best Practice Guide, p xv.
[49] *Work Health and Safety (Mines and Petroleum Sites) Regulation 2022* (NSW), cl 76.

surface where it will not cause safety issues for the mine and is usually vented to the atmosphere as VAM.[50].

In some mines the gas is captured through either pre-drainage or post-drainage and used to generate electricity. Two methods of energy generation are currently employed in Australia and include the burning of methane in a gas turbine which drives a generator to produce energy; or the burning of methane in a gas engine to produce energy. While both methods have proven to be successful, the gas engine is suited to gases with less methane content, removing the argument against use where the coal seams are less methane rich. Further, additional gas engines can be added over time, minimising the upfront cost and enabling gradual increases in capacity as needed. [51]

The Federal Climate Change Authority, in its *2024 Sector Pathways Review* for the resources sector, noted that gas drainage and utilisation for underground mines is a currently available commercial technology, with barriers to adoption largely being cost related.[52]

Open cut or surface mines

As noted above, methane emissions from open-cut mines often occur when coal seams are exposed as a result of blasting. Currently, mine operators are not required to mitigate or abate these emissions and there is a growing body of satellite evidence to show that methane emissions from open-cut coal mines are being significantly underestimated.[53]

Fugitive emissions from open cut coal mines are significantly more difficult to abate than emissions from underground mines. However, there are some measures available. For example, although not common practice due to low gas content or little operational benefit to the mines, pre-drainage from boreholes at surface mines has been demonstrated to achieve measurable reductions in methane emissions.[54] As discussed above, the low gas content can be effectively used in gas engines to generate electricity. Pre-drainage can be applied to existing mines before operations move to new areas and after operations have ceased in an area.[55]

---

[50] ACARP and University of Wollongong, *Underground Coal Drainage Methods*, available at: http://undergroundcoal.com.au/fundamentals/09_drainage.aspx#:~:text=Gas%20drainage%20for%20the%20purpose,bonding%20largely%20governed%20by%20pressure.

[51] ACARP and University of Wollongong, *Underground Coal Gas Utilisation*, available at: http://undergroundcoal.com.au/fundamentals/14_gasutilisation.aspx

[52] CCA Sector Pathways Review, pp 121-123.

[53] C. Wright, *How an accounting shift could conceal millions of tonnes of coal mine emissions*, Ember, 2024, available at: https://ember-climate.org/insights/research/accounting-shift-could-conceal-millions-of-tonnes-of-emissions/#supporting-material.

[54] ACARP and University of Wollongong, *Underground Coal Gas Utilisation*, available at: http://undergroundcoal.com.au/fundamentals/14_gasutilisation.aspx

[55] International Energy Agency, *Global Methane Tracker Documentation 2025 Version*, May 2025, available at: <https://iea.blob.core.windows.net/assets/451af9a0-8736-40dc-b843-69275d6fdb07/GlobalMethaneTracker2025Documentation.pdf>, p 32.

The Bulga Coal Complex in the NSW Hunter Valley is both an open cut and underground operation, and as such had drainage infrastructure installed for its underground works. However, this infrastructure was dismantled to make way for further open-cut works.

Coronado's Curragh mine in Queensland is an open-cut mine that is investigating how to beneficially use its "waste mine coal gas", being its methane emissions, as a diesel substitute for its operating fleet or for power generation.[56]

Inactive, decommissioned, or abandoned mines

Coal mines do not stop emitting fugitive methane once mining stops. Methane emissions from abandoned coal mines (sites that no longer have a mining tenure), coal mines in care and maintenance, or inactive coal mines continue unless specific measures (for example, sealing abandoned mines, flooding mines, capping vents) are taken to prevent leakage.[57]

The International Energy Agency's 2025 *Global Methane Tracker* identified that abandoned coal, oil and gas facilities (which it defined as "facilities that have been closed and where there are no plans to restart production") emit more methane than all but the largest three fossil fuel producing countries (China, the United States, and Russia).[58] Abandoned coal mines were estimated to have emitted nearly 5 Mt of methane in 2024, and abandoned oil and gas wells released just over 3 Mt in the same period.

In NSW, for example, two ventilation shafts at the Appin Mine have been disused since 1996-1997, and have been left unrehabilitated for nearly 30 years with unabated methane venting from the shafts (see **Case Study 2**).[59]

iii. Methane emissions and NSW's legislated emissions reduction targets

Climate Change (Net Zero Future) Act 2023

On 30 November 2023, the NSW Parliament passed the Net Zero Act. The statutory purpose of the Act is to give effect to the international commitment established through the 2015 Paris Agreement to hold the increase in the global average temperature to well below 2°C above pre-industrial levels, pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels, and increase the ability to adapt to the adverse impacts of climate change.[60] It also provides that, in enacting the Act, the Parliament of NSW recognises that "action is urgently required to reduce greenhouse gas emissions and to address the adverse impacts of climate change."[61]

---

[56] Coronado, *Emissions reduction,* available at: https://coronadoglobal.com/sustainability/emissions-reduction-projects/.
[57] UNECE Best Practice Guide.
[58] IEA Global Methane Tracker 2025, pp 12-13.
[59] See ABC News, *Methane leaking out of old mining site in Dharawal National Park near Sydney that closed decades ago*, 21 July 2024, available at: <https://www.abc.net.au/news/2024-07-21/methane-gas-leaking-mine-appin-nsw-climate-change/104029280>.
[60] *Climate Change (Net Zero Future) Act 2023* (NSW) (**Net Zero Act**), s 3(1).
[61] Net Zero Act, s 3(2)(b).

The Net Zero Act specifies the following (scope 1 and 2) emissions reduction targets for NSW:

- 50% reduction on 2005 emissions by 2030;
- 70% reduction on 2005 emissions by 2035; and
- net zero reduction on 2005 emissions by 2050. [62]

The Act provides that the Premier and Minister must ensure NSW achieves the legislated 2050 target.[63]

The Act sets out guiding principles for action to address climate change. The guiding principles include:

- that that there is a critical need to act to address climate change which is a serious threat to the social, economic and environmental wellbeing of New South Wales;
- that action to address climate change should:
    - be taken as early as possible to minimise the cost and adverse impacts of climate change,
    - be taken in a way that considers the economic risks of delaying action to address climate change,
    - be consistent with the right to a clean, healthy and sustainable environment,
    - be consistent with the principles of ecologically sustainable development, and
    - take into account the best available science (amongst other things). [64]

The guiding principles also provide that the Government of New South Wales is responsible for "urgently developing and implementing strategies, policies and programs to address climate change" and "ensuring the Government of New South Wales pursues best practice in addressing climate change." [65]

Finally, the Net Zero Act also established the NSW Net Zero Commission,[66] with functions including to monitor and review, and to provide advice and recommendations to the Minister on, progress towards the NSW emissions reduction targets, as well to monitor and review action currently being taken in NSW to address climate change.[67]

The Net Zero Act does not itself require explicit actions to be taken to achieve the NSW emissions reduction targets, nor are its targets legislatively integrated into other relevant legislation and decision-making processes. However, in May 2024, the NSW Government directed entities involved in assessment and decision-making processes under the planning system to consider NSW's emissions reduction targets and, to the extent relevant, consider the guiding principles of the Net Zero Act when

[62] Net Zero Act, s 9.
[63] Net Zero Act, ss 8(5) and 11.
[64] Net Zero Act, s 8.
[65] Net Zero Act, s 8(10).
[66] Net Zero Act, Pt 3.
[67] Net Zero Act, s 15.

examining new developments.[68] In June 2024, the Minister for Planning wrote to the chair of the Independent Planning Commission (**IPC**) asking that these matters be considered for developments currently before the IPC.[69] This would include any new, expanded, or otherwise modified coal mines seeking development consent under the EP&A Act.

While various policies and guidance documents are being prepared with a view to meeting the now legislated targets, the latest projections from the NSW Department of Climate Change, Energy, the Environment and Water (**DCCEEW**) indicate that NSW will not meet either its 2030 or 2035 targets without rapid and significant action from both Government and the private sector.[70]

NSW Government policy is that all sectors ratchet down emissions to meet NSW's legislated targets,[71] however annual fugitive methane emissions, primarily from coal mine expansions and mining of more methane-rich coal seams, are projected to increase by 32% over 2021-2030.[72]

NSW Net Zero Commission

In October 2024, as required by the Net Zero Act,[73] the NSW Net Zero Commission released its first annual report. It found that NSW is not on track to meet any of its emissions reduction targets unless faster and more significant progress is made on emissions reductions decisively now.[74]

The 2024 Annual Report found that fugitive emissions from the resources sector in NSW "are almost entirely from coal mining and primarily relate to the geological conditions prevalent at an operation, which vary significantly between sites".[75] It observed that, although several federal and state-led initiatives target (scope 1 and 2) emissions reduction in this sector, very little onsite abatement has, or is likely to, be incentivized under current settings.[76] It noted that fugitive emissions from coal mining in NSW will "continue to be significant in the medium term", pointing to the approval of a number of large coal mine approvals since 2022.[77]

---

[68] NSW Climate and Energy Action, *Ministerial Statement Updates regarding Net Zero Plan Stage 1: 2020-2030 and previous Implementation Updates*, 20 May 2024, available at <https://www.energy.nsw.gov.au/nsw-plans-and-progress/government-strategies-and-frameworks/reaching-net-zero-emissions/update> (**May 2024 Ministerial Statement**).
[69] The Hon Paul Scully MP Minister for Planning and Public Spaces, letter to IPC Chair regarding Net Zero Act, available at: < https://www.ipcn.nsw.gov.au/sites/default/files/2025-02/Signed%20%20MIN24572%20%20Letter%20to%20IPC%20Comissioner%20%20NSW%20Net%20Zero%20redacted.pdf >.
[70] May 2024 Ministerial Statement.
[71] May 2024 Ministerial Statement.
[72] State of NSW and Department of Climate Change, Energy, the Environment and Water, *NSW greenhouse gas emissions projections 2023 Methods Paper*, October 2024, available at: https://www.environment.nsw.gov.au/sites/default/files/nsw-greenhouse-gas-emissions-projections-2023-240217.pdf, p 11.
[73] Net Zero Act, s 21.
[74] NZC 2024 Annual Report, p 9.
[75] NZC 2024 Annual Report, p 47.
[76] NZC 2024 Annual Report, p 44.
[77] NZC 2024 Annual Report, p 45.

The Net Zero Commission also explicitly identified the large number of coal mine applications (for new and extended mines) currently under assessment as a risk to NSW being able to meet its emission reduction targets.[78]

At the time of the 2024 Annual Report, 33 planning applications for coal operations were under consideration by the Planning Department, and of these 22 would have potential impacts on emissions in NSW.[79] At the date of this report, development consent has been granted to four of these applications, with conditions consistent with those of other approved coal mines. That is, as is discussed below, conditions that are unlikely to result in any meaningful abatement of methane or other GHG emissions, therefore making the achievement of the legislated NSW emission reduction targets more difficult.

If NSW's emissions reduction targets are to be met, there can be no new or expanded coal mines in NSW

The Net Zero Commission noted that emissions increases associated with extended or expanded coal projects would require other sectors to make greater emissions cuts, and conversely the importance of all sectors of the economy playing their part in meeting NSW's legislated emissions reduction targets. Emissions increases associated with extended or expanded projects "pose a major challenge for the state's regulatory arrangements".[80]

That is, any emissions that will be released if new or expanded coal mines currently before the Planning Department are approved would mean that other sectors will have to make even greater emissions reductions in order for NSW to meet its legislated emissions reduction targets. This would impose an unfair burden on other sectors while prioritising the coal sector.

The report of the Joint Standing Committee inquiry into the Annual Report found that "there is considerable uncertainty regarding whether emissions targets can be achieved - particularly the 2030 and 2035 interim targets - given what the Net Zero Commission describes as a 'sizeable pipeline' of new coal expansions currently being assessed by the NSW Department of Planning, Housing and Infrastructure." It recommended that the government request the Net Zero Commission "to provide a further report on the resources sector, including methane abatement technology and fugitive emissions, as a matter of urgency."[81] The Government's response is due at the end of June 2025.

The NSW Productivity and Equality Commission's (**P&E Commission**) March 2025 *Achieving Net Zero Paper 2 - Decarbonising buildings, industry, and waste* examines how to achieve NSW's legislated emissions reduction targets in a range of sectors, including the mining and extractive industry sector. The P&E Commission has made clear that in its view the most cost effective and efficient emissions

[78] NZC 2024 Annual Report, p 43.
[79] NZC 2024 Annual Report, p 45.
[80] NZC 2024 Annual Report, p 12.
[81] New South Wales Parliament Legislative Council Joint Standing Committee on Net Zero Future, *Report no. 1. 2024 Report of the Net Zero Commission*, March 2025, available at: <https://www.parliament.nsw.gov.au/lcdocs/inquiries/3085/Report%20No%201%20-%20Net%20Zero%20-%2028%20March%202025%20-%20FINAL.pdf>, Finding 3 and Recommendation 2.

reduction measure would be a broad-based, economy wide, price on carbon.[82] In the absence of such a price however, it noted that "strategic decisions around the future of coal could also be a cost-effective option for reducing mining emissions".[83] It noted that one such decision could be to prevent further coal mine approvals, which it said would mean current development consents would provide a predictable pathway to significantly reduced fugitive methane emissions (based on coal output) by 2050, because all current approvals are set to expire by 2048.[84]

It also noted that "NSW Government emissions projections currently include some 'likely' coal mine extensions based on published proposals. Not approving these extensions could reduce mining emissions in the 2030s and 2040s markedly."[85]

In October 2024, the Federal Climate Change Authority released its Sector Pathways Review - a review of the potential technology transition and emissions pathways for six sectors of the economy that best support Australia's transition to net zero emissions by 2050.[86] Its sectoral pathway for the resources industry[87] set out existing and prospective technologies for decarbonization of the sector, and was informed by published literature where available, as well as views expressed during stakeholder engagement.[88] It set out a number of pathways by which fugitive emissions from underground and surface coal mines can be reduced.[89]

Ultimately, however, the Climate Change Authority noted that "[d]eclining domestic production of coal and gas will contribute to a reduction in Australia's emissions," and the sectoral pathway sees "output from the fossil fuels subsector declines steadily to 2050, whereas the non-fossil fuels subsector continues to grow".[90] That is, there is no credible place for an expanding fossil fuel subsector in the resources sector if Australia is to meet its 2050 emissions reduction commitments.

As such, our primary recommendation for the abatement of coal mine methane in NSW is that no new or extended coal mines be approved in NSW, because these projects and the emissions associated with them are incompatible with NSW's legislated emissions reduction targets.

---

[82] NSW Productivity and Equality Commission, *Achieving net zero: Ensuring a cost-effective transition*, November 2024, available at < https://www.productivity.nsw.gov.au/sites/default/files/2024-11/NSW-Productivity-and-Equality-Commission-Achieving-net-zero-paper-1-Ensuring-a-cost-effective-transition.pdf > (**P&E Commission Net Zero Paper 1**), p 2.
[83] NSW Productivity and Equality Commission, March 2025, *Achieving Net Zero Paper 2 - Decarbonising buildings, industry, and waste,* available at < https://www.productivity.nsw.gov.au/sites/default/files/2025-05/Achieving-net-zero-paper-2-decarbonising-buildings-industry-and-waste.pdf> (**P&E Commission Net Zero Paper 2**), p 37.
[84] P&E Commission Net Zero Paper 2, pp 37-39.
[85] P&E Commission Net Zero Paper 2, p 39.
[86] CCA Sector Pathways Review 2024.
[87] CCA Sector Pathways Review 2024.
[88] CCA Sector Pathways Review 2024, p 119.
[89] CCA Sector Pathways Review 2024, p 120-121.
[90] CCA Sector Pathways Review 2024, pp 118-119.

In our view, scientific evidence, the public interest,[91] NSW's legislated emissions reduction targets and the guiding principles of the Net Zero Act necessitate the refusal of any applications for new or expanded coal projects. That is, these projects can and should be refused development consent under the planning framework as currently exists.

This is the primary mechanism by which coal-mine methane emissions in NSW can be mitigated to preserve the possibility of meeting NSW's legislated emission reduction targets.

However, there remains a significant amount of discretion given to decision-makers in the planning framework, and that discretion has historically meant that coal mines have been approved regardless of their climate impacts.[92]

Ideally, for certainty to communities and to industry, a legislative prohibition should be placed on new or expanded coal-mining development in, for example, the EP&A Act itself, or at Sch 1 to the *State Environmental Planning Policy (Resources and Energy) 2021* (where a number of specific areas are already set out in which coal mining, or coal seam gas development, are prohibited) (see **Recommendation 8**).

iv. Current Commonwealth regulation regarding coal mine methane

At a federal level, to the extent coal mine methane emissions are dealt with, it is by way of the NGER Act and regulations.[93] The NGER Act reporting regime imposes GHG reporting requirements on facilities emitting over 25,000 tonnes of carbon dioxide equivalent (**CO_2-e**) per year. The Safeguard Mechanism, also contained in the NGER Act is "a mechanism to ensure that net covered emissions of greenhouse gases from the operation of a designated large facility do not exceed the baseline applicable to the facility."[94] The Safeguard Mechanism applies to industrial facilities emitting more than 100,000 tonnes of CO_2-e per year. The Safeguard Mechanism is intended to assist in meeting Australia's federal legislated emissions reduction targets under the *Climate Change Act 2022* (Cth) of 43% below 2005 levels by 2030 and net zero by 2050.

National Greenhouse and Energy Reporting Scheme

The Climate Change Authority's 2023 review of the NGER Act found that where facilities reported using Methods 1-3, there were significant discrepancies between reported emissions and emissions estimated using satellite data.[95] Certain fugitive emissions don't have to be reported at all, such as

[91] In making decisions under the EP&A Act, the public interest includes consideration of the principles of ecologically sustainable development, which include the consideration of the impacts of a development on climate change, and the impact of climate change on a development: See for example *Minister for Planning v Walker* (2008) 161 LGERA 423; [2008] NSWCA 224; *Aldous v Greater Taree City Council* (2009) 167 LGERA 13; [2009] NSWLEC 17; *Gloucester Resources Limited v Minister for Planning* [2019] NSWLEC 7.

[92] With the notable exceptions of the Gloucester Resources and Kepco Bylong coal mines, both of which were refused consent based in part on their climate impacts.

[93] *National Greenhouse and Energy Reporting Act 2007* (Cth) (**NGER Act**), *National Greenhouse and Energy Reporting Regulations 2008* (Cth), and *National Greenhouse and Energy Reporting (Measurement) Determination 2008* (Cth).

[94] NGER Act, s 22XD.

[95] CCA 2023 NGER Review, 5.

those from decommissioned open cut coal mines.[96] As a result, it is likely that actual methane emissions are at least 60% higher than currently reported.[97] Consequently, the Climate Change Authority recommended upgrading methods for fugitive methane emissions to "higher order methods",[98] the phasing out of Method 1, and development of a policy framework for implementing independent verification of facility-level fugitive methane emissions estimates using top-down measurements conducted by reporters and reported through the NGER Scheme.

Such reforms would bring Australian reporting standards in line with current international best practice, currently considered by the Climate Change Authority to be the Oil and Gas Methane Partnership 2.0 and Metcoal Methane Partnership.[99] They will also likely demonstrate that fugitive methane emissions from coal and gas projects are more extensive than currently comprehended by climate change policy in NSW, and at the federal level, where the effectiveness of Safeguard Mechanism relies in part on accurate reporting.

The Federal Government's response to the review agreed with 11 of the recommendations, agreed in principle to 13 recommendations and noted one recommendation.[100]

In relation to emission estimation, the Federal Government has made changes to phase out Method 1 estimation methods for fugitive emissions from the extraction of coal from open cut mines, commencing on 1 July 2025 for safeguard facilities that produce more than 10 million tonnes of coal in 2022-23, and expand to all safeguard facilities from 1 July 2026. These amendments cover over 90% of the fugitive emissions from open cut coal mines reported using Method 1 in financial year 2022-23.[101]

Following this, the Federal Government will identify priorities for phasing out Method 1 estimation methods from other sources, including underground coal mines. There is no timeframe given within which this will occur.[102]

In relation to Method 2, the Federal Government has agreed to review the Method noting that given the technical complexity of the method, consultation will be held with stakeholders including industry, interested community grounds and the scientific community to determine the scope and timing of the review, including opportunities to reflect onsite emission abatement activity.[103] In August 2024, the

[96] CCA 2023 NGER Review, 6.
[97] IEA Global Methane Tracker 2025.
[98] CCA 2023 NGER Review, 6.
[99] CCA 2023 NGER Review, 6.
[100] Australian Government, *Australian Government response to the Climate Change Authority's 2023 Review of the National Greenhouse and Energy Reporting legislation*, August 2024 , available at: <https://www.dcceew.gov.au/sites/default/files/documents/government-response-cca-nger-review.pdf> (**Government response to CCA 2023 NGER Review**).
[101] Government response to CCA 2023 NGER Review, p 10.
[102] Government response to CCA 2023 NGER Review.
[103] Government response to CCA 2023 NGER Review, p 11.

Minister announced that the government has commissioned the Chief Scientist to lead a panel reviewing Method 2 for open cut coal mines.[104]

Safeguard Mechanism

In practice, the Safeguard Mechanism does little to reduce actual, onsite, emissions from coal mines, including coal mine methane emissions.

The Safeguard Mechanism requires that net GHG emissions of each "designated" facility do not exceed its set baseline of emissions. The facilities captured by this scheme emit over 100, 000t CO_2-e per annum and their baselines must reduce 4.9% per annum unless they are a Trade Exposed Baseline Adjusted facility, which are facilities facing "elevated risk of carbon leakage."[105] These facilities can apply for a discounted baseline decline rate at no less than 2%.[106] A facility can meet their baseline targets by actual onsite emissions reduction, or purchase and surrender of Australian Carbon Credit Units (**ACCUs**)[107] or Safeguard Mechanism Credits (in-scheme credits) (**SMCs**).[108]

Existing facilities are transitioning to a government-approved industry average emissions intensity value (industry average values) to set their baselines. The consequence of calculating baselines against the average of the very high emitters and lower emitters in the coal mining sector is that the latter will automatically receive SMCs from the scheme in recognition of "emissions reductions" that have not actually occurred, and the former will be able to achieve their "emissions reductions" by the purchase of those SMCs.

Currently, the coal mining sector's industry average values are from both open cut and underground coal mines, where most open cut coal mines report significantly fewer methane emissions per tonne of coal than underground mines. In the short term, open cut coal mines will immediately fall below the industry average and have access to SMCs, which can be purchased to offset emissions at underground coal mines with above-industry average emissions. Once the transfer is complete, no real emissions reduction has occurred. The problem is exacerbated because there are limited abatement options for open cut coal mines once mining has commenced. So broad is the range of emissions intensities in the coal mining sector, that this averaging may continue to cancel out even the effect of the annual decline rate out to 2030, effectively relieving the coal sector from the requirement to undertake any direct abatement.[109]

---

[104] The Hon Chris Bowen MP Minister for Climate Change and Energy, *Chief Scientist Cathy Foley to lead expert methane reporting panel*, 26 August 2024, available at: <https://minister.dcceew.gov.au/bowen/media-releases/chief-scientist-cathy-foley-lead-expert-methane-reporting-panel>

[105] See DCCEEW, Safeguard Mechanism Reforms Factsheet, 6.

[106] DCCEEW, The Safeguard Mechanism Reforms Position Paper, 48.

[107] *National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015* (Cth) (**Safeguard Mechanism Rule**), Pt 4, Div 5.

[108] Safeguard Mechanism Rule, Pt 3A.

[109] Energy and Resource Insights, *Money for nothing: Australia coal mines under the reformed safeguard mechanism*, October 2023, available at: <https://assets.nationbuilder.com/lockthegate/pages/8405/attachments/original/1696370769/Cross-cutting_-_Report__Coal_in_Safeguard_2.0_Oct23.pdf?1696370769>.

The Safeguard Mechanism does not differentiate between GHGs, how they are generated, or the abatement options available. Some of the special characteristics of methane include that the release of fugitive emissions triggered by coal mining can continue even long after mining has ceased (see, for example, **Case Study 2** in relation to the Appin Mine).

Methane abatement relies on the proper regulation of coal mining, a power largely controlled by the state governments. The Safeguard Mechanism provides no approval mechanism to prevent new entrants into the scheme or prevent the expansion of existing facilities. The NSW Government therefore has a crucial role in achieving Australia's Nationally Determined Contribution under the Paris Climate Agreement in addition to meeting the NSW emissions reduction targets under the Net Zero Act.

There is no limit on the number of ACCUs that a facility can use to meet their targets and the cost of an ACCU will likely be lower than the cost of onsite abatement. ACCUs cannot, in real terms, offset one tonne of methane emissions reduction.

Methane and carbon dioxide are different greenhouse gases with critically different characteristics, but carbon credits treat them the same, flattening their different global warming potential with conversion factors, but making no other distinction. ACCUs are calculated to represent a tonne of carbon dioxide equivalent using a global warming potential over 100 years (GWP100), based on the global warming potential of carbon dioxide (1 tonne of carbon dioxide has a GWMP100 of 1). The danger of methane emissions, and potential mitigation opportunity of reducing them is obscured by using GWP100 because its dangerous warming potential is far higher in the short term. While the GWP100 for methane is equivalent to 28 to 36 tonnes of carbon dioxide over 100 years, it is equivalent to over 80 tonnes of carbon dioxide when measured over 20 years.[110]

Rather, given the relative global warming potential for methane is between 84-87 over a 20-year period, and given methane's short 12 year atmospheric lifespan, it is arguable that if offsets for methane were considered appropriate, the 20-year period equivalent or 84-87 tonnes of carbon dioxide to each tonne of methane should be applied for offsets to be relied on by a proponent. Preferably, methane emissions should be avoided, or reduced (as required by the mitigation hierarchy) rather than offset.

For completeness, we also note that the NGER Act contemplates and allows for state and territory laws dealing with the reduction of GHG emissions. It explicitly states that the Safeguard Mechanism is not intended to limit the operation of state or territory laws that are capable of operating concurrently.[111]

It is clear that the Safeguard Mechanism by itself will not, and is not intended to, reduce Australia's GHG emissions at a sufficient rate and volume to reach net zero by 2050, let alone meet the NSW legislated emission reduction targets. As such, a mix of policy instruments is necessary, and what we recommend in this report.

[110] International Energy Agency, *IEA Methane Tracker 2021, Methane and Climate Change*, 2021, available at: <> https://www.iea.org/reports/methane-tracker-2021/methane-and-climate-change.
[111] NGER Act, s 22XO.

A mix of policy instruments to achieve GHG emissions reductions is in fact more effective at emission reduction than stand-alone policies, according to a meta-evaluation of 1500 climate policies that have been implemented in the past 25 years over 41 countries.[112]

It is therefore not only permissible, but crucial that the NSW Government utilise its own regulatory powers and functions to ensure that GHG emissions, including those from facilities covered by the Commonwealth Safeguard Mechanism, are reduced rapidly as required by the best available evidence in order to mitigate further impacts to the people and environment of NSW by anthropogenic climate change.

III. Regulation of fugitive methane emissions from existing coal mines in NSW

The framework for the regulation of coal mines in NSW is complex, multi-layered, and duplicative.[113] Broadly, it involves three key regulatory frameworks, namely planning approvals, pollution control in the form of environment protection licences, and minerals titles. Each has its own appointed regulator and separate legislation, plans, policies and codes. This report does not seek to explain the process in detail, but focuses on those aspects where methane emissions from existing and former coal mines could, and should, be controlled.

As we discuss below, this framework as currently administered does not in practice require project proponents and regulators to take practical measures to minimise (or prevent) fugitive methane emissions. However, there are steps that can be taken by regulators, without legislative change, to do so for many existing coal mines.

There are also a number of legislative amendments which should be made to ensure appropriate reduction in coal mine methane emissions consistent with NSW's emission reduction targets, and more broadly to ensure NSW meets its Net Zero obligations and makes development decisions that are consistent with the principles of ecologically sustainable development and the Net Zero Act.

i. Environment Protection Licences under the Protection of the Environment Operations Act

Role and functions of the NSW EPA

The EPA is the primary environmental regulator in NSW, and is established under the *Protection of the Environment Administration Act 1991* (NSW) (**POEA Act**). Its objectives are (our emphasis):

> (a) to protect, restore and enhance the quality of the environment in New South Wales, having regard to **the need to maintain ecologically sustainable development**, and

[112] A Stechemesser et al, *Climate policies that achieved major emission reductions: Global evidence from two decades*, Science vol 385, 884-892 (2024), available at: <https://www.science.org/doi/10.1126/science.adl6547>.
[113] EDO's fact sheet – Mining and Coal Seam Gas in NSW - sets out the framework as at June 2021, in detail. Available at <https://www.edo.org.au/wp-content/uploads/2022/02/210615-Mining-and-Coal-Seam-Gas-in-NSW.pdf> However, we note that the fact sheet was last updated on 15 June 2021, and although broadly correct, some elements are now out of date.

(b) **to reduce the risks to human health and prevent the degradation of the environment**, by means such as the following—

- **promoting pollution prevention**,
- **adopting the principle of reducing to harmless levels the discharge into the air, water or land of substances likely to cause harm to the environment,**
- **taking action in relation to climate change**,
- **minimising the creation of waste by the use of appropriate technology,**
- regulating the transportation, collection, treatment, storage and disposal of waste,
- encouraging the reduction of the use of materials, encouraging the re-use and recycling of materials and encouraging material recovery,
- adopting minimum environmental standards prescribed by complementary Commonwealth and State legislation and advising the Government to prescribe more stringent standards where appropriate,
- setting mandatory targets for environmental improvement,
- promoting community involvement in decisions about environmental matters,
- ensuring the community has access to relevant information about hazardous substances arising from, or stored, used or sold by, any industry or public authority,
- conducting public education and awareness programs about environmental matters.[114]

"Ecologically sustainable development" (**ESD**) in NSW law is defined in the POEA Act as requiring "the effective integration of social, economic and environmental considerations in decision-making processes", and can be achieved through the implementation of certain principles and programs (commonly referred to as the principles of ESD), including:

- **the precautionary principle:** that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
- **inter-generational equity**: that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.
- **conservation of biological diversity and ecological integrity**: that conservation of biological diversity and ecological integrity should be a fundamental consideration.
- **improved valuation, pricing and incentive mechanisms**, including **polluter pays**: those who generate pollution and waste should bear the cost of containment, avoidance or abatement.

[114] POEA Act, s 6.

The EPA is required by the POEA Act to (among other things) develop environmental quality objectives, guidelines and policies to ensure environment protection (including developing environmental quality objectives, guidelines and policies to ensure environment protection from climate change).[115]

The EPA also has a range of functions and powers under the POEO Act and relevant regulations, which it administers. These include:

- administering the EPL scheme, which includes:
    - a broad discretion in relation to imposing conditions on EPLs - conditions can include (but are not limited to): setting limits on the emission or discharge of substances; requiring monitoring and reporting; requiring pollution studies and reduction programs; and post-closure requirements;
    - imposing fees on EPLs, including under the load-based licensing scheme;
    - enforcing licensee compliance with EPLs;
- developing and implementing schemes involving economic measures as a means of achieving cost-effective environmental regulation or environment protection under Chapter 9 of the POEO Act, including tradeable emissions schemes, green offsets schemes and environmental monitoring programs; and
- investigating and enforcing pollution, waste, and other offences.

The EPA's role and powers to address GHG emissions more generally are discussed in EDO's November 2020 report **Empowering the EPA to prevent climate pollution**.[116] Although this report was released before the enactment of the Net Zero Act (and consequential amendments, including the inclusion of climate change specifically as an EPA objective, along with and the requirement to develop environmental quality objectives, guidelines and policies to ensure environment protection from climate change), its discussion and recommendations remain relevant and available to the EPA. Legislative and policy development, as well as increasing GHG emissions levels since the report was released merely underscore the need for urgent action, including those actions set out in that report.

EPA's Climate Change Policy and Climate Change Action Plan 2023–26

In January 2023, in response to the *Bushfire Survivors for Climate Action* decision by the Land and Environment Court of NSW,[117] which required the EPA to meet its statutory requirement to develop environmental quality objectives, guidelines and policies to ensure environment protection from climate change, the EPA released its Climate Change Policy 2023-2026. This policy describes the causes and consequences of climate change in NSW and outlines a regulatory approach and set of actions the

[115] POEA Act, s 9; *Bushfire Survivors for Climate Action Incorporated v Environment Protection Authority* [2021] NSWLEC 92; 250 LGERA 1.
[116] Available at <https://www.edo.org.au/2020/11/26/empowering-the-nsw-epa-to-prevent-climate-pollution/>.
[117] *Bushfire Survivors for Climate Action Incorporated v Environment Protection Authority* [2021] NSWLEC 92; 250 LGERA 1

EPA says will be taken.[118] The three key pillars of the Climate Change Policy, 'inform and plan', 'mitigate' and 'adapt', are intended to be delivered through the Climate Change Action Plan 2023-2026.[119]

The Climate Change Action Plan sets out actions that it says will be taken in a staged way over the three-year span "and beyond". Relevant actions and stated timeframes include:

- progressively require licensees to prepare, implement and report on climate change mitigation and adaptation plans (Action 5(b)) (timeframe: 12-24 months, and then ongoing);
- regulate short-lived climate pollutants (including methane) from licences (Action 14) (timeframe: ongoing);
- develop a series of GHG emission reduction targets and related pathways for key industry sectors (Action 16) (timeframe: within 12 months, then ongoing);
- prepare or adopt climate change mitigation guidance for key industry sectors, including performance outcomes (Action 17) (timeframe: 12-24 months, and then ongoing);
- progressively place GHG emission limits and other requirements on licences for key industry sectors (Action 18) (timeframe: 12-24 months, and then ongoing); and
- encourage and support the regulated community to innovate (Action 19) (timeframe: within 12 months, then ongoing).

The Climate Change Action Plan was released before the enactment of the Net Zero Act, which provides further impetus and urgency to rapidly reduce GHG emissions in NSW through its legislated emissions reduction targets, and especially the 2030 and 2035 target.

Despite this, as at the date of writing, more than 24 months since the release of the Climate Change Action Plan, and only six months from its expiration, none of the above have been implemented with respect to fugitive methane emissions from coal mines. These emissions are rising, and will continue to do so unless decisive and rapid action is taken in the very near future. There has been no indication that the EPA is taking the near-term risks of coal mine methane or the urgent need for action on this source of GHG emissions with the urgency it requires.

Environment Protection Licence conditions

EPLs issued under the POEO Act are a key, and powerful, regulatory tool for the EPA to achieve its statutory objectives, the statutory objectives of the POEO Act, and the stated goals of its Climate Change Policy and Climate Change Action Plan. EPLs could be used to effectively regulate and minimise methane emissions from coal mines immediately without any legislative change.

[118] NSW Environment Protection Authority, January 2023, *EPA Climate Change Policy*, available at <https://www.epa.nsw.gov.au/sites/default/files/23p4264-climate-change-policy.pdf>.
[119] NSW Environment Protection Authority, January 2023, *Climate Change Action Plan 2023–26* , available at <https://www.epa.nsw.gov.au/sites/default/files/23p4265-climate-change-action-plan-2023-26.pdf>.

Coal mining is a scheduled activity for the purpose of the POEO Act and requires an EPL to be carried out.[120]

Coal mine methane emissions fall within the definition of both "air pollution" and "waste" under the POEO Act and could be regulated as such. "*Air pollution*" is defined as "the emission into the air of any air impurity" and air impurity is defined as including "smoke, dust (including fly ash), cinders, solid particles of any kind, gases, fumes, mists, odours and radioactive substances".[121] "*Waste*" is defined as including "any substance (whether solid, liquid or gaseous) that is discharged, emitted or deposited in the environment in such volume, constituency or manner as to cause an alteration in the environment" or "any discarded, rejected, unwanted, surplus or abandoned substance".[122]

The EPA has recognised that GHGs (including methane) are pollutants. In its 2022-23 Annual Report the EPA said that it was "now in a position to regulate greenhouse gases like any other pollutant."[123]

In its January 2023 Climate Change Action Plan, the EPA also acknowledged that the EPA is able to place emissions limits on GHGs, and (as set out above) pledged to do so at Actions 14 and 18.

The EPA has significant discretion in the conditions it imposes on EPLs. A range of common EPL conditions could be applied to methane emissions from existing coal mines, including:

- "limit" conditions, which set numeric limits on the emission or discharge of specified substances. These conditions are commonly placed on EPLs with respect to particulate matter and other air pollutants, but to date have not been placed on methane (or GHGs such as carbon dioxide);
- operating conditions, which place requirements on how the activity is to be carried out;
- monitoring conditions, which require monitoring and measurement at specified point sources, discharge points, or generally on and around the licenced premises;
- reporting conditions, which require licensees to report a range of matters to the EPA, including the results of monitoring;
- conditions requiring pollution studies and reduction programs, which require licensees to take a specified course of action to assess and reduce pollution. These conditions are commonly used by the EPA currently as a time limited enforcement measure in response to a pollution event, however there is no reason for this to be their only use - the POEO Act places no such prescription on their imposition;
- post-closure requirements to ensure that facilities are appropriately decommissioned and rehabilitated, with no ongoing pollution.

[120] POEO Act, Sch 1 cl 28.
[121] POEO Act, Sch 6.
[122] POEO Act, Sch 6.
[123] NSW EPA, *Annual Report 2022–23*, available at: <https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/about/23p4475-annual-report-2022-23.pdf>, p 43.

Another measure used by the EPA to reduce pollution from licenced facilities is its load-based licensing scheme, where licence fees are based on the loads of pollutants released into the environment. These pollutants and licence fees are set out in the *Protection of the Environment Operations (General) Regulation 2022,* and currently do not include methane (or GHGs more generally).

Unlike conditions of development consents (discussed below at pages 34-37), EPLs can be varied by the EPA at any time.[124] This allows for the adaptive management of a site and to ensure that licence conditions reflect ongoing updates in scientific understanding of environmental impacts. The mechanisms or measures to be used to protect the quality of the environment and reduce risks to human health from licensed activities are not static in nature but should evolve over time as threats to the environment and risks to human health change.

However, despite this power, and the legislative and policy requirements set out above, the EPA has yet to impose conditions on any coal mine in NSW that impose limits on, or even require monitoring or reporting of, methane emissions.

This is despite ample recent opportunity to do so. For example, from January 2024 to January 2025 (that is, with both the Climate Change Policy and the Net Zero Act in place), the EPA conducted statutory licence reviews of 58 coal mining licences. In undertaking these licence reviews, the EPA was required to consider a number of matters,[125] including (of particular relevance to coal mine methane emissions):

- the objectives of the EPA as set out in s 6 of the POEA Act (and extracted above), which include "to reduce the risks to human health and prevent the degradation of the environment by means such as… adopting the principle of reducing to harmless levels the discharge into the air, water or land of substances likely to cause harm to the environment; [and]… taking action in relation to climate change"[126]
- the pollution caused or likely to be caused by the carrying out of the activity or work concerned and the likely impact of that pollution on the environment; and
- the practical measures that could be taken:
    - to prevent, control, abate or mitigate that pollution, and
    - to protect the environment from harm as a result of that pollution.

Very few changes were made to EPLs as a result of these reviews, and no variations were made that required the reduction, measurement, or any further regulation of methane (or other GHG) emissions.

In EDO's experience, and as the above demonstrates, in practice despite the requirements of the POEO Act, EPL licence reviews are "tick a box" exercises which do not substantively engage with the

[124] POEO Act, s 58. However, for State Significant Developments, this only applies after the first licence review period (5 years): EP&A Act, s 4.42(2)(c).
[125] POEO Act, s 45.
[126] POEA Act, s 6(1)(b).

environmental and human health impacts of the licenced activity or engage in adaptive management of those impacts.

However, in our experience it has also proved extremely difficult for communities to compel the EPA to do so or to otherwise hold the EPA to account, particularly in light of the three key regulatory frameworks and their overlapping requirements and responsibilities. This is exemplified by the matter of *Maules Creek Community Council Incorporated v Environment Protection Authority* [2024] NSWLEC 71.

Case Study 1: Maules Creek Community Council Incorporated v Environment Protection Authority [2024] NSWLEC 71

This case concerned a licence review conducted in 2023 by the EPA in relation to the Maules Creek Coal Mine, in which no conditions were placed regulating methane or certain other pollutants.

The Maules Creek Community Council argued that the EPA had failed to consider the impacts of methane and other pollutants during its licence review. Preston CJ found that although the EPA review was silent on methane (and other pollutants) in its review documentation, it could be inferred that the EPA had considered these matters as potentially being addressed by the development consent or an industry wide approach.[127]

In forming its opinion, the Court considered the EPA's current process for licence reviews and its approach to regulation of methane emissions. The Court found that the EPA relies on the NGER Scheme, including the Safeguard Mechanism, together with what is allowed under the development consent for the project.

The development consent was subject to several conditions including a requirement to carry out the project in accordance with the Environmental Assessment, the statement of commitments, conditions of consent, and the conditions in the EPL (which is devoid of any GHG emissions limits, monitoring and verification requirements and reduction targets). The development consent is subject to a condition to undertake regular monitoring of GHG emissions and energy efficiency initiatives to ensure Scope 1 and GHG emissions/ tonnes of coal are kept to "*the minimum practicable level*". Further, there are environmental performance conditions which, in relation to GHG emissions, require the holder to "*implement all reasonable and feasible measures to minimise the release of GHG emissions from the site to the Satisfaction of the Planning Secretary*". However, when environmental organisations have asked the Department of Planning to take action under such conditions they are referred back to the EPA.

The cross-reference between the EPL and development consent, the vague conditions, together with the lack of actual limits in the approval or management plans, onsite monitoring and verification of emissions or reduction targets, results in unregulated GHG emissions and uncertainty as to who the appropriate regulatory authority is.

[127] *Maules Creek Community Council Incorporated v Environment Protection Authority* [2024] NSWLEC 71 at [162]-[164].

Further, from August to October 2024, the EPA conducted a "State-wide coal mine consultation", which it described as "an important opportunity to have a look at the sector as a whole and ensure licences are operating as intended, to protect the health of the community and environment", seeking feedback on licence conditions, including monitoring and reporting conditions.[128]

In December 2024, the EPA's response to the consultation was released. It noted the significant community concern about the regulation of GHGs and climate change relating to coal mines, however did not commit to any specific or time-bound changes to EPLs (or other regulatory measures) to address these concerns. No acknowledgement of the time-critical nature of the requirement to reduce GHG (and particularly methane) emissions across the NSW economy. Its only discussion of the Net Zero Act and NSW's legislated emissions reduction targets was an unsubstantiated assertion that the EPA Climate Change Policy and Climate Change Action Plan "are consistent with the principles, objectives and targets in the Climate Change (Net Zero Future) Act 2023".[129] However, it did not acknowledge that the EPA is significantly behind the schedule for specific emissions reduction measures on coal mines (and other licensed activities) that was set out in the Climate Change Action Plan, which had anticipated that by January 2025, the following would have occurred:

- progressively require licensees to prepare, implement and report on climate change mitigation and adaptation plans (Action 5(b)) (timeframe: 12-24 months, and then ongoing);
- regulate short-lived climate pollutants (including methane) from licences (Action 14) (timeframe: ongoing);
- develop a series of GHG emission reduction targets and related pathways for key industry sectors (Action 16) (timeframe: within 12 months, then ongoing);
- prepare or adopt climate change mitigation guidance for key industry sectors, including performance outcomes (Action 17) (timeframe: 12-24 months, and then ongoing); and
- progressively place GHG emission limits and other requirements on licences for key industry sectors (Action 18) (timeframe: 12-24 months, and then ongoing).

None of these have been done.

The consultation response demonstrated no urgency and made no commitments with respect to emissions reductions, and pushed back further possible timeframes for any real emissions reductions arising from its actions. Its language was vague and non-committal, the operative words being "progressively" "prepare", "potential", "possible", and "guidance". It finished by stating that "[t]he EPA is implementing these actions in a staged, progressive and iterative manner, allowing time for licensees to adjust, and for data to inform what actions must be taken and where". This is not commensurate

[128] NSW EPA, *State-wide coal mine consultation*, October 2024, available at: <https://yoursay.epa.nsw.gov.au/state-wide-coal-mine-consultation>.
[129] EPA NSW, December 2024, *NSW Coal Mine Consultation Summary Report*, available at: <https://hdp-au-prod-app-nswepa-yoursay-files.s3.ap-southeast-2.amazonaws.com/2517/3338/1896/24p4566-nsw-coal-mine-consultation-summary-report.pdf> (**Coal Mine Consultation Summary Report**), p 5.

with the urgency of action required in order for NSW to have any chance of meeting its legislated emissions reduction targets, nor is it consistent with the EPA's statutory objectives.

Climate Change Mitigation and Adaptation Plans

A key component of the EPA's proposed regulation of GHG emissions from NSW coal mines as set out at Action 5(b) to its Climate Change Action Plan and reiterated in its consultation response is "progressively requiring and supporting licensees to prepare, implement and report on Climate Change Mitigation and Adaptation Plans (**CCMAPs**)."[130]

EDO is concerned that this further delays the requirement for coal mines to actually reduce their GHG emissions, given preparation by the licensee and the EPA's review and acceptance of these plans, let alone implementation of the plan, can take a significant period of time. Further, in the absence of legislated, clear, measurable, enforceable, and time-bound requirements for CCMAPs, we think there is a very real risk that CCMAPs will merely replicate the ineffectual Air Quality and Greenhouse Gas Management Plans already required under development consents (discussed further below), and may fail to reduce methane (and other GHG) emissions in any material way. They should not be relied on as a sole measure to reduce coal mine methane (or other GHG) emissions.

ii. Development consent under the Environmental Planning and Assessment Act

The primary legislative framework for land-use planning and development control in NSW is the EP&A Act and subordinate legislative instruments such as State Environmental Planning Policies, which are primarily administered by the NSW Planning Department. Coal mines must obtain development consent under the EP&A Act to operate.

Conditions of Consent

Development consent under the EP&A Act is, where granted, invariably subject to conditions. Although there are no prescribed standard conditions for coal mines, there are conditions that are typically imposed, with some variation and project or site-specific customization.

Unlike EPLs, which to date have had no conditions directed towards methane emissions reduction, a number of common conditions of consent could conceivably be utilised to require substantial mitigation of fugitive methane emissions for existing coal mines. In practice, however, they are neither drafted with sufficient specificity and objectivity, nor interpreted and enforced so as to impose concrete limits on methane emissions.

Specific methane limits or mitigation measures

No development consents for coal mines in NSW contain limits on methane emissions, specify mitigation measures, or prohibit high emitting practices such as venting.

[130] Coal Mine Consultation Summary Report, p 6.

Unusually, however the development consent for the Narrabri Gas Project does set out limits on total project Scope 1 and 2 GHG emissions, including "Gas Flaring", "Gas Venting", "CO_2 Venting" and "Fugitive Emissions".[131] This is an improvement on conditions with no limits, however, that the limits are on total project emissions (rather than for example, annual limits) means that any enforcement of the condition is only possible towards the end of the project lifetime. There is a significant amount of inherent uncertainty associated with such a condition, including that the condition could be varied, that sufficiently accurate data must be collected and kept to evidence an enforcement action. Further, it isn't clear whether the intent of the condition is a hard cap on emissions - that the consequence of a breach would be the cessation of operation of the development, or merely the usual penalty. However, it is an example of a condition of consent that seeks to place numeric limits on GHG (including, but not exclusively, methane) emissions.

Subjective requirements

Common conditions of consent which, on their face, appear designed to require reductions in GHG emissions (including fugitive methane emissions), are limited in their practical effect by the requirement being qualified by subjective terms such as "reasonable and feasible", and by the way in which the regulator (the Planning Department) has interpreted these terms.

For example, the conditions on the development consent for the recently approved Mount Pleasant Optimisation Project require the proponent to "take all reasonable and feasible steps to… improve energy efficiency and minimise Scope 1 and Scope 2 GHGEs generated by the development." [132]

The Wilpinjong Coal Mine conditions include the requirement that the proponent "shall… implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site"[133].

The terms "reasonable and feasible", "minimise" and "improve" have been relied on by proponents to delay action, including the implementation of mitigation measures under the guise that the available technology is neither economically reasonable nor feasible to implement on economic grounds and that further investigations are being conducted to find reasonable and feasible mitigation measures. In this manner, no emissions reductions are achieved despite an ostensible requirement to do so.

EDO's experience is that proponents are quick to describe any active measures to minimise emissions and any measures that impose additional costs as "not feasible" or, using the terminology commonly contained in relevant conditions of consent and management plans, "not reasonable and feasible", and

[131] Development Consent for the Narrabri Gas Project SSD 6456, condition B20, available at <https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-6456%2120200929T234612.186%20GMT>.
[132] Development Consent for the Mount Pleasant Optimisation Project SSD 10418, condition B31(a)(iii), available at: <https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-10418%2120220907T051757.541%20GMT>.
[133] Development Consent for the Wilpinjong Extension Project SSD-6764, condition 19(b), available at: <https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-6764-MOD-4%2120240913T020755.077%20GMT> .

that regulators readily accept this assertion. This loophole cannot reasonably be accepted by regulators. Certain emissions mitigation and substitution measures are available and should be routinely required by regulators. Ensuring this is a requirement for operators without discretion will force industry to include the costs in business plans as a necessary outlay. If operators are not paying to mitigate emissions, they are simply externalising the costs of the release of these emissions on to the public and government, contrary to the polluter pays principle and the Net Zero principles.

Air Quality and Greenhouse Gas Management Plans

Development consents for coal mines and gas projects invariably require the proponent to develop an Air Quality and Greenhouse Gas Management Plan (**AQGGM Plan**) (also referred to in less recent consents as an Air Quality Management Plan). The matters these management plans must address are not uniform across consents, however more recent development consents require the AQGGM Plan to:

> "describe measures to be implemented to ensure best practice management is being employed to:
>
> • minimise the development's air quality impacts;
>
> • minimise the development's Scope 1 and 2 GHGEs; and
>
> • improve the development's energy efficiency."[134]

In December 2023, on behalf of our client the Lock the Gate Alliance, EDO wrote to the Minister for Planning requesting an industry wide review of consent and management plan conditions requiring the proponent "to implement all reasonable and feasible measures to minimize GHG emissions". The letter set out how most sites were failing to reduce emissions under their approved AQGGM Plans.

For example, measures actually taken at the Wilpinjong Coal thermal coal mine included:

- investigating areas to minimise electricity consumption off site;
- reviewing alternative energy sources; and
- minimising the use of diesel by optimising the design of haul roads to minimise the distance travelled and maintaining the fleet in good operating order.

None of these measures are in line with industry best practice or meaningfully reduce emissions. The mine's annual reports showed no actual actions had been taken to minimise energy consumption, use solar or renewable power generation onsite, or even to purchase green power. To our knowledge, no enforcement action has been taken or is being contemplated by the Planning Department to enforce the condition requiring the proponent to implement all reasonable and feasible measures to minimise GHG emissions. As such, the condition is essentially ornamental. However, despite the ineffectiveness

[134] Development consent for the Mount Pleasant Optimisation Project SSD 10418, condition B32(d)(ii), available at: <https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-10418%2120220907T051757.541%20GMT>.

of current conditioning, no such AQGGM Plan review has been undertaken in response to this letter, let alone steps to require onsite emissions reductions to address current failings.

iii. Minerals titles under the Mining Act

The NSW Resources Regulator administers the *Mining Act 1992* (NSW)(**Mining Act**), the objects of which include the encouragement and facilitation of discovery and development of mineral resources in NSW, having regard to the need to encourage ESD.[135] The Resources Regulator is also responsible for work health and safety at mine sites in NSW.

In order to explore for and mine mineral resources such as coal, exploration licenses and mining leases[136] are required. Both exploration licenses and mining leases are issued subject to conditions.[137] Of particular relevance to coal mine methane emissions are those relating to rehabilitation.

Rehabilitation requirements

Since 2021,[138] prescribed conditions relating to rehabilitation have been imposed on mining leases.[139]

The *Mining Regulation 2016* (NSW) requires that the holder of a mining lease must rehabilitate land and water in the mining area that is disturbed by activities under the mining lease as soon as reasonably practicable after the disturbance occurs.[140]

However, in practice, in relation to enforcement of this requirement, the Resources Regulator defers to the development consent granted under the EP&A Act. In its most recent Exploration and Mining Rehabilitation Report, the Resources Regulator stated that rehabilitation "must achieve a final outcome as required by the development consent of a mine, which may include but is not limited to the re-establishment of native ecosystems, agriculture and a variety of rural, urban and industrial land uses".[141]

Case study 2: Appin Mine – North Cliff Shafts No 3 and No 4

In Dharawal National Park, southwest of Sydney, there is an underground coal mine- the Appin coal mine. The site has two shafts which have been disused since 1996/7, and have been left unrehabilitated for nearly 30 years. Throughout this time the mine site has had, and continues to have, unabated methane venting from the shafts.

The site is subject to a range of authorisations with associated requirements: a mining lease which has rehabilitation conditions; an EPL which has water and particular matter monitoring requirements, but

[135] *Mining Act 1992* (NSW) (**Mining Act**), s 3A(a).
[136] Coal Leases -similar to a Mining Lease- were issued under the *Mining Act 1973*. They are no longer issued but some remain active in NSW.
[137] Mining Act, Sch 1B Part 3.
[138] Through the *Mining Amendment (Standard Conditions of Mining Leases—Rehabilitation) Regulation 2021* (NSW).
[139] *Mining Regulation 2016* (NSW) (**Mining Regulation**), s 31A; Sch 8A, Pt 2.
[140] Mining Regulation, Sch 8A, cl 5.
[141] NSW Resources Regulator, *Exploration and mining compliance and rehabilitation report 2022–23*, available at: <https://www.resources.nsw.gov.au/sites/default/files/2024-03/annual-exploration-mining-compliance-rehab-report-FY23.pdf>, p 5.

no requirement relating to GHG emissions, and a development consent subject to conditions requiring Air Quality and GHG Management, reasonable and feasible abatement requirements, and rehabilitation requirements. There are three relevant regulators associated with these authorisations: the NSW Resources Regulator; EPA; and Department of Planning (respectively).

EDO acted for Protect Our Water Catchment in relation to these methane emissions, as well as abandoned and unremediated stockpiles of coal wash. Despite all three regulators requiring the remediation of the site under their respective legislation and authorisations, in the nearly 30 years since the two shafts in question ceased to be used, this has not occurred.

In its correspondence with EDO, the Department of Planning acknowledged that it has regulatory powers to enforce its own remediation conditions, however deferred (without adequate explanation) to the NSW Resources Regulator. The EPA similarly deferred to the Resources Regulator (despite being the state's primary pollution and environment regulator).

For its part, the Resources Regulator stated that it considered that until 2016 there was no requirement (under the Mining Act) for mining leaseholders to rehabilitate as soon as practicable, and that the Appin Mine rehabilitation plan was only finalized in March 2023, with consultation and investigations being required prior to rehabilitation actions being taken. This demonstrates a significant gap in the regulation of fugitive emissions from mine sites that are no longer operating but are not yet officially closed, which can take many years to decades for many mines and as seemingly occurred for Appin Mine.

It is wholly inadequate that this issue has persisted for so long and that NSW's environmental and planning regulators have essentially abrogated their statutory responsibilities. This overlap in regulatory areas of responsibility has enabled buck passing and inaction on compliance with conditions of consent and on a significant pollution issue. Meanwhile methane - a potent GHG – continues to be vented unabated and seemingly without any action to address it.

iv. Regulatory delay and buck-passing

As is apparent from the discussion above, the regulation of coal mine methane in NSW is ineffective, beset by delay, regulatory overlap, and buck-passing by the three key regulators.

This overlap in statutory requirements and powers leads to uncertainty as to who the appropriate regulator is to determine environmental standards or to enforce the requirements that are in place.

In EDO's experience, it is often extremely difficult for communities who are concerned about coal mines which are not complying with various requirements relating to environmental quality and human health to obtain assistance from the relevant regulators. This is exemplified by the nearly 30 year failure by the proponent and by regulators to rehabilitate two shafts at the Appin Mine, resulting in unabated and continuing emissions of methane, which continues today.

IV. Recommendations in detail

The following recommendations have been drafted to address the limitations and gaps in the current regulation of methane emissions from existing coal mines at both a state and federal level. They draw on influences such as the Regulation of the European Parliament and of the Council on Methane Emissions Reduction in the Energy Sector,[142] the UNECE Best Practice Guide for Coal Mine Methane,[143] policy analysis by the International Energy Agency[144] and Rennie Advisory,[145] and ongoing work of Australian experts including from Ember and the Environmental Defense Fund.

Their design is based on an emissions reduction hierarchy, beginning with the submission that the most effective coal mine methane emissions reductions in the resources sector will come from approving no new coal projects, including extensions. The next priorities are to transition the highest emitting sources to their lowest emitting alternatives: for example, upgrading venting to flaring, and flaring to capture and destruction, wherever feasible.

The NSW government has several routes available to it to achieve significant reductions in coal mine methane emissions: through administrative and policy measures that do not require legislative change (**see Recommendations 1-4**), and through more overarching legislative change, including to properly integrate the legislative and policy requirements of the Net Zero Act into relevant legislation, (**see Recommendations 5-8**).

Given the potency of methane as a GHG, any proven mitigation measures implemented at existing operations will have significant and immediate emission reduction impacts. This will not only assist with meeting NSW's legislated emission reduction targets and aid the EPA in fulfilling its legislated obligations, but also go to holding global temperature rise to under 1.5°C.

Recommendation 1: Refuse any applications for new or expanded coal or other fossil fuel projects

The scientific consensus is that net-zero emissions must be achieved by 2050 to make the stabilisation of global warming at 1.5°C possible. The pathway to 1.5°C has no place for new or expanded coal or other fossil fuel projects.[146] Approving any such projects would be contrary to the public interest under the EP&A Act[147] and incompatible with legislated emissions reduction commitments under the Net Zero

[142] European Commission, *Regulation (EU) 2024/1787 of the European Parliament and of the Council of 13 June 2024 on the reduction of methane emissions in the energy sector and amending Regulation (EU) 2019/942*, available at < https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=OJ:L_202401787> (**EU Methane Regulations**).
[143] UNECE Best Practice Guide.
[144] International Energy Agency, *Policy Database*, 2025, available at: <https://www.iea.org/policies>.
[145] Rennie Advisory, *Methane Emissions Reduction: International policy and technology insights for the Australian fossil fuel sector*, August 2023, available at: <https://www.rennieadvisory.com.au/insights-portal/3enn51koxztkzi89gvrzn1ilu7ygkf> (**Rennie Report**).
[146] See, for example, CCA Sector Pathways Review, pp 118-119.
[147] In making decisions under the EP&A Act, the public interest includes consideration of the principles of ecologically sustainable development, which include the consideration of the impacts of a development on climate change, and the impact of climate change on a development: See for example *Minister for Planning v Walker* (2008) 161 LGERA 423; [2008] NSWCA 224; *Aldous v Greater Taree City Council* (2009) 167 LGERA 13; [2009] NSWLEC 17; *Gloucester Resources Limited v Minister for Planning* [2019] NSWLEC 7.

Act (as well as the *Climate Change Act 2022* (Cth) and international emissions reduction commitments to which Australia is a party).

Scientific evidence, the public interest, NSW's emissions reduction targets and the guiding principles of the Net Zero Act necessitate the refusal of any applications for new or expanded coal (and other fossil fuel) projects. These projects can, and in our view must, be refused development consent under the planning framework as currently exists.

The NSW Net Zero Commission has highlighted the significant risk that further approvals of new or expanded coal mines pose to NSW being able to meet its legislated, mandatory, net zero targets.[148] It observed that "[a]ny 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. The emissions increases pose a major challenge for the state's regulatory arrangements."[149]

The NSW P&E Commission has advised that a strategic decision to prevent further coal mine approvals would mean current development consents would provide a predictable pathway to significantly reduced fugitive methane emissions (based on coal output) by 2050, because all current approvals are set to expire by 2048.[150] It also noted that "NSW Government emissions projections currently include some 'likely' coal mine extensions based on published proposals. Not approving these extensions could reduce mining emissions in the 2030s and 2040s markedly."[151]

The most effective measure to reduce coal mine methane emissions in NSW is to stop approving new or expanded coal mines.

Recommendation 2: Develop and impose strong and consistent standard methane mitigation requirements for addition to existing environment protection licences and integration into management plans under development consents

Significant reductions in methane emissions from existing NSW coal mines can be achieved, with no legislative change, through the use of powers already available to regulators to impose and vary conditions and management plans under licences and consents. "Standard" requirements for methane mitigation and abatement should be developed and implemented consistently across planning, pollution, and mining approvals.

The EPA is able to vary an EPL, including its conditions, on its own initiative and at any time.[152] Following the first review period of the EPL, there is no requirement that the EPL be granted consistently with the development consent for the relevant activity.[153] Following their development, "standard" methane

[148] NZC 2024 Annual Report, p 43.
[149] NZC 2024 Annual Report, p 12. Footnotes omitted.
[150] P&E Commission Net Zero Paper 2, pp 37-39.
[151] P&E Commission Net Zero Paper 2, p 39.
[152] POEO Act, s 58, in particular subs (1), (3)(b), and (4).
[153] EP&A Act, s 4.42(2)(c).

conditions should be imposed on all EPLs that are eligible for variation (that is, those which are past the first review period for the EPL).

There is no equivalent broad power providing for the amendment of conditions on development consents - modification or variation of development consents is only available:

- on application of the proponent;[154]
- in the context of a proposed State Environmental Planning Policy, and may entitle a proponent to compensation;[155] or
- by the Minister, to impose a condition requiring monitoring or an environmental audit at any time.[156]

However, development consents for State Significant Developments such as coal usually contain a condition that the Planning Secretary may direct an operator to review and revise a management plan required under the development consent. [157] As such, the Planning Secretary should direct a review and require revision of all air quality management plans, and all revised plans should include the "standard" conditions.

These requirements should be applied consistently to existing EPLs and development consents, where available.

a. Methane emissions limits should be developed and imposed

Conditions of EPLs and development consent management plans must include enforceable, reviewable methane emission limits and reviewable emission reduction targets that are consistent with NSW's emission reduction targets. These limits must be gross (not net) emissions limits, and must exclude offsets.

Many coal mines in NSW are already required as a condition of their development consent to implement all reasonable and feasible measures to minimise the release of Scope 1 and 2 GHG emissions from the site. Numeric limits are placed on other air pollutants, either through licence conditions, or through prescription under the *Protection of the Environment Operations (Clean Air) Regulation 2022*.

Limits should be determined having regard to a sub-sectoral emissions reduction pathway consistent with NSW achieving its 2030, 2035 and 2050 emissions reduction targets, determined by or in close consultation with the Net Zero Commission and independent experts. In line with NSW Government policy that all sectors ratchet down emissions to meet NSW's legislated targets,[158] methane limits on

[154] EP&A Act, s 4.55.
[155] EP&A Act, s 4.57.
[156] EP&A Act, s 9.40.
[157] See, for example: Development Consent for the Wilpinjong Extension Project SSD-6764, condition 5(e) and Schedule 2 – General Environmental Conditions, available at: <https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-6764-MOD-4%2120240913T020755.077%20GMT>.
[158] May 2024 Ministerial Statement.

coal mines should ratchet down consistently with meeting NSW's legislated emissions reduction targets.

Given the significant risks of methane emissions, especially in relation to short and medium term warming, and the impact on other sectors of the NSW economy if the coal mining sector does not reduce its emissions; if a proponent is of the view that technological or project design abatement opportunities to meet relevant limits are unavailable, operational/production restrictions must be applied to ensure methane emissions limits are not exceeded.

b. Requirements must be objective and enforceable

As discussed above with respect to development consents, current conditions that require mitigation measures for methane and other Scope 1 and 2 GHG emissions invariably use the terms "reasonable and feasible", "practicable", and similar subjective or qualifying terms.

In our experience, these terms have been relied on by proponents to indefinitely delay the implementation of mitigation measures under the guise that the available technology is neither economically reasonable nor feasible to implement on economic grounds, or that further investigations are being conducted to find reasonable and feasible mitigation measures. In this manner, no emissions reductions are achieved despite an ostensible requirement and ability to do so, given the subjective nature of this test.

Methane emissions abatement and mitigation should be mandatory and binding, not subject to the proponent's convenience. As such, subjective and qualifying phrases must not be used in methane abatement conditions to ensure that conditions are clear and enforceable. Methane abatement requirements must be SMART- specific, measurable, achievable, relevant, and time-bound.

c. Mandate the implementation of best available technology for methane abatement

Standard methane abatement conditions should require the implementation of best available techniques/ best available technology (**BAT**), including in relation to venting and flaring equipment, VAM abatement, and pre- and post-mining drainage where appropriate.

BAT is a concept used in jurisdictions such as the EU and United States, which means the most effective and advanced pollution control methods available for the polluting activity in question. The concept is technology-based, requiring the implementation of a particular technology or combination of technologies, however invariably directives and guidance documents setting out what constitutes BAT for a particular industrial activity and pollutant will also set out the range of pollution concentration levels that can be achieved with BAT.

What is considered BAT will be a dynamic question as technologies mature and practices change globally in the pursuit of emissions reductions.

BAT as required for coal mine methane in NSW must be consistent with international best practice, not simply reflecting current industry practice in Australia. This is of particular importance as practice in Australia lags behind industry practice in, for example, VAM abatement. The CCA Sector Pathways

Review highlighted this, noting that although still a nascent technology in Australia "commercial-scale deployment of this technology has been demonstrated with multiple commercial VAM projects currently in operation, mostly in China and the US (CSIRO & Global Methane Initiative, 2018; U.S. Environmental Protection Agency, 2018)." [159]

Examples to date could include requiring equipment that vents to be replaced by non-emitting alternatives where they meet the standards and technical prescriptions for components designed to vent,[160] or only allowing flaring combustion devices with an auto-igniter or continuous pilot, and complete destruction removal efficiency for hydrocarbons.[161]

Other jurisdictions within the UK, Canada, and the US,[162] have been successful in setting emissions thresholds on standard equipment such as compressors, pneumatic devices and storage vessels. Colorado regulation, for example, requires that large storage tanks meet a 95% Volatile Organic Compound reduction targets, and flares must be designed for 98% efficiency.[163]

Where BAT changes during a project's lifetime in accordance with a periodic review, the conditions should allow a reasonable time in which operators must become compliant with updated standards.

An independent working group for determination and periodic review of BAT for methane abatement should be commissioned

To protect the integrity of conditions requiring best available technologies, an independent body (possibly under the Net Zero Commission) should be established in NSW to determine what constitutes BAT for coal mine methane abatement. It should also be required to periodically review and make any necessary updates to a BAT standard against which operators must comply. Members of this body must be independent and not have conflicts of interest.

In October 2024, the Climate Change Authority released its Sector Pathways Review - a review of the potential technology transition and emissions pathways for six sectors of the economy that best support Australia's transition to net zero emissions by 2050. Its sectoral pathway for the resources industry set out existing and prospective technologies for decarbonization of the sector, and was informed by published literature where available, as well as views expressed during stakeholder engagement.[164] It set out a number of pathways by which fugitive emissions from underground and surface coal mines can be reduced.[165]

The Climate Change Authority noted that deployment of, for example, commercial scale VAM (which is in use commercially in other jurisdictions) "at even only a small portion of coal mines could result in meaningful emissions reduction". It goes on to observe that "[a]pproximately 60% of the fugitive

[159] CCA Sector Pathways Review, pp 122.
[160] See, for example, EU Regulations, Art. 15(4)(a).
[161] EU Regulations, Art. 17.
[162] Rennie Report, p 69.
[163] Rennie Report, p 72.
[164] CCA Sector Pathways Review, p 119.
[165] CCA Sector Pathways Review, pp 121-123.

methane emissions from underground coal mines are from ventilation air methane systems (EY Port Jackson Partners (internal assessment, unpublished), 2024). Anglo American have recently undertaken initial concept studies and are working to progress from a pre-feasibility to feasibility stage in VAM abatement with the design and construction of an industrial unit at its Moranbah North mine in Queensland (AngloAmerican, 2023)."[166]

d. Require best practice measurement, monitoring, reporting and verification of methane emissions

Studies repeatedly show that Australia is significantly underreporting its methane emissions, and that actual emissions from open cut coal mines in particular are likely to be around double the NGER Scheme estimates for open cut coal mines relying on lower order methods.[167] Relying on inaccurate data jeopardises the effectiveness of any framework or initiative relying on it, such as the Net Zero Emissions Dashboard. It threatens accurate understanding of any remaining 'carbon budget' and how emissions reductions efforts are tracking, and therefore needs to be urgently addressed.

Standard methane abatement conditions to be imposed on EPLs and development consent management plans must require monitoring, reporting, and verification of coal mine methane emissions in line with the Metcoal Methane Partnership, or current international best practice as defined by an independent body.

Monitoring data must be required to be published, and made available on the EPL public register, within a specified period and in a specified manner, in line with monitoring and reporting of other pollutants under the POEO Act.

e. Require progressive rehabilitation designed and implemented to minimise the risk of abandoned mine methane.

Standard methane abatement requirements must include measures designed to minimise the risk of ongoing methane pollution following the active working of a site.

EPL "standard" methane abatement conditions should require a Pollution Reduction Program to set out plans for progressive, mandatory, rehabilitation works to prevent fugitive methane emissions (this should apply to all disturbance, including boreholes, shafts and portals that form part of a gas drainage system), as well as post-operational monitoring and reporting of methane emissions, and remediation works where methane seepages or leakages are detected.

As shown by **Case Study 2** in relation to the Appin Mine, the Resources Regulator does not necessarily enforce the requirement for rehabilitation to be carried out within a reasonable time from disturbance of the site. Therefore, a Pollution Reduction Program condition must ensure that rehabilitation directed

[166] CCA Sector Pathways Review, p 122.
[167] See, for example, Ember Report 2022; Ember Report 2023; IEFFA Report 2023; CCA 2023 NGER Review; Open Methane Results 2024; IEA Global Methane Tracker 2025.

to methane abatement is mandatory, enforceable, progressive and occurs within a set time, not a discretionary "reasonable" timeframe.

f. Prohibit unabated venting and non-emergency flaring

Unabated venting of methane must be prohibited, as it is an unnecessary release of methane where alternative methods of managing the emissions exist.

Based on existing practices and available technologies both underground and open-cut or surface mines should be required to pre- and post-drain, where there are no further unacceptable environmental impacts, and beneficially utilise the methane laden coal seam gas. Flaring should only be permissible in emergencies. Venting unabated methane to the atmosphere should be unlawful and treated as an air pollution offence under the POEO Act.

Recommendation 3: Resource and empower regulators to enforce new and existing conditions that regulate methane

Conditions of authorisations and other regulatory requirements are only as effective as their enforcement. It is essential that relevant enforcement teams in the EPA, Planning Department, and Resources Regulator are provided with increased resourcing and specialist staff with capacity to schedule audits and receive and scrutinize monitoring data to ensure compliance. It must be made clear to the regulated community that this is an area of focus for regulators and there must be significant institutional, governmental, and Ministerial support for this enforcement.

Recommendation 4: Ensure that management of mines in care and maintenance and rehabilitation of closing coal mines minimises risk of abandoned mine methane.

Methane emissions at abandoned mine sites or sites in care and maintenance, (known internationally as "abandoned mine methane") are already a significant source of emissions in NSW and will become an increasing problem as coal mining decreases with increasing moves to decarbonise globally and projects reaching the end of their project lifecycles.[168]

Evidence given at the United Nations Economic Commission for Europe 9th International Forum on Energy for Sustainable Development estimated that abandoned mine methane would rise to represent approximately 24% of all coal mine methane in the world by 2100.[169] Currently, abandoned mine methane represents at least 3% of Australia's coal mine methane emissions.[170] This is likely to be a significant underestimate in the future if current reporting requirements remain unchanged, such as

[168] R. Campbell et al,, *Dark side of the boom: What we do and don't know about mines, closures and rehabilitations*, The Australia Institute, 15 April 2017, available at: <https://australiainstitute.org.au/report/dark-side-of-the-boom/>.
[169] N. Kholod et al, *Global CMM and AMM Emissions: Implications of Mining Depth and Future Coal Production*, Presentation at the 9th International Forum on Energy for Sustainable Development, 15 November 2018, available at: <https://unece.org/fileadmin/DAM/energy/images/CMM/CMM_CE/9_-_CMM_-_Kholod_Mining_depth_and_emissions.pdf>.
[170] Ember Report 2022, p 10.

there being no requirement at a federal or state level in NSW to report on emissions of coal mines and gas projects that has been decommissioned or are in care and maintenance.[171] There is particular concern with respect also to the abandonment of underground mining and the cessation of fans and other technologies that were utilized to manage methane emissions – leading to potentially high levels of release of methane emissions.

Currently the management of abandoned mine methane and the environmental impact of these sites falls into a regulatory no man's land, as is demonstrated by **Case Study 2** in relation to the Appin Mine.

It is critical that NSW has laws and policies in place to ensure these sites are appropriately monitored and managed to mitigate current sources and prevent the exponential growth of abandoned site methane as coal mines come offline.

We have made recommendations above seeking to mitigate the risk that current mines currently applying for or subject to development consents become future sources of abandoned mine methane.

Current sources of abandoned mine methane must be identified and controlled. An audit of all coal mines in care and maintenance, and former coal mines (as well as other potential sources of abandoned mine methane such as abandoned gas wells) for methane seepages and leakages must be undertaken.

An emerging avenue to assist in the identification of emissions sources, including abandoned sites and mines in care and maintenance is remote methane monitoring, which has been taken up as a policy measure in jurisdictions such as California of government-conducted remote methane emissions monitoring. In 2022, the Californian legislature approved funding to expand the frequency and area covered by remote sensing and satellite technology to monitor emissions.[172]A similar program could be rolled out in NSW.

Recommendation 5: Legislate power for consent authorities to vary conditions of development consents

Currently, consent authorities (such as the Planning Department) are unable to vary conditions of development consents under the EP&A Act, even operational conditions for ongoing development proposed to operate for a number of decades (in comparison to, for example a residential building consent), without the applicant having applied for a modification of consent.[173] This means development consents have very little capacity to be amended based on evolving environmental, societal, and technological circumstances. This is in contrast to EPLs, which can be varied by the EPA unilaterally, at any time, for any reason.[174]

Amendments should be made to the EP&A Act to enable the variation of conditions of consent. This would mean older or outdated consents are able to be amended to properly address emerging

[171] CCA 2023 NGER Review, p 6.
[172] Rennie Report, p 46.
[173] Noting that even where this is the case, the variation of conditions must have a connection to the subject matter of the development consent.
[174] For State Significant Developments, this only applies after the first licence review period: EP&A Act, s 4.42(2)(c) .

environmental, technological, and legal circumstances (for example, enabling explicit requirements relating to fugitive methane).

Recommendation 6: Implement the polluter pays principle through a levy on methane emissions

A fundamental principle of ESD as defined in the NSW planning system by the POEA Act is improved valuation, pricing and incentive mechanisms, including polluter pays - that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement.[175]

The NSW Productivity and Equality Commission's November 2024 Achieving Net Zero research paper 1 ('*Ensuring a cost-effective transition*') echoes this that "[w]herever possible, we should adopt price-based mechanisms to encourage efficient investment… A comprehensive carbon dioxide-equivalent price would provide households and businesses with a positive incentive to reduce their emissions wherever it is cheaper for them to do so. This would ensure abatement occurs at the lowest possible cost to the economy."[176]

A price on methane emissions could be a simple and effective mechanism which would drive reductions in methane emissions and encourage technological innovation in methane abatement. Any price on methane should reflect its much higher near-term warming effect compared to carbon dioxide.

The POEA Act explicitly provides mechanisms by which the polluter pays principle can be implemented. These mechanisms are used for a range of pollutants and waste products produced by activities in NSW, but have not to date been used for methane or other GHGs.

For instance, the load-based licensing scheme (**LBL scheme**), which operates under the POEO Act[177] and the *Protection of the Environment Operations (General) Regulation 2022*,[178] sets out regulated pollutants and a licence fee system based on the volume of pollutant emitted.

However, currently the LBL scheme does not apply to coal mining or related industries, and does not list methane or other GHGs as assessable pollutants. This can be rectified through amendments to the POEO Regulation. Fees must be set at a high enough level to be reflective of the environmental and social cost of methane emissions and to incentivise emissions reductions.

Fees generated by the LBL scheme for methane emissions could be used to encourage further emissions abatement.

[175] POEA Act, s 6(2)(d)(i).
[176] P&E Commission Net Zero Paper 1, p 2.
[177] POEO Act, s 9.
[178] *Protection of the Environment Operations (General) Regulation 2022*, cll 31-55; Sch 2.

Recommendation 7: Reduce regulatory buck-passing and improve monitoring and enforcement through clear allocation of regulatory functions

As outlined in the case studies and discussion above, the often-overlapping legislative provisions and interplay between the three regulators leads to uncertainty and a resulting lack of regulation or enforcement and methane emissions continuing unabated. This is not a tenable position for industry or for communities bearing the burden of a poorly regulated industry. This was recognised with respect to the coal seam gas industry where, following the *2014 Independent Review of Coal Seam Gas Activities in NSW* conducted by the NSW Chief Scientist and Engineer, the EPA was designated the lead regulator for that industry in NSW. It is now responsible for compliance and enforcement of conditions of EPLs, development consents, conditions of petroleum titles (such as those relating to rehabilitation), and water approvals.[179]

An amendment to the POEO Act and Mining Act designating the EPA as the lead regulator for coal mining would provide certainty and consistency in relation to compliance and enforcement, and would reduce the potential for buck passing that has occurred with rehabilitation requirements at the Appin Mine.

Legislative change may also be required to support additional investigative powers and compliance and enforcement options (such as civil penalty provisions).

Any change or consolidation of enforcement powers should also be accompanied by additional resourcing and expertise, as per **Recommendation 3.**

Recommendation 8: Operationalise Net Zero Act in planning, pollution, and mining laws

Finally, in order to meet NSW emissions reduction targets and provide certainty for industry and the community, the EP&A Act, POEO Act, Mining Act, and subordinate instruments must be amended to facilitate the Net Zero Act and the whole-of-government obligations under that Act to reduce emissions of GHGs, including methane. Amendments should include:

- prohibiting the approval of new or expanded coal mines or gas projects in NSW;
- explicitly requiring decision-makers[180] in relation to applications for development consent, EPL, or mining lease, to consider whether the application is consistent with achieving the purpose, guiding principles, targets and objectives of the Net Zero Act;
- prohibiting the granting of applications for development consent, EPL, or mining lease if the development is not consistent with the emissions reduction targets set out in the Net Zero Act;[181] and

[179] See POEO Act, Sch 2A; EP&A Act, s 9.4; *Petroleum (Onshore) Act 1991* (NSW), s 136B.
[180] For example, at s 4.15 of the EP&A Act, s 45 of the POEO Act, and s 63 of the Mining Act.
[181] Net Zero Act, s 9(1).

- duties on decision-makers, and in particular consent authorities and appropriate regulatory authorities, to give effect to the purpose of the Net Zero Act, and to take all reasonable steps to exercise their functions in accordance with, and to promote, the purpose, guiding principles, targets and objectives of the Net Zero Act.

Additionally, for clarity, the Strategic Statement on Coal and the Future of Gas Statement must be formally rescinded as (amongst other things) incompatible with the purpose, guiding principles, targets and objectives of the Net Zero Act. This does not require legislative amendment.