

Feedback to New South Wales' Environment Protection Authority's Public Consultation on the draft Climate Change Policy and draft Action Plan 2022-2025

Published date: 02 November 2022

Lead author: Anatoli Smirnov (anatoli@ember-climate.org)

Other authors: Sabina Assan (sabina@ember-climate.org)

Delineation:

This document is Ember's feedback regarding the draft Climate Change Policy and Climate Change Action Plan 2022- 2025, published by the Environmental Protection Authority ("EPA") of New South Wales ("NSW") on September 8th 2022.

Our feedback focuses on coal mine methane emissions, in which the team preparing this note have expertise and up to date knowledge of the issue globally and in Australia. Part of this paper also has comments regarding the issue of anthropogenic methane emissions in general, where the writers of this report have strong understanding.

Our comments may be relevant to sector-specific methane emissions such as oil and gas; agriculture; waste or other, but this is outside of the scope of this document.

Overview

We welcome the opportunity to comment on the NSW EPA's draft Climate Change Policy and Climate Change Action Plan 2022- 2025.

This document describes the importance of specifically focussing on methane emissions from the coal mining sector in NSW's Climate Change Policy and proposes two new pillars for action in NSW's Action plan; *Inform and Plan*, and *Mitigate*.

Inform and Plan Pillar covers two new actions in which NSW's EPA collaborates with existing and future international methane emission reduction initiatives, to develop and implement measurement, reporting and verification frameworks on coal mines in NSW, Australia and globally.

Mitigate Pillar covers a new action, where NSW's EPA ensures that methane emissions from active, "care and maintenance", closed and abandoned mines are minimised.

Contents

Chapter 1: Importance of Coal Mine Methane	3
Chapter 2: Proposed New Actions:	7
Pillar 1: Inform and Plan	7
Pillar 2: Mitigate	10
Supporting Materials: Measuring CMM	

Chapter 1

Importance of Coal Mine Methane

The EPA's Action Plan recognises a duty to protect the people of NSW and its environment from climate change. We highlight two key methane targets which will be vital to put NSW on a climate safe trajectory, and address Australia's ambitions for climate action.

Over the last few years, Methane has leapt to the forefront of international climate efforts, as it is now seen as the single most effective opportunity to reduce global warming in the short term. On average, over a period of 20 years, the greenhouse gas is over 80 times more potent than carbon dioxide, and emissions are increasing at [record](#) rates.

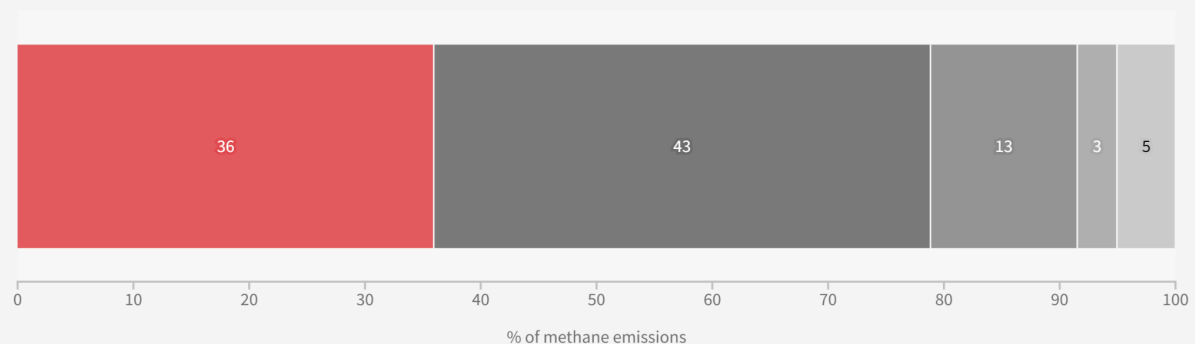
Methane is inherently linked to any coal deposit. When mining coal, whether underground or open-cut, methane is released to the atmosphere. In the case of underground mines, these emissions can continue for decades after the mining ends.

Coal mines responsible for 36% of NSW's methane emissions in 2020

EMBER

Sources of methane emissions in New South Wales in 2020, as reported to the Paris Agreement Inventory.

■ Coal Mining ■ Agriculture ■ Waste ■ Oil & Gas ■ Other



Source: Australia's Greenhouse Emissions Information System (2020)

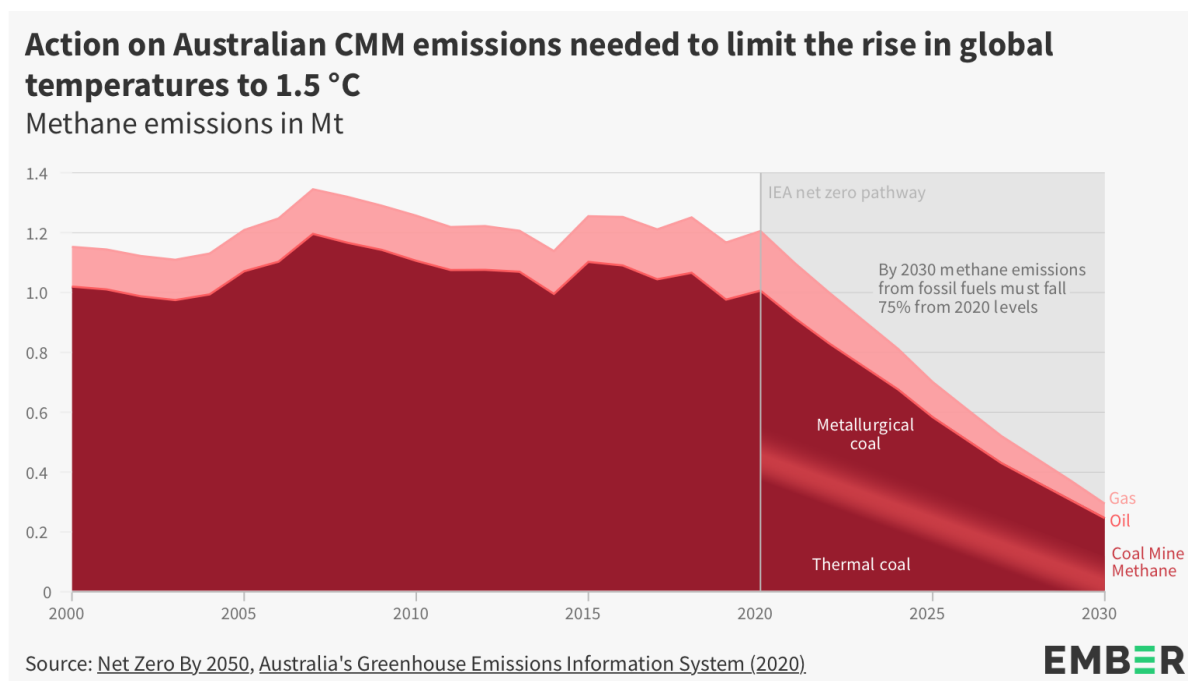
Coal mines in New South Wales and Queensland dominate Australia's coal mine methane (CMM) emissions, releasing over 1 million tonnes of methane in 2020. In New South Wales, coal mines are responsible for over 90% of the state's methane emissions from the energy sector and 36% of its total methane emissions.

There is a risk that CMM emissions are being underreported due to the Government's simplistic and outdated CMM reporting legislation. The [IEA estimates](#) that Australia's reported CMM emissions are missing 800 thousand tonnes of methane, suggesting emissions are almost [twice as high](#) as what mines reported in 2020. The Supporting Materials section (below) suggests how to improve the measurement, reporting and verification frameworks on coal mines to ensure the integrity of any methane accounts and climate targets.

For an in-depth briefing on the scale of methane emissions from Australia's and NSW's coal mines, and actions to mitigate, please see our report "[Tackling Australia's Coal Mine Methane Problem](#)".

75% reduction in energy sector methane emissions by 2030

The International Energy Agency (IEA) [study](#) of how to transition to a net zero energy system by 2050, found that methane emissions from the coal mining industry must be reduced by 75% from 2020 levels by 2030 to limit the rise in global temperatures to 1.5C. This decline needs a steep reduction in thermal coal use for electricity and an increase in the deployment of emissions reduction measures, in particular for metallurgical coal which will still be critical for steel production in 2030.



An important factor for New South Wales is that its coal production is dominated by thermal coal rather than metallurgical coal. Pillar 2 of our proposed actions in Chapter 2 covers how NSW can mitigate CMM according to the IEA net zero target.

30% methane emissions reductions by 2030

Recently (October 23, 2022), Australia has joined the [Global Methane Pledge](#). The Methane Pledge is a non-binding, but diplomatically significant document, where its signatories recognise that in order to keep global warming to 2 degrees C, action must be taken to reduce methane emissions by 2030. The Pledge notes that methane's short atmospheric lifetime means that by reducing emissions, we have an opportunity to quickly restrain global warming, giving the world a chance to tackle longer-acting greenhouse gasses.

To achieve this, signatories commit to improve their measurement, reporting and verification (MRV) processes and to mitigate all feasible emissions from the waste and energy sectors. The goal is for collective action to reduce global anthropogenic methane emissions by over 30% by 2030.

It is generally accepted that many of the actions necessary to honour the commitments of the Pledge must be done at state rather than federal level.

Chapter 2

Proposed New Actions

Using the language and contents of the Methane Pledge, Ember proposes three New Actions

Pillar 1: Inform and Plan

Proposed New Action I

Engage and collaborate with existing international methane emission reduction initiatives [such as Climate and Clean Air Coalition, the Global Methane Initiative, the International Methane Emissions Observatory and the Global Methane Hub], to jointly develop and implement world leading requirements for measurement, reporting and verification of methane emissions.

Proposed New Action II

Require and support Australia's regulated coal, oil and gas producing companies to implement the highest tier IPCC good practice measurement, reporting and verification (MRV) methodologies, whilst continuing to improve the accuracy, transparency, consistency, comparability, and completeness of MRV processes at their facilities.

Pillar 2: Mitigate

Proposed New Action III

Ensure methane emissions from leaks and venting at active, care and maintenance, closed and abandoned coal mines are minimised.

Pillar 1: Inform and Plan

Proposed New Action I: *Engage and collaborate with existing international methane emission reduction initiatives [such as Climate and Clean Air Coalition, the Global Methane Initiative, the International Methane Emissions Observatory and the Global Methane Hub], to jointly develop and implement world leading requirements for measurement, reporting and verification of methane emissions.*

The Methane Pledge calls for international cooperation on methane emissions, as Pledge signatories “Commit to support existing international methane emission reduction initiatives”.

A number of Australian companies are already cooperating with the UNEP’s International Methane Observatory [to develop state of the art methane measurement methodologies from coal mines](#). Expanding and furthering such collaborations will aid in improving the reporting of emissions, and facilitate mitigation of methane from specific CMM sources.

A particularly relevant initiative is a forming [partnership for the metallurgical coal sector](#), to measure and mitigate methane emissions. Once negotiated, the Framework will be similar to the Oil and Gas Methane Partnership 2.0 framework. Australian metallurgical coal mines should take a leadership role in developing and implementing these measures.

Equally importantly, by collaborating on such initiatives, Australia’s expertise on methane emissions can be “exported” to countries that don’t have the same level of technical and scientific knowledge.

The international initiatives explicitly listed in the pledge are:

- *International Methane Emissions Observatory (IMEO) under the UNEP*, see their [2022 Annual Report](#)) are “a data-driven, action-focused initiative by the UN Environment Programme (UNEP) with support from the European Commission to catalyse dramatic reduction of methane emissions, starting with the energy sector”. The IMEO are very active in working with measurement and abatement of coal mine methane
- *The Climate and Clean Air Coalition* ([link to their 2020 strategy](#)): “is a voluntary partnership of governments, intergovernmental organisations, businesses, scientific institutions and civil society organisations committed to improving air

quality and protecting the climate through actions to reduce short-lived climate pollutants". They focus on methane emissions from oil, gas, waste and agriculture.

- Global Methane Initiative (GMI): is a long established, international public-private partnership focused on reducing barriers to the recovery and use of methane as a valuable energy source, working with oil, gas, coal and waste sectors
- Not listed in the Pledge is the recently formed Global Methane Hub, which is an initiative set up with \$340 million of philanthropic funding, offering grants and technical support to implement the Global Methane Pledge.

We note that the proposed *New Action 1* has some overlap with *Continuing Actions 1 and 2*, but we suggest that the specifics of measurement, reporting and verification (MRV) of methane emissions must be taken out into a separate new action.

Deliverables/KPI:

- NSW's EPA to enter into discussions (formal or informal) with the four organisations above to investigate cooperation potential;
- That coal, oil and gas companies operating in NSW join relevant voluntary frameworks. [OGMP 2.0 for Oil and Gas Industries](#), and similar ones for the coal industry (when announced)

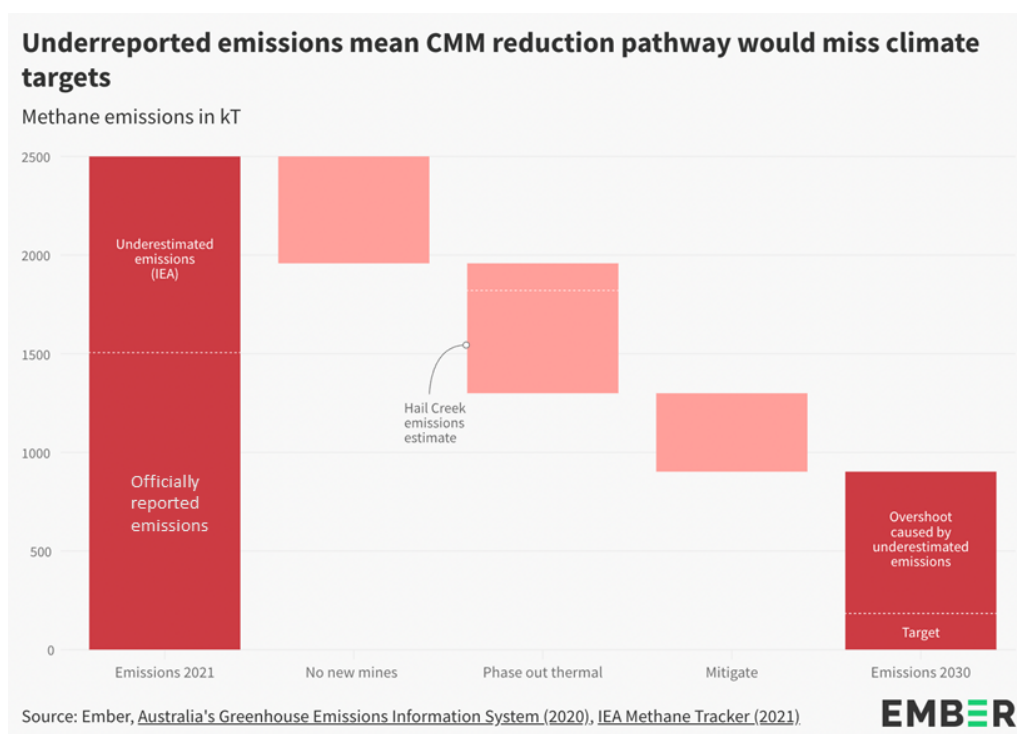
Proposed New action II

Require and support regulated coal, oil and gas producing companies to implement the highest tier IPCC good practice measurement, reporting and verification (MRV) methodologies, whilst continuing to improve the accuracy, transparency, consistency, comparability, and completeness of MRV processes at their facilities.

These are explicit commitments of the Methane Pledge and it would make sense that these are implemented at state level, with NSW's EPA leading on these.

Australia has an MRV process in place which is more advanced than a number of major methane emitting countries (Australia reports Tier 3 to IPCC). Despite this, there is evidence that current reporting substantially underestimates the methane emissions from coal mines, which dominate Australia's methane emissions from the energy sector. Satellites showed that [Hail Creek mine emits](#) ten times more methane than it officially reports and [our research highlights](#) the IEA's estimates that Australia's methane emissions are double than what is estimated.

In order for NSW to properly plan its climate strategy, it must get a precise understanding of what its methane emissions are. The graph below demonstrates how Australia's underestimated CMM emissions could challenge the integrity of climate targets.



For an overview of how CMM sources are currently estimated, gaps in understanding and suggestions for improvements, see the Supplementary Material of this document.

Deliverables/KPI:

- All active and closed mines in New South Wales should be required to report detailed source types using source-specific activity and emission factors, and reconcile these measurements with site-level measurements. (See Supplementary Material)

Pillar 2: Mitigate

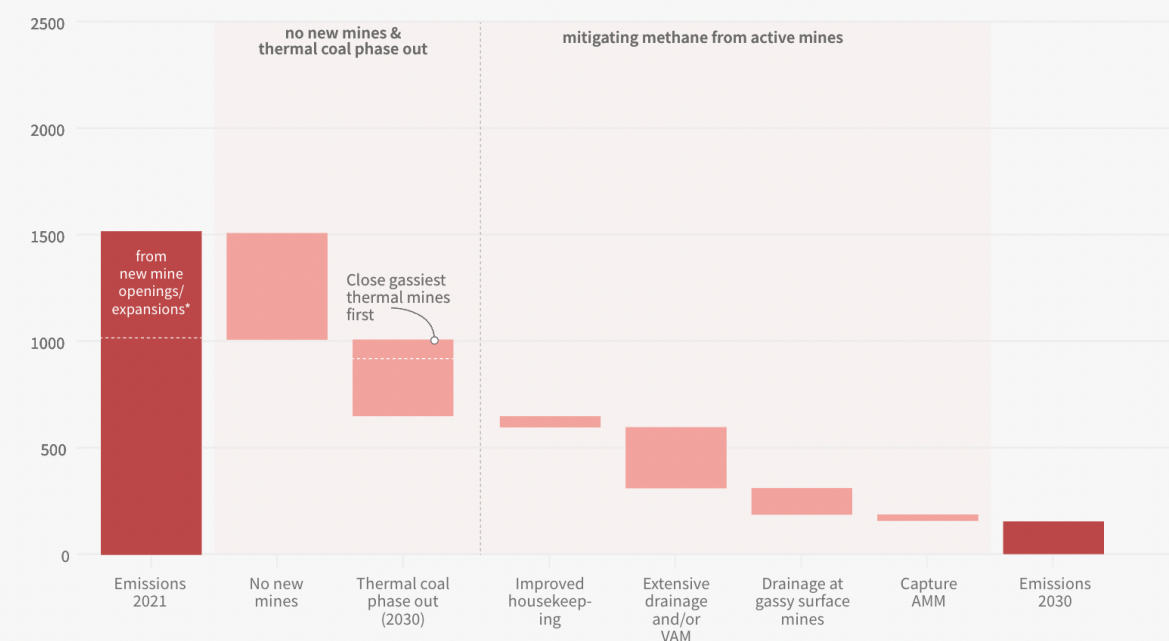
Proposed New action III

Ensure methane emissions from leaks and venting at active, care and maintenance, closed and abandoned coal mines are minimised.

Our [recent analysis](#) of Australia's methane emissions from the coal sector demonstrates how important coal mine methane is to addressing Australia's climate change ambitions and achieving climate commitments.

Coal mines could reduce 77% of the methane they emit. That's 18% of Australia's methane

Methane emissions in kT



Source: Ember, [Australia's Greenhouse Emissions Information System \(2020\)](#), [IEA Methane Tracker \(2021\)](#)

Coal mine methane emissions contribute towards NSW's domestic emissions regardless of whether the coal is exported or not and therefore, NSW's EPA Action Plan should address it.

Potential reductions in CMM come from a combination of capture and destruction of methane from operating and closed coal mines, closure of the gassiest thermal coal mines and crucially, not opening new coal mines. This applies particularly to thermal coal used for electricity generation as this can be replaced with renewable energy. The plot above demonstrates that it is not feasible to achieve the reduction targets necessary to keep global warming below 2C by only implementing mitigation technologies, without action on reducing coal production.

The New South Wales' coal industry is dominated by thermal coal production (~85% of coal mined is thermal coal), which is possible to replace with renewable power.

An example of mitigating emissions can be seen in the European Commission's [proposal on methane emissions reduction in the energy sector](#). The proposal bans flaring and venting from coal mine drainage stations (thermal and metallurgical) after 2025 and explicitly bans the venting of ventilation air methane from only thermal coal mines after 2027, with a commitment to determine metallurgical coal regulations at a later stage.

Deliverables/KPI:

- The EPA Action Plan should have a firm target for methane reduction ambitions from NSW's coal sector, we suggest this should be a 75% reduction by 2030;
- Mitigate methane emissions from all active mines using readily available technologies, including VAM destruction; Potential mechanism would be a sufficiently high charge for venting or leaking methane directly into the atmosphere.
- Commit to close "gassy" thermal coal mines (including exporters), unless they reduce their methane emissions to below 0.5kg per tonne of coal;
- Commit to no new coal mines or expansions, particularly thermal coal;
- Mitigate methane emissions from "care & maintenance", closed and abandoned mines. Emissions are highest immediately after operations cease, all operating mines should be required to have an abandoned mine methane (AMM) mitigation plan to be implemented immediately after closure.

For more information on CMM reduction potential in Australia, and links to further documentation on mitigation technologies currently available to coal mines, see our report "[Australia's coal mines can deliver two thirds of methane cuts](#)"

Supporting Materials

Measuring CMM

This is a brief summary of the approaches to measure CMM, that we are currently developing in collaboration with other players in the methane space. We welcome any further discussions on this topic.

Underground mines

The Australian Government considers measurements reliable as estimates come from monitors located in mine shafts, and use [NGER's method for estimation](#). Satellite data suggests that they may still be underestimated; Oaky North Underground Mine was found to be emitting [almost double that of officially reported emissions](#) in 2018 and 2019.

Problem: Estimation of methane emissions do not require continuous measurements (can be periodic) and current methane monitors are not precise enough to measure methane emissions (they are built to measure methane only for safety purposes). The present monitors will not be able to tell within reasonable uncertainty yearly emissions reductions/increases.

How should you measure? There should be continuous measurements on all drainage and ventilation systems. These should be sensitive enough to measure methane emissions to +/- 0.5 Kt/yr. See [Europe's Methane Regulation](#) for more details.

Open-cut mines

The Government is aware that methane emission estimates from surface mines need improvement. Satellite data showed surface mines can emit significantly more than previously estimated. Earlier this year Glencore's Hail Creek Open Cut mine in Queensland's Bowen Basin was found to emit [10 times its reported emissions for four years consecutively \(2018-2021\)](#). Since emerging, this satellite data catalysed a review by the Department, and consequent improvements to the inventory used to estimate methane emissions. The improved method, implemented in June 2021, resulted in a significant increase in estimated emissions from open cut mines in Queensland (increase of [44% for open cut mines](#)).

Problem: Estimating methane from open cut coal mines is done using default emissions factors. Although recently improved (as mentioned above) they do not capture the variability of each coal deposit. This method is likely to miss “super emitting” coal mines. Measuring methane at open-cut mines is considered difficult by the industry (although it is definitely not impossible). Unfortunately, there are no examples we are aware of in which an open cut mine has conducted continuous methane measurements.

How should you measure? Ideally, there should be continuous methane measurements at all open cut coal mines. Otherwise we suggest each coal mine uses its deposit specific emission factor. See the following method proposed by the [EU Methane Regulation](#):

“Mine operators shall establish those emission factors on a quarterly basis, in accordance with appropriate scientific standards and take into account methane emissions from surrounding strata.”

Abandoned mines

Closed Underground mines are required to estimate and report methane emissions annually, until 20 years after closure. Emissions are estimated using default emissions factors, and the mine's last working methane measurement.

Problem: [Research](#) has shown that if mines are not shuttered responsibly, they can continue emitting methane indefinitely. Gassy mines can still emit around 30% of their initial emissions 20 years after operations have ceased (see Figure A1 below). These emissions typically occur at well defined point sources, such as ventilation shafts or pressure-relief vents. In Australia, the cumulative methane emissions are only counted up to 20 years after a mine is closed, while research indicates that methane emissions could continue at a significant rate indefinitely.

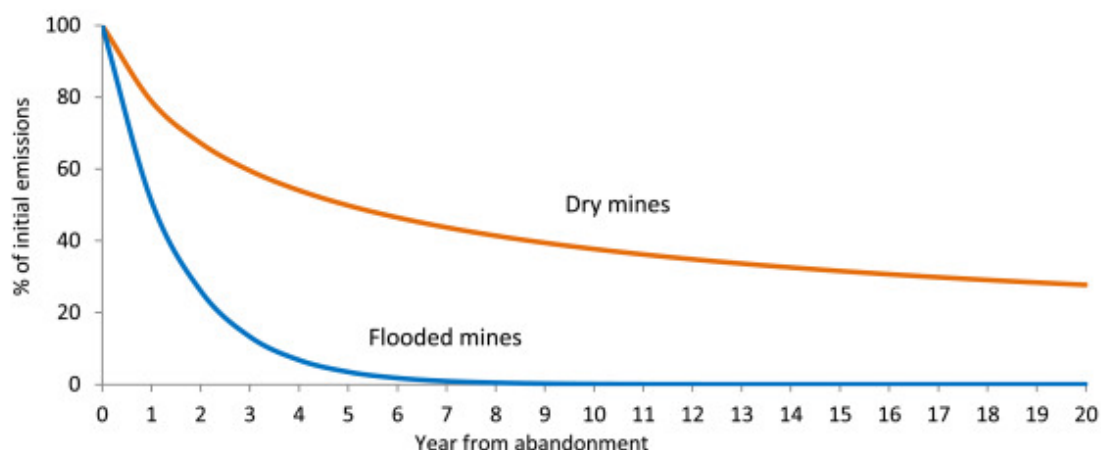


Figure A1: Assumed AMM emission reductions over time from dry and flooded mines.
[Kholod et al. \(2020\)](#)

Furthermore, a national inventory of all closed and “care & maintenance” mines does not yet exist with each state and territory having different regulations. Few mines are responsibly shuttered, with many remaining in “care and maintenance” for decades. The Australian Conservation Foundation found that of all the [644 mines in New South Wales, only one mine has ever been fully closed](#).

How should you measure?

A comprehensive national database of all inactive and abandoned mines is required. Methane measurements should be taken at all point sources.

© Ember, 2022

Published under a Creative Commons ShareAlike Attribution Licence (CC BY-SA 4.0). You are actively encouraged to share and adapt the report, but you must credit the authors and title, and you must share any material you create under the same licence.