Submission No 13

INQUIRY INTO EMISSIONS FROM THE FOSSIL FUEL SECTOR

Organisation: Minerals Council of Australia

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The Hon Jeremy Buckingham, MLC
Chair of the Joint Standing Committee on Net Zero Future
Parliament House
Macquarie Street
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Dear Chair

Inquiry into emissions from the fossil fuel sector

The Minerals Council of Australia (MCA) represents Australia's minerals exploration, mining and processing industry nationally. The MCA acknowledges the submission provided to this inquiry by the New South Wales Minerals Council and advises that it fully supports that submission. The MCA would like to make some key points in support of that submission focusing on fugitive emissions relating to coal mining.

The MCA notes that several of the inquiry's Terms of Reference have been, or are being, specifically addressed in reviews by federal government agencies (including the Clean Energy Regulator, Climate Change Authority and federal Department of Climate Change, Energy, the Environment and Water (DCCEEW)), and by the federal government's Expert Panel on Atmospheric Measurement of Fugitive Methane Emissions in Australia. These processes are best equipped to consider several of the technical issues covered in the Terms of Reference.

The Safeguard Mechanism and its incentivisation of emissions reduction

Several of the inquiry's Terms of Reference relate to emissions from the fossil fuel sector, its impact on NSW emissions reduction targets and the feasibility of emissions reduction efforts.

Most of the coal mining sector in NSW operates under the Safeguard Mechanism, which establishes a framework for Australia's largest emitters to measure, report and manage their emissions. In 2023 the Safeguard Mechanism was reformed to ensure that relevant facilities contribute fairly to Australia's greenhouse gas (GHG) emission reduction commitments. Currently, under the *Climate Change Act 2022* (Cth), Australia is legislated to reduce GHG emissions by 43 per cent below 2005 levels by 2030 and to achieve net zero by 2050. As a result, the Safeguard Mechanism incentivises facilities to monitor and evaluate both existing and emerging technologies continuously to determine their feasibility and potential for emissions reduction.

The MCA urges the Inquiry and the NSW Government to acknowledge the emissions reduction efforts made by the sector through the Safeguard Mechanism and to adopt a similar outcomes-based approach, allowing these efforts to contribute to NSW emissions reduction targets.

Quantification and measurement of coal-mine industry fugitive emissions

Since the establishment of the National Greenhouse and Energy Reporting (NGER) scheme in 2007, the coal industry has worked cooperatively with the federal government and its officials and agencies, with independent analytical laboratories and with third party auditors to improve the scheme.

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The industry has fully funded extensive research to support this activity through its research program ACARP, which we understand is rare for NGER reporting sectors. This has involved research into methods and industry guidelines for the measurement, estimation and reporting of fugitive emissions from open cut and underground coal mines, with particular reference to sampling and reporting approaches that comply with the guiding principles set out in the NGER Measurement Determination.

In addition, since 1998, ACARP has invested in independent, scientific research on minesite GHG abatement technologies.

ACARP adopts a technology-neutral, science-based approach to assess the application of technology. This is informed by its objectives to deliver significant safety, environmental and economic improvements to the coal industry.

Seaborne coal exporting country approaches to coal mine fugitive emissions measurement and reporting

Table 1 in **Attachment A** provides information on coal mine fugitive emissions' reporting requirements of all major seaborne exporters (Australia, Canada, Colombia, Indonesia, Russia, South Africa and the USA). It covers each country's approach to gases covered and requirements for reporting mining, post-mining and decommissioned or closed mine emissions.

Australia's existing hierarchy of measurement methods, from Method 1 to Method 4, depicts increasing accuracy and reducing uncertainty, with higher order methods requiring more rigorous and comprehensive measurement and sampling than lower order ones.

It is evident that none of the other six major seaborne exporters has the equivalent level of accuracy and coverage in reporting of coal mine fugitive emissions as Australia.

Australia is unique in also having two comprehensive fugitive emissions reporting guidelines developed by ACARP with input from government officials, auditors and laboratories. One of these guidelines has been imported into the NGER Measurement Determination as a standard for open cut Method 2 or 3 fugitive emissions reporting. Both guidelines are cited in the Clean Energy Regulator's 'Estimating emissions and energy from coal mining guideline' (August 2025).

Adequacy of the NGER reporting requirements

The existing coal fugitive emissions measurement methods are workable, auditable and cost effective, using mature technology and established techniques that are proven for the application of inventory measurement. They are:

- Workable in that they align with and integrate existing regulatory and industry practices where practicable. Key examples include:
  - *Underground mining* – Method 4: The ability to apply gas monitoring equipment and procedures established under state coal mine safety legislation in measuring emissions from ventilation air; and
  - *Open cut mining* – Methods 2/3: The use of a mine's existing Joint Ore Reserves Committee (JORC) Code-compliant (or equivalent) geological model as the source of coal seam data and information on geological structures affecting in-situ gas contents.
- Auditable in that the methods employ activity and emissions measures and data sources that are independently verifiable to a 'limited' or 'reasonable' standard of assurance. These include:
  - *Underground mining*: Gas concentration and flow readings from ventilation monitoring equipment and gas drainage systems used for direct measurements and, where a Method 1 emission factor is employed, tonnes of run-of-mine (ROM) coal produced.
  - *Open cut mining*: ROM coal (Method 1) and, for Methods 2/3, gas contents that can be sampled and reconciled with the mine's gas distribution model, and quantities of

excavated carbonaceous strata that can be checked against the mine's annual coal-mined geological survey and reconciliation process.

- Cost effective in providing flexibility of measurement effort against accuracy for most coal mine fugitive emissions sources. The existing method options strike a reasonable balance between the costs of implementation and measurement completeness, uncertainty and accuracy.

Notwithstanding the adequacy of the current statutory reporting framework it is important to ensure the approaches remain fit for purpose. The MCA has supported:

- Phasing out a Method 1 approach for reporters who, since 2011, have been required to use a Method 4 approach for fugitive emissions from underground mines
- Phasing out a Method 1 approach for the extraction of coal from open-cut mines covered by the Safeguard Mechanism. All such facilities in NSW already report using Method 2
- Review of the current Method 2 approach for reporting fugitive emissions from the extraction of coal from open-cut mines to ensure it remains fit for purpose and is based on the best available science, technologies and practices. This review is being undertaken by DCCEEW and ACARP is funding further research to assist the review.

The MCA recognises it is important to remain open to potential improvements or enhancements to NGER from the use of new technologies and practices, including the development of atmospheric measurement techniques such as satellite-based remote sensing techniques.

Consistent with the Climate Change Authority, the coal industry is cautious about the use of satellite- or aircraft-based surveys in this way to infer emissions annual inventory from individual coal mines and groups of mines and of the simplistic extrapolation of the conclusions of such studies and claims to the Australian coal industry generally.

The fitness-for-purpose of satellite or other 'top-down' measurement techniques must be assessed and proven for application before such techniques have a role in Australia's coal mine fugitive emissions reporting framework – for example, as part of a multi-tiered monitoring approach involving aerial and ground-based sensing as a means for validating 'bottom-up' emission estimates at a regional or national scale.

At the current level of technology development, the industry considers it is too early to be definitive about the potential suitability of atmospheric measurement technologies specifically for estimating NGER scheme facility GHG inventories but supports continued science-based assessment of its use.

The MCA understands there is growing and ongoing community interest in this area. It is therefore important that government decisions on the use of atmospheric measurement technologies are based on sound science.

The federal government's Expert Panel on Atmospheric Measurement of Fugitive Methane Emissions in Australia is undertaking work to understand whether and how atmospheric methane monitoring, including satellite-based sensing, might support and/or complement existing fugitive emissions measurement practices. The MCA is actively supporting this initiative.

If you have any queries with regard to this submission please contact Peter Morris, Principal Adviser on 6233 0600 or at peter.morris@minerals.org.au.

Yours sincerely

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ATTACHMENT A

AUSTRALIAN AND OTHER SEABORNE COAL EXPORTING COUNTRY APPROACHES TO COAL MINE FUGITIVE EMISSIONS MEASUREMENT AND REPORTING

Parties to the United Nations Framework Convention on Climate Change (UNFCCC) are subject to a carbon accounting process. Under this framework they are obliged to monitor, collate and report annual inventories of greenhouse gas (GHG) emissions from all major anthropogenic sources.

National inventories play an essential role in determining the scale of emissions, planning mitigation policies and implementing effective actions. Monitoring, reporting and verification (MRV) programs at the local level help governments better understand the local coal mining industry's contribution to GHG emissions of a country and help identify promising mitigation opportunities.[1]

The Intergovernmental Panel on Climate Change's Guidelines for National Greenhouse Gas Inventories[2] explain the sources of fugitive emissions from coal mining. Most major coal mining countries include methane (CH_4) emissions from working coal mines in their inventories although often closed/decommissioned mines are not covered.

Over 70 countries mine coal but only a small number export it by sea. A summary of the approach to mandated fugitive emissions reporting by Australia and the other major seaborne coal exporting nations that compete with Australia is provided in **Table 1**.

The IPCC's guidelines explain the use of appropriate 'tiers' to develop emissions estimates for coal mining in accordance with good practice. The three tiers involve moving from estimates to direct measurement approaches. Tier 1 requires that countries choose from a global average range of emission factors and use country-specific activity data (typically run-of-mine production) to calculate total emissions. Tier 2 uses country- or basin-specific emission factors that represent the average values for the coals being mined. Tier 3 uses direct measurements on a mine-specific basis and, properly applied, has the lowest level of uncertainty. Tiers 1 and 2 represent NGER Method 1 approaches. The other NGER methods (2, 3 and 4) are Tier 3 approaches.

As shown in Table 1, none of the other major seaborne exporters has the equivalent level of accuracy and coverage adopted by Australia in mandated coal mine fugitive emissions reporting under the *National Greenhouse and Energy Reporting Act 2007* (Cth).

To assist industry meet its statutory reporting requirements governments typically publish guidelines. In Australia this is done by the Clean Energy Regulator. Australia is unique in also having comprehensive underground and open cut guidelines developed by the coal industry's research program (ACARP) with input from government officials, auditors and analytical laboratories. These industry guidelines are cited in the official guidelines and the open cut guidelines have been imported into the NGER Measurement Determination as a standard for open cut Methods 2/3 fugitive emissions measurement.

[1] UN Economic Commission for Europe (2021), *Best Practice Guidance for Effective Management of Coal Mine Methane at National Level: Monitoring, Reporting, Verification and Mitigation*, ECE Energy Series No. 71, p. iii.

[2] Intergovernmental Panel on Climate Change (2019), *Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2: Energy*, Chapter 4, Fugitive Emissions.

TABLE 1: MANDATORY COAL MINE FUGITIVE EMISSIONS REPORTING BY MAJOR COAL PRODUCING COUNTRIES THAT EXPORT COAL BY SEA

	UNDERGROUND MINE METHODS			SURFACE MINE METHODS			POST-MINING	DECOMMISSIONED MINES	ADDITIONAL METHODS
COUNTRY	1	2/3	4	1	2/3	4			
Australia Method 1 approaches are all Tier 2.	NA	NA	CH_4 & CO_2	CH_4 (Being phased out)[a]	CH_4 & CO_2	NA	UG: Method 1 for CH_4 OC: As per surface mine methods	Method 1 for CH_4 Method 4 for CH_4 & CO_2	*Flaring:* • UG: 1 & 2 for CH_4 & N_2O & 1-3 for CO_2 • OC: 1 for CH_4 & N_2O and 1-3 for CO_2 *Venting for UG & OC:* • Method 4 for CH_4 & CO_2
Canada	CH_4 (Tier 2)	NA	NA	CH_4 (Tier 2)	NA	NA	Method 1 for CH_4 (Tier 2/3)	Method 1 for CH_4 (Tier 2/3)	NA
Colombia Not mandated	NA	NA	NA	NA [CH_4 and CO_2 (Tier 1) govt estimate]	NA	NA	NA [OC: as per surface mine methods (Tier 1) estimated by govt]	NA	Currently there is no mandated reporting by mines to government but the government is working to require this in the near future.
Indonesia	CH_4 (Tier 1/2)	NA	NA	CH_4 (Tier 1/2)	NA	NA	Method 1 for CH_4 (Tier 1/2)	NA	*Flaring:* • UG: 1 CH_4 & CO_2
Russia	CH_4 (Tier 2)	NA	NA	CH_4 (Tier 2)	NA	NA	Unclear	Unclear	*Note:* The UNFCCC 2024 review team was unable to verify Russia's Tier 2 reporting approach.
South Africa Method 1 approaches are all Tier 2	CH_4 and CO_2	NA	NA	Emissions default to zero as the country EF = 0	NA	NA	Method 1 for UG for CH_4 and CO_2 Emissions default to zero for OC as country EF = 0	NA [Planned but not yet available]	NA CO_2, CH_4 and N_2O from spontaneous combustion of coal seams planned but not yet in inventory
USA	NA	NA	CH_4 [Mandated for large emitters but self-certifying plus govt estimates]	NA [Method 1 estimate by US EPA (Tier 2 approach)]	NA	NA	NA [Method 1 estimate by US EPA (Tier 2 approach for CH_4 and CO_2)]	NA	*Flaring*: Method 1 for CH_4: Operating UG mines liberating CH_4 at volumes less than the reporting threshold plus surface and decommissioned UG mines do not report. The US EPA estimates emissions from surface mines and post-mining activities based on a Method 1 (Tier 2) approach.

Sources: National Inventory Reports and supporting documents provided under the United Nations Framework Convention on Climate Change and UNFCCC Expert Review Team report on Russia, 2024.

Notes: (a) The Australian federal government phase out commenced on 1 July 2025 initially with Safeguard facilities that produced more than 10 Mt of coal in 2022-23 and then expanding to all Safeguard facilities from 1 July 2026. Additional phasing out is yet to be announced. All NSW open cut mines covered by the Safeguard Mechanism (>95% of coal sector emissions) already use Method 2.

EF = Emission Factor, which may be based on IPCC data (Tier 1) or country specific (Tier 2); NA = Not available; OC = Available methods for estimating emissions from open cut mining; UG = Available methods for estimating emissions from underground mining.