



**PRESIDENTIAL
CLIMATE COMMISSION**
TOWARDS A JUST TRANSITION

STAKEHOLDER REPORT

The Role of Methane Abatement in South Africa's Climate Compatible Development Pathway: Coal Mine Methane

Wednesday, 25 February 2026
11h00-13h00 SAST



1. EXECUTIVE SUMMARY

The Presidential Climate Commission (PCC) convened a second stakeholder dialogue focusing on coal mine methane as part of its ongoing work on methane abatement in South Africa's climate compatible development pathway. This engagement builds directly on the [initial](#) methane dialogue, which highlighted the need for deeper, sector-specific discussions, particularly in relation to fugitive emissions from coal mining. Coal mine methane presents a complex and often under-examined component of South Africa's emissions profile. While contributing a relatively small share of total national greenhouse gas emissions (approximately 2%), it is closely linked to the country's coal-dependent energy system and therefore remains strategically important.

The dialogue highlighted three central themes. First, significant challenges remain in accurately measuring and accounting for coal mine methane emissions due to their diffuse, fugitive nature and limitations in existing methodologies. Second, while international experience demonstrates viable mitigation technologies, South Africa's unique geological conditions, particularly low methane concentrations, limit the applicability and economic feasibility of these interventions. Third, there is a clear need for improved data systems, stronger policy alignment, and targeted financial mechanisms to unlock realistic mitigation opportunities.

The discussion reaffirmed that coal mine methane is not a "silver bullet" for climate mitigation or the just transition but remains an important component of a broader, integrated response. The insights captured in this report reflect stakeholder perspectives and do not constitute PCC policy positions.

2. INTRODUCTION

Methane remains a critical greenhouse gas in global climate mitigation efforts due to its high warming potential over a short time horizon. While South Africa's methane emissions are dominated by agriculture and waste, fugitive emissions from coal mining form an important, though less understood, component of the national inventory. Coal mine methane is released during coal extraction, handling, and post-mining processes, and is classified as a fugitive emission within the national greenhouse gas inventory. These emissions are inherently difficult to quantify, as they are often dilute, intermittent, and spatially dispersed.

South Africa's continued reliance on coal for energy production further elevates the importance of understanding these emissions within the context of a just energy transition. Improving measurement, reporting, and mitigation of coal mine methane can support climate ambition while balancing economic resilience, energy security, and community livelihoods. This engagement aimed to unpack current monitoring practices, identify practical mitigation opportunities, and explore the policy, financial, and technical conditions required to advance action in this space.

3. CONTEXT: WHY COAL METHANE ABATEMENT MATTERS FOR SOUTH AFRICA

Coal mining remains central to South Africa's energy system and regional economies. As such, fugitive emissions from coal mining represent a relevant component of the national emissions profile, even if relatively small in proportion. The national greenhouse gas inventory currently

includes emissions from underground and surface mining, as well as post-mining activities, using Tier 2 country-specific emission factors. However, key gaps remain, particularly in relation to abandoned mines and spontaneous combustion, due to insufficient data.

The broader national context reflects several intersecting challenges:

- Persistent data and measurement gaps in coal mining emissions
- Fragmented policy and institutional coordination
- Limited technical capacity and monitoring infrastructure
- Underdeveloped project pipelines and financing mechanisms

These constraints highlight the need for a coordinated and evidence-based approach to coal mine methane within South Africa's climate and development framework.

4. KEY POINTS FROM THE WEBINAR

4.1 Overview of Coal Mine Methane Emissions

The Department of Forestry, Fisheries and the Environment (DFFE) outlined the current status of methane monitoring and accounting within the national greenhouse gas inventory. Coal mine methane emissions are estimated at approximately 1.2 MtCO₂e annually, representing around 2% of national methane emissions. The inventory relies on Tier 2 methodologies using country-specific emission factors, which better reflect South African conditions compared to international defaults. However, uncertainties remain due to the fugitive nature of emissions and limitations in activity data. A key emerging issue is the divergence between satellite observations and ground-based inventory data, highlighting the need for improved integration of measurement approaches.

4.2 Data, Measurement, and Policy Landscape

Research presented by the University of Cape Town highlighted significant gaps in publicly available data and the absence of a coherent national strategy for coal mine methane. While emissions data is reported through regulatory systems, company-level data is not publicly accessible, limiting the ability to triangulate and validate estimates.

Key challenges identified include:

- Limited granularity and accessibility of emissions data
- Lack of alignment across policy frameworks
- Absence of a lead coordinating authority
- Incomplete coverage of emission sources, particularly abandoned mines

These constraints undermine the development of targeted mitigation strategies and highlight the need for improved governance and data transparency.

4.3 Mitigation Opportunities and Constraints

International experience suggests that up to 90% of coal mine methane emissions could be abated under suitable conditions, using technologies such as pre-drainage, flaring, and energy recovery. However, South Africa's context presents unique challenges. Methane concentrations in local coal

seams are significantly lower than in countries such as Australia, limiting the feasibility of these technologies. Industry experience demonstrates that:

- Methane concentrations are often too low for economically viable capture or utilisation.
- Continuous monitoring systems are still under development and face reliability challenges.
- Previous mitigation projects (e.g. flaring) have proven uneconomic over time.

As a result, mitigation opportunities may be limited to a small number of high-emitting sites, and further research is required to assess feasibility.

4.4 Financing and International Perspectives

Global experience highlights the importance of integrated policy frameworks, financial incentives, and regulatory mechanisms in enabling methane mitigation. Examples from countries such as China and Australia demonstrate the role of:

- Carbon markets and crediting mechanisms
- Regulatory standards and emissions thresholds
- Robust measurement, reporting, and verification (MRV) systems

In South Africa, the absence of dedicated funding instruments and project pipelines remains a key barrier. Addressing these constraints will require coordinated public and private sector engagement, alongside international collaboration.

5. STAKEHOLDER REFLECTIONS

Stakeholder reflections converged around a shared recognition that coal mine methane remains a technically complex and underdeveloped area within South Africa's climate response. Participants emphasised that current emissions estimates are subject to significant uncertainty, driven by diffuse emission sources, limited monitoring infrastructure, and gaps in publicly accessible data. There was strong support for improving measurement systems through enhanced mine-level data collection, integration of satellite and ground-based observations, and greater transparency in reporting frameworks. At the same time, stakeholders acknowledged that South Africa's geological conditions fundamentally constrain the applicability of international mitigation solutions. Low methane concentrations limit the economic viability of technologies such as flaring and energy recovery, reinforcing the need for locally appropriate approaches grounded in empirical data and practical experience.

The discussion also highlighted systemic barriers, including fragmented policy frameworks, limited technical capacity, and the absence of dedicated financial instruments to support early-stage projects. Stakeholders stressed that without targeted support, coal mine methane mitigation is unlikely to scale in a meaningful way. Equity considerations featured prominently in the dialogue. Participants raised concerns about the impacts of mining-related emissions on surrounding communities and the need for more inclusive approaches to data sharing and decision-making. There was a strong call for ensuring that future interventions are aligned with just transition principles, particularly in coal-dependent regions facing economic restructuring. This intervention was further strengthened with a recommendation for a coordinating committee, proposed steered by the PCC, to guide a strategic approach to methane abatement with key stakeholders, particularly government.

Overall, stakeholders emphasised the importance of situating coal mine methane within a broader, integrated approach to methane abatement and the just transition, rather than treating it as a standalone solution.

6. CONCLUSION

This second PCC dialogue on methane has deepened the understanding of coal mine methane within South Africa's climate and development context. The engagement highlighted both the technical complexities and the strategic importance of this emissions source, while underscoring the limitations of current data and mitigation approaches. Participants demonstrated strong alignment on the need to prioritise improved measurement, strengthen policy coordination, and develop realistic, context-specific mitigation pathways. The discussion also reinforced that coal mine methane is one component of a broader methane and just transition agenda, requiring integrated and multi-sectoral responses.

7. WAY FORWARD

The dialogue underscored that advancing coal mine methane mitigation will require a phased and evidence-based approach. There was a strong call for the formation of a steering committee, with the Presidential Climate Commission functioning as the coordinating body. The aim of this committee would be to focus key emerging priorities with the aim to strategically coordinate data improvement, policy alignment, and the development of context-appropriate mitigation projects to enable a credible and scalable coal mine methane abatement pathway.

8. CONTACTS

For more information on this topic please contact the Presidential Climate Commission Secretariate by email to mitigation@climatecommission.org.za.