SUBMISSION TO THE DEPARTMENT OF CLIMATE CHANGE, ENERGY, THE ENVIRONMENT AND WATER (DCCEEW)

2026-27 Safeguard Mechanism Review Consultation Paper

LETA

Low Emission Technology Australia

September 2026

Key points

- Low Emission Technology Australia (LETA) is a fund established in 2006 by the Australian black coal industry to invest in technologies that significantly reduce emissions and support the transition to a low emission global economy, in line with the Paris Agreement.
- LETA has invested more than $400 million in member funds, helping unlock a further $800 million in co-investment and directing more than $1.2 billion towards low emission technologies.
- LETA's submission focuses on the Safeguard Mechanism and onsite abatement, particularly how the reformed Mechanism is driving practical emissions reductions at covered facilities.
- The reformed Safeguard Mechanism is already strengthening incentives for facilities to reduce emissions. LETA supports the Review's recognition that onsite abatement cannot be assessed reliably through aggregate gross emissions or emissions-intensity data alone. Changes in reported emissions may reflect production levels, resource characteristics, operating conditions, outages, closures, decommissioning and other factors unrelated to deliberate abatement.
- This is particularly important for coal mining fugitive emissions, which can vary materially because of geology, seam gas content, mine depth and sequencing, ventilation requirements, drainage performance, production disruptions and safety obligations.
- The Review should recognise the full abatement investment pathway, including feasibility studies, engineering design, pilot and demonstration projects, safety validation, regulatory approvals, construction and commissioning. These activities are important leading indicators even where reported emissions have not yet fallen.
- LETA has allocated nearly $60 million to ventilation air methane (VAM) abatement projects, with this investment expected to approach $100 million by 2030. Its portfolio includes regenerative thermal oxidation, catalytic oxidation and open-cut methane abatement projects.
- VAM abatement illustrates the barriers facing onsite projects. Deployment is site-specific, capital-intensive and safety-critical, requiring stable operating conditions, detailed engineering, technology demonstration, mine safety approval and careful integration with ventilation and emergency systems.
- The Safeguard Mechanism should continue encouraging onsite abatement while preserving unrestricted access to Australian Carbon Credit Units (ACCUs) and Safeguard Mechanism Credits (SMCs). Credit use is not evidence that a facility is failing to pursue onsite abatement, particularly where longer-term projects are under development.
- LETA does not support limits or discounts on ACCU or SMC use, mandatory onsite abatement quotas, or sector-specific surrender restrictions. These would increase compliance costs and regulatory uncertainty without evidence they would increase total emissions reductions.
- Policy should instead focus on overcoming deployment barriers through targeted co-funding, coordinated approvals, technology-neutral performance standards, clear methodological guidance, stronger Commonwealth-state regulatory coordination, support for local capability and continued investment in emerging technologies.
- LETA recommends retaining the Safeguard Mechanism as the central, flexible and market-based national framework, with declining baselines supported by compliance flexibility and practical measures that help facilities convert incentives into safe, commercially viable emissions reductions.

Low Emission Technology Australia

Introduction

LETA is an investment fund established in 2006 by the Australian black coal industry to invest in technologies that can significantly reduce emissions and support the transition to a low emission global economy, in line with the Paris Agreement.

LETA partners with government, research institutions, universities and industry locally and internationally to develop projects that can, over time, reduce and remove greenhouse gas emissions from large-scale industrial processes such as power generation, steel and cement manufacturing, mining, and energy sources such as cleaner (low-carbon) hydrogen. Further information about LETA can be found on our website, at www.letaustralia.com.au.

LETA welcomes the opportunity to provide a submission to the Department on its *Safeguard Mechanism Review* consultation paper (the Consultation Paper). LETA's submission focuses on Section 2 and Section 3 (particularly Subsections 3.1 and 3.4) of the Consultation Paper.

In addition, LETA was involved in the preparation of and supports the submissions made by the Minerals Council of Australia and the Australian Industry Greenhouse Network. LETA also refers the Department to LETA's submissions to the Authority's parallel consultations on methane[1] and its *2026 Annual Progress Report*[2].

Those submissions provide detailed evidence on methane abatement technologies, barriers to deployment, and LETA's investment portfolio in onsite abatement through ventilation air methane (VAM) abatement, regenerative thermal oxidisers (RTOs), catalytic oxidation technologies and related safety and engineering work. They also highlight LETA's views on various aspects of the Safeguard Mechanism, particularly the importance of a deep and liquid Australian Carbon Credit Unit (ACCU) and Safeguard Mechanism Credit (SMC) market.

The reformed Safeguard Mechanism has strengthened the existing commercial and compliance incentives for covered facilities to identify, assess and implement emissions reduction opportunities. However, onsite abatement opportunities, particularly those related to coal mining and fugitive methane emissions, are technically complex, capital-intensive, site-specific and subject to appropriately rigorous safety requirements.

For this reason, and as will be discussed further below, LETA encourages the Review to recognise the full onsite abatement investment pathway, from feasibility assessment and engineering design through to demonstration, safety validation, regulatory approval, construction, commissioning and operation.

The LETA recommendations that follow are based on technology readiness, project development experience, mine safety obligations, operational variability, capital investment cycles, carbon-market function and the need for long-term regulatory certainty.

[1] LETA's submission was provided to the Authority on 7 August 2026. It is also available on the LETA website at letaustralia.com.au/api/media/file/LETA-Submission-CLIMATE-CHANGE-AUTHORITY-METHANE-REVIEW.pdf and LETA's media release launching the submission is available at letaustralia.com.au/media-releases/coal-producers-call-on-government-to-co-fund-methane-abatement-as-industry-investment-heads-toward-100m.

[2] LETA's submission was provided to the Authority on 16 August 2026. It is also available on the LETA website at letaustralia.com.au/api/media/file/leta_submission_climate_change_authority_consultation_paper_2026_annual_progress_advice_july_2026_dmd_160826pdf.

LETA's investment in abatement technology

LETA's investment approach is focused on accelerating proven concepts toward commercial deployment.

Rather than supporting technology development in isolation, LETA invests across the technology readiness pathway to help move promising solutions from validation, prototyping and demonstration through to first-of-a-kind deployment and towards broader commercial application.

This approach reflects LETA's core role in reducing technical, commercial and deployment risks for technologies that can materially lower emissions in mining and hard-to-abate sectors – generally in sectors that are covered by the Safeguard Mechanism.

Since its establishment, LETA has invested more than $400 million of member funds and helped unlock a further $800 million in co-investment, resulting in more than $1.2 billion directed toward technologies that reduce emissions, improve industrial competitiveness and position Australia as a global leader and partner in decarbonisation.

The portfolio is designed around a "carbon stewardship" model, meaning emissions reduction is pursued across the lifecycle of these industries, from resource extraction and industrial production through to CO_2 capture, transport, utilisation and storage. This approach is set out in Figure 1.

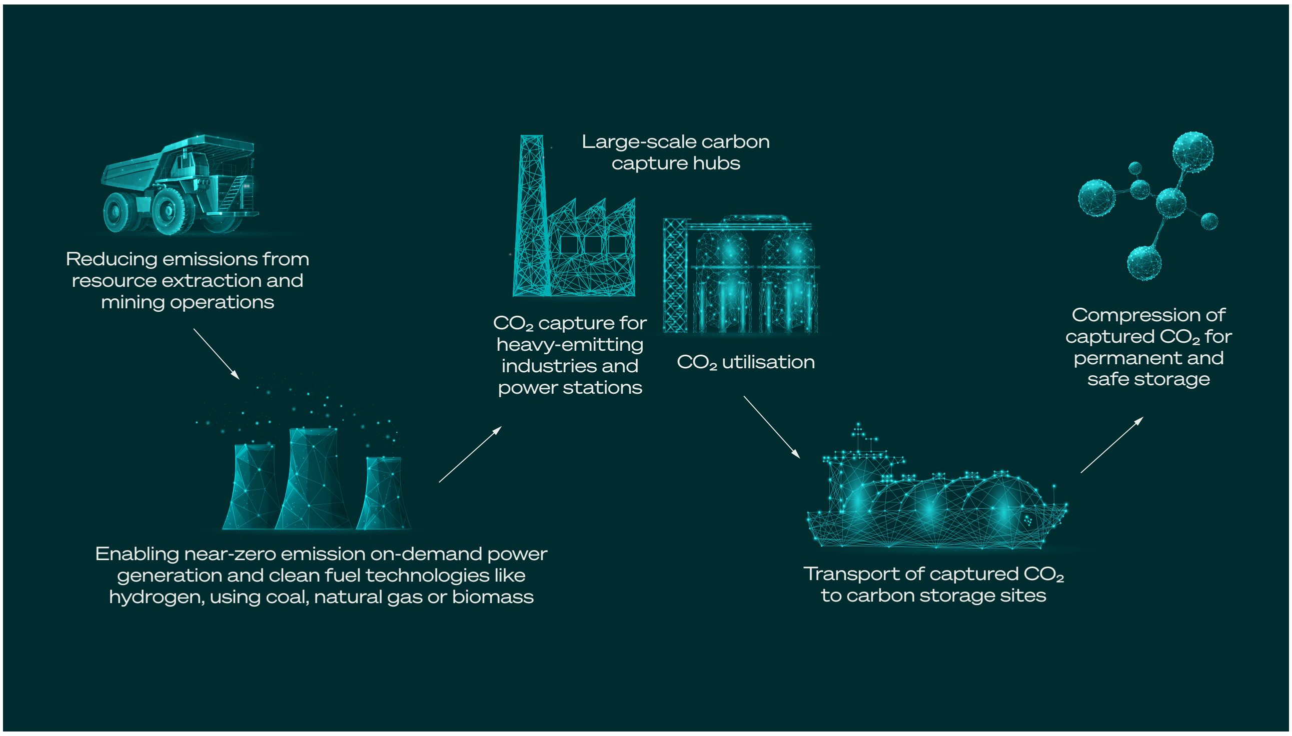

Figure 1: LETA's carbon stewardship investment approach

LETA's investment strategy is guided by several core principles.

- LETA prioritises technologies that can reduce emissions from sectors where abatement is technically complex, capital intensive and in many cases difficult to achieve. This includes coal mining, resource extraction, power generation, steel, cement, fertiliser and other heavy industrial processes.
- LETA invests in technologies that can reduce the cost of emissions reduction. Directly relevant to the Safeguard Mechanism and this Review, LETA's focus areas include fugitive methane abatement, carbon capture, carbon transport, carbon storage, carbon utilisation, near-zero emission power generation and clean fuel technologies such as hydrogen and ammonia produced using coal or biomass with emissions capture.
- LETA seeks to leverage collaboration. Its portfolio includes partnerships with Australian and international industry participants, technology providers, governments, research institutions and customers in key export markets. This collaboration is intended to accelerate technology learning, increase co-investment and build deployment pathways across Australia and the Asia-Pacific.
- LETA's approach is outcome-focused. Projects are selected and supported based on their potential to reduce emissions, improve the commercial viability of low emission technologies, support Australian industrial competitiveness and create pathways for large-scale deployment.

LETA's current and forward portfolio is organised around several technology themes[3].

- A major area of LETA investment is reducing direct (Scope 1) emissions from mining operations, particularly fugitive methane emissions from coal mining. The portfolio includes technologies such as RTOs, catalytic VAM abatement and open-cut pre-drainage approaches. As highlighted in LETA's Climate Change Authority methane submission and considered further below, LETA has a long history of investing in methane abatement research, development and demonstration.
  - To date, LETA has allocated nearly $60 million to VAM-related projects, with investment expected to approach $100 million by 2030. Current projects include the Anglo American VAM Demonstration and the Mining3 Catalytic VAM program. These projects are intended to demonstrate abatement pathways for mines with different methane concentrations and operating conditions, including technologies suitable for lower-concentration ventilation air methane streams.
  - An overview of LETA's methane abatement investment portfolio can be found at Attachment 1. An overview of other industry led methane abatement projects can be found at Attachment 2.
- LETA's portfolio includes multiple carbon capture technologies designed to reduce emissions from power generation and industrial production. These investments seek to lower the cost, footprint and energy intensity of capture technologies while improving their suitability for commercial deployment across sectors such as steel, cement and power generation.
  - Current projects include the KC8 PACER project, which is deploying Australian capture technology at Cement Australia's Gladstone cement kiln and the Kawasaki Heavy Industries Carbon Capture project, which uses solid sorbents to reduce operating costs and improve capture efficiency for power stations. LETA is also supporting GTI Energy's RotaCap technology for steel and cement applications and a POSCO steel capture project in Korea to demonstrate carbon capture performance in steelmaking.
- LETA supports technologies that can enable near-zero emission, flexible power generation and clean fuel production using coal, gas or biomass with integrated emissions capture.
  - This includes support for the 8 Rivers Allam-Fetvedt Cycle pre-FEED project, a zero emission power generation technology with potential applications across coal, biomass and natural gas. LETA's forward focus also includes the utilisation of Australian coal in North Asian hydrogen and ammonia production, including partnerships with Japanese power utilities and studies examining the role of Australian coal in clean hydrogen and ammonia value chains.
- LETA's investment approach recognises that carbon capture cannot be deployed at scale unless it is supported by reliable transport, storage and utilisation pathways. The portfolio therefore includes projects to improve CO_2 storage efficiency, identify new storage basins, develop transport solutions and support commercial utilisation of captured CO_2.
  - Current projects include the NSW Storage project with the NSW Government, the CO2CRC Otway Stage 4P project to improve the efficiency and cost-effectiveness of CO_2 injection, and the SGC Coal2Carbon project in Korea, which seeks to convert CO_2 from a coal-fired power station into high-value materials used in batteries, electric vehicles and semiconductor manufacturing.
- LETA's portfolio includes strategic studies that help identify future investment opportunities, policy requirements and deployment pathways.
  - These include the J-Power gasification trials, the Carbon Reduction Fund Institute in Japan, the Asian CCUS Hub Study[4] and the studies highlighted above examining the role of Australian coal in clean hydrogen and ammonia value chains across the Asia-Pacific. These projects are designed to inform future commercial opportunities, assess market risks and support Australia's role as a long-term supplier of resources, energy and low-emission technology solutions to the region.

LETA's investment approach provides a practical mechanism for industry-led onsite abatement. By combining member funding, co-investment, technology partnerships and targeted support for demonstration and deployment, LETA helps bridge the gap between promising low-emission technologies and commercial-scale application.

The investment portfolio is aligned with Australia's long-term emissions reduction objectives while supporting industrial competitiveness, regional economic activity and Australia's role as a trusted energy and resources partner in the Asia-Pacific. These issues are considered further below.

[3] An overview of some of LETA's low emission technology investments can be found at letaustralia.com.au/our-work#projects.

[4] See letaustralia.com.au/media-releases/ccus-hub-study-identifies-five-asia-pacific-hub-sites-and-welcomes-new-consortium-partners for more information.

Onsite abatement

(PAGE 11-12)

With this background in mind, this section responds to the two Review questions posed on page 12 of the Consultation Paper:

> Are Safeguard policy settings and Government support mechanisms suitable for developing and deploying emissions reduction technologies for the industrial sectors? Are there any remaining barriers to undertaking on-site abatement, including sector specific barriers?
>
> Are there any important areas that are not covered by government policy or programs?

The Safeguard Mechanism already provides a material incentive for covered facilities to assess, plan and implement onsite abatement. Under the reformed Mechanism, facility baselines decline over time, creating increasing pressure on covered facilities to reduce emissions and manage compliance obligations through a combination of onsite abatement, SMCs, ACCUs and other flexibility mechanisms. Baselines are generally calculated on an emissions-intensity basis and adjusted for actual production levels, while also being subject to an annual decline rate. This framework places downward pressure on both emissions intensity and absolute emissions over time, creating a clear incentive for ongoing investment in emissions reduction technologies and operational improvements.

This design creates several practical incentives for industry action.

- Declining baselines create a forward-looking compliance obligation. Facilities that do not reduce emissions intensity over time face increasing exposure to carbon unit costs or the need to access other compliance options. This creates a direct and ongoing commercial incentive to identify and pursue onsite abatement opportunities where they are safe, technically feasible and cost effective.
- The Mechanism rewards facilities that reduce gross emissions below their baselines by allowing them to generate SMCs. This provides a positive incentive for facilities to overperform against their baselines where practical abatement opportunities exist.
- The availability of ACCUs and SMCs provides flexibility for facilities that do not yet have immediately deployable onsite abatement options. As will be considered further below, this flexibility is a core design feature of the Safeguard Mechanism and important for industries such as coal mining, where some of the largest potential abatement opportunities, including VAM abatement, are technically complex, capital intensive, site-specific and subject to rigorous safety requirements and will take time to be broadly deployed across the industry.
- The Mechanism's use of emissions-intensity baselines means that facilities are not simply rewarded for reducing production. This is important for maintaining productive industrial activity while still encouraging emissions reductions per unit of output. Baselines are adjusted for production each year so facilities are not rewarded for reducing production or penalised for growth.
- The Mechanism includes additional transparency measures where facilities surrender ACCUs equal to 30 per cent or more[5] of their baseline. In those circumstances, facilities must provide an explanation to the Clean Energy Regulator.

[5] See cer.gov.au/markets/reports-and-data/safeguard-data/2024-25-baselines-and-emissions-data#accu-surrender-statements for more information. The Clean Energy Regulator has noted (in its *2023-24 Safeguard Data Insights* publication, available at cer.gov.au/document_page/2023-24-safeguard-data-insights) that the Safeguard Mechanism is "... designed to incentivise emissions reduction projects at large facilities but recognises that time and capital investment is needed before onsite emissions reductions can be realised."

An overview of LETA's onsite methane abatement investments and other industry led methane abatement projects

As noted above, LETA's methane submission to the Authority provides detailed and substantive evidence of the range of projects and investments that industry is planning and undertaking – either through LETA or directly – to enable future onsite abatement. These projects and planned investments provide the direct evidence of onsite abatement activities and enabling investments relevant to Safeguard Mechanism covered coal mining facilities.

This investment portfolio, together with the Case Studies and other project examples presented in this submission, as well as the examples provided in the Minerals Council of Australia submission, tells a compelling story: Australian coal producers are already reducing methane emissions onsite through drainage, utilisation and flaring projects; pioneering VAM technologies through demonstration projects; investing in next-generation solutions; and partnering with governments and researchers to address technical, commercial and safety challenges.

In methane abatement, LETA's work has focused on three areas:

1. **Technical feasibility and safety:** including the development of functional safety cases for VAM abatement systems connected to primary mine ventilation systems, safe connection duct architectures, isolation, flame arrest, dilution, and default-to-atmosphere arrangements in the event of equipment trips.
2. **Demonstration readiness for regenerative thermal oxidisers (RTOs):** including work with member companies to establish first-of-a-kind large scale demonstrations of VAM abatement at Australian mine sites.
3. **Catalytic oxidation research and development:** including pilot-scale work on catalysts that may oxidise methane at lower temperatures and at lower methane concentrations than are practical for RTOs.

LETA's investments in RTOs and catalytic oxidation technologies are designed to build the technical and safety evidence base needed to support the deployment of emissions reduction solutions that are reliable, commercially viable, and compatible with Australia's rigorous safety standards. By progressing both relatively mature and emerging technologies, LETA is helping to ensure that practical abatement options can be deployed across a range of mine conditions.

Case Study 1 highlights LETA's early involvement in VAM abatement technology development.

Case Study 1: Centennial Coal's Mandalong VAM Demonstration Project and the Foundations of Australia's Methane Abatement Program

One of the most important milestones in Australia's methane abatement journey was the demonstration scale VAM oxidation project at Centennial Coal's Mandalong Mine in New South Wales. Developed with support from LETA, together with Coal Innovation NSW and technology developers, the project, which was undertaken during 2009-2013, was one of the first attempts globally to safely connect an RTO directly to an operating underground mine ventilation system.

The project was established not simply to test methane destruction technology, but to address the far more challenging question of how such systems could be safely integrated into Australian coal mines under some of the world's most stringent mine safety requirements.

The Mandalong project became a foundation stone for much of the methane abatement work that followed. Through LETA's investment, the project helped develop and validate concepts that remain central to Australian VAM deployment today, including functional safety cases, safe connection duct architectures, flame arrest systems, pressure relief mechanisms, isolation arrangements and fail-safe "default-to-atmosphere" operating modes. These engineering and safety principles continue to inform the work now being undertaken through LETA's methane abatement portfolio and have helped establish the technical and regulatory confidence needed for larger commercial projects.

Importantly, the Mandalong project demonstrated that methane abatement is not simply a technology deployment challenge. It highlighted the need for extensive engineering design, safety validation, regulator engagement and operational integration before commercial implementation can occur.

The lessons learned from Mandalong helped shape subsequent Australian research programs, including CSIRO's VAMMIT and catalytic oxidation technologies and the wider industry effort to develop practical pathways for reducing fugitive methane emissions from underground coal mining.

The project remains a strong example of how long-term industry investment, through LETA, has created the technical foundations required for future methane abatement deployment. More than a decade before methane became a major policy focus, the Australian coal industry was already investing in demonstration projects that sought to understand how meaningful methane reductions could be achieved safely, credibly and at commercial scale.

Perhaps most importantly, it created the technical and regulatory knowledge base that has enabled subsequent investment in large-scale VAM abatement projects and emerging catalytic oxidation technologies across the Australian coal industry.

Today, many of the safety frameworks and engineering principles emerging from the Mandalong project continue to underpin LETA's work in advancing VAM abatement technologies across the coal industry.

> The Safeguard Mechanism should continue to support emissions reduction, while allowing flexibility for facilities to efficiently and effectively manage compliance during the period in which complex abatement technologies are being developed, demonstrated and deployed.

Commercially ready and near-term viable technologies to reduce onsite methane emissions from coal mining differ by source. This is reflected in LETA's – and the industry's – projects investments.

Underground coal mines

For underground coal mines, pre-mining drainage, post-mining drainage, flaring and utilisation of drained methane are established practices. Pre-mining drainage is already utilised for managing safety at underground mines and also to reduce emissions where drained gas is flared, used onsite for electricity generation, transported for offsite generation or otherwise managed.

For VAM abatement, RTOs represent the most mature and commercially proven technology. However, as discussed further below, their application is subject to site-specific constraints and they are not suitable for all coal mine operations. RTOs oxidise methane over ceramic beds at temperatures of approximately 1,000°C, converting methane into carbon dioxide and water. When methane concentrations and airflow rates are within the design range, destruction efficiencies exceeding 90 per cent can be achieved.

However, RTOs generally require inlet methane concentrations of around 0.4 per cent to sustain operation without supplemental fuel. At concentrations closer to 0.2 per cent, self-sustaining operation is not currently considered feasible because the thermal efficiency required to maintain oxidation would exceed the practical capabilities of existing materials, insulation systems and ducting configurations. Accordingly, VAM oxidation should be viewed as a site-specific abatement technology rather than a universally applicable solution.

Catalytic oxidation technologies are likely to be a medium-term rather than near-term abatement option. By enabling methane oxidation at temperatures of around 500°C, these systems may be capable of operating at lower methane concentrations than RTO-based technologies. However, significant technical and commercial challenges remain, including demonstrating catalyst longevity, resistance to contaminants, safe integration with mine ventilation systems, and acceptable economics at commercial scale.

Open-cut coal mines

For some open-cut mines, pre-drainage of coal seams may provide a practical means of reducing fugitive methane emissions before mining occurs. Where geological conditions are suitable, gas drainage can reduce the volume of methane released during mining while creating opportunities for flaring, utilisation and other methane management pathways.

While a significant proportion of LETA's methane abatement portfolio has focused on VAM from underground coal mines, its work program has increasingly expanded to address fugitive methane emissions across a broader range of mining methods, including open-cut operations.

However, the feasibility of these approaches is highly site-specific and depends on factors including geology, mine planning, gas composition and flow rates, infrastructure availability, remaining mine life and overall project economics. Experience from projects currently under assessment across the industry suggests that meaningful abatement opportunities may exist at some operations, but their suitability cannot be assumed across the sector. Continued investigation, demonstration and deployment support will therefore be necessary to identify and commercialise the most viable opportunities.

An example of industry action to reduce open-cut fugitive methane emissions is outlined in Case Study 2.

Case Study 2: Demonstrating a Scalable Pathway for Fugitive Methane Abatement in Open-Cut Coal Mining through the Curragh Open-Cut Fugitive Emissions Capture Pilot in Queensland

Fugitive methane emissions from open-cut coal mines remain one of the mining sector's most challenging decarbonisation issues. While methane is a high-impact greenhouse gas, practical and commercially viable approaches to capturing these emissions in active open-cut mining environments have historically been limited. To address this challenge, this case study outlines Coronado Global Resources' proposed fugitive methane capture pilot at the Curragh Mine in Queensland.

The project builds on several years of operational experience and previous pilot programs. Earlier trials involved drilling methane drainage wells and converting two haul trucks to operate on a compressed natural gas and diesel hybrid configuration. While these activities demonstrated technical feasibility, lower-than-expected gas deliverability highlighted the need for improved reservoir understanding and more effective drainage strategies. Subsequent underground gas drainage trials generated additional insights, leading to a revised approach that combines enhanced reservoir characterisation, improved drilling techniques and greater integration with mine planning processes.

The proposed pilot seeks to establish whether open-cut methane drainage can improve the potential emissions reduction approach. The project will assess gas recovery rates, optimise well placement and drainage patterns, validate greenhouse gas accounting methodologies, and demonstrate how emissions capture infrastructure can operate safely alongside active mining operations.

A key objective is to determine whether methane can be captured before it would otherwise be released during mining, thereby reducing Scope 1 emissions and meeting compliance obligations under the Safeguard Mechanism.

The pilot includes appraisal drilling, reservoir modelling, methane capture wells and monitoring systems. Preliminary modelling indicates the potential for meaningful methane abatement during the appraisal phase. Captured gas will initially be flared to support measurement and verification activities. Potential future utilisation options may be assessed separately.

Importantly, the value of the project extends beyond a single mine site. The project may provide information relevant to the development of methodologies that could be applied more broadly across open-cut coal mining operations. The project will generate practical guidance on reservoir assessment, drilling design, operational integration, regulatory requirements, safety management and emissions accounting. Subject to project outcomes and stakeholder requirements, findings may inform broader industry and regulatory understanding.

This project illustrates how targeted support for first-of-a-kind demonstration activities can accelerate the development of scalable methane abatement technologies. By reducing technical uncertainty and establishing a transferable operating model, the Curragh pilot has the potential to contribute to understanding of methane abatement opportunities for reducing fugitive methane emissions across Australia's open-cut coal mining sector.

Through workshops, technical forums, industry collaborations and project assessments, LETA has observed growing interest in practical, cost-effective and measurable methane reduction opportunities across a wide range of operating environments. This reflects the continuing challenge of methane abatement across the Australian coal industry, where proven drainage, flaring and utilisation technologies are only suitable in certain circumstances and material emissions reduction pathways are not yet universally available or economically viable.

Case Study 3 highlights BHP's work at the BMA Saraji Mine.

Case Study 3: BMA's Saraji Open-Cut Coal Mine in Queensland

Abating low concentration fugitive methane from open-cut mines presents a unique challenge, with no viable technologies currently available. To address this industry-wide challenge, LETA is supporting BHP to undertake an innovative proof-of-concept methane gas drainage trial at BMA's Saraji Mine.

The trial reflects a shared commitment to advancing practical methane abatement solutions and generating insights that could benefit the broader open-cut coal mining industry.

This means that, consistent with a technology-neutral approach, the Review should focus on recognising and rewarding measured and verifiable emissions reductions rather than assuming the universal applicability of any particular technology or abatement pathway.

A credible policy framework should therefore distinguish between:

- Mature options deployable now.
- Options viable only in certain operational contexts.
- Opportunities needing targeted enabling support.
- Emerging technologies requiring further demonstration.

As will be considered further below, Australia's policy settings are driving near-term methane abatement, with the extent varying by sector, facility, emissions source and jurisdiction. The Safeguard Mechanism provides significant incentives for large facilities to reduce net emissions, including methane emissions. Facilities are responding through a range of compliance options, and onsite methane abatement is the clear focus. State-based measures, particularly in NSW and Queensland, will also drive abatement.

Current policy settings will likely drive near-term abatement where:

- Drained methane can be flared or utilised. Case Study 4 provides an example of a leading industry project, reflecting one of several initiatives across the industry that have been implemented or are being developed where site-specific resource characteristics and operating conditions make such projects feasible.
- Equipment can be upgraded or replaced.
- VAM concentrations are sufficiently high and stable for RTO deployment.
- Regulatory approvals and safety cases can be completed in time.

Case Study 4: Stanmore Resources: Transforming Fugitive Methane into Energy at South Walker Creek

Supported through Queensland's Low Emissions Investment Partnerships (LEIP) program[6], Stanmore Resources is developing a first-of-its-kind methane utilisation project at its South Walker Creek metallurgical coal mine in the Bowen Basin.

The project will capture coal seam methane that would otherwise be released as fugitive emissions and use it to fuel a new 20 megawatt (MW) power station at the mine. Scheduled for operation from 2027, the project will provide a long-term, self-sufficient electricity supply while reducing mine emissions through the productive use of methane.

By applying gas capture techniques traditionally associated with underground coal mines to an open-cut operation, the project has the potential to establish a new abatement pathway for the broader Australian coal industry and demonstrates how targeted government-industry partnerships can accelerate practical emissions reductions using proven technologies.

The ability to utilise drained methane in this way reflects the unique resource characteristics of South Walker Creek. Given that these characteristics may not exist at other mining operations, it should not be assumed that projects of this kind can be replicated across the industry.

Beyond the specific circumstances of South Walker Creek, the project highlights a broader policy issue for open-cut methane abatement by demonstrating that, in suitable geological settings, methane capture and utilisation can provide a credible emissions reduction pathway while delivering operational benefits through the productive use of captured gas.

It also shows that innovation in methane management is occurring across the coal industry and is not limited to underground mining or methane destruction technologies. While projects of this nature will not be suitable for every operation, they provide evidence that open-cut fugitive methane emissions should not be regarded as an intractable emissions source.

Barriers preventing uptake of onsite methane abatement opportunities

A key focus of the Review should be the identification and assessment of the barriers to onsite methane abatement, many of which are significant and remain unresolved. Recommendations to address these barriers should sit at the centre of the Review's reform agenda if the objective is to accelerate the deployment of methane abatement technologies.

Importantly, no single policy response will address all barriers. Constraints arise from a combination of technical, safety, economic and commercial, supply chain, regulatory and approvals, market related, and site specific factors, each of which may require a tailored policy response.

Technical barriers

For VAM, the most significant barrier is the mismatch between available technology and the operating conditions of many Australian underground mines. As noted above, RTOs require relatively stable flows and methane concentrations, with a practical self-sustaining threshold of around 0.4 per cent methane. Many mines experience concentrations below this level for long periods, and concentrations vary with panel position, seam gas content, drainage practices, barometric conditions and production schedules.

Safety-related barriers

Safety is the overriding priority on any mine site. Any technology connected to a primary mine ventilation circuit must maintain statutory ventilation requirements and avoid increasing risks of explosion, fire or asphyxiation. Australian regulations and industry practice appropriately requires conservative connection infrastructure, long safe connection ducts, isolation, flame arrest, dilution, pressure relief and default-to-atmosphere behaviour during abnormal conditions.

Overseas designs and operational experience cannot be directly adopted in Australia, as some international projects employ shorter duct runs and less conservative connection arrangements than would be acceptable under Australian mine safety requirements.

Case Study 5 highlights work undertaken through a combination of Commonwealth and industry resources and involved collaboration between universities, mining companies and engineering partners. This model is important because the knowledge generated, particularly around safety guidelines and testing data, has benefits beyond any single mine or company. Such sector-wide enabling work is difficult for an individual operator to justify alone, especially where the benefits include regulatory confidence, standardised design guidance and reduced risk for future projects.

[6] See www.treasury.qld.gov.au/policies-and-programs/investment/leip/#current-partnerships for more information and additional examples.

Case Study 5: University of Newcastle VAM Abatement Safety Project

The University of Newcastle Ventilation Air Methane Abatement Safety Project[7] was a major government, industry and research collaboration designed to address a key barrier to large-scale VAM abatement: the safe integration of abatement plant with underground coal mine ventilation systems.

The project commenced in July 2013 and concluded in March 2018. It had a total budget of about $26.95 million, funded 50 per cent by the Commonwealth and 50 per cent by LETA with partners including (then) South32 and Glencore.

Its purpose was not simply to prove that methane could be oxidised. Rather, it aimed to determine the critical science and engineering issues underpinning the safe operation of VAM capture ducts, particularly explosion hazards and the control measures needed to manage them.

Its key contribution was the development of a large-scale test facility and associated safety research to support validated design guidance for VAM capture ducts and related explosion mitigation systems. A major output was a 100-metre VAM capture duct/test facility at Londonderry in western Sydney, designed to replicate mine ventilation conditions and allow controlled testing of gas and gas particulate hazards, explosion behaviour, protective devices and mitigation strategies.

The key finding was that broad VAM deployment depends on more than reactor performance. The safety critical interface between the mine ventilation system, capture duct, abatement unit, sensors, isolation systems and emergency controls must be demonstrably safe and regulator-acceptable. The project therefore sought to develop validated safety design guidelines and functional safety requirements to support industry uptake.

The principal lesson for policy is that emissions reduction in underground coal mining requires an integrated approach to technology, safety, regulation and commercial incentives. Public and industry co funded research, development and deployment can play a critical role in de-risking these systems, but broad deployment will also require durable policy settings, clear crediting or compliance value, and pathways for translating safety guidance into mine-level approvals and investment decisions.

This Case Study is highly relevant to current efforts to reduce fugitive methane emissions. It demonstrates that VAM abatement is not simply a matter of selecting a technology and installing it at a ventilation shaft. Rather, deployment requires validated safety design guidelines, large-scale testing data, regulator and operator confidence, mine-specific engineering integration, clear allocation of responsibility for operational and emergency controls, and a durable policy or market signal, including the Safeguard Mechanism and co-funding arrangements, that supports investment.

The project also demonstrates the value of collaborative research, development and deployment in addressing barriers that are too large, too specialised or too safety-critical for individual companies to tackle in isolation. This is precisely the type of work in which LETA invests.

Economic and commercial barriers

Capital costs for VAM abatement are driven by oxidiser size, connection duct length and specification, foundations, acoustic treatment, stacks, instrumentation and environmental controls. Operating costs include auxiliary fuel, fan power, monitoring and maintenance. As noted above, at low methane concentrations, auxiliary fuel can become the dominant operating cost and reduce or reverse emissions benefits. Project economics also depend on utilisation pathways for captured gas, plant uptime, equipment maintenance, carbon pricing assumptions, baseline treatment, crediting arrangements, grant support and remaining asset life.

Supply chain barriers

Some technologies face constraints relating to vendor capacity, Australian deployment experience, trained workforce availability, and local fabrication or service capability. Broad VAM deployment would require significant supply chain development, including expanded manufacturing capacity, local fabrication partnerships, trained installation and maintenance teams, and reliable spare parts supply. These capabilities cannot be developed immediately and will require time to mature.

Regulatory and approvals barriers

VAM plants may involve visible plumes, noise, stack height requirements and other potential community impacts. Deployment also depends on environmental approvals, community engagement and mine safety approvals, each of which can materially affect project timing.

How barriers could be overcome

These barriers mean the Review should treat VAM as an important but site-dependent opportunity. Policy should avoid presuming universal viability and focus on reducing and removing barriers.

Barriers could be reduced through:

- Co-funding for demonstrations and early deployments[8]. LETA is already investing in projects and stands ready to work co-operatively with Government to co-fund projects.
- Clear, coordinated approval pathways across environmental and safety regulators.
- Technology-neutral, site-specific arrangements.

[7] See www.newcastle.edu.au/research/centre/energy/research/ventilation-air-methane-abatement-safety-project for more information.

[8] Such a co-funding initiative could build on existing and previous funding initiatives, such as those offered in NSW through Coal Innovation NSW (www.resources.nsw.gov.au/geological-survey/projects/coal-innovation-nsw/fugitive-methane-emissions-from-coal-mines) in Queensland through LEIP (www.treasury.qld.gov.au/policies-and-programs/investment/leip) and at the national level, with revisions to the funding arrangements to more appropriately support a technology-neutral and Safeguard Mechanism-covered facility focus, through the Powering the Regions Fund (business.gov.au/grants-and-programs/powering-the-regions-fund-safeguard-transformation-stream-round-1 and business.gov.au/grants-and-programs/powering-the-regions-fund-safeguard-transformation-stream-round-2).

- Co-investment in catalytic oxidation and other next-generation technologies.
- Support for local supply chain development.
- Staged implementation timelines aligned with technology readiness and mine safety validation.

Such support is an enabling measure that helps facilities respond to the Safeguard Mechanism by bringing forward safe, credible and commercially viable onsite abatement. The most effective policy approach is therefore not to impose duplicative methane-specific obligations or technology mandates, but to maintain the Safeguard Mechanism as the central national framework and support its operation through practical measures that remove barriers to deployment.

Policy settings should encourage investment wherever measurable and verifiable emissions reductions can be demonstrated and ensure that emissions reductions achieved through drainage, capture, utilisation or other methane mitigation activities are appropriately recognised within Australia's emissions accounting and Safeguard Mechanism frameworks.

In addition, the design features highlighted in the list above mean that the Safeguard Mechanism is already encouraging covered facilities to examine onsite abatement options, while preserving flexibility for facilities where immediate onsite reductions are not yet technically, commercially or safely available.

This balance is vital. The Safeguard Mechanism should continue to support emissions reduction, while allowing flexibility for facilities to efficiently and effectively manage compliance during the period in which complex abatement technologies are being developed, demonstrated and deployed. As noted above, this is particularly important for fugitive methane emissions from coal mining, where emissions can vary materially because of geology, mine sequencing, seam gas content, ventilation requirements, production variability and decommissioning activity.

The Review should not interpret the use of ACCUs or SMCs as evidence that facilities are not pursuing onsite abatement. In many cases, facilities may need to use flexibility mechanisms while feasibility studies, engineering design, safety validation, approvals, procurement, construction and commissioning are underway. This is especially relevant for first-of-a-kind or early deployment projects, where the investment pathway may take several years before emissions reductions are visible in reported data.

The Consultation Paper on page 13 recognises that the full effect of the reforms on onsite abatement will only be observable over time, because many industrial decarbonisation projects require major capital investment and long lead times.

Assessing the extent to which the Safeguard Mechanism is driving onsite abatement

The Review should recognise that the Safeguard Mechanism is already creating a clear incentive for onsite abatement. The key policy question is not whether to replace or duplicate that incentive, but how to help facilities convert that incentive into practical emissions reductions. For coal mining methane, this means supporting demonstration, safety validation, approvals coordination and early deployment of technologies such as RTOs and catalytic oxidation, while recognising that technology availability, mine safety and site-specific conditions will determine what is feasible at each facility.

LETA's investment portfolio provides direct evidence of this industry response. This investment is consistent with the Safeguard Mechanism's role in encouraging emissions reduction at covered facilities. While LETA's work predates the 2023 reforms, the reformed Scheme strengthens the commercial context for these investments by increasing the value of practical onsite abatement and encouraging facilities to identify credible pathways to reduce emissions over time.

It is also the case that measuring onsite abatement is not straightforward. The consultation paper notes that gross emissions reductions at Safeguard Mechanism facilities indicate onsite abatement, and also reflect changes in production, shifts in the location of activity, operating conditions, facility openings or closures, temporary outages or disruptions.

LETA also notes that emissions intensity can be an indicator because it may distinguish changes in production from changes in emissions performance. However, emissions intensity is also affected by input quality, resource characteristics and operating conditions, and that a facility may undertake genuine abatement activity while still reporting higher emissions intensity because of other factors.

These points are especially important for coal mining facilities. Fugitive methane emissions from coal mines are inherently variable. They are affected by geology, seam gas content, mine depth, mine sequencing, production activity, drainage performance, barometric conditions, ventilation requirements, decommissioning activities and safety obligations.

Both the Climate Change Authority and the Clean Energy Regulator have recognised the operational factors that can affect emissions intensity in coal mining facilities. On page 36 of its *2026 Annual Progress Advice* consultation paper, the Authority cites the Regulator's finding that increases in coal mining emissions intensity in 2024-25 reflected factors including operations moving into gassier areas, mine decommissioning activities and production disruptions. The Authority further notes that some coal mines reduced their emissions intensity by capturing and combusting coal mine waste gas.

This reinforces the need for caution in drawing conclusions from headline emissions data. The Review should avoid treating changes in gross emissions or emissions intensity as definitive evidence of either the presence or absence of onsite abatement.

In its submission to the Authority, LETA noted the proposed use of a range of indicators, including changes in gross emissions and emissions intensity at Scheme and sector level, interpreted alongside facility-level evidence, case studies and stakeholder information about planned, commenced and completed onsite abatement activities. This advice is also relevant to the Department's review.

In addition, LETA recommends that the Review explicitly distinguish between:

1. Operational emissions changes, such as changes in production, throughput, operating conditions or mine sequencing.
2. Structural emissions changes, such as facility openings, closures, decommissioning or changes in product mix.
3. Resource-driven emissions changes, particularly in coal mining, where fugitive emissions may change because mining has entered areas with different gas content.
4. Deliberate onsite abatement, such as methane drainage, flaring, utilisation, electrification, energy efficiency, process optimisation, fuel switching or deployment of abatement technologies. A number of this direct onsite abatement was outlined in detail in LETA's methane submission to the Authority.

5. Enabling abatement investment, such as feasibility studies, front-end engineering design, safety case development, pilot projects, demonstration projects and research into emerging technologies.

This final category is particularly important. In coal mining for example, meaningful onsite abatement cannot be delivered simply by purchasing and installing an "off-the-shelf" technology. For VAM abatement, for example, deployment requires site-specific engineering, validated safety systems, environmental approvals, mine safety approvals, technology demonstration and commercial risk management.

LETA therefore recommends that the Review's assessment should recognise not only tonnes of emissions already reduced, but also the investment pipeline that is being developed in response to the Safeguard Mechanism and complementary policy settings.

As was the case with its advice to the Authority, LETA considers that the Review should assess the extent to which the Safeguard Mechanism is driving onsite abatement using a multi-factor framework that combines quantitative indicators with facility-level evidence and sector-specific interpretation.

While it is clear that the Safeguard Mechanism is driving onsite abatement, LETA recommends that the Review assess onsite abatement using the following categories of evidence.

Gross emissions trends

The Consultation Paper on page 37 notes that, across the first two completed years of the reformed Safeguard Mechanism, gross emissions fell by 5.8 Mt CO_2-e, or 4 per cent, while net emissions fell by 17.5 Mt CO_2-e, or 13 per cent.

Emissions intensity

Emissions intensity can help distinguish production changes from changes in emissions performance. However, emissions intensity can also be affected by factors outside the direct control of facility operators.

In coal mining, this includes the gas content of the resource being mined, mine depth, mine sequencing, ventilation requirements and drainage conditions. The Review should therefore interpret emissions intensity changes in light of facility-level explanations and sector-specific data.

Credit surrender and baseline data

The Authority should also consider the interaction between facility baselines, gross and net emissions, SMC generation, and the surrender of SMCs and ACCUs.

The Consultation Paper notes that facilities may comply by reducing onsite emissions, surrendering ACCUs, surrendering SMCs or using other flexibility mechanisms.

These are core design features of the Safeguard Mechanism and, as discussed further below, should be retained.

Credit surrender data can help identify facilities that are facing near-term compliance obligations without immediately available onsite abatement options. However, the use of ACCUs or SMCs is not evidence that a facility is not pursuing onsite abatement. In many cases, facilities may use carbon units while developing longer-term onsite abatement projects.

Assessing evidence of investment response

As with LETA's recommendations to the Authority, the Review should assess whether the Safeguard Mechanism is influencing investment behaviour, not only whether emissions reductions have already occurred.

For many Safeguard Mechanism facilities, particularly coal mining facilities with fugitive emissions, onsite abatement requires feasibility work, engineering design, technology selection, safety case development, environmental approvals, procurement, construction and commissioning before emissions reductions can be delivered.

This means that investment activity is an important leading indicator of future onsite abatement. As highlighted in LETA's methane submission, and considered earlier in this submission, the industry is already investing in a range of projects to develop and deploy the technologies and safety systems needed to reduce fugitive emissions.

Accounting for production, operational conditions and emissions variability

LETA recommends that the Review account for production and operational variability by:

- Comparing emissions intensity as well as gross emissions.
- Using facility-level detail to interpret changes in emissions.
- Distinguishing temporary changes from structural improvements.
- Identifying resource-driven emissions variability, particularly for fugitive emissions.
- Considering multi-year trends rather than single-year movements.
- Recognising the effect of mine sequencing and geology in coal mining.
- Distinguishing closures, outages and decommissioning effects from deliberate abatement.
- Recognising that abatement projects may be underway even where reported emissions have not yet fallen.
- Using case studies to supplement aggregate data.

In particular, the Review should avoid drawing simplistic conclusions that rising emissions at a facility indicate a failure to undertake abatement. In assessing whether the Safeguard Mechanism is driving onsite abatement, the Review should consider both completed emissions reductions and the investment response generated by the Scheme.

As noted above, declining baselines, SMC generation, ACCU surrender obligations, and the requirement for facilities to explain why surrendered carbon credit units exceed baseline emissions by more than 30 per cent all create incentives to identify and progress onsite abatement options. However, converting these incentives into reported emissions reductions will take time, particularly for complex industrial facilities and fugitive emissions sources.

Domestic offsets

(PAGE 12-16)

This section responds to two of the questions asked on page 16 of the Consultation Paper, namely:

> Are new policy measures for ACCU use needed to accelerate industrial decarbonisation?
>
> If policy measures are needed, what would be the best way to reduce reliance on ACCU use without unduly disrupting the carbon market and when should any such measures start?

LETA supports a Safeguard Mechanism that continues to encourage onsite abatement while maintaining unrestricted access to ACCUs and SMCs.

LETA does not consider that the issue should be framed as a choice between onsite abatement and the use of ACCUs or SMCs. The Safeguard Mechanism was intentionally designed to deliver emissions reductions through a combination of onsite abatement and flexible market-based compliance options. Declining baselines establish the emissions reduction obligation, while ACCUs and SMCs enable facilities to meet that obligation in an economically efficient manner.

The existing framework is already delivering emissions reductions

The available evidence does not demonstrate a need to restrict ACCU or SMC use. As noted above, across the first two completed years of the reformed Safeguard Mechanism, gross emissions fell by 5.8 Mt CO_2-e, or 4 per cent, while net emissions fell by 17.5 Mt CO_2-e, or 13 per cent. It is still too early to draw firm conclusions about the full effect of the reforms on onsite abatement, given that many industrial decarbonisation projects require major capital investment and long lead times. The evidence supports maintaining the current flexibility settings. The Safeguard Mechanism is already contributing to emissions reductions while allowing facilities the time needed to develop and deploy onsite abatement technologies.

Independent reviews of the ACCU Scheme have found the existing framework is fundamentally sound

The legislation, policy framework and administrative arrangements underpinning the ACCU Scheme have been reviewed or assessed five times since 2022[9]. Each process has concluded that the existing framework is fundamentally sound. The resulting recommendations have focused principally on administrative and institutional improvements to strengthen method integrity, governance, transparency, permanence arrangements and the availability of market information.

Elements of the Scheme are also currently subject to proposed amendments under the *Carbon Credits and Other Legislation Amendment (Integrity and Transparency) Bill 2026*. The Bill, which is currently before Parliament, seeks to implement recommendations arising from the independent reviews of the ACCU Scheme, thereby strengthening the

[9] These reviews and assessments comprised: (1) the December 2022 report of the Independent Review of Australian Carbon Credit Units, chaired by Professor Ian Chubb (available at www.dcceew.gov.au/sites/default/files/documents/independent-review-accu-final-report.pdf), which found that the ACCU Scheme was essentially sound and recommended governance and integrity reforms to improve its operation; (2) the Climate Change Authority's December 2023 review (available at www.climatechangeauthority.gov.au/2023-review-accu-scheme-0), which found that the Scheme was fundamentally well designed; (3) the Australian National Audit Office's 2024 performance audit (available at www.anao.gov.au/work/performance-audit/issuing-compliance-and-contracting-australian-carbon-credit-units), which found that the Clean Energy Regulator's administration of the Scheme was largely effective; (4) DCCEEW's 2026 progress assessment (available at www.dcceew.gov.au/sites/default/files/documents/progress-report-reforming-accu-scheme-2026.pdf), which found that significant progress had been made in reforming the Scheme; and (5) the Climate Change Authority's September 2026 review (available at www.climatechangeauthority.gov.au/reviews/2026-review-accu-scheme), which found that the ACCU Scheme remained fundamentally sound and did not require major redesign.

integrity and transparency of carbon credit generation and reporting, as well as public confidence in the Scheme[10].

Restrictions on ACCUs would not increase emissions reductions

Proposals to restrict ACCU use appear to rest on the assumption that suitable onsite abatement opportunities are immediately available across all Safeguard Mechanism facilities. The evidence does not support that assumption.

As discussed above, many industrial emissions sources are characterised by long investment lead times, significant technical complexity, site-specific operating conditions, safety requirements and regulatory approvals. In underground coal mining, meaningful methane abatement opportunities often require years of feasibility assessment, engineering design, demonstration, safety validation, environmental approvals, mine safety approvals, procurement, construction and commissioning before emissions reductions can be realised.

The use of ACCUs and SMCs during this development pathway does not represent a "failure" of the Safeguard Mechanism. Rather, it demonstrates that the Mechanism is functioning as intended by maintaining an emissions reduction obligation while allowing facilities to develop credible, safe and commercially viable abatement solutions.

Importantly, the analysis by the Climate Change Authority, highlighted in its 2026 Annual Progress Advice Consultation Paper, indicates that limits on ACCU use would not increase total net abatement. The likely effect would therefore be to increase compliance costs and alter the location of abatement rather than deliver additional emissions reductions.

The evidence supports retaining unrestricted ACCU and SMC use

Open access to ACCUs and SMCs remains a fundamental strength of the Safeguard Mechanism:

- Open trading promotes least-cost abatement. The Consultation Paper recognises that ACCUs and SMCs allow emissions reductions to occur where and when they can be achieved most efficiently and that offset use improves economic efficiency by allowing lower-cost abatement opportunities to be realised first.
- Open access supports investment certainty. Facilities make investment decisions over long time horizons and require confidence that compliance obligations can be managed while major decarbonisation projects are developed and deployed.
- Open supports technology development. Emerging technologies such as VAM oxidation, catalytic oxidation and other industrial methane abatement technologies require substantial research, demonstration, safety validation and commercial development before they can be deployed at scale. Compliance flexibility allows these technologies to mature without imposing excessive compliance costs on facilities during the development period.
- Open access recognises that abatement opportunities vary significantly between facilities. Geology, resource characteristics, mine sequencing, emissions profile, technology readiness, safety requirements and remaining asset life all influence the practical availability of onsite abatement opportunities. A framework that assumes all facilities can achieve equivalent levels of onsite abatement within the same timeframe would not be equitable.

Existing evidence points to technology constraints, not excessive flexibility

In 2024-25, twenty-three facilities were required to explain why more onsite abatement had not been undertaken because they surrendered ACCUs equal to at least 30 per cent of their baseline. As noted above, the Clean Energy Regulator reports that these facilities commonly cited limited availability of affordable decarbonisation technologies and operational circumstances.

The importance of these constraints is illustrated in Case Study 6, which demonstrates how methane concentration can determine the technical viability of RTO technology. The case study is based on information provided by BHP Mitsubishi Alliance to the Clean Energy Regulator.

Case Study 6: BHP Mitsubishi Alliance's Broadmeadow Mine Highlights the Need for Next-Generation Technologies

BHP Mitsubishi Alliance's Broadmeadow underground mine illustrates why a technology-neutral approach remains essential. While the Goonyella Broadmeadow Mine (GBM) already captured and flared drained methane where safe and practical, publicly reported information provided under the Safeguard Mechanism indicates that the mine's relatively low ventilation air methane concentrations are not currently suitable for the VAM abatement technologies most likely to be deployed commercially in Australia over the medium-term.

This demonstrates that not all mines can utilise the same methane reduction technologies and reinforces the importance of ongoing investment in emerging options such as catalytic oxidation.

The GBM example also highlights why future policy should focus on enabling innovation and supporting deployment where technologies are technically feasible, rather than assuming a one-size-fits-all solution across all underground mines. The technical knowledge generated through the project has informed subsequent methane abatement initiatives supported by LETA and the broader Australian coal industry.

In information provided to the Clean Energy Regulator in early 2026[11], BMA noted:

There is limited fugitive emissions abatement technology available for the relatively low coal seam methane intensity of current open cut operations at GBM. A seam gas resource characterisation drilling and testing program is being undertaken to identify potentially viable sites and seams for future pre-mining gas drainage. BMA Co, through BHP, is also participating in research and development of novel techniques for open cut fugitive abatement.

[10] See www.aph.gov.au/Parliamentary_Business/Bills_Legislation/Bills_Search_Results/Result?bId=r7532 for further information.
[11] See cer.gov.au/document/2024-25-30-explanation-letter-goonyella-broadmeadow-mine for more information.

> The Safeguard Mechanism should continue to operate as a flexible, market-based mechanism that delivers emissions reductions through declining baselines supported by unrestricted access to ACCUs and SMCs.

This evidence suggests that technology availability and deployment barriers, rather than ACCU or SMC use, are the principal constraints on greater onsite abatement.

Additional constraints are not warranted

For these reasons, LETA does not support:

- Quantitative limits on ACCU and/or SMC use.
- Discounting the compliance value of ACCUs and/or SMCs.
- Mandatory onsite abatement quotas.
- Sector-specific restrictions on ACCU and/or SMC surrender.
- Other measures designed to force substitution of onsite abatement for ACCU or SMC use.

Such measures would increase compliance costs, reduce flexibility, create regulatory uncertainty, increase risks for trade-exposed industries and potentially weaken investment incentives across both industrial decarbonisation projects and ACCU-generating projects, without clear evidence that they would increase overall emissions reductions.

Options that should be pursued

As noted above, policy should focus on helping facilities convert the Safeguard Mechanism's incentive signal into real-world abatement outcomes, rather than restricting the compliance flexibility that underpins the Scheme's cost-effectiveness.

The Safeguard Mechanism should continue to operate as a flexible, market-based mechanism that delivers emissions reductions through declining baselines supported by unrestricted access to ACCUs and SMCs.

The Review should reject proposals to impose restrictions on ACCU and/or SMC use or to discount the compliance value of ACCUs and/or SMCs.

The available evidence demonstrates that the Safeguard Mechanism is already reducing emissions, that major industrial abatement opportunities often require long development and deployment timeframes, and that restricting ACCU and/or SMC use would increase compliance costs and redistribute abatement rather than increase total emissions reductions.

Maintaining open access to ACCUs and SMCs is essential to preserving the economic efficiency, environmental effectiveness, equity and simplicity of the Safeguard Mechanism while enabling the continued development of practical long-term abatement solutions.

International units

(PAGE 17)

This section responds to the two questions asked on page 17 of the Consultation Paper, namely:

> **Is there any ongoing interest in using international offsets for Safeguard Mechanism compliance in the future and what is the rationale for this?**
>
> **How would the market need to develop before inclusion in the Safeguard Mechanism could be considered at future review points and what considerations should be given regarding interoperability, recognition and integrity?**

LETA recognises the Government's current priority of supporting domestic emissions reduction and does not propose immediate access to international units. However, the legislative framework and future review processes should preserve the option of considering high-integrity international units as Article 6 markets mature.

An enduring prohibition on international units could remove a potentially valuable mechanism for managing compliance costs and supporting international cooperation.

As noted on page 17 of the Consultation Paper, international carbon markets represent a potential future source of offsets that could contribute to Safeguard Mechanism compliance.

However, it is not accurate to characterise previous business support for international units as arising solely from the low prices that prevailed under the Kyoto Protocol. Rather, such support reflects the value of deep and liquid carbon markets in enabling the efficient and cost-effective fulfilment of climate policy obligations, including under the Safeguard Mechanism.

As the Consultation Paper notes, it remains unclear whether low-cost offsets will be available under the Paris Agreement's international trading framework. Equally, it remains unclear whether such offsets will be unavailable. Preserving the option of future access to international carbon markets, consistent with Australia's longstanding participation in international trading arrangements, therefore remains a legitimate compliance pathway that should not be foreclosed.

LETA recommends the Review establish a range of conditions that could inform future consideration of access to international units.

These conditions could include:

- Units should be authorised under relevant Article 6 mechanisms and subject to corresponding adjustments to ensure their use is consistent with Australia's nationally determined contribution.
- Measurement, reporting, verification, permanence and reversal arrangements should be robust, transparent and independently verifiable.
- Registry systems should provide safeguards against double issuance, double claiming and double use.
- Australian entities should have secure legal title and access to clear and predictable tax, accounting and compliance treatment.
- Markets should demonstrate adequate liquidity, transparent price discovery, and manageable sovereign, counterparty and delivery risks.
- Access to international units should complement, rather than displace, the development of Australia's domestic ACCU and SMC markets.

International cooperation can support technology transfer and emissions reductions in sectors and regions where Australia maintains strategic partnerships. LETA's international engagement demonstrates the value of cross-border collaboration in developing, commercialising and deploying low emission technologies. Accordingly, any future use of international units should be framed as a high-integrity complement to domestic action, rather than a substitute for practical emission reduction activities and technology deployment in Australia.

Rather than seeking to determine this issue permanently through the 2026-27 Review, the Government should establish objective readiness criteria and a future review mechanism. This approach would provide clarity and certainty to market participants without implying that international units will be admitted before appropriate accounting, integrity and market governance arrangements are in place.

It would also preserve a clearly defined pathway for the future consideration of Paris Agreement Article 6 units, should those markets mature in a manner that meets Australia's integrity, accounting and market-readiness expectations.

Conclusion

LETA considers that the reformed Safeguard Mechanism is already generating a strong and growing incentive for covered facilities to identify and pursue onsite abatement opportunities.

In assessing the effectiveness of the Mechanism, the Review should take a practical and evidence based approach that considers not only emissions outcomes, but also the investments, project development activities and operational constraints that shape abatement decisions at the facility level.

The Review should recognise that abatement projects often progress through a lengthy development pathway, including feasibility assessment, engineering design, demonstration, safety validation, regulatory approval and commissioning. This is particularly relevant for fugitive methane emissions from coal mining, where technological solutions may require substantial testing, adaptation and investment before deployment at commercial scale.

LETA recommends that the Safeguard Mechanism remain the central, flexible and market-based framework for reducing emissions from Australia's large industrial facilities. The Safeguard Mechanism should continue to be supported by unrestricted access to ACCUs and SMCs, while governments focus on practical measures that help facilities translate the Scheme's incentive into safe, technically viable and commercially deployable abatement projects.

Targeted co-funding, coordinated approval processes, clear methodological guidance, and continued support for technology development and demonstration are likely to be more effective than additional restrictions, quotas or technology mandates in accelerating onsite emissions reductions while maintaining industrial competitiveness and investment certainty.

LETA would welcome further engagement with the Department during the course of the Review and as its findings and recommendations are developed.

ATTACHMENT 1

LETA's methane abatement technology investment portfolio

LETA's investment portfolio demonstrates sustained industry commitment to developing practical methane abatement options for Australian coal mines. To date, LETA has allocated nearly $60 million to VAM-related projects, with investment expected to approach $100 million by 2030.

As noted in the LETA submission, this portfolio has focused on three linked priorities:

- Establishing the safety and engineering foundations for connecting abatement systems to primary mine ventilation circuits.
- Supporting demonstration readiness for RTO technologies at suitable mines.
- And advancing catalytic oxidation technologies that may be better suited to lower-concentration methane streams.

The portfolio demonstrates that VAM abatement has the potential to deliver meaningful emissions reductions over the medium-term. However, it also shows that successful deployment is highly dependent on site-specific conditions, including methane concentration, ventilation stability, mine design, safety requirements, technology maturity and project economics.

These findings support LETA recommendations for a policy approach focused on targeted co-funding, demonstration and validation activities, and the achievement of measured emissions reductions, rather than prescriptive mandates or methane specific targets.

LETA's longstanding leadership in the development and demonstration of VAM abatement technologies in Australia is illustrated in Case Studies 1 and 4 of this submission.

This Attachment provides an overview of selected investments from LETA's current and future portfolio, with a particular focus on the Mining3 CATCH4 Program and Anglo American Steelmaking Coal's VAM Abatement Project.

A summary of these projects is presented below. Detailed project descriptions, provided by the project proponents, Anglo American and Mining3, can be found in Attachment 1 to LETA's submission to the Climate Change Authority's Methane Review, available at: letaustralia.com.au/api/media/file/LETA-Submission-CLIMATE-CHANGE-AUTHORITY-METHANE-REVIEW.pdf.

AngloAmerican Steelmaking Coal's VAM Abatement Project

AngloAmerican Steelmaking Coal's VAM Abatement Project demonstrates that significant emissions reductions from underground coal mining are technically achievable, but that deployment is currently constrained by safety, engineering and commercial challenges. Following extensive global technology assessments, RTOs were identified as the only commercially mature technology capable of abating ventilation methane at the scale required for underground mines.

The project has focused on developing and independently verifying a fail-safe control and isolation system to ensure RTOs can operate safely in the presence of variable methane concentrations, with this work being undertaken in partnership with the University of Newcastle's Newcastle Institute for Energy and Resources (NIER).

The first deployment phase aims to safely treat emissions from a single ventilation shaft and abate approximately 550 kt CO_2-e per year. While concept and prefeasibility studies have been completed and the project is progressing through safety system verification and detailed design, key lessons include the critical importance of methane characterisation and ventilation management, as well as the ongoing challenge posed by low methane concentrations, which can significantly increase RTO capital and operating costs while reducing abatement efficiency.

Subject to completion of verification and detailed design activities, the project is expected to be execution-ready on a single site as a demonstration by the end of 2026.

Mining3 CATCH4 Program

The Mining3 CATCH4 Program provides an evidence base for a staged, technology-neutral approach to methane abatement policy. The program demonstrates that catalytic oxidation is a credible emerging pathway for treating low-concentration ventilation air methane from underground coal mines, particularly where conventional thermal oxidation technologies may be technically or commercially constrained.

However, CATCH4 also confirms that VAM abatement is not an off-the-shelf solution. Future deployment depends on successful pilot validation, long-duration catalyst performance, contaminant tolerance, mine safety integration, regulatory approvals, supply chain capability and mine scale economics.

The program therefore supports policy settings that co-fund demonstration and early deployment, streamline approvals, reward measured emissions reductions and avoid prescriptive technology mandates before technologies are commercially mature.

ATTACHMENT 2

Other industry-led investment in methane abatement technology projects

As noted in the body of the submission, in addition to LETA's investment portfolio, industry has since 2004 led investment in, along with governments, a range of methane abatement projects. In addition to some of those highlighted in the submission, some of these include:

- West Cliff Ventilation Air Methane Project (WestVAMP)[12]: The West Cliff Ventilation Air Methane Project (WestVAMP) was a pioneering greenhouse gas abatement initiative led by then BHP Billiton Illawarra Coal at West Cliff Colliery in New South Wales. Developed in 2004 with support from the Australian Government's Greenhouse Gas Abatement Program, which contributed $6 million towards the project, WestVAMP was designed to destroy methane contained in mine ventilation air and generate electricity using innovative oxidation technology. The project became the world's first commercial-scale facility to generate power solely from ventilation air methane, reducing greenhouse gas emissions by approximately 200,000 to 250,000 tonnes of CO_2-e per year while producing around 5 MW of electricity. WestVAMP demonstrated that low-concentration methane emissions from underground coal mines could be effectively abated at commercial scale. However, the technology was not widely replicated across the coal industry due to its high capital cost, the relatively small amount of electricity generated and the fact that only a limited number of mines have the methane concentrations, ventilation volumes and mine life necessary to make such projects economically viable. As a result, WestVAMP remains an important early example of successful innovation in methane mitigation and emissions reduction, despite its limited uptake.
- Ventilation Air Methane Regenerative After Burner (VAM-RAB) technology[13]: Coal Innovation NSW provided up to $2.2 million from 2009 to support Centennial Mandalong Pty Ltd in trialling a Ventilation Air Methane Regenerative After Burner (VAM-RAB) at the Mandalong mine. The technology was designed to oxidise more than 99 per cent of methane at approximately 1,000°C in a self-sustaining process. Although a demonstration plant was constructed, heat-up trials were unsuccessful, and the project was discontinued in 2019 by agreement between the parties. Nevertheless, the project provided valuable insights into the safety and operational challenges associated with deploying VAM abatement technology at active mine sites, informing subsequent work on safe design and installation.
- Ventilation air methane (VAM) catalytic mitigator[14]: Coal Innovation NSW provided up to $1.5 million in 2018 to support CSIRO's development and pilot-scale trial of a catalytic VAMMIT system at (then) South32's Appin mine. The catalytic approach was designed to operate at lower temperatures than conventional thermal systems, process lower methane concentrations and reduce input power requirements. The pilot system was tested for 476 hours using real mine ventilation air at methane concentrations of 0.08 per cent to 0.38 per cent. While efficiency was lower than thermal systems, the project demonstrated the potential for catalytic technology to treat low concentration VAM streams.
- GM³ RTO demonstration plant[15]: GM³ has received approval to construct and operate a VAM abatement demonstration plant at Appin Mine using RTO technology, with construction commencing in 2026 and the project expected to reduce fugitive methane emissions by around 36,000 t CO_2-e per year while generating operational knowledge to support broader deployment of VAM abatement across the underground coal mining industry. Gasco has been awarded a contract by GM³ to supply and manufacture the RTO unit.

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[12] See www.bhp.com/news/media-centre/releases/2007/09/nsw-premier-morris-iemma-opens-world-first-power-generation-project-at-bhp-billitons-west-cliff-mine.

[13] See www.resources.nsw.gov.au/geological-survey/projects/coal-innovation-nsw/fugitive-methane-emissions-from-coal-mines and majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=DA97/800-MOD-7%2120200309T074916.562%20GMT.

[14] See www.resources.nsw.gov.au/geological-survey/projects/coal-innovation-nsw/fugitive-methane-emissions-from-coal-mines and www.resources.nsw.gov.au/sites/default/files/2024-05/csiro-s32-vam-project-final-report.PDF.

[15] See community.gm3.au/vam-project and www.gasco.net.au/hydrogen-renewable-gas-conferences-2.

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