Methane: **Creating a stink for Australia** and the climate crisis

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AUSTRALIAN CONSERVATION FOUNDATION

Cover. Open pit mining. *Photo.* Unknown
Below. A gas fractionation plant, Australia.
Photo. Jason Benz Bennee / Shutterstock

Executive summary

The Australian government's gas led recovery indicates deafness to a clear and present danger for all Australians: the rapid pace of global heating and the driving greenhouse force of methane, especially over the next critical decade.

Australia's fugitive emissions, which are methane emissions from coal, oil and gas extraction, production and distribution, are our fifth largest source of emissions, reportedly around 10% of total emissions.

Growth in Liquefied Natural Gas (LNG) exports has been a driver of growth in fugitive methane emissions. However, coal mining, domestic gas and oil extraction are an ongoing source. Abandoned unproductive coal mines and gas wells can release significant methane emissions.

Research by the Australian Conservation Foundation (ACF) shows Glencore's Ravensworth underground coal mine in New South Wales, which was mothballed seven years ago, has quietly leaked methane equivalent to more than a million tonnes of CO2. This coal pit has the carbon footprint equivalent to 33,000 cars on the road every year.

This short report highlights the extent of Australia's methane problem, how it is set to grow if gas and coal continue to be pursued for domestic use and export, and outlines some ready solutions.

Below. CSG Gasfields Darling Downs, QLD May 2016.
Photo. Lock The Gate

Background

Methane (CH-4) has long been known to be a potent greenhouse gas. It is around 84 times more powerful than carbon dioxide at warming the atmosphere when assessed over a 20-year period, and around 34 times more powerful over a 100-year period.

The United Nations Intergovernmental Panel on Climate Change (IPCC) Special Report on Global Warming of 1.5°C alerted the world to the fact that humanity is critically close to driving global heating well beyond 1.5°C and past dangerous tipping points. The importance of near-term action makes methane reduction particularly critical given its potency over a short time horizon.

In April 2021, the US National Oceanic and Atmospheric Administration reported that methane levels in the atmosphere are the highest on record.[1] They acknowledged that the largest source of human caused methane emissions — the oil and gas industry — is an important sector for reducing methane emissions.

The responsibility to keep global warming below 1.5 – 2.0°C was accepted by 195 countries, including the biggest and most advanced economies in the world, upon signing the Paris Climate Agreement.

Australia has ratified the Paris Agreement. However, the Australian government's actions are inconsistent with its obligations. The federal government has not: set a long-term emissions reduction target, released a long-term climate strategy, increased its 2030 Paris target (which is more in line with catastrophic 3.0°C than 1.5°C), and to date, has not offered a fair share contribution to mobilising US $100 billion dollars annually to assist low-income countries decarbonise their economies and adapt to unavoidable climate impacts.

Amongst the government's most concerning recent actions is its obsession with gas and its efforts to provide public money to new gas developments despite their dangerous contribution to climate change, including through dangerous fugitive emissions.

1. https://research.noaa.gov/article/ArtMID/587/ArticleID/2742/Despite-pandemic-shutdowns-carbon-dioxide-and-methane-surged-in-2020

Gas led recovery is pervasive in the Australian government's agenda

Methane is the main constituent of gas.[2] Pursuing gas for climate reasons cannot be justified, nor can it be justified for economic reasons as the world transitions rapidly to zero emissions electricity and transport. Yet, the Australian government remains committed to the idea of a 'gas led recovery' and is making significant investment of public funds in new long-lived gas infrastructure — accelerating exploration as part of a plan to open five massive new gas basins and building a new gas-fired power generator in the Hunter region.

The Australian government has also actively promoted gas as a transition fuel to assist with Australia's transition to renewable energy despite experts, including the Australian Energy Market Operator (AEMO), stating that the transition will not require any new gas projects.

Numerous efforts have also been made to turn existing policy and finance/funding bodies into vehicles for the Australian government to provide public funds to the gas and coal industries. These include:

- Proposing amendments to the Clean Energy Finance Corporation (CEFC) Act that would have undermined CEFC's independence, low emissions remit, commitment to profitability, and avoidance of fossil fuels — attempted but failed.
- Attempting significant changes to the remit of the Australian Renewable Energy Agency (ARENA) through regulation — attempt #1 failed, but similar regulations have been re-tabled for a second attempt.[3]
- Proposing amendments to the Northern Australia Infrastructure Facility (NAIF) Act — successful. Followed by a $175m investment in a new Olive Downs coal mine.
- Tabling an Instrument under the Industry Research and Development Act to fund a feasibility study for a new coal-fired power plant at Collinsville — successful despite motions to disallow the Instrument.
- Budgeting $8.7m for an uncompetitive grant to upgrade to the Vales Point coal-fired power plant through the Underwriting New Generation Investment scheme. Vales Point later rejected the grant.
- Tabling an Instrument under the Industry Research and Development Act to boost Australia's diesel storage program.
- Tabling an Instrument under the Industry Research and Development Act to provide $50 million to accelerate exploration through grants to drill wells in the Beetaloo Basin, Northern Territory (NT).
- Announced plan to amend Export Finance Australia (EFA) legislation to make it easier for Australia's Export Credit Agency to fund export-linked projects in Australia.
- Ongoing efforts to change the Emissions Reduction Fund (ERF) so that fossil fuel related projects can bid for climate funding. This includes a proposed new ERF method to support fossil fuel related carbon capture and storage.
- Ongoing efforts to force gas and coal into fed-state energy deals (e.g., New South Wales (NSW) required to 'inject an additional 70 petajoules of gas per year into the east coast market and 'remove barriers to coal supply to the Mount Piper Power Station'.)[4]

2. https://www.britannica.com/science/methane

3. https://www.legislation.gov.au/Details/F2021L01043

4. https://www.pm.gov.au/media nsw-energy-deal-reduce-power-prices-and-emissions

Intergenerational Report and government **action are inconsistent**

The Australian Government's 2021 Intergenerational Report (page 60) anticipates the decline of fossil fuels like coal and gas. The report states:

"129 countries have committed to net zero emissions by 2050, including key trading partners such as Japan and South Korea, while China has committed to carbon neutrality by 2060. In 2019-20, these 3 countries accounted for 87 per cent of Australia's [Liquefied Natural Gas] export value, 74 per cent of Australia's thermal coal export value and 55 per cent of Australia's metallurgical coal export value.

These commitments by other countries, if fully implemented, are likely to reduce demand for unabated fossil fuels over some decades."

Yet, the government continues to fund fossil fuel projects and their dangerous greenhouse emissions.

Fossil fuel sources of methane

Fugitive methane emissions occur during the production, processing, transport, storage, transmission, and distribution of fossil fuels including coal, crude oil and natural gas. Fugitive emissions from gas production are released during flaring, venting and leakage. Coal mining is another source, which can extend well beyond mine closure. Decommissioned underground coal mines continue to contribute to fugitive emissions.

IEA (2021) Net Zero by 2050: A Roadmap for the Global Energy Sector

The International Energy Agency (IEA) has directly countered the Australian government's plan for a gas led recovery stating in their *Net Zero by 2050 Roadmap for the Global Energy Sector* that "beyond projects already committed as of 2021, there are no new oil and gas fields approved for development in our pathway [to net-zero], and no new coal mines or mine extensions are required."

According to the IEA, methane constitutes about 60% of emissions from the coal and natural gas supply chains and about 35% of emissions from the oil supply chain.

The IEA's roadmap sees methane emissions from fossil fuels fall 75% between 2020 and 2030. The decline comes from reducing fossil fuel consumption (roughly a third) as well as other measures.

The IEA makes clear there is no room for new gas developments or expanded methane emissions if the world is to keep 1.5°C of global heating within reach. Methane emissions must be cut deeply and rapidly if this goal is to remain within reach.[5]

[5] https://www.unep.org/news-and-stories/press-release/global-assessment-urgent-steps-must-be-taken-reduce-methane

Australia's fugitive methane emissions are a potent climate problem; **the best solution is a rapid tranformation to renewables**

Previous. Coal fired power station in N.S.W.Australia
Photo. Alf Manciagli / Shutterstock

Global Methane Assessment

The *Global Methane Assessment* released in May 2021 by the Climate and Clean Air Coalition (CCAC) and United Nations Environment Programme (UNEP) determined that human-caused methane emissions can be reduced by up to 45% this decade, and that such reductions would avoid nearly 0.3°C of global warming by 2045 and be consistent with keeping the Paris Climate Agreement's goal to limit global temperature rise to 1.5°C within reach.

The assessment also found that a 45% reduction would prevent 260,000 premature deaths, 775,000 asthma-related hospital visits, 73 billion hours of lost labour from extreme heat, and 25 million tonnes of crop losses annually. Some of these public health benefits relate to the fact that methane causes ground-level ozone, which is a contributor to a range of respiratory problems and other serious medical issues.

The assessment's conclusion was that urgent steps must be taken to reduce methane emissions this decade. The Executive Director of the UNEP concluded that "Cutting methane is the strongest lever we have to slow climate change over the next 25 years and complements necessary efforts to reduce carbon dioxide."

Australia's methane emissions have been **under-estimated**

Reported fugitive emissions have historically been hard to verify, but it's now clear that methane emissions in Australia have been larger than officially reported. In addition, they are set to continue growing.

In 2020, it was revealed that Australia's greenhouse gas accounting had been underestimating national emissions by about 10%.[6] This was mostly due to a failure to properly recognise the impact of methane released during gas production. Changes were made to the *National Greenhouse and Energy Reporting Act* after significant delay.[7] The result was an adjustment to the way methane emissions are converted to a carbon dioxide equivalent. The changes recognised that methane has more significant global warming potential than was being documented. The changes are projected to increase Australia's reported annual emissions by about 3% compared with what they would have been without correcting this error.

Concerns remain that Australia has a problem with full and accurate reporting of methane emissions, particularly those related to coal and gas.

Cutting methane is the strongest lever we have to **slow climate change over the next 25 years** and complements necessary efforts to reduce carbon dioxide.

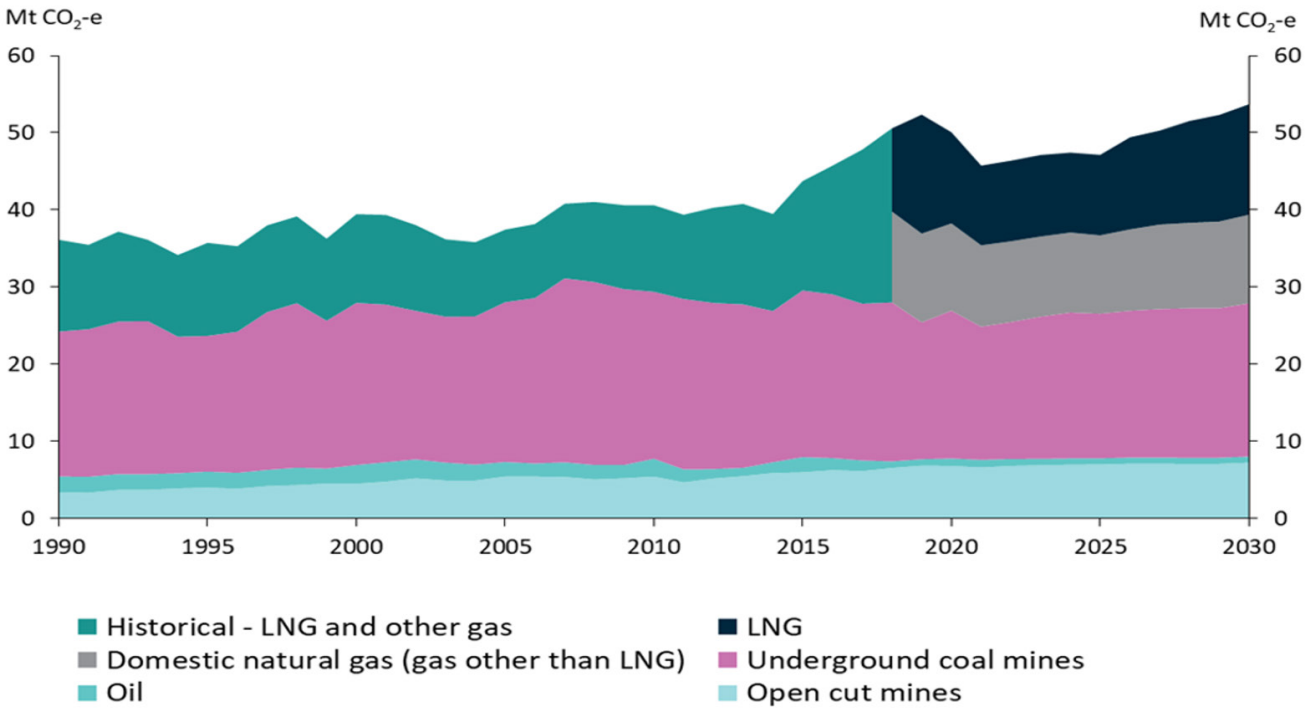
6. https://www.theguardian.com/environment/2020/aug/26/methane-released-in-gas-production-means-australias-emissions-may-be-10-higher-than-reported

7. http://www.cleanenergyregulator.gov.au/NGER/About-the-National-Greenhouse-and-Energy-Reporting-scheme/global-warming-potentials

Current size and sources of **Australia's methane emissions problem**

Australian Government (2021) Quarterly Update of Australia's National Greenhouse Gas Inventory December 2020

Fugitive emissions make up 10% of Australia's reported annual emissions and is our fifth largest source of emissions. The graphic below shows the main sources of fugitive emissions in Australia.

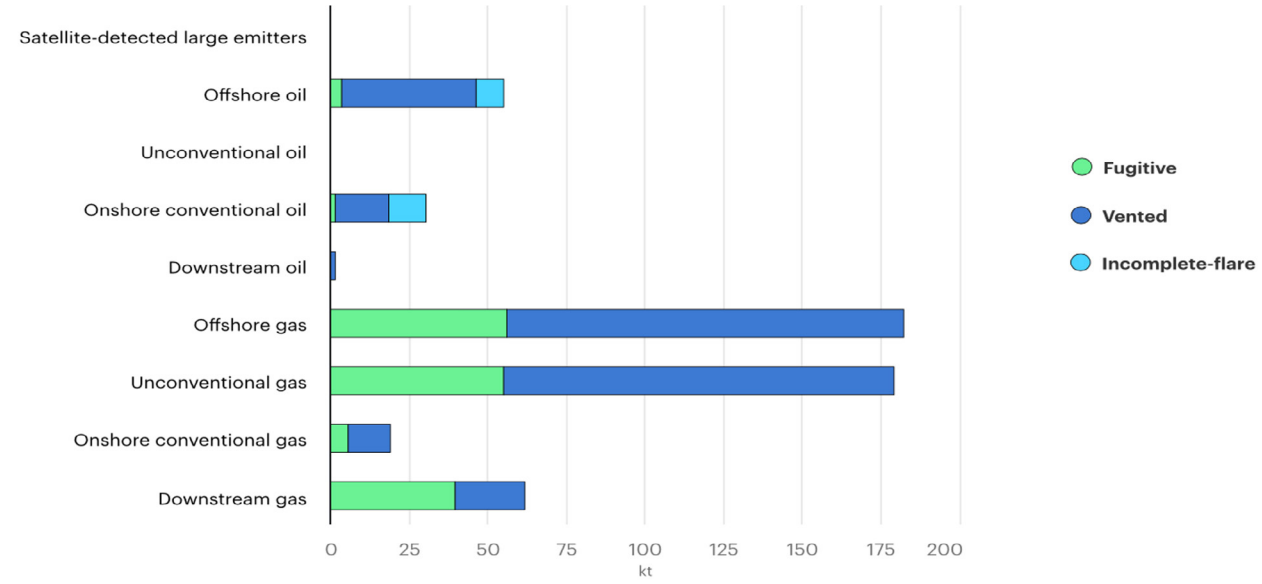


Source: *Australian Government (2020) Australia's emissions projections 2020*

Current size and sources of **Australia's methane emissions problem**

The IEA's summary of Australia's methane emission sources shows that the most significant sources of methane emissions are from offshore gas and unconventional gas, and the majority of those emissions are vented.

Australia emissions sources, IEA estimate



Projected methane emissions from Australia's proposed project pipeline

An analysis of fossil gas projects proposed in Australia concluded that they represent an annual climate impact more than half of Australia's annual emissions. Australia's already identified gas resources, if burned, would have a climate impact larger than annual emissions from any country. Further resources pursued by governments and companies represent a climate impact larger than annual world emissions, taking up 28% of a 1.5°C carbon budget, or 8% of a 2°C budget.

While these alarming estimates calculate potential greenhouse gas emissions that may not eventuate if the projects do not proceed, the Australian government's obsession with gas developments, including opening up massive new basins using public money — regardless of whether they may be considered good investments — increases concern they will indeed add to global heating and the methane problem.

Source: *IEA 2021: Australian methane emissions sources (measured in kilotonnes of methane)*

Current size and sources of **Australia's methane emissions problem**

Beetaloo Basin

The Australian government has released a *Beetaloo Basin Strategic Plan* and followed it with public funds to accelerate exploration and open up the basin to new gas developments. This includes a $224m commitment to the *Beetaloo Basin Strategic Plan* with $50m to provide non-competitive grants for companies to rapidly drill exploration wells.

The Beetaloo Basin in the Northern Territory is the first of five new fossil gas basins that the Australian government plans to open as part of their climate impacting 'gas led recovery.'

The former Federal Environment and Energy Department estimated that Beetaloo "developments could eventually lead to life cycle emissions in Australia of 5 to 39 million tonnes of carbon dioxide equivalent per year."

In addition, the Department acknowledged that "emissions from development of onshore shale gas in the Northern Territory may be difficult to offset and could impact on Australia's progress in meeting Paris Agreement commitments."

These are likely to be significant underestimates of the likely greenhouse gas emissions from opening the Beetaloo Basin to fossil gas developments. NT officials have warned that the emissions could be three times higher. It has been reported that email correspondence from NT officials stated that "[We are] looking at somewhere between 39 million tonnes to 117 million tonnes a year in carbon offsets." This has been calculated to be equivalent to 22% of Australia's current annual emissions.

The NT Fracking Inquiry found that onshore unconventional gas development in the NT would have "unacceptable" climate impacts and should not go ahead unless all greenhouse gas emissions were offset in full, including domestic combustion emissions.

Deloitte's Beetaloo Sub-basin gas development study for the government also acknowledged these risks:

"The NT Fracking Inquiry highlighted the risks related to Scope 1 and 2 emissions from the development of the Beetaloo Sub-basin. As it stands, the NT Fracking Inquiry estimated that a gas field producing 365 PJ/year would also produce 26.5 MtC02-e, whilst a gas field producing 1,240 PJ/year would produce 38.9 MtC02-e. 96 In the second case, this does not include a further 60 MtC02-e produced overseas as a result of LNG exports.97 As such, the risk assessment of the full life-cycle emissions from a new 1,240 PJ/year gas field indicated an "unacceptable" risk for Australian and global emissions.98

Ultimately the NT Fracking Inquiry recommended that the "NT and Australian governments seek to ensure that there is no net increase in the life cycle GHG emissions emitted in Australia from any onshore shale gas produced in the NT."

The NT government agreed to implement the recommendation to offset in full all greenhouse gas emissions when overturning their moratorium on hydraulic fracturing (fracking). At current low offset prices in Australia, it has been estimated that offsetting projected emissions would cost more than half a billion dollars every year. At projected Paris-aligned prices the cost is estimated to be closer to $4bn. Despite resumption of exploration, including exploratory drilling in the Beetaloo sub-basin, there is still no clarity on how offsets will be acquired and who will pay for them.

Below. Coal mine. *Photo.* Steve Morfi / Shutterstock

Current size and sources of **Australia's methane emissions problem**

Methane from coal

Geo analytics firm, Kayrros SAS, used satellite observations from the European Space Agency to determine that the Bowen Basin in Queensland, which is one of the world's largest exporters of metallurgical coal, is producing significantly more methane emissions than global competitors. They determined that for every tonne of coal produced in the Bowen Basin, an average of 7.5 kilograms of methane are released. This is 47% higher than the global average.[8] The methane released annually from the Bowen Basin is 1.6 million tonnes.

While many claims have been made by the Australian government about the climate benefit of exporting Australia's coal due to its comparatively higher quality and lower emissions, the extremely high methane emissions from the Bowen Basin's metallurgical coal does not appear to have been a consideration. The added methane burden, even for steel making coal, should be acknowledged as a serious concern and all possible measures should be taken to reduce methane release into the atmosphere.

8. https://www.bloomberg.com/news/articles/2021-07-06/top-australian-coal-mines-are-spewing-more-methane-than-rivals

Case study: Methane emissions from the closed Ravensworth Underground Mine

Australia has more than 50,000 abandoned mines, and there are thousands of abandoned petroleum and gas wells. State auditors general in New South Wales and Victoria have highlighted risks to the environment from abandoned or inadequately decommissioned mines and wells.

The Ravensworth coal mine is a zombie mine that hasn't produced a lump of coal since 2014, but every year it vents a huge amount of methane into the atmosphere.

Since Ravensworth Underground Mine was mothballed seven years ago, it has quietly leaked methane equivalent to more than a million tonnes of CO2. This coal pit might be out of sight and out of the public mind, but it has a carbon footprint equivalent to 33,000 cars on the road every year.

In its Climate Report 2020: Pathway to Net Zero Glencore boasts about capturing and flaring methane from its Australian mines since 2008. However, at Ravensworth Underground Mine, Glencore has ceased trying to capture or flare. Instead, it is now venting methane directly into the atmosphere.

Globally, the coal mining industry accounts for about 8% of total methane emissions. After closure, underground coal mines continue to release methane into the atmosphere. This methane is known as abandoned mine methane (AMM). AMM is an important but often overlooked source of methane emissions.

Ravensworth Underground Mine lies beneath the traditional lands of the Wonnarua people, 25km northwest of Singleton, in the Hunter Valley, NSW.

Glencore, which has managed the mine since 2008, stopped digging in 2014 due to low coal prices, high mining costs, and 'geological constraints.' Since the last 130 miners were laid off in late 2014, the longwalls have sat untouched, but the now-opened coal seams continue to release coal seam gas — in the form of methane.

Above the surface, the only sign of the underground mine is three cylindrical tanks — enclosed methane flares built to burn vented gas at a rate of 3,000 litres per second. But for the last few years, the flares have been silent. Documents obtained by ACF reveal that Glencore shut down the flares sometime before 2018.

It is not clear exactly when or why flaring ceased, or whether flaring could at that time have been considered part of Glencore's promise to 'implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site,' as required by the conditions of approval for the mine's expansion.

The Ravensworth coal mine is a zombie mine that hasn't produced a lump of coal since 2014, but **every year it vents a huge amount of methane into the atmosphere.**

When Glencore asked for permission to expand Ravensworth Underground Mine in 2010, approval was granted on the condition that Glencore minimises emissions by finding a way to capture and reuse the methane leaching out of the coal seam. When Glencore failed to do that, the NSW government watered down the condition to allow Glencore to instead carry out 'option 2', which was flaring the methane —burning it before releasing it directly into the air.

Above. CSG Gasfields Darling Downs, QLD May 2016.
Photo. Lock The Gate

There's a reason flaring was considered 'option 2' for every party involved in that approval process. Flaring is bad (the IEA is putting pressure on petroleum companies around the world to stop it) but it's vastly better than venting the methane straight into the atmosphere. Flaring converts the methane to less potent heat-trapping CO2, reducing the damage done when gas has nowhere to go but up.

Despite Ravensworth Underground Mine leaking more than a million tonnes of greenhouse gases since Glencore shut it down, Glencore appears to be patting itself on the back. In the 2019 Ravensworth Complex Annual Review, Glencore reports 'There are no proposed improvements for greenhouse gas in 2020, with 2019 GHG emissions falling well below predicted levels.'

The trouble is, those predicted levels — reported in management plans and to the National Greenhouse and Energy Reporting (NGER) register — are based on a version of the mine that is fully operational. Right now, Ravensworth Underground Mine employs no miners and produces nothing — but is not formally closed, not rehabilitated, not relinquished, and still pumping out methane equivalent to over 150,000 tonnes of CO2 pollution every year, effectively unchecked. ACF knows of no mechanism requiring coal mines in care and maintenance to reassess and minimise emissions when production is suspended or stopped.

This unchecked methane release seriously undermines Australia's work to cut its emissions and undoes great work farmers and other landholders are doing to sequester carbon.

While sitting idle for the last seven years, Ravensworth Underground Mine has emitted the same amount of carbon that taxpayers have spent ($12-15 million dollars) through the Emissions Reduction Fund (ERF) to sequester carbon elsewhere. To put it another way, that's roughly 2% of all the carbon Australia has officially abated since the ERF's carbon abatement program started in 2015.

And Ravensworth Underground Mine isn't the only zombie mine. Across Australia, between 206 and 972 mines are in 'care and maintenance,' according to official estimates analysed by The Australia Institute.

The ability to put a mine into 'care and maintenance' allows miners to avoid their environmental and social obligations and contributes to the low proportion of mines that are closed and rehabilitated.

Mines can be left in 'care and maintenance' for decades. Of all 644 recorded mines in NSW, only one has ever been fully closed, rehabilitated and relinquished, according to official government data analysed by The Australia Institute. Australia-wide, fewer than 30 mines have ever been fully closed, rehabilitated and relinquished.

The 2019 Senate Committee report [on Rehabilitation of mining and resources projects and power station ash dams as it relates to Commonwealth responsibilities] identified significant stakeholder concern that the practice of placing mine sites into care and maintenance indefinitely can be used by operators to deliberately avoid their rehabilitation obligations, citing case studies of mines in Queensland and the Northern Territory.

Without enforceable national standards or sufficient state requirements, 'care and maintenance' mode can delay — virtually indefinitely — rehabilitation work, including work that would stop methane being needlessly vented into the atmosphere. Studies in the US have shown abandoned coal mines continue to pump out methane for 'an extended period' — at least 15 years. Timely rehabilitation can bring that down by years or decades, significantly reducing the volume of methane unnecessarily polluting our planet and heating our climate.

New satellite technology providing a transparency solution

There is good news to help address concerns about unreported methane pollution. New technology is being launched to shine a light on the world's greatest offenders. Australia, like other countries will be viewed by satellite trackers that will measure methane pollution from oil and gas facilities worldwide 'with broad scope and exacting precision.'[9] MethaneSAT is one of these satellites. Due to be launched next year, MethaneSAT will focus only on methane and its data will be quickly made available for public use.

The most effective solution is to rapidly transition away from coal, oil and gas to renewable electricity, improved energy efficiency and demand management.

There are solutions available to cut fugitive methane emissions

Unlike CO2 which stays in the atmosphere for hundreds of years, methane starts breaking down quickly, with much of it gone after a decade. This means cutting methane emissions now can rapidly reduce the rate of warming in the near-term, and this is critical to keeping global warming as close to 1.5°C as possible.

There are cost effective measures available today that can achieve cuts in fugitive methane emissions from coal, oil and gas.

The most effective solution is to rapidly transition away from coal, oil and gas to renewable electricity, improved energy efficiency and demand management.

However, as the transition occurs and until fossil fuel operations cease, there are targeted measures that should be applied. These include:

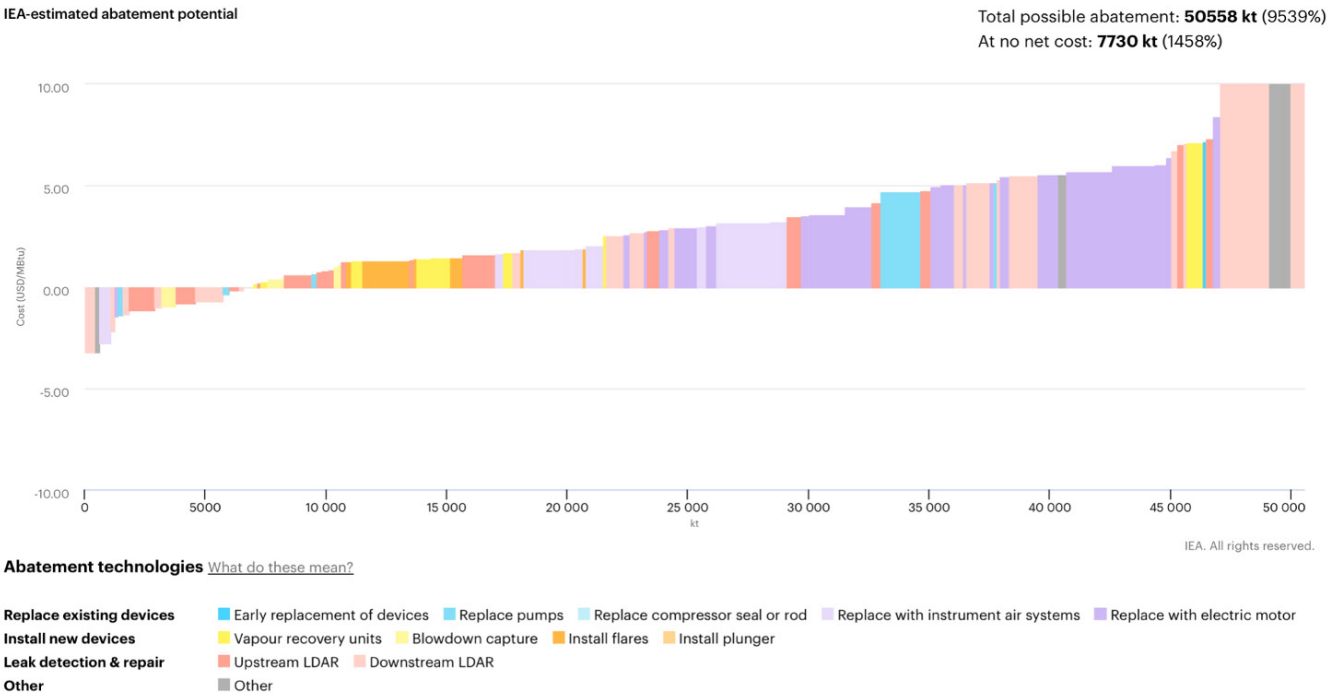
- detecting and repairing leaks
- recovering vented gas (capture, vapour recovery units, well plungers, flares)
- improving fugitive emissions control (cap unused wells, replace gas pumps and devices with electric or air systems and motors)
- managing coal mines (de-gasification, oxidising air methane, flooding abandoned mines).

The IEA has identified opportunities for global methane abatement including abatement technologies (see graphic below). Many can be applied at no net cost.

[9] https://www.edf.org/climate/how-methanesat-is-different

New satellite technology providing a transparency solution

IEA global abatement potential



These measures should be required urgently by the Australian government along with rapidly reducing reliance on fossil fuels through renewable electricity and energy efficiency measures.

Methane reduction has become a critical part of the global effort to tackle climate change. There are good examples of jurisdictions that are leading the way with actions to address fugitive methane including targets, strategies, regulations and funding. Examples include:

- The Biden Administration has committed $16 billion to clean up old mine sites and plug abandoned oil and gas wells.
- California has set a target to reduce methane by 40% below 2013 levels and new regulations.
- The European Union is expected to set new methane targets/strategies this year covering the entire gas chain (e.g., transmission, distribution, storage, and regasification).
- Canada and Mexico have set federal regulations.

Source: *IEA 2021*

New satellite technology providing a transparency solution

Mine closure and rehabilitation: the path forward

The Ravensworth case study (above) provides an example of a single coal mine that has leaked methane equivalent to more than a million tonnes of CO2 since it was mothballed. Multiply that potential for methane leakage across the many hundreds of coal mines held in care and maintenance in Australia and the thousands of abandoned petroleum and gas wells. The result is likely to be shocking. Australia's fugitive methane problem is both historic and growing, yet it is not entirely transparent, understood or controlled.

In 2016, the ACF commissioned a report from the Mineral Policy Institute[10] that highlighted the systemic and structural failures in the regulation of mine closure and rehabilitation in Australia. *Ground Truths: Taking responsibility for Australia's mining legacy* revealed a looming disaster that urgently required national action, noting then there were 50,000 abandoned mines in Australia and that a failure to reform the regulation of mine closures will result in long term pollution affecting communities, water, air and wildlife.

Now, five years later, Australia is no closer to understanding the extent of the problem, including the full extent of fugitive emissions from Australia's fossil fuel mining legacy. Nor are there clear and consistent policy settings in place to ensure that owners of post-production mines and wells have taken necessary actions to reduce fugitive methane, and other toxic pollutants as quickly and permanently as possible.

As such, many of the recommendations made in ACF's 2016 mine rehabilitation report remain relevant today. Some of these include:

- Establish a national inquiry into mine site rehabilitation and mine closure practices including the adequacy of existing regulatory regimes, the extent of financial liability and changes required to securely fund the long-term management of mining sites, the environmental, economic and social risks associated with un-remediated sites and the role of mine rehabilitation in providing employment opportunities in the post-mining boom era.
- Implement a national legal obligation for closure liability accounting and reporting on a site-by-site basis, to be included in annual financial statements and as a separate line item in company balance sheets.
- Encourage and facilitate greater jurisdictional coordination. Adopt Australian minimum standards: (a) post closure assessment and reporting, (b) greater transparency and independent assessment of mining proposals and (c) environmental financial instruments.
- Legislate for and implement national annual reporting on the impacts of mine closure. This must include the financial liability from both mining legacies and post-mine management.

In addition, timing and enforcement related to the movement of mines from care and maintenance to decommissioning and rehabilitation should be reviewed and tightened so that closed mines are rehabilitated as quickly as possible to reduce long-term risks of fugitive methane emissions, and other toxic pollutants.

[10] https://d3n8a8pro7vhmx.cloudfront.net/auscon/pages/847/attachments/original/1466127496/MPI_mine_rehab_report.pdf?1466127496

Below. Oil and gas refinery plant. *Photo.* ToppyBaker / Shutterstock

Summary

Methane is a critical global concern and reducing its impacts is a key part of keeping 1.5°C of global warming within reach.

Australia's fugitive methane emissions are growing — in defiance of the global call for rapid methane reductions. They are projected to remain on an upward trend due to the Australian government's obsession with fossil gas, and failure to create strong and enforceable national standards to regulate fugitive emissions from mothballed coal mines and gas wells.

Australia's current inaction on greenhouse gas emissions, including fugitive methane, is unsustainable. Methane emissions are becoming increasing visible with satellite trackers providing detailed, publicly available data that pinpoints releases, soon making it impossible to inaccurately report or ignore fugitive methane from coal, oil and gas.

Australia's most immediate path forward must be to stop investing public money in new coal, oil or gas developments and to accelerate the development of clean renewable energy both for domestic use and export.

Methane is a critical global concern and reducing its impacts is a key part of keeping 1.5 degrees of global warming within reach.

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