EMBER

The Cost of Extending a Mine

The Lake Vermont mine and extension could release up to 100 million tonnes of C02-e if approved, before any of its coal is burned.

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About

This research evaluates the integrity of the estimated Scope 1 (methane) emissions from the Lake Vermont mine, which is currently seeking approval to expand its underground and surface mining. Ember's independent assessment of the likely methane emissions from the extension relied upon reported run-of-mine coal production data, State-based emissions factors and comparisons against the average methane intensity of underground mines in the Bowen Basin according to their emissions reporting to the Clean Energy Regulator (2016-2021).

Executive Summary

The climate impact of mining at Lake Vermont could be double what is currently estimated

The Lake Vermont mine is currently applying for permission to ramp up coal production and release the carbon equivalent of up to 100 million tonnes of CO2-e over the next 23 years until 2055, as Australia targets net zero by 2050.

The Lake Vermont Meadowbrook Extension Project, which is 70% owned by Queensland mining company [Jellinbah Group Pty Ltd](#), is currently applying to expand its mining operations until 2055. The application includes plans to start underground and expand open-cut mine operations.

Ember's analysis indicates that the mine may be significantly under-estimating the potential methane emissions that will result from the mine's operation, and pose a significant threat to both the legitimacy of the Safeguard Mechanism, and make it far more difficult for the Australian and Queensland governments to achieve their climate targets.

01   100 million tonnes of C02-e

The lifetime methane emissions of the mine could be between 78 - 100 million tonnes of CO2-e (20yr GWP).

02   2 - 2.5 x under-estimate

The methane emissions could be between 2.2 and 2.5 times higher than the company estimates in the EIS.

03   30+ years of unabated emissions

The mine has no credible emissions reduction pathway over the lifetime of the mine.

The Lake Vermont mine extension is now due to be considered by the Queensland government and the federal government (through the bilateral process under the *EPBC Act*). Based on the significant risk that the mine has under-estimated its methane pollution emissions, and has no clear plan for mitigating these emissions onsite, Ember is concerned the approval of the extension will pose a risk to the Safeguard Mechanism, as well as the Queensland and Australian government climate targets for 2030, and 2050.

"The Lake Vermont Meadowbrook proposal is symptomatic of a much bigger problem. Proposed coal mines and expansions are under-estimating their methane emissions, relying on lax emissions measurement laws, to avoid regulatory and public scrutiny."

"Poor estimates prevent regulators from properly assessing the environmental and climate impacts of these projects, leading to inadequate environmental approval conditions or pollution controls. Instead of being a rigorous process that reduces climate harms, coal facilities are getting away with a licence to pollute - risking the safeguard mechanism and Australia's climate targets."

Annika Reynolds
Climate Policy Advisor, Ember

Lake Vermont's methane emissions are a threat to Queensland and Australia's climate targets

The Lake Vermont mine is currently applying for permission to release the carbon equivalent of up to 100 million tonnes of CO2-e emissions over the next 23 years.

The Lake Vermont Meadowbrook Extension Project, which is 70% owned by Queensland mining company Jellinbah Group Pty Ltd, is currently applying to expand its mining operations until 2055. The application includes plans to expand both underground and open-cut mine operations.

Our modelling and independent calculations indicate that the methane intensity of the underground operations contemplated by the Lake Vermont Extension are more likely to be within the range 7 to 9 tonnes of methane per thousand tonnes of coal. This would result in lifetime methane emissions of between 27 and 34 million tonnes of CO2-e emissions (100 year GWP) and 78 - 100 million tonnes of CO2-e emissions when accounting for the 20 year climate impact of methane (20 year GWP).

This is before any of that coal is even burned.

Ember estimates that the climate impact of the Lake Vermont mine could be up to 2.5 x higher than estimated

■ EIS Estimate ■ Ember Estimate

Lifetime methane emissions (100 year GWP)

Lifetime methane emissions (20 year GWP)

CO2–e million tonnes
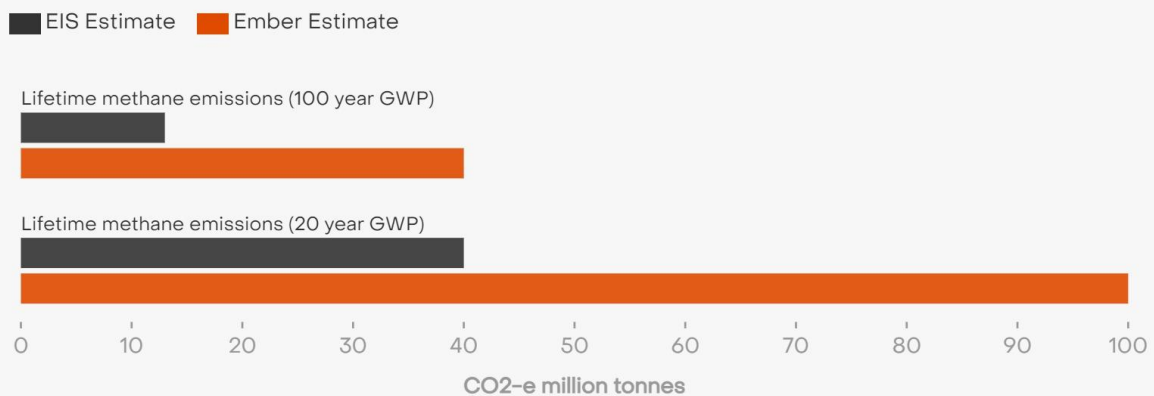
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The methane emissions could be between 2.2 and 2.5 times higher than the company estimates.

The mine has submitted an Environmental Impact Statement (EIS), with an estimate that the current mine and proposed extension will emit the equivalent of 13 million tonnes of CO2-e (100 year GWP). However, this estimate relies upon outdated and inaccurate methods.

In particular, the mine's 23 years of planned underground mining operations have been significantly underestimated, especially compared with other neighbouring underground mines. These underground methane emissions represent the lion's share of their potential methane emissions between now and 2055.

Lake Vermont methane content is significantly below the average for operating underground mines in the Bowen Basin

Coal methane content [Tonnes methane per thousand tonnes of coal]
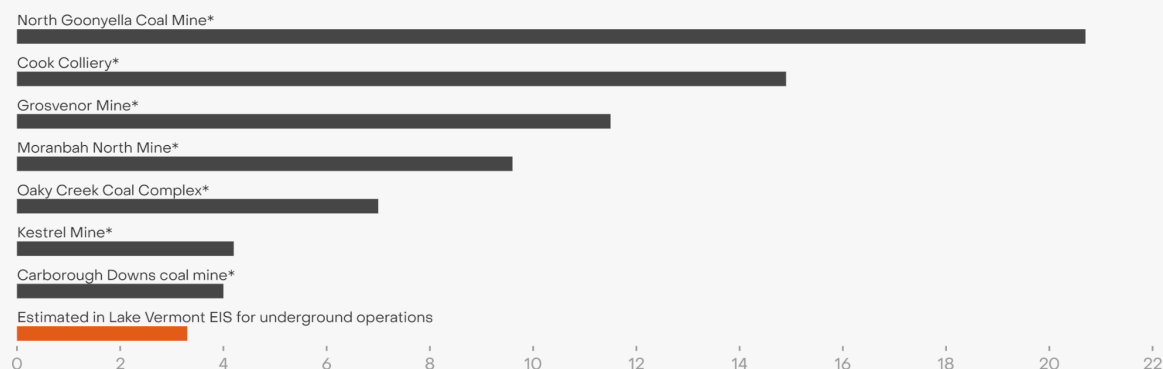
Source: Ember Calculations , Clean Energy Regulator · *Average calculated from reported emissions to CER

This will impact the Safeguard Mechanism, and make it more difficult for the Australian and the Queensland governments to achieve their climate target

The existing Lake Vermont mine is currently regulated under the safeguard mechanism, and would report as a single facility if the extension is approved. According to the mine operator's own estimates, the mine extension is expected to push their emissions 1.4 times higher than the current baseline.

Ember's analysis indicates this could be a significant under-estimate, increasing the likelihood that the project will exceed its current baseline going forwards. If that happens, the mine's increased emissions would mean that it would either need to negotiate for a higher baseline under the safeguard mechanism, or rely on a significant number of Australian Carbon Credit Units to remain compliant with its obligations.

In either case, approving this extension would increase the total emissions currently regulated under the safeguard mechanism and impact whether the safeguard mechanism drives genuine emissions reduction to 2030 and beyond.

Considering the significantly increased emissions potential, the proposed lifetime of the coal mine extension and the lack of any clear mitigation plan, the mine would also make it more

difficult for the Queensland and Australian government's to meet both their 2030 and 2050 emissions reduction targets.

> **"Australia should be leading international best practice for measuring and mitigating methane emissions from its coal mining sector."**
>
> "Instead, cases such as the Lake Vermont Meadowbrook Extension highlight an inadequate approach to estimating methane pollution, the lack of an independent third party review mechanism, and the clear lack of regulation for onsite mitigation at coal mines."
>
> "This project does not currently demonstrate integrity in the estimation, or management of methane emissions."
>
> **Dr. Sabina Assan**
> Coal Mine Methane Analyst

There is no credible mitigation plan over the next 30 years as the mine emits up to 100 million tonnes of CO2-e emissions.

Coal mines have a variety of off-the shelf, cost effective methane mitigation options that have been in practice across the industry for the last 25 years. However, the mine has not made any clear commitments to bring down their potential emissions over the next 30+ years.

The Queensland Department of Resources determined from a study of coal mines in the Bowen Basin, that on average 35% of methane emissions from open cut coal mine operations can be reduced or eliminated through pre-drainage. This could reduce emissions from the open cut operations by **63 thousand tonnes of methane, or more than 5 million tonnes of CO2-e emissions (20 year GWP)**.

Their underground mining operations have even more cost effective mitigation options available. Not only would pre-drainage increase the safety of underground mining operations, but the mine could also potentially install technologies to capture and destroy the ventilation air methane throughout its operations. Currently, the mine has indicated that this methane will be flared "where practicable" and has no responsible pathway for mitigating these emissions.

This is in clear opposition to international best practices and the objectives of the Federal Government's safeguard mechanism. In contrast, the [EU parliament has recently passed legislation](#) banning any venting of this methane directly into the atmosphere, and ensuring at least a 98% efficiency rating for any methane flaring, capture or utilisation.

Methodology

Conversion Factors

This submission is based on the GWPs contained in the IPCC's latest [emissions metrics](#), in order to express methane in CO2-equivalent emissions. Throughout the report, where methane emissions data was reported in metres cubed it has been converted into methane emissions in tonnes using the [conversion factors](#) applied by the United States EPA.

Calculating the Estimated Methane Emissions from the EIS and Independently

This submission has calculated estimated methane emissions from the fugitive emissions estimated in tonnes CO2-e by the proponent in the EIS. Methane emissions from the current Lake Vermont mine operations were estimated by using the reported run-of-mine coal production and the relevant State-based emissions factor, and calculations of the estimated underground methane emissions were derived from comparing the open cut mine emissions to the total estimated fugitive emissions provided in the EIS. Our analysis on the average methane intensity of underground mines in the Bowen Basin is based on data reported to the Clean Energy Regulator in CO2-equivalent emissions, averaged over the last five years (2016-2021). To convert to methane emissions, our analysis assumed that 90% of reported CO2-e emissions from underground mines are fugitive methane.

Acknowledgements

Ember's submission

This analysis draws from Ember's submission to the Chief Executive, Queensland Department of Environment and Science, in regards to the [Proposed Lake Vermont Meadowbrook Project](#) prepared by Bowen Basin Coal Pty Ltd. The submission was authored by Annika Reynolds and Dr Sabina Assan, with contributions from Chris Wright.

Header image

Coal loading stockpile by night.

Credit: Doug Steley B / Alamy Stock Photo