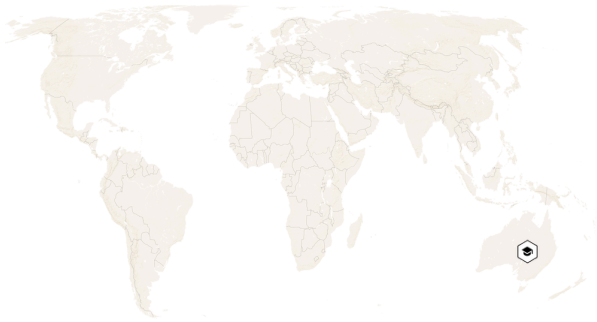
MEASUREMENT OF LNG FACILITY EMISSIONS IN AUSTRALIA

Surveying all onshore LNG liquefaction facilities in Australia to improve understanding of industry-wide emissions and provide most comprehensive dataset of LNG liquefaction emissions to date.



DONOR:
European Commission

BENEFITTING COUNTRIES OR REGIONS:
Australia

SECTOR:
Oil & Gas

STATUS: **Published**

TIMELINE: **Measurements 2023 to 2024, paper published 2025**

IMEO SCIENCE OBJECTIVE:

→ **Advance reconciliation and data integration approaches for multi-scale emissions data**



KEY FINDINGS

The study has two components. First, the quantification methods were evaluated against operator reporting of carbon dioxide emissions. This established that the methane emissions quantification was accurate and unbiased. In the second phase, the validated methods are applied to quantify emissions at each onshore LNG liquefaction facility in Australia and derive industry-wide estimates of production-normalized methane emissions intensity.

RATIONALE

Liquified Natural Gas (LNG) has emerged as a major import and export product around the world, with the IEA projecting over 250 billion cubic meters of liquefaction capacity to be brought online annually through 2030. However, amid this growth there remains significant uncertainty surrounding methane emissions from LNG facilities (liquefaction, regasification and shipping). This study aims to conduct facility-level airborne measurements of all onshore LNG liquefaction facilities in Australia, a major global LNG exporter. The results will improve knowledge of industry-wide emissions and emission intensities while identifying common factors responsible for varying levels of emissions.

United Nations Environment Programme | International Methane Emissions Observatory
1 rue Miollis 75015 Paris, France | methanedata.unep.org
For more information, please contact unep-methanescience@un.org

RELATED PUBLICATIONS

An evaluation of airborne mass balance and tracer correlation approaches to estimate site-level CH4 emissions from LNG facilities using CO2 as a tracer of opportunity (Lunt et al. 2025)

SIGNIFICANCE FOR DECISIONMAKERS

For buyer countries:
Liquefaction is a key part of the global LNG supply chain, but few studies have examined emissions from a wide number of these assets of different ages and design specifications. This study will establish a more comprehensive understanding of the emissions associated with imported gas. For buyers, this provides the information required to ask questions of their suppliers and their commitments to reduce methane emissions.

For policymakers:
The work will establish whether common emission factor-based methods for reporting LNG emissions are representative of the measurement-based emissions of both carbon dioxide and methane, and whether current reporting methods are fit for purpose.

STUDY APPROACH/ACTIVITIES

Measurements of carbon dioxide and methane were taken from an aircraft flying downwind of LNG facilities. At least five days of measurements were performed around each site, with multiple quantifications per site. In total, over 100 quantifications of LNG emissions were collected as part of the study, providing the most extensive dataset of LNG emissions to date.

CATALYZING ACTION

Insights from the study that can be used to better understand emissions have been shared with facility operators. Methods and preliminary insights have also been shared with the Australian Department of Climate Change, Energy, the Environment and Water to aid ongoing efforts to ensure accurate reporting of emissions.

OTHER SUPPORTERS/STAKEHOLDERS

Principal Investigator: **Airborne Research Australia, Australia**



The UN Environment Programme's International Methane Emissions Observatory (IMEO) exists to provide open, reliable, and actionable data to the individuals with the agency to reduce methane emissions. IMEO does this by integrating and reconciling data across sources, including its global methane science studies. IMEO supports measurement and research studies around the world to close the knowledge gap on methane emissions and provide policy-relevant insights to decisionmakers.