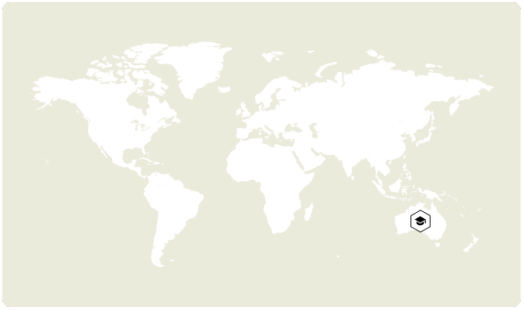
RECONCILING LNG EMISSIONS

Comparing measured emissions at LNG facilities with estimates derived from measurement-based, source-level emission factors.



DONOR:
Oil and Gas Climate Initiative

BENEFITTING COUNTRIES OR REGIONS:
Australia

SECTOR:
Oil & Gas

Subsector, if applicable:
LNG

STATUS:
Manuscript drafting

TIMELINE:
Measurements 2021

IMEO SCIENCE OBJECTIVE:

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

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KEY FINDINGS

To enable more accurate assessment of LNG emissions, this study attempts to reconcile emission estimates obtained from two independent measurement approaches at two LNG liquefaction plants. The reconciliation will compare emissions estimated from different measurement approaches and explore whether the contribution of emissions from different known emission points in a site are representative of all sources within the LNG facility when scaled by production data.

RATIONALE

Liquified Natural Gas (LNG) has emerged as a major import and export product around the world, with the International Energy Agency 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).

RELATED PUBLICATIONS

In progress

SIGNIFICANCE FOR DECISIONMAKERS

For LNG operators: Company members of UNEP's Oil and Gas Methane Partnership 2.0 (OGMP 2.0) must reconcile source- and site-level measurements to achieve OGMP 2.0's Level 5 emissions reporting. This study will outline key considerations for oil and gas operators in this process through a practical example of reconciliation of source- and site-level measurements at two LNG liquefaction facilities. The work will explore the overlap between site-level and total source-level emission estimates and investigate reasons for differences between them.

STUDY APPROACH/ACTIVITIES

The study combines two measurement approaches at different scales to quantify and compare emissions at source and site level. A ground-based instrument was used to estimate emissions and generate production-weighted emission factors from several individual sources within each LNG site. At a different time, measurements from an aircraft were used to quantify the total methane emissions from both sites. Emissions at the time of the aircraft measurements were compared by using operator activity data to calculate source-level emissions based on emission factors derived using the ground-based measurements.

CATALYZING ACTION

The project stimulated the pursuit of further airborne measurements from a wider selection of LNG facilities, as well as efforts to better characterize the accuracy of the measurement approaches.

OTHER SUPPORTERS/STAKEHOLDERS

Principal Investigator: **National Physical Laboratory, UK**

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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.