

EMISSIONS FROM COAL SEAM GAS PRODUCTION IN AUSTRALIA



Natural gas production from coal seams is an increasing but understudied phenomenon. While emissions are relatively low, measurements indicate mitigation opportunities.



DONOR:
OGCI



BENEFITTING COUNTRIES OR REGIONS:
Australia



SECTOR:
Natural gas



Subsector, if applicable:
Gas production from coal seams

STATUS:
Published

TIMELINE:
Measurements 2018; Latest publication 2022



IMEO SCIENCE OBJECTIVE:

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



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KEY FINDINGS

This study found that measurement of dual isotopic signatures of methane can help to distinguish coal seam gas emissions from other individual source sectors in the Surat basin such as agriculture, waste and coal mine methane. CSG upstream sources emit about 0.4 per cent of produced gas, which is comparable to some onshore dry gas fields (Marcellus Shale in the US and Groningen field in The Netherlands). However, it is substantially smaller than other regions, especially those where oil is co-produced (wet gas).

This study identified that water management/brine ponds associated with CSG may be a mitigation opportunity overlooked by existing bottom-up emissions inventories.

RATIONALE

Coal-seam gas production is an increasing but understudied phenomenon. It is important to understand the scale and scope of emissions from the practice to better manage them. This study provides data about emissions from coal-seam gas production and represents a critical first step in understanding other places where this production occurs. The Surat Basin is Australia's largest coal seam gas (CSG) basin accounting for almost 20 per cent of Australian natural gas production, and is the focus of this study.



RELATED PUBLICATIONS

Dual isotopic signatures (Lu et al., 2021);
Inventory comparison (Neininger et al., 2021);
Isotopes identify inventory knowledge gaps (Kelly et al., 2022)



SIGNIFICANCE FOR DECISIONMAKERS

For Oil and Gas Operators and Executives

Methane emissions at individual gas production sites in the Surat basin appear relatively low and comparable with other dry gas fields. However, accurate reporting must include all associated processes and facilities including CSG brine ponds, which collect large amounts of water from the coal seams. These ponds appear to produce short but large releases of methane to the atmosphere, which need to be captured for mitigation and measured for accurate reporting.

For Policymakers

The emission levels from CSG in the Surat basin are relatively small on a per well basis and on a per area basis. These low levels are difficult to detect by existing satellites, and difficult to attribute to natural gas production given the wide spectrum of agricultural methane sources nearby. However, the total CSG-related emissions will increasingly be important as well-count increases. As such, requirements for CSG operators to locally measure top-down and report their emissions will become more important.



CATALYZING ACTION

The Surat study team conducted a month-long measurement campaign to characterize CSG related methane emissions using a variety of measurements (methane and methane isotopes in vehicles and on aircraft). Aerial mass balances were calculated based for 32 subregions allowing the emission quantification of these sub-regions, the detection of spatial emission patterns and their comparison with an existing gridded emission inventory.



STUDY APPROACH/ACTIVITIES

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OTHER SUPPORTERS/STAKEHOLDERS

Principal Investigator: **Airborne Research Australia, Australia; University of New South Wales, Australia**

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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.