



SOCIAL AND ECONOMIC IMPACTS AND OPPORTUNITIES

GISERA | Gas Industry Social and Environmental Research Alliance

Offsets for greenhouse gas emissions of onshore gas in the Northern Territory

This project seeks feasible options to offset lifecycle greenhouse gas (GHG) emissions associated with proposed production and consumption of onshore gas extracted from the Beetaloo Sub-basin.

The Beetaloo Sub-basin

The Beetaloo Sub-basin is situated southeast of Katherine in the Northern Territory and spans approximately 30,000 square kilometres. One of the most promising areas for shale gas production in Australia, it contains an estimated gas resource of 178,200 petajoules (PJ).

As there is currently no natural gas production in the Beetaloo, the project will use scenario analysis to represent potential gas extraction, coupled with technical calculations on the GHG emissions implications of those scenarios.

NT Hydraulic Fracturing Inquiry Recommendations

GHG emissions offsets are accounting mechanisms to counteract emissions produced by an activity with another activity that reduces emissions. Examples in Australia include reforestation, avoided de-forestation, carbon capture and storage, and support of Indigenous fire management in Northern Australia.

Carbon offset markets can be complex and since the COP 21 Paris agreement there has been greater scrutiny of their governance and efficacy.

The project will simulate the implementation of carbon offset options over the lifetime of the onshore gas production scenarios, with a particular focus on domestic options that engage with the Northern Territory Aboriginal Carbon Industry Strategy.

Recommendations for offset options will be based on maturity of technology, demonstrated effectiveness, application at scale, quality of governance and indicative cost.

The final project outcome will be a report combining the production scenarios and options for offsetting the emissions from those scenarios, with the aim of net zero increase in lifecycle GHG emissions.

Key points

- Lifecycle GHG emissions take into account all stages of gas field development, including exploration, construction, and final combustion.
- A key aspect in developing natural gas is the estimation of fugitive methane emissions from production scenarios.
- CSIRO has conducted research on methane emissions for more than 30 years across a range of industries, including Queensland's coal seam gas industry.
- This project will assess life cycle GHG emissions from onshore shale gas extraction in the Beetaloo Sub-basin, and will explore options for mitigating and offsetting their contribution to climate change.



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Establishing the scope of the project

There are Government and community concerns that GHG emissions from any new onshore gas project might challenge Australia's commitment to emissions reduction in line with international agreements.

There is a need to respond to these concerns with quantitative analysis of the lifecycle emissions that may result from gas extraction in the Beetaloo Sub-basin, and what measures could be taken to abate those emissions.

The project will begin with extensive stakeholder consultation to establish the conceptual and physical scope of the work. The scale, geography, geology and infrastructure needs of onshore gas production in the Beetaloo need to be taken into consideration.

Developing emissions production scenarios

Information gathered during the initial scoping exercises will inform the development of gas production scenarios within the Beetaloo and the resulting GHG emissions from construction and operations.

Factors that will influence those scenarios include: number of wells, drilling, finishing and operational emissions (including fugitive emissions); energy and emissions for gas and water treatment facilities; pumping and pipeline transport; and gas consumption in Australia.

Lifecycle analysis of emissions production scenarios

Lifecycle analysis (LCA) examines all inputs to a product – in this case natural gas – through a detailed look at each process in the supply chain and then establishing an emissions intensity for each element.

LCA assigns an environmental impact per unit – in this case, 'a petajoule (PJ) of natural gas produced from the Beetaloo Sub-basin'. Emissions that arise from the combustion of exported gas will be excluded.

This component of the project provides a clear link between the gas production scenarios developed previously, and the exploration of offset options that will follow.

Options for offsetting

The Final Report of the Scientific Inquiry into Hydraulic Fracturing in the Northern Territory recommended "the NT and Australian Governments seek to ensure there is no net increase in the lifecycle GHG emissions emitted in Australia from any onshore shale gas produced in the NT".

This project will address that recommendation by calculating potential emissions from onshore gas production and consumption in Australia, then simulating the implementation of different carbon offset options over the lifetime of those production scenarios.

More information

More about the [project](#)

Scientific inquiry [final report](#)

About the [Beetaloo Sub-basin](#).



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GISERA is a collaboration between CSIRO, Commonwealth and state governments and industry established to undertake publicly-reported independent research. The purpose of GISERA is to provide quality assured scientific research and information to communities living in gas development regions focusing on social and environmental topics including: groundwater and surface water, greenhouse gas emissions, biodiversity, land management, the marine environment, and socio-economic impacts. The governance structure for GISERA is designed to provide for and protect research independence and transparency of research.