

Darwin Pipeline Duplication Project

Submission to the NT EPA

Thank you for the opportunity to present IEEFA's submission to this consultation.

Regards,

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Submitted via [Email](#)

Executive Summary

Santos openly states that the Darwin Pipeline Duplication Project is a project to facilitate its Bayu-Undan Carbon Capture and Storage (CCS) project. The CCS project is not defined as to its environmental, economic or social effects.

Effectively the Northern Territory Environment Protection Authority (NT EPA) is being asked to sanction a project whose details are not disclosed. The ill-defined CCS aspect leaves the Barossa to Darwin liquefied natural gas (LNG) project a high greenhouse gas emitter, making the entire project inconsistent with the Northern Territory Government's stated net-zero by 2050 target.

The Federal Government learned expensive and painful lessons regarding decommissioning bonds (in particular the Northern Endeavour exercise in the Timor Sea). There appears to be no comprehensive decommissioning plan for the Darwin pipeline nor the necessary bonds put in place. The Northern Territory Government should avoid replicating the federal government's experience.

Finally, Santos has not dimensioned the lifecycle greenhouse gas emissions of its Barossa project. It has made claims as to the greenhouse gas emissions from gas that are simply not sustainable.

IEEFA calls for:

1. An independent review of the lifecycle emissions of the Barossa/Darwin LNG project.
2. A full environmental impact statement (EIS) for the Darwin Pipeline Duplication Project.
3. A full EIS for the Bayu-Undan CCS project that the Darwin Pipeline Duplication Project so clearly facilitates.

Key Contentions

1. The Project does not dimension its purpose

On page 3 of Santos's Referral Report¹, the proponent states:

"Importantly, executing the DPD Project in a timely manner preserves the existing Santos Bayu-Undan to Darwin pipeline for re-purposing opportunities into the future, including carrying carbon dioxide for offshore carbon capture and storage (CCS). This opportunity will help Santos meet its emission reduction targets and achieve net-zero Scope 1 and 2 absolute emissions by 2040."

The NT EPA is being asked to approve a pipeline that facilitates a project (CCS at Bayu-Undan) that is not dimensioned in any way.

2. Ill-defined Carbon Capture and Storage project may not lower emissions

John Robert, a guest contributor with IEEFA, has attempted to interpret Santos' incomplete plans for a CCS project in a recent report.² Robert concludes that the CCS project may not significantly lower emissions:

"Santos now has an application for approval for a new Darwin Harbour pipeline for its Barossa gas – potentially enabling a carbon capture and storage (CCS) scheme in an attempt to reduce the very high emissions from the development.

But uniquely, despite the new application, Santos' project would still actually produce more carbon dioxide emissions offshore and onshore than its production of liquefied natural gas (LNG) – even with CCS implemented successfully – making it one of the more expensive and dirtiest gas projects in the world."³

IEEFA acknowledges that the NT EPA does not approve offshore projects. The Darwin Pipeline Duplication Project facilitates CCS offshore at Bayu-Undan, and that will substantially increase the Northern Territory's onshore emissions – at the Darwin LNG plant (DLNG). The carbon dioxide (CO₂) removal facilities at DLNG will have to be trebled, producing more vented CO₂ and more emissions from combustion of (then 18%CO₂) fuel gas at greater rates. Also, the separated CO₂ will have to be compressed onshore to send it 500km down the pipe to Bayu-Undan, producing significant emissions (of both greenhouse gases and other pollutants) onshore that have not been specified by the proponent or assessed by the NT EPA.

¹ Santos. Darwin Pipeline Duplication (PDD) Project NT EPA Referral. December 2021.

² IEEFA. Santos' Proposed New Darwin Harbour Pipeline for Barossa Gas – Potentially Enabling a CCS Scheme – Remains Problematic. February 2022.

³ IEEFA. Santos' Proposed New Darwin Harbour Pipeline for Barossa Gas – Potentially Enabling a CCS Scheme – Remains Problematic. February 2022.

3. *The Project is not consistent with Northern Territory Government policy*

The Darwin Pipeline Duplication Project facilitates the Barossa gas project. The Barossa project runs contrary to the stated Northern Territory policy target of net zero by 2050^{4,5}

The International Energy Agency (IEA) has clearly stated that no new natural gas fields are needed globally in the Net Zero Emissions by 2050 Roadmap, beyond those already under development. Many of the LNG liquefaction facilities currently under construction or at the planning stage are not needed.⁶

4. *There appears to be no firm decommissioning plan or bond*

On page 43 of the Darwin Pipeline Duplication Project NT EPA Referral, Santos states:

“The DLNG facility and existing Bayu-Undan to Darwin pipeline have existing conditions of approval for a future decommissioning plan. It is expected that the Project will be considered within this plan and/or a separate Project decommissioning plan.”

Given the uncertain future for gas in a net-zero world (see point 5), the NT EPA needs to ensure a robust decommissioning plan for the pipeline with a bond paid up front to cover the decommissioning costs. Without such a regime, it is likely that the Northern Territory taxpayer will have to pick up the bill for decommissioning costs.

5. *Santos dramatically overstates the role of gas in a low emissions future*

Santos is attempting to downplay the role of gas in global warming by consistently quoting figures that do not apply to the Barossa gas/Darwin LNG project.

Santos states on page 14 of the Santos' Referral Report:

“Santos' role in low-carbon future is built around natural gas, which produces half the greenhouse gas emissions of coal when used to generate electricity. It is the perfect partner for renewable energy sources and can be made even cleaner with carbon capture and storage (CCS).”

This statement contains a number of half-truths that are not applicable to the Barossa to Darwin LNG project. In total, these half-truths add up to a lie.

⁴ SBS. [Where each Australian state and territory stands on net zero](#). 16 October 2021.

⁵ Northern Territory. [Climate Change Response Towards 2050 – Northern Territory Government](#). July 2020.

⁶ International Energy Agency. [Net Zero by 2050 – A roadmap for the global energy sector](#). May 2021.

Half-truth No.1: Santos quotes the wrong figure for renewables-rich grids.

According to the gas industry-funded arm of CSIRO known as GISERA^{7, 8}, gas consumed domestically produces:

- 50% fewer emissions than coal when burned in the more efficient combined cycle gas turbine (CCGT), or
- 31% fewer emissions than coal when burned in an open cycle gas turbine (OCGT), known as gas peakers.

Santos claims that gas is “the perfect partner for renewable energy sources” and yet chooses to quote the type of power plant that is being phased out of renewables-rich grids such as Australia.

Renewables-rich grids need open cycle gas turbines (OCGT), known as gas peakers. These plants are able to start up and shut down relatively quickly and compliment renewables. Even gas peakers are facing increased competition from grid scale batteries⁹ that are faster to start up and shut down and do not have the high fuel costs.

In Australia, renewables have grown to account for 31% of generation in the National Electricity Market (NEM) in 2021. Gas has declined from a high of nearly 13% seven years ago to under 6%.¹⁰ Australia is converting to a renewables-rich grid with less gas. Renewables are displacing gas in the NEM.

Santos quotes the wrong figure for gas-fired power stations. They should be quoting “31% less emissions” as this is the figure for gas peakers that compliment renewables.

Half-truth No.2: Barossa is not low carbon gas, it is carbon dioxide rich gas.

The “31% fewer emissions than coal” figure is not applicable to the Barossa to Darwin LNG project. The figure should be greatly reduced by the fact that the source of the gas is Barossa, a field that has the highest CO₂ content of any LNG export field in Australia.¹¹

⁷ GISERA. [Whole of Life Greenhouse Gas Emissions Assessment of a Coal Seam Gas to Liquefied Natural Gas Project in the Surat Basin, Queensland, Australia](#). Final Report for GISERA Project G2. Page viii.

⁸ IEEFA. [Volkswagen lied about emissions from their vehicles, and the gas industry is also lying about their emissions](#). March 2020.

⁹ Renew economy. [Big Battery Storage Map of Australia](#).

¹⁰ [Opennem.org.au](#).

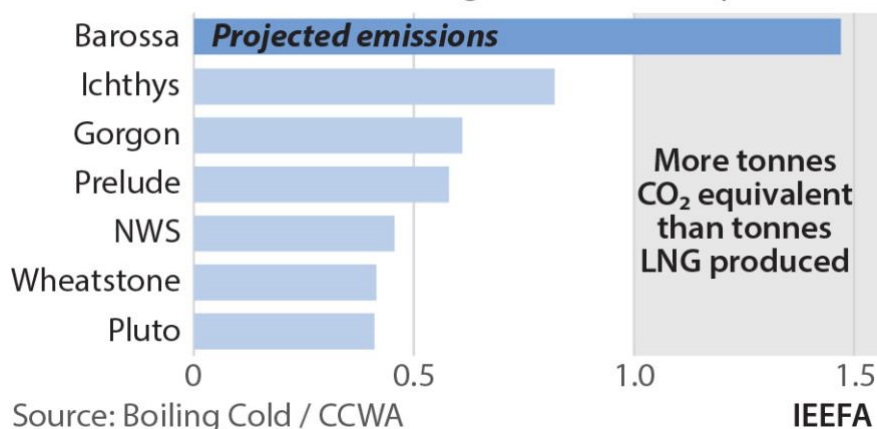
¹¹ IEEFA. [Santos' Barossa gas field emissions create major risks for shareholders](#). 31 March 2021.

Barossa gas has three times the CO₂ content that the DLNG plant can handle.¹² The gas from Barossa contains so much CO₂ that most of it will have to be separated and vented offshore to meet the requirements of the DLNG plant to which it will be piped under the current approved plans.

When the venting and combustion emissions off- and on-shore are calculated, the Barossa to Darwin LNG project looks more like a CO₂ emissions factory with an LNG by-product.¹³

Australia's LNG Carbon Intensity

Emissions from Barossa will be greater than LNG produced



For Barossa offshore gas, its 18% by volume of CO₂ is more than any gas currently made into LNG - or about twice that of the next dirtiest gas being made into LNG in Australia - Ichthys and Gorgon.¹⁴

Adding the venting and combustion emissions at the DLNG plant (2.05 million tonnes of CO₂ per annum) to the Barossa total offshore emissions of 3.38 million tonnes of CO₂ per annum (MtCO₂pa) gives a grand total of 5.4 MtCO₂pa to produce 3.7 million tonnes of LNG per annum - extreme by any standard.¹⁵

The Barossa gas project is far from an average emissions project, making it worse for greenhouse gases than Santos erroneously asserts.

¹² IEEFA. Santos' Barossa gas field emissions create major risks for shareholders. 31 March 2021.

¹³ IEEFA. Santos' Barossa gas field emissions create major risks for shareholders. 31 March 2021.

¹⁴ IEEFA. Santos won't solve the problem of Barossa LNG with carbon capture and storage. 21 October 2021.

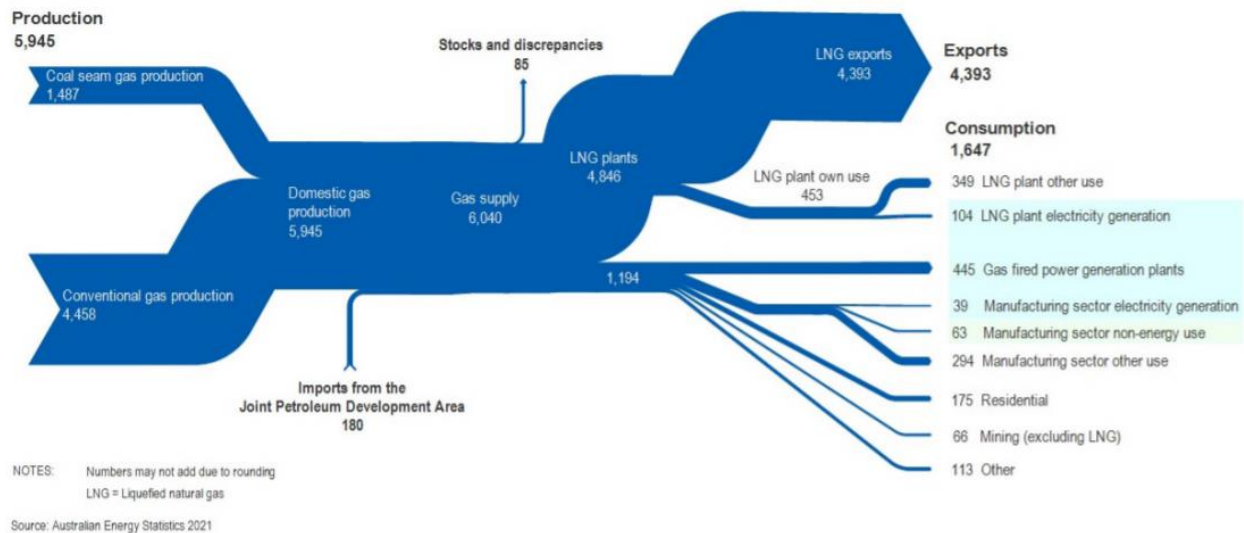
¹⁵ IEEFA. Should Santos' Proposed Barossa Gas "Backfill" for the Darwin LNG Facility Proceed to Development. March 2021.

Half-truth No.3: The gas to LNG conversion has been ignored. Barossa gas is to be converted to LNG, an energy intensive process.

Furthermore, the “31% fewer emissions than coal” figure is just for gas sourced domestically. It is not applicable to the energy intensive LNG and shipping process that the Barossa to Darwin LNG project involves.

According to the Australian Energy Update 2021¹⁶, 453 petajoules (PJ) are burnt in the process of making LNG, equivalent to more than 9% of the gas that enters Australian LNG plants.

Australian natural gas flows, petajoules, 2019-20



Half-truth No.4: Barossa LNG needs to be shipped. Shipping is an energy intensive process.

The “31% fewer emissions than coal” figure is just for gas sourced domestically. Barossa gas is turned into LNG and then shipped. It is not domestically sourced gas for the country that imports the LNG.

A further 2-6% of the gas is lost as gaseous boil-off in the shipping process according to Professor Robert Howarth of Cornell University:

“LNG is kept in liquid form by allowing some methane to ‘boil off,’ resulting in evaporative cooling. In a typical voyage, 2 to 6% of the LNG is lost as gaseous methane due to this boil-off. Usually, the methane is used as fuel to help power

¹⁶ Australian Government Department of Industry, Science, Energy and Resources. [Australian Energy Update 2021](#). September 2021.

the ship, but it seems highly likely that some is emitted to the atmosphere, although I am aware of no data on this emission," Howarth says.¹⁷

In total, approximately 13% of the gas is burnt/lost in the energy intensive LNG and shipping processes that will be undertaken by this project.

Half-truth No.5: Fugitive emissions and intentional flaring occur in every gas project.

The "31% fewer emissions than coal" statement is just based on the process of burning the gas in the plant itself. It does not account for the emissions across the entire supply chain.

Methane (natural gas) is the greatest threat to the warming climate.¹⁸ If leakages/flaring in the entire supply chain from the well to the customer exceed 2-3% of the methane produced, gas is worse for the climate than coal.¹⁹

According to BP, the oil and gas major:

"The wider energy industry leaks about 3.2% of the gas it produces, which is probably almost enough to offset the benefit of switching from coal to gas."²⁰

Summary of Point 5

Santos have stated that its "role in low-carbon future is built around natural gas, which produces half the greenhouse gas emissions of coal when used to generate electricity. It is the perfect partner for renewable energy sources and can be made even cleaner with carbon capture and storage (CCS)."²¹

This statement is simply not true in the case of the Barossa LNG project that the Darwin Pipeline Duplication Project facilitates. Santos quotes the wrong figure for renewable-rich grids. Barossa is not an average gas field, but rather one high in CO₂.

The Barossa gas and LNG project is an export operation and uses gas in both the energy intensive LNG process and the shipping process. The Santos referral

¹⁷ Testimony of Robert W. Howarth, Ph.D. Cornell University, Ithaca, NY 14853 USA before the Joint Committee on Climate Action House of Oireachtas, Ireland. 9 October 2019. Page 2.

¹⁸ IEEFA. [Volkswagen lied about emissions from their vehicles, and the gas industry is also lying about their emissions](#). March 2020. Pages 3-4.

¹⁹ IEEFA. [Volkswagen lied about emissions from their vehicles, and the gas industry is also lying about their emissions](#). March 2020. And GISERA. [Whole of Life Greenhouse Gas Emissions Assessment of a Coal Seam Gas to Liquefied Natural Gas Project in the Surat Basin, Queensland, Australia](#). July 2019. Page 26: "A general consensus has emerged from these studies that climate benefits of natural gas replacing coal are lost where fugitive emissions from all upstream operations are greater than 3% of total production (Alvarez et al 2012; Zavala-Araiza et al 2015). The lower level of 2% was based on a shorter 20-year (Global Warming Potential) time frame as opposed to the 100-year time frame. Sourced from correspondence with Professor Ian Lowe.

²⁰ Bloomberg Law. [BP to install permanent methane leak detectors on new projects](#). 10 September 2019.

²¹ Santos. [Darwin Pipeline Duplication \(PDD\) Project NT EPA Referral](#). December 2021.

statement excludes the effect of fugitive emissions and venting/flaring that occur with all gas projects to a greater or lesser degree. The CCS project will not significantly lower emissions.

In summary, it is likely that the Barossa gas/LNG project produces marginal benefits over coal in the generation of greenhouse gases when burned for power in a gas peaking plant.

The Barossa gas/Darwin LNG project is inconsistent with the Net Zero by 2050 stated target of the Northern Territory government.

A full lifecycle analysis of the greenhouse gas emissions from the Barossa gas/Darwin LNG export project needs to be independently undertaken prior to approval of the Darwin Pipeline Duplication Project.

Santos has not been truthful about the greenhouse gas effects of the project in the Darwin Pipeline Duplication Project NT EPA Referral paper.

About IEEFA

The Institute for Energy Economics and Financial Analysis (IEEFA) examines issues related to energy markets, trends and policies. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy. www.ieefa.org

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