Technical Conference

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Pluto Train 2 Project – Lower Carbon Emission Intensity by Design

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PART OF A BETTER FUTURE

Woodside Energy

Disclaimer and important notice

This presentation contains forward looking statements that are subject to risk factors associated with oil and gas businesses. It is believed that the expectations reflected in these statements are reasonable but they may be affected by a variety of variables and changes in underlying assumptions which could cause actual results or trends to differ materially, including but not limited to: price fluctuations, actual demand, currency fluctuations, drilling and production results, reserve estimates, loss of market, industry competition, environmental risks, physical risks, legislative, fiscal and regulatory developments, economic and financial market conditions in various countries and regions, political risks, project delay or advancement, approvals and cost estimates.

All references to dollars, cents or $ in this presentation are to US currency, unless otherwise stated.

References to “Woodside” may be references to Woodside Energy Group Ltd. or its applicable subsidiaries.

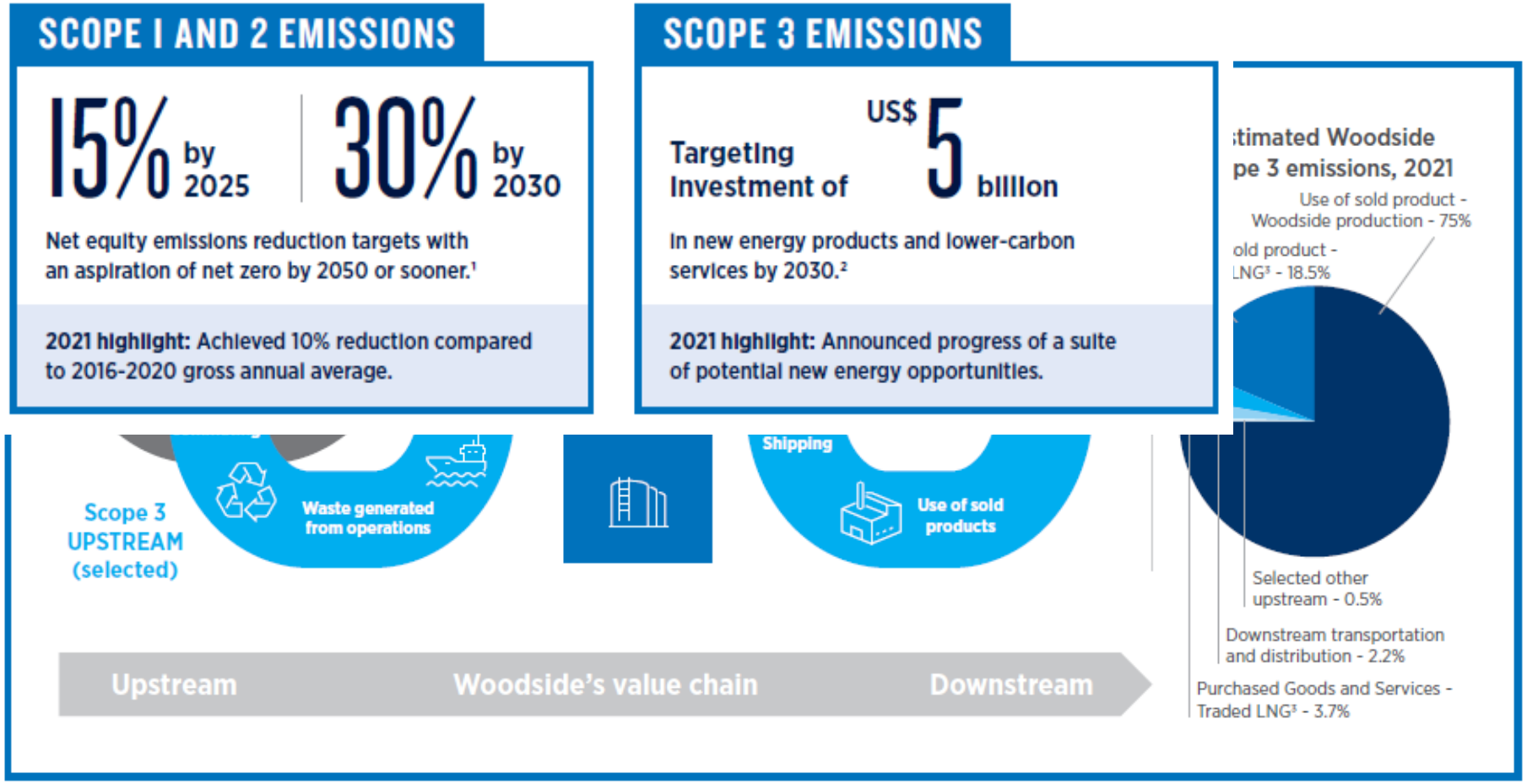
Woodside Energy – Introduction

- Woodside Energy (Woodside) was founded in Australia in 1954.
- Largest energy company listed on the ASX, with a portfolio of world-class assets.
- On 22 November 2021, Woodside Energy approved the Final Investment Decision (FID) to sanction its Scarborough and Pluto Train 2 developments.
- Pluto Train 2 will be one of the lowest carbon intensity projects for LNG delivered to customers in northern Asia, at approximately **0.26tCO2-e/tLNG.**

Woodside Energy assets

Woodside Energy – Climate Strategy

- Woodside aims to thrive through the energy transition by building a low-cost, lower-carbon, profitable, resilient and diversified portfolio.



- Scarb

[1] Target is for net equity Scope 1 and 2 greenhouse gas emissions, relative to a starting base of the gross annual average equity Scope 1 and 2 greenhouse gas emissions over 2016-2020 and may be adjusted (up or down) for potential equity changes in producing or sanctioned assets with an FID prior to 2021. Post-completion of the Woodside and BHP petroleum merger (which remains subject to conditions including regulatory approvals), the starting base will be adjusted for the then combined Woodside and BHP petroleum portfolio.

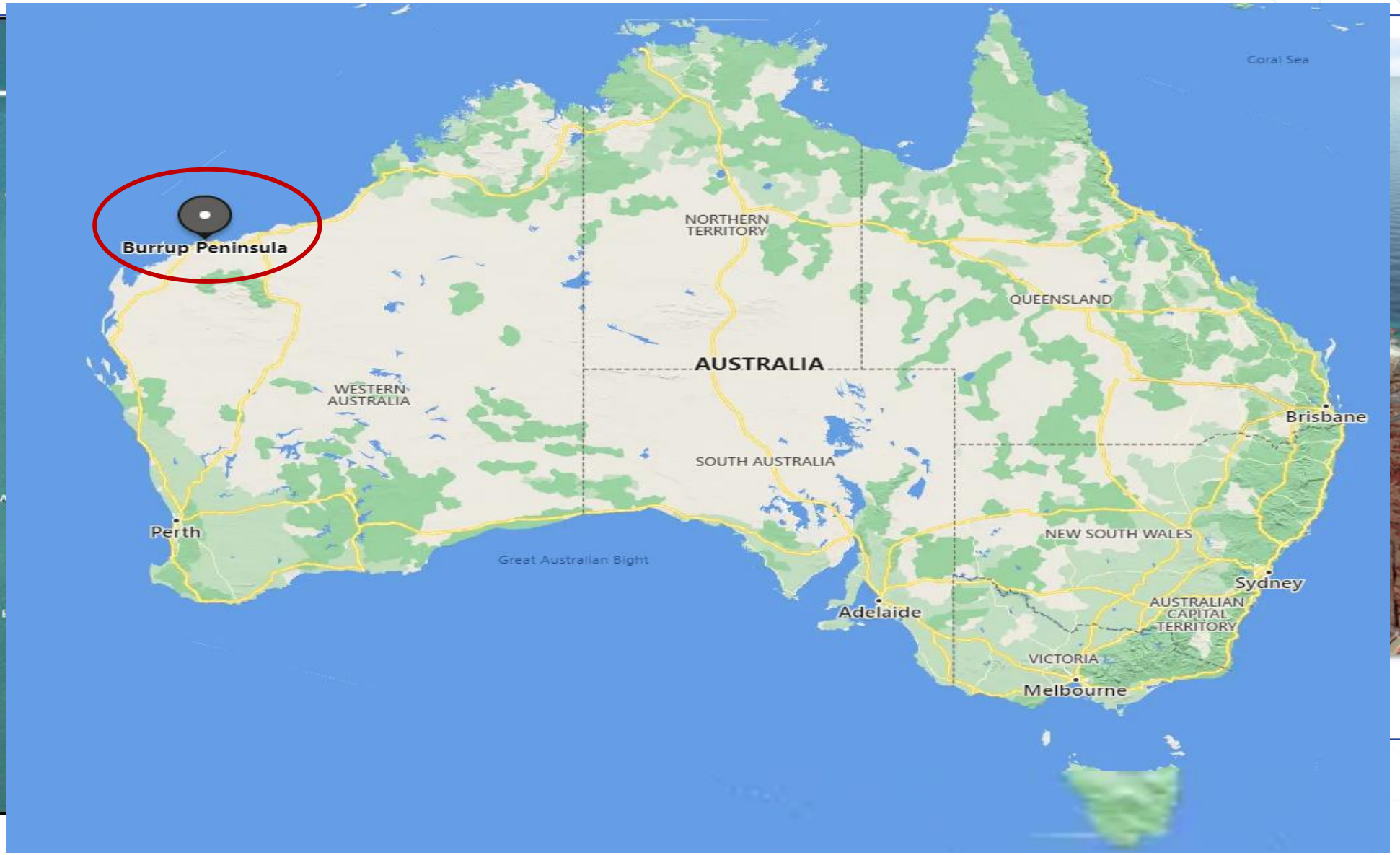
[2] Investment target assumes completion of the proposed merger with BHP's petroleum business. Individual investment decisions are subject to Woodside's investment hurdles. Not guidance..

[3] Traded LNG means the purchase and/or sale of spot and/or ship or LNG cargoes.

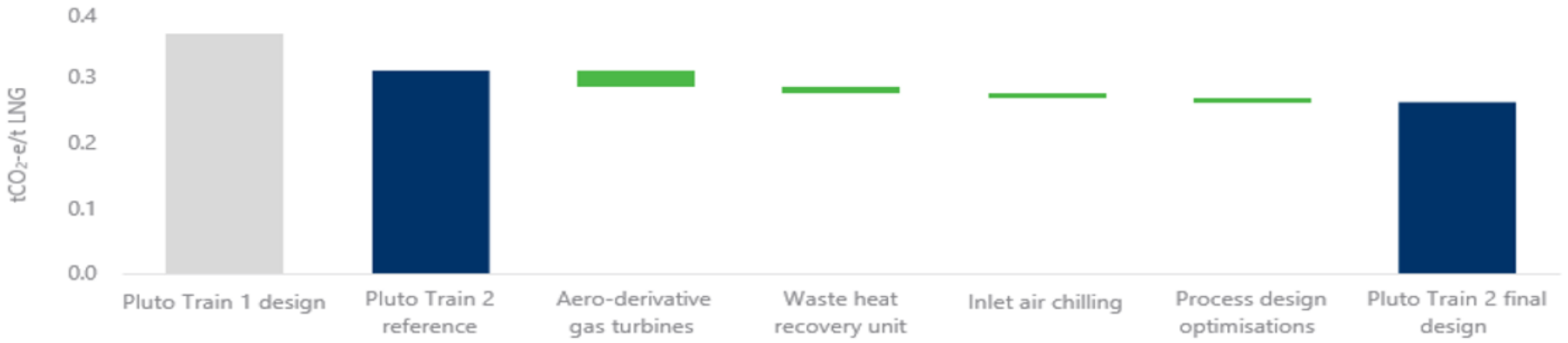
World Resources Institute and World Business Council for Sustainable Development (2015). Corporate Value Chain (Scope 3) Accounting and Reporting Standard, page 5, Woodside Climate Report 2021.

Data supporting these categories is provided in the climate related data table on page 48, Woodside Climate Report 2021.

Scarborough and Pluto Train 2 Development



Pluto Train 2 – Emissions Reduction Strategy



Main areas of focus for the Project to address Scope 1 and 2 emissions:

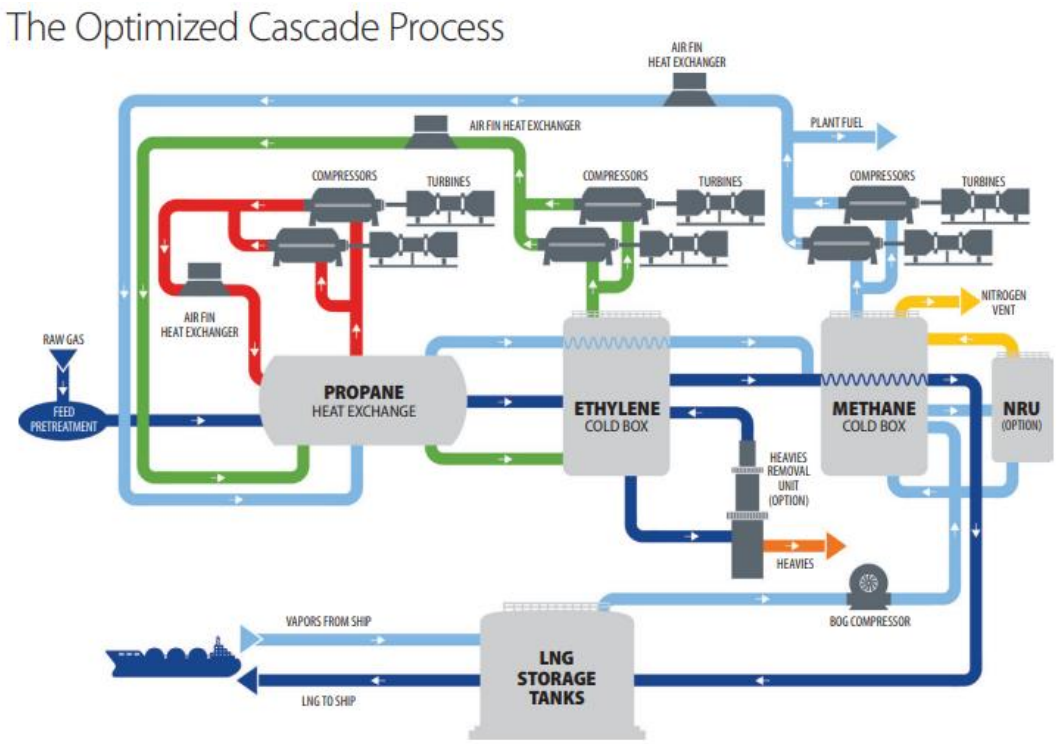
1. Minimise flaring,
2. Design out, and
3. Construction execution opportunities.

Minimise Flaring

- Pluto Train 2 ties into the existing Pluto Train 1 flaring system which has been designed to reduce greenhouse gas emissions, including:
  - Designed for “No Continuous Flaring”,
  - Minimising operational flaring minimised by:
    - Minimising emergency flaring, and
    - Smokeless flare design and a mixture of sonic and conventional flare tips.

- The Pluto Train 2 design continues to look for ways to reduce flaring via design of the process control system and philosophies, equipment selection and operating and maintenance strategies which minimises, or avoids entirely, venting or flaring where it is safe to do so.

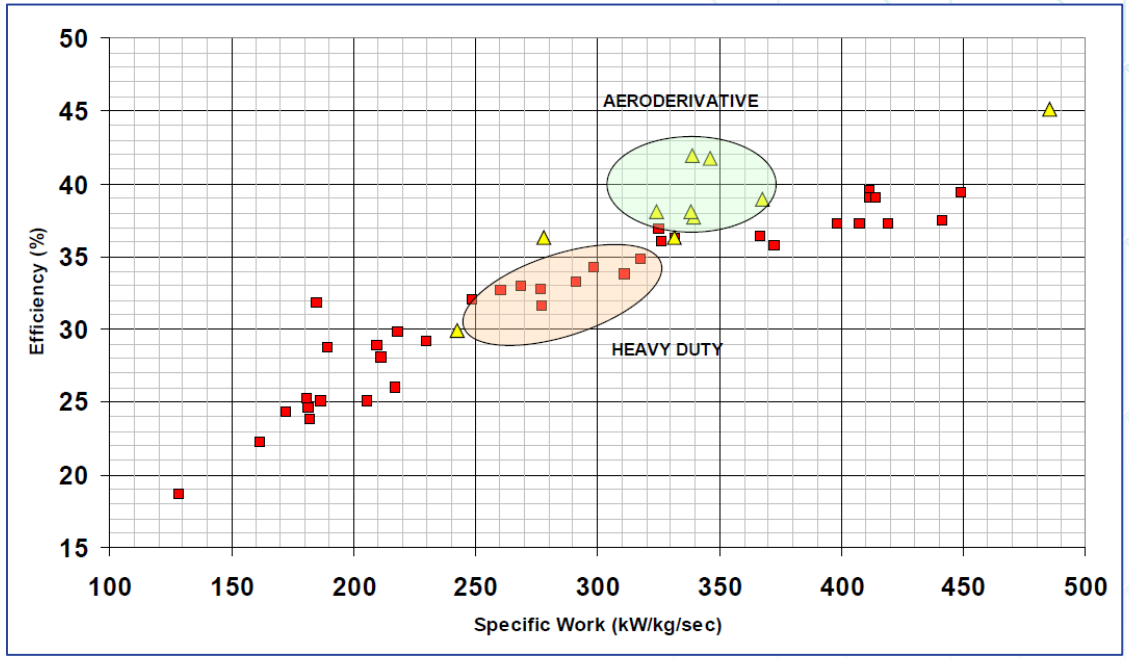
Design Out – Process Technology Selections



1. ConocoPhillips Optimized Cascade® Process LNG Liquefaction Technology, including OCP CryoSep™ heavies removal unit (HRU)
2. Acid Gas Removal Unit (AGRU) Design
3. NRU design (OCP Nitro™) and selection of Recuperative Thermal Oxidizer (RcTO)

Design Out – Equipment Selections

- Pluto Train 2 focussed on the big emitters:
  - Refrigeration drivers and power generation driver
    - number of gas turbines
    - gas turbine's thermal efficiency
    - power margins
  - Waste heat recovery systems
  - Inlet air chilling systems
  - Nitrogen oxides (NOX) control
    - emission rates
    - operability, reliability, and
    - compatibility with ConocoPhillips Optimized Cascade Process.

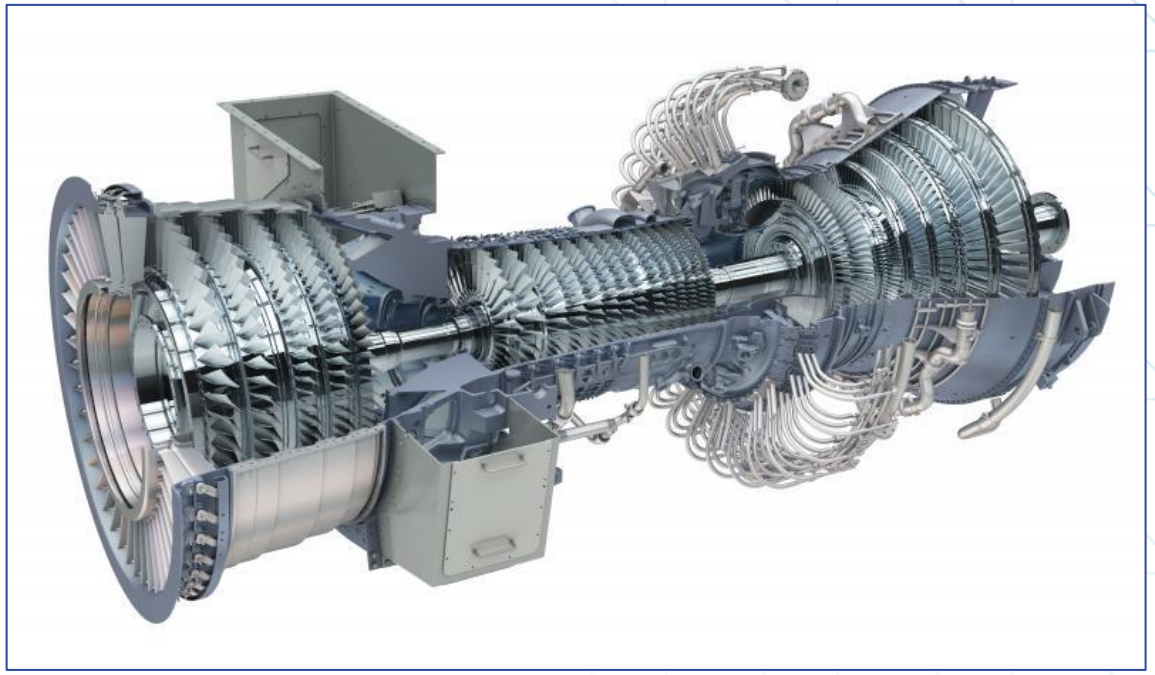


- Outcomes:
  - LM6000PF+ refrigerant drivers with:
    - WHRU on ethylene strings for hot oil heating
    - Inlet Air Chilling (IAC) on all six units
    - DLE NOX control
  - Frame 6b for power generation, to achieve high reliability integration with existing Train 1 Power generation system

Design Out – Reducing NOx Emissions

- NOx such as those from turbine exhaust systems interact with trace gases in the upper atmosphere which ultimately results in a net enhancement of the greenhouse effect.

- The Project considered a number of NOx control technologies, including :
  - Water/Steam injection,
  - Selective catalytic reduction, and
  - Dry Low NOx combustion technology (the DLE 1.5 combustor system selected)



GE LM6000PF+ aero-derivative gas turbine

- In summary, the use of high efficiency aero-derivative gas turbine compressor drivers, with inlet air chilling (IAC), DLE combustors, combined with unfired waste heat recovery units (“WHRUs”) reduces the greenhouse emissions to air.

- This selection results in approximately a 27% reduction in NOx emissions intensity when compared against the Pluto Train 1 design (Woodside, 2007 and 2011).

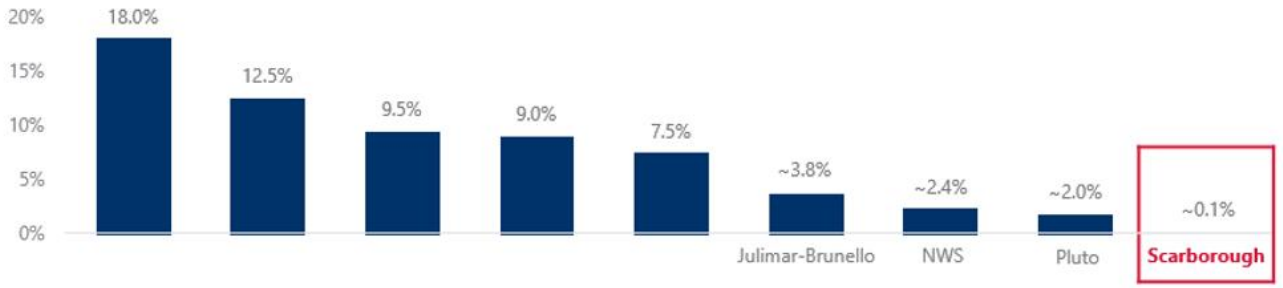
Construction Execution Opportunities

- The Project collaborated with the Contractor to identify and implement a number of execution opportunities and supply chain initiatives to reduce Scope 1 and Scope 2 emissions.

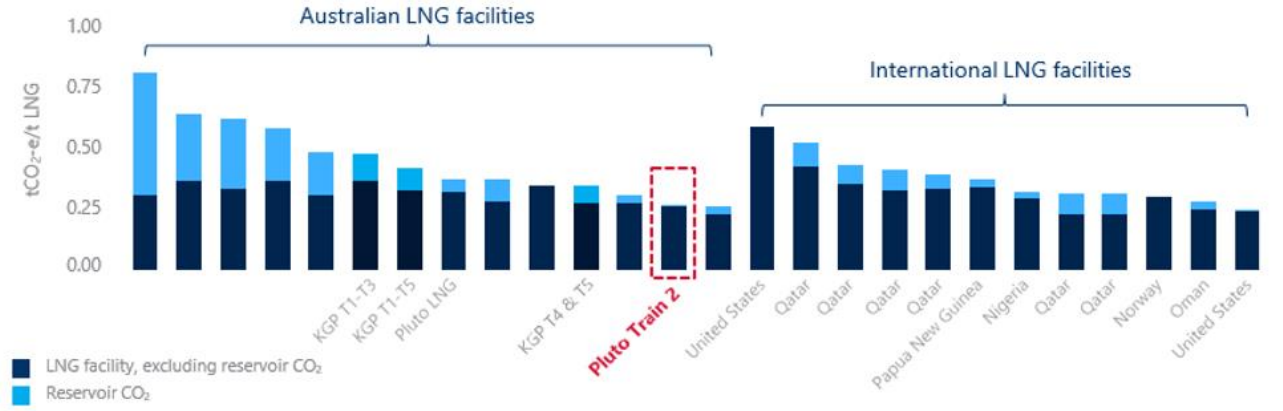
- The following opportunities were implemented:
  - Concrete specification – the production of cement is a considerable contributor to the overall global greenhouse gas emissions (in the order of 5-8%). The Project requires 62,000 cubic metres to complete the scope,
  - Solar panels were installed at the module yard to power the wifi grid,
  - Planting trees to offset the emissions from the batch plan. Community tree planting programs expected to start in 2023,
  - Installing solar panels on the module yard constructions offices, and
  - Use of tricycles instead of pick-up trucks to commute around the module yard.

Outcome – Pluto Train 2 Carbon Intensity

Reservoir CO_2 in relation to other Australian LNG projects[1]



Amongst the lowest carbon intensity LNG sources[2,3]



1. Source: Scarborough Offshore Project Proposal. Dataset includes Barossa, Browse, Gorgon, Ichthys and Prelude. Where a range for reservoir CO_2 was disclosed for other reserves, midpoint value taken for the chart.
2. Source: publicly available company information.
3. Scarborough gas processed through Pluto Train 2.

LNG assists coal-to-gas switching in Asia

Aligned with our customers' decarbonisation goals

Will be one of the lowest carbon intensity projects for LNG delivered to customers in north Asia[3]

- Overall greenhouse intensity of Pluto Train 2 reduced to approximately **0.26tCO2-e/tLNG**
- This will be one of the lowest carbon intensity projects for LNG delivered to customers in north Asia

Acknowledgements

Greg Thomas – Director, LNG Technology & Licensing, ConocoPhillips Company

Qi Ma – Process Engineering Supervisor, ConocoPhillips

Michael Calderon – Staff Process Engineer, ConocoPhillips

References

1. Woodside Climate Report 2021 Climate Report 2021 (woodside.com)
2. Greenhouse effect of NOx Greenhouse effect of NOX - PubMed (nih.gov)