

Gladstone is a proud industrial hub that has supported Australia and regional industry as a key player in manufacturing, exporting resources and local employment, in:

- Alumina and Aluminium
- Liquefied Natural Gas
- Cement
- Ammonium Nitrate.

Unfortunately, these vital products and activities come with an onerous emissions burden, the immediate Gladstone area represents ~13 million tonnes of CO₂ emissions per annum by facilities entrained by the Safeguard Mechanism alone. Unabated, these emissions will likely require significant purchases of carbon credits that will make carbon capture and storage (CCS) collaboration an economically attractive proposition and support offsetting irreducible emissions in some sectors.

Gladstone and its industries are pragmatically preparing itself for a low-carbon future by establishing the components of becoming a renewable energy and future fuels hub, however, significant delays in the roll-out of renewables put these decarbonisation methods at risk and do not support continuous operations fully. A potential option that this study proposes to analyse is the viability of a CCS hub with export routes for Gladstone. Gladstone could create a CCS hub that would support existing local industry and drive further investment and job creation by derisking decarbonisation futures and providing an immediate, practical method of removing CO₂ emissions, gathering them and transporting them to sites that can safely and permanently host them underground with a small footprint and impacts. It's modular nature would allow low-carbon future fuels to participate.

CO2Tech will provide:

- A fast paced screening study on the techno-economic fundamentals for carbon capture, gathering and export of CO₂ utilising shared infrastructure amongst commercial partners
- Techno-economic feasibility of viable export routes and transport methods of CO₂ to advanced storage projects.

A Gladstone CCS hub would replicate a CCS program in Europe known as the Northern Lights which gathers CO₂ from a range of hard-to-abate industrial hubs emitters and stores them permanently underground offshore.

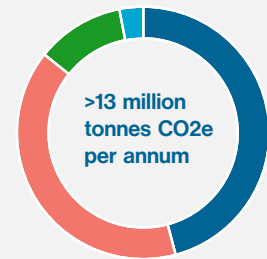
Gladstone has limited local underground storage options and a statewide ban on CO₂ storage means transporting to offshore basins is the most likely cost-effective method of disposing of CO₂.

The industrial emissions, skilled workforce, deep water port, experience with safely transporting gases and political support for industry and manufacturing in the Gladstone region make it an ideal candidate for a CCS hub.

Policy in Australia beginning to crystallise around the importance of onshoring emissions, decarbonisation and shared infrastructure (Net Zero, Future Made In Australia, Critical Minerals, Safeguard Mechanism). CCS hubs sit at the nexus of these complimentary policies, strategies and targets.

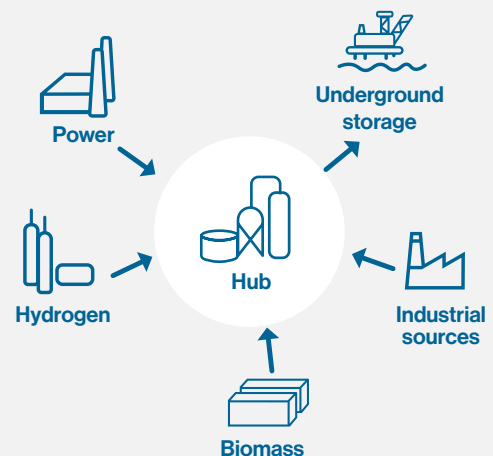
CCS projects take time to mature and begin with pre-feasibility studies. Preparing a low-footprint CCS decarbonisation option in parallel with existing options is key to ensure delivery aligns with stated other underground storage projects in Australia.

Gladstone's emissions and industry mix.

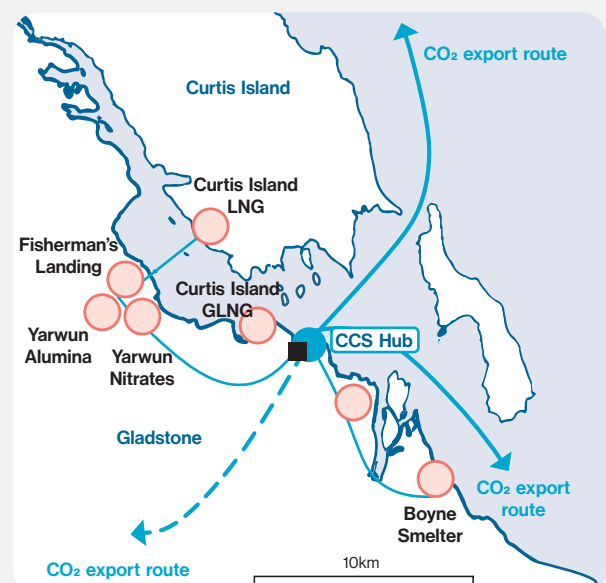


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A CCS hub consolidates emissions from various industries and prepares for transport and storage underground.




Schematic representation of possible emissions sources, CO₂ gathering network to temporary storage hub and CO₂ export route from Gladstone.



Why CO2Tech?


CO2Tech has unrivaled practical experience in capturing CO₂ from industrial emissions in Australia. It can leverage its unique access to advanced storage projects providing the crucial connection between carbon capture and permanent underground CO₂ storage.

Practical experience in post-combustion capture and advanced, proprietary CO₂ capture technology HyCaps



Market

Low-cost post-combustion CO₂ capture from power, industry, oil and gas, and hard-to-abate sectors.



Novelty

Features


- ✓ Hybrid technology.
- ✓ Combine solvent absorption and membrane in a single process.
- ✓ Solvent regeneration without phase change.

Benefits

- ✓ Lower energy requirement.
- ✓ Modular design, easy to scale up.
- ✓ Ability to operate on any liquid solvent.
- ✓ Suitable for retrofit and greenfield applications.
- ✓ Lower footprint, OPEX and CAPEX.

COSMIC – Costing Model for Integrated Carbon Capture and Storage

CO2Tech hosts a unique techno-economic evaluation software called COSMIC, that leverages its proprietary subsurface database and expertise.



Market

Applicable to all sectors considering CCUS solutions.

COSMIC has an easy-to-use Graphic User Interface (GUI) that provides options for various CO₂ capture technologies, CO₂ compression and different modes of CO₂ transport. Fossil fuel based or renewable energy can be selected to meet the energy requirements for the CCS chain.

COSMIC uses simple mass and energy balances to determine the type and size of equipment required. Equipment costs are estimated using published/literature data, CO2CRC costing data base, scaling law and the use of Lang factors. The model also calculates the mass of CO₂ captured and CO₂ avoided.

Our clients



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