

# State of Play of CCS in South Australia

South Australian Regulatory Framework

Moomba CCS Project

Michael Malavazos  
Department for Energy and Mining



Government of South Australia  
Department for Energy and Mining

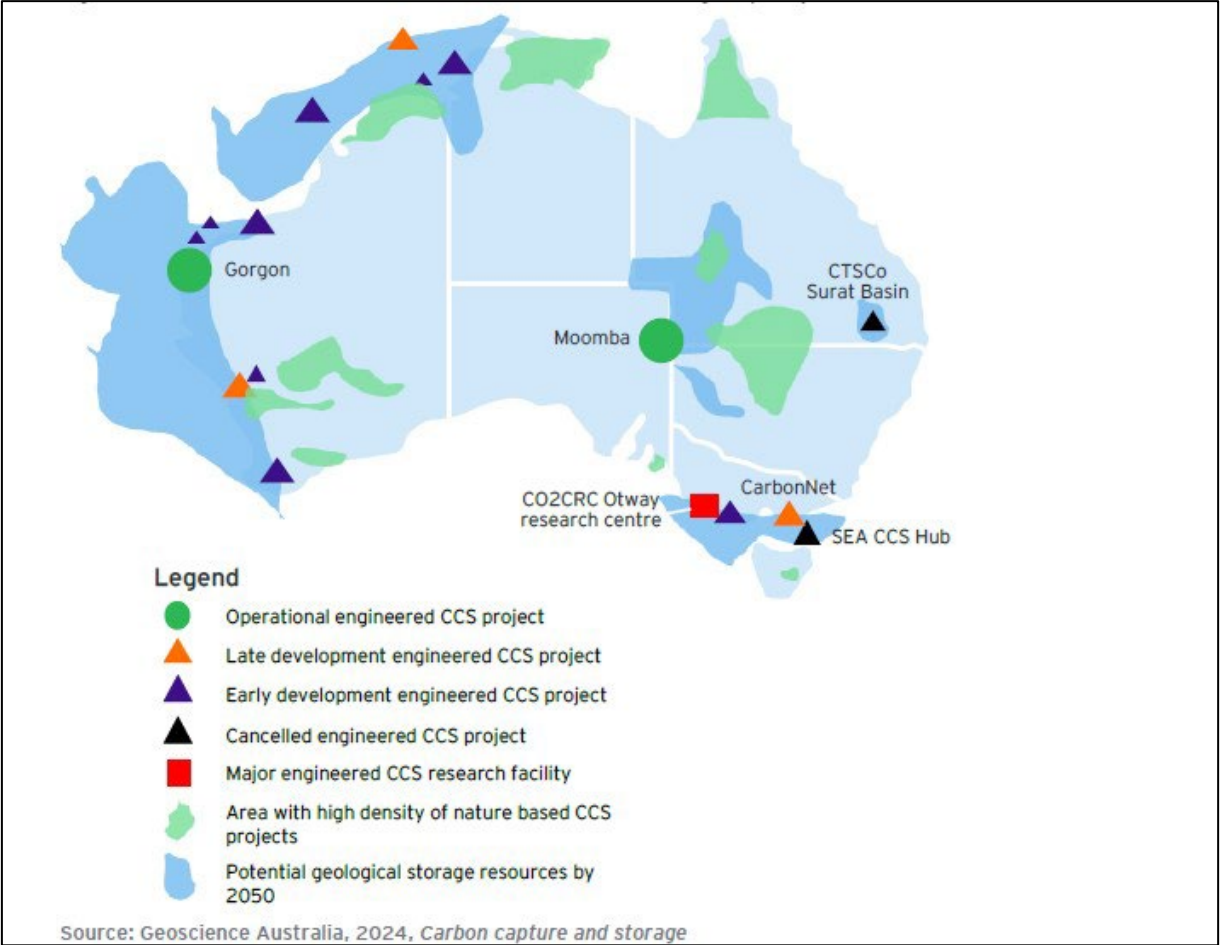
**ENERGY RESOURCES SUMMIT**

# Content

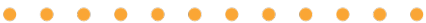
- Status of CCS interest in Australia
- Background on CCS legislation in Australia;
- Moomba CCS project regulated under such legislation;
- Where to from here with commercial CCS deployment.



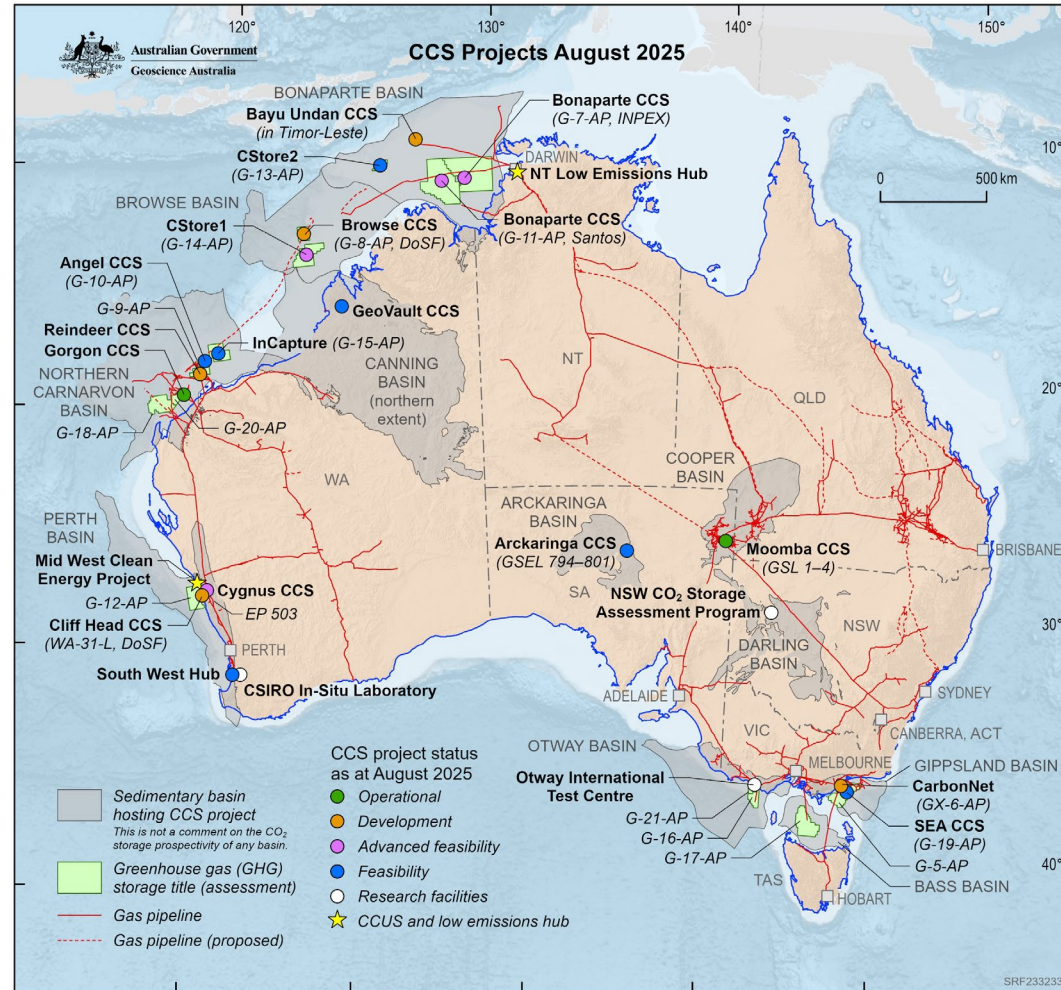
# CCS Operations in Australia



**GSSA**  
**DISCOVERY DAY**



# CCS Operations in Australia



On 12 June 2024, the Queensland Government banned all greenhouse gas (GHG) storage and injection activities in Queensland's Great Artesian Basin (GAB).  
Pipelines routes from the GPlnto petroleum database.  
DoSF: Declaration of an identified Greenhouse Gas Storage Formation.



**GSSA**  
**DISCOVERY DAY**



# South Australia's Regulatory Framework

- South Australian *Energy Resources Act 2000* covers all CCS stages - established in 2009 in response to the 2005 COAG/MCMPR guiding regulatory principles

1. Underground resources in Australia belong to the Crown – including the pore space for CCS.
2. Licensing – secure rights and tenure
3. Environmental assessment –
  - a) focussing on risks and objectives to address those risks  
[Moomba CCS Project EIR](#) and [Moomba CCS SEO](#)
  - b) early stakeholder engagement
  - c) adoption of relevant and recognised standards
4. Efficient and effective approvals and surveillance
5. Effective and transparent Monitoring and Verification  
[Monitoring and Verification Plan](#)
6. Rental payments for use of pore space
7. Minimise risks of long-term liability



**GSSA**  
**DISCOVERY DAY**

Version: 11.7.2024

South Australia  
**Energy Resources Act 2000**

An Act to regulate exploration for, and the recovery, production, transmission, storage and management of, certain energy resources, and for other purposes.

---

**Contents**

Part 1—Preliminary

Division 1—Formal

1 Short title

Division 2—Objects of Act

3 Objects

Division 3—Interpretation

4 Interpretation

Division 4—Rights of the Crown

5 Rights of the Crown

Part 2—Administration

Division 1—The Minister

6 Administration

6A Interaction with other legislation

7 Delegation

Division 2—Authorised officers

8 Authorised officers

9 Identity cards

Division 3—Authorised investigation or survey

9A Authorised investigation or survey

Part 3—Licensing regulated activities

Division 1—Requirement for licence

10 Regulated activities

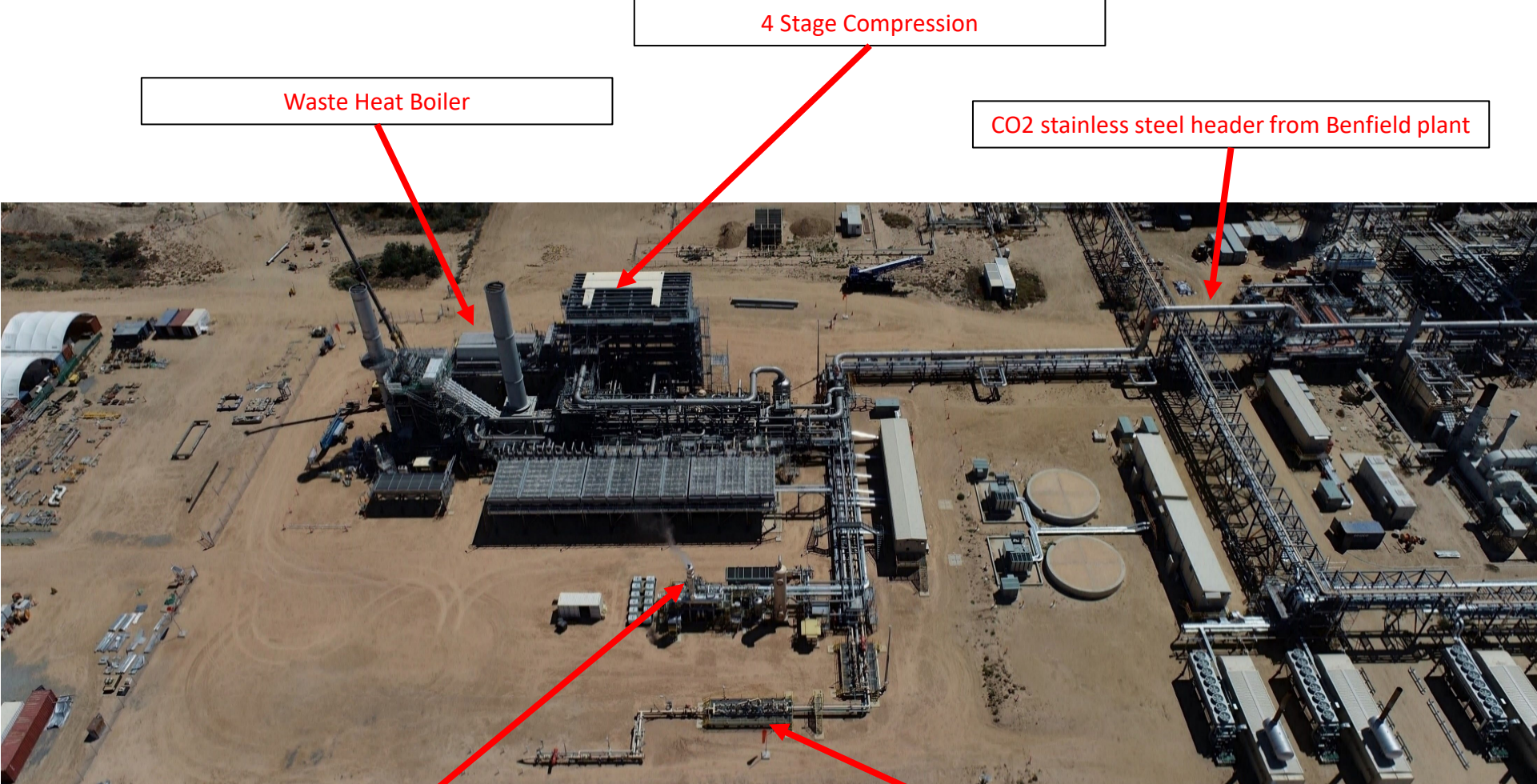
11 Requirement for licence

---

Published under the *Legislation Revision and Publication Act 2002* 1



# Moomba CCS Facility



Waste Heat Boiler

4 Stage Compression

CO2 stainless steel header from Benfield plant

TEG Dehydration Unit

Metering and Pipeline Export

Source: Santos Ltd.



**GSSA**  
**DISCOVERY DAY**  
●●●●●●●●●●

# Moomba CCS Environmental Approval

- Objective/Risk based approach
- Environmental Impact Report (EIR)
  - Addresses all environment risks (natural/social/economic) and how risks will be managed to ALARP. – [Moomba CCS Project EIR](#)
- Statement of Environmental Objectives (SEO)
  - Prepared on the basis of addressing relevant risks detailed in the EIR:
    - Environmental objectives to be achieved
    - Assessment criteria to measure objectives
    - Gazette – activity and location specific regulation
    - [Moomba CCS SEO](#)
    - Key SEO requirement: approved public [Monitoring and Verification Plan](#)



# MOOMBA MONITORING AND VERIFICATION PLAN

<https://www.energymining.sa.gov.au/industry/energy-resources/regulation/projects-of-public-interest/cooper-basin-carbon-storage>



**GSSA**  
**DISCOVERY DAY**

**Santos**

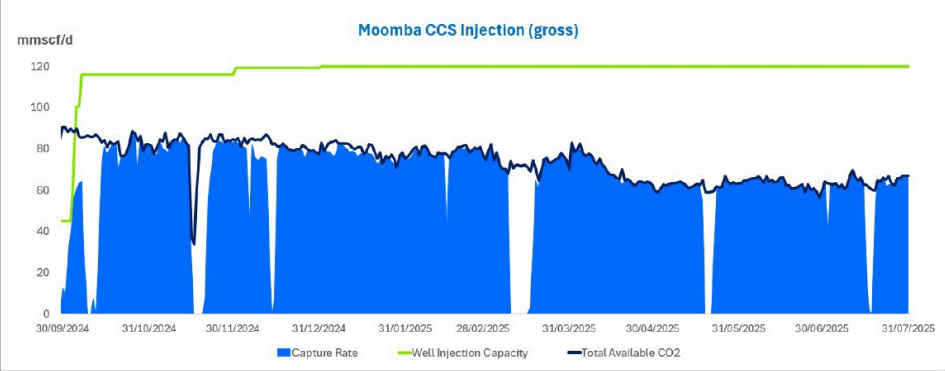
8530-040-LDD-0002

**Moomba CCS project – Strzelecki and Marabooka Toolachee monitoring and verification plan**

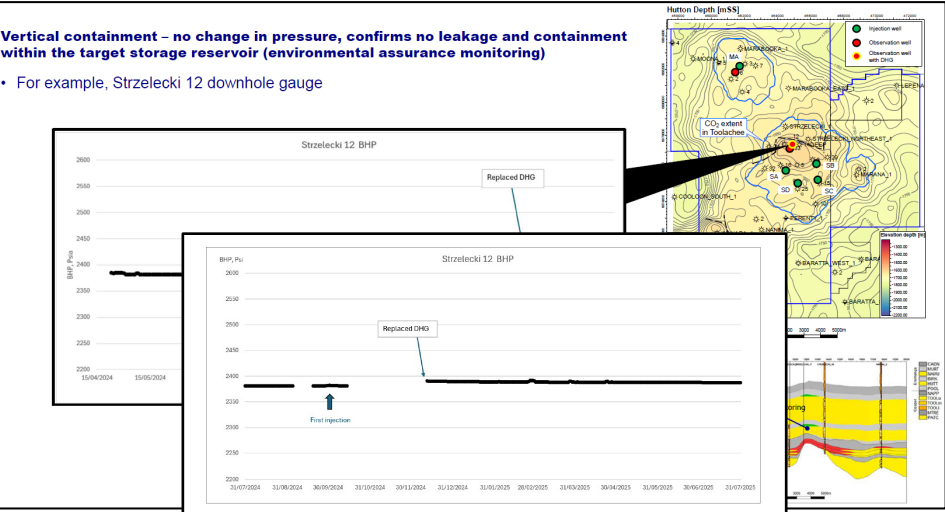


**Santos**

Establish community confidence in CCS by proving that CCS works – tell and show the world why CCS projects are proving to be successful e.g. Gorgon and Moomba – sell the wins!

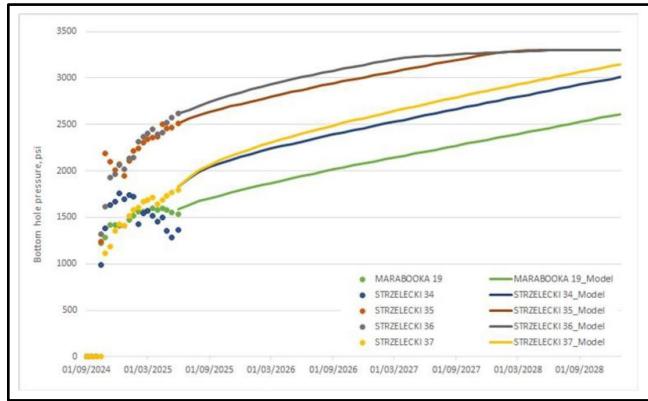


Source: [Moomba M&V Plan and Reports](#)

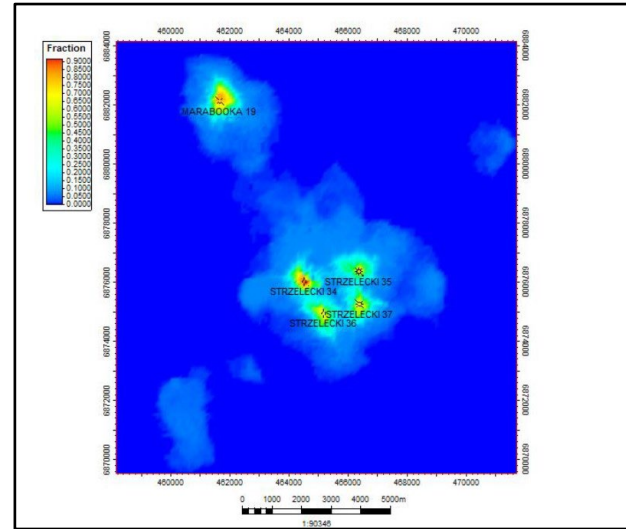


**GSSA**  
**DISCOVERY DAY**

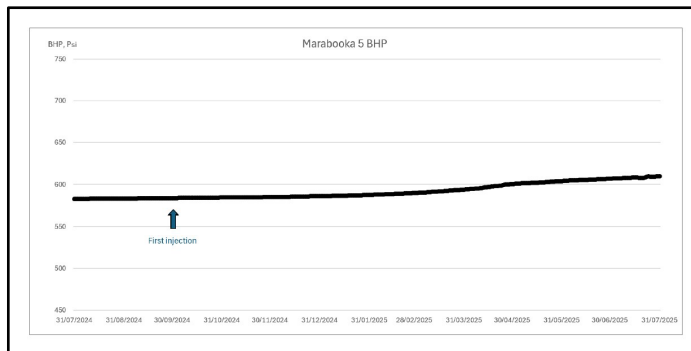
### BHP Actual vs Modelled



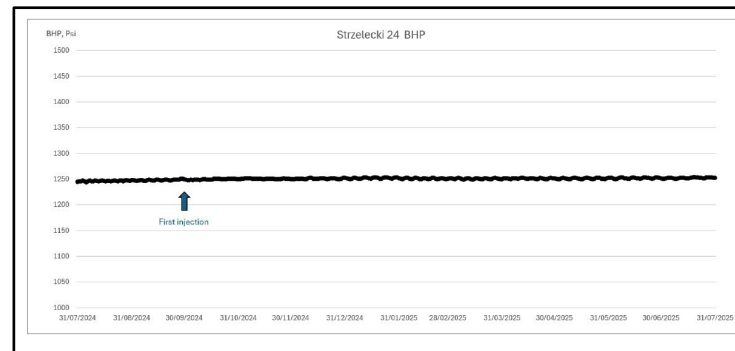
### 1 Million Tonne Injection Modelled



### BHP Closest Monitoring Well



### BHP Furthest Monitoring Well



**GSSA**  
**DISCOVERY DAY**





# Some observations to progress CCS:

- Above all: must have consistent federal government CO<sub>2</sub> abatement policy, best to be technologically agnostic – don't pick winners – allow all technologies to serve their purpose
- Remove potential policy barriers to CCS deployment
- Best achieved through an effective financial incentive framework – e.g. ACCUs/carbon price/effective safe-guard mechanism?
- Recognise and acknowledge that CCS is “a” CO<sub>2</sub> abatement technology not “**the**” abatement technology
- Won't be long before narrative moves from “net-zero” to “net-negative” – hence importance of CCS
- Efficient, effective and practical regulation premised on:
  - Continuing development and implementation of best practice CCS standards including (M&V)



# Some observations to progress CCS:

- Need economies of scale: establish CCS hubs – adjacent to point sources – e.g. steel/cement/power plants
- Viable Ship transport – Australia has potential to become Asia's CCS hub!
- Regional hub maybe? Australia/Indonesia/Malaysia work together?
- Government/industry partnerships  
– particularly for key infrastructure ([SA Government CCUS Infrastructure Report](#))
- Establish community confidence in CCS by proving that CCS works – tell and show the world why Gorgon and Moomba CCS projects are proving to be successful – sell the wins!



# South Australian Import Opportunity



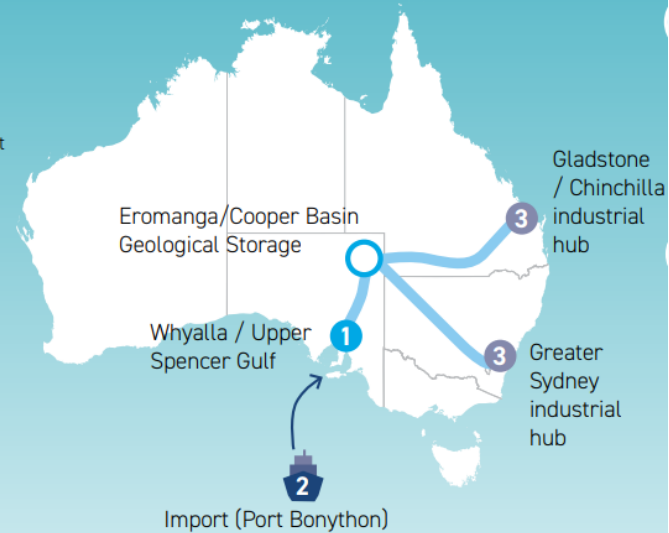
## Three Local Clusters and Global Import Opportunity

The analysis considers three phases with three clusters of industry generating CO<sub>2</sub>, as well as global import scenario. The phases are generally independent and the program can be modified to capitalise on the best-for-state opportunities.

- Phase 1**  
Phase 1 – Upper Spencer Gulf / Whyalla Cluster - A CCUS hub is developed at Whyalla in the Upper Spencer Gulf, with infrastructure development occurring entirely within SA to maximise state economic activity. A pipeline is constructed for the transport of CO<sub>2</sub> to the storage location.
- Phase 2**  
Phase 2 – Global Importation - Development of CCUS import infrastructure, with CO<sub>2</sub> imports occurring via Port Bonython from trade partners such as Japan and South Korea. Additional pipeline infrastructure supports the transport of CO<sub>2</sub> for storage.
- Phase 3**  
Phase 3 – Greater Sydney & Gladstone/Chinchilla Clusters - QLD and NSW CCUS hubs are implemented with an interstate pipeline for the transport of CO<sub>2</sub> into SA for storage.

## Next Steps

ISA undertook this study to understand the potential establishment of a CCUS industry in SA and the ability to address local, national and international opportunities. This study indicates that a range of opportunities exist for SA and presents one potential scenario for infrastructure and partnerships. The next steps will further explore the opportunities and feasibility of CCUS for SA.



Source: [Infrastructure SA, CCUS Infrastructure and National Supply Chain Study](#)



**GSSA**  
**DISCOVERY DAY**



# Commercialisation Pathways for CCS in Australia

## Supply chain and commercialisation pathways for CCS and low carbon fuels

CCS and gas supply infrastructure has the potential to be repurposed to support the development and distribution of low carbon fuels.

Through capturing or importing CO<sub>2</sub> and then exporting it to our trading partners in the form of synthetic gas, **there is a potential opportunity to create a circular decarbonisation model.**

Synthetic gas has the same properties and chemistry as natural gas. It can use existing gas pipelines, LNG facilities and gas distribution networks, avoiding significant infrastructure costs to substantially upgrade gas distribution networks to carry hydrogen.

This provides Santos with a potential opportunity to commercialise synthetic gas at a scale and cost basis more optimally than other investments, such as hydrogen, which requires separate distribution infrastructure.

In addition to power generation, high-temperature heating and chemicals manufacturing, synthetic gas has the potential to provide relatively low-cost decarbonisation for hard-to-abate sectors where alternative technologies are not yet proven or economically viable.

### What is required to facilitate a carbon management business?

The creation of a third-party carbon capture, transport and storage industry relies on a number of developments, including:

#### Regulatory

- Government-to-government bilateral agreements to allow cross-border carbon storage and commercial agreements between emitters, infrastructure providers and storage sites

#### Technological

- Advances in technology for emitters to deploy cost competitive CO<sub>2</sub> capture technology and vessels for CO<sub>2</sub> transportation

#### Commercial

- Demand crystallisation as the energy transition progresses
- Establishment of commercial frameworks for access to terminal and pipeline infrastructure and CO<sub>2</sub> storage locations

The first South Korean-built gas carrier to transport captured CO<sub>2</sub> is scheduled for delivery in 2025.

Japan is currently trialling its first LCO<sub>2</sub> carrier in a series of voyages.



**GSSA**  
**DISCOVERY DAY**

Source: Santos [Climate Transition Action Plan](#) | Santos | Santos

# Thank You



Government of South Australia  
Department for Energy and Mining

## ENERGY RESOURCES SUMMIT

