How can we make CCS happen:
A regulator's perspective

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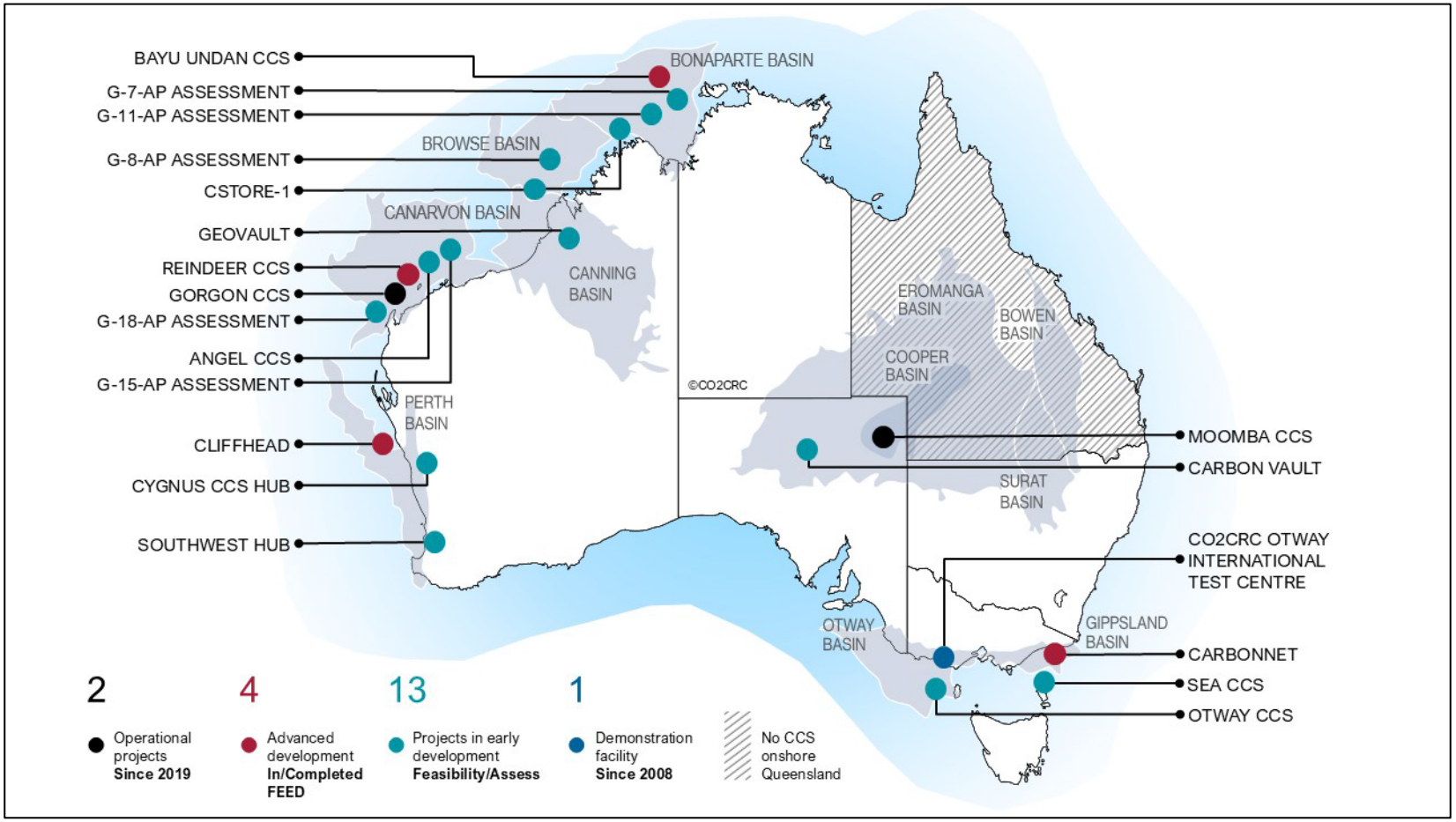
SOUTH AUSTRALIA

Government of South Australia
Department for Energy and Mining

Content

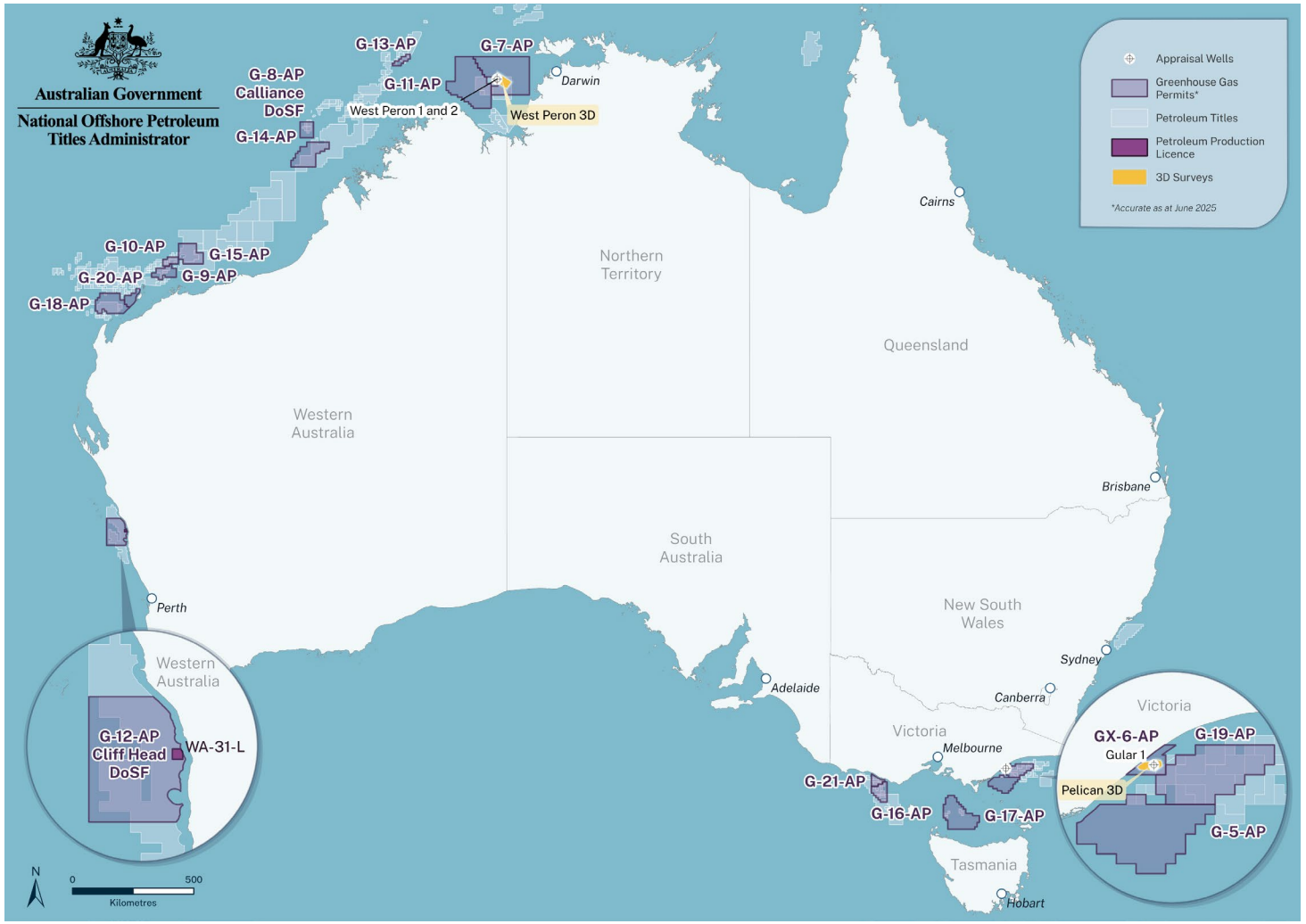
- Status of CCS interest in Australia
- Background on CCS legislation in Australia;
- South Australian CCS regulatory framework;
- Important technical challenges with CCS; and
- How best to progress large scale CCS deployment.

CCS Operations in Australia



Source: co2crc

CCS Offshore Permits in Australia

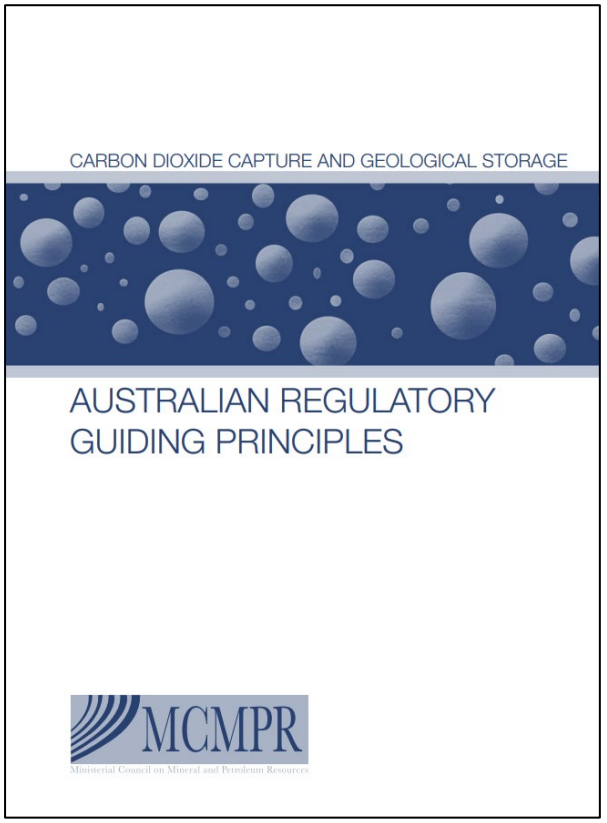


Source: NOPTA

Effective CCS Legislation – historical context

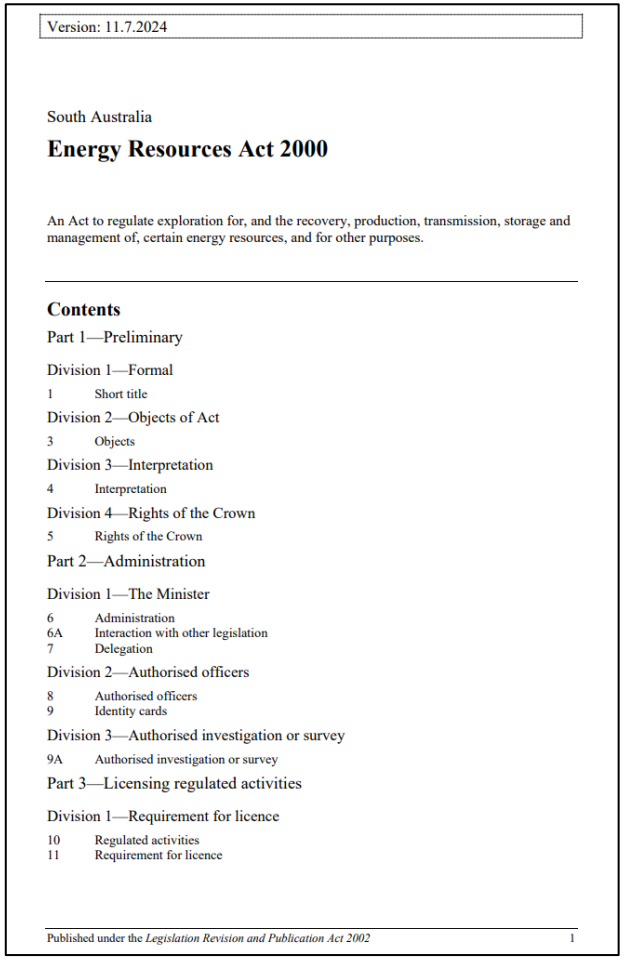
In 2005 COAG/MCMPR published guiding regulatory principles for CCS, calling for:

- Effective resource access and property rights
  - *Secure CCS storage rights – industry investment certainty*
- Nationally consistent assessment and approval processes
  - *Risk based regulation – Process Safety Management framework*
- Effective Monitoring and Verification
  - *Demonstrate CCS is working*
- Long term liability post closure
  - *Once secure storage is demonstrated – liability reverts to state*



Example: 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
- Why regulate CCS:
    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 risk to State of long-term liability



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

Important technical CCS matters

- Above all, objective is to maintain 95% plus CCS network availability – community confidence
- Understand the underground geology and hydrodynamic behaviour of CO_2 plume
- Understand CO_2 phase behaviour (gas vs dense phase)
- Know your CO_2 stream specification/composition – establish what impurities are present
- Impurities affect phase behaviour – in turn can lead to uncontrollable corrosion
- Expected phases of operation, pressure and temperature variations due to:
  - Start-ups: – incl. commissioning
  - Shut-downs: planned and unplanned
  - Depressurisation events: planned and unplanned
- Material selection and dehydration: addressing corrosion risks – don't forget what happened at Gorgon!

Source: Experience and ISO/TR 27925

Some observations to progress CCS:

- Above all: must have consistent federal government CO_2 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_2 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)

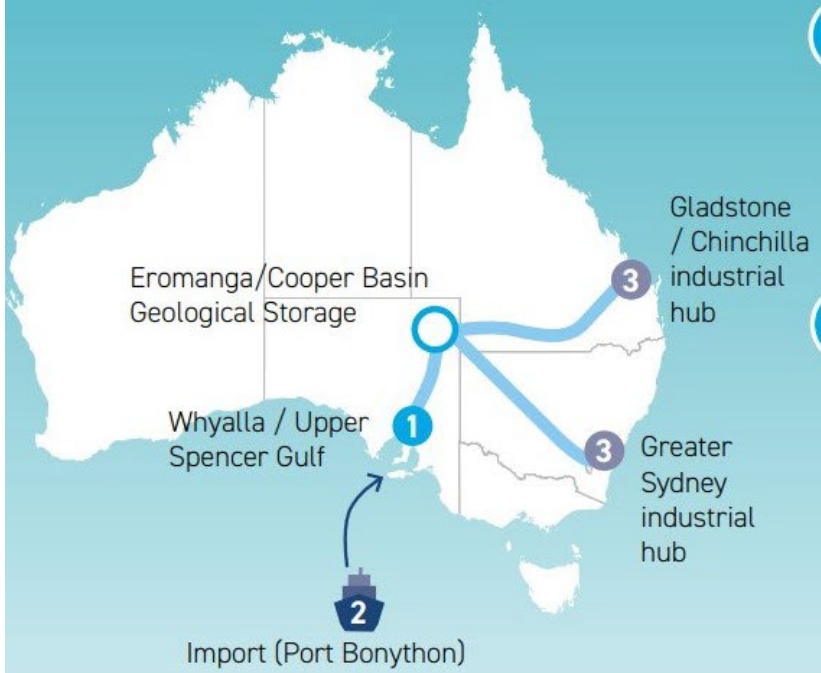
Some observations to progress CCS:

- 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 CCUS Infrastructure Report

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.



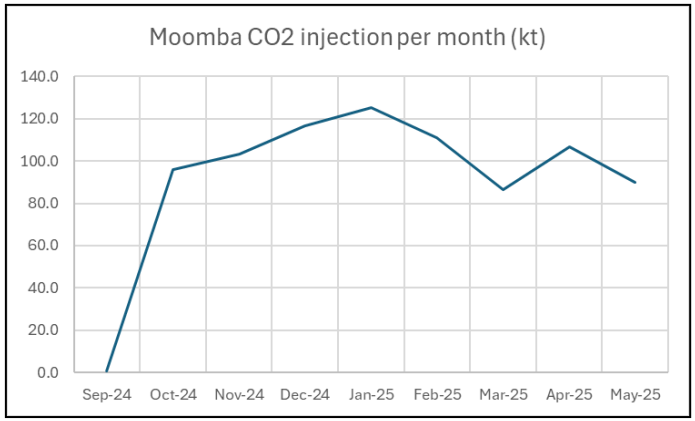
1. **CCUS Partnerships** – Establish a holistic CCUS forum (network or similar) across all elements of the supply chain, including regulators, industrial emitters, technology partners, potential owners/operators, and research and development partners.

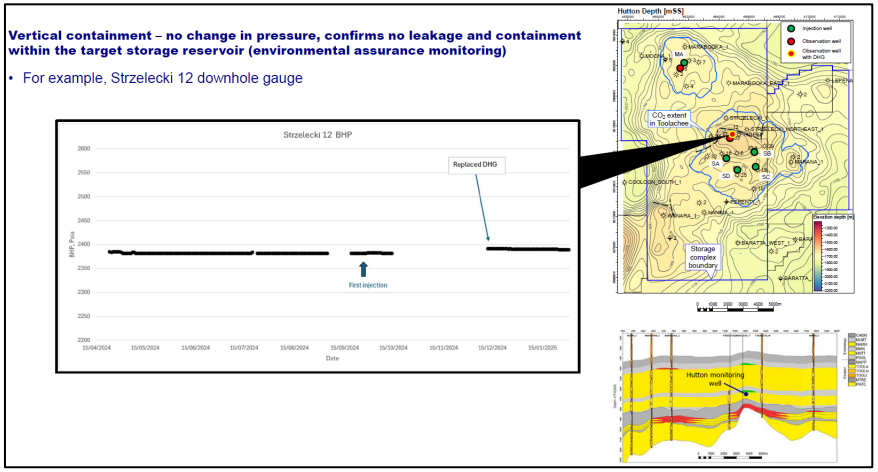
2. **Development Pathway** – Undertake a strategic assessment of the frameworks under which a CCUS ecosystem would be developed, regulatory approvals, engage with supply chain operators, and undertake analysis of discrete project elements and business models

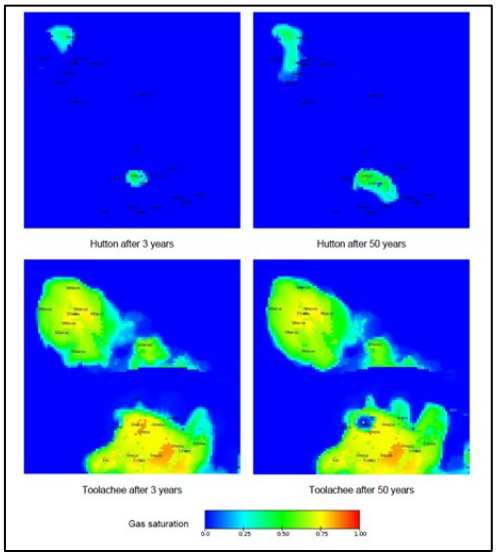
3. **Detailed Business Case** – A detailed business case will be developed for feasible opportunities identified as part of Step 2, including preferred operating model and underpinning infrastructure

Some observations to progress CCS:

- 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!







Link to public report

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