



Australian Government
Department of Resources,
Energy and Tourism

Carbon Capture and Storage (CCS) in Australia

Carbon Sequestration Leadership Forum

Technical Group Meeting

Perth, Australia

25 October 2012



Presented by

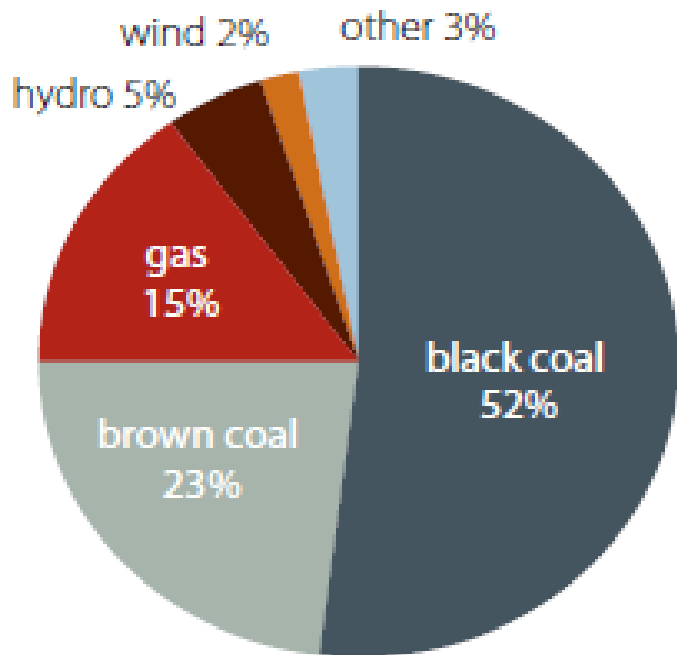
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Current State of Play



Australia's electricity generation is predominately driven by fossil fuels.

In order to meet our emissions reduction goal of 5% by 2020 and 80% by 2050, there is going to have to be substantial investment in **low emissions technologies (including CCS)** as well as renewables.



Clean Energy Priorities

- Renewable Energy Target
(20 per cent by 2020)
- Carbon pricing
- Clean Energy Finance Corporation
- Australian Renewable Energy
Agency
- **Low emissions fossil fuel**





CCS - Low Emissions Coal Policy





Australian Government funding in CCS

- Major government funding support flows from:
 - CCS Flagships program (\$1.7 billion)
 - National Low Emissions Coal Initiative (\$370 million), established in 2008
 - National CO₂ Infrastructure Plan (\$61 million)
 - Global CCS Institute (\$315 million)
- With additional support flowing from other programs.

“Australian Government funding is aimed at providing the framework and investment support needed to accelerate the development and deployment of CCS”.

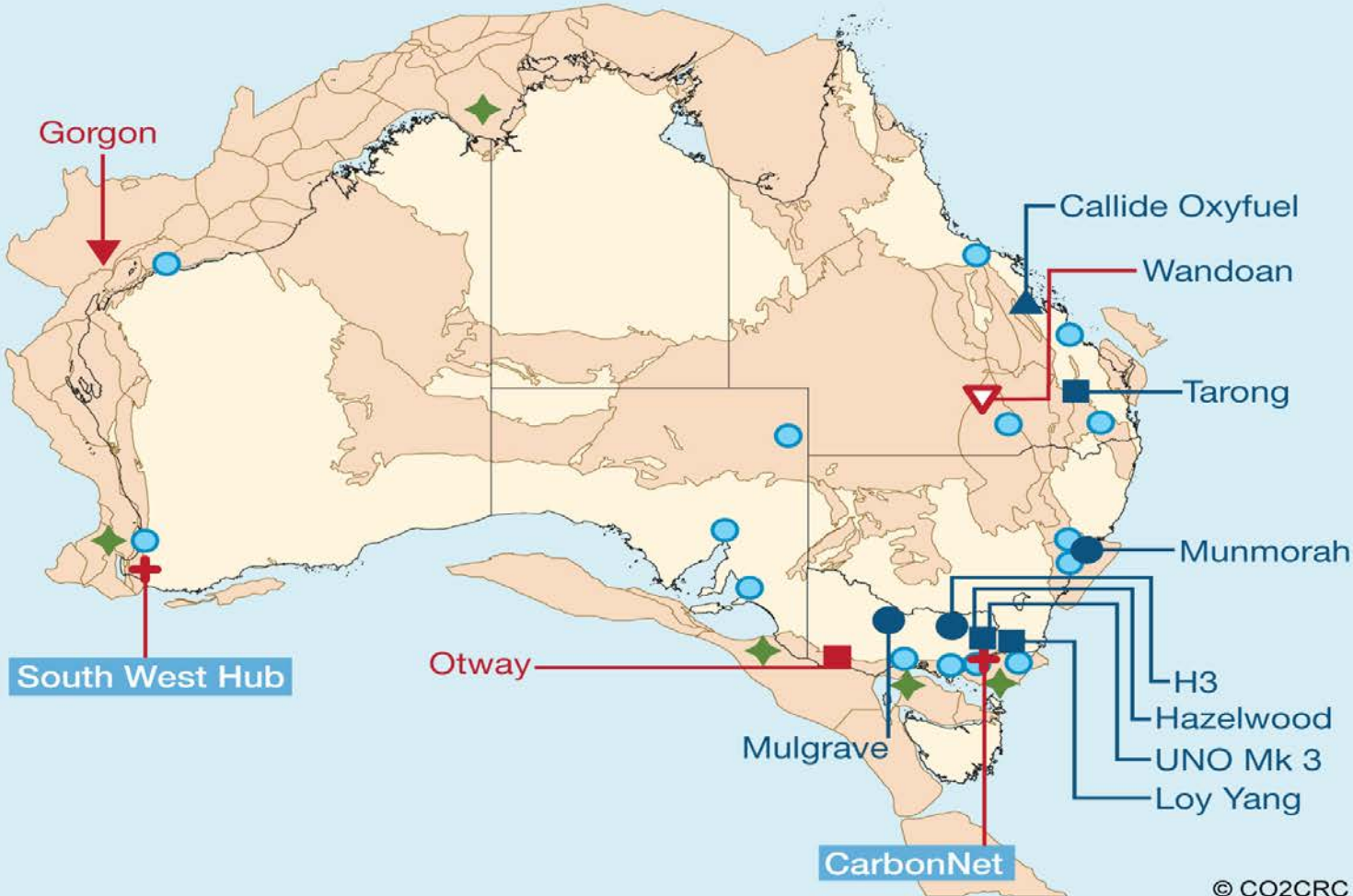
CCS Projects in Australia

CCS PROJECTS

- ▲ Capture - feasibility
- ▲ Capture - advanced
- Capture - operational
- Capture - completed
- ▼ Storage - feasibility
- ▼ Storage - advanced
- Storage - operational
- Storage - completed
- + Storage hub - feasibility
- Major emission nodes
- ◆ Offshore CCS permits
- Basins with potential for CO₂ storage

(Spatial data supplied by Geoscience Australia)

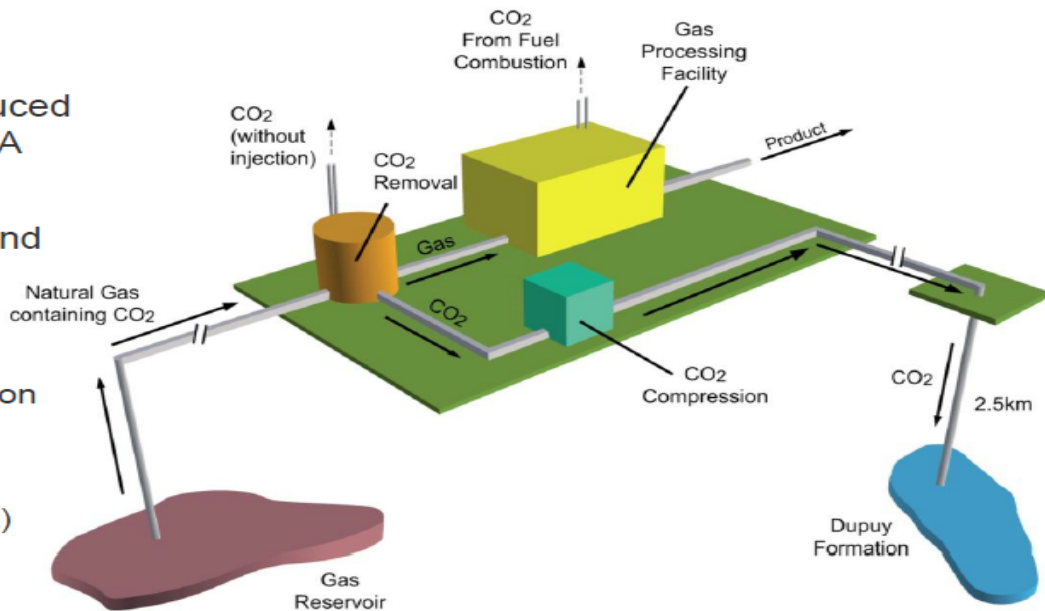
CCS Flagship project





The Gorgon Project

- The first project in Australia to significantly reduce emissions by the underground injection of carbon dioxide
- Project emissions expected to be reduced by approximately 40% (3.4 – 4.0 MTPA CO₂e)
- \$150+ million spent on investigation and development prior to FID
- Number of world firsts
 - First greenhouse gas storage legislation
 - First project to undergo detailed environmental impact assessment (including public review and comment)





The South West Hub



- Major industrial area of WA generating 25 MT of CO₂ p.a.
- Sequestration of 300,000 tonnes of CO₂ in bauxite residue.
- Storage of up to 6.5 MT of CO₂ per annum for 40 years being investigated.
- The utilisation of CO₂ from CSBP at Kwinana for the Enabling Case and Perdaman Fertilisers for the Base Case presents the project with a commercial opportunity for CCS.



**South West Hub – Drill
Rig, February 2012**



Source: Department of Mines and Petroleum, WA.

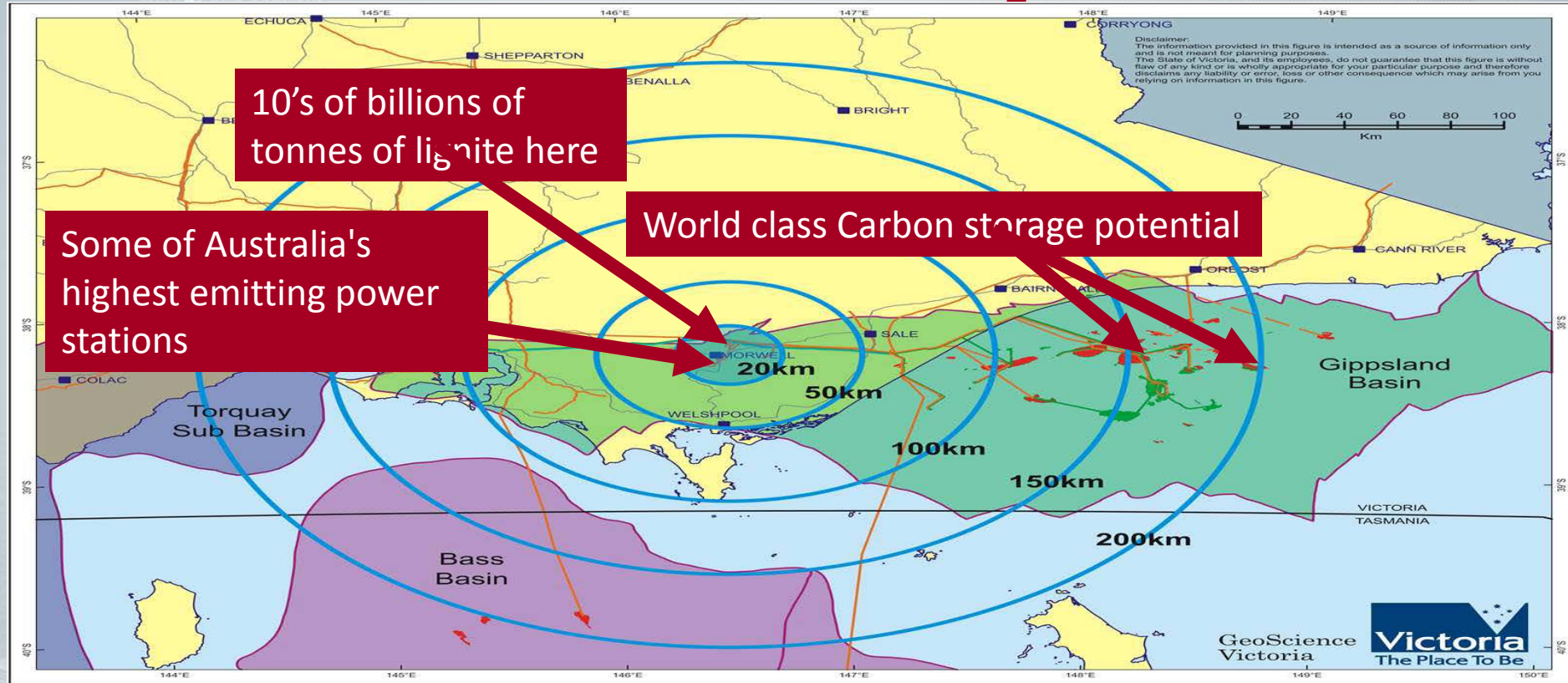


SWH – Collecting Seismic Data (March 2012)

Source: Department of Mines and Petroleum, WA.



CarbonNet Project



The 2009 National Carbon Task Force study found that the offshore Gippsland basin contains both the best quality and largest volume of CO2 reservoirs from 25 major basins across Australia



Callide Oxyfuel Project



Callide A Power Station

- Collaborative Project involving Australian and Japanese Governments and industry including CS Energy, JCOAL, Xstrata Coal, Schlumberger, IHI, Mitsui, and JPower.
- The Project involves retro-fitting oxy-combustion technology to a 30 MW unit of the Callide A power station in Queensland and the capture and geological storage of 10,000 tonnes of CO₂ per annum.
- Generation of electricity by oxy-firing commenced in March 2012. Project expected to start capturing CO₂ around the end of 2012.

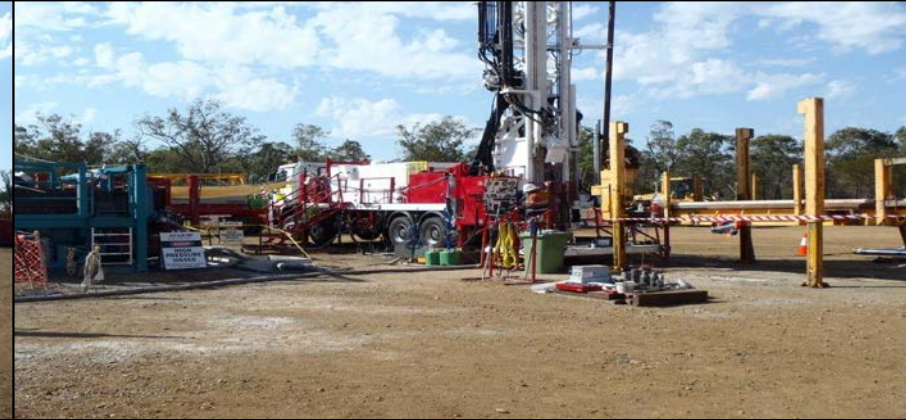
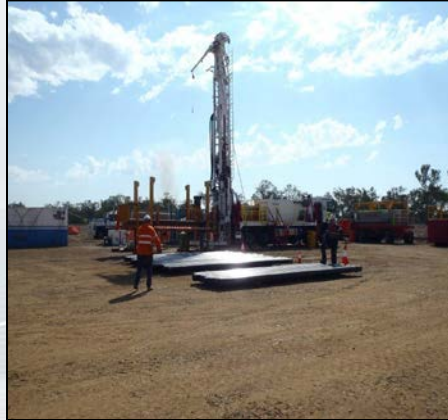


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Queensland CCS Flagship project

A revised Queensland CCS Flagship project proposal is being developed and is due to be considered at the end of 2012.

Photos: Prefeasibility work in progress. Source CTSC0





Other Milestones in CCS

- Awarding of the first greenhouse gas injection tenement to CarbonNet;
- The establishment of ANLEC R&D, a national research program to support CCS demonstration activities;
- Implementing pre-competitive storage exploration programs funded through the National Carbon Mapping Infrastructure Plan and the National CO₂ Infrastructure Plan;
- The establishment of a *CCS Communication and Awareness Strategy* which commenced in 2012.





Milestones in CCS - Continued

- Significant progress of other large scale pilot and medium scale demonstration projects including:
 - world first coupling of electricity generation at the Callide plant with oxyfuel capture;
 - injection of CO₂ at the CO₂CRC's Otway site;
 - Ongoing research associated with post combustion capture projects using different solvent technologies in Victoria, NSW and QLD.





Summary

- A carbon price commenced in Australia on 1 July 2012
- The policy is designed to transition the economy to a low carbon future and to incentivise investment in least cost abatement
- CCS policy and programs precede the introduction of a carbon price and will complement long term abatement targets
- Demonstrating CCS at commercial scale is critical to future deployment
- Planning for and implementing demonstration projects requires consideration of all elements of the CCS puzzle and generates valuable knowledge



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Thank you