

Australian Government

Geoscience Australia

The Gorgon Project – A brief Overview

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The Gorgon Project

Acknowledgements

- This presentation was sourced from material made publically available by the Gorgon Joint Venture.
- Principle sources :
 - The Gorgon Project Web-site
 - http://www.chevronaustralia.com/ourbusinesses/gorgon.aspx#z
 - The Gorgon Environmental Approvals Site:
 - http://www.chevronaustralia.com/ourbusinesses/gorgon/environmentalresponsibility/
 - Gorgon Presentation to the CSLF Technical Committee Meeting, Pau March 2010
 - http://www.cslforum.org/publications/documents/Pau2010/FosterGorgonPau0310.pdf
 - With thanks to Chevron Australia

China Australia Geological Storage of CO2

The Gorgon Project

Project by Joint venture

- •Chevron (47.333%)
- •Shell (25%)
- •ExxonMobil (25%)
- •Osaka Gas (1.25%)
- •Tokyo Gas (1%)
- •Chubu Electric Power (0.417%)

Operated by Chevron Australia in joint venture with





Barrow Island – a class A nature reserve



Nature and Industry co-existing, Barrow island also is the site of Australia's largest onshore oilfield which has been producing for 40 years.



The Gorgon Project

- \$43 billion LNG project
- Single biggest project in Australia
- World's biggest CCS program
- Recognised by Carbon **Sequestration Leadership** Forum





中澳二氧化碳地质封存



CO₂ is compressed and injected 2.5km underground into **Dupuy Formation**

The Gorgon Project: Gas Fields

- Greater Gorgon Fields lie 130-200km offshore and contain about 40 trillion cubic feet of gas
- Average 14% CO₂ in gas fields
- Processing Facility onshore Barrow Island 3x5Mtpa trains.



The Gorgon Project: CCS

- Gas piped and separated on Barrow Island
- CO₂ removed for sales gas
- CO₂ compression attached to gas facility
- Up to 3.4Mtpa of CO₂ will be captured, piped and stored in deep formations below Barrow Island









The Gorgon Project: CCS

- Injection
 - 8-9 injection wells
 - ~4 pressure management wells
- Monitoring
 - repeat seismic data
 - observation wells
 - near surface soil gas monitoring



Regional Stratigraphy



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Geology



http://www.gorgon.com.au/index.html

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Geology

Cores of the Dupuy Formation and Basal Barrow Group Shale

SANDSTONE



SANDSTONE (Dupuy Formation Upper Massive Sand)

very few internal barriers. This will enable the CO2 to migrate relatively freely through the formation.

100 mm

BIOTURBATED SILTSTONE (Upper Dupuy Formation)

Low permeability bioturbated siltstone, finely bedded siltstone. The siltstone is slightly permeable to CO2 and will act as a baffle to migration.

BIOTURBATED SILTSTONE



SHALE

SHALE (Basal Barrow Group Shale) The basal Barrow Group shale is a marine shale and represents an effective barrier to vertical migration of CO2.

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Simulation

Predicted migration of CO₂ plume during the operational phase



Simulation

- CO₂ plume (in beige) after
 40-years
- Incorporates:
 - migration
 - baffles
 - barriers
 - seals

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INJECTION PHASE, MACRO LEVEL



Simulation

 Reservoir simulation based on the preferred injection scenario showing the extent of the CO_2 plume over 1000 years at the base of the Barrow **Group Shale**

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Monitorina

- CO₂ Injection & Pressure Management wells
- Surveillance wells
- 4D Surface Seismic
- Soil Gas
- Pressure sensors



Current Status of project

- All necessary permits and approvals have now been obtained
- Construction of the facilities started in November 2009 with a ground breaking ceremony and are now underway











What's in a name?

- The Gorgon field was named after a nearby geological feature on the sea bed – the Gorgon Patch.
- The Gorgon Patch was named after the SS Gorgon the ship which first identified the feature.





• Questions

