



# Projects Interaction and Review Team (PIRT) Meeting

Clinton Foster  
Chair, Australia

27 October 2014  
Warsaw, Poland



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***WELCOME***

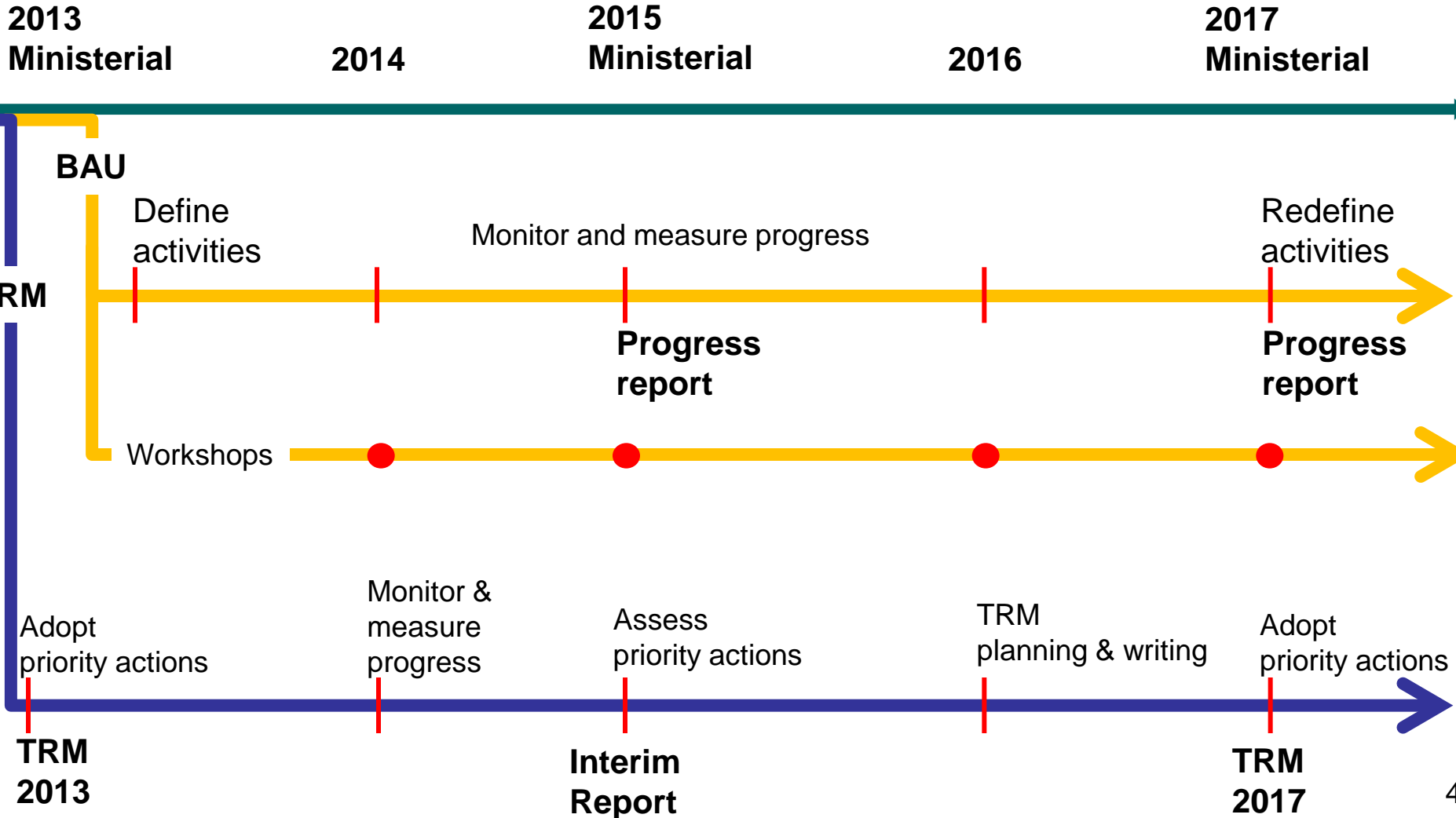


# PIRT - two functions (Seoul meeting)

Business as Usual	New Activities from Technical Roadmap (TRM)
<ul style="list-style-type: none"><li>• Project recognition</li><li>• Project monitoring<ul style="list-style-type: none"><li>• Workshop</li></ul></li></ul>	<ul style="list-style-type: none"><li>• Collaboration with CCS organisations</li><li>• Monitoring TRM priority actions<ul style="list-style-type: none"><li>• Summarise CCS progress</li></ul></li><li>• TRM publication</li></ul>



# PIRT Action Time Line





# Operation and Procedures of the PIRT

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## Project Recognition

- Project proposals should be circulated to Active Members by the CSLF Secretariat.
- No later than ten days prior to PIRT meetings, Members are asked to submit a free-text comment, either supporting or identifying issues for discussion on each project nominated for CSLF recognition.



# Operation and Procedures of the PIRT

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- At PIRT meetings or via proxy through the PIRT Chair, individual country representatives will be required to comment on projects nominated for CSLF recognition .
- Recommendations of the PIRT should be reached by consensus with one vote per member country only.



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# Norcem CO<sub>2</sub> Capture Project

## PIRT Members' Recommendations





## Norcem CO<sub>2</sub> Capture Project

### PIRT Members' Recommendations

PIRT Member	Recommendation	Supporting Comments
Australia (Foster)	Approve	"Australia welcomes the application to this industrial process."
European Commission (Schuppers)	Approve	"...the approach to test 4 different capture technologies on emissions from the cement industry strikes me as innovative and of wider interest."
France (Bonijoly)	Approve	"...all the members of the European Cement Research Academy ... see this project as an important step towards the overall reduction in CO <sub>2</sub> emissions for the cement industry. ... They are convinced of the benefits of this project for their industry. "
Japan (Tanaka)	Approve	



# Norcem CO<sub>2</sub> Capture Project

## PIRT Members' Recommendations

PIRT Member	Recommendation	Supporting Comments
Saudi Arabia (Aleidan)	Approve	“Capturing CO <sub>2</sub> from fixed sources (e.g cement industry) is relevant to Saudi Arabia research interests. Even though the project is investigating mature technologies, the benchmarking will offer valuable insights.”
United Kingdom (Sharman)	Approve	“...an excellent project addressing important CO <sub>2</sub> capture aspects of industrial CCS. ... The Benchmarking Study is particularly relevant [and] the dissemination activities ... look comprehensive.”
United States (Litynski)	Approve	“...technologies being tested ... are of significant interest to DOE and we look forward to leveraging the international collaboration to learn more about the flexibility of these capture technologies.”



# Agenda Item 6

## Knowledge-Sharing from CSLF-Recognized Projects – with GCCSI

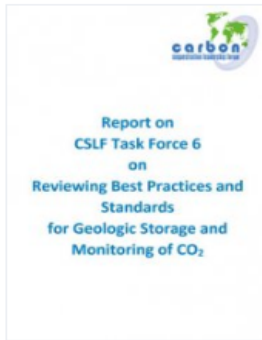


Solutions to Climate Change. All in one spot.

<http://decarboni.se/publications/report-cslf-task-force-6-reviewing-best-practices-and-standards-geologic-storage-and-monitoring-co2>



Search bar with magnifying glass icon, [Search](#) button, and [Browse](#) button.



**PUBLICATION**

## Report on CSLF Task Force 6 on reviewing best practices and standards for geologic storage and monitoring of CO<sub>2</sub>

This presentation is intended for those who want a quick look at available standards, guidelines and best practice manuals to safe and efficient storage of CO<sub>2</sub>. It is based on the Carbon Sequestration Leadership Forum report *Reviewing Best Practices and Standards for Geologic Storage and Monitoring of CO<sub>2</sub>, an Initial Compilation of Standards, Best Practices and Guidelines for CO<sub>2</sub> Storage and Monitoring*.

This content has been incorporated into *openCCS: Storage*, the handbook for delivering carbon capture storage (CCS) projects brought to you by the Global CCS Institute.

Source:

> [Carbon Sequestration Leadership Forum \(CSLF\)](#)

Publication date:  
**16 Apr 2013**

Downloads:  
[Download the document](#)

**TOPICS**

[Carbon capture, use and storage \(CCUS\), CO<sub>2</sub> storage](#)

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We have taken reasonable care to ensure this information is correct and current at the time of publication - check with the publisher for updates.

**RECOMMENDED TO YOU**

# Best Practices and Standards for Geologic Storage and Monitoring of CO<sub>2</sub>



- Content
  - Summary
    - For a high level summary with indications of which storage topics are included in the documents, [click her](#)
  - Standards general
    - [CSA: Z741-12 - Geological storage of carbon dioxide](#)
    - [ISO/TC 265 "Carbon dioxide capture, transportation, and geological storage" – work in progress](#)
  - Guidelines
    - [Australia](#)
    - [European Commission](#)
    - [Alberta, Canada](#)  
[Summary Report of the Regulatory Framework Assessment](#)
    - [London Convention and Protocol](#)
    - [OSPAR](#)
    - [Site screening, characterization and selection](#)
    - [US EPA](#)
    - [World Resources Institute \(WRI\): Guidelines for CCS](#)
  - Best Practice Manuals
    - [General](#)
    - [Simulation and modelling](#)
    - [Well construction and integrity](#)
    - [Monitoring and verification](#)
    - [Risk assessment and management](#)
    - [Operation](#)
    - [Closure](#)

# OSPAR



- The OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic has issued Decision 2007/2 on the Storage of Carbon Dioxide Streams in Geological Formations
- [http://www.ospar.org/html\\_documents/ospar/html/ospar\\_convention\\_e\\_updated\\_text\\_2007.pdf](http://www.ospar.org/html_documents/ospar/html/ospar_convention_e_updated_text_2007.pdf)
- [http://www.google.no/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCQQFjAA&url=http%3A%2F%2Fwww.ospar.org%2Fdocuments%2Fdbase%2Fdecrecs%2Fagreements%2F07-12e\\_co2%2520gl%2520and%2520fram.doc&ei=yvBAVOq0CYWxaeSpgPgL&usg=AFQjCNF2Gwg\\_5zwO-SWZyOZ3zVgaTOdHVA&bvm=bv.77648437,d.d2s](http://www.google.no/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCQQFjAA&url=http%3A%2F%2Fwww.ospar.org%2Fdocuments%2Fdbase%2Fdecrecs%2Fagreements%2F07-12e_co2%2520gl%2520and%2520fram.doc&ei=yvBAVOq0CYWxaeSpgPgL&usg=AFQjCNF2Gwg_5zwO-SWZyOZ3zVgaTOdHVA&bvm=bv.77648437,d.d2s)
- The Convention is accompanied by Guidelines for Risk Assessment and Management of Storage of CO<sub>2</sub> Streams in Geological Formations
- The Guidelines provide generic guidance for Contracting Parties when considering applications for permits to store CO<sub>2</sub> in geological formations under the seabed. The Guidelines have four Annexes, whereof Annex 1 – Framework for Risk Assessment and management of Storage of CO<sub>2</sub> Streams in Geological Formations (FRAM) – is relevant for this overview. It addresses:
  - Problem formulation
  - Site selection and characterization
  - Exposure assessment
  - Effects assessment
  - Risk characterization
  - Risk management



## Agenda Item 6.1

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Report on the Gorgon CO<sub>2</sub> Injection Project

- recognised 2010, CSLF meeting Warsaw

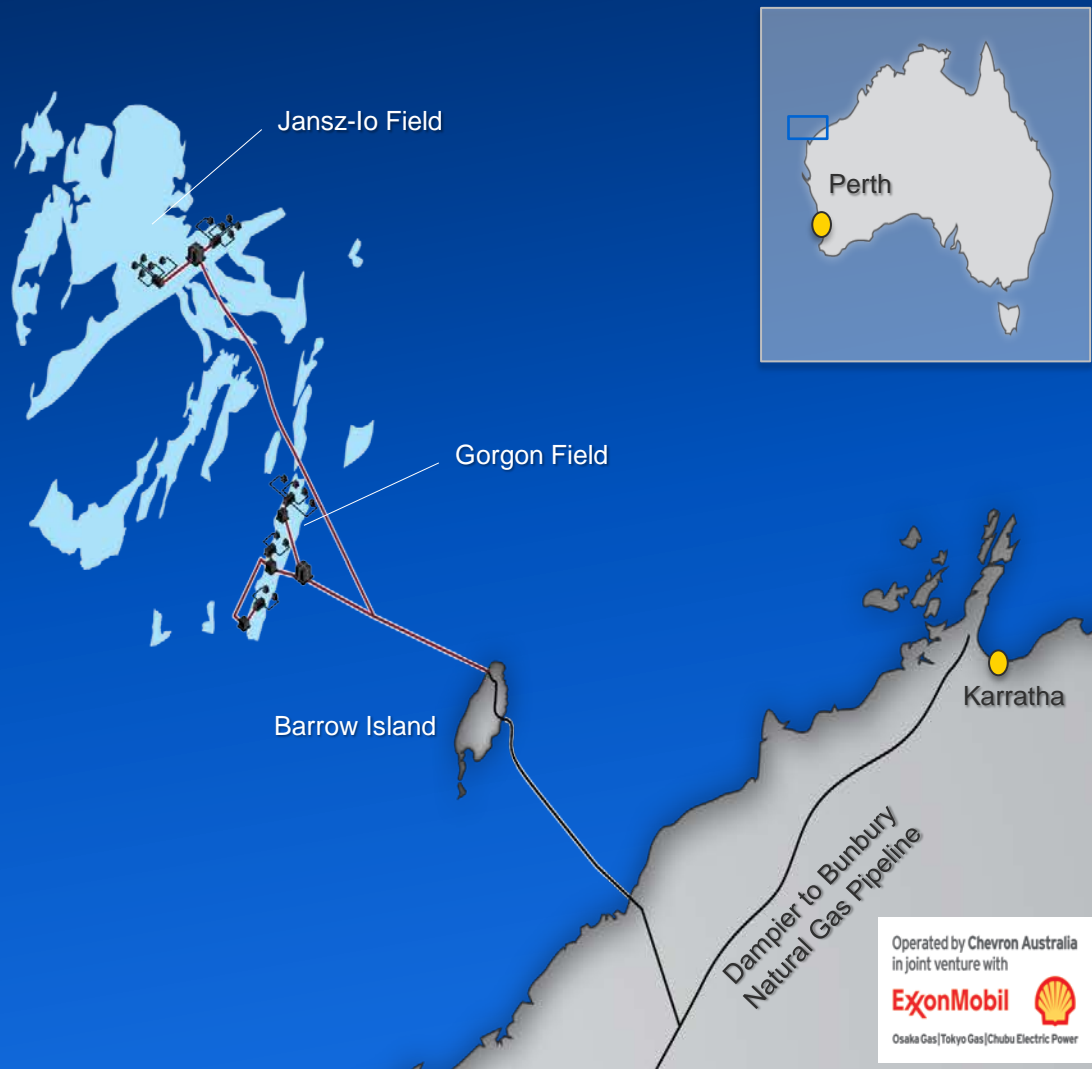
# Gorgon Project Overview 2014



- AUD \$52 billion investment
- Sub sea development of the Gorgon and Jansz-Io gas fields
- 3 x 5.2 MTPA LNG trains
- A domestic gas plant with capacity of 300 terajoules per day
- Carbon dioxide injection project

## Joint Venture Participants

- Chevron (47.3%)
- ExxonMobil (25%)
- Shell (25%)
- Osaka Gas (1.25%)
- Tokyo Gas (1%)
- Chubu Electric Power (0.417%)



Operated by Chevron Australia  
in joint venture with  
**ExxonMobil**  
Osaka Gas|Tokyo Gas|Chubu Electric Power



# Gorgon Project

## Carbon Dioxide Injection Project



**Carbon Sequestration Leadership Forum**  
6-8 October 2010

# Gorgon Project

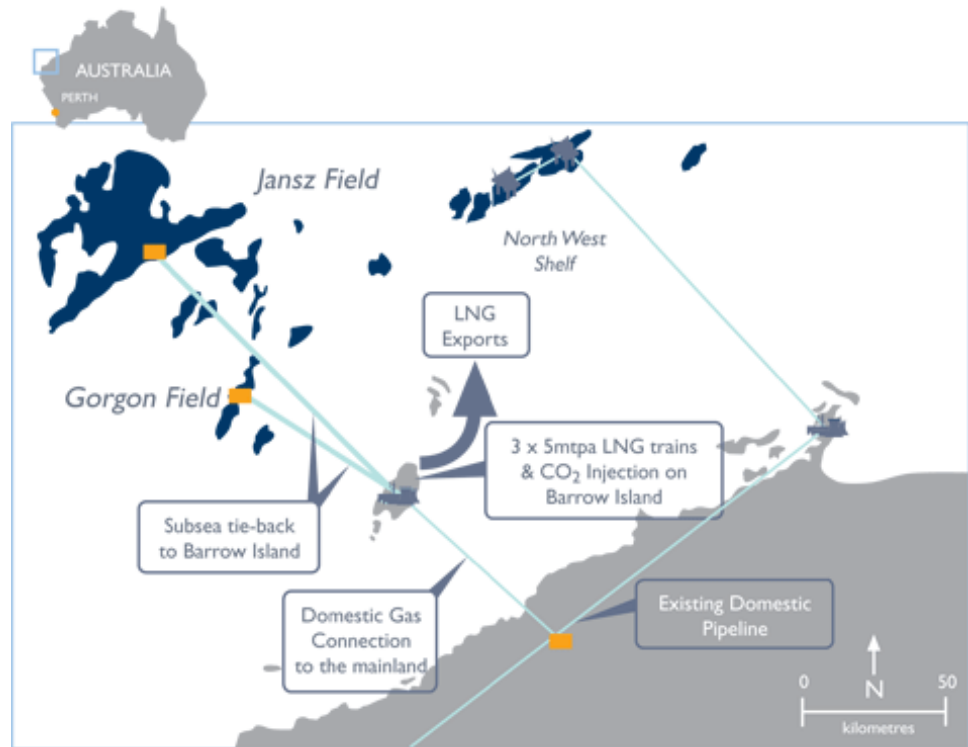


## Joint Venture Participants

- Chevron (~47%)
- ExxonMobil (25%)
- Shell (25%)
- Osaka Gas (1.25%)
- Tokyo Gas (1%)
- Chubu Electric Power (0.417%)

## Project Development Plan

- 3 x 5 MTPA LNG trains
- A domestic gas plant with capacity of 300 terajoules per day
- LNG shipping facilities to transport products to international markets
- Greenhouse gas management via CO<sub>2</sub> injection project
- First gas scheduled for 2014



The Australian Government has committed \$60 million to the Gorgon Project's Carbon Dioxide Injection Project as part of the Low Emissions Technology Demonstration Fund



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# Carbon Dioxide Injection Project 2010



The first project in Australia to significantly reduce emissions by the underground injection of carbon dioxide

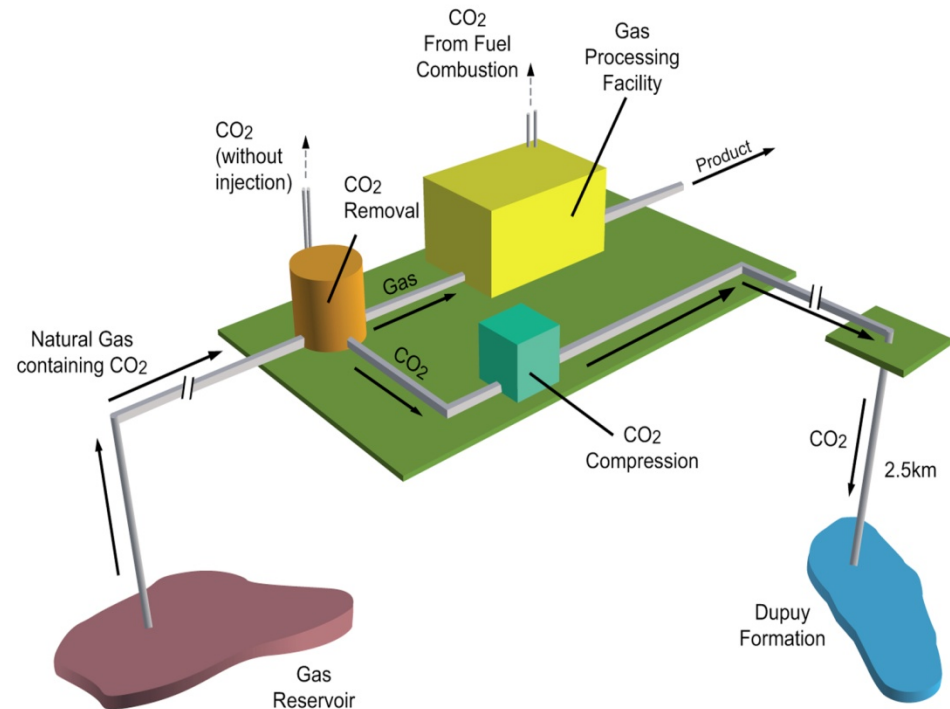
Project emissions expected to be reduced by approximately 40%

\$150+ million spent on investigation and development to date

Injection of between 3.4 and 4.0 million tonnes of reservoir carbon dioxide per year or over 100 million tonnes over the life of the project

Number of world firsts

- First greenhouse gas storage legislation
- First project to undergo detailed environmental impact assessment (including public review and comment)

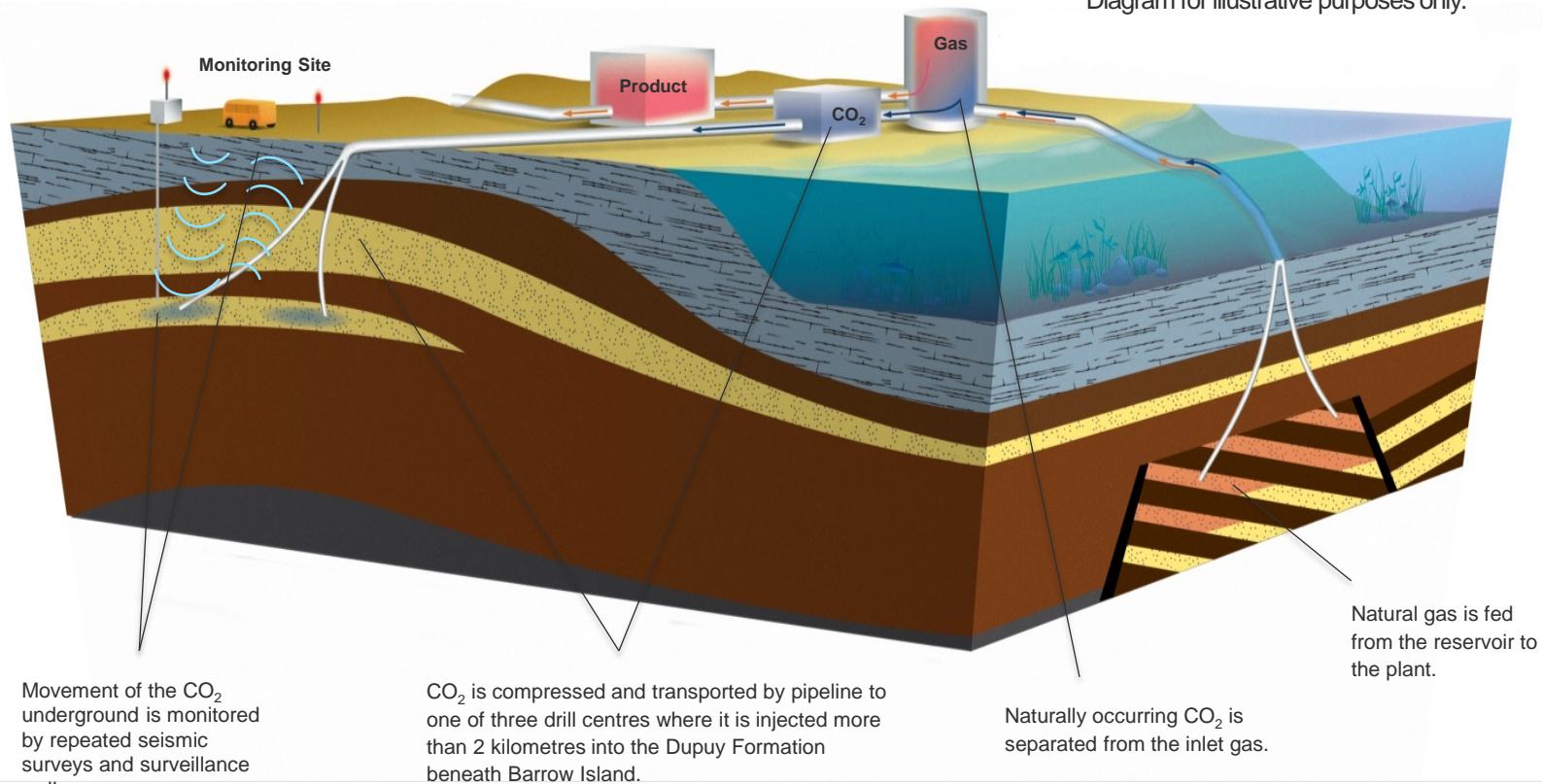


# Chevron-operated Gorgon Project 2014

## Carbon Dioxide (CO<sub>2</sub>) Injection Project



\* Diagram for illustrative purposes only.



Movement of the CO<sub>2</sub> underground is monitored by repeated seismic surveys and surveillance wells.

CO<sub>2</sub> is compressed and transported by pipeline to one of three drill centres where it is injected more than 2 kilometres into the Dupuy Formation beneath Barrow Island.

Naturally occurring CO<sub>2</sub> is separated from the inlet gas.

Natural gas is fed from the reservoir to the plant.



The Australian Government has committed \$60 million to the Gorgon Carbon Dioxide Injection Project as part of the Low Emissions Technology Demonstration Fund (LETDF).



# WAPET Landing & Town Point 2010

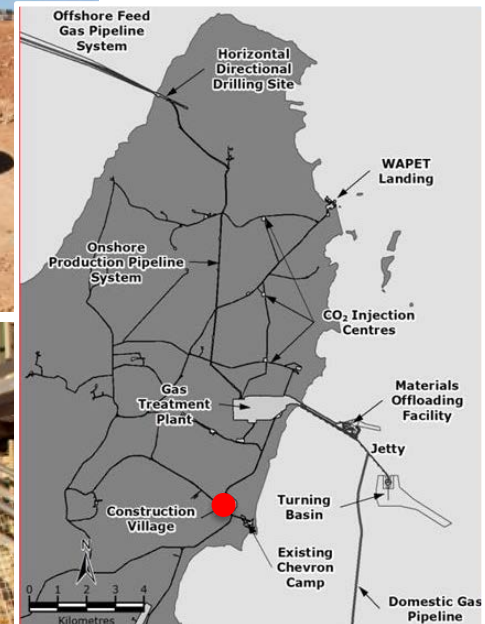


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# Construction Village & Fly Camp 2010



Operated by Chevron Australia  
in joint venture with



Osaka Gas | Tokyo Gas | Chubu Electric Power

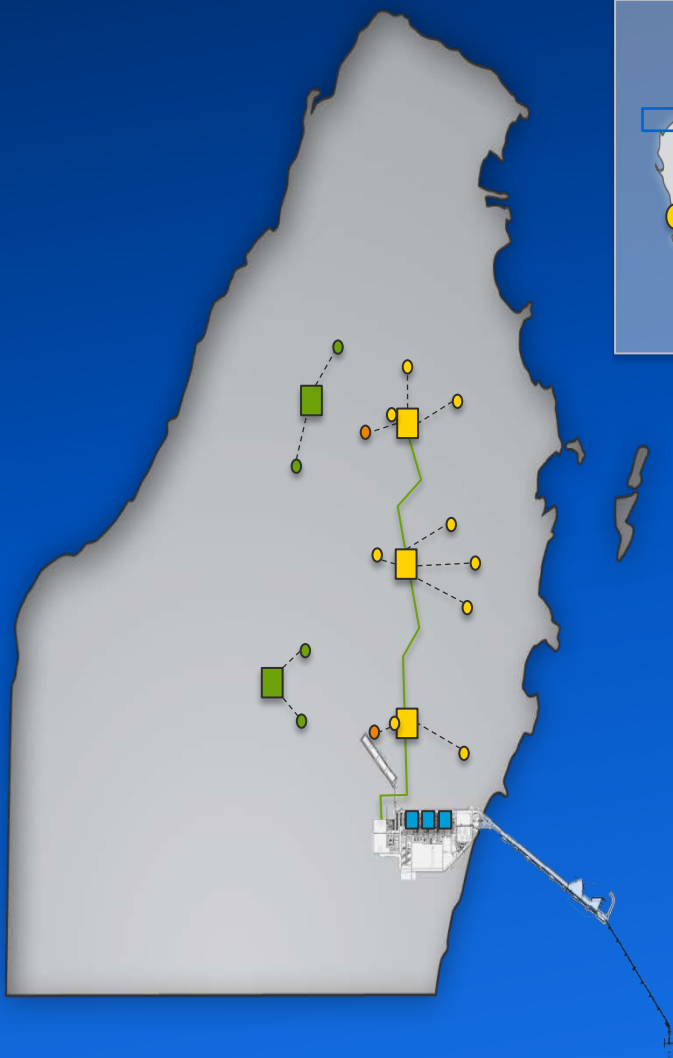
# Carbon Dioxide Injection Project 2014

## Project Facilities



**Legend**

- Drill Centre Surface Location
- Planned Injection Well Bottom Hole Location
- Planned Pressure Management Drill Centre Surface Location
- Planned Water Production Well Bottom Hole Location
- Reservoir Surveillance Well
- CO<sub>2</sub> Pipeline
- CO<sub>2</sub> Compressor Module



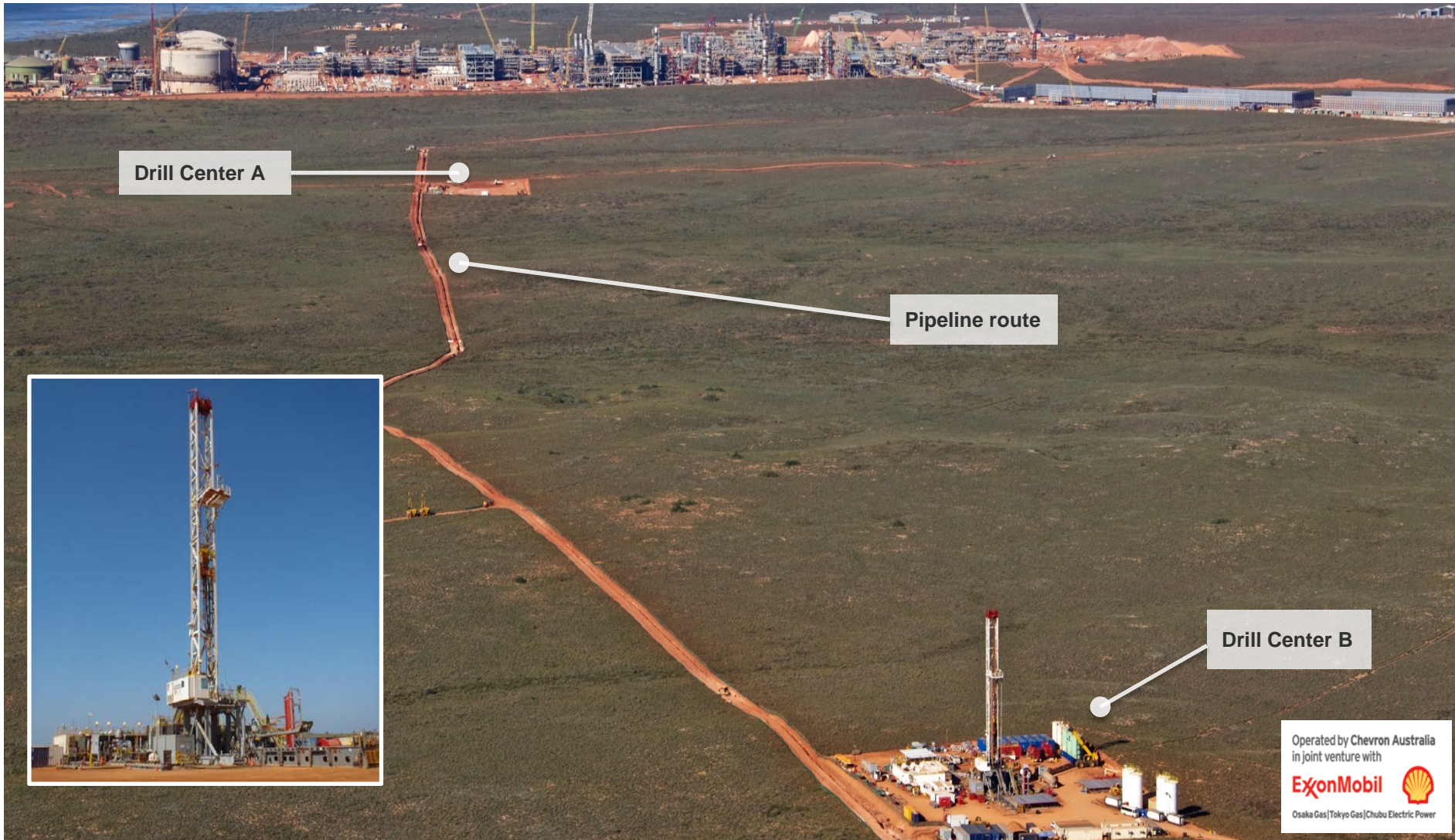
\* CO<sub>2</sub> Injection Project facilities have not been drawn to scale. For illustrative purposes only.

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# Carbon Dioxide Injection Project 2014



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Osaka Gas | Tokyo Gas | Chubu Electric Power



# Gas Treatment Plant Site



Operated by Chevron Australia  
in joint venture with



Osaka Gas | Tokyo Gas | Chubu Electric Power

# Gorgon Project Plant Site

Plant Site – July 2014



CO<sub>2</sub> Compressor Module



Operated by Chevron Australia  
in joint venture with  
**ExxonMobil**  
Osaka Gas | Tokyo Gas | Chubu Electric Power



# Agenda Item 7, TRM 2017 - confirmation

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*From the Minutes Seoul*, following responsibilities were assigned:

Area #1: CO<sub>2</sub> Capture Technologies in Power Generation (Norway)

Area #2: CO<sub>2</sub> Capture in Industrial Sector (South Africa & UK)

Area #3: CO<sub>2</sub> Transport (Australia)

Area #4: Large-Scale CO<sub>2</sub> Storage (Japan and France)

Area #5a: Monitoring (United States & France)

Area #5b: Mitigation / Remediation (European Commission)

Area #6: Understanding the Storage Reservoirs (United Kingdom – to be confirmed)

Area #7: Infrastructure (United Kingdom – to be confirmed)

Area #8a: CO<sub>2</sub> Utilization, non-EOR (France, M. David Savary, Solvay)

Area #8b: CO<sub>2</sub> Utilization, EOR (Saudi Arabia)



## **Agenda Item 9**

### **Closing Comments / Adjourn**