

# *Australian CCS Policy and Implementation*

*CAGS Workshop, Changchun, July 2011*



Niki Jackson

Asst Manager, CCS International Section  
Department of Resources, Energy and Tourism

ENHANCING AUSTRALIA'S **ECONOMIC PROSPERITY**

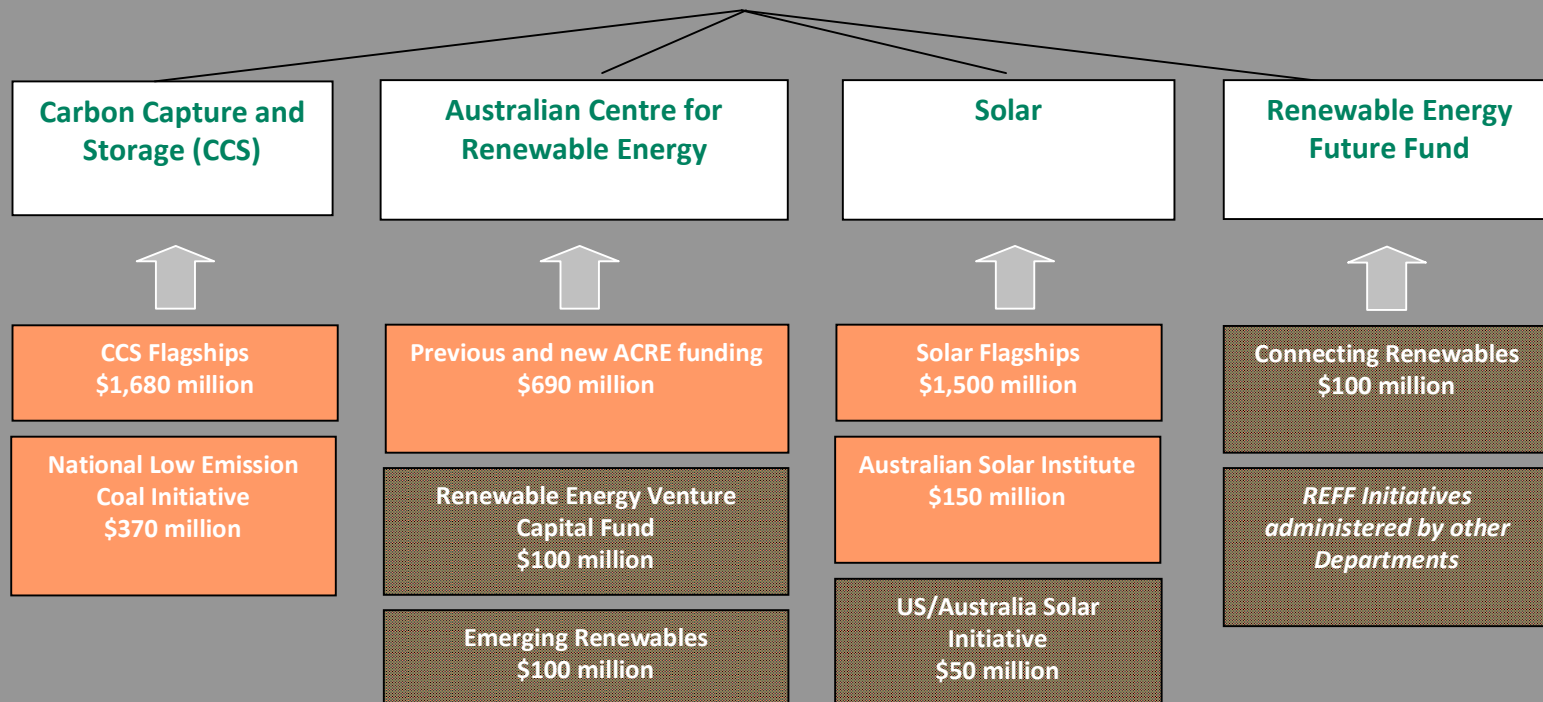
# Greenhouse commitments

- Australia's emission reduction targets
  - By 2020: 5 % below 2000 levels
  - By 2050: 60% below 2000 levels.
- Targets a major challenge given reliance on coal
  - Coal 80% of electricity and 32% of emissions
  - Reliance on coal will decline but will continue to be the major source of power
  - Improvements in generating efficiency important
  - CCS essential to achieve major cuts in emissions
  - Responsibilities as a major international energy supplier.



# Clean energy initiative (CEI)

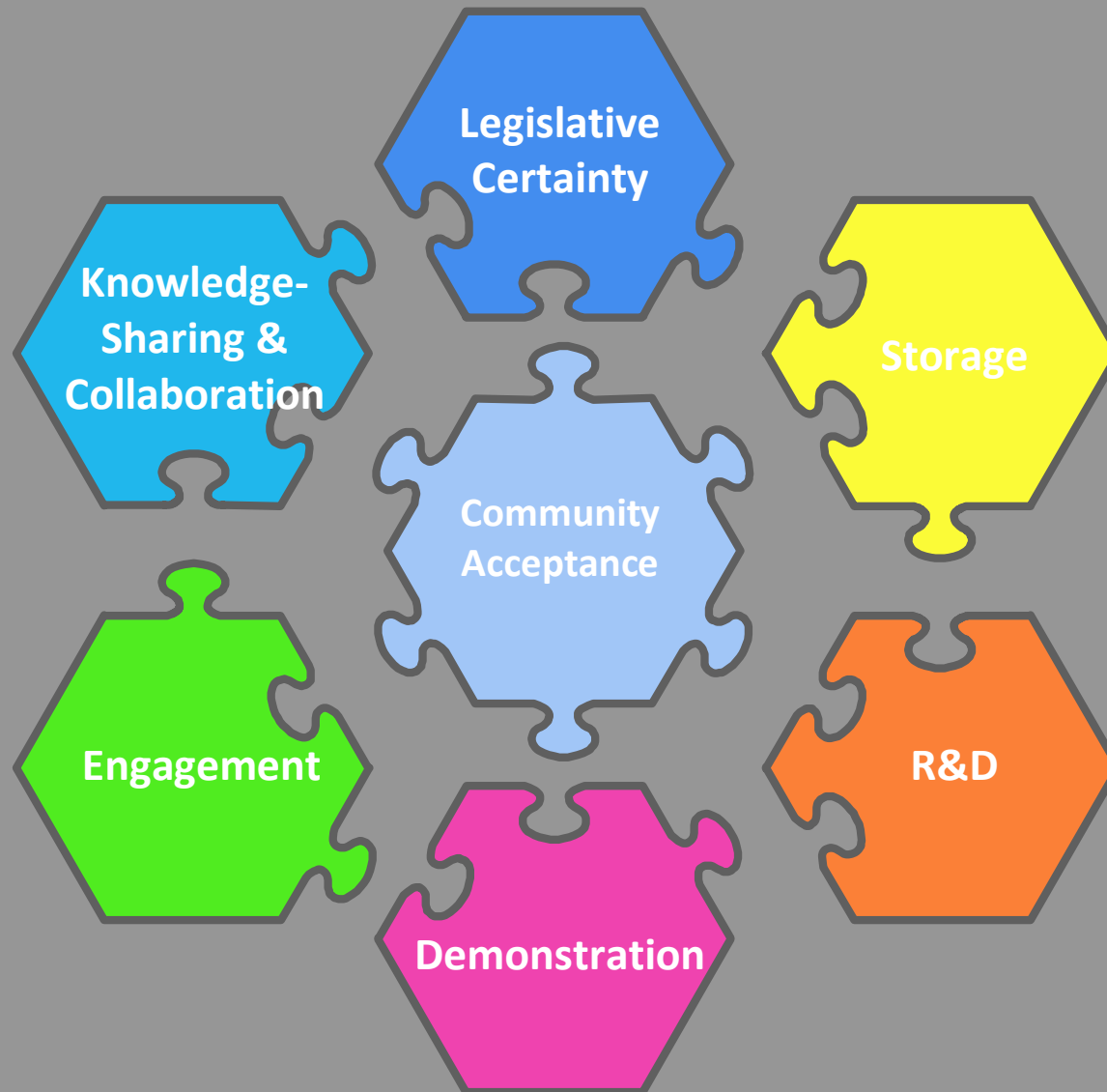
\$5 billion



Measures denoted in blue are funded through the Renewable Energy Future Fund

Measures denoted in orange are funded through prior announcements

# The CCS puzzle

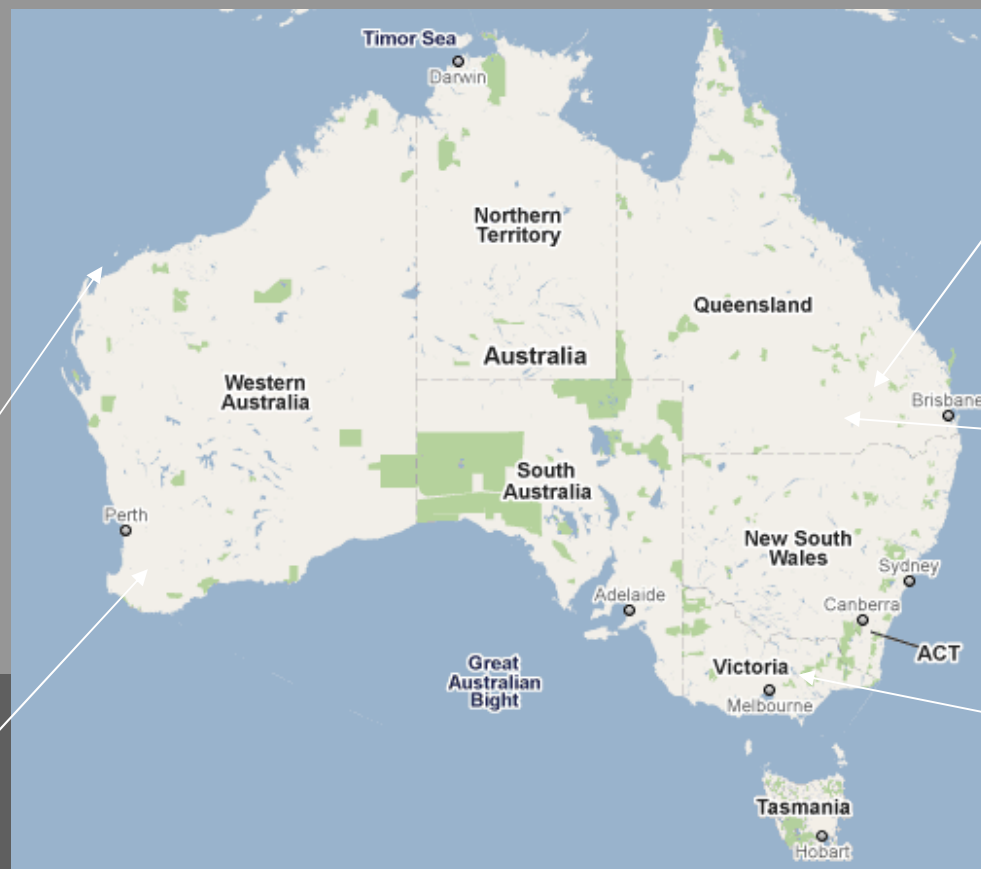




# CCS Flagships & Commercial Scale Projects

**Gorgon LNG Project**  
To sequester 3.5 MT  
per year

**Collie South West  
Hub** – to sequester  
2.4MT with potential to  
7 MT



**ZeroGen**  
400MW IGCC  
sequestering  
3.0MT per  
year  
**Wandoan** –  
330MW IGCC  
sequestering  
2.5MT per  
year  
**CarbonNet** –  
hub to  
sequester 3 –  
5 MT

# Demonstration Projects

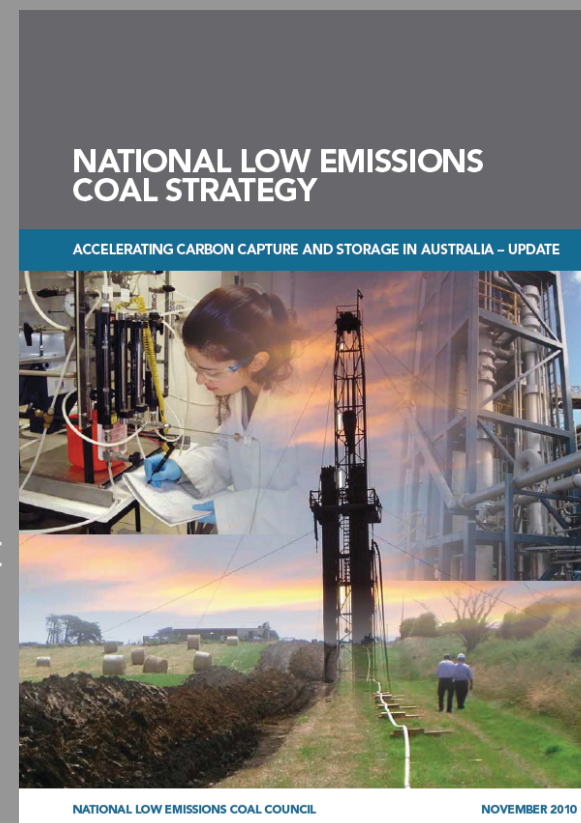


## National Low Emissions Coal Initiative

- Pilot scale and medium scale Post Combustion Capture (PCC)
  - Loy Yang (Victoria)
  - Munmorah (NSW)
  - Tarong (Queensland)
- Callide Oxyfuel
- Calera carbonation project
- Nippon Steel Engineering ECOPRO
- Otway storage project

# National Low Emissions Coal Initiative (NLECI)

- Established 2008.
- Research, demonstration and deployment of low-emission coal technologies involving CCS.
- \$370 million in funding:
  - \$75 million – Australian National Low Emission Coal R&D Agency (ANLEC R&D)
  - \$50 million – National Carbon Mapping and Infrastructure Plan
  - \$50 million – Callide oxyfuel combustion project
  - \$150 million – demonstration projects in Queensland, NSW and Victoria.
  - \$20 million – Australia-China Joint Coordination Group on Clean Coal Technology (JCG)

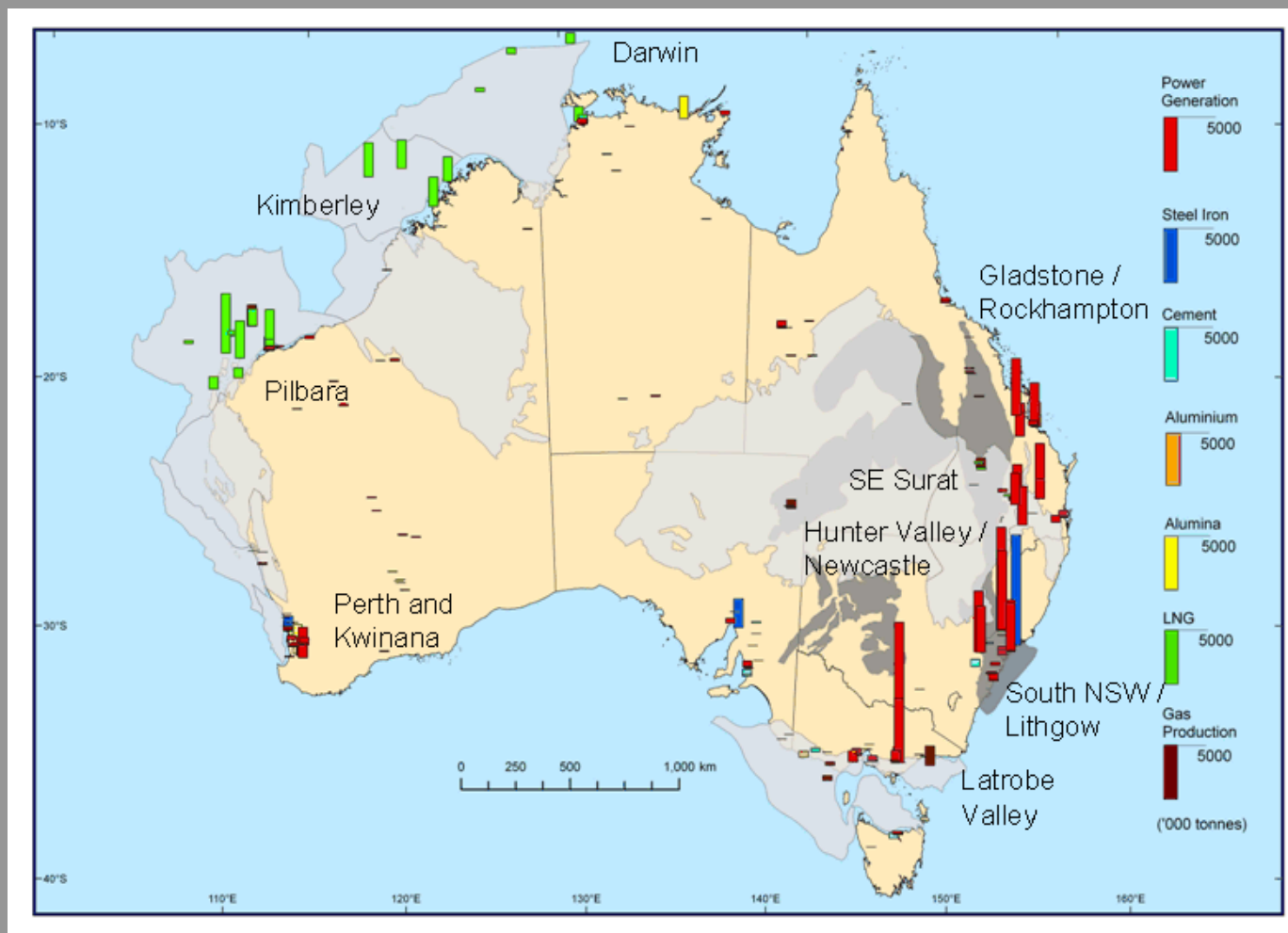


# National CCS Council

- Established November 2010
- Commercially-oriented advice to government
- Brings together key stakeholders (industry, research, generators)
- Key policy areas:
  - Effectiveness of CCS legislation
  - Consistency of CCS data;
  - Integration of CCS supply chain;
  - Translate the experiences gained from projects to reducing costs and risks; and
  - Addressing community concerns.



# National Carbon Mapping and Infrastructure Plan



Geographical distribution of emissions by industry estimated for 2020

# National CO<sub>2</sub> Infrastructure Plan

- \$60.9 million (2011-12 Budget)
- Reduce barriers to CCS and promote industry and investor confidence.
- Assist the development of integrated CCS projects in Australia.

## Four components:

1. CCS exploration and appraisal program;
2. Additional on- and offshore CO<sub>2</sub> storage data;
3. National CO<sub>2</sub> Drilling Rig Deployment Strategy;
4. National CO<sub>2</sub> Storage and Transport Infrastructure Assessment.





# Commonwealth GHG Storage Legislation

## *Offshore Petroleum and Greenhouse Gas Storage Act 2008*

- title system similar to that used for petroleum
  - safe and secure storage
  - managing interactions with the petroleum industry
  - site closure and treatment of long term liability
  - CCS-specific regulations
- 
- Release of 10 offshore areas



# International CCS Collaboration

Australia is an active member of a number of multilateral forums:

- Global CCS Institute;
- Carbon Sequestration Leadership Forum;
- CCUS Action Group – through the Clean Energy Ministerial (CEM);
- International Energy Agency (CCS Unit);
- Asia Pacific Partnership on Clean Development and Climate;
- Asia Pacific Economic Cooperation.



International  
Energy Agency





# Australia-China collaboration on CCS

- Australia-China Joint Coordination Group on Clean Coal Technology (JCG)
  - \$20 million
  - Post-combustion capture (PCC) feasibility study.
- Asia Pacific Partnership on Clean Development & Climate (APP) – Cleaner Fossil Energy Taskforce
  - Enhanced Coal Bed Methane (ECBM)
  - Pilot-scale PCC project at Gaobeidian
  - China Australia Geological Storage (CAGS)
- Carbon Sequestration Leadership Forum
  - Active participation
  - CSLF Ministerial in Beijing, September 2011



# JCG - Collaborative R&D Projects

**1. Integrated radar & optical satellite remote sensing for safeguarding CCS**

Uni of NSW; National Research Centre [China]; China Shenhua Group

**2. Assessing the value of co-optimising ECBM recovery and CO<sub>2</sub> storage**

Uni of NSW; China Univ of Geosciences; Qinshui Lanyan Coalbed Methane

**3. Chemical looping gasification of coal for zero emissions power generation**

Uni of Qld; Southeast University, Nanjing; Zhejiang University, Hangzhou

**4. Further dev of an aqueous ammonia PCC process for application in Australia and China;**

CSIRO; Tsinghua University, Zhejiang University

**5. Optimal practices for CO<sub>2</sub> ECBM productions for Chinese Coals**

CSIRO; China University of Geosciences

**6. Kinetics of steam fluidized bed drying and Oxy-CFB combustion characteristics of Victorian brown coal & Chinese lignite**

Monash Uni; Shengli Energy; Kelong Pet. Chem. Equip; Liaoning Fu-an Grp

# Global Carbon Capture and Storage Institute

- Established 2009.
- An international hub of CCS knowledge and expertise.
- Currently over 300 members.
- Aim is to accelerate global deployment of commercial-scale CCS projects.
- Connects members around the world to solve problems, address issues and learn from each other through:
  1. Fact-based advocacy;
  2. Project assistance; and
  3. Knowledge sharing.



ENHANCING AUSTRALIA'S ECONOMIC PROSPERITY

# Challenges for CCS deployment in Australia

## Storage issues

- Greater levels of certainty needed for prospective geological storage.
- Need for further geological storage exploration.

## Financial support

- Encouraging commercial investment in CCS projects;
- Funding support for demonstration projects and transitional support measures.

## Policy settings

- Inconsistent state and Commonwealth regulatory frameworks
- Uncertainty surrounding the carbon pricing mechanism

## Community acceptance

- A risk for project approvals at the local level
- A risk for public funding support at the wider community level.



**Thank you!**

[www.ret.gov.au](http://www.ret.gov.au)