



# The Global Carbon Capture and Storage Institute GCCSI

World Coal Institute

Policy Roundtable on Climate Change and Coal: U.S. Actions and Opportunities

**Bob Pegler**

Deputy CEO of the GCCSI

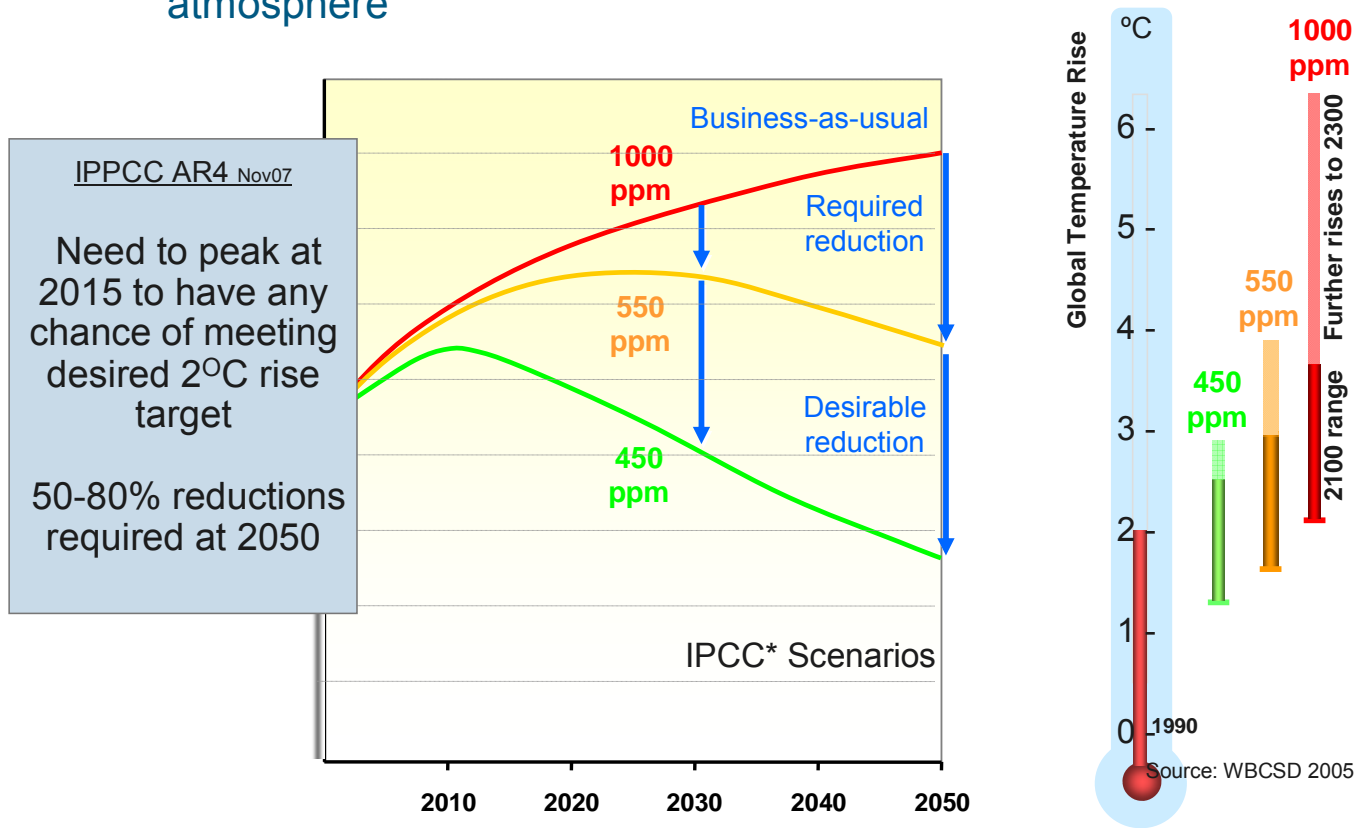
Washington DC

23<sup>rd</sup> June 2009

# The fundamental driver

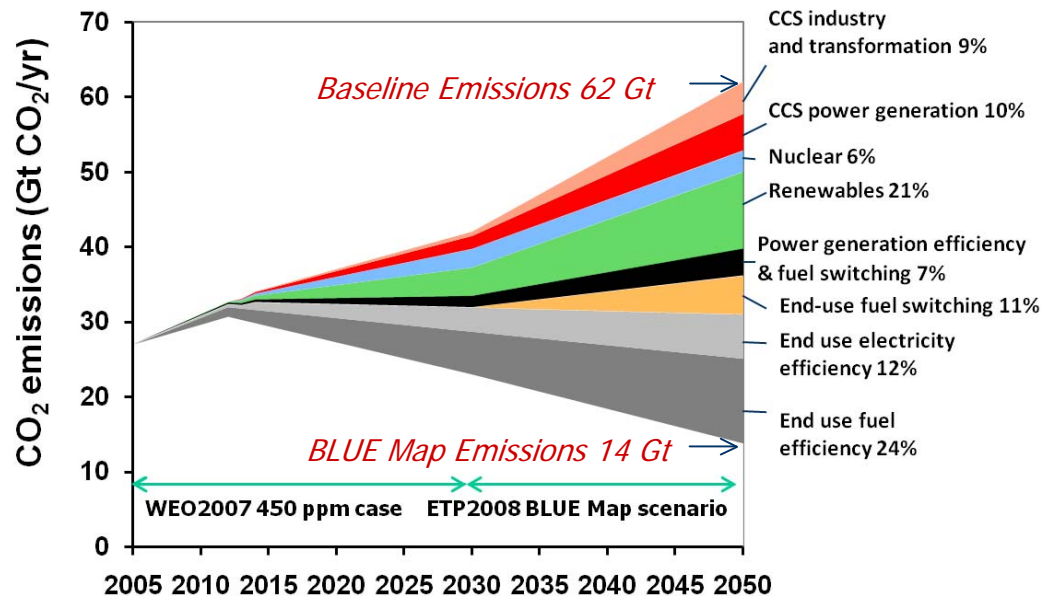
## Climate Change : Global CO<sub>2</sub> Projections

Goal: A long term moderate stable CO<sub>2</sub> concentration in the atmosphere



# The importance of CCS

## A New Energy Revolution: Cutting Energy Related CO<sub>2</sub> Emissions



~20% of required CO<sub>2</sub> reduction by 2050 could be attributable to deployment of CCS

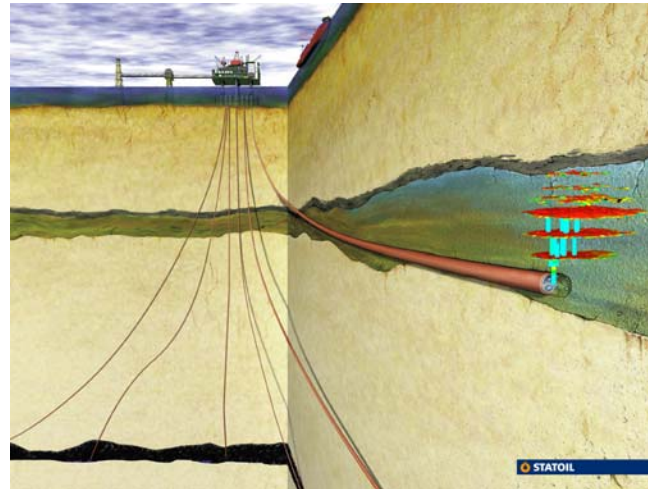


# The need for demonstration at scale



## CCS is already happening worldwide

- **Sleipner, Norway**  
1 Mt/year since 1996
- **Permian Basin, US**  
70+ projects, total of 500 Mt/stored
- **In Salah, Algeria**  
1.1 Mt/y since 2004
- **Weyburn, Canada**  
2 Mt/y since 2000



*Now need to upscale, reduce costs and test the full CO<sub>2</sub> chain and the range of storage options*

***“We strongly support the recommendation that 20 large scale CCS demonstration projects need to be launched globally by 2010, with a view to supporting technology development and cost reduction for the beginning of broad deployment of CCS by 2020.”***

G8 Statement of June 2008

The GCCSI is a major response by  
Kevin Rudd Prime Minister of Australia

# Mandate and objectives of the GCCSI

- Acceleration of the global adoption of safe, commercially and environmentally sustainable CCS
- Drive co-operation to deliver a diverse portfolio of 20+ fully integrated industrial scale demonstration projects by 2020:
  - Across a range of emitters
  - Across a range of technologies
  - Along the entire capture, transport and storage chain
- Work in concert with existing bodies to overcome barriers to broad industrial scale deployment of CCS (IEA, CSLF etc.)
- Be responsible for effective sharing of non-proprietary knowledge of CCS among stakeholders and interested parties

The GCCSI is a global action

# Membership and support:

## Foundation Members as of June 2009

### Founding Members

The Government of Australia  
The Emirate of Abu Dhabi  
The Government of Canada  
European Commission  
The Government of the Peoples Republic of China  
The Government of France  
The Government of Germany  
The Government of Indonesia  
The Government of Italy  
The Government of Japan  
The Government of the Republic of Korea  
The Government of Mexico  
The Government of Netherlands  
The Government of New Zealand  
The Government of Norway  
The Government of Papua New Guinea  
The Government of South Africa  
The Government of United Kingdom  
The Government of United States of America

The State Government of New South Wales  
The State Government of Queensland  
The State Government of South Australia  
The State Government of Victoria  
The State Government of Western Australia

Asian Development Bank  
Japan Bank for International Cooperation  
Alstom Power Ltd  
AMEC Plc  
Anglo American Services (UK) Limited  
ARUP Pty Ltd  
BHP Billiton  
BP Australia Pty Ltd  
Chevron Australia Pty Ltd  
China Huaneng Group  
Chiyoda Corporation

Doosan Babcock Energy Limited  
The Dow Chemical Company  
ENEL  
Exxon Mobil Australia Pty Ltd  
General Electric International Inc  
Golder Associates Pty Ltd  
Greenhouse Gas Storage Solutions (GGSS)  
Hatch Associates Pty Ltd  
Hitachi Limited  
HTC Pureenergy Inc  
Hydrogen Energy International Limited  
INPEX Corporation  
IHI Corporation  
JGC Corporation  
Nippon Steel Engineering Co. Ltd  
Macquarie Capital Advisers Ltd  
Mitsubishi Corporation  
Mitsui & Co Ltd  
Parsons Brinckerhoff Australia Pty Ltd  
Peabody Pacific Pty Ltd  
PricewaterhouseCoopers  
Rio Tinto Ltd  
RWE Power AG  
Samsung Techwin Co Ltd  
Santos Limited  
Senergy Alternate Energy Ltd  
Services Petroliers Schlumberger  
Shell International Petroleum Company Ltd  
Southern States Energy Board  
StatoilHydro ASA  
Taisei Corporation  
Toshiba Corporation  
Total S.A.  
TRUenergy Development Pty Ltd  
Woodside Energy Ltd  
Worley Parsons Services Pty Ltd  
Xstrata Coal Pty Ltd  
ZEEP Australia Pty Ltd

Australian Coal Association  
British Geological Survey  
Carbon Capture and Storage Association  
Cooperative Research Centre for Greenhouse Gas Technologies (CO2CRC)  
Commonwealth Scientific and Industrial Research Organisation (CSIRO)  
demosEUROPA  
Electric Power Research Institute (EPRI)  
The Clinton Foundation  
Główny Instytut Górnictwa (Poland)  
IEA Greenhouse Gas R&D Programme  
Japan Coal Energy Center (JCOAL)  
National Low Emissions Coal Research Ltd  
Petroleum Technology Research Centre  
Research Institute of Innovative Technology for the Earth (RITE)  
South African National Energy Research Institute (SANERI)  
The Climate Group  
Underground Coal Gasification Association  
United States Energy Association  
University College of London  
World Coal Institute

### Collaborating Participants

International Energy Agency  
International Energy Forum  
The World Bank

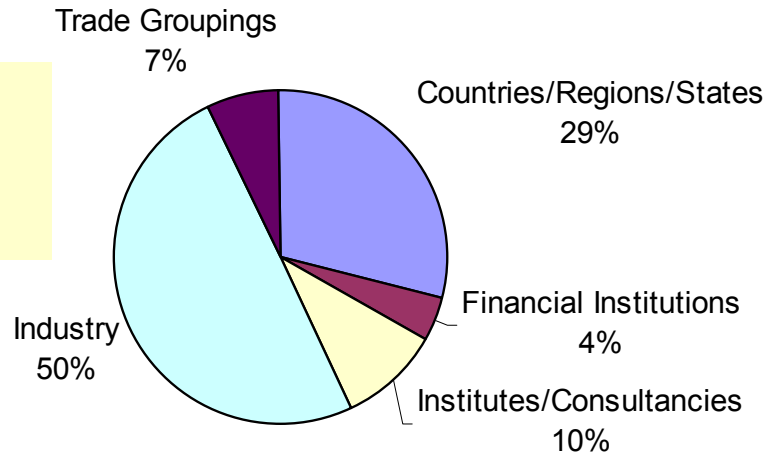
Foundation Members: 93  
Collaborating Participants: 3



# Balance of the GCCSI participants

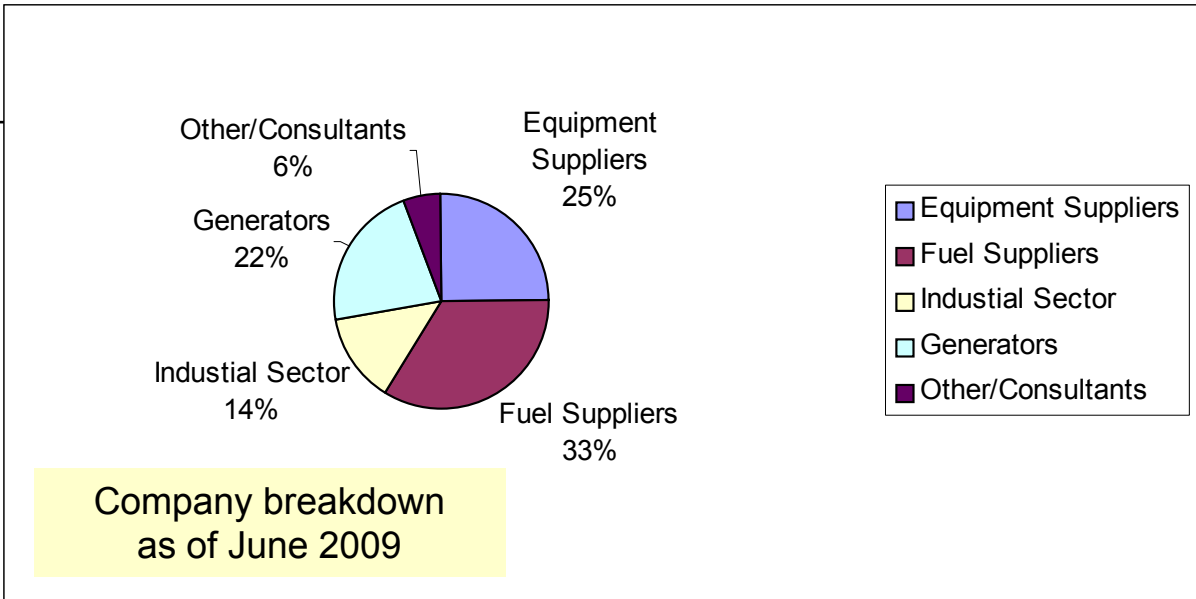
Total: 96

The GCCSI co-operating organisations as of June 2009

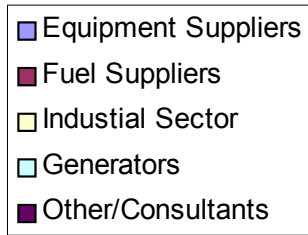


The GCCSI is set on maintaining a balance in organisational, political and geographical representation.

**Foundation Membership is open to 30<sup>th</sup> June 2009**



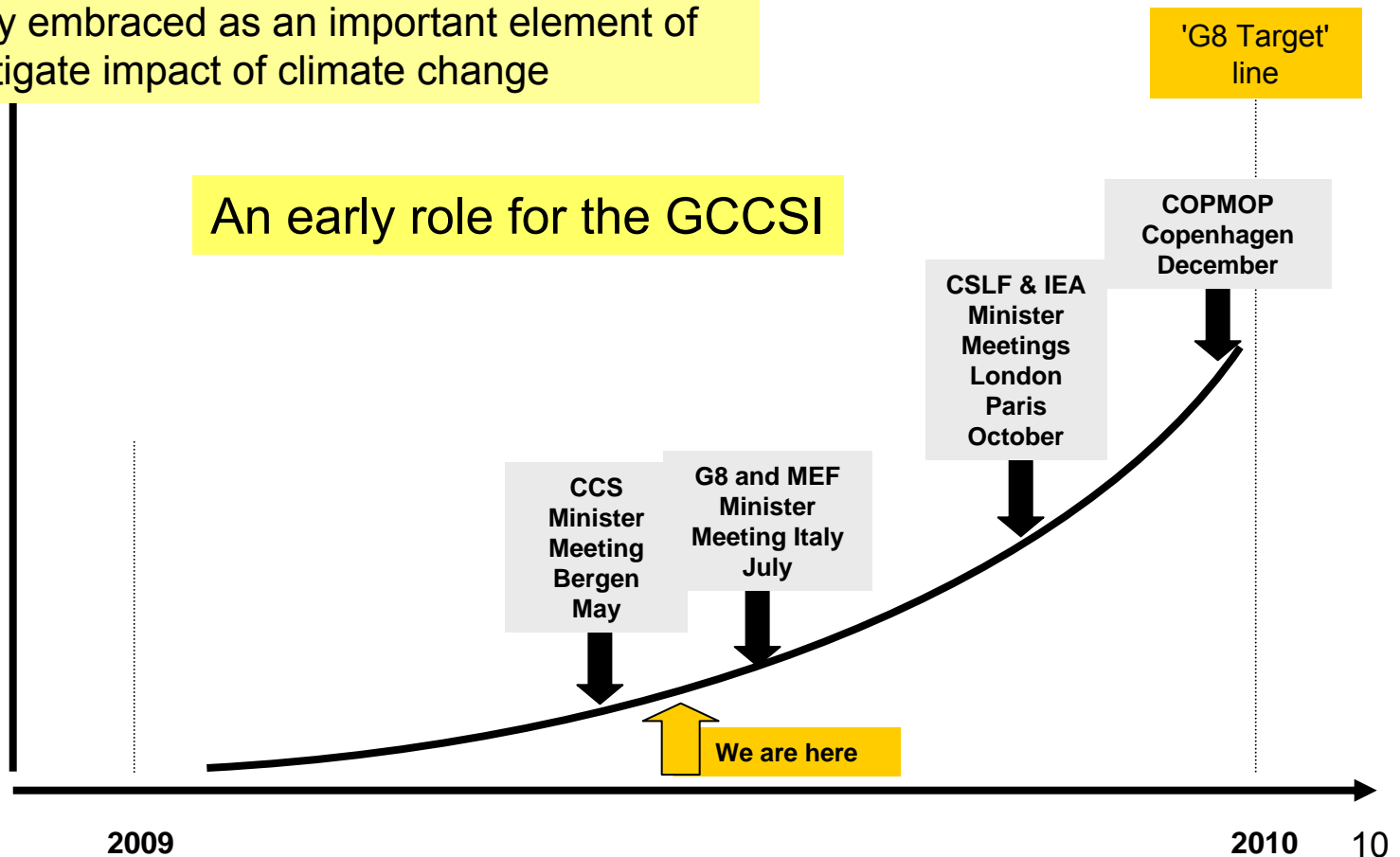
Company breakdown as of June 2009



# 2009: an extremely important year

Key inputs and positions required to ensure that CCS is fully embraced as an important element of tools to mitigate impact of climate change

An early role for the GCCSI



# Added value of the GCCSI

The GCCSI brings to the arena a much needed resource:

- Budget commitment of AUD\$100m pa from Australian Government
- Initially provide financial support but increasingly remove barriers to deployment of CCS
- Provide full time funded expertise to assist in demonstration CCS project implementation in all aspects of capture, transport and storage
- Underpin and expand the capability of other international organisations

## Legal Entity

- Non profit company limited by guarantee: start date of 1<sup>st</sup> July 2009
- Skill-based board of directors
- International Advisory Panel of senior international advisors
  - Chair - James Wolfensohn
- Technical Advisory Committee for peer review/advice

## Organisational aspects

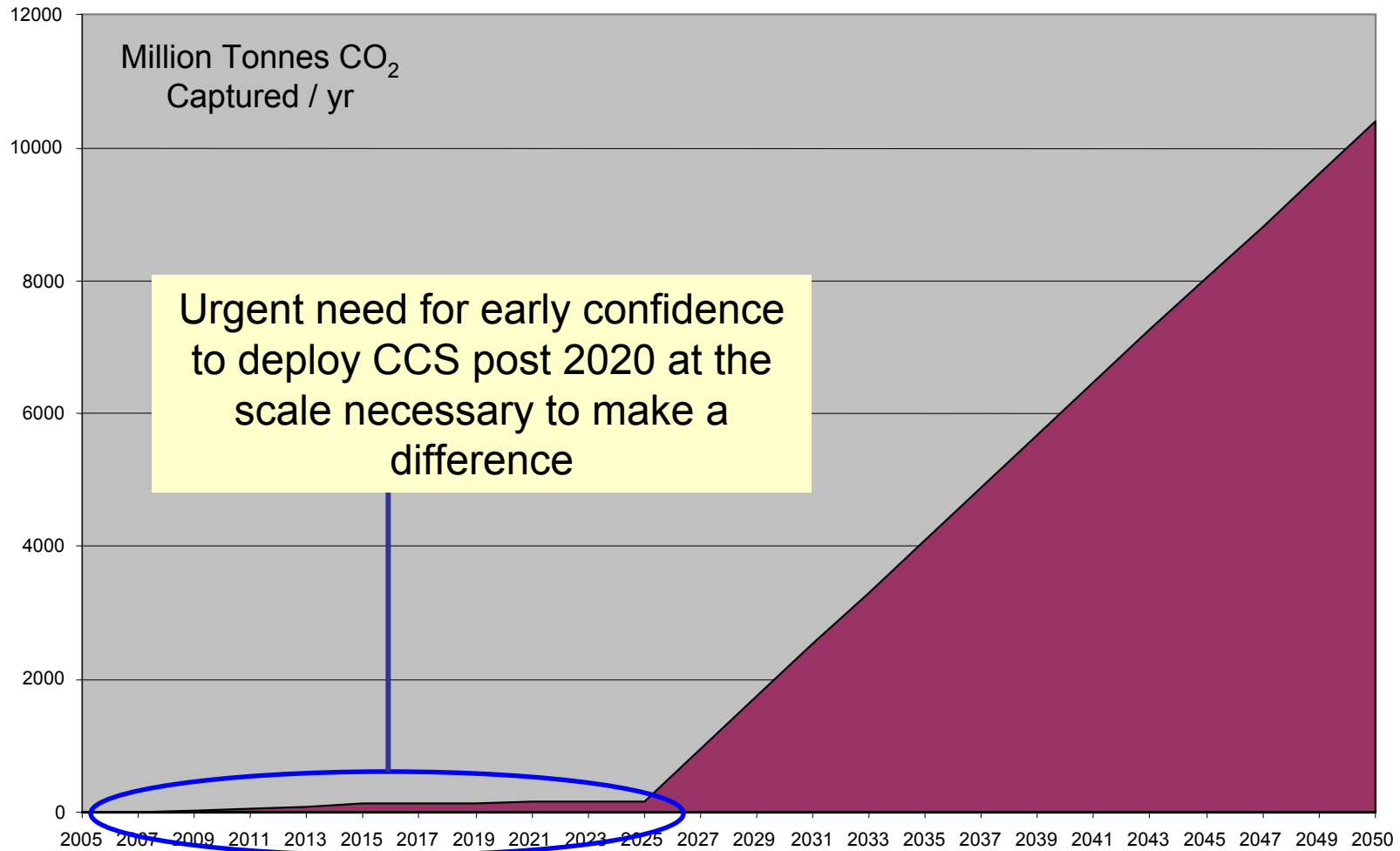
- Australia/Canberra hub: 40-50 individuals plus corporate function
- Linkages/actions worldwide: 'hub and spoke' model, could include:
  - Europe
  - North America
  - Asia
- 'Business build' underway
  - Focus on countries active in the GCCSI plus regions having high project needs or project potential
  - Focus on 'where the projects are'

# Some basic questions

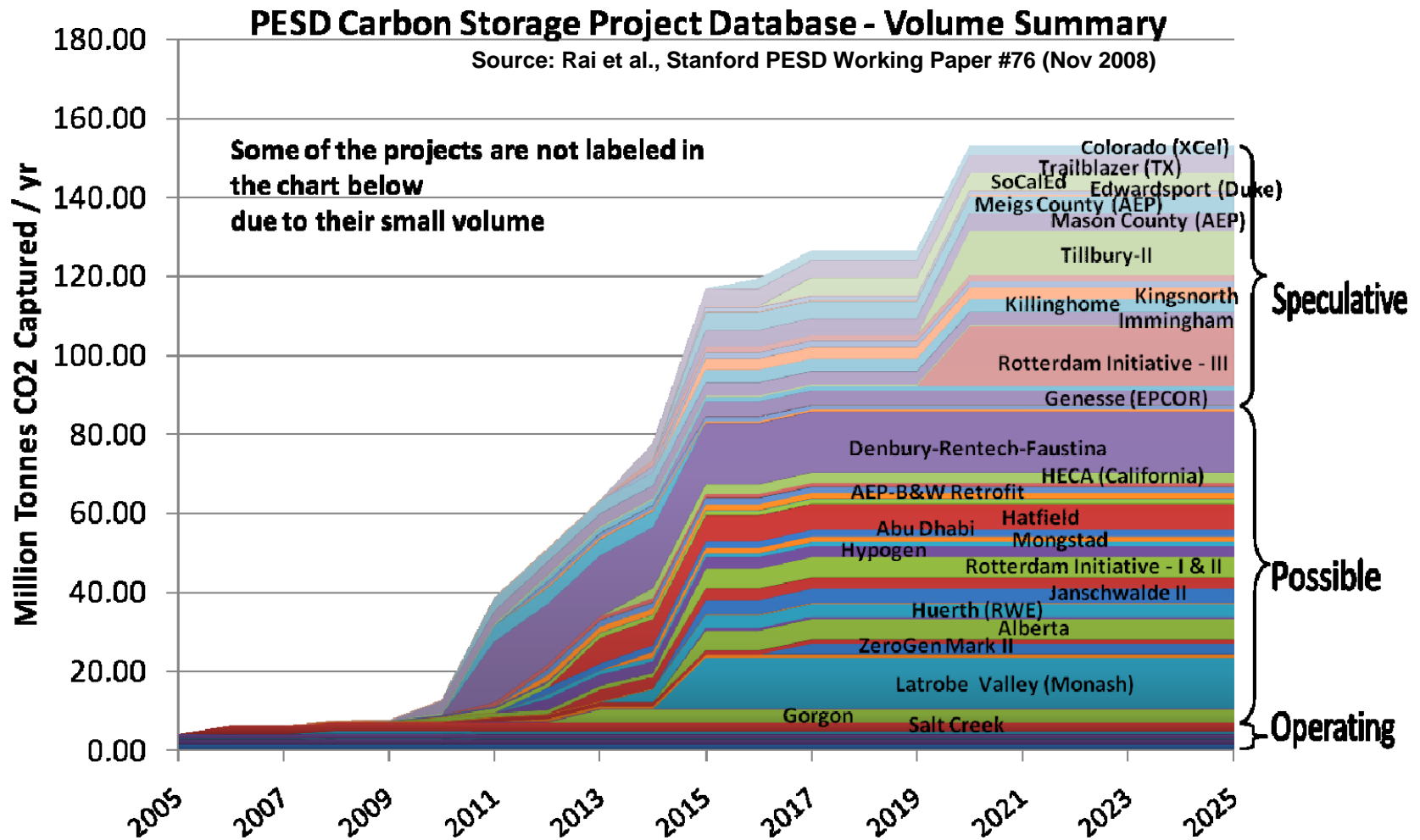
- What is the 'real' position with large scale integrated projects, the projects that are needed to provide the necessary level of confidence? What is stopping projects from moving forward?
- What is the impact of the financial crisis and the subsequent recession on the investment in CCS? How can the increased government action be built upon?
- What is the 'desired' portfolio required to give confidence in the breadth of application of CCS at scale? What are the criteria and rationale for support?
- How to share the knowledge gained and 'learn by doing'?

# Deployment of CCS: The magnitude of the issue

CCS deployment needed to contribute ~10 Gt of CO<sub>2</sub> by 2050



# Deployment of CCS: A 'Stanford' view of the short term



# Primary work themes

- Drive development of CCS projects
- Support CCS uptake globally
- Build CCS capability

# Immediate Work Programme - 1

## Demonstration project related actions

- Strategic Analysis of the Global Status of CCS: a global survey of projects to provide a 'hard nosed' assessment of the real status and to identify what the barriers are and what can be done about them Worley Parson Consortium  
Final reports due Sept 2009
- Global Projects Portfolio and Rationale for Support LEK
- Strategic Partnerships – working with the early mover of projects: Clinton Foundation, Climate Group, ADB, World Bank, EC,...
- Initiate more Projects – methodology and process for identification; tracking and monitoring action; creation and encouragement of consortia; facilitation actions and removal of barriers

Projects are the primary focus

# Immediate Work Programme - 2

## Knowledge Sharing and Community Acceptance

- Understanding and guidance on 'Knowledge Sharing'
- Community Outreach and Public Awareness action

## Baseline and Supporting Actions

- Definition of 'CCS Ready'
  - Preparing the pathway to 'zero emission' deployment
- Global CO<sub>2</sub> Storage Atlas
- Capacity building in Emerging Markets Economies
  - Link with CSLF and others as appropriate

## CCS International Landscape

- ‘Calgary’ recommendations to G8+ in June 2008 becoming the ‘accepted’ way of accelerating the deployment of CCS globally
- Responsibility assignment to ‘Calgary’ recommendations
  - The GCCSI will focus on CCS demonstration related issues
  - How can the GCCSI assist/accelerate?

## International Partnerships

### IEA: At all levels

- Implementing Agreements
  - GHG R&D Programme
  - Clean Coal Centre
- CCS and Route Map development
- Working Party on Fossil Fuels (WPFF)
- Coal Industry Advisory Board (CIAB)

The GCCSI will provide support and work to ensure strong management and co-ordination

### Carbon Sequestration Leadership Forum (CSLF)

- technical route map development
- identification of technical priorities
- capacity building
- advice on policy aspects

Focus on working with stakeholder governments, corporations and NGOs

- bring forward CCS projects, R&D and investment
- targeting developing and semi-developed countries

Funding for discrete projects

Facilitated investment in and partnering with:

- The Clinton Foundation
- The Climate Group
- Carbon Sequestration Leadership Forum
- World Bank
- Asian Development Bank

50% of funding committed in first half of 2009

## China and India are particular importance to the GCCSI

- Together they may account for 60 per cent of the global incremental co2 emissions (from 2005 to 2030)

## Committed to supporting China's and India's involvement in the CCS arena.

- In partnership with their governments and our stakeholders.

## How to do we best engage China and India?

- China

- Specific project initiatives funded by the GCCSI;
- Support for the ADB's roadmap project – 'CARBON DIOXIDE CAPTURE AND STORAGE (CCS) DEMONSTRATION-STRATEGIC ANALYSIS AND CAPACITY STRENGTHENING'

- India

- Partnering with Indian R&D and industry bodies
- Work on IGCC and super critical plants that are capture ready.

[www.globalccsinstitute.com](http://www.globalccsinstitute.com)



**An Australian Government Initiative**