



**Australian Government**

# **Global Carbon Capture and Storage Institute**

IEF-IFP Symposium  
Role of Technology in the Petroleum Sector in  
Enhancing Global Energy Security

Riyadh, Saudi Arabia  
15 December 2008

# World Energy Demand - overview

**Growth in world energy demand estimated at 55 per cent between 2005 and 2030 (IEA) .**

- By 2050 emissions will reach 62Gt globally, more than double the level in 2005 (27 Gt per year).

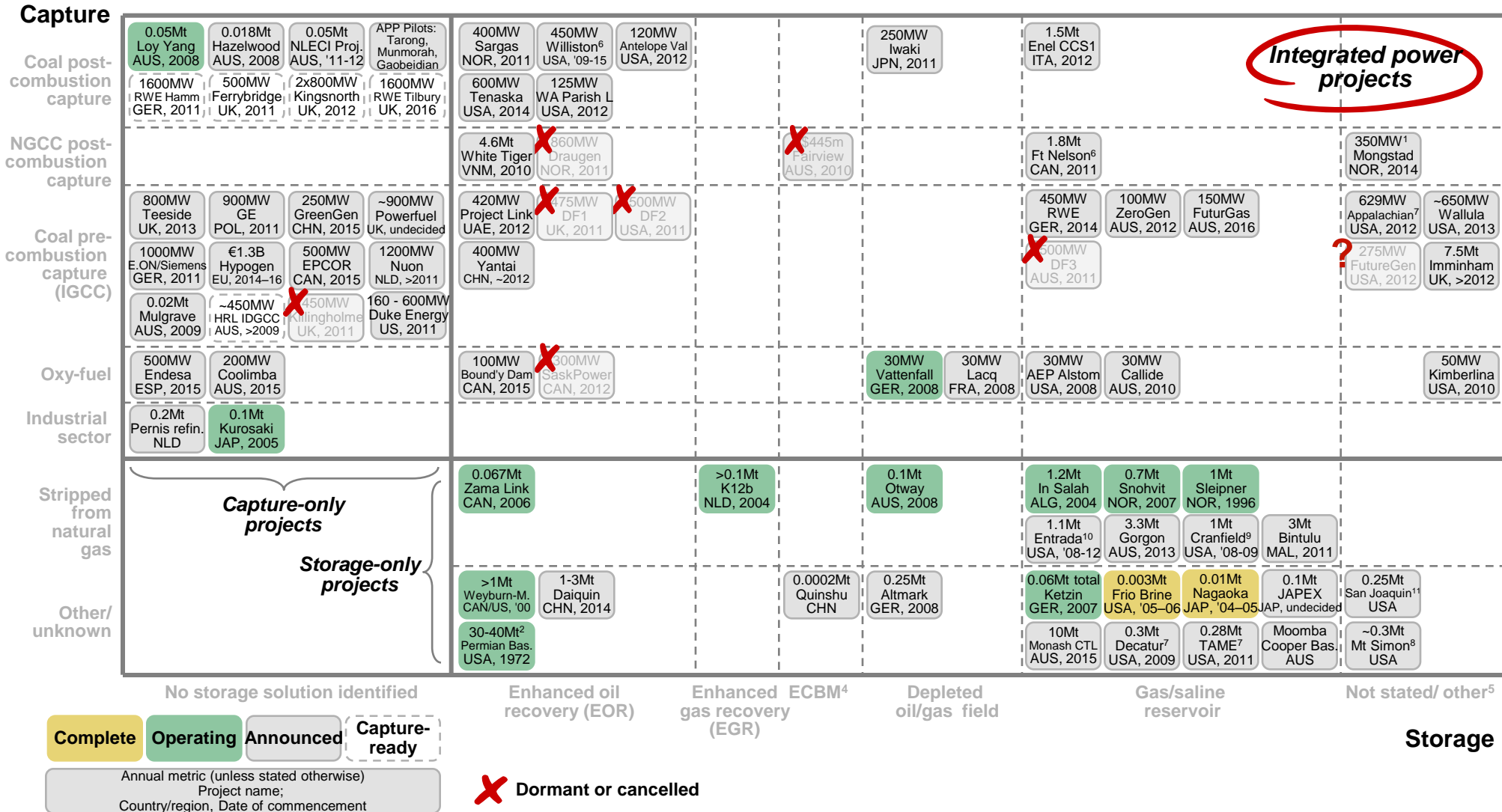
**Increased energy demand expected to be met almost entirely through a range fossil fuel energy sources (IEA's World Energy Outlook 2008 ):**

- Global primary demand for oil (excluding biofuels) will rise by 1% per year on average
  - share of world energy will drop, from 34% to 30%
- Global demand for natural gas will grow by 1.8% per year
  - Natural gas share in total energy demand rising marginally to 22%
  - Most of the growth in gas use will come from the power-generation sector
- World demand for coal will increase by 2% a year on average
  - Coal's share in global energy demand climbing from 26% in 2006 to 29% in 2030
  - largely driven by the growth of the economies of China and India

**The energy sector will have to play the central role in meeting energy security and curbing emissions through a mixed portfolio approach to include:**

- improvements in efficiency;
- embracing renewables; and
- through low-carbon technologies, such as carbon capture and storage (CCS)

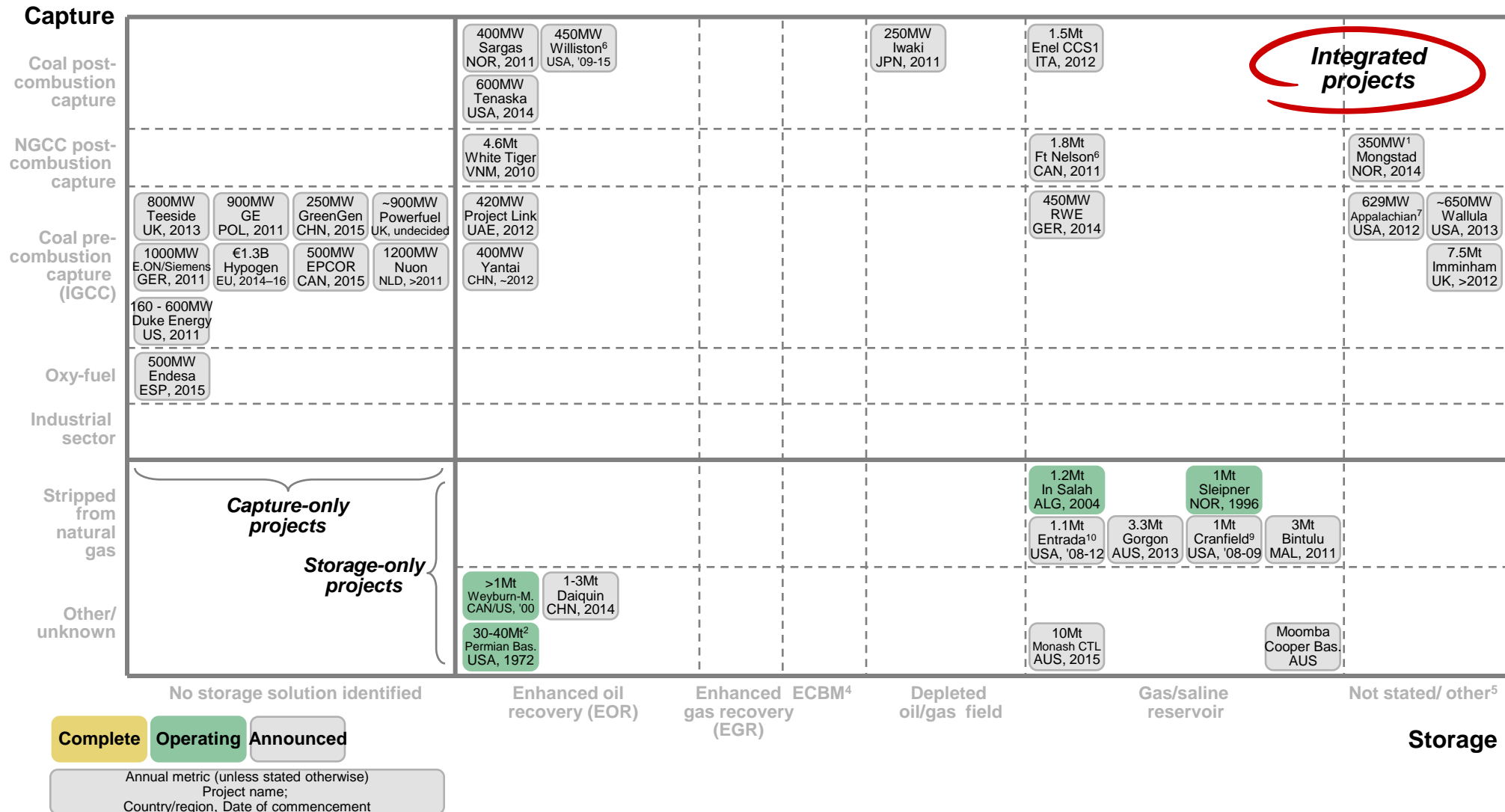
# Many integrated projects are needed for portfolio



1. "CHP with post-combustion CCS" 2. Permanency of storage is unclear 3. Potential EOR storage 4. Enhanced coalbed methane recovery 5. eg. Depleted coal seams 6. PCOR 7. MRCSP 8. MGSC 9. SECARB 10. SWP 11. WESTCARB. Source: IEA, Fossil fuel-fired power plants and CO2 capture and storage; CSIRO, Australian CCS Commercial and R&D Projects, 2007; Gassnova, International CCS technology survey; Carbon Capture and Sequestration Technologies @ MIT, <http://sequestration.mit.edu/tools/projects/index.html>; Gassnova International CCS Technology Survey 2008; RET interviews

# Many more industrial-scale projects needed

Projects of greater than 250 MW power generation or 1Mtpa CO<sub>2</sub> storage



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# Need for concerted global action is broadly accepted

## G8-IEA-CSLF recommendations

- 1 Demonstrating CO2 capture and storage and bridging the financial gap**
  - Commitment by 2010 to at least 20 fully integrated industrial-scale demonstration plants, for broad deployment of CCS by 2020
  - Addressing financial gaps and risks in early CCS projects
- 2 Taking concerted international action**
  - Fostering international action to partner, financially support, build capacity and share information
  - Including CCS in the CDM in December 2008
- 3 Creating a value for CO2 for commercialisation of CCS**
  - Creating long-term policy certainty
  - Introducing appropriate instruments to create a value for CO2 and incentives for RD&D
- 4 Establishing legal & regulatory frameworks**
  - Necessary for large-scale geological storage of CO2
- 5 Communicating with the public**
  - Dedicating resources to disseminate information and public outreach
- 6 Infrastructure**
  - Developing perspectives for the availability of a CO2 transport infrastructure
- 7 Retrofit CO2 capture**
  - Development of new fossil fuel power stations should have regard to what might be required for retrofit of CCS

# A Global CCS Institute

## Delivering concerted global action

Potential high-level activities of a global institute

### Flagship Demonstration Projects

- Define and commit to a shared target portfolio of industrial scale projects and track global progress toward the target
- Bring government/industry consortia together to deliver those projects
- Provide full-time, funded expertise to assist in demonstration project implementation

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### Science and Technology

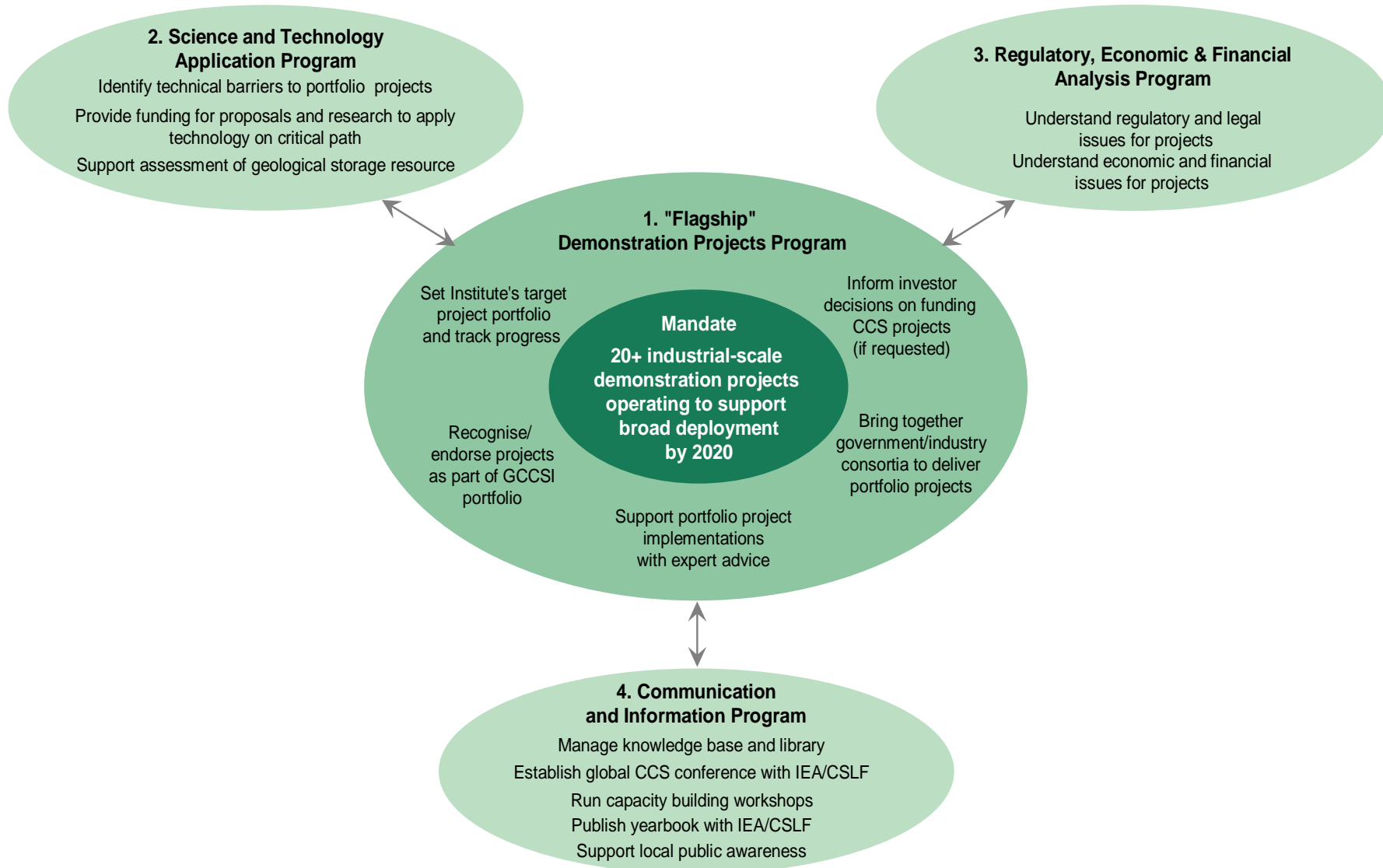
- Identify and, if necessary, support targeted R&D on the critical path to deploying demonstration projects

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### Knowledge Sharing and Communication

- Share non-proprietary information and lessons from the demonstration projects
- Deliver an annual assessment of CCS demonstration project progress
- Build public awareness and acceptance of CCS

# Four programs centred on delivering the mandate



# Global CCS Institute's mandate is complementary to other international CCS bodies

<b>CSLF</b>	"To facilitate the development of improved cost-effective technologies for the separation and capture of carbon dioxide for its transport and long-term safe storage; to make these technologies broadly available internationally; and to identify and address wider issues relating to carbon capture and storage. This could include promoting the appropriate technical, political, and regulatory environments for the development of such technology"	Have successfully driven R&D, information sharing, legal frameworks, pilot projects for CCS
<b>IEA<sup>1</sup></b>	"To share information, to coordinate policies and to co-operate in the development of energy programmes that ensure energy security, encourage economic growth and protect the environment"	
<b>IEA GHG</b>	<p>"IEA GHG focuses its efforts on studying technologies to reduce greenhouse gas emissions. IEA GHG was established in 1991 and aims to provide its members with informed information on the role that technology can play in reducing greenhouse gas emissions. The Programme has three main activities which are</p> <ul style="list-style-type: none"> <li>• Evaluation of technologies aimed at reducing greenhouse gas emissions,</li> <li>• Promotion and dissemination of results and data from its evaluation studies,</li> <li>• Facilitating practical research, development and demonstration activities (R,D&amp;D)"</li> </ul>	
<b>ETP-ZEP</b>	<ul style="list-style-type: none"> <li>• "To enable European fossil fuel power plants to have zero CO<sub>2</sub> emissions by 2020"</li> <li>• "To identify and remove the barriers to creating highly efficient power plants with zero emissions, which would drastically reduce the environmental impact of fossil fuel use, particularly coal"</li> </ul>	Aims to drive industrial scale demonstration in Europe
<b>Proposed GCCSI "Mandate"</b>	<p>The GCCSI will accelerate the global adoption of commercially and environmentally sustainable Carbon Capture and Storage. Initially it will drive co-operation to deliver a diverse portfolio of 20 integrated industrial scale demonstration projects to support broad deployment by 2020</p> <ul style="list-style-type: none"> <li>• Across a range of emitters (power generation, industrial, natural gas stripping)</li> <li>• Across a range of technologies</li> <li>• Along the entire capture, transport and storage chain</li> </ul>	Will drive industrial scale demonstration and deployment globally

1. In relation to CCS  
Source: Organisation websites



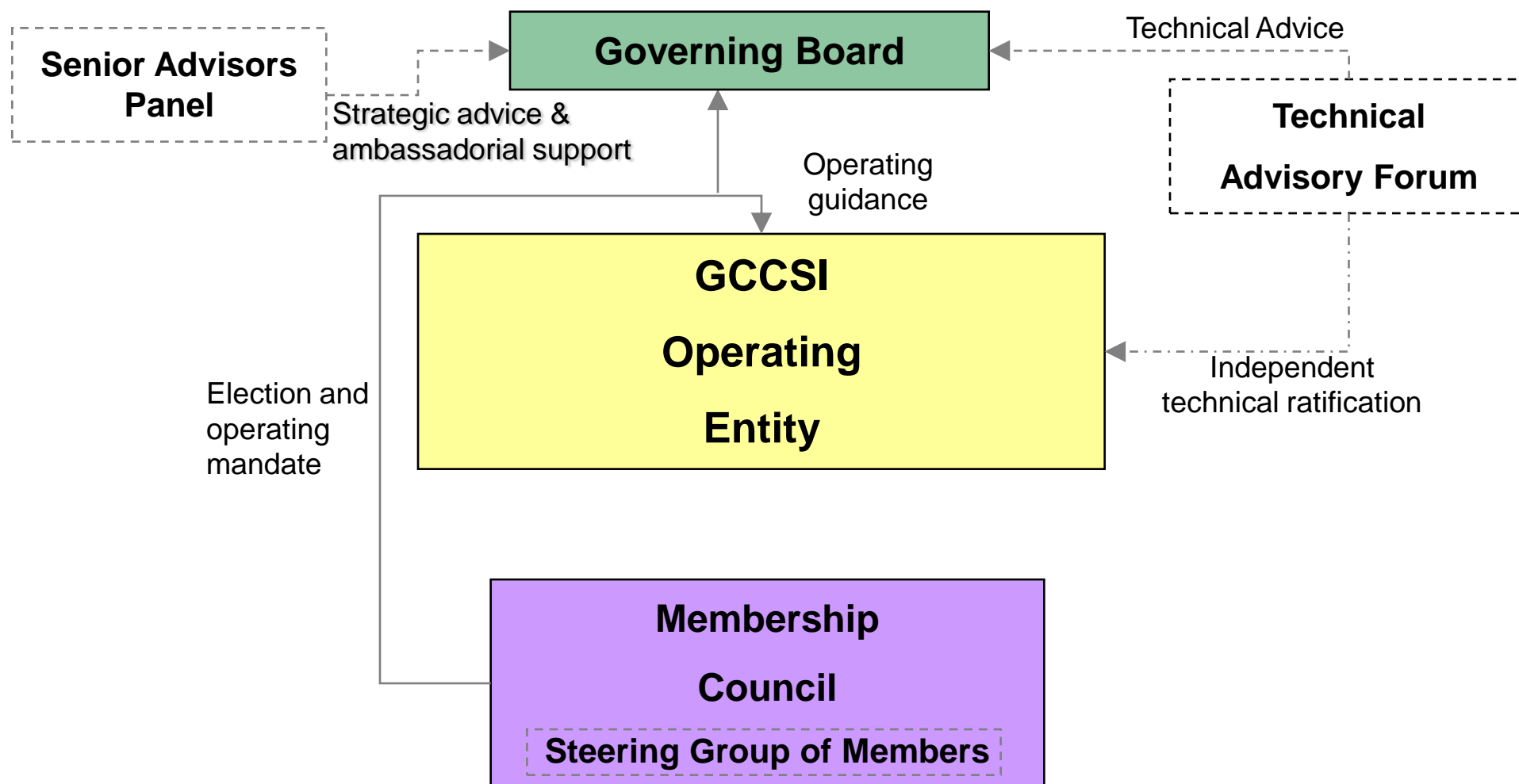
# Global CCS Institute Preparatory Meeting

- **An International Preparatory Meeting was held on 24-25 November in London**

## The Meeting:

- Affirmed the core focus and rationale of the Global CCS Institute to support international efforts to meet the G8's goal of commitment to at least 20 fully integrated industrial-scale CCS demonstration projects by 2010 and operating by 2020
- Agreed that the Global CCS Institute could do much in filling the needed gap in the current international CCS architecture by bringing together industry partnerships, governments and researchers to develop and invest in commercial-scale CCS demonstration projects, track the progress and provide the expertise to assist in demonstration project implementation.
- Fine tuned the governance and administrative architecture of the Institute.
- Continued to shape the Institute in particular its relationship to existing international bodies.
- Built on the support that has already been offered during the international consultations. Announced Foundation Members are Shell International Petroleum, Rio Tinto Ltd, Mitsubishi Corporation, Anglo American, Xstrata Coal, Services Petroliers Schlumberger, Alstom and The Climate Group

# Proposed Business Model for the Institute



# Key messages

- **CCS is an important part of the response to global warming, but it faces significant challenges.**
- **There is global recognition of the need to have a diverse portfolio of industrial-scale CCS projects by 2020, but many more successful projects will be needed to deliver this.**
- **On 19 September 2008, the Prime Minister of Australia, Kevin Rudd announced a \$100 million Global Carbon Capture and Storage (CCS) Institute, as part of a new Global CCS Initiative to speed up the development of CCS technology.**
- **We believe the level of concerted international action required to achieve these targets needs a new approach and a new mechanism - but one which complements and leverages the work in existing international forums (in particular, the IEA/CSLF) and other international partnerships.**
- **Australia will take the lead in establishing and funding a dedicated global institute for this purpose and will design it in collaboration with the international community.**
- **We engaged The Boston Consulting Group as an independent consultant to develop a business model for the institute in collaboration with potential members.**
- **We have road-tested the rationale and business model at our international Preparatory Meeting in London, 24-25 November.**
- **The core focus on demonstration projects was universally supported with broad agreement that the Global CCS Institute could fill a gap in the current international CCS architecture.**
- **We will launch the Institute in January 2009.**