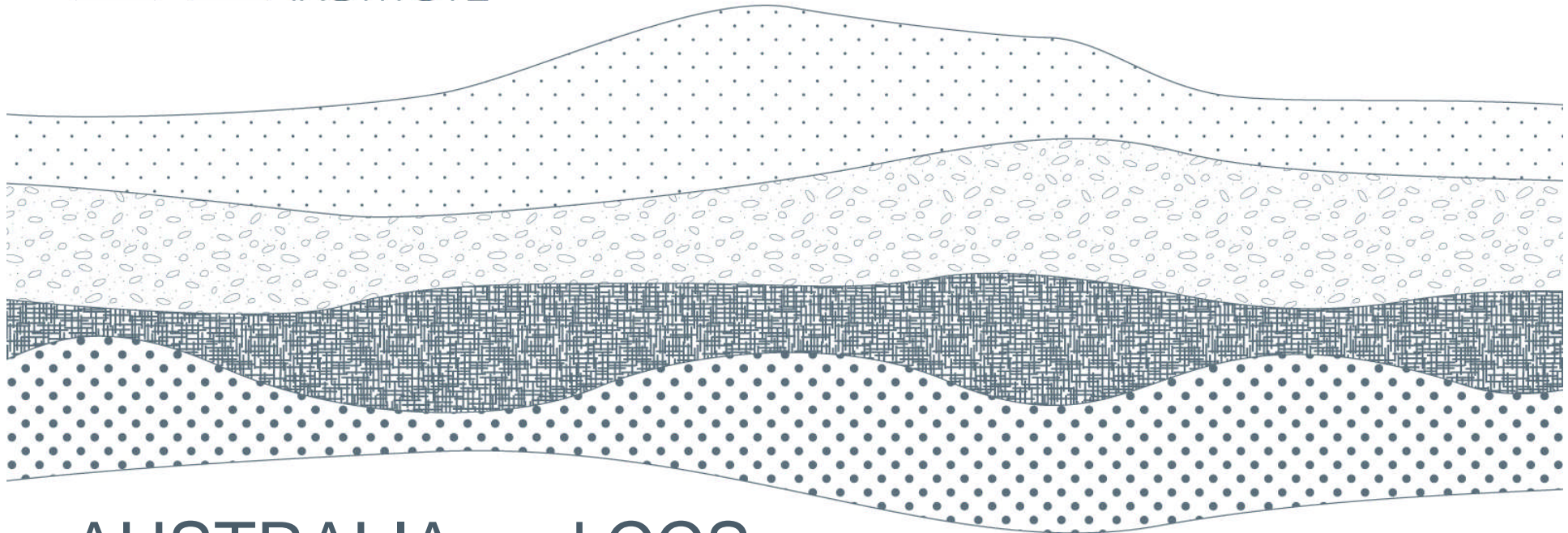




GLOBAL
CCS
INSTITUTE



AUSTRALIA and CCS

Nick Otter, CEO Global CCS Institute

World Coal Institute, Sydney 6 May 2010

AUSTRALIA AND CCS – POLICY DRIVERS

- **Climate Change**
 - National action
 - Global action
- **Economic Growth**
 - GDP depends on continued export of resources
 - Coal
 - LNG

**Satisfy both through global encouragement of
`sustainable` use of fossil fuels in power generation
and energy intensive industrial sector through CCS**

AUSTRALIA ENERGY MIX AND EMISSIONS

- **2008/09**
 - Coal ~70%
 - Gas ~ 20%
- **2029/30**
 - Coal ~42%
 - Gas ~38%
- **Emission Reductions :**
 - Energy efficiency
 - Increased renewables
 - Near term fuel switch
 - **CCS for coal fired power**
 - **CCS for other industry and gas-fired power**

AUSTRALIA CCS ROADMAP

- National Low Emission Coal Council Strategy Report
- Carbon Storage Task Force Report
- Low Emissions Coal R&D
- Storage Legislation
- Release of potential storage sites to industry
- Existing demonstration pilot projects
- **New Flagship Demonstration Program**
 - ~2.3b AUD
 - 4 candidate projects

A BOLD INTERNATIONAL INITIATIVE

Global CCS Institute

- Pivotal role in facilitating the development and deployment of commercial-scale CCS projects
- Initial aim of getting 20+ fully integrated industrial scale demonstration projects announced and operational prior to 2020
- Acquisition, analysis and dissemination of CCS Knowledge
- Work collaboratively to build confidence in CCS and drive international momentum

INTERNATIONAL LAUNCH

9th July 2009

The Global CCS Institute was formally launched at G8/Major Economics Forum (MEF) meeting in L`Aquila, Italy by the Prime Minister of Australia, Kevin Rudd, US President Obama and Prime Ministerial support from Canada, Italy, Republic of Korea, Mexico and UK.

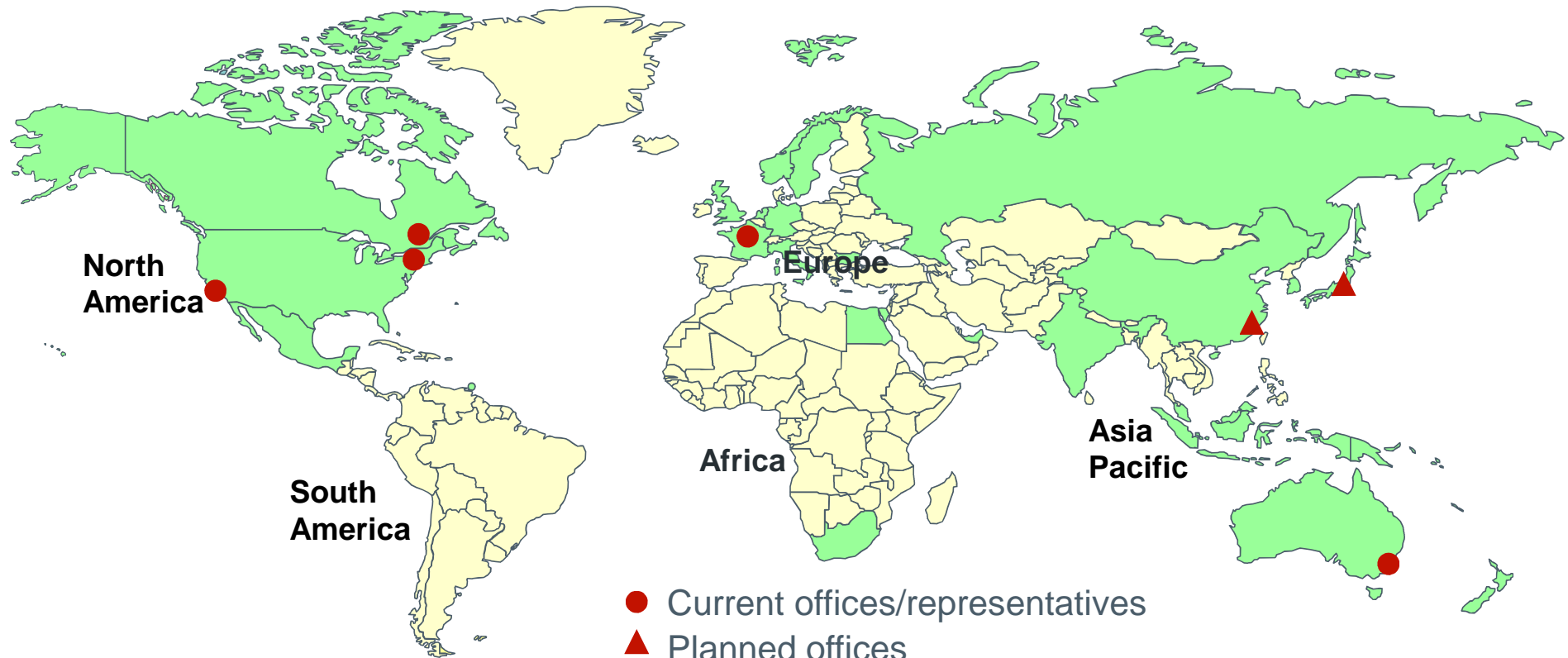


LEGAL ENTITY

- **The Global CCS Institute has been registered as a not-for-profit company limited by guarantee under the Australian *Corporations Act 2001***
- **Membership is open to Governments, industry and non-Government organisations**
- **Funding Agreement with Australian Government of 100m AUD/year for 4 years**
- **International Advisory Panel**

Mr James Wolfensohn	Lord Nicholas Stern
Ms Leena Srivastava	Professor Zeng Rongshu
Mr Claude Mandil	Mr Russell Higgins AO

THE INSTITUTE'S MEMBERSHIP AND PRESENCE



● Current offices/representatives

▲ Planned offices

■ Country members (26)

Other Members (186), including state governments, industry participants, NGOs and government agencies

REQUIRED DEVELOPMENTS TO MAKE CCS A REALITY

Infrastructure and technology

... to handle 2050 flowrates equal to half of current oil industry flowrates

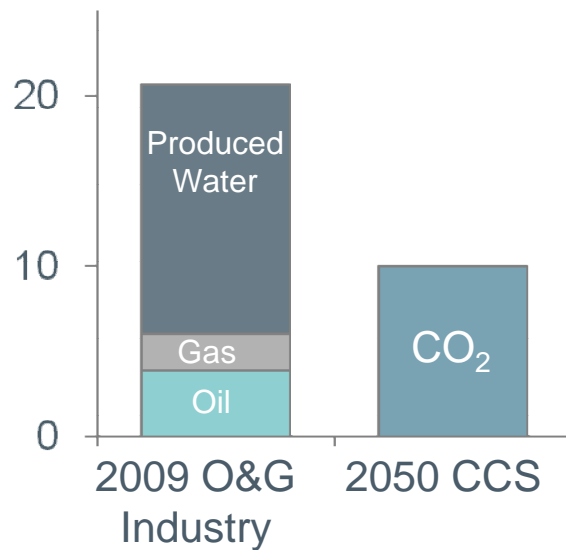
Funding and financing

... to cover the US\$2-3 trillion of additional capex

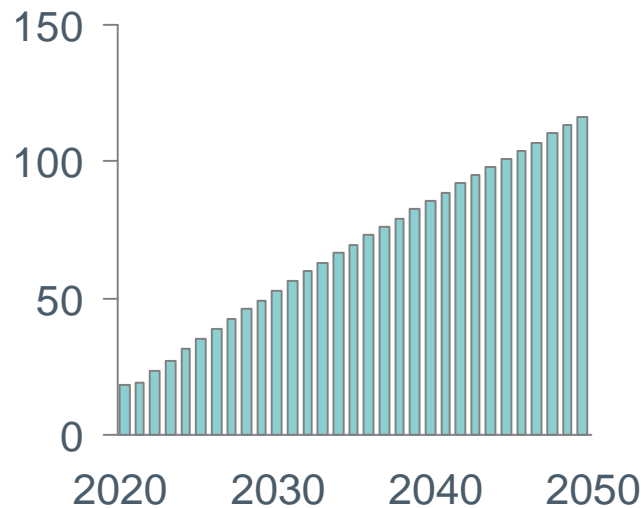
Capacity and knowledge

... to deliver average 110 full-scale projects pa

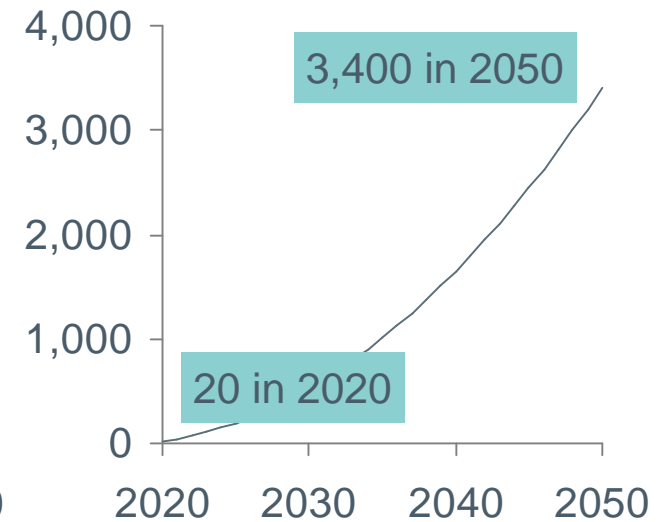
Flowrate (Gt/yr)



US\$billion invested pa



Projects



Notes: O&G industry mass flowrates: $(0.25\text{Tbpd}_{\text{water}} * 160 * 365) + 3928.8 \text{ Mto} + (3065.6 \text{ bcm gas}) * 0.7\text{kg/t} = 20.6\text{Gt/yr}$; Learning rate of 8%

Source: BP; Strategic Analysis of the Global Status of CCS; GlobalData "Global Oil and Gas Capital Expenditure Outlook"; IEA; "Global Onshore and Offshore Water Production" (Dal Ferro)

GLOBAL CCS INSTITUTE STRATEGIC FRAMEWORK FOR ACTION

OVERARCHING OBJECTIVE

“To accelerate the broad deployment of commercial CCS”

Regional Profiles and Global Services

ENABLING STRATEGIES

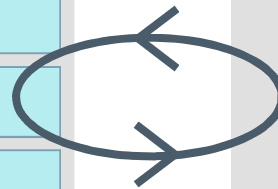
Policy/Regulatory

Financial/Commercial

Public Awareness

Technical

Capacity Building



PROJECTS STRATEGY

Strategic Analysis of Projects

Project Support Program

Thematic Focus Groups

Knowledge Sharing

MEMBERS

Services Model

Member Charter

ACTIONS TO DATE

- **A set of high quality knowledge products**
- **Built relationships with strategic partners**
- **Range of workshops and conferences on CCS deployment**
- **Project Support Program**
- **Capacity and capability building actions worldwide**

ACTIONS TO DATE

- **A set of high quality knowledge products**
- **Built relationships with strategic partners**
- **Range of workshops and conferences on CCS deployment**
- **Project Support Program : ~50m AUD/year**
- **Capacity and capability building actions worldwide**

PROJECTS STRATEGY COMPOSED OF THREE ELEMENTS

1

Strategic Analysis of Projects

- Maintain a comprehensive, global view of project progress and challenges

2

Project Support Program

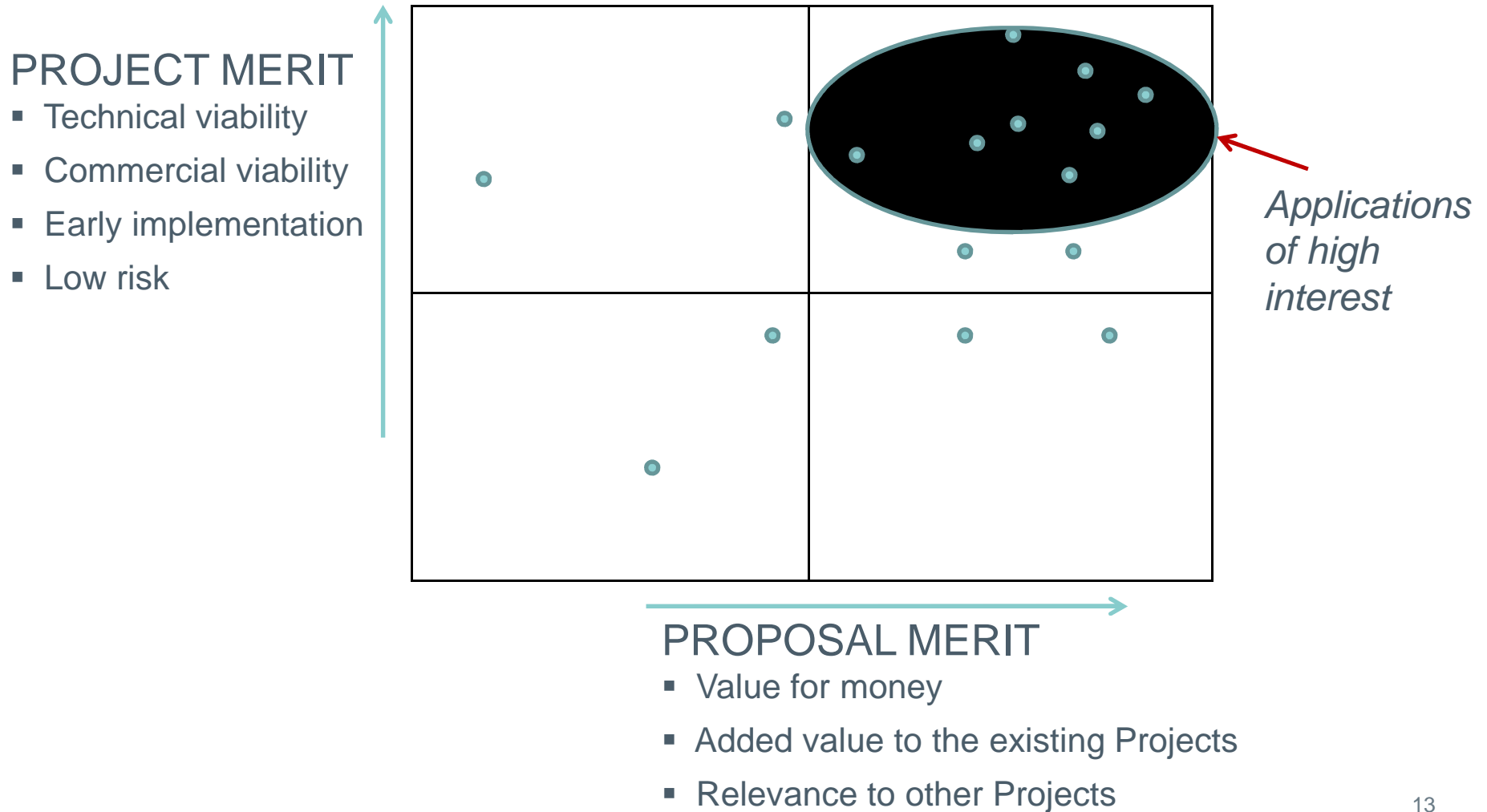
- Directly support member activities which address key project barriers

3

Thematic Focus Groups

- Facilitate knowledge sharing between project proponents in order to promote best practice

PROJECT AND PROPOSAL MERIT ASSESSMENT



		REGION						
		NORTH AMERICA	EUROPE	CHINA	OCEANIA	LATIN AMERICA	RoW	
CAPTURE	POWER	Pre combustion	1-2 applications	1-2 applications	No projects	1-2 applications	No projects	No projects
		Post combustion	> 5 applications	3-5 applications	No projects	1-2 applications	No projects	No projects
		Oxy combustion	1-2 applications	1-2 applications	No projects	1-2 applications	No projects	No projects
	INDUSTRY	Steel	No projects	No projects	No projects	No projects	No projects	No projects
		Cement	No projects	No projects	No projects	1-2 applications	No projects	No projects
		Natural gas processing	No projects	1-2 applications	No projects	No projects	No projects	1-2 applications
		Fertilizer production	No projects	No projects	No projects	3-5 applications	No projects	No projects
		Refinery/H2 production	1-2 applications	No projects	No projects	No projects	No projects	No projects
	TRANS.	Pipeline (point to point)	> 5 applications	1-2 applications	No projects	3-5 applications	No projects	1-2 applications
Pipeline (network-hub)		No projects	1-2 applications	No projects	1-2 applications	No projects	No projects	
Ship		No projects	1-2 applications	No projects	No projects	No projects	No projects	
STORAGE	Depleted gas field	No projects	3-5 applications	No projects	1-2 applications	No projects	No projects	
	Depleted oil field	No projects	1-2 applications	No projects	No projects	No projects	No projects	
	Saline Aquifer	1-2 applications	3-5 applications	No projects	3-5 applications	No projects	1-2 applications	
	Enhanced oil recovery (EOR)	> 5 applications	1-2 applications	No projects	No projects	No projects	No projects	

Source: Global CCS Institute analysis

KEY: No projects 1-2 applications 3-5 applications > 5 applications

PRELIMINARY FOCUS GROUP THEMES

Stakeholder Engagement

- Current thinking and new approaches to practically address stakeholder engagement at the project level

Storage – MMV

- Cost effective and practical approaches to give certainty of permanent and safe storage

Technology Scale-up

- Challenges in scaling up capture equipment to commercial levels

The Hub Concept

- Common challenges and potential solutions for the development of CCS Hubs

INSTITUTE'S CURRENT ACTIVITIES: KNOWLEDGE SHARING



OBJECTIVE
"...ent of commercial CCS"



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Public Awareness

Technical

Capacity Building

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Knowledge Sharing

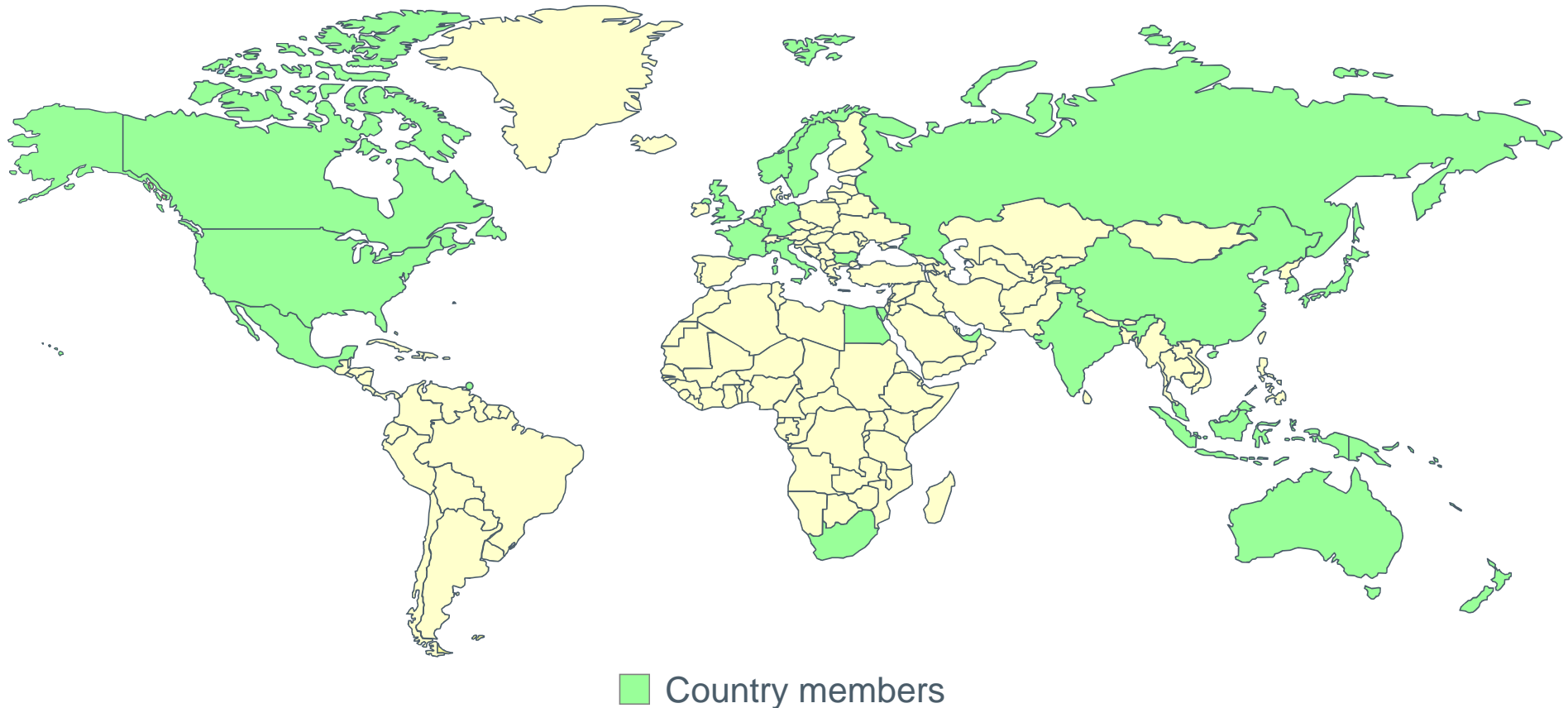
MEMBERS

Services Model

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CCS KNOWLEDGE ROLE

‘INTERNATIONALISATION OF NATIONAL CCS LEARNINGS’



Formal arrangement made with Australian Government : model for future



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