



## **CSLF PIRT Meeting**

# **Discussion Task Force to Assess Progress on Technical Issues Affecting CCS**

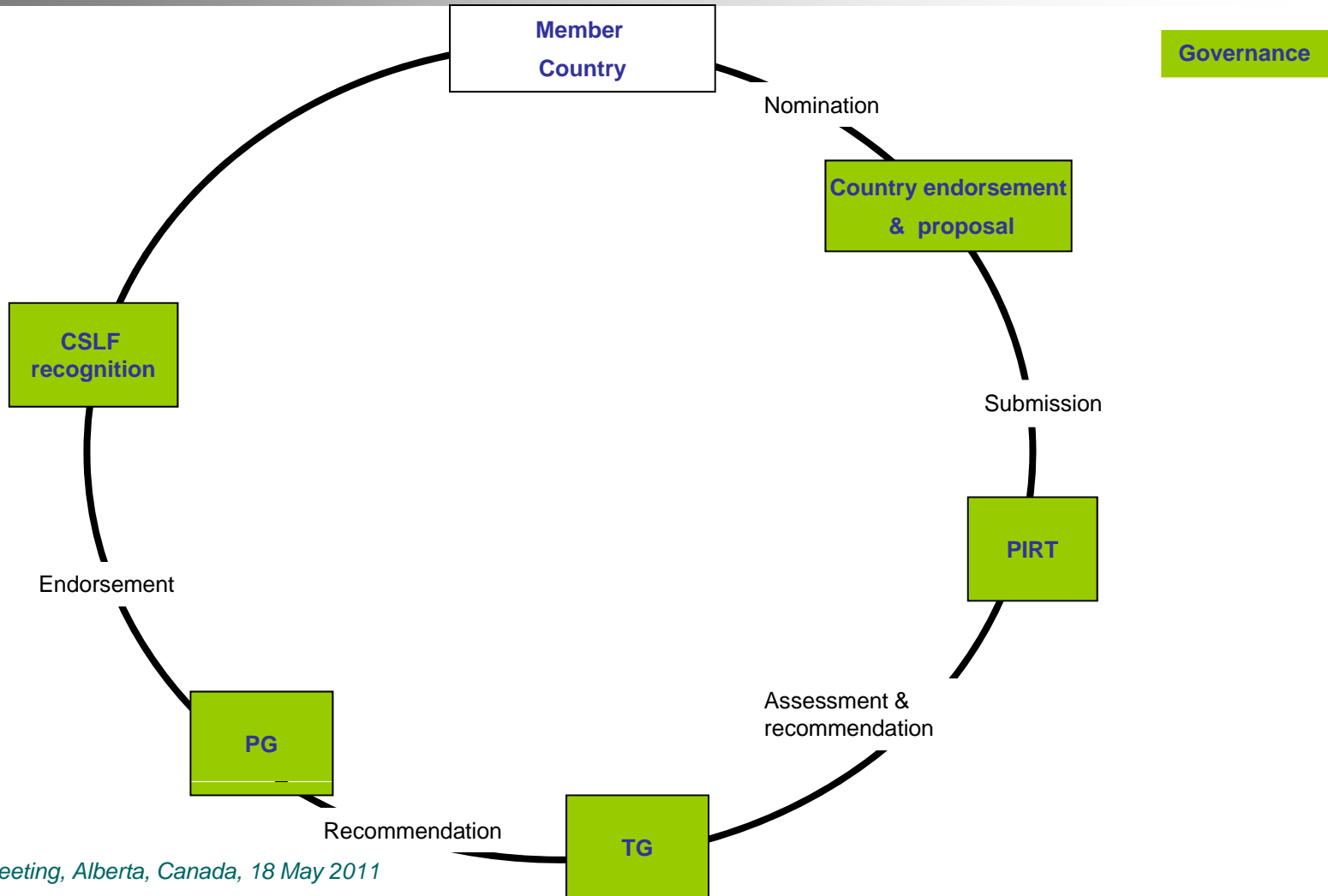
**Edmonton, Alberta, Canada  
18 May 2011**

**Clinton Foster**  
PIRT Chair, Australia

**Agenda 5**



# Current Process



CSLF PIRT Meeting, Alberta, Canada, 18 May 2011





# Task Force to Assess Progress on Technical Issues Affecting CCS

## CSLF-Project Milestone Model

- Merges (where applicable) the TRM and PIRT gaps
- Provides granularity of the projects and the issues they assess
- Utilises project's milestones to assess the progression on technical issues
  - clearly depicts **technical progress**
- Will depict clearly the scale of projects
  - clearly depicts **scale of progress**
  - R&D to commercial reality
- Will provide evidence-based recognition for a CSLF-project's achievements



# Assessing Progress: Transport

PIRT GAP	TRM PRIORITY	PROJECT	SCALE (Total Mtpa)	CCS Asset Lifecycle Model (After GCCSI)					
				IDENTIFY	EVALUATE	DEFINE	EXECUTE	OPERATE	
<b>TRANSPORT</b>									
Cost benefit analysis and modeling of CO2 pipeline and transport systems	Conduct cost benefit analysis and modeling of CO2 pipeline networks and transport systems for <b>tankers</b> and trucks	CCS Rotterdam Project (Source: RCI CCS)		Liquid Logistics Shipping Concept					
Safety and mitigation of pipelines through urban areas	Develop proper mitigation measures and design, to ensure safe establishment and operation of CO2 pipelines through densely populated areas			Rotterdam Afgang en Opslag Demo (ROAD)					
Identify regulations and standards for CO2 transport	<ol style="list-style-type: none"> <li>Identify and define proper safety protocols for CO2 pipelines, including response and remediation</li> <li>Update technical standards for CO2 transport as new knowledge become available</li> </ol>			Rotterdam Climate Initiative (Port of Rotterdam)		?			



# Assessing Progress: Transport

PIRT GAP	TRM PRIORITY	NUMBER OF PROJECTS										Total number of Projects and their CCS Lifecycle (After GCCSI)					SCALE (Total Mtpa of all Projects)			
		1	2	3	4	5	6	7	8	9	10	IDENTIF	EVALUAT	DEFINE	EXECUT	OPERATE				
Cost benefit analysis and modeling of CO <sub>2</sub> pipeline and transport systems	Conduct cost benefit analysis and modeling of CO <sub>2</sub> pipeline networks and transport systems for tankers and trucks	[Progress bar: 5 units]											2				2	1		
Tanker transport of liquid CO <sub>2</sub>		[Progress bar: 2 units]											2							
Specifications for impurities from various processes	<ul style="list-style-type: none"> <li>Develop detailed specification with respect to the impurities present from various processes (power station, refineries, industry), which are not present in current CO<sub>2</sub> production units</li> <li>Acquire experimental thermodynamic data for CO<sub>2</sub> with impurities (H<sub>2</sub>, SO<sub>x</sub>, NO<sub>x</sub>, H<sub>2</sub>S, O<sub>2</sub>, methane, other hydrocarbons etc), develop improved equations of state and establish phase diagram database for the most likely compositions of the CO<sub>2</sub> stream to be transported</li> <li>Understand the effects impurities may have on CO<sub>2</sub> compression and transport, including evaluation of corrosion potentials</li> </ul>	[Progress bar: 4 units]																		
Dispersion modeling and safety analysis for incidental release of large quantities of CO <sub>2</sub>		<ul style="list-style-type: none"> <li>Conduct further research into leaks and running ductile fractures to improve understanding of the effects and impacts of a burst in the pipeline, including experiments and model development</li> <li>Improve dispersion modeling and safety analysis for incidental release of larger quantities of CO<sub>2</sub> from the transport system, including the marine setting (e.g., CO<sub>2</sub> pipeline, CO<sub>2</sub> ship, other land transport or intermediate storage tank at harbour)</li> </ul>	[Progress bar: 1 unit]															1		
Safety and mitigation of pipelines through urban areas	Develop proper mitigation measures and design, to ensure safe establishment and operation of CO <sub>2</sub> pipelines through densely populated areas	[Progress bar: 3 units]															2	1		
Safety protocols to protect CO <sub>2</sub> pipelines, including response and remediation	Identify and define proper safety protocols for CO <sub>2</sub> pipelines, including response and remediation	[Progress bar: 1 unit]															1			
Identify regulations and standards for CO <sub>2</sub> transport	Update technical standards for CO <sub>2</sub> transport as new knowledge become available	[Progress bar: 3 units]															2			1
Identify reliable sources of information and data related to the design, cost, and space requirements, operation, and integration of CCS with energy facilities	N/A	[Progress bar: 3 units]											1	2						
Conduct periodic technical reviews of all aspects of recognized large-scale CCS demonstration projects and report on the "lessons learned"	N/A	[Progress bar: 1 unit]															1			
On a periodic basis, update the Technology Roadmap to include technology gaps identified during the technical assessment of demonstration projects	N/A	[Progress bar: 2 units]											1	1						
Integrate with existing infrastructure		[Progress bar: 3 units]											1	2						
Energy price issues would encourage the take-up of CCS	N/A	[Progress bar: 4 units]											1	2						1



# Assessing Progress: Storage

PIRT GAP	TRM PRIORITY	PROJECT	SCALE (Total Mtpa)	CCS Asset Lifecycle Model (After GCCSI)				
				IDENTIFY	EVALUATE	DEFINE	EXECUTE	OPERATE
<b>STORAGE</b>								
DSF: Development for pressure build-up management, including production and disposal of brine	Increase knowledge regarding relief wells and water production with advantages and disadvantages as a way to regulate the pressure during CO2 injection utilizing data from the petroleum industry	GORGON (Warsaw 2010)		→				
	Develop guidelines and procedures for handling saline produced water at on-shore as well as off-shore sites			→				
Remediation of existing wells	Identify and develop cost-effective well mitigation approaches in case of well leakage			→				
Worldwide storage capacity in unmineable coal seams	Assess storage capacity in un-mineable coal seams at local and regional scales	No current projects						