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POLICY GROUP

A REPORT FROM THE
LEGAL, REGULATORY AND FINANCIAL ISSUES TASK FORCE

CONSIDERATIONS ON REGULATORY ISSUES FOR CARBON DIOXIDE CAPTURE AND STORAGE PROJECTS

Note by the Secretariat

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Considerations on Regulatory Issues for Carbon Dioxide Capture and Storage Projects
Report from the Legal, Regulatory and Financial Issues Taskforce

Background

The inaugural meeting of the CSLF in June 2003 established a Legal, Regulatory and Financial Issues Taskforce. The first action undertaken by the Taskforce has been the development of this document to be presented to Ministers for consideration during their meeting in September 2004. Australia was nominated to take the lead on this Task Force.

The attached report was sent to the Policy Group for review and comments were received by the deadline of 10 August. These comments are incorporated in this revision.

Action Requested

The Policy Group is requested to approve the report from the CSLF Legal, Regulatory and Financial Issues Taskforce. Upon approval by the Policy Group, it is requested that the report be presented to the Ministers for approval.

CONSIDERATIONS ON REGULATORY ISSUES REPORT

In November 2003, Australia hosted an international sequestration regulatory workshop with eight of the then fifteen CSLF member countries participating. The workshop shared information on regulation and discussed a proposed timeframe and work program to address regulatory issues.

Australia presented a discussion paper to the CSLF Policy Working Group in January 2004 in Italy, and proposed a gap analysis methodology to identify gaps and identify and prioritise key international regulatory processes and issues. This was intended to form the basis of a work program on regulatory issues relating to carbon dioxide capture and storage.

The Taskforce workshop in November 2003 proposed a whole of project life approach to identifying regulatory mechanisms and issues. Four key stages in a carbon dioxide capture and storage project's life cycle were identified that were further refined at the Taskforce's July 2004 meeting to be: capture; transport; injection; and post-injection. The taskforce recognised that these stages to some extent overlapped. It was also recognized that these stages could be further sub-categorised for activities.

The gap analysis aimed to consider which regulatory issues are most important and to identify where further work needs to be done for carbon dioxide capture and storage regulation. This analysis also identified areas where information sharing may be useful for countries in developing their own regulatory framework.

Within each of the stages the following key considerations were identified for use in the gap analysis: event/ risk (eg. CO_2 leakage); impact (e.g. environmental damage); owner/ responsible party (e.g. operator/ regulatory assessor); and the type of legislation/ regulatory process in place, if any, to manage the risk in question. The structure of this gap analysis was in part selected to be consistent with other work being undertaken.

The next section of this paper summarises the main issues highlighted by the gap analysis responses received and then goes on to identify a set of regulatory considerations structured around the four stages of a project life cycle identified above, namely: capture, storage, injection and post-injection. These issues emerge from the international experience relevant to carbon dioxide capture and storage regulation, where existing legislation is currently being applied to cover certain components of carbon dioxide capture and storage projects. Whilst experience to date has mainly been in the oil and gas industry and fertilizer plants, the technology will have a significant impact on other sectors, including electricity generation. CSLF members are encouraged to consider these issues in the context of their own domestic policies and frameworks.

GAP ANALYSIS SUMMARY

The gap analyses received identified risks and responsibilities relating to each phase of a project life cycle. The countries that responded are Australia, Canada, Japan, Norway, United Kingdom and the United States. These countries all identified similar issues' in domestic regulation for carbon dioxide capture and storage projects, but differed slightly on aspects of projects that were covered by existing regulation. Common issues identified by the responding countries to the gap analysis approach are outlined below.

Capture Stage
A large amount of existing regulation was identified of potential applicability to the 'capture stage' of a project. The United States, as well as Canada and Norway have significant experience in this stage of a project due to experience with projects such as Joffre (capture at the fertiliser plant that is transported to the oilfield in Canada), and from gas plants, Sleipner (Norway) and Weyburn (capture and treatment at the Dakota Gasification Company in the United States and injection in Canada). The gap analysis responses identified that for some countries further work needs to be undertaken regarding how CO_2 is categorised in order to determine the applicability of and any need to modify or extend existing legislations/ regulations. Emission inventory guidelines for the purpose of reporting to the United Nations Framework Convention on Climate Change and for emissions trading purposes, where relevant, would need development and the basis to do this exists.

Transport Stage
Some countries already have experience with transport of CO_2 and there are also numerous parallels between CO_2 transport and transport of natural gas, for which regulatory frameworks exist in most countries. There are also parallels with pipelining acid gas (H_2S and CO_2) in Canada from the gas plant to the injection well at distances up to 20 km. Transport of CO_2 may trigger regulatory review in some countries, as physical distances from CO_2 source to sink are project specific; therefore transport of CO_2 maybe by pipeline, road, rail or ship. Consequently, regulation of all methods of transport may require review to ensure CO_2 is covered. As with the transport of oil and gas, regulation for the transport of CO_2 needs to take account of environment, health and safety risks. The coverage of existing regulations and analytical techniques may need to be assessed and extended and emission inventory guidelines need to be developed where applicable, as for the capture stage.

Injection Stage
Some countries have experience with the underground injection of CO_2, and even more countries with the injection of natural gas for storage, which helps to address the 'injection stage' issues. Canada also has experience with the injection and underground storage of acid gas. A major gap in the regulatory frameworks for some countries for this stage is the provision for assessment of various formations to determine their storage potential, integrity relative to leakage and ability to endure CO_2 storage over time. Criteria need to be developed for the various formations to take account of environmental, health and safety and community concerns. In addition, measurement, monitoring and verification standards may have to be developed to comply with applicable international agreements. The gap analysis responses identified that some form of licensing and regulatory regime may be required to inject CO_2, possibly similar to existing approvals for the extraction of oil and gas, which takes into account the views of stakeholders and the community.

Post-Injection Stage
Historical experience in the underground storage of natural gas again helps to address 'post-injection stage' issues. There remains a regulatory gap to be filled in the area of developing monitoring and verification standards for the various formations, to be applied during post-injection. These standards would need to comply with the United Nations Framework Convention on Climate Change inventory review process. The fate of CO_2, including physical and chemical transformations induced by its placement, must be measured to satisfy environmental, health and safety issues. Currently, these standards do not exist. The gap analysis responses identified that a regulatory regime may be required to determine responsibility over the long-term, and to manage the issues associated with CO_2 storage in the 'post-injection' stage. This might be informed by existing practice in the oil and gas industry for decommissioning of infrastructure.

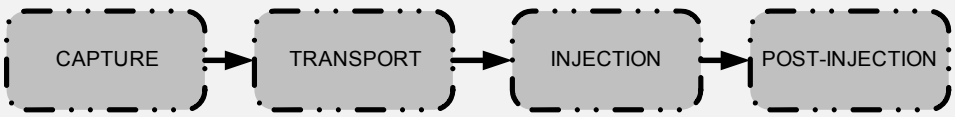
INTRODUCTION

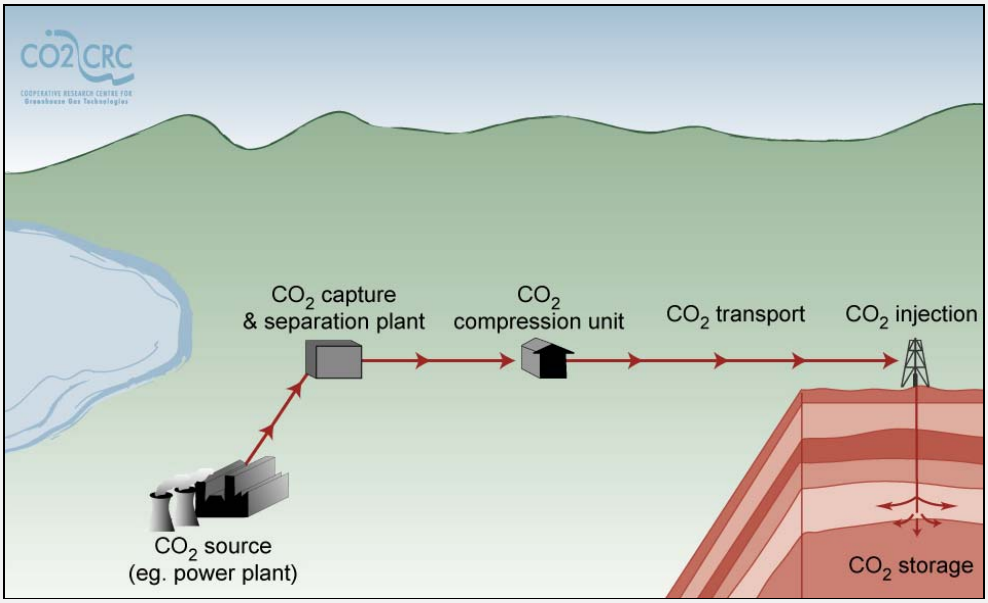
Against a background that carbon dioxide capture and storage offers the potential for a commercially viable option to reduce greenhouse gas emissions and recognising the need to address appropriate legislative and regulatory issues, the Taskforce offers this factual report on possible practice for carbon dioxide capture and storage. The report could be an important tool for the CSLF and its Members in providing insights into further research and development work on these issues.

The following considerations are based on current practice and experience and an assessment of future requirements, and are in no way intended to be binding on CSLF member countries. The considerations put forward by the Taskforce are not necessarily intended for R&D, pilot or demonstration projects. The considerations aim to be appropriate to and compatible with member country's regulatory regimes and it is not intended to produce a 'one size fits all' approach.

They are structured around four stages of the life cycle of a carbon dioxide capture and storage project: capture; transport; injection; and post-injection. It should be recognised that these considerations may need to be addressed in the planning stage of carbon dioxide capture and storage projects. There are also some overarching considerations that apply to all four stages of the project life cycle.

Carbon Dioxide Capture and Storage Project Life Cycle





Source: [Cooperative Research Centre for Greenhouse Gas Technologies (CO2CRC) – Australia]

OVERARCHING CONSIDERATIONS FOR CARBON DIOXIDE CAPTURE & STORAGE PROJECTS

1. A regulatory framework should be soundly based, publicly stated, instil public confidence and provide predictability for stakeholders.

Features could include:

- adequate opportunities for public participation and information sharing;
- drawing upon existing legislation and regulatory provisions, where relevant;
- establishment of new legislation/ regulatory provisions, where necessary;
- consistency with international law;
- flexibility to allow a range of technologies for carbon dioxide capture and storage;
- consistency with environmental, health and safety regulations;
- consistency with economic considerations, while avoiding over-regulation as appropriate;
- appropriate monitoring and verification;
- ensure the appropriate standards for operations and monitoring based on transparency and sound analysis;
- provision of mechanisms for community consultation; and
- clarification of the legal status of CO_2 within legislation and regulations.

2. A regulatory framework which is consistent within national borders and across national borders, where possible whilst respecting the sovereignty of national governments.

Features could include:

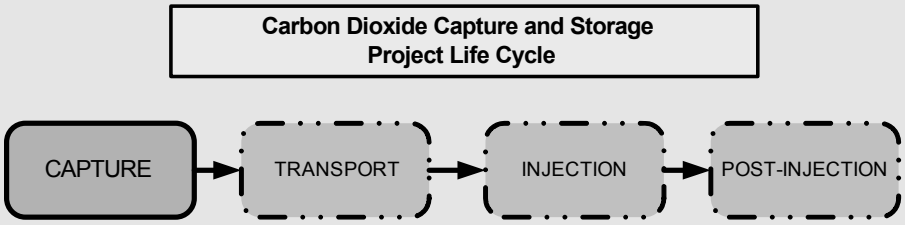
- regulatory frameworks that work together to facilitate the conduct of national and international pilot, demonstration and deployment of projects.

3. A regulatory framework which recognises countries' existing rights and obligations under international laws.

Features could include:

- that carbon dioxide capture and storage activities are consistent with countries' international legal obligations;
- the development of appropriate measurement, monitoring and verification procedures for the capture, transport, injection and post-injection stages to support emissions reporting in line with applicable international requirements; and
- seeking clarity in relevant international treaties where necessary.

CAPTURE STAGE CONSIDERATIONS FOR CARBON DIOXIDE CAPTURE & STORAGE PROJECTS



4. A regulatory framework which recognises existing legislation can be applied in many cases to handle facilities and hardware associated with CO_2 capture.

Features could include:

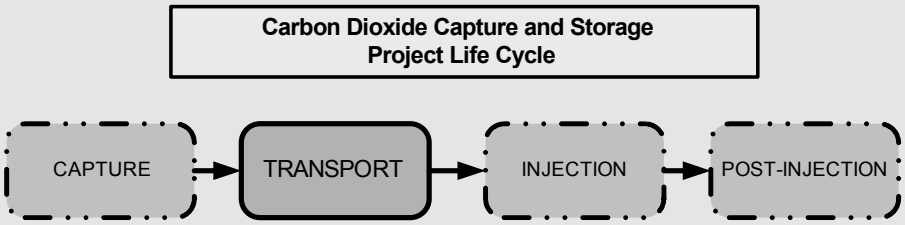
- recognition that existing legislation can be built on to address the capture of CO_2 in areas such as health and safety, environment, petroleum, coal, mineral resources, dangerous goods, pollution control, planning legislation;
- recognition that potential occupational safety hazard to workers in capturing CO_2 may be managed by applying or amending existing occupational health and safety (OH&S) regulations to workers capturing CO_2; and
- recognition that capture of CO_2 may be managed by applying/ amending existing environmental regulations where relevant, such as those used in mineral processing, chemical manufacturing and electricity generation plants.

5. A regulatory framework which provides predictability to project proponents and governments regarding property rights, responsibility for CO_2 capture and accurate accounting for emissions during the capture phase.

Features could include:

- allowance for different ownership and/or property right responsibilities between the plant owner and investors in CO_2 capture, if different entities; and
- reporting to government on a regular basis the amount of CO_2 captured and CO_2 emitted where applicable.

TRANSPORT STAGE CONSIDERATIONS FOR CARBON DIOXIDE CAPTURE & STORAGE PROJECTS



6. A regulatory framework which provides for transport of CO_2 by pipeline building on existing legislation for natural gas, petroleum or commodity pipelines, as appropriate.

Features could include:

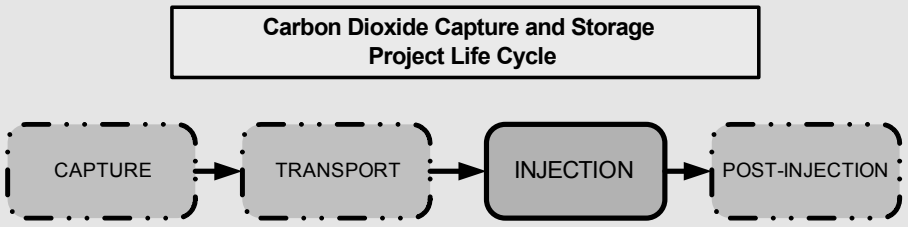
- allowing for management of risks in the areas of leakage associated with transport modes including, pipeline integrity, health and safety, and environmental impact consistent with national approaches, regulations and legislation on risk, safety and environmental impact;
- measuring and verifying and reporting to government(s) on a regular basis the amount of CO_2 including at the beginning and end points;
- facilitating third party access to CO_2 pipelines to promote best use of infrastructure, where appropriate;
- allowing for transportation in pre-existing gas or fuel pipelines providing they meet the required standards for CO_2; and
- providing certainty in property rights for pipeline owners and users through some form of licensing regime;
- allowing for different ownership structures of pipelines; and
- allowing for pipelines which cross jurisdictions.

7. A regulatory framework which builds on relevant existing legislation for other goods in the transport of CO_2 by road, rail or ship, as appropriate.

Features could include:

- managing environment, health and safety issues; and
- ensure consistency with international legal obligations, where transport crosses international borders.

INJECTION STAGE CONSIDERATIONS FOR CARBON DIOXIDE CAPTURE & STORAGE PROJECTS



8. A regulatory framework which adopts a science-based approach to site evaluation that takes into account environmental, health, safety and community concerns to be used for identification of appropriate sites for the injection of CO_2.

Features could include:

- encouraging the development and use of new technologies in the identification of sites;
- compliance with domestic and international legal obligations when selecting sites;
- using environmental impact and assessment procedures for evaluating projects for injecting CO_2 where appropriate, including consideration of the effect of leakage on ecosystems and humans;
- requiring a level of proof on performance standards that is in line with "best available technology"; and
- developing criteria for the various formations to mitigate investment, environmental, safety and health risk.

9. A regulatory framework which gives clarity and transparency to project proponents in relation to access and property rights through arrangements that allow the injection of CO_2 provided risks are being managed to the satisfaction of the applicable government body (s).

Features could include:

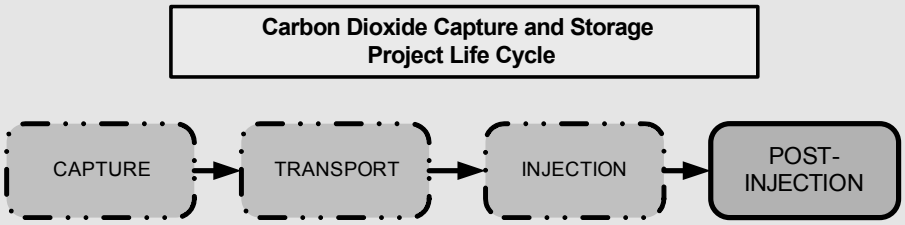
- acknowledging that issues of property rights and regulatory control in respect of reservoirs that extend across international borders should be determined between the relevant countries;
- issuing government licences according to transparent and timely approvals processes;
- taking into account views of stakeholders and the community;
- making CO_2 injection and storage facilities available for use by third parties, as appropriate;
- allowing for CO_2 capture and storage 'hubs'; and
- recognising existing relevant property rights such as land holder and resource development rights, as appropriate.

10. A regulatory framework which manages CO_2 injection and storage through a licensing and regulatory regime.

Features could include:

- an appropriate licensing and regulatory regime taking into account relevant existing frameworks for measuring, verifying and reporting to government the amount of CO_2 being injected in accordance with applicable domestic and international standards;
- monitoring the migration and potential CO_2 during the operation of the injection site;
- ensuring injection conditions are on a project by project basis, allowing for differences in size, formations, environments etc;
- developing a plan of action for emergency response, as appropriate; and
- developing operating parameters to ensure the long term integrity of the storage site.

POST-INJECTION STAGE CONSIDERATIONS FOR CARBON DIOXIDE CAPTURE & STORAGE PROJECTS



11. A regulatory framework which provides clarity and transparency to project participants and the community on the management and assignment of long-term responsibilities.

Features could include:

- set technical standard for validation of long-term integrity;
- defining responsibility for the management of long term storage;
- appropriate provisions to minimise the potential for orphan sites; and
- establishing and/or clarifying ownership of the subsurface rights.

12. A regulatory framework which manages storage sites in a manner that assures the community of effective long-term storage of CO_2 and provides project participants with the appropriate clarity and transparency of obligations.

Features could include:

- appropriate monitoring requirements;
- requirements for regulating the future use of the storage site and its surroundings, as appropriate;
- requirements for the management of possible unplanned events; and
- ensuring appropriate technologies are used for monitoring.