



## IPCC WORKING GROUP III HIGHLIGHTS SATURDAY, 24 SEPTEMBER 2005

On Saturday, delegates completed line-by-line consideration of the draft SPM in plenary and closed the eighth session of WGIII after agreeing to the revised text of the SPM and accepting its underlying scientific and technical assessment. In the morning, delegates finished deliberations on a section of the SPM concerned with the costs of CCS and its economic potential. In the afternoon, evening and into the night, delegates considered sections on: risks of CCS; legal issues associated with storage; implications for emission inventories and accounting; and the public perception of CCS. Delegates also resolved outstanding issues after discussions in several informal contact groups and in informal consultations. Co-Chair Metz closed the meeting at 1:15 am on Sunday morning.

### CONSIDERATION OF THE DRAFT SUMMARY FOR POLICY MAKERS

**What are the costs of CCS and what is its economic potential?** After the US expressed concern about text being policy prescriptive, delegates agreed to amend the text to note that models indicate that the major contribution of CCS to climate change mitigation would come from deployment in the energy sector. Delegates then considered text on the minimum carbon prices necessary for a major CCS contribution to mitigation. CHILE and NEW ZEALAND expressed concern over the US\$ 25 - 30 price quoted, given the long lifetime of some projects. Delegates agreed to text noting that most modeling, as assessed in the Special Report, suggests that CCS systems start to deploy at a significant level when carbon prices begin to reach approximately US\$ 25 - 30.

On text noting that low cost capture possibilities can lead to storage of up to 360 Mt CO<sub>2</sub> "cumulatively" under low or absent incentives, AUSTRALIA suggested clarifying that "cumulatively" refers to the lifetime of the projects observed in the underlying study. The Lead Authors agreed to reword the 360 Mt CO<sub>2</sub> reference and delegates agreed to the rest of the sentence.

On worldwide storage capacity in geological formations, DENMARK and GERMANY suggested noting that the quoted amount of "at least" 2,000 Gt CO<sub>2</sub> is an estimate. CHINA expressed concern that the text did not explain that this number relates to technical, as opposed to economic, storage potential.

Delegates agreed to accept the text with an explanation of the number in a footnote. In the next paragraph, the US stressed the need to convey that storage potential in saline formations could be much larger than 2,000 Gt CO<sub>2</sub>. Delegates agreed that the text would refer to uncertainty in the "upper limit estimates." GERMANY highlighted that ocean and geological storage potential cannot be directly compared given their different retention times, and JAPAN noted that this difference is addressed elsewhere in the SPM. Delegates agreed to text and a footnote explaining the economic potential of CCS under different stabilization scenarios, and in a least-cost mitigation portfolio.

On the role of CCS in mitigation portfolios, delegates agreed to DENMARK's proposal to specify that text noting that "CCS in a mitigation portfolio reduces the costs of stabilizing carbon dioxide concentrations by 30% or more" refers to certain scenario studies. CHINA proposed deleting a figure that shows the contribution of CCS as part of a mitigation portfolio, noting that the figure only refers to two scenario studies for stabilization at 550 ppmv CO<sub>2</sub>. GERMANY, AUSTRIA, and KENYA highlighted the relevance of the figure and supported keeping it. AUSTRALIA supported retention of the figure, but agreed with CHINA that the text should state that it refers to illustrative examples of the range of scenario studies. After informal consultations led by AUSTRALIA, delegates agreed to add text noting that analyses in this field are limited and further assessment may be necessary to improve information. In the figure itself, delegates agreed to remove all references to the 550 ppmv scenario, and that these changes will apply to a figure in the Technical Summary of the Special Report, but the figure would remain unchanged in the Special Report. In the caption to the figure, delegates agreed to emphasize that: the figure provides an illustrative example of the global potential contribution of CCS as part of a mitigation portfolio; the results vary considerably on regional scales; and the example is based on a single scenario and does not show the full range of uncertainties associated with these matters.

**What are the local health, safety and environmental risks of CCS?** On local risks associated with carbon dioxide pipeline transport, ZAMBIA sought clarification of a statement that the risks are possibly lower than comparable hydrocarbon pipelines. Lead Author Richard Doctor explained that the statement was based on 20 years of experience in the US. The text was



accepted without amendment. Lead Authors Richard Doctor and Peter Cook answered questions on the risks to humans of exposure to concentrations of carbon dioxide. The US proposed, and delegates agreed, to specify that a sudden, large release of carbon dioxide would pose immediate dangers to human life and health at exposures to concentrations of carbon dioxide greater than 7-10% by volume in air. Delegates agreed to a US proposal to add a sentence from the Technical Summary noting that no major obstacles to pipeline design for CCS are foreseen.

On the risks posed by geological storage, Co-Chair Davidson introduced text that notes that with appropriate site selection, a regulatory system, and the appropriate use of remediation methods, the local health, safety and environmental risks of geological storage would be comparable to risks of current activities such as natural gas storage, EOR, and deep underground disposal of acid gas. Delegates agreed to this text after deleting a reference to less severe impacts of leakage from offshore storage locations relative to onshore locations.

On the effects of direct ocean injection of carbon dioxide, delegates considered whether direct injection “would” or “could” cause mortality of ocean organisms. JAPAN sought to include text specifying that mortality only occurs near injection points, while CHILE, supported by MALAYSIA and CHINA, said ocean effects could not be inferred from the results of studies in confined environments. In the afternoon, delegates returned to this issue, approving text for the remaining paragraph of the section, which notes that the environmental impacts of large-scale mineral carbonation would be a consequence of the required mining and disposal of resulting products that have no practical use, and explains that the impacts of mineral carbonation are similar to those of large-scale surface mines.

**Will physical leakage of stored carbon dioxide compromise CCS as a climate change mitigation option?** FRANCE, with support from others, stressed the need to highlight that leakage from ocean storage could offset some of the benefits of CCS. The US, with support from JAPAN, CANADA and others, proposed separating wording on geological and ocean storage due to differences in retention times, and to include mineral carbonation as a separate heading. Delegates agreed to this proposal.

On the policy implications of slow leakage from storage sites, BELGIUM suggested that a reference to leakage of “small” quantities of carbon dioxide offsetting benefits from CCS is misleading, and proposed, and delegates agreed, to delete “small.” Supported by NORWAY and the US, BELGIUM proposed distinguishing more clearly between leakage from ocean and geological storage. JAPAN underscored that an 85% retention rate can be achieved when carbon dioxide is injected to an ocean depth of 3000 meters, and noted parallels between ocean and geological storage. After further discussion and informal consultations led by the US, delegates agreed to note that assessments of the implications of leakage for climate change mitigation depend on the framework chosen for decision making, and on the information on the fractions retained for geological or ocean storage, as presented elsewhere in the SPM.

**What are the legal and regulatory issues for implementing carbon dioxide storage?** Delegates agreed to add “*inter alia*” before the list of existing regulations that could be directly applicable to geological storage, and to add “pollution controls” to the list, as proposed by NORWAY. A reference to US property

rights was removed, as suggested by CANADA and supported by the US and EGYPT, and replaced with a reference to subsurface property rights.

Delegates agreed to a proposal by the US clarifying that no formal interpretation exists on whether carbon dioxide injection into the ocean is compatible with international law. The NETHERLANDS requested inclusion of reference to cross-border geological storage. The US proposed, and delegates agreed, to delete reference to the UN Convention on the Law of the Sea as it was speculative. After JAPAN noted that the OSPAR Convention is a regional treaty, a paragraph elaborating on the OSPAR and London conventions was deleted.

**What are the implications of CCS for emission inventories and accounting?** Referring to comments about the organization of this section, Co-Chair Metz noted the importance of distinguishing between emission estimation, monitoring, and accounting. On text noting that current UNFCCC reporting guidelines are not fully applicable to CCS, discussion centered on whether reference to the Revised 1996 IPCC Guidelines on National Greenhouse Gas Inventories, or to reporting guidelines under the Kyoto Protocol should be included. After informal consultation, text was agreed with reference to the IPCC Guidelines.

**What are the Gaps in Knowledge?** AUSTRIA, with support from GERMANY, BELGIUM, and others, proposed the addition of a new section in the SPM, which notes that there are gaps in knowledge regarding some aspects of CCS, and that increasing knowledge and experience would reduce uncertainties and facilitate decision making. Delegates agreed to the proposal.

**What is CCS and how could it contribute to mitigating climate change?** After a report from NORWAY on the work of a contact group established on Thursday, delegates agreed to text for the opening section of the SPM. The agreed text states that CCS is an option in the portfolio of mitigation actions for stabilization of greenhouse gas concentrations, and that the TAR indicates that no single technology option will provide all of the reductions.

## CLOSING PLENARY

Delegates reconvened just before 1:00 am on Sunday morning and approved the revised draft SPM (8th WG III/Doc. 2a, Rev. 1). Delegates also approved the Adjustments to the Technical Summary and Chapters for consistency with the approved SPM (8th WG III/Doc. 2c), and the underlying scientific/technical assessment in the Special Report (8th WG III/Doc. 2b). WG III agreed to pass on its best wishes to the family of the late Dr David Pearce.

## IN THE CORRIDORS

The corridors began to fill up as the plenary emptied throughout the last day of WGIII-8, with more informal contact groups convening to consider particular sections of the draft SPM. While the day began with some pessimism as to whether the remaining text of the draft SPM could be agreed by the scheduled closing time, steady progress during the afternoon seemed to take many delegates by surprise. By the 6.00 pm dinner break, some participants were prepared to lay wagers as to the finishing time, with one optimistic delegate suggesting 8.00 pm, while more seasoned observers suggested that 12.00 am was more realistic. In the end, experience had its way.