Further guidance relating to the clean development mechanism

- carbon dioxide capture and storage technologies -

FCCC/KP/CMP/2006/L.8:
INFORMATION ADDRESSING THE FOLLOWING ISSUE

(d) Long-term liability for storage sites

Submitted by Greenpeace

Liability is one of the most essential regulatory issues facing carbon dioxide capture and storage (CCS) projects. It will impact the costs of CCS projects and will be crucial in advancing public acceptance of the technologies and processes. It will also co-determine the likelihood of undertaking a remediation activity in case of leakage. Liability issues can be divided into short- and long-term, with the preponderance of unresolved liability issues relating to long-term storage[1].
In the short-term resonsibility and liability issues are propably more complex, because multiple parties may be involved in the operation of the different elements of the CCS chain. It may also occur that several parties use the same CO_2 storage site, and all the parties may face joint and separate responsibilities. Such a situation complicates the assignment of liability for possible emissions. The total amount of CO_2 leakage accounted across the whole CCS chain must somehow be accountable back to the entity that is receiving for example emission reduction credits for the activity, or the entity exporting the CO_2 for storage.
In the long-term liability for any seepage of CO_2 from geological storage sites presents a somewhat different issue. This also accounts to impacts not directly linked to CO_2 escaping to the atmosphere, e.g. pollution of groundwater due to CO_2 leakage. It is likely that liability for long-term stewardship of storage reservoirs will be handed over to host governments after a set period of time or e.g. upon insolvency of the site operator.

	Project status	Liability
Short-term	Pre-injection, injection and any contractual period covering post-injection (abondonment period)	Operational liability
Long-term	Post-injection stage (after abondonment period, to be decided case-by-case), generally from 50-100 to thousands of years	Environmental liability In Situ liability Trans-border liability Climate liability

Potential sources of liability include public health impacts, environmental and ecosystem damage. Another source of liability is associated with leakage from geologic storage reservoirs and its effect on climate change. Assuming that carbon emissions will be controlled under a regulatory regime in the future, there will be a liability associated with leakage with regard to the effect on climate change.

Given this potentially complicated situation for liability, governments may be able to take on some of the burdens like done for nuclear waste. Frameworks for payments to the public in the case of a nuclear accidents exist e.g. in Germany or the United States. Nuclear plants are required to take on private insurance. In addition, all nuclear plant operators contribute to an industry trust fund. The insurance is capped simply because no insurance company would be willing to bear the full

damages of disaster. Figueiredo et al. who have studied liability issues for the United States[3] come to the conclusion that whether liability for geologic carbon storage will be treated like hazardous waste which has been much more burdensome to participants (and much more politicized) or like natural gas storage projects is uncertain. The answer will depend in part on the results of current research assessing the risks of this technology, the first projects that attempt to store carbon on a large scale explicitly for the purposes of reducing emissions of carbon dioxide to the atmosphere, the reaction of the public and interest groups to those risks and efforts, and actuarial and financial analyses of liability.

With regard to CCS in the CDM in order to account for seepage in the case of storage in non-Annex I countries, Bode & Jung[2] discuss three different solutions:

1. Ban on CCS with storage in non-Annex I countries
2. Consideration of seepages by discounting
3. Creation of rules that account for actually occurring releases

Solution 2 that deals with discounting of emission reductions would need to based on an assumed standard rate of seepage. The discount factors for seepages would have to be estimated ex ante for the whole time frame of storage. However, credible values for discounting are not available – and will propably not be available because of the long timeframe of CO_2 storage projects. Another reason why discounting is problematic is that it is difficult to account for unforeseeable events or wilful releases. If the discount factor acknowledges the possibility of these events or releases it is very conservative and thus provides little incentives to invest in CCS. If, on the other hand, the discount factor is low and thus provides incentives, it can not include the possible undesirable releases[2].
With solution 3, rules can be set to account for actually occuring releases. Discussions and agreements related to responsibilities, liability, contractual obligations, compensation of damage through transboundary effects, etc. between all parties need be described as part as conditions for permit decisions. As long as there is one unit the project is likely to be manageable. Accounting might become much more complicated, if different CO_2 exporting (capture) countries use the same storage reservoir, and if release rates are a function of the quantity and quality (the problem of impurities) of CO_2 stored. And finally, transboundary reservoirs, too, may be difficult to deal with due to the territory principle underlying the Kyoto Protocol.

It must be noted, that CDM projects that generate credits are subject to relatively short crediting periods. A storage site, however remains after a CDM project, and propably liability to that project, has ended. Risks and uncertainties of leakage (seepage), costs of long-term monitoring and remediation in case of leakage might be handed over to the host country if no other agreements have been undertaken. This could contradict one of the aims of the CDM to enable sustainable development. CCS than might not be the right technology for CDM. Should CCS be banned from the CDM? Bode & Jung state that this would decrease the storage potential and may conflict with the objective of technology transfer to non-Annex I countries. A technology like CCS, however, that is not sustainable may need another way of technology transfer than CDM. In any case, if a project is undertaken in a developing country it is crucial that the project undertaking entity (industry and later on the government of the developed country) takes over liability in the short and long-term.

References:

[1] NETL (2006): International carbon capture and storage projects overcoming legal barriers. DOE/NETL-2006/1236
[2] Bode S., Jung M.(2005): Carbon dioxide capture and storage (CCS) – liability for non-permanence under the UNFCCC. *HWWA Discussion Paper Nr. 325*
[3] Figueiredo M., Reiner D., Herzog H. (accepted): Framing the Long-Term In Situ Liability Issue for Geologic Carbon Storage in the United States. *Mitigation and Adaptation Strategies for Global Change*