The Kyoto Protocol requires the EC (consisting of the 15 Member States before May 2004) to reduce greenhouse gas emissions by 8% below 1990 levels by 2008-2012. There are different technical and management options that could help to achieve this target, including an increased use of renewable and nuclear energy or an increase in forested areas that work as CO\textsubscript{2} sinks. One of the possible solutions is cleaner use of fossil fuels by capturing and storing the CO\textsubscript{2} generated during the production and consumption of fossil fuels in geological reservoirs underground. Our current technical capacity is sufficient to store worldwide emissions from several decades up to several hundred years. Nevertheless, the key factor affecting the implementation of such a solution are the risks associated with underground CO\textsubscript{2} storage.

A new study has overviewed current knowledge regarding the health, safety and environmental risks of CO\textsubscript{2} capture and storage underground and has assessed the gaps in knowledge in this regard. The authors used recent scientific literature and information gained from research projects, supported by expert consultation.

The major findings of the current analysis were:

- Risks caused by failures in surface installations are well understood and can be minimised by applying risk abatement technologies and safety measures.
- The risk associated with the storage of CO\textsubscript{2} underground itself (CO\textsubscript{2} and methane linkage, seismicity, ground movements and displacements) is less well understood.
- The lack of knowledge and data to properly quantify the processes controlling/causing risks is partially due to the fact that this mitigation option is relatively new. Another complicating factor is that underground storage has long-term effects that are difficult to assess by means of injection operations or laboratory experiments.
- One of the main issues to be further studied is the leakage of CO\textsubscript{2} from the geological reservoir. In particular the processes that control leakage through wells, faults and fractures need to be objectives for future research projects in order to assess leakage rates for various geological reservoirs.
- The effects of elevated concentrations of CO\textsubscript{2} on terrestrial animals and plants are well known, but the possible impacts on marine ecosystems need further research.
- Risks are strongly dependant on specific reservoir and site conditions (ecosystems, onshore/offshore, presence of water resources, etc.). This makes recommendable the assessment and monitoring of a variety of pilot and demonstration storage projects in order to better understand the site specific nature of risks.

The current study provides new insights regarding CO\textsubscript{2} capture and storage underground that may be very useful for policy makers as they prioritise research, set standards and define strategies in this area.


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