AKE 10: Future Perspectives: CO_2-Storage

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Geological CO_2 storage - concepts and state of knowledge

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The German national climate targets aim at 80-95% reduction of greenhouse gas emissions by 2050. To reach these targets, additional and intensified measures for greenhouse gas reduction are necessary, which have to cover all emission sources and sectors. To limit global warming to significantly <2°C by end of the century so-called negative emissions are necessary in the second half of the century in all likelihood. Long-term geological storage of CO_2, captured at emission sources, is an essential measure within the portfolio of emission reduction technologies. In combination with biomass it is the only currently available technique that allows for negative emissions in climate relevant quantities. Currently, 15 industrial scale projects store 30 Mt of CO_2 per year worldwide. The longest operating CO_2 stoarge project is "Sleipner" off-shore Norway, which stores 1 Mt of CO_2 per year since 1996. In Germany, experiences on geological CO_2 storage has been gained at the pilot site Ketzin, where $\sim$ 67 kt of CO_2 have been stored between 2008 and 2013. Storage reservoirs are typically porous rocks (either depleted hydrocarbon reservoirs or saline aquifers) at $>$ 1000 m depth that are overlain by impermeable cap rocks. Crucial to any storage project is a site-specific monitoring concept, based on geochemical and geophysical methods. With such a system, surveilance of the storage system, detection of even small amounts of CO_2 and sound prediction of long-term behaviour is possible.