



Completion of five years of safe CO₂ injection and transition into the post-closure phase at the Ketzin pilot site

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The injection of CO₂ at the Ketzin pilot site in Germany ended after five years in August 2013. We present the key results from site operation and outline future activities within the post-closure phase. From June 2008 onwards, a total amount of 67 kt of CO₂ was safely injected into a saline aquifer (Upper Triassic sandstone) at a depth of 630 m - 650 m. The CO₂ used was mainly of food grade quality (purity > 99.9%). In addition, 1.5 kt of CO₂ from the pilot capture facility “Schwarze Pumpe” (power plant CO₂ with purity > 99.7%) was injected in 2011. During regular operation, the CO₂ was pre-heated on-site to 45°C before injection in order to avoid pressure build-up within the reservoir. During the final months of injection a “cold-injection” experiment with a stepwise decrease of the injection temperature down to 10°C was conducted between March and July 2013. In summer 2013, the injection of a mixture of 95% CO₂ and 5% N₂ was also tested. After ceasing the injection in August the injection facility and pipeline were removed in December 2013.

Geological storage of CO₂ at the Ketzin pilot site has so far proceeded in a safe and reliable manner. As a result of one of the most comprehensive R&D programs worldwide, a combination of different geochemical and geophysical monitoring methods is able to detect even small quantities of CO₂ and map their spatial extent. After the cessation of CO₂ injection a series of activities and further investigations are involved in the post-closure phase. The aim is that Ketzin will for the first time ever close the complete life-time cycle of a CO₂ storage site at pilot scale. The five wells (1 injection/observation well, 4 pure observation wells) will be successively abandoned within the next few years while monitoring is continuing. The partial plugging of one observation well in the reservoir section was already completed in fall 2013. The new four-years project COMPLETE (CO₂ post-injection monitoring and post-closure phase at the Ketzin pilot site) started in January 2014. Activities within COMPLETE include R&D work on well integrity, post-closure monitoring as well as two field experiments. One is a back-production test of the CO₂ aiming at information on the physicochemical properties of the back-produced CO₂ as well as the pressure response of the reservoir. The other experiment will focus on brine injection into the CO₂ storage reservoir in order to study e.g. the residual gas saturation. Public outreach has been a key element for the project from the very beginning and accompanies the research on CO₂ storage at Ketzin since 2004. Thus dissemination (e.g. www.co2ketzin.de) and activities at the visitor centre at the pilot site will continue within COMPLETE and along the entire life cycle of the Ketzin project.