The CO2 ReMoVe project will investigate ways of monitoring and verifying CO2 injected into geological storage sites. This large Integrated Project is coordinated by TNO (the Netherlands Institute for Applied Scientific Research) and is funded by the European Commission’s Sixth Framework Programme for Research, Technological Development and Demonstration Activities. The project started on the 1st March 2006 and over 5 years 30 partners from 12 different countries from all over the world will invest €15 million to bring together all relevant research, industry experience and know how in the field of underground storage of carbon dioxide.

Since 1990, Europe and the European Commission have invested large research efforts in CO2 geological storage, first developing inventories of possible storage sites and volumes, then building models to study the subsurface behavior of CO2 and reservoir to assess possible problems, moving on to risk analysis at different relevant time scales. Since the start of the industrial-scale injection at Sleipner, (Norway) in 1996, the focus of research has shifted to monitoring the injected CO2. Over the last ten years, experience has been acquired from large scale projects (Sleipner, Norway; Weyburn, Canada) and smaller, “laboratory” projects in the Netherlands and Poland. Three new geological storage projects (In Salah; Algeria, Snøhvit; Norway, and Ketzin; Germany) provide the opportunity to build on this work. Other storage projects in Poland (Tarnow, Kaniow) or Canada (Weyburn) will be considered in the course of the project.

The consortium of industrial, research and service organizations propose a range of monitoring techniques, applied over an integrated portfolio of storage sites in order to develop:

1. methods for base-line site evaluation;
2. new tools for monitoring geological CO2 storage, including well performance;
3. new tools to predict and model long term storage behavior and risks;
4. a rigorous risk assessment methodology for a variety of sites and time scales;
5. Guidelines for best practice for the industry, policy makers and regulators.

As a result an extensive range of monitoring datasets will be collected including repeat time-lapse seismic data, microgravity surveys, down hole fluid sampling, tracers, soil gas measurements.

The project will use and adapt methods already developed independently for predicting hydrocarbon production performance and for predicting safety performance of stored CO2.
CO₂ReMoVe will combine these methodologies in an industrial risk assessment, for all phases of storage, i.e. baseline evaluation, operation, site closure and long-term. In parallel, monitoring tools will be compared and benchmarked to recommend programmes for generic monitoring. This will be combined with innovative tool development and tool optimization, for monitoring surface and atmospheric CO₂ fluxes, as well as for detection and measurement of CO₂ in the subsurface, allowing detection and quantification of CO₂ which may have migrated from the storage site.

All of the research will be systematically integrated into an experience platform that will provide the basis for best practice guidelines.

The recommendations from these international efforts will form an important step towards a worldwide consensus in licensing and certification of the storage sites in different geological settings, including oil and gas reservoirs, coal seams and saline aquifers.

The project will build towards a better understanding of how CO₂ can be stored and monitored safely. Results will be disseminated to the public and policy makers. It will also provide the tools for quantifying and monitoring injected CO₂ required for geologically stored CO₂ to qualify for credits under the emissions trading mechanism.

Photos courtesy of BP, Statoil, Sonatrach, GFZ