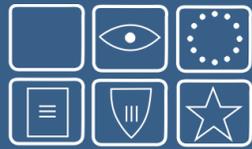


Newsletter

February 2012



CO₂ REMOVE

research monitoring verification

Blogs

Catch up with research from the CO₂ReMoVe project from the series of blogs produced by the CO₂ReMoVe team. These have been posted on the project website (www.co2remove.eu) and the Global CCS Institute website (www.globalccsinstitute.com/campaign/2011/11/co2remove).

Topics include monitoring and risks, there is also an insight from BP who are one of the operators of the In Salah site

in Algeria which is the world's first onshore industrial-scale storage site. Please take time to read these blogs and provide feedback and comments.



In Salah site, Algeria

Closing conference – 29th February 2012

The CO₂ReMoVe project has been researching predictive performance assessment and monitoring and verification techniques for CO₂ storage.

Over the last six years the consortium has had the opportunity to integrate their experience at both industrial- and pilot-scale geological storage sites aimed at testing specific technologies and methodologies.

The project is now nearing completion and in February IFP Energies nouvelles will host the CO₂ReMoVe closing

conference at their offices in Rueil Malmaison near Paris.

The conference will provide new and in many cases unpublished insights into the performance of actual CO₂ storage projects, give results of new monitoring and performance assessment techniques, and explain how the results are used in the European regulatory processes.

For more information about the conference please visit our website www.co2remove.eu.

CO₂ReMoVe blogs:

[What CCS operators should know before they start: findings from In Salah](#) – **Allan Mathieson, BP**

[CCS in the CDM and how science-policy interactions work in practice](#) – **Heleen de Coninck, ECN**

[Solving the risk paradox: merging subjective judgements and quantitative analyses](#) – **Richard Metcalfe, Quintessa**

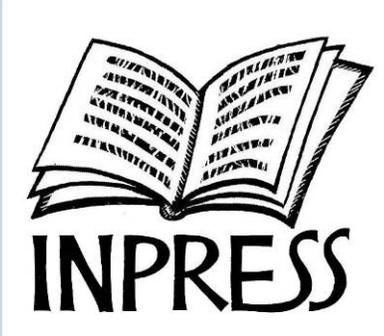
[Research into monitoring tools to monitor less](#) – **Andy Chadwick, BGS**

[Site performance assessment: from early scenarios to prediction](#) – **Jean-Pierre Deflandre, IFPEN**

[CO₂ storage: do impurities matter?](#) – **Tom Mikunda, ECN**



K12-B platform in the Dutch sector of the North Sea where CO₂ is being injected into the same reservoir from which it was extracted



CO₂ReMoVe book

The main public deliverable from the CO₂ReMoVe project is the CO₂ReMoVe book.

The book is intended to synthesize how CO₂ReMoVe results may be useful for regulatory processes. It will provide a review and a definition of strategies of performance assessment, monitoring and verification (onshore and offshore). The book will also summarise the tools that have been developed throughout the project for both performance assessment and monitoring.

The CO₂ReMoVe research partners have had direct access to actual data from all the world's large-scale storage sites plus a number of pilot-scale projects. The book will provide insights into the performance of these actual CO₂ storage sites.

The book is aimed at policy makers, regulatory bodies, international organisations, scientists and industry.

The book is currently under development and will be available shortly after the project ends.

Executive board visit to Svalbard

In September 2011, the CO₂ReMoVe executive board visited the CO₂ lab at UNIS – the University centre in Svalbard (<http://co2-ccs.unis.no>).

There they had the opportunity to discover the research into potential CO₂ storage sites. The research was presented by UNIS staff and research students both at the centre and in the field.

The CO₂ lab has completed phase 1 of their project which involved identifying reservoirs suitable for CO₂ storage.

The project is now into phase 2 where they intend to verify the injectivity and storage abilities of the reservoir. Water (with tracers) is initially being used for injection which will take place over 2-3 years.

Phase 3 will initiate a medium-scale pilot project to demonstrate the CO₂ storage by injecting CO₂. Monitoring will be performed via newly drilled wells.

Phase 4 will demonstrate full-scale carbon capture and storage chain using CO₂ sourced from the local coal-fired power plant.



Drilling rig close to Longyearbyen



Core samples from the drilling rig



CO₂ReMoVe Executive Board field visit

Adding practical experience to the EU CCS Directive

On July 7th and 8th, CO₂ReMoVe participants discussed how they could add relevant information to the EU Guidance Documents for Member States implementation of the EU CCS Directive in a workshop hosted by ECN in Amsterdam. In particular, the CO₂ReMoVe partners looked at the second Guidance Document, which gives guidance on "Site Characterisation, CO₂ Stream Composition, Monitoring and Corrective Measures". As these guidance documents are relatively theoretical, CO₂ReMoVe would potentially be able to provide practical advice based on the field observations and operational experience from actual CO₂ storage sites.



A number of areas were found where CO₂ReMoVe experience could be useful. For instance, according to the EU CCS Directive, a site has sufficient integrity in the long term if there is conformity of the actual behaviour of the injected CO₂ with the modelled behaviour. The CO₂ReMoVe project experience from the Sleipner, Ketzin, In Salah and Snøhvit projects, however, all showed that differences between modelling outcomes and the first monitoring results are almost a given, but that storage safety was never impaired. Hence, upgrading and modifications of the model are needed not at pre-determined timeslots, but whenever new data or analyses are available. The condition for the EU CCS Directive should only be implemented at longer timescales.

The EU CCS directive also states that a site has sufficient integrity in the long term if there is no detectable leakage and if the storage site is evolving towards long-term stability. In the projects that CO₂ReMoVe has been involved in, all this seemed to be the case. So CO₂ReMoVe confirms the viability of the permanence assumptions in the Directive.



Installations at Ketzin, Germany

CO₂ReMoVe is funded by the EC 6th Framework Programme and by industry partners Statoil, BP, Schlumberger, ConocoPhillips, ExxonMobil, Total, DNV, Vector, Vattenfall and Wintershall. R&D partners are BGR, BGS, BRGM, CMI, DNV, ECN, GFZ, GEUS, IEA-GHG, IFP, Imperial College, MEERIPAS, OGS, TNO, URS, Quintessa, Schlumberger SINTEF, Total and Vattenfall R&D. Three R&D institutes outside Europe participate in CO₂ReMoVe: CSIR from South Africa, UNDLP from Argentine and ISM from India.

For more information please go to the website (www.co2remove.eu) or contact the project coordinator Ton Wildenberg (e-mail ton.wildenberg@tno.nl tel. + 31 30 256 4636).



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