

7680

What have we Learnt From CCS Demonstrations?

B. Beck (IEAGHG), M. Haines (IEAGHG), T. Dixon (IEAGHG), N. Wildgust (IEAGHG) & L. Basava-Reddi* (IEAGHG)

SUMMARY

IEAGHG has undertaken an assessment of the learning that is being provided by operational, large-scale, pilot, demonstration and commercial CCS projects around the world. This was undertaken by questionnaire and analysis of the responses.

The criteria to define operational large-scale CCS projects, was that they were operational by the end of 2008, and satisfied one of the following criteria:

- Capturing over 10,000 tCO₂ per year from a flue gas;
- Injecting over 10,000 tCO₂ per year with the purpose of geological storage with monitoring;
- Capturing over 100,000 tCO₂ per year from any source;
- Coal-bed storage of over 10,000 tCO₂ per year;
- Commercial CO₂-EOR is excluded unless there is an associated monitoring programme.

There were found to be 28 eligible projects from which 20 questionnaires were returned and information was provided verbally from 3 other projects.

As the CCS industry looks to move from demonstration phase to full scale deployment, it is useful to assess which technologies have been demonstrated and which are yet to be demonstrated. The European Union Zero Emissions Technology Platform matrix was used to identify the key technology steps on which testing are still required.

From analysis of responses, key themes, learning points and areas for beneficial collaboration are identified. Coverage of projects is summarised in terms of geological properties and monitoring techniques.

From this initial analysis, key learning areas identified as warranting further investigation include:

- Effectiveness of various monitoring techniques
- Injectivity - prediction, restoration and enhancement
- Design to avoid hydrate formation
- Performance of materials in CO₂ environments
- Scaling up capture train size
- Wells - designing, placing, and monitoring cementation

Whilst complete large scale CCS systems on power plants are still to be demonstrated, there is already significant operation of closely integrated parts of CCS systems. The survey returns are also encouraging in that they show some specific areas where more information sharing is likely to be of benefit to future projects. In particular this can help in defining those areas which need further development and testing.