



# Expert Review of Regional Carbon Sequestration Partnerships Phase III

*Executive Summary*

*Date: 2<sup>nd</sup> May 2008*

*This document has been prepared for the United States Department of Energy.  
It is not a publication of the Operating Agent, International Energy Agency or its Secretariat.*



# **Expert Review of Regional Carbon Sequestration Partnerships Phase III**

## **Executive Summary**

The Regional Carbon Sequestration Partnerships Programme (Partnerships Programme) is a multi-million dollar research programme which is underway in the USA. The Partnerships Programme is being carried out in three phases:

- Phase I – Characterization (2003-2005)
- Phase II – Validation (2005-2009)
- Phase III – Deployment (2008-2017)

The USDOE requires that an independent technical review of the Phase III programme should be undertaken at the outset of the programme. The USDOE approached the IEA Greenhouse Gas R&D Programme (IEA GHG) to undertake the Phase III technical review. IEA GHG has extensive experience of CO<sub>2</sub> injection projects worldwide and has organised a number of independent technical reviews on behalf of member organisations such as USDOE. To review the Partnerships Programme and the Phase III activities IEA GHG appointed an independent international panel of experts. The experts were drawn from on-shore CO<sub>2</sub> injection projects underway in Canada, Europe and Australia, many of the experts were involved in the IPCC Special Report on CO<sub>2</sub> Capture and Storage or the IPCC 2006 Inventories Guidelines report.

The expert review panel found that the Phase III of the Regional Partnerships was an excellent program that will achieve significant results for CCS both in the United States, Canada and internationally. It was unanimously agreed that Phase III of the Partnerships Programme will significantly advance and accelerate the field CCS. The individual projects within Phase III programme complement each other and together build a comprehensive and expansive research programme, the size and scope of which is which is unique throughout the world. Overall, it was considered that the individual projects cumulatively achieve the goals of the Partnerships Programme. Furthermore, it was considered by the panel that the goals of the individual projects were both realistic and achievable within the timescales set by NETL for the Partnerships Programme as a whole. The panel recognized that this programme and all of the projects reviewed should be implemented immediately to benefit national and international governmental organizations and industry that will be responsible for implementing CCS projects.

The Partnerships Programme is a unique activity in international CCS terms. No other country or region has embarked upon such an ambitious CCS initiative. In addition, the Partnerships Programme will demonstrate capture from a range of industrial operations such as natural gas processing, ethanol production and most importantly power production. It will be the first in the world to demonstrate the fully integrated chain of CO<sub>2</sub> capture from power station flue gas, transport and injection into a geological storage



formation. The review team, however, noted that there are inherent problems associated with the development of a suite of fully integrated projects. Particular issues include; project success and potential for financial over run. In terms of project success, there is a higher risk with integrated projects and in particular those with more novel CO<sub>2</sub> capture technologies that permitting, constructional and operational delays could impact on the ability of projects to achieve their technical commitments under the Partnership Programme. In addition, in the current financial climate there is a higher potential for equipment cost escalation which could also impact on the ability of projects to achieve their financial commitments under the Partnership Programme. Both issues will need to be carefully monitored by the programme managers NETL and action taken as appropriate.

The individual projects going forward combine together to make the Partnership Programme a major research initiative covering a wide range of different industrial CO<sub>2</sub> sources, pipelining options and geological storage formations. This variety of projects is a major strength of the Programme. In addition, non technical features such as the breadth of membership, public awareness activities and engagement in regulatory development covering different states and federal jurisdictions are also particular strengths. The inclusion of committed governmental, industrial, academic and research organisations is a key feature, the legacy of which will be a broad community of organisations that can take CCS forward into wide scale implementation in the United States, Canada and beyond.

In undertaking the review specific issues relevant to each project were identified with gaps being identified, suggestions for project modifications made or recommendations to improve the projects capabilities to deliver key results. These specific issues should become discussion points between the Programme Managers, NETL and the individual project teams. Actions to address the specific issues highlighted should also be developed by NETL and agreed with the project teams.

In reviewing the program the review panel highlighted also a number of areas where it was felt that additional value could be drawn from the Partnerships Programme. Such activities could include:

- Undertake a comparison of the performance of the various different simulation models that will be used.
- Undertake a compilation of the performance and limitations of the wide range of different monitoring techniques used for the benefit of industry and regulators.
- Undertake a compilation of the performance and limitations of different risk assessment techniques and associated results used in the program for the benefit of industry and regulators.
- Document and compile information and experience about communication strategies, regulatory issues and liability with the aim of producing a composite set of best practise for guidance for future project developers.
- Draw together information about the comparison between technical storage capacity and actual storage capacity.