

Carbon capture and storage -- new research shows tough road ahead to realize potential

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Government plans to develop carbon capture and storage (CCS) technologies to reduce carbon emissions received a cautious welcome today. A new report concluded that most of the uncertainties facing these technologies can – in principle – be resolved.

Carbon capture and storage: realising the potential? is the culmination of a two-year project funded by the UK Energy Research Centre (UKERC). The report assesses the technical, economic, financial and social uncertainties facing CCS technologies, and analyses the role they could play in achieving UK energy policy goals. Its publication today follows the announcement earlier this month of a new long-term strategy for CCS by the Department of Energy and Climate Change, including the re-launch of the UK's £1 billion competition to develop commercial scale CCS projects.

The report's lead author, Professor Jim Watson, Director of the Sussex Energy Group at the University of Sussex says:

'We still don't know when CCS technologies will be technically proven at full scale, and whether their costs will be competitive with other low-carbon options. So it is vital that the Government's commitment to these technologies leads to several full scale CCS projects as soon as possible. Only through such learning by doing will we know whether CCS is a serious option for the future, and how the technical, economic and legal uncertainties currently facing investors can be overcome'

The report draws lessons from history, and concludes that previous technologies have faced similar challenges to those affecting CCS technologies today. In the past, such uncertainties have been resolved sufficiently for these technologies to succeed. While care is needed when learning from history, the findings offer some optimism that, given the right actions by [government](#) and industry, the uncertainties surrounding CCS can also be dealt with.

But even if rapid progress is made with the UK's re-launched demonstration programme, which aims to have CCS plants operational later this decade, difficult choices will remain for government and other decision makers, say the authors. The report identifies four key areas where such choices need to be made:

- Deciding whether to keep options open, or close them down. The French government focused on one technological variety early on for its nuclear programme. Doing this for CCS may help speed up development, but there is a risk of picking inferior technology. The authors caution that it is too early for government and industry to close down on a particular variant of CCS technology. They welcome the plans for several substantial demonstration projects which will help to identify which variants of CCS technology can be scaled up successfully.
- Designing financial support for effective CCS demonstration and deployment. A regulatory approach that makes CCS compulsory for all fossil plants will only work if the technology is more advanced, and the additional costs can be passed onto consumers. CCS technologies are not yet at this stage. In the mean time, the government should ensure that industry maximises efficiency and minimises costs of new CCS plants. History shows that not all demonstrations will perform as expected, and government should ensure that lessons are learned from successes and failures.

- CCS deployment is a marathon, not a sprint. Developing new energy technologies can take a long time, and the process is often far from smooth. The report shows that costs do not necessarily fall in the way supporters hope – and can rise for several years before they come down, as technologies are scaled up. This requires patience. Government also needs to ensure it has an independent capability to assess costs to inform future decisions about whether to continue with public funding for CCS or to divert resources to other low carbon options.
- Dealing with storage liabilities. The report shows highlights lessons from UK nuclear waste management policy to show how complex liability arrangements for CO₂ storage could be. For CCS, a balance needs to be struck between limiting liabilities for investors and protecting the interests of future taxpayers. Agreements will be needed on where this balance should lie, and what arrangements are needed to fund and insure against potential liabilities.

Professor Watson comments:

'It will be vital to keep options open in the government's CCS commercialisation programme. Whilst it is welcome that the government has learned from the mistakes of the past, and now plans to support a number of CCS technologies, there is a long way to go before CCS is a reality at full scale. Complex negotiations with industry lie ahead. As the National Audit Office argued recently, such negotiations require substantial capacity and skills within government to bring such negotiations to a successful conclusion.'

More information: Copies of the report are available for download at www.ukerc.ac.uk/support/tiki-index.php?page=ES_RP_SystemsCCS

Provided by UK Energy Research Centre

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