

## Putting carbon back underground: carbon capture and storage research and deployment

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Initially, the idea of geologically sequestering carbon dioxide as a mitigation option, first proposed around 1990, was met with a combination of indifference and scepticism. However, pioneering research and then the Sleipner Project in 1996 provided an enormous boost to the credibility of carbon capture and storage (CCS) as a mitigation option. Despite that, the commercial uptake of the technology has been slow over the subsequent decade with only three additional storage projects commenced—first the Encana Weyburn (EOR with storage), followed by the BP In Salah and most recently, the Statoil Snovit storage project. To that can be added a number of acid gas disposal projects in western Canada, undertaken as part of petroleum production operations, and the injection of carbon dioxide into the subsurface as part of enhanced oil recovery (EOR) projects for the past 40 years by oil companies. But in such cases, any storage of carbon dioxide has not been the primary focus. There is clearly a global need to accelerate work on CCS.

Australia's experience in CCS is instructive, both for showing the technology pathway that has been adopted and also for demonstrating the time and effort required to move from research to demonstration. In the late 1990s the Gorgon JV

partners commenced their work on geological storage. This work was sharply focussed on Barrow Island and was commercial-in-confidence. In 1998, the APCRC, (predecessor to CO2CRC), commenced the GEODISC Project to assess Australia's geological storage resources. This project was successful in that it demonstrated there was a large storage resource—enough to store a large proportion of Australia's stationary CO<sub>2</sub> emissions. However the identification of a storage resource does not necessarily equate to a usable storage 'reserve' and, over the past five years, CO2CRC has sought to identify the usable (operational) storage capacity in a number of areas.

The CO2CRC is now undertaking demonstration projects in capture (Latrobe Valley) and storage (CO2CRC Otway Project). These represent an important step forward for CCS in Australia and internationally. In terms of the amount of injected CO<sub>2</sub> (approximately 100,000 tonnes of CO<sub>2</sub> over 12–18 months), the Otway Project represents Australia's first storage project and the largest scale of injection for any demonstration project. Similarly, the range of monitoring technologies deployed onsite is one of the most comprehensive.

There are a number of other storage projects now proposed for Australia, but realistically none of these are likely to start storing CO<sub>2</sub> much before 2012. CCS is part of a portfolio of mitigation options that will be required to address greenhouse gas concerns. But considering that the use of fossil fuels is likely to increase rather than decrease in the future, Australia and other countries must seek to accelerate the rate of large scale CCS deployment.

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