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Moving CCS Forward: Bridging the Industrial Divide – Learnings from the CO2CRC Otway Project, Australia

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The CO2CRC Otway Project is Australia's first demonstration of deep geological storage of carbon dioxide. The project was developed more than a decade ago to demonstrate geological carbon storage at a commercially significant scale, which means the injection, monitoring and verification of CO_2 in a depleted gas field and deep saline aquifer. So far 65,000 tonnes of CO_2 were injected into a depleted gas field (2009, 2,000m depth) and 15,000 tonnes into a saline aquifer (2016, 1,500m depth).

Through its unique access to a depleted reservoir as well as multiple deep reservoir/seal pairs in saline formations the CO2CRC Otway site provides unmatched opportunities for benchmarking and improving monitoring concepts and technologies from the deep subsurface to the atmosphere. The site has been characterised in incredible detail and tested for CO_2 storage in both, depleted gas fields and saline formations. So far, approximately $90M were invested into research and existing infrastructure over the last ten years. Another key enabler for the CO2CRC Otway project is the readily available source of CO_2 from a natural reservoir for current and future research.

Deemed as a project of national significance, all operations at the CO2CRC Otway Project are strictly regulated under Victorian legislation and have to follow best practices of the oilfield industry. CO2CRC has to continuously prove the performance of its operations including drilling, injections and compliance monitoring against a multitude of legislative requirements.

In general, monitoring and verification programs rely strongly on repetitive, surface-based surveillance (such as conventional reflection seismic) and are likely to be costly and can face geographical, societal and/or economic impediments. A key challenge for any operator who has to ensure compliance is that monitoring technologies may simply be unable to yield sufficient resolution or accuracy to satisfy regulatory, environmental and societal expectations.

CO2CRC's monitoring and verification program requires measuring the CO_2 plume behaviour with wide spatial coverage, good spatial resolution and high temporal frequency, and subsequently requires surveys in regular intervals over years of operation and periods following injections.

Through its activities CO2CRC continues to successfully demonstrate its capability to undertake the necessary modelling, monitoring and other technical aspects that are required to effectively ensure compliance under the relevant legal obligations for onshore underground CO_2 storage in Australia.

By ongoing testing technologies and workflows at the CO2CRC Otway Site, CO2CRC has demonstrated how very strong research in the context of scientific, regulatory and environmental parameters enables project operators, regulators and the general public to gain confidence in successful operations of an onshore CO2 storage project.

This presentation will outline considerations of climate politics, energy security, policy settings, legislation, public perception, natural gas storage, and how the CO2CRC Otway Project and its globally unique setting continues to be one of the world's few sites where ground breaking research assists an emerging industry to move forward.