eReport

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ANLEC R&D Report Summaries

The following reports are available from the ANLEC R&D website:

Techno-economics Modelling

Access to CCS is essential for the lowest NEM system cost

News headlines often depict technologies as being in a race to deliver decarbonisation. However, delivering a low emissions grid at minimum financial cost is analogous to building a successful sporting team. Every team has players (power generation assets) with different but complementary strengths. The right selection and balance of these elements delivers the required success (net-zero emissions). This report addresses two simple questions:

- what is the lowest system cost to achieve decarbonisation of the National Electricity Market (NEM)
- how is the lowest system cost affected if some technologies are either not available or their deployment is constrained?

For an aspirational target of net-zero emissions by 2050, the report confirms that firm, dispatchable low emissions power generation is essential to a competent NEM grid. (Examples of firm dispatchable low emissions technology are coal+CCS, gas+CCS and nuclear). If such technologies are not deployed for the NEM, modelling shows the system will pay a cost penalty of $20 Bn/year. That's the equivalent of building two Snowy 2.0's every year!

More information: The Impact of NEM Constraints on the System Cost to decarbonise the grid

Surat Basin

Chemical tracer detection using Raman Scattering downhole

This project evaluated and tested a tracer field tool for downhole monitoring of CO_2, as a low cost and real time alternative to current tracer methods. The WellDog Reservoir Raman System (RRS) can detect very low levels of fluorescent tracers. Researchers used one fluorescent tracer commonly used for labelling and tracking the movement of water during a sequestration project. The estimated limit of detection for that tracer using the WellDog Raman scattering sensor without mechanical modification, was less than the equivalent of 2.5mg of dye in an Olympic-sized swimming pool. Another common tracer was also investigated as a fluorescent tracer specific to dense-phase CO_2. However, it was not effective because results showed that at elevated temperatures of the Precipice Sandstone formation, it dissolved into the water. The project offers a method for using a CO_2-labelling fluorescent dye in a CCS scenario.

More information: Chemical Tracer Detection using Raman Scattering

Strategies for near surface monitoring

ANLEC R&D has funded a number of studies into shallow monitoring. Any CCS application is always considered in the context of its resource interaction including: the type of land use, water and coal seam gas (CSG) developments nearby. This report makes a critical assessment of the various near surface monitoring technologies, matching them against risk assessment, practicality, and international best practice. This results in a short list of suitable techniques, primarily process-based soil gas monitoring and vegetation condition monitoring for assurance, and the use of the Process Based Method and certain carbon isotopes for attribution.

More information: Strategies for near-surface monitoring

ANLEC R&D is a member of the following IEA implementing agreements. For access to their reports, please contact admin@anlecrd.com.au.

IEA Clean Coal Centre Reports

1. Kelsall, G. (2020) Carbon Capture Utilisation And Storage – Status Barriers And Potential, ccc/304
2. Zhang, X. (2020) Technology Developments In Cofiring Biomass, ccc/305
3. Baruya, P. (2020) Coking Coal – The Strategic Raw Material
4. Zhu, Q. (2020) Digital Transformation Of The Coal Sector, ccc/307
5. Metzger, S. (2020) Carbon Prices And Their Impact On Coal Power, ccc/308

IEAGHG R&D Program Reports

1. Value of Emerging and Enabling Technologies in Reducing Costs, Risks and Timescales for CCS
2. Techno-Economic Benchmarks for Fossil Fuel-Fired Power Plants with CO_2 Capture
3. Future role of CCS technologies in the power sector
4. The Status and Challenges of CO_2 Shipping Infrastructures
5. IEAGHG Summary Hydrogen workshop
6. Review of Constructability and Operational Challenges faced by CCUS Projects
7. IEAGHG HTSLCN Combined Meetings Report
8. Understanding the Cost of Reducing Water Usage in Coal and Gas Fired Power Plants with CCS
9. Beyond LCOE Value of technologies in different generation and grid scenarios
10. 4th International Workshop on Offshore Geologic CO_2 Storage
11. IEAGHG Monitoring Network Virtual Discussion Panel Report

Global CCS Institute Reports

1. Friedmann, et al. (2020) Net-Zero and Geospheric Return: Actions Today For 2030 And Beyond
2. Loria, P. (2020) De-risking of CCS: A Primer for Investors and Businesses in the United States
3. Havercroft, I. (2020) Environmental, Social and Governance (ESG) Assessments and CCS