eReport

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ANLEC R&D Report Summaries

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

Techno-Economics Modelling

Two reports describe outcomes of studies to decarbonise the east coast electricity grid at lowest cost to consumers. They are systems assessments of viable grid configurations using MEGS software (Modelling Electricity Grid Systems). This modelling minimises the total system cost of power asset additions to the National Energy Market (NEM) in an outlook to 2050.

Hydro Energy Storage and the National Energy Market

In the context of targeting 'net-zero' emissions by 2050, this report outlines the characteristics of a NEM asset portfolio that has access to very large quantities of pumped hydro energy storage. It demonstrates that to maintain a viable grid system at lowest system cost, even with massive energy storage resources, CCS will be necessary.

The impact of big infrastructure on the National Energy Market

This study examines the value proposition of four substantial upgrades and how they may impact the asset portfolio for deep decarbonisation of the NEM.
- Upgrading Interconnection
- Large pumped hydro storage
- Access to CO_2 capture and storage
- Deployment of synchronous condensers for grid support

The approach is similar to a cost benefit analysis, whereby the positive and negative effects of a new technology are all accounted for to determine the overall net cost or benefit to the power system.

More information: The role of electricity systems modelling in optimising planning decisions

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Surat Basin

A system for low cost, non-specialist CO_2 flux monitoring

This project aimed to develop a low-cost, CO_2 flux monitoring system for use by non-specialists. It sought an alternative to the typically expensive and labour-intensive techniques requiring specialist expertise currently used for atmospheric monitoring. Researchers deployed and compared multiple CO_2 flux monitoring systems and developed automated data visualisation tools. Through adaptation of an existing tomographic system design, researchers successfully developed a system of sensors and a software package capable of detecting CO_2 leakage. This software provides guidance as to both the location of, and leakage rate from a point source. There are ongoing discussions around the development and utilisation of low-cost sensors for use with the software.

More information: Leakage quantification using atmospheric detection techniques

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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. Lockwood, T (2020) Market designs for a reliable electricity grid

2. Reid, I (2020) Beneficial uses of coal fly ash

IEAGHG R&D Program Reports

1. IEAGHG (2020) Value of Emerging and Enabling Technologies in Reducing Costs, Risks and Timescales for CCS

2. IEAGHG (2020) The Clean Refinery and the Role of Electricity Generation

3. IEAGHG (2020) IEAGHG Faults and their Significance for Large-Scale CO2 Storage Workshop

4. IEAGHG (2020) IEAGHG Monitoring & Environmental Research Combined Networks Meeting

Global CCS Institute Reports

1. Beck, L (2020) The US Section 45Q Tax Credit for Carbon Oxide Sequestration: An Update

2. Townsend, A (2020) Scaling up the CCS Market to Deliver Net-Zero Emissions

3. Beck, L et al (2020) Is CCS expensive: Decarbonisation costs in the net-zero context

4. Zhang, T (2020) CCS Development in Southeast Asia

5. Turan, G (2020) CCS: Applications and Opportunities for the Oil and Gas Industry

6. Tamme, E et al (2020) The Role of CCS in the Paris Agreement and its Article 6

7. Townsend A et al (2020) The Value of Carbon Capture and Storage (CCS)

8. Rassool, L (2020) Overview of Organisations and Policies Supporting the Deployment of Large-Scale CCS Facilities