



CO2CRC is Australia's leading carbon capture, utilisation and storage (CCS) research organisation

## CO2CRC INSIGHTS | DECEMBER 2019

- **POLICY: Hydrogen Strategy lays out role for CCS**
- **CO2CRC commences HESC delivery**
- **CCUS Research Symposium held in Victoria**
- **DEVELOPMENT: CarbonNet drilling to commence**
- **DEVELOPMENT: COAL21 throws weight behind Surat Basin Project**
- **GCCSI releases Status of CCS Report**
- **FINANCE: US DOE announces US\$43 million for FLECCS**
- **RESEARCH: Norway's DNV predicts high CCS uptake**
- **PROJECTS: Heidelberg launches new Canadian project**
- **ENERGY: Boundary Dam reaches 3Mt milestone**
- **PROJECTS: Scotland moves forward with carbon cluster**

### **POLICY: Hydrogen Strategy lays out role for CCS**

Australia's [National Hydrogen Strategy](#) (NHS) released last month highlights the considerable role to be played by CCS for clean hydrogen production in Australia. The strategy was authored and led by Chief Scientist Dr. Alan Finkel and advocates for a 'technology-neutral' approach to developing a hydrogen export industry in which hydrogen is produced from a number of sources including hydrocarbon sources with CCS and electrolysis of water with renewable electricity.

Hydrogen production is a potentially significant clean energy source for the world going forward; its emissions are effectively zero as hydrogen combustion produces only water. The

current barrier to hydrogen as an energy source is the energy and materials required to produce clean hydrogen -- this is where CCS comes in.

Hydrogen production from hydrocarbon sources, whether by steam methane reforming (SMR) or coal gasification converts fossil fuels to a mix of hydrogen, carbon dioxide and/or carbon monoxide. The carbon emissions need to be captured for the process to remain carbon neutral.

The report also states that this could have a positive impact on state economies, noting: "The production of hydrogen from brown coal, when coupled with CCS presents a significant opportunity and comparative advantage for Victoria. The conveniently located CarbonNet Project [see below] could enable production of clean hydrogen for domestic and export markets."

A pilot project for coal gasification in Victoria commenced in July 2019 and is part of an international strategy to develop hydrogen exports. The synergy between carbon capture and hydrogen production is now being fully explored in, for example, collaborations between the Carbon Sequestration Leadership Forum and the International Energy Agency (IEA) Hydrogen Technology Collaboration Program.

---

### **CO2CRC commences delivery of HESC hydrogen refining pilot plant**

CO2CRC has delivered the first major component of a hydrogen refining plant to AGL's Loy Yang facility in Victoria's Latrobe Valley.

The plant will be used as part of the Hydrogen Energy Supply Chain (HESC) project – a world first trial to establish the feasibility of supplying clean hydrogen for export from Latrobe Valley's brown coal.

Read more about the project here .

---

### **CO2CRC 2019 CCUS Research Symposium**

CO2CRC brought together more than 130 delegates for a two-day symposium on CCUS. Top national and international scientists and researchers along with industry leaders, professionals, technology vendors and policy makers met in Torquay, Victoria to showcase fundamental developments in CCUS R&D, the latest progress on demonstration projects and updates from large-scale CCS projects around the world.

More information about the event, including research and presentation abstracts can be found here.

---

### **DEVELOPMENT: CarbonNet drilling to commence**

Victoria's CarbonNet project is set to commence test drilling in Bass Strait off Ninety Mile Beach in order to prove CO<sub>2</sub> emissions can be stored in Bass Strait's rock structures.

The drilling will be undertaken by the 150-metre tall Noble Tom Prosser rig at a site approximately 8 kilometres offshore.

The long-term aim of the CarbonNet project is to find suitable storage sites for emissions generated in the Latrobe Valley from both energy and industrial processes.

The Gippsland Basin in Bass Strait was chosen as it has highest technical ranking for carbon storage sites in the country, as determined by the National Carbon Study's technical assessment of carbon storage sites in 2009.

The drilling is part of the development phase of the CarbonNet project, following on from the concept and feasibility stages. It follows on from a seismic survey that was completed in 2018. It also builds on the lessons learnt from CO2CRC's Otway demonstration project.

It has the support of both Victorian State and the Federal governments.

---

### **DEVELOPMENT: COAL21 throws weight behind Surat Basin Project**

COAL21, the industry-backed low emissions technology fund, has thrown its weight behind the proposed carbon capture and storage (CCS) hub in the [Surat Basin in Queensland](#) .

The Surat Basin project is owned and operated by the Coal Transport and Storage Company (CTSCo – a subsidiary of Glencore) with additional [federal funding](#) from the Department of Industry, Innovation and Science. The project aims to demonstrate the viability of industrial-scale CCS in the Surat Basin, located approximately 400 km north-west of Brisbane and home to a number of coal-fired power stations and other emission sources.

The funding from COAL21 will support a final investment decision scheduled for June 2020 to begin construction of a \$150 M carbon capture plant at the Millmerran Power Station as part of an integrated CCS hub. It is expected that the project will capture emissions equivalent 25,000 cars annually over a 25 to 30-year lifespan.

---

### **Release of GCCSI Status of CCS Report**

The Global Carbon Capture and Storage Institute (GCCSI) has published its annual 'Global Status of CCS' [report](#) . According to the report, which documents the current status of CCS around the world, there is a total of 51 CCS facilities around the globe that are either operating, under construction or under development.

The full report can be read [here](#) .

---

### **FINANCE: US DOE announces US\$43 million for FLECCS**

The US Department of Energy has announced another set of grants for carbon capture and storage (CCS) research and development. The Flexible Carbon Capture and Storage (FLECCS) program is aimed specifically at grid-connected power generation.

The program aims to support CCS technologies that are operating on grids with high levels of variability – such as wind and solar. It seeks to address CCS design and operational considerations to advance 'flexible' CCS technologies which can both reduce variability and still provide a lower levelised cost of electricity in the grid.

The FLECCS program will support retrofits to existing electricity-producing assets as well as greenfield power generation projects. The only stipulation is that carbon-based fuel is an input to the generating process.

Ultimately the project seeks to achieve a zero net carbon grid.

---

### **RESEARCH: Norway's DNV predicts high CCS uptake**

A new report recently released by Norwegian standards organisation DNV GL sees a significant uptake of CCS technology going forward, particularly in China.

According to DNV, a combination of a carbon price and new technological developments (i.e. lower abatement costs) will significantly drive CCS uptake.

DNV projects that around 50 per cent of all carbon capture will take place in China, followed by the United States and the European Union. This can be attributed to a declining industrial base, particularly in the European Union.

In addition, DNV is calling for more cooperation between the gas, renewables and CCS sectors. The report concluded that gas will increasingly provide baseload power, becoming the primary energy source from around 2025. CCS will be needed to limit CO<sub>2</sub> emissions from gas energy generation, helping achieve emissions reduction targets.

“All major routes to successfully decarbonising gas rely on the large-scale uptake of carbon capture and storage,” says Liv A. Hovem, CEO of DNV GL.

---

### **PROJECTS: Heidelberg Cement launches new Canadian project**

Heidelberg Cement's Canadian subsidiary, Lehigh Cement, has launched a new feasibility study of a full-scale CCS project in Alberta, Canada.

The feasibility study, to be undertaken with Canada's International CCS Knowledge centre will examine capturing more than 90% of the plant's CO<sub>2</sub> emissions from the company's cement plant in Edmonton. The project is part of Heidelberg Cement's broader target to be completely carbon neutral by 2050, and for the production of carbon-neutral concrete.

Alberta's provincial government has given financial support to the project, tipping in around CAD1.4 million (AUD1.5 million) to the project.

Heidelberg Cement has been a global leader in emissions reductions in concrete in building materials. The company's Belgian operation is part of the LEILAC (Low Emissions Intensity Lime And Cement) consortium, which has been a pioneer in the field. The LEILAC project relies heavily on Australian technology from Calix Ltd. The pilot project will test and demonstrate a novel *Direct Separation Calciner* technology which promises to capture the CO<sub>2</sub> released from the limestone in an almost pure form without significant additional energy use.

---

### **ENERGY: Boundary Dam reaches 3Mt milestone**

SaskPower's Boundary Dam has captured a total of 3 million tonnes of CO<sub>2</sub>, marking a significant milestone for the project.

Boundary Dam 3 CCS Project is an integrated coal-fired electricity, carbon capture and storage operation that commenced operation in 2014 -- the first of its kind -- that is able to capture 1 million tonnes of CO<sub>2</sub> annually. This is the equivalent of taking 250,000 cars off the road.

The project involved retrofitting carbon capture to an existing coal fired power unit. The carbon dioxide is captured and transported via a 50 kilometre pipeline to nearby oilfields where it is used for enhanced oil recovery. A portion of the captured CO<sub>2</sub> is also delivered to a storage site, Aquistore, to demonstrate that storing CO<sub>2</sub> deep underground is safe and permanent.

The milestone achieved by Boundary Dam and its ongoing operation is significant both in terms of its technical achievement, and as proof of concept. Not only can existing facilities be retrofitted with CCS for improved environmental outcomes, they are also able to operate commercially and over the long term.

---

### **PROJECTS: Scotland moves forward with carbon cluster**

Scotland has firmed up its CCUS policy with a new agreement between the country's North East Carbon Capture, Usage and Storage Alliance ( NECCUS ) and the Scottish Government. NECCUS is a collaboration between industry, academia and government to support and promote the deployment of both CCS and hydrogen production in Scotland to help decarbonise the heating, heavy industry, transport and chemicals sectors.

The Acorn CCS project based at the St Fergus gas terminal in Scotland will be the first project taken forward under NECCUS. The project is expected to be fully operational by 2024 and in the first phase, will make use of existing CO<sub>2</sub> emissions at the St Fergus gas terminal to commission a very large scale CO<sub>2</sub> transport and storage infrastructure that can support much larger future volumes.

The Acorn Hydrogen project is also under consideration. The project will repurpose natural gas into clean hydrogen for energy and industrial purposes, with carbon safely stored underground.

---

FOLLOW US

