As for carbon capture, Scientists from the University of York developed an innovative new green material named Starbons which can be used in capturing emissions from power stations, chemical and other large scale manufacturing plants; U.S. technology developer ION Engineering planned to test its solvent technology at Technology Centre Mongstad; by the end of June, Air Products and Chemicals, Inc. successfully captured and transported 3 million metric ton of CO₂ by pipeline to be used for enhanced oil recovery. As for carbon storage, Scientists at the University of Strathclyde studied the ability of complex rock strata beneath the North Sea to trap CO₂ securely, which will help to provide the tools for selecting the most suitable CO₂ storage sites; a UK-Australian research team found that reservoir’s waters changed their oxygen composition when in contact with bubbles of trapped CO₂, and the testing samples of water for this altered form of oxygen provides a simple way to measure the amount of CO₂ stored within the rock. Furthermore, Norway planned to realise CCS by 2022; CO₂CRC and Canada’s Petroleum Technology Research Centre will collaborate; Global CCS Institute says that industrial emissions is overlooked in climate fight.

**York Chemists Lead Breakthrough in Carbon Capture**

2016/07/04

Scientists from the University of York have developed an innovative new green method of capturing carbon dioxide (CO₂) emissions from power stations, chemical and other large scale manufacturing plants. Starbons, made from waste biomass including food peelings and seaweed, were discovered and first reported 10 years ago by the York Green Chemistry Centre of Excellence. Using these renewable materials provides a greener, more efficient and selective approach than other commercial systems of reducing emissions.

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**Scottish Study of CO₂ Flow through North Sea Geology Will Help Select storage Sites**

2016/07/07

Scientists at the University of Strathclyde have secured funding for a four-year project to study the ability of complex rock strata beneath the North Sea to trap CO₂ securely. Their findings will help to provide the tools for selecting the most suitable CO₂ storage sites as part of the large-scale development of carbon capture and storage, a key climate change technology. These tools could also greatly expand the potential for CO₂ storage worldwide.

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**Norway's Plans to Realise CCS by 2022**

2016/07/08

The Ministry of Petroleum and Energy has released a feasibility study report on full-scale carbon capture, transport and storage in Norway. The Government says it has chosen a step by step approach following industry best practice for maturing CCS projects in Norway. "The feasibility studies are an important part of this work and show that realising a full-scale CCS chain in Norway within 2022 is possible and at lower costs than for projects considered in Norway earlier," said Minister of Petroleum and Energy Tord Lien.

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**ION Engineering to Test Solvent at Mongstad**

2016/07/01
U.S. technology developer ION Engineering (ION) has signed a contract to test its solvent technology at Technology Centre Mongstad (TCM). ION is currently developing its solvent system to scale up to the commercial level. After successfully testing at the National Carbon Capture Center (NCCC) in the U.S., ION moves to TCM as the next step toward commercialization.

**Texas CO₂ Capture Demonstration Project Hits Three Million Metric Ton Milestone**

2016/07/01

On June 30, Allentown, PA-based Air Products and Chemicals, Inc. successfully captured and transported, via pipeline, its 3 millionth metric ton of carbon dioxide (CO₂) to be used for enhanced oil recovery. This achievement highlights the ongoing success of a carbon capture and storage (CCS) project sponsored by the U.S. Department of Energy (DOE) and managed by the National Energy Technology Laboratory (NETL).

**CO₂CRC and Canada’s Petroleum Technology Research Centre Collaborate**

2016/07/05

The two organisations will work to accelerate the uptake of carbon capture and storage technology. Australian and Canadian carbon capture and storage research leaders have quickly moved to establish a memorandum of understanding where internationally significant projects led by CO₂CRC and the Petroleum Technology Research Centre (PTRC) will collaborate on a range of technologies to drive down the costs of carbon capture and storage as an industrial scale emissions reduction tool.

**Water Sampling Technique to Monitor Underground CO₂ Storage**

2016/07/12

A simple, cost-effective way to monitor CO₂ stored underground has been developed by a UK-Australian collaboration. In the first experiment of its kind, researchers studied the different forms of oxygen in waters sampled from rocks deep below ground at the storage site in the Otway Basin, in south eastern Australia. They found that the reservoir's waters changed their oxygen composition when in contact with bubbles of trapped CO₂. Testing samples of water for this altered form of oxygen provides a simple way to measure the amount of CO₂ stored within the rock.

**Industrial Emissions Overlooked in Climate Fight, Says Global CCS Institute**

2016/07/01

More than eight billion tonnes of annual carbon dioxide (CO₂) emissions are being overlooked in a climate debate focused too narrowly on energy policy, according to Brad Page, CEO of the Global CCS Institute. The institute has released two new public information reports highlighting the long-term application of carbon capture and storage (CCS) technology in a variety of industrial sectors.

**CO₂ Storage and Surface Flooding Process of Wu 38 Well Block in Yanchang Oilfield**

Chen Longlong, Jiang Shaojing, Yang Yongchao, Huang Chunxia, Yu Huagui, Bai Chenglai 2016/6

3 movable injection stations have been built in Wu38 well block of Yan Chang Oilfield. At the same time, five gas injection wells can be gas injected, which involving 24 production Wells. It is the first standardization surface process system that CO₂ storage and CO₂-EOR in the northwest. The system main body consists of two big modules: low pressure and high pressure. Low pressure module includes CO₂ storage tank, CO₂ feeding and circulation area, supercharging area; high- pressure module includes CO₂ injection and loop area, auxiliary monitoring system. After the surface process system put into use, the single well CO₂ injection rate is 25t/d, it can realize automatic monitoring and data
storage. According to the forecast, the oil recovery of \( \text{CO}_2 \) flooding is 10.79% higher than that of water flooding, which has the vital significance to the reduction of \( \text{CO}_2 \) greenhouse gas emissions and low permeability reservoir development.

**Technical and Economic Analysis of Oxygen-enriched Incineration of Oily Sludge in Fluidized Bed**

Hai Yunlong; Yan Weiping; Zhang Xuhui; 2016/6

The technical process and advantages of oxygen-enriched incineration of oily sludge in fluidized bed are introduced. The power consumption of main equipment and the technical and economic indexes of the oily sludge oxygen-enriched incineration system are calculated. By the technology of oxygen-enriched incineration oily sludge in fluidized bed, zero emission of flue gas and other pollutant can be achieved, the steam produced can be directly used for production and livelihood of oil field, the liquid \( \text{CO}_2 \) produced can be directly used for oil displacement, and \( \text{SO}_2 \) and \( \text{NOx} \) in flue gas can be converted into sulfuric acid and nitric acid. Using a fluidized bed boiler with 200 t/d of daily disposal ability, 73 kt of oily sludge is treated per year, so 73 million yuan of sewage charge can be saved per year; The steam output of the boiler is about 177 kt per year, so 13.806 million yuan of steam cost can be saved per year; Totally, 86.806 million yuan of cost is saved per year. In addition, 5.56 t sulfuric acid with 40% of mass fraction and 0.708 t nitric acid with 37% of mass fraction can be recovered per day, and 99 kt \( \text{CO}_2 \) can be recovered per year.

**The Use of Biomass to Reduce Power Derating in Combined Cycle Power Plants Retrofitted with Post-combustion \( \text{CO}_2 \) Capture**

Roberto Carapellucci, Lorena Giordano, Maura Vaccarelli 2016/5

Carbon dioxide capture and storage (CCS) is gaining widespread interest as a potential method to control greenhouse gas emissions from combustion processes of fossil fuels, especially in electric power plants. Retrofitting existing power plants with post-combustion \( \text{CO}_2 \) capture technologies, the most mature options today, has been suggested as a possible mean to reduce \( \text{CO}_2 \) emissions. After adding a carbon capture unit, both electricity and steam are required by the capture system, essentially forcing the power plant to operate in cogeneration. Instead of derating the base plant for post-combustion capture energy needs, steam could be generated in an external auxiliary unit designed specifically for the capture island. Since this auxiliary plant would be a new build, the plant could be designed for the particular heat load of the capture section in order to minimize efficiency losses and increase the energy saving. This paper examines the energy behavior of combined cycle power plants with \( \text{CO}_2 \) post-combustion capture, assuming that the reboiler duty is satisfied by steam extracted upstream the low pressure turbine or by an auxiliary biomass boiler. These options are also compared in terms of cost of electricity (COE) and capture cost per tonne of \( \text{CO}_2 \) avoided. The platform used to simulate the power plant is the commercially available software GateCycle; the \( \text{CO}_2 \) capture process is simulated using ChemCad software and assuming 90% \( \text{CO}_2 \) capture ratio with monoethanolamine (MEA 30wt%) as absorbent.
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Best wishes!

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