

FACTSHEET CCS

INFORMATION ABOUT CCS – CARBON CAPTURE AND STORAGE

CCS AT NORDJYLLANDSVÆRKET

In February 2008 Vattenfall announced plans to build a full-scale Postcombustion Carbon, Capture & Storage (CCS) demonstration plant for the capture and storage of CO₂ from Nordjyllandsværket. However, Vattenfall decided in 2009 to postpone the project. Vattenfall is investing in CCS demonstration plants in Germany and the Netherlands, but Nordjyllandsværket will be first in line when the technology becomes commercially available.

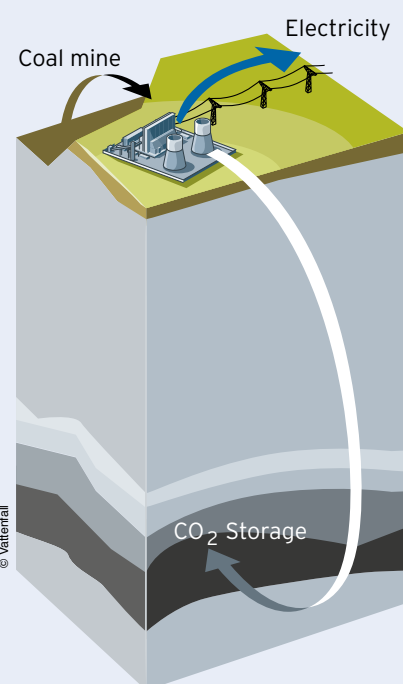
Nordjyllandsværket - Unit 3

Unit 3, which was commissioned in 1998, is still the world's most efficient coal-fired power plant, with an output of 411 MW of electricity and 420 MJ/s of district heating. With co-generation of electricity and district heating, total utilisation of up to 91% of the energy supplied to the boiler can be achieved. The efficient use of the fuel means less waste and thus a better environment. Each year approximately 800,000 tonnes of coal is burned, which results in the emission of approximately 1.9 million tonnes of CO₂. At present, other residual products such as fly ash and sulphur are removed from the flue gas and then used as useful raw materials in other industrial contexts. The high efficiency and the short distance to a suitable store make it expedient to invest in a CCS plant at Nordjyllandsværket.

Coal replaced with biomass

The North Jutland solution aims to 'drain' half a million tonnes of CO₂ from the atmosphere every year. This is achieved by replacing up to a third of the coal with CO₂-neutral biomass. Nordjyllandsværkets total CO₂ balance will be negative because the CCS plant cap-

CARBON CAPTURE AND STORAGE (CCS)



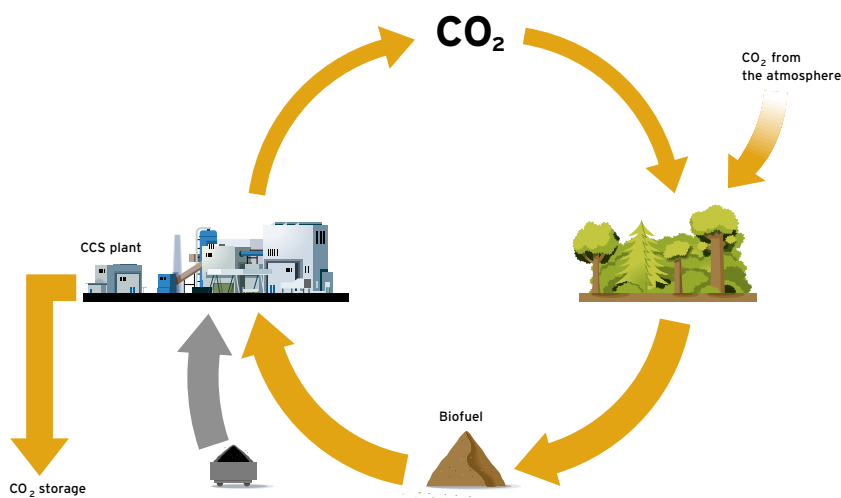
CCS stands for the technologies used to capture and store the carbon dioxide (CO₂) generated in combustion processes, for example in a power plant. Essentially, three different processes are available: Oxyfuel, Postcombustion and Precombustion (IGCC). Today, all three technologies are available in the Vattenfall Group. The common aim of all these processes is to produce a concentrated stream of CO₂, compress it and then store it underground instead of releasing it into the atmosphere.

tures the CO₂ that is actually emitted from the biomass during combustion.

Biomass are CO₂-neutral because straw and trees, for example, absorb the same quantity of CO₂ in their growth period as they emit during combustion. This means that net emissions of CO₂ into the atmosphere are zero for biomass.

and test drilling have also been postponed until further notice.

In the course of the next few years, a number of small yet important surveys will be conducted on the Vedsted structure. This will make the plant better prepared for rapid introduction of a CCS plant.



Geological surveys

Historically, it has been known for many years that the Vedsted structure in the Municipality of Jammerbuget, approximately 30 km northwest of Nordjyllandsværket, appears to be suitable for the storage of CO₂.

In the late summer of 2008 a 2D seismic survey was carried out in an area of approximately 20 x 25 km. The result of the survey is very promising. It confirms the presence of the structure and geology that were expected to be found there. Since the project has been postponed, further geological surveys

When the project will become relevant again depends on Vattenfall's financial situation and when the CCS technology is regarded as being commercially available.



Nordjyllandsværket

As at: April 2010

Read more about Vattenfall's project on CCS at www.vattenfall.com/ccs