FACTSHEET CCS

INFORMATION ABOUT CCS – CARBON CAPTURE AND STORAGE

SCHWARZE PUMPE: A PILOT PLANT FOR OXYFUEL

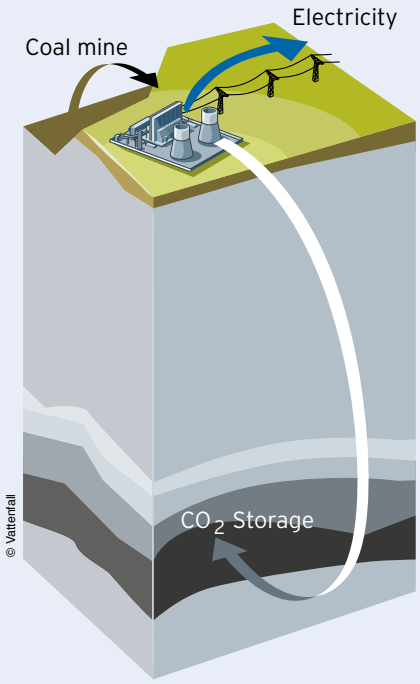
On September 9 2008, Vattenfall inaugurated the world's first industrial scale Oxyfuel pilot plant at its Schwarze Pumpe site south of Berlin. The pilot plant will be in operation for five years, including a first test programme of three years. More than 90 % of the carbon dioxide, CO_2, produced in the combustion process in the pilot plant will be captured and further processed for transport and underground storage.

The pilot plant, wich has a capacity of 30 MW_{th}, has been running for some time now, delivering promising results. It represents the first step towards testing the overall process at a plant size that allows valid conclusions, and towards furnishing proof of the industrial-scale feasibility of the process. The focus lies on verifying the interaction between all the components, the achievable level of CO_2 capture and the ability to scale this plant dimension up to the next stage of a demonstration power plant. A further aim of operating the pilot plant is to develop and test new materials, especially those suited for the Oxyfuel process. In addition, questions need be answered concerning plant availability, purity requirements regarding the CO_2 and the investment and operating costs.

Whole CCS chain will be tested

The unique thing about Vattenfall's pilot plant is that all the components of the Oxyfuel technology are included and tested. When the legal framework is in place the transport and storage of CO_2 will be tested as well. The aim is to

CARBON CAPTURE AND STORAGE (CCS)



CCS stands for the technologies used to capture and store the carbon dioxide (CO_2) 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 CO_2, compress it and then store it underground instead of releasing it into the atmosphere.

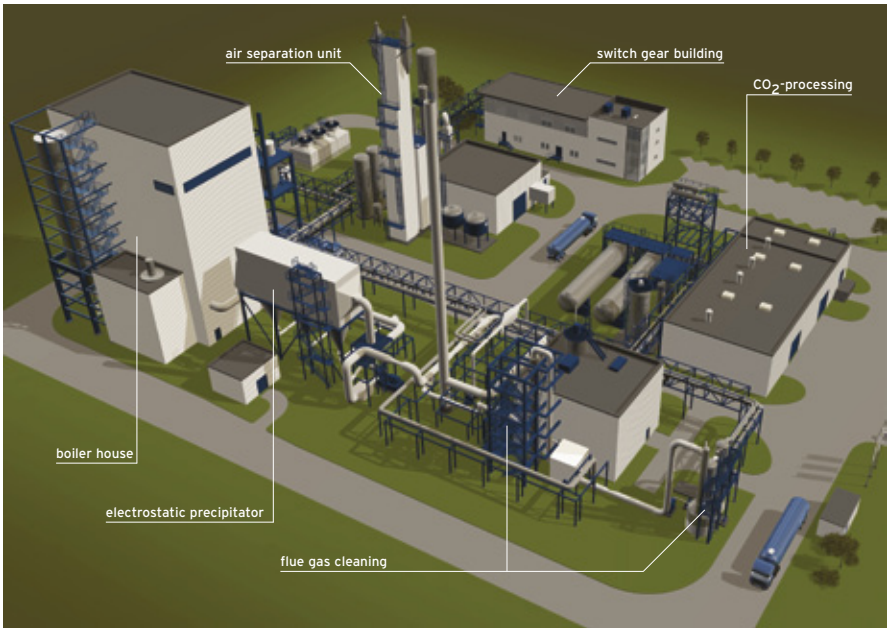
validate the technology of the different parts and to learn how they all function together. The pilot plant is one important step in our scale-up process towards a full-scale power plant with CCS.

Beneficial site

The Schwarze Pumpe site was selected as it proved advantageons in numerous ways. The produced steam, for example, can be used in surrounding industrial facilities or the neighbouring Schwarze Pumpe power plant. Furthermore, synergies with regard to supply and disposal to and from the site can be fully used.

The pilot plant marks the transition of this technology from the laboratory to practice and will, above all, serve the purpose of researching the interaction of the individual components at power plant scale. Its unique character has so far attracted a number of visitors from industry, politics and the media.

Based on the conclusions from the pilot plant, the next step will be to build demonstration power plants around the Vattenfall Group. The capacity of a demonstration plant is around 300 MW_e and feasibility studies have been initiated both in Jänschwalde in Germany and at Magnum II in the Netherlands.



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

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