

Newsletter

2-2008

The first DECARBit year

After Consortium and Grant Agreement negotiations, DECARBit, the largest CCS project within FP7, was launched on the first of January 2008. In the beginning of February representatives from 20 out of 21 project parties, as well as the Commission officer, met in Trondheim for the project kick off meeting.



DECARBit EB and PMt members on a guided visit in Lisbon

At the same time the first General Assembly (GA) and the Executive Board (EB) meetings were held, and the DECARBit GA and EB were constituted and approved. In February the project funding was transferred to all executing parties, and the scientific work of the project could commence.

The second EB meeting was arranged by EDP in Lisbon in September. To enhance the scientific progress of DECARBit, the Technical and Exploitation Advisory Committee - an expert panel headed by Professor Klaus Hein, was officially established during the EB meeting in Lisbon.

The first meeting of the European Benchmarking Task Force (EBTF), which is lead by Allen Pfeffer from ALSTOM CH and consists of members from DECARBit, CAESAR and CESAR, was held October 9 in Amsterdam. The objective of EBTF is to ensure consistency in the benchmarking assessments among European CCS R&D projects.

There were two poster presentations from DECARBit in GHGT9 which was held in Washington DC in November, and we are looking forward to more presentations during the conference to be held in Oslo February 9-10 2009. The planning for the Oslo conference is on schedule, so please remember to register if you have not already done so.

Finally I would like to wish you all a merry Christmas and a happy new year!

Best regards
Nils A. Røkke



European Conference on CCS Research, Development and Demonstration

10-11 February 2009,
Oslo, Norway

www.ccs-conference.com



CEASAR

The FP7 CAESAR project aims to improve the energy efficiency and the economics of the SEWGS (sorption enhanced water gas shift) CO₂ capture process through development and optimization of sorbent materials, SEWGS reactor design, process design and integration in a natural gas fuelled power plant.

The use of the SEWGS process for CO₂ capture in IGCC power plants will also be investigated. Confidence in the SEWGS process has been gained in the EU project CACHET by the proof-of-principle of the process on a bench scale. In the first 18 month the CAESAR activities are focusing on sorbent development and application assessments for the SEWGS process.

Sorbent material design and development

This work is performed by SINTEF and ECN with support of Air Products and BP the two industrial partners in CAESAR project. Work to date has focussed on preparation activities for sorbent development and testing. SINTEF has synthesised a set of new sorbents. A screening test is performed for all new sorbents and compared with hydrotalcite, the reference material. The most promising sorbents are selected for further development, which include combinatorial screening of materials composition for optimisation of promising candidates. Further, SINTEF automated and commissioned a PSA (pressure swing adsorption) unit with automated LabView program. The reference hydrotalcite material was tested in this unit under 5, 10 and 20 atm pressures and 400 °C, for both dry and wet conditions. A high-pressure magnetic suspension balance is commissioned in December 2008 at SINTEF. With this advanced apparatus it is possible to test sorbents under extreme and realistic process conditions, e.g. at high pressures, temperatures and in the presence of corrosive gases.

Novel sorbents are developed and tested by ECN in a continuous flow test rig. Preliminary results indicate that substantial increases in cyclic CO₂ adsorption capacity can be obtained by addition of some promoters. In the next months, the optimal amounts of these promoters will be investigated. Sorbent development also focuses on improving the mechanical stability of sorbents.

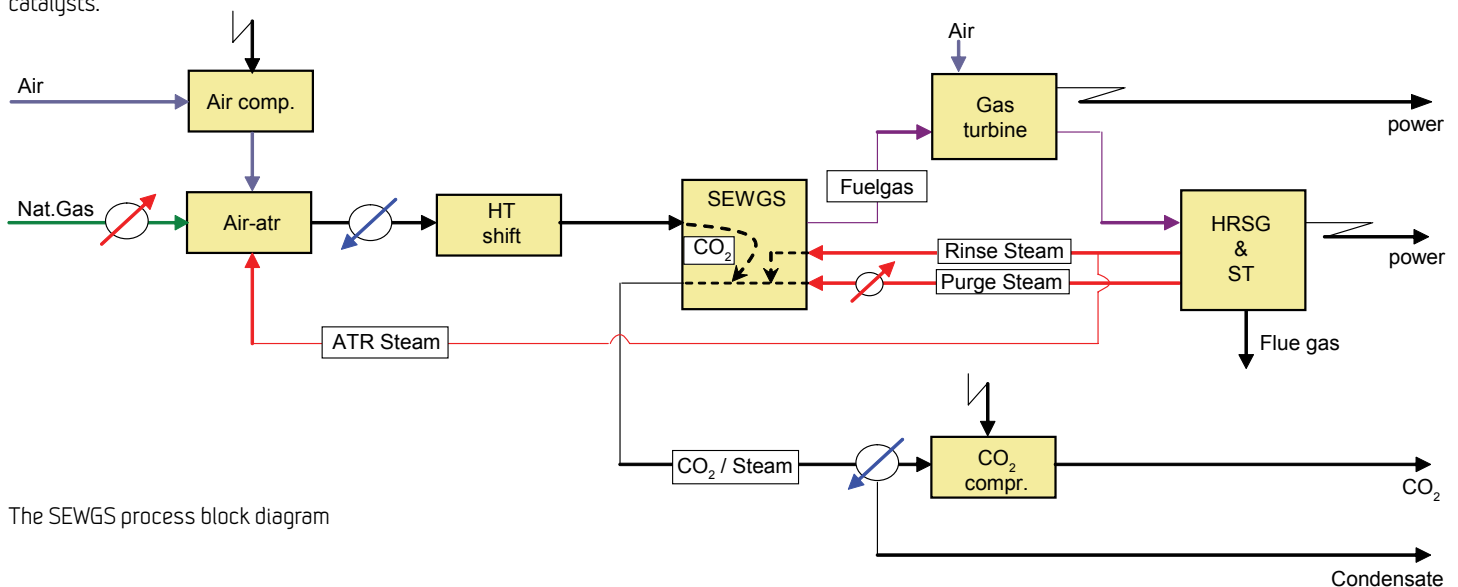
ECN have finished a desk study with regard to the stability of sour gas shift catalysts under the specific cyclic process conditions in a SEWGS unit. Thermodynamic calculations show that part of the catalyst may loose activity. Furthermore, some possible side reactions could yield trace amounts of impurities. The study was based on some assumptions that need to be verified experimentally. The results will be used in the definition of the experimental program for testing of the sour shift catalysts.

Preliminary base case and SEWGS systems integration

Politecnico di Milano has started with the integration and optimization of the SEWGS system into the Natural Gas Combined Cycle (NGCC) system. An air-blown auto-thermal reformer (ATR) has been adopted for the conversion of natural gas into hydrogen. The SEWGS system was modelled using performance parameters based on experimental results achieved by ECN and Air Products in the CACHET project. Three different levels of SEWGS integration in the HRSG (heat recovery steam generator) have been proposed. Besides an intermediate integration, a full integration of SEWGS in the NGCC as well as a completely independent hydrogen island has been proposed. These integration possibilities will be compared with respect to economics.



High-pressure magnetic suspension balance commissioned at SINTEF



The SEWGS process block diagram

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