



Project Acronym : CACHET

Project Title : Carbon Dioxide Capture and Hydrogen Production from Gaseous Fuels

Coordinator : BP EXPLORATION OPERATING COMPANY LTD EXPLORATION & PRODUCTION TECHNOLOGY (EPT) - UNITED KINGDOM

Website : <http://www.cachetco2.eu/>

ABSTRACT

CACHET is a 3-year, integrated research project, funded by the E.C. that aims to develop technologies to reduce GHG emissions from power stations by 90%. CACHET is a strong and diverse international consortium of highly experienced research institutes, universities, energy businesses, engineering and manufacturing companies. CACHET is co-ordinated by BP with participants from EU Member states and EU Acceding and Associated countries, USA, Canada, China and Brazil and is related to the joint industry/government CO₂ Capture Project (CCP).

The objective of the project is to develop innovative technologies for H₂ production from natural gas, halving the incremental cost of low-carbon energy. The H₂ produced can be used to provide energy, with water as the only by-product. The technologies developed will reduce CO₂ emissions in the power generation sector where substantial cost reductions will be available to zero-emissions fossil fuelled CCGT power plants. Any improved economics may also interest industrial processes which use H₂ at large scale, such as crude oil refining, chemical manufacture, and fuel cells for use in transport. The project will provide an opportunity for the development of an H₂ fuelled economy ahead of the emergence of cost-effective renewable-based H₂ supply.

Four promising pre-combustion carbon capture technologies will be further developed, evaluated and cost estimated on a consistent, integrated basis within the framework of the project, namely HyGenSys (Power-Gen Steam Methane Reforming), Redox Technologies (One-Step decarbonisation, and Chemical Looping Reforming), Hydrogen Membrane Reactors for Natural Gas Reforming and Sorption-Enhanced Water Gas Shift. All of the technologies are still in the development phase and further resource is required to generate sufficient technical performance and cost data for economic assessment and technology risk analysis. If successful, the new technologies could be ready for pilot-testing by 2009, followed by pre-commercial demonstration, with commercial use expected around 2015.

The CACHET Consortium has spent considerable effort in designing and building large experimental equipment which will help to increase understanding and confidence in each of the technologies at this larger scale. The team has a strong desire to 'learn by doing', and the highlights of this include the multicolumn SEWGS unit at ECN, the 120 kW chemical looping reactor at the Technical University of Vienna and IFP's cold mock-up unit to test catalyst loading and fluid dynamics in the HyGenSys reformer. The membrane team have successfully scaled-up both membranes by an order of magnitude and ECN are now constructing a multitubular reactor for the next testing stage. The experimental aspects are well supported by continued optimisation, integration, HSE and economic evaluation to ensure full understanding of the potential of each of these technologies in true industrial scenarios.

PARTNERS

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