

# NanoGloWa.

Development of Nano Membranes against Global Warming for CO<sub>2</sub>-capture.



To fulfill the requirements beyond Kyoto, the ultimate way to reduce CO<sub>2</sub> emissions from fossil fired power plants is by CO<sub>2</sub> capture. Existing methods like adsorption and non selective cooling are not very cost effective and consume a lot of energy: up to 25% of the power plant output. CO<sub>2</sub> emission reduction by gas separation through nano structured membranes does currently not exist in industrial applications. The potential of the technology however is substantial.

Main bottlenecks are the availability of suitable and reliable membranes at an acceptable price level.

## **Objectives**

The objective of this project is to develop optimal nano structured membranes and installations for different applications in CO<sub>2</sub> capture from power plants. The application in gas separation processes like CO<sub>2</sub> capture in power plants offers the

potential to decrease CO<sub>2</sub> emission as is required by the Kyoto protocol. The main innovation is the industrial application of cost effective membranes for CO<sub>2</sub> removal from flue gasses. This will lead to a reduction of energy consumption of CO<sub>2</sub> separation at a low price below 20 Euro/ton. The membrane performance as result of the project should substantially increase, resulting in a cost-price factor 5 lower than for current membranes. This step forward will be achieved by radical innovations in membrane technology. Smart design modules, for long life, low degradation and contamination combined with integrated performance monitoring, will be developed and tested in the laboratory and in the field. Liquefaction of gasses after separation with the benefit of reduced transport costs is another innovation. Cooperation and field testing with the future end-users is facilitated by this project.

## Benefits

The project helps the EU to fulfill the requirements of the Kyoto protocol (-6.0% in 2010) to reduce greenhouse gas emissions, of which CO<sub>2</sub> contributes the most (>80%) and helps to become a more environmental friendly and sustainable society.

## Project details

Sixth Framework Program

Duration: December 2006-December 2007

Budget: 16,000,000 Euro

## Project coordinator

- KEMA, Arnhem, Netherlands

## Project partners

- Institute Européen des Membranes, Montpellier, France
- Orelis, Miribel, France
- Haffmans, Marssteden, Netherlands
- Endesa Generación, Madrid, Spain
- C-Tech Innovation, Capenhurst, Great Britain
- Yodfat Engineers (1994), M.P. Misgaw, Israel
- Israel Electric Corporation, Haifa, Israel
- Céramiques Techniques et Industrielles, Salindres, France
- Instalaciones Inabensa, Madrid, Spain
- Norwegian University of Science and Technology, Trondheim, Norway
- Parker Filtration and Separation, Oldenzaal, Netherlands
- E.ON Engineering, Gelsenkirchen, Germany
- Istituto per la Tecnologia delle Membrane – Consiglio Nazionale delle Ricerche, Rende, Italy
- University of Twente, Enschede, Netherlands
- Portuguesa de Producao de Electricidade, Lisboa, Portugal
- Integrated Aerospace Sciences Corporation, Athens, Greece
- Laser Zentrum Hannover, Hannover, Germany
- Facultes Universitaires Notre-Dame de la Paix, Namur, Belgium
- Paul Scherrer Institute, Villingen, Switzerland
- Siemens, Berlin, Germany
- Specific Polymers, Montpellier Cedex, France
- Energi E2, Copenhagen, Denmark
- HyGear, Arnhem, Netherlands
- Industrial Chemistry Research Institute, Warsaw, Poland
- Rheinisch-Westfälische Technische Hochschule, Aachen, Germany

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