Membrane technology for low CO2 power generation

Fact Sheet

Project Information

Grant agreement ID: JOU20084

Project closed

Start date
1 November 1993

End date
31 October 1996

Funded under
Specific research and technological development programme (EEC) in the field of non-nuclear energy, 1990-1994

Total cost
No data

EU contribution
No data

Coordinated by
British Coal plc
United Kingdom

Objective

The use of fossil fuels in the production of electricity is one of the main man-made sources of carbon dioxide. Although the case for any enhanced greenhouse effect due to carbon dioxide is not proven, it is prudent to investigate options for minimising the release of all man-made greenhouse gases. The objectives are to demonstrate the technical and economic feasibility of using membrane separation for the removal of carbon dioxide from fossil fuel derived fuel gas. In addition, issues associated with the scale-up/engineering of candidate systems will be investigated.

In Europe, fossil fuel-fired systems will continue to play a major role in the energy

scene for the forseeable future. Many research and demonstration projects are underway to provide high efficiency plants which will lead to reduced carbon dioxide emissions per unit of electricity produced. However, if a man-made greenhouse effect proves to be a significant problem, it is likely that further reductions in carbon dioxide emissions will be demanded. One option is to remove the carbon dioxide so that it can be stored (e.g. underground or at the bottom of the ocean).

A number of technologies exist for the removal of carbon dioxide from process gases. Studies have indicated that membrane separation of hydrogen from synthesis gas produced from an integrated gasification combined cycle (IGCC) with a water gas shift reactor has the potential to give the highest overall plant efficiency. Membranes have been used extensively for liquid:liquid and gas:gas separation purposes and various, well understood approaches have been developed. Hydrogen separation is already carried out on the industrial scale using polymer or palladium/silver membranes. Ceramic membranes are also under development for this purpose. All of these options have the potential to be adapted to power generation.

It is expected that the outcome of this project will be proof of the concept of using membrane separation for carbon dioxide removal, the identification of suitable membrane systems and the determination of membrane characteristics and operating limitations. In addition, a detailed analysis of the scale-up/engineering issues associated with the candidate systems will be investigated to provide the information required for a full economic assessment.

Fields of science (EuroSciVoc)

natural sciences > chemical sciences > inorganic chemistry > **transition metals**

natural sciences > chemical sciences > **polymer sciences**

engineering and technology > chemical engineering > **separation technologies**

engineering and technology > environmental engineering > **energy and fuels**

Programme(s)

FP3-JOULE 2 - Specific research and technological development programme (EEC) in the field of non-nuclear energy, 1990-1994

Topic(s)

0202 - Reduction of emissions

Call for proposal

Data not available

Funding Scheme

CSC - Cost-sharing contracts

Coordinator

British Coal plc

EU contribution

No data

Total cost

No data

Address

Hobart House Grosvenor Place
SW1X 7AE London
United Kingdom

Participants (4)

Centre National de la Recherche Scientifique (CNRS)

France

EU contribution

No data

Address

8 rue de l'École Normale
34053 Montpellier

Total cost

No data

Institut Français du Pétrole

France

EU contribution

No data

Address

1-4 avenue du Bois Préau
92506 Rueil-Malmaison

Total cost

No data

JOHNSON MATTHEY PLC (TRADING AS SYNETIX)

United Kingdom

EU contribution

No data

Address

Blounts Court, Sonning Common
RG4 9NH READING

Total cost

No data

VITO - Vlaamse Instelling voor Technologisch Onderzoek NV

Belgium

EU contribution

No data

Address

200,Boeratang
2400 Mol

Total cost

No data

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