

GEO ENeRGY

Promoting R&D capability in the service of European Industry

EC Seeks Industry Input on *New Framework Programme*

At the 5th European Union Hydrocarbons Symposium - the Strategic Importance of Oil & Gas Technology, held in Edinburgh (26-28 November 1996), the EC expressed its wish to involve the oil and gas industry in the preparatory phase of its Framework Programme V (1998 - 2002).



this opportunity to contribute to the debate on Europe's future energy programmes.

In his speech Mr de Sampaio Nunes stressed the continuing

importance of the oil and gas industry to Europe in the coming decades and from this point of view asked two important questions.

1. Is Europe's oil and gas industry innovative enough to face international competition?
2. What role should the EC's 5th Framework programme play in this process?

It is the opinion of ENeRG that EC support has played an important role in the development of innovative European technology to date and that it is essential that funding is not only continued but increased to reflect the economic and political importance of oil and gas. This theme is discussed in this issue of Geo Energy. The RTD needs of the oil and gas sector are outlined and the priority areas for EC funding are discussed. An example of how EC support has benefited innovative SMEs is also given.

Speaking on behalf of Mr Papoutsis, the Energy Commissioner, Mr Pedro de Sampaio Nunes, DGXVII's Director for Energy Technology, stressed the importance of consulting the industry and market actors in defining future programmes. ENeRG, which represents the main research actors within oil and gas related RTD, welcomes



Mr Pedro de Sampaio Nunes speaking at the 5th European Union Hydrocarbons Symposium.

RTD Needs in the Oil and Gas Sector

EU Member countries will depend on oil and natural gas to supply about 65% of energy needs for the next 50 years. Approximately two-thirds of the current hydrocarbon supply is not substitutable by other fuels in the foreseeable future. This is especially true with respect to transport: cars, other road transport and aircraft. About 30% of Europe's hydrocarbon consumption

is produced in Europe. Alternative fuels, such as renewable energy sources will, at best, supply 10% to 15% of the total energy requirements.

Fortunately, European hydrocarbon reserves, primarily in the North Sea, are very large indeed. However, as this province becomes increasingly mature, maintaining continued

exploitation efficiency will require advances in know-how and innovative technology solutions. European companies can ensure the maintenance of high levels of production from indigenous resources at competitive costs for decades to come provided timely investment is made in RTD&D. This is a key to the functioning of the innovation supply chain.

Major business changes

After many years of diversification and in-house development of nearly all skills and technologies required, E & P companies now focus increasingly on core activities and on the near term rate of return. This has resulted for two reasons. Firstly, there has been a general change in attitude towards the source of competitive advantage, namely the development of skills and

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Priorities for European Union RTD & D Investments

The importance of continuing EU support for the hydrocarbons industry has already been outlined. In this article, ENeRG outlines its proposal for the scientific and technical focus of the EU's oil and gas RTD&D investments.

Four major themes are considered. These are as follows:

- technology for clean hydrocarbon production and utilisation;
- exploration methods to find and characterise, with a significantly higher success rate, accumulations of oil and gas of smaller size and located in the most complex geological settings;

- field development and production technology capable of optimising both the oil and gas in difficult and presently uneconomic discoveries and those which might be found through enhanced exploration capability;
- innovative production and transportation technology.

1. Clean hydrocarbon production and utilisation

The objective is to achieve fully environmentally acceptable production, field decommissioning and subsequent use of oil and gas. Included is the decarbonisation of oil and gas both at the site of production, for example through the re-injection of produced but

unwanted carbon dioxide, and in the downstream treatment of oil and gas upon conversion to energy.

2. Exploration methods

The primary objective is to optimise indigenous resources but the achievement of capability will be relevant globally. It will require improved understanding and quantitative modelling of the processes associated with oil and gas generation, migration and entrapment, and an enhanced capability to detect and characterise, in compositional and volumetric terms, hydrocarbon accumulations by remote sensing methods. This will minimise the need for exploration and appraisal drilling.

3. Field development and production technology

Examples of high impact/high added value strategic targets which need to be addressed include enhanced, high resolution rock and fluid imaging technology linked to precise positioning of wells with customised, complex and optimal trajectories and to intelligent, multi-functional well systems for reservoir monitoring, drainage and fluid processing. The objective is to achieve cost-efficient step-change improvements in field recovery and well productivity.

4. Innovative production and transportation technology

There is considerable potential to improve oil and gas production capability in the marine environment and in the transportation of gas, especially from remote locations. In addition to issues relating to design, construction, re-use and decommissioning of production facilities offshore there are also the challenges in the integration of reservoir performance predictions, fluids processing and handling technology during the whole life of a field. Furthermore there is the prospect of placing an increasing amount of the required production and processing technology on the seabed or downhole.

These proposals for increased investment by the EU in oil and gas RTD&D can, if accepted, make a considerable contribution to retaining and further developing Europe's capability in areas of science, engineering and technology of major strategic importance now and for the next 50 years.

RTD Needs

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technologies are now shared with other companies. Secondly, no single company (including the oil majors) is able to develop in-house all of the necessary technologies and skills required in today's petroleum business. This is particularly true of the North Sea where technical expertise has reached a very high level.

The outcome is that many tasks are now outsourced to R&D organisations and service companies, many of which are highly innovative SMEs.

Public image and the environment

The hydrocarbon sector has always been in the public eye and during the past decade the main issue has been environmental impact. The industry is making serious efforts to ensure pollution-free production and transport of oil and gas. However, a potentially much larger issue is that of carbon dioxide emissions.

Eliminating carbon dioxide emissions from fossil fuel fired energy supply systems is a major challenge. Yet, the major components of such a system already exist: heat and electricity can be generated in central power plants, while specially designed plants provide transport fuels, for instance as pollution-free hydrogen. Carbon dioxide and other combustion products are removed from the power plants effluent and the carbon dioxide is returned to the subsurface by injection. Studies show that electricity with no emission of carbon dioxide can be produced at the same unit cost as electricity from wind mills.

The obvious gain for the community is less environmental impact. In addition, improved security of supply through diversification, as well as cost-efficient

energy for the consumer is extremely important. For the hydrocarbons sector the gain would be increased social acceptability, something which is of importance to the future of the energy industries.

The Importance of EU Support

With the globalisation of business, Europe has, for a number of reasons, a vested interest in supporting technological development within the hydrocarbon sector. Important reasons include optimisation of the exploitation of Europe's indigenous energy sources, and competitiveness of the supply industry, much of which involves SMEs. Other important reasons are the need to maintain a strong European science and technology base, particularly with a view to the ongoing outsourcing to different players in the supply chain. Lack of coherence in the European supply chain, could easily increase American competition in the domestic market resulting in the loss of jobs and revenue.

The hydrocarbon sector needs more, not less, RTD&D investments at a community level, if the environmental and social targets defined by the community are to be achieved for the better of Europe's citizens. An EU Energy RTD&D Strategy without a proper balance with respect to hydrocarbons is not credible. While it is important to invest for the future by supporting renewable energy sources, it is equally important that hydrocarbons technology is not neglected.

Oil and gas will, after all, provide the majority of Europe's energy supply for many years to come.

ENeRG Commences European RTD Strategy Studies

A consortium of ENeRG members has been successful in winning support for two integrated projects within the THERMIE Programme to contribute to the development of European energy RTD strategy. The projects are:

- Oil and Gas Production Outlook, North-West Europe, co-ordinated by the Institut Français du Pétrole
- Cost Efficiency in a New Era through the use of New Technology (CENET), co-ordinated by Rogaland Research, Norway.

The "Outlook" study will focus on production forecasts for the North West European Continental Shelf and on how the application of innovative technology might impact future production from both existing fields and still to be developed reserves. A key underlying issue is the relationship between future RTD&D investment decisions and the

optimisation of Europe's indigenous oil and gas resources.

Other contributors to the "Outlook" study include Rogaland Research (Norway), the Petroleum Science and Technology Institute (UK), the Danish Energy Agency, the Geological Survey of Denmark and Greenland (GEUS), and Eniricerche s.p.a. (Italy).

CENET will target those areas of science and technology which have greatest potential to impact exploration and production efficiency, with a particular emphasis on the development of economically marginal fields.

In the context of the business drive to increase the value of reserves and to improve finding and recovery efficiencies, the study will also seek to identify areas in which innovation in technology is most likely to bring competitive advantage to European "technology delivery" companies in international markets

Other contributors to the CENET study include the Institut Français du Pétrole (France), TNO (The Netherlands), PSTI (UK), Geological Survey of Denmark and Greenland, Osservatorio Geofisico Sperimentale (Italy), Forbairt (Ireland) and the Institute of Drilling and Production (Austria).

The results of both studies will aid the prioritisation and focusing of RTD&D investments.

Further information on these studies can be obtained from:

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for the "Outlook" study;
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for the CENET study.

JOULE Creates Jobs in Danish SME

A small Danish company has created new jobs by participation in international research supported by the European Union in the third framework programme under JOULE.

The Danish company Ødegaard & Danneskiold-Samsøe (ØDS) has 50 employees and participated in the Geoscience II group under JOULE in the third framework programme. The company is part of a group working on stratigraphic inversion and modelling: ØDS is working on inversion of 3D post stack seismic data for oil exploration together with the French company CGG.

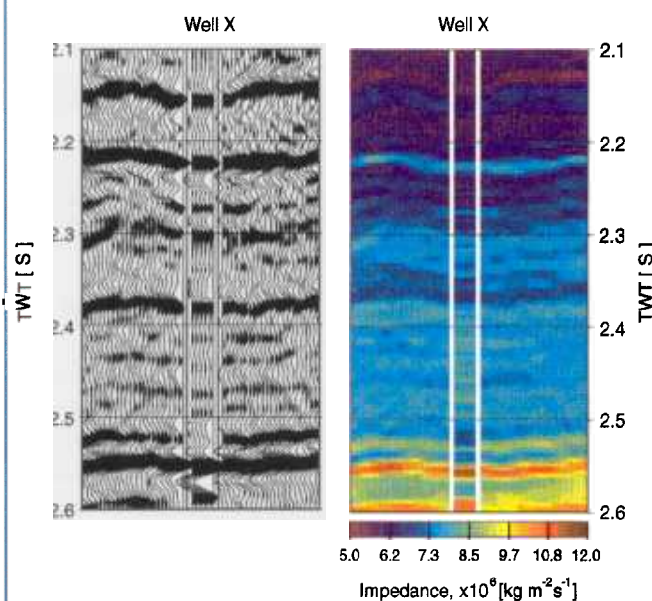
Although the research under JOULE has only just been completed, the new techniques developed are already on the market and being offered as a consultancy to oil companies.

The 3D inversion group presently has a staff of 12 persons from three EU countries and is growing rapidly. The new

ØDS the market leader in the North Sea for 3D seismic inversion services and an increasingly important player in the rapidly expanding Far Eastern and North America markets.

This research project is a good example of how EU funding can provide an innovative small-medium sized enterprise (SME) with a unique product which is also creating jobs in the EU. The developed product, ISIS, enables the geometry and character of reservoirs to be determined much more accurately from the seismic data, making drilling by oil companies more productive.

Blind well prediction



Synthetic seismic data and blind well test.
Courtesy Texaco North Sea UK Company

ISIS: Blind Well prediction.

A consortium of ENeRG members is working on an EC-funded project to develop recommendations for the European Commission on how to improve the world-wide competitiveness of the European Union's upstream oil and gas supply industry, with a focus on small to medium-sized enterprises. The consortium includes PSTI (UK), TNO (Holland), IFP (France), GEUS (Denmark), Rogalands Forskning (Norway) and Eniricerche (Italy).

The project involves the research of working relationships between the upstream oil and gas sector world-wide and its European service and supply sector small and medium sized companies (SMEs). The contribution of the latter to the European economy and their potential to improve competitiveness through technical innovation and specialised skills will be quantified as part of the scope of work. A logistical analysis in relation to markets geographically,

technically, politically and economically will be undertaken. This will identify the strengths and weaknesses of Europe's upstream SMEs, and the opportunities and challenges which lie ahead.

One of the expected outcomes of this project is a database describing economic characteristics of European service companies, as well as a much improved understanding of the key influencing characteristics of successful innovation.

This project has already revealed many interesting aspects of the service and supply sector, not least the significant differences in both quality and approach taken by each country in capturing technical and economic data related to SMEs in the upstream oil and gas sector.

The project team will be reporting its findings to the EC in April 1997.

Further information on this study can be obtained from Ipo Ritsema, TNO. Tel: +31 15 269 7199.

European Union Publications

The 1996 edition of the "European Oil and Gas Demonstration Project Inventory" is now available. This publication, which complements the Project Status Reports published by DGXVII, includes details of innovative oil and gas technologies developed in Europe which have not received funding from the EC. Over 70 projects are included from the UK, Italy, France, the Netherlands and Germany.

Three new flag brochures have been published recently on innovative technologies supported by the THERMIE programme. Brochure No. 192 describes an automated guidance system for directional drilling developed in the UK by Cambridge Drilling Automation Ltd which offers the potential for reduced drilling costs and improved oil yields.

The EUROSILM drilling system developed by Forasol (France) and

Security DBS (Belgium) is described in brochure No. 198. EUROSILM is an innovative slimhole drilling technique which has the potential to reduce exploration costs by 25% to 50%.

Brochure No. 199 describes a traffic and offshore platform safety system (called TOPPS) developed in The Netherlands by MARIN. TOPPS will help coastguards and offshore operators to anticipate the track of a drifting vessel thus allowing them to take timely action to prevent collisions between ships and offshore facilities.

These publications can be obtained free of charge by faxing or e-mailing your request to Jonathan Shackleton at PSTI.
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