EUROPEAN GAS
RESEARCH GROUP

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Position Paper on the European Union's 7th R&D Framework Programme (FP7)

Introduction

This paper outlines the GERG position with regard to the European Union's proposals for the Seventh R&D Framework Programme, highlights the contribution the European gas industry can make to the future of Europe and argues the case for the provision of co-funding for natural gas related R&D projects of value to Europe, its environment and its citizens.

Background

GERG, the European Gas Research Group, was founded in 1961 to strengthen the gas industry within the European Community and it achieves this by promoting research and technological innovation in all aspects of the gas chain.

GERG members have developed a large European reservoir of specialist knowledge, which currently represents a high quality research resource numbering in excess of 2000, many of whom are international leaders in their field. Its priorities are: networking; technical information exchange; and the promotion of collaborative R&D, as evidenced by its wide portfolio of projects, some with European Union funding, carried out by dedicated, multi-disciplinary Project Teams. At the time of writing[1], the GERG project portfolio includes twenty-two collaborative R&D projects with a total value in excess of €37 M.

GERG membership currently stands at 15 members from 10 countries across Europe, each actively involved in natural gas R&D, and these members serve a European gas industry which employs in excess of 150,000 people and which has the responsibility of supplying more than 80 million domestic, commercial, industrial and power station customers. In fact, more than 210 million people across Europe gain a direct benefit from the use of natural gas and, crucially, will continue to do so for many years.

The European gas industry and its customers, both domestic and industrial, already do and will continue to benefit in future from a strong R&D Programme for natural gas which will ensure a significant contribution is made to security of supply and environmental improvement, whilst serving to strengthen the international competitiveness of the European Union.

GERG supports the view that natural gas has, and will continue to have, a significant part to play in the European energy scenario and, therefore, merits a strong and recognisable position in both European Union Energy R&D Policy and in pragmatic European Union RTD Framework Programmes, as an accurate reflection of its growing importance in the coming decades, particularly in the context of sustainable development.

Strategic Importance of Natural Gas

There can be no doubt, whatever criteria are used, that natural gas is of increasing strategic interest to the European Union and, as a consequence, European gas industry R&D activity should benefit from European Union co-funding for reasons including those outlined below:

[1] August 2004

Diversity of Energy Supplies

Natural gas provides 23% of the European Union's primary energy consumption and it is anticipated that this will grow to around 28% by 2020[2]. The world's proven natural gas reserves are estimated at some 70 years at current consumption levels. However, when known, additional, recoverable reserves are taken into account, actual lifetimes of gas reserves are considered to be much higher, extending well beyond 100 years. If additional occurrences, such as the tantalising prospect of methane hydrates, are taken into account it's clear that there are vast, untapped quantities of methane to be extracted.

With regard to security of supply, the European Union is fortunate to be so well placed, given the wide geographical dispersion of natural gas. The existing natural gas network, in Europe and beyond, whether pipeline or LNG based, has benefited significantly over the years, and will continue to benefit, from a rigorous approach to system design and management, based ultimately on sound R&D. This will be vital if the gas industry's exemplary safety record is to be maintained and it's clear that it will become increasingly important as the European gas industry broadens its supply base to ensure that the flow of natural gas into Europe continues.

It's also worth noting that that improved energy efficiency in gas appliances could offer significant savings, given the quantities of gas consumed, and, thus, make a considerable contribution to security of energy supply.

Environmental Advantages

Natural gas provides a bridge to wards a sustainable future in Europe. It is by far the cleanest and most efficient fossil fuel. It can, by virtue of its chemical structure, guarantee to deliver reduced CO_2 emissions, when compared to other fossil fuels, and is particularly advantageous in minimising other atmospheric emissions. It is widely recognised that greater natural gas usage, coupled with R&D on, for example, the development of cogeneration, for which natural gas is the fuel of choice, high efficiency-low emission processes and renewable/natural gas hybrid schemes, will contribute significantly to the European Union's environmental improvement objectives. Indeed, renewables must be integrated with traditional fossil fuel technology in order to create market acceptance and this will necessitate significant R&D.

In addition, the replacement of coal by natural gas in Europe will contribute significantly to achieving the Kyoto objectives. Naturally, the natural gas industry is aware of, and is facing up to, new challenges with regard to sustainable development. It is currently involved in examining how best it can contribute to, for example, the move to the hydrogen economy; the coupling of renewable energies with natural gas to offer energy supply continuity; drastic reduction of CO_2 emissions through energy demand management; energy efficiency in buildings and industry; and, for the longer term, CO_2 capture and sequestration.

International Competitiveness

With the anticipated growth in the development of natural gas world-wide, largely because of its environmental and economic advantages, the European gas industry aims to maintain its place at the forefront of the development of cost-effective, high quality, environmentally sound technologies. Opportunities for exporting European Union-developed natural gas technologies and related European gas industry technical services should be available on a global scale. It is vital, therefore, that Europe and European Industry derive maximum benefit from European Union-based natural gas research activities.

European Union Technology Base

Topics of relevance to the European gas industry also serve both to expand and strengthen the technological base of the European Union, especially as many have applications beyond the energy sector. Extremely important examples are those associated with safety, environmental aspects such as emissions measurement and reduction, and the formulation of appropriate European Union standards, areas in which GERG Members are particularly active.

[2] IEA

Strategic Contribution

GERG members are at the forefront of gas technology and, from its pan-European viewpoint, GERG considers itself well situated both to identify priorities for R&D and to propose appropriate solutions. Clearly, there are certain strategic projects for which a pan-European, joint industry approach are essential because of cost, because of risk, or because there are advantages to be gained from working with others and from developing systems that can be applied more universally. Three relevant areas are outlined below:

Hydrogen

Hydrogen is a major plank in the European Union's 'bridge to security of energy supply' on its way to the 'Hydrogen Economy' and it is likely that hydrogen can play a major rôle in bringing about clean energy conversion in the longer term. .

The European gas industry has an important strategic rôle to play. Clearly, in the shorter term, say the next twenty to thirty years, the cheapest route to hydrogen, in any reasonable quantity, will be from fossil fuels. Natural gas is the obvious feedstock of choice, because it offers the lowest CO_2 route to hydrogen and, with the development of improved sequestration technologies, will offer the cleanest, most cost-effective source of hydrogen on the required scale.

In addition, between supply and demand, there will be a need for a high quality, reliable pipeline network capable of delivering natural gas/hydrogen mixtures. Clearly, the environmental advantages could be significant, with respect to the Kyoto targets, even if the distributed mixture contains no more than 20% hydrogen.

The European gas industry leads the world in this area. Led by Gasunie and set up within the GERG framework, with funding from the European Union, the *NATURALHY* project represents a large, integrated body of work that could lead to the widespread delivery of hydrogen in Europe within the next 20-30 years. As a consequence, it could make a significant contribution to an enlarged Europe's environmental aspirations whilst, at the same time, providing a logical stepping stone to the feasible, but distant, hydrogen future in Europe.

Energy efficiency

Energy consumption in the European Union is increasing and, as this trend is expected to continue, Europe is importing more and more energy products. If no measures are taken, in the next 20 to 30 years 70% of the European Union's energy requirements - compared to the current 50% - will be met by imported products. With enlargement a fact, and European Union membership heading towards 30, there is growing concern about a potential, long-term energy shortfall.

The logic is straightforward:

- the European Commission estimates a potential for energy efficiency improvement of more than 18% of present consumption;
- if the proposed target for improvement of energy intensity is met, this could realise two-thirds of the potential savings by 2010 and would result in avoided carbon dioxide emissions of almost 200 Mt/year, or around 40% of the European Union's Kyoto commitment.

It's clear that energy savings at this level make a considerable contribution to long-term security of energy supply. As a consequence, there are both pan-European and national initiatives to reduce energy usage and the gas industry can develop the technology to make a contribution to such initiatives, over and above what they currently provide, with appropriate investment in relevant, collaborative R&D.

Hi-tech solutions, with uses beyond the gas industry

Network operators are constantly striving to improve the overall management of their networks and technological progress makes this possible by the introduction of new or improved equipment to enhance operation and maintenance in areas such as ground penetrating radar, satellite remote sensing or infra-red laser-based leakage detection. In addition, advances in mobile computing, GPS technologies or sensor-fusion could be used to complement the traditional skills associated with important areas such as pipe location and leakage detection.

For projects such as these, where the technology moves very fast and where there are major benefits and few drawbacks from developing systems that can be applied equally outside the developer's own organisation, several points are obvious. They will need significant R&D activity. They should be carried out on a collaborative basis because they will be very expensive. Their implementation could have significant advantages beyond the gas industry, indeed for all those utilities involved in, for example, transmission network monitoring, street works and leakage detection.

With European Union support, GERG members have extended the technological boundaries in these areas in successful FP5 projects such as *GIGA, PRESENSE and VOGUE*.

Crucially, support for similar projects has not been available in FP6, even though they clearly offer significant benefits with regard to security of supply, safety, emissions reduction and quality of life for citizens.

Concluding remarks

The natural gas industry in Europe is going through a period of extraordinary change:

- demand for natural gas is set to grow across Europe and the development of safe, well controlled, and reliable natural gas networks will be essential if customers are to achieve the maximum benefit;
- increased emphasis is being placed on the development of integrated approaches to urban energy issues and to the identification of solutions which will enhance the well-being and quality of life of Europe's citizens;
- there is an increasing requirement to address the problems associated with energy efficiency and emissions and, although natural gas is the preferred fossil fuel as it offers a clean and efficient energy source, there remains a demand for high quality R&D if further improvements are to be made;
- there is a requirement to deliver benefits to shareholders in newly privatised companies which implies cost savings and, almost inevitably, this has meant significant reductions in R&D expenditure and an emphasis on payback in the shorter term.

Against this background, it's clear that natural gas and its guardians in the European gas industry have a lot to offer to Europe and its citizens in the coming years as reliance on natural gas increases. This is true not only for technology, but also where socio-economic issues prevail. The gas industry's knowledge of its traditional market means that it is well placed and well qualified to understand and anticipate specific scenario-defined issues such as, for example, the public response to the introduction of new technologies into the marketplace.

With sustainability as the keyword, it may be that the link between natural gas and renewables isn't obvious. However, it's worth repeating that natural gas can provide a bridge towards a sustainable future and, if the aim is to achieve market acceptance, renewables will have to be integrated with traditional fossil fuel technology; this will need significant R&D.

GERG and its members believe that natural gas should be considered of strategic importance to Europe and that a more pragmatic approach should be taken in the development of the Seventh R&D Framework Programme, to ensure that there will be opportunities for securing European Union co-funding for high quality projects which are, without doubt, of significant value to Europe.