

FEANI position paper on Research and Development

approved by the FEANI General Assembly on 29 September 2006

FEANI is a federation of the national engineering associations in 26 European countries and hence is the voice of the professional engineers in Europe. Through engagement in production of materials, manufacturing, communication, and infrastructure engineers constitute a major source of EU economic power and social cohesion.

Engineers play an essential role in many economic sectors, including manufacturing, infrastructure and communication. While all are important, one key element in maintaining a sustainable European economy is to promote innovation and development in the manufacturing sector as this accounts for over half the EU GDP. (The 22 percent of GDP represented by direct manufacturing is multiplied two to one by the value of manufacturing related support industry). Such a large proportion cannot be realistically replaced by reliance on service industries, particularly as some services, for example engineering consultancy, may require an indigenous industry in which to develop saleable knowledge.

Engineering and associated activities are major contributors to Europe's balance of trade with the rest of the world. The EU25 may have an overall deficit of €60 billion in trade in goods but manufactured products generate a surplus of €130 billion. Trade in engineering and construction services (plus associated architectural and technical consultancy) is in surplus by €10 billion, which constitutes around 25 percent of the total EU25 trade in services surplus.

Rebalancing the EU budget

In March 2000 the European Council launched the Lisbon strategy – an ambitious agenda for reform. The heads of states and governments committed themselves to make the EU the most dynamic and competitive knowledge-based economy in the world. However, the reforms have not had sufficient impact yet. The growth gap between North America and Asia on one side and Europe on the other has widened over recent years. Furthermore, Europe is at the same time facing the challenge of demographic change, a diminishing workforce and an ageing population with increased needs, combined with a low European economic growth rate, which will halve over the coming decades and reach just over 1 percent per year. Faced with these challenges Europe needs to put much more emphasis on competitiveness enhancing programmes.

*Fédération Européenne d'Associations Nationales d'Ingénieurs
European Federation of National Engineering Associations
Föderation Europäischer Nationaler Ingenieurverbände*

*Avenue Roger Vandendriessche 18, B-1150 Brussels, Belgium
Tel. +32 2 639 0390, Fax +32-2 639 0399; Web site: <http://www.feani.org/>*

FEANI supports rebalancing the EU budget to a much more competitive profile. At present only 9 percent of the EU budget is spent on innovation and technology whereas 40 percent is spent on agriculture. These figures need to be more in balance if Europe wants to be competitive. More EU investments must be made in large-scale infrastructure and public projects, which drive research and innovation along the whole industrial chain, as well as directly in R&D.

Giving priority to applied research

The focus of EU funding for research has shifted in recent years towards an increased support for general basic research and single academic teams. With governments currently resistant to increased payments for the EU budget, the result is that these research objectives are being met at the expense of targeted innovation and industrial and market relevant research.

FEANI believes that, as regards research and development, much more focus must be given to the objective in the Treaty of the European Community:

“The Community shall have the objective of strengthening the scientific and technological bases of Community industry and encouraging it to become more competitive at international level” [EC Treaty, article 163.1].

FEANI recommends that measures be taken to move the focus of the EU Framework Programme funded research to make it more industrially relevant. In this context the introduction of Technology Platforms has been very useful as they provide a boost to developing lines of research which answer the requirements of industrial markets.

FEANI suggests that the Technology Platforms and the Joint Technological Initiatives evolve to become significant tools for fostering European competitiveness. This should be reflected in the financing and in the political commitment.

FEANI believes that the EU should promote transnational approaches especially in those engineering sectors where individual national size is below the critical mass needed to support significant R&D.

Bridging the gap between science and business

More must be done to exploit and develop research achievements. At present there is a gap to be bridged between the research communities on one hand and the business community and the corporate sector on the other. Engineers have a crucial role to play here as they are trained to take blue sky innovations and turn them into useful, commercially viable and/or socially beneficial products, services and infrastructure.

FEANI recommends that a best practice analysis should be made in order to get a clearer picture on how to ensure beneficial cooperation between academic research institutions and industry. Funding must be reserved within the framework programme to facilitate technology transfer from scientific research to the company level. This could include funding exchanges of academic and industrial personnel.

FEANI suggests developing a Technology Transfer Facility within the framework programme, which could play an important role, in collaboration with existing local technology transfer initiatives, in taking projects from universities or research centres to a development stage where venture capital could be forthcoming.

FEANI also recommends that the EU evaluation criteria take the industrial relevance of project proposals and their alignment with the need of European industry into consideration. To support this FEANI suggests increasing the number of industry experts in the evaluation teams.

Strengthening the research and development in SMEs

Small and Medium-sized Enterprises (SMEs) are the backbone of European Economy. They constitute 99 percent of all European enterprises and provide some 75 million jobs and contribute 65 percent of Europe's BNP. Supporting SMEs in their research and development activities is important, since SMEs have been shown to provide a fertile breeding ground for new ideas and innovative ways.

The level of competence of their workforce is vital for innovation activity in SMEs. Companies employing academic workers are two to three times as innovative as companies with no academic workers. A recent Danish research report points to the fact that SMEs employing their first academic worker on average end up employing five additional blue-collar workers.

SMEs which cooperate closely with higher and further education institutions and research centres have a considerably larger innovation potential than other SMEs. Thus more attention and resources should be allocated to establishing such cooperation.

Not-for-profit organisations play an important role in bridging the gap between science and business. Especially with regard to SMEs who do not have resources themselves to get involved with external researchers, not-for-profit organisations can act as important contact facilitators.

FEANI suggests that Community financial contributions to not-for-profit organisations activities should be able to reach a maximum of 100 percent of the total eligible costs. This will enable not-for-profit-organisations to facilitate contacts between researchers and SMEs.

Encouraging a European wide patent system

If Europe is to catch up with the United States and Japan in terms of private R&D investments, and in terms of being able to transform research results and new technological and scientific know-how into industrial and commercial success stories, businesses need a legal framework for the protection of intellectual property rights, which is accessible and cheap for SMEs.

In the US, a patent protection costs around €10.000. In Europe, the same protection costs around €50.000 and it can only be achieved in 8 EU countries. Consequently, EU companies are filing fewer patents than their American competitors. In 2002, US companies filed 301 patents per million of population, compared with just 60 per million by European businesses.

The establishment of a Community wide patent system would give companies an opportunity to obtain a single patent, which would be legally valid throughout the EU; thereby removing the competitive handicap, suffered by Europe's innovators, stimulating investment in R&D and strengthening European competitiveness.

FEANI believes that the development of a cost-effective and efficient Community wide patent system is one of the important tasks facing European policy makers.

Increasing the number of technology students

It is necessary to create an educational structure to underpin a strategy for market-driven innovation. Employees must have the skills to manage such a development. It is not enough to emphasise and invest in R&D if we do not have the required foundation in terms of human resources. The Bologna process should facilitate the development of this foundation through enhancing the mobility of students and employability of European higher education graduates thus ensuring competitiveness of European higher education on the world scale.

At present, too few students choose the natural sciences and the technical disciplines, even less so for female students. At the same time the demographic changes in Europe in the coming decades make it even more urgent to encourage more young people to graduate from universities and technical institutions. A modern high-tech engineering sector, that competes globally, needs sufficient highly skilled employees if we are to avoid labour market shortages in the future. To achieve this objective efforts need to be targeted at all stages of education from kindergarten to post-graduate level.

Attractive environment for research and development

More emphasis must be put on measures to attract and develop the skills demanded by European companies in order for them to stay competitive in the 21st century. The apparent decline in student enrolments in science and technology in many European countries is viewed with concern. New data show that Europe will need at least 700,000 additional researchers if the target of 3 percent investment in R&D is to be met by 2010.

FEANI acknowledges the renewed emphasis being given to supporting training and career development of researchers. It is extremely important that the programme addresses those disciplines that are in greatest demand by European companies. The programme must also be capable of meeting the need for continual updating of the cutting edge knowledge of engineers and scientists in industry. Life long learning is vital to Europe maintaining a technological lead and is a concept to which the engineering profession is fully committed.

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European Green Card

The availability of a skilled workforce, both quantitatively and qualitatively, is of paramount importance to optimise research in the knowledge-based society. But Europe is facing drastic demographic changes that will have a major impact on its ability to fulfil the Lisbon objectives. The Commission estimates that by 2030 the EU will be short of 20.8 million (6.8 per cent) people of working age. The number of people 65+ will rise by 52,3% (40 million), while the age group of 15-64 will decrease by 6,8% (20,8 million).

A similar pattern can be identified for most other regions in the developed world. The result will be an even more intense global competition to attract labour, not least the highly skilled, specialised and creative knowledge workers, who are the backbone of an innovative, competitive society.

Winning this competition – being able to attract and sustain a larger and more competent work force – demands a common, comprehensive approach operating at EU and national levels and including several measures, one of which is a work permit system that welcomes skilled labour.

Some countries have already adopted green cards – specific resident permits for foreign researchers. But the development of a European-wide area of competitiveness and growth demands the adoption of common rules, which would address the issue of immigrants' right to move around the EU, thereby making it easier for companies to hire the specialists they need and for researchers to develop their expertise.

Summary

FEANI recommends that:

- The EU budget should be rebalanced with a greater proportion being directed to funding innovation and technology and with the emphasis on economically relevant research.
- Links, including exchanges of personnel, between research centres and business be actively encouraged, particularly in relation to SMEs.
- The development of a European wide patent system needs to be urgently taken forward
- Further action should be taken to promote the uptake of science and engineering education, to support research training and to facilitate the mobility of skilled third country personnel.

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