



**European Research policy and the European Commission Communication
"Science and Technology: the key to the future of Europe - guidelines for future
European Union policy to support research"
COM (2004) 353, 16 June 2004**

ORGALIME Position Paper

29 October 2004

1. Introduction

Orgalime represents the mechanical, electrical, electronic and metalworking industries in 23 European countries. We speak for 33 trade federations representing over 130,000 companies. These industries (the engineering industries), the vast majority of which are small and medium-sized enterprises, employ some 7 million people and, in 2003, accounted for 1,175 billion Euro of output, that is a quarter of the EU's manufacturing output and a third of its manufactured exports.

These companies play a major role in the economy of Europe. At the industrial level, the engineering industries are both major purchasers of materials produced by the primary transformation industries, as well as essential suppliers to all manufacturing industry in all the major industrial sectors including the energy sector, the primary transformation industries including the foundry and steel sectors, the transport industry including the automotive, aeronautics and rail equipment producers, agro- and food industry in general, the chemical, petrochemical and plastics industries and, of course the mechanical and electrical engineering industries. The engineering industries are the suppliers of equipment and technology for the health, social and leisure sectors. They are also the providers of water, wastewater, air treatment etc. equipment, essential to the creation and maintenance of a safer environment. Our industry is also both today and increasingly a major provider and user of services. In brief the engineering industries then, as provider of enabling technologies for most other sectors, play a key role in the competitiveness of the European economy of a whole, including in those projects such as Airbus and Galileo and the ICT technologies developed by our industry itself.

In this position paper we comment on recent developments in the area of research at European level and provide input for the ongoing consultation process for the upcoming 7th Framework Programme (FP7).

Orgalime believes that the prime driver for achieving an internationally competitive European engineering industry lies in the efficient use of resources, innovation, research and education. While much of the effort in this area must come from industry itself and from member states, Orgalime believes that European RTD and innovation policies should focus on developing framework conditions that stimulate innovation, entrepreneurship, growth and employment and on ensuring that strong and efficient links are fostered between the worlds of science and industry. It is in this way that the institutions will be able to effectively contribute to the objective of European research policy as laid down in Article 163 of the Amsterdam Treaty.

2. Building on our strengths: Technological Leadership

The engineering sector plays a key role in Europe and its future; at the *economic level*– by contributing significantly to overall economic output of the EU, at the *social level* – as major provider of employment and benefits to society and individuals, and at the *technological level* – as a driver and enabler of innovation. Against this background, it is particularly disappointing to note that the current EU 6th RTD framework has almost entirely excluded the engineering sector as such from its thematic RTD priorities.

While the engineering industry has traditionally been one of the prime exporting sectors of the European economy and thereby a driver of growth, it is today not escaping increasingly intense global competition and the resulting pressures on cost . Companies deploy many strategies to mitigate these effects, e.g. by outsourcing certain business activities. They need increasingly to concentrate efforts on their area of competitive advantage, which is primarily *technological leadership*. Orgalime believes that to secure the long-term international competitiveness of the European engineering industry, market leadership will only be achieved through technological leadership.

Therefore the European RTD and innovation policies are of paramount importance to support industry in this endeavour. We share the view of the European Round Table of Industrialists which states that “the transformation of scientific breakthroughs from basic research into commercial success is fundamental to competitiveness”.

Europe does not suffer from a lack of new ideas, but from an inability to transform these into new products and processes. In this respect, the EU RTD Framework Programme has a crucial role in supporting engineering companies in providing them with necessary framework conditions to ensure their long-term competitiveness.

Due to the long-term scientific approach of the previous framework programmes and the lack of flow of results into real products and processes , much of our industry has lost interest in participating in European research programmes, because companies also require results in the short term. European research should work more efficiently in a collaborative way through dynamic company networks and all research and implementation partners should be involved in long-term vision and technology roadmap building.

3. Our recommendations for the EU Framework Programmes

Growth and Competitiveness

If it is Europe’s goal to achieve sustainable growth and competitiveness, it can only be achieved through a better quality of the entire research and innovation system. This does not only include the capacity to create new knowledge (research), but also an understanding of how the knowledge might be used and applied in industry (innovation).

Competitive advantage will also come from the existence of an effective know-how transfer from science to beneficial and useful application in industry. However, most enterprises of our sector do not possess the necessary research capacity or personnel to carry out research on their own. They must rely on engaging in a model of collaborative research as a consequence of the fact that industries now deal with increased knowledge intensity and thus complexity, often spanning over several other domains (e.g. information technology).

Innovation and sustainable growth depend upon high scientific quality and a continuous and close interaction between science, industry and government, so that demand-driven research and learning processes can take place. This should be encouraged by the FP7. In this context, the role of *processes* should not be forgotten: if

it is true that the creation of new products leads to growth, and EU Framework Programmes rightly support research in creating new products, in reality, it is the improvement in processes that lead to higher productivity and thus growth. To support and fund research on improving existing processes should therefore be one of the essential aims of EU research policy.

Advanced research and technology is more important than basic research

Basic research is crucial, however not sufficient to achieve competitiveness. Our industry is concerned at the particular emphasis that the European Commission gives to basic research. Industry is united in the belief that Europe's goal should be to achieve leadership in advanced research and technology. Therefore efforts in basic research should not be decoupled from the needs of industry. Industry needs to be part of the coordination process and those conducting basic research should be led by economic, industrial and societal needs. The link with industry and applications in the economy needs to be ensured when determining research themes. A strong integration is needed between what is funded in basic research and how this knowledge can lead to increased competitiveness.

As experience has shown, European industry, often supported by European funded research, is capable of going beyond basic research to achieve world leadership in products in such areas as civil aviation, space, production machinery and mobile communications technologies.

Keep it flexible – cut out the bureaucracy

The instruments of EU RTD Framework Programmes need to allow for *flexibility* regarding consortium sizes, clear participation rules, clear definition of the objectives of the instruments, and allow a participation of companies across the value-creating chain regardless of company size. More flexibility and autonomy is also required when it comes to allocating the work and the budget for projects. With regards to the evaluation of specific projects, we feel that it is essential for evaluators to ensure both *coherence in their appraisals and* short delays between the steps of approval of a research project.

Furthermore, the Commission should consider that one way of keeping bureaucratic procedures to a minimum could be alleviated by foreseeing a strong role for industrial association groupings, who can shoulder much of the work of project administration, leaving the R&D and innovation to companies and to researchers.

Support for providing the right technology for security

In its Communication "Security Research : The Next Steps" - COM(2004) 590 final, the Commission announced the development of a European Security Research Programme (ESRP) from 2007 onwards as part of the 7th Framework Programme, in order to enhance the protection of Europe's citizens and economy.

As the engineering industries, which Orgalime represents, provide the technology for both civil and defence security, we very much welcome the Commission's ambitions. To create a safe environment, Europe must take advantage of its technological strengths. Although technology itself cannot guarantee security, it is obvious that security without the support of technology is impossible. Civil, security and defence applications nowadays often draw on the same technological base and create new synergies between different research sectors. New technology trends also offer new opportunities. Modern reliable technology is furthermore a prerequisite for the good functioning of such key European services as transport and energy supply. Research has therefore an important role to play in guaranteeing a high level of protection in all areas of life.

4. The engineering industry experiences with FP6 Instruments

Further support especially for small and medium-sized companies

The co-operative and collective research model still remains one of the most favoured instruments for SMEs of our sector. Through this they can participate in European pre-competitive research activities, as well as in smaller projects with instruments such as Specific Targeted Research Projects (STREPs) .

SME-specific measures of the FP 6 should therefore be strengthened in order to make it the most efficient funding mechanism, having a broad, horizontal scope, creating positive effects for universities and securing a continued education in science and engineering. This will lead to future scientific careers.

SME-specific measures at European level need to be further exploited and enhanced to reflect the way innovations occur within the entire value-creating chain. The instruments need also to be adjusted to allow and encourage participation of smaller engineering companies. Often a typical innovative company of the engineering sector lies in the “mid-range” employing between 250-1000 people. These companies are not adequately addressed in the current FP6, and it is precisely they who are the main drivers of innovation within several major sectors.

Co-operative research (CRAFT)

Companies from the engineering industries welcome and take part in CRAFT-projects. We therefore urge the Commission to increase funding for this instrument.

Collective research

This new instrument was welcomed by IAGs (Industrial Organisations Groupings), which are dominated by SMEs and indeed in reality proved to be successful. Taking into consideration the success of this new initiative, the vast over-subscription of collective research projects and their value for SMEs, we recommend increasing the importance and the budget for collective research in FP7. We also suggest that the collective research instrument should be further developed to address the needs of mid-range companies, which are larger than the limits included in the EU SME-definition, but too small to possess the resources to participate in e.g. Integrated Projects (IPs).

Specific Targeted Research Projects (STREPs)

The mid-layer of research organisations and enterprises that have been able to take the lead in FP5 initiatives, may currently be able to act as the driver in STREPs. However, severe “breakthrough” requirements are in many cases even more heavily imposed on STREPs than on Integrated Projects. The “stairway of excellence” that was promised by the Commission when announcing the STREPs is not really available. In the fields relevant to the engineering sector, incremental improvements do not seem to be appreciated by the Commission. This we believe needs to be reconsidered.

Integrated Projects (IP)

IPs are primarily not meant for SMEs; however, in certain cases, IPs for SMEs can be an appropriate instrument. In practice, we see two ways that SMEs can participate in IPs. First, SMEs could join ongoing IPs. In this case a specific mechanism should be created that will act as an interface between large IP coordinators and SMEs willing to participate in R&D with a view to solving their problems. Second, SMEs could propose their own IP through dedicated calls for IP for SMEs. However, we fear that this new Instrument, specifically adapted to SME traditional (but high tech) industries has been insufficiently promoted, and not sufficiently explained, nor clarified in due time.

Networks of Excellence (NoE)

In relation to the needs of engineering companies, we are concerned that a significant portion of funding is being allocated to Networks of Excellence. NoEs are not currently seen as being the most relevant instrument in satisfying the RTD needs of our industry. We believe that NoEs currently lack strong industrial participation or guidance, and are mainly driven by research institutes. We are anxious that with the current set-up in FP6, it is only major R&D organisations (including research departments of large industrial enterprises) which will participate in, or take the lead in the NoEs. We believe that NoEs need to be conceived in a way which ensures strong industrial guidance and leadership. In their current conception, therefore, NoEs will most likely not serve the needs of the engineering industry.

Other instruments

Engineering companies do also participate in co-ordination actions and specific support programmes, and Orgalime welcomes these community instruments.

Finding the balance between old and new instruments

In conclusion, Orgalime believes that a better balance needs to be struck between the funding allocated to the new and the “old” instruments: a greater portion of the available budget should be reserved for the “older” instruments, with less going to NoEs, at least within the production technology area.

5. Call for a separate topic for the engineering industry in FP7

The Engineering industry is only barely addressed in the priorities of the FP6. This leads to a very scattered and dispersed approach for the industry as a whole. Of the seven thematic priorities in FP6 some are more relevant than others for the engineering industry. However, with this dispersion of the core activities of the engineering sector, companies are required to thoroughly study the FP6 to identify possible areas of relevance to their activities. With the current set up, it is very difficult for engineering companies to recognise their core activities in the priorities of the FP6. Even within the “Nanotechnology and nanosciences, Knowledge-based multifunctional materials, New production processes and devices” (NMP)- a clearer prioritisation needs to be achieved. In relation to the importance of our industry for the economy of Europe and for society, we feel that the engineering industry is clearly underrepresented today.

The engineering industry is the main supplier of the means of production for a range of other application domains. It would therefore be highly desirable to concentrate such key enabling technologies under one distinctive topic under the upcoming FP7. If these enabling technologies were made more visible, recognisable and addressable, innovative engineering companies would be more inclined to participate in FP7. There is even a need for clear thematic issues that directly address the R&D and innovation needs of specific sub-sectors of the engineering sector.

6. Establishing a Technology Platform for Manufacturing Enabling Technologies

ORGALIME therefore, in collaboration with CECIMO (European Committee for Cooperation of the Machine Tool Industries) is in the process of establishing an industry oriented technology platform that addresses the different aspects of technological innovation. This proposed technology platform for the Engineering Sector aims to provide a framework for the development of a European vision on how the sector - together with its research and business partners and its stakeholders - can face its future technological and socio-economic challenges. It will convert this vision into coordinated and concentrated efforts in these areas. The Technology Platform will furthermore support vertical sector-based platforms or their equivalent structures. We hope the Commission will support us in our efforts. The platform may well be integrated within Manufuture (www.manufuture.org). In the attached annex we outline our project in detail.

7. Conclusions

While Orgalime fully subscribes to the Commission's view that more money must be invested, both by public authorities and by industry if the vision developed in Lisbon in the year 2000 is to be achieved, we feel that today it is time for the Commission to seriously reconsider how it will invest the funds allocated to Research and innovation at a European level.

Our industry is fully aware of the crucial role that research and innovation plays for the future of our industry and of our clients' industries and services in Europe. Europe has been very successful in driving major projects such as Airbus and Galileo, which have had a positive knock on effect down the whole supply chain of manufacturers in Europe, including the many SMEs and mid size companies of our industry which is the main supplier to these projects. We are therefore concerned to ensure that the increasing tendency to develop large projects driven by the research community rather than by industry and the market should be reconsidered.

We therefore hope that the Commission will seriously consider Orgalime's proposals: the past Framework Programmes for RTD have contributed substantially to improvements in the level of marketable technology. It is essential that this should once again be the case.



Engineering the future –

Technology Platform for the Manufacturing Enabling Technologies

Summary	<p>A Technology Platform specifically designed for the Manufacturing Enabling Technologies industry will mobilise and concentrate a critical mass of research and innovation effort in a mission-oriented plan with actions that will provide practical benefits to enterprises actively operating in the sector. Enhancing the competitiveness of this sector has a leverage effect on the prosperity of European manufacturing industries and ultimately of European citizens.</p>
<i>Definitions</i>	<p>Manufacturing is initially defined for this purpose as <i>the production of goods, and covers industries such as automotive, aerospace, textiles and clothing, agricultural products and food, electro-domestic appliances, electronic equipment...</i></p> <p>The Manufacturing Enabling Technology Industries are defined as <i>business-to-business (B2B) sectors which design, develop and manufacture machine tools, production machinery and systems, lifting and handling equipment, textile machines, agricultural machinery, construction equipment,...and their supply chains</i>. These sectors are also referred to as 'the Engineering sectors' (typically falling under NACE codes 29 to 33).</p>
<i>Rapid solutions to real problems</i>	<p>The Platform will bring together all relevant stakeholders to identify the innovation challenge, develop the necessary research & innovation programme and implement the results. It will promote the practical application of technologies to provide rapid solutions to real problems.</p>
<i>Goals</i>	<p>The main goals of the Technology Platform are as follows:</p> <ul style="list-style-type: none">• Ensure an industry-driven European research and innovation policy for manufacturing enabling technologies.• Identify key technologies according to industrial needs and prioritise research effort to avoid duplication and improve co-ordination and effectiveness.• Increase effectiveness of public research investment, by setting the best conditions for industrial research (optimal use of European, national/regional research, EUREKA and private research funds, collaborative RTDI support programmes and instruments adapted to industrial/SME needs).• Convert innovative research output into commercial success by ensuring the effective flow of results down the science, research and innovation value chain into products and services fitting market demand (technology transfer mechanisms, financial support for pilot-applications, IPR regimes...)• Attract more professional careers in Manufacturing Enabling Technologies related activities through adequate education and training actions.• Improve the appropriateness and added value of European regulations and standards.• Identify opportunities for non-technological innovation (business models, investment models, service models, co-operation models...)

The need for a Technology Platform in Manufacturing Enabling Technologies

Support for manufacturing industry to achieve growth

Fragmented RTDI

Vision

Structure, interfaces

Joint research and innovation actions, exchange of results

The Manufacturing Enabling Technology Industries are focused on advanced, leading edge and knowledge-based technology which is strategically crucial to support manufacturing industry and its service sectors in achieving societal goals, full employment and sustainable economic growth. The economic and technological growth of Manufacturing Enabling Technology Industries is essential for the support of future "winning" technologies such as nanotechnology.

Research, Technology Development and Innovation (RTDI) activities remain fragmented and lack co-ordination in terms of actions and actors. Technological and socio-economic challenges (framework conditions for innovation, regulations, changing business environments...) can only be addressed properly if all interrelations are identified and all stakeholders involved. Some initiatives have recently started the process of developing common visions, but the sector requires a solid framework to fully exploit the potential benefits offered by RTDI activities in Europe.

The technology platform will constitute a framework for the development of a European vision on how the sector, together with its research and business partners, can face its technological and socio-economic challenges and support the growth of the entire European manufacturing base. It will convert this vision into an action plan and implement it.

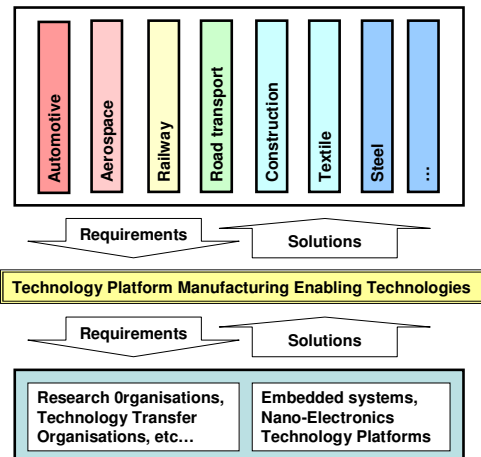
Common challenges

There is a huge common space of functional requirements that are relevant for the entire sector: productivity, speed, flexibility, accuracy, ergonomics, safety, autonomy, sustainability... Most enabling technologies that are used to answer these requirements are common to many sub-sectors: mechatronics, control engineering, ICT technologies (embedded systems), material technologies, micro/nanotechnology (sensors, actuators...)

From a socio-economic point of view, the mechanical engineering sector shares a lot of challenges:

- o lack of transfer of research results into industrial innovation, support for entrepreneurship, IPR issues...
- o education and training, employment
- o bringing regulation and standardisation in line with technological innovation and competitiveness
- o changing business environment, markets and political framework

The Technology Platform is structured as a horizontal activity that supports vertical sector-based platforms or equivalent structures (user sectors can be regarded as customers). This support is envisaged as networking activities for exchange of research and innovation results between vertical and horizontal platforms and vice versa. The networking activity is essential in order to develop the appropriate manufacturing enabling technologies of the future.



**Themes
addressed by the
Technology
Platform**

- Long term scientific, research and technological development of enabling 'hard' and 'soft' technologies which facilitate the development, manufacture and efficient use of machinery systems.
- Short and medium-term solutions that enable the development, manufacture, testing and servicing of equipment through access to expertise and best practice drawn from leading edge research institutes and companies.
- Exploitation of new, emerging and established markets for the machinery system products; integration of end users and machinery system providers in developing solutions.
- Modernising regulations and standards; enhanced cooperation with standardisation bodies and regulatory authorities.
- Measures improving education and training (harmonised approaches, lifelong learning practices...).
- Best practices and mechanisms for effective technology transfer of research results to industrial partners, with appropriate access rights solutions.
- Development of a service culture that acknowledges the current changes in the nature of manufacturing. Where once an enterprise would have manufactured physical products for a one-time sale, assistance to shift towards building long-term relationships with customers and servicing their needs around a manufactured product.
- Development of the appropriate financial and contractual means to determine the final price of a customised technological solution between the machinery user and the machinery builder (new business models). The development of business models must take into account the current customers' trends that transform the machine supplier into a solution provider, a maintenance partner, a performance partner and now a "value" partner.
- Development of innovative supply chain relationships which will be characterised by capabilities and practices such as:
 - Sharing of information and technology among suppliers and competitors;
 - Equitable sharing of the rewards of collaboration;
 - Cross-cultural systems of information management, representation and communication; enterprises focused on market opportunities rather than self-preservation and growth.

<p>Sequence of Actions <i>Agreement on Vision and Strategic Mission</i></p> <p><i>Establish High Level Group and Executive Secretariat</i></p>	<ol style="list-style-type: none"> 1. Based on this document, agree with core-stakeholders on the major European need and mission of the technology platform. 2. Prepare proposal to justify to the European Commission and sector-based enterprises the setting up of a Technology Platform, its benefits for manufacturing industry, society and the economic performance of the European Union. <ol style="list-style-type: none"> a. Establish structures, procedures and management to ensure an industry-directed approach; identify the composition of the High Level Group (HLG) to initiate, define and direct the Technology Platform. The HLG will consist of a balanced combination of European Trade Associations, major end users, machine builders, leading academics, research institutes, representatives from EC and regional bodies. Industrial stakeholders will chair the HLG and lead the secretariat. b. Establish the Technology Platform Work Plan
<p><i>Technology Road Map with Action Plan</i></p> <p><i>Integrated support measures</i></p> <p><i>Implementation</i></p>	<ol style="list-style-type: none"> 3. Implement the Technology Platform: <ol style="list-style-type: none"> a. Based on industry-oriented technology roadmaps and identified non-technological barriers and opportunities, an integrated action plan will be established. This “Strategic Research and Innovation Agenda” will provide for a coherent set of measures that will encompass the entire innovation chain, from basic and applied research, education and training until industrial application. It will include a sound strategy for achieving the mission and a detailed action plan for execution. It will be based on existing initiatives (horizontal European foresight studies such as Informan, Futman and Manvis; Mantys Foresight results, national and sectorial roadmaps). <div data-bbox="826 728 1449 1041" style="text-align: center;"> <pre> graph TD A[Identification of industry-oriented technology roadmaps] --> B[Definition of Strategic Research and Innovation Agenda] C[Identification of non-technological barriers or opportunities with respect to industrial innovation] --> B B --> D[Implementation of Strategic Research and Innovation Agenda] </pre> </div> b. Devise and select the most appropriate research and innovation instruments and measures, with special focus on ensuring a strong industrial participation. c. Prepare detailed budgets and obtain funding commitments from EC, regional bodies, industrial enterprises and trade associations, if appropriate. d. Implement the research and innovation programme.
<p>Conclusion</p>	<p>ORGALIME (European federation of national industry associations representing the European mechanical, electrical, electronic and metal articles industries) and CECIMO (European Committee for Cooperation of the Machine Tool Industries) are joining forces in order to establish an industry oriented technology platform that addresses the different aspects of technological innovation. Other key stakeholders will be invited to join.</p>