

Securing a material advantage

“ I have high hopes for fruitful exchanges on working methods and benchmarking, and for real joint European activities on materials science and technology. ”

Research into the science and technology of materials is a strategically vital component of a competitive economy. But maintaining expertise right across this huge field demands a large research budget and a long history of research and development. Most European countries and regions have to specialise, leaving them vulnerable when new discoveries attract young researchers to work abroad.

The ENMatSSA project brings together the research councils of seven countries active in materials research.

Their aim is to lay the foundations for an ERA-NET that will identify research gaps and opportunities, promote joint research programmes, and develop a collective capacity capable of matching that of any region in the world.

This is a preparatory project. The consortium will use it to look for additional partners and to define the workplan for a full Coordination Action under the ERA-NET scheme.

Along with information technology and biotechnology, materials technology is one of the three most important research fields in most industrial countries. Like materials science, its close cousin, it is an interdisciplinary field drawing from many areas of chemistry, physics and the engineering sciences. It has a vital role in the transport, aerospace and electronics sectors, and the many new materials coming out of the research laboratories include amorphous metals, biomaterials, high-temperature superconductors and even more exotic products.

So wide is the scope of materials science and technology that only the largest countries can support the comprehensive high-level expertise needed to make them largely self-sufficient. To keep a foothold in this economically important technology, smaller countries and regions must specialise, relying on the know-how which is the common property of the scientific community but building up expertise in key areas. A good research centre, even though specialised,

can also act as a channel for feeding a broad range of new techniques and discoveries from overseas into the national economy.

But this need to specialise can mean that a country's research strategy is vulnerable to new discoveries which change the direction of the field as a whole. An individual country may be left behind if the focus of attention shifts to an area outside its competence. It takes time to build up expertise in a new area, and in that time young researchers can be lost to more attractive jobs in countries where they can work closer to the cutting edge of their chosen subject.

Compelling case for collaboration

It is difficult for individual countries to sustain viable research groups in the face of growing competition for the best researchers. Researchers, too, must inevitably balance their interests in basic research with the need to earn a living from commercially oriented work, which can slow their research efforts.

New Member States have additional problems – although they have a considerable number of experienced materials researchers, their resources are limited and there are few coordinated research programmes.

For all these reasons, there is a compelling case for European countries to collaborate in materials science and technology, in order to achieve a critical mass of



Specific support action



“ *Transnational collaboration at this level has never been attempted before. Active contacts between colleagues in other European funding organisations will be beneficial in many ways.* ”

Full title:

ERA-NET Materials – a preparatory phase

Research field:

Materials

Coordinator:

Finland: Tekes, National Technology Agency

Partners:

- Belgium: Institute for the Promotion of Innovation by Science and Technology in Flanders
- Finland: The Academy of Finland
- Ireland: Enterprise Ireland
- Latvia: Latvian Council of Science
- Luxembourg: National Research Fund
- Norway: Research Council of Norway
- Slovenia: Ministry of Education, Science and Sport

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researchers and build up a full range of specialist expertise which can be shared between them. Collectively, they could gain some of the advantages already enjoyed by larger countries such as the US.

Of course, international co-operation is already common in these fields. As far as researchers themselves are concerned, there are a number of organisations that promote the sharing of information in materials science. Schemes such as those organised by the EU, the European Science Foundation, and the Nordic Industrial Fund can meet some of these needs. So, too, can academic societies and networks of research organisations, although many of these are dominated by US researchers. But until now there has been no European or international body that brings together another important group of people – the policy-makers. To help European countries and regions strengthen their research base in materials science and technology, the people and organisations which plan and support research programmes in these areas must also be brought together.

Team players

This preliminary project was proposed by research councils and agencies in seven small European countries, including two new EU Member States, Slovenia and Latvia. It focuses on the establishment of a larger consortium of countries to undertake a full-scale ERA-NET in materials research, and on the preparation of detailed plans for the follow-up project. The partners are hoping that countries and regions with a strong materials R&D track record will be among the new members.

In the longer term, the partners expect the subsequent ERA-NET to include the benchmarking of national policy-making methodologies and the creation of durable partnerships for future research planning. Concrete collaborative activities on selected topics will be designed to strengthen their collective research base. Policy-making bodies from additional countries are expected to join the network, further improving the transfer of knowledge and skills in materials technology throughout the European Research Area. The ERA-NET should significantly improve the career prospects of materials researchers in Europe, making it less likely that their knowledge and skills will be lost overseas.