

An ESF position paper

# **New structures for the support of high-quality research in Europe**

**A report from a High Level Working Group constituted  
by the European Science Foundation to review the option of creating  
a European Research Council**



**April 2003**

The European Science Foundation (ESF) acts as a catalyst for the development of science by bringing together leading scientists and funding agencies to debate, plan and implement pan-European scientific and science policy initiatives.

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It maintains close relations with other scientific institutions within and outside Europe. By its activities, the ESF adds value by cooperation and coordination across national frontiers and endeavours, offers expert scientific advice on strategic issues, and provides the European forum for science.

# New structures for the support of high-quality research in Europe

*A report from a High Level Working Group constituted by the European Science Foundation to review the option of creating a European Research Council*

## Contents

<i>Exchange of letters between Sir Richard Sykes, Chair of the High Level Working Group and Professor Enric Banda, Secretary General of ESF</i>	i
<i>Tribute to Professor Keith Pavitt</i>	ii
<b>Introduction</b>	1
<b>Background</b>	1
The context	1
The challenges for the ERA – the need for a grand vision	2
Research in Europe – some facts and figures	3
Weaknesses in the current European science funding system	4
National versus trans-national research – current status	5
<b>A pan-European solution</b>	6
The need for an ERC	6
The ERC scope and mandate	6
Possible activities of an ERC	8
<b>The environment for an ERC</b>	10
Organisational issues – founding fathers and relationships to major stakeholders	10
Governance of an ERC	10
Financing of the ERC	11
ERC positioning vis-à-vis existing European structures and national funding bodies	12
<b>The way forward</b>	12
Initial steps towards an ERC	12
<b>Conclusions</b>	14
<b>Appendices</b>	17
1. <i>Membership of the High Level Working Group</i>	17
2. <i>Preliminary organogram showing possible ERC governance</i>	17
3. <i>Acronyms used</i>	18
4. <i>References and other relevant publications</i>	19

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27 March 2003

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*Dear Enric,*

I have great pleasure in submitting this report entitled "New Structures for the Support of High-Quality Research in Europe" to the ESF as a conclusion of the work carried out by the High Level Working Group.

I thoroughly enjoyed being involved in this exercise, and valued greatly the wisdom and debate within the team of experts assembled to analyze the issues and make recommendations. I look forward, with great enthusiasm, to the further evolution of the important concepts concerning the furtherance of European Science.

Kindest regards.

*Richard*



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11 April 2003

*Dear Richard,*

Thank you very much for the report of the High Level Working Group, which you chaired, on "New Structures for the support of high-quality research in Europe". ESF appreciates the work of all the members of the Working Group in producing this report. I particularly wish to mention the contribution made by the late Professor Keith Pavitt, whose untimely death during the work of your Group, is a major loss to European research.

I am glad to inform you that the ESF Governing Council has received and endorsed the report for publication and wide distribution among scientists and science policy makers in Europe.

A European Research Council responsible for funding the highest quality "researcher initiated" science is essential for the future development of Europe. I very much hope and urge that, based on your report, decision makers will take the opportunity to move ahead quickly in the establishment of such a body.

I recognise that there remains much to do in terms of the details of the structure, funding and mode of operation of a European Research Council. As a matter of priority, ESF will work on these issues in order to aid its realisation.

ESF, which brings together most of Europe's research councils and national research organisations, is particularly well placed to contribute to the European Research Council 'project'. It is both willing and able to evolve and change rapidly and to participate in this endeavour.

With my very best wishes.

Enric Banda

**Professor Keith Pavitt – a tribute**

Tragically Keith Pavitt died during the course of the work covered in this report. His colleagues in the High Level Working Group would like to record their appreciation of his contribution to the activities of the Group.

Through his academic work at the Science Policy Research Unit (SPRU) at Sussex University, UK in the field of science policy, he has contributed greatly to demonstrating the importance of basic research for the economic well-being of our society.

## Introduction

In the ESF Plan, 2002-2006 <sup>(Ref.1)</sup>, it was recognised that the concept of the European Research Area (ERA) as proposed by European Commissioner Philippe Busquin and accepted by the EU Member States Heads of Government in Lisbon in March 2000 inevitably increased speculation on the structures needed to deliver the concept, one of which could be a European Research Council (ERC). Such a body should have a major responsibility for the expansion of research funding for fundamental research (defined here as “science at the forefront of knowledge” as in the ESF Plan) at the European level by complementing strongly the efforts performed at a national level.

The ESF is a major player in the development of ideas on the future support of the European research base through its institutional membership – the funding agencies, national research organisations and academies of sciences and arts in 29 countries. It therefore decided that it should structure and lead a rigorous debate on both the merits and disadvantages of an ERC and the ways in which it may be achieved. To assist in this endeavour, ESF formed a High Level Working Group (HLWG) in April 2002 to review the case for establishing new funding structures, and to prepare recommendations. This report is the outcome of the HLWG’s work and as such represents a particular contribution to advancing the debate on what an ERC could, and should, be expected to deliver. It specifically addresses issues related to the **need for an ERC**, the **scope of its remit and basic principles**, its **mode of operation, institutional development**, and its **funding sources and principal funding mechanisms**.

## Background

### The context

Here at the outset of the 21<sup>st</sup> century, there is widespread agreement that the world is experiencing social, environmental, and technological change at an unprecedented rate. The continuing transition internationally in the division of labour from hands, tools, and machines to brains, computers, and laboratories makes it imperative for research policy-makers as well as public and private funders of research and technological development (RTD) to embrace the processes of assessing strengths and weaknesses, reviewing funding modes and institutional structures, and subsequently adapting to changing environments for knowledge generation.

The contribution of RTD to economic growth and competitiveness has become an essential ingredient for the sustainable development of Europe socially, environmentally, and culturally. The quality and accessibility of new knowledge and relevant RTD expertise are decisive attributes for the future well-being of our societies. This then places even more emphasis on the appropriate training of highly qualified researchers so that they can assume pivotal and leadership functions not only in our universities and research organisations, but also in business and in wider sectors of society. Providing a continuous flow of such highly qualified researchers must increasingly be seen therefore as a vital mechanism for transferring expertise out of publicly funded universities and other research organisations into society more generally.

If Europe is to address this task then it must not only recognise the requirement for change but must also establish the necessary institutional structures at the forefront of

knowledge to fulfil it. The European Research Advisory Board (EURAB) has itself supported this type of approach.

Such institutional structures should:

- prove themselves ready to take on new challenges and new research areas identified through dialogue with the various sectors of the scientific community;
- show a capability for aligning research and research support to themes of significance to mankind in the future;
- demonstrate a readiness to avoid rigid structures and so develop interdisciplinary as well as interinstitutional forms of research endeavour;
- prove their suitability for the training of future generations of researchers and for ensuring the transfer of the resulting expertise;
- show themselves ready to work with their respective international research communities in ensuring that the highest standards of achievement can be attained.

### The challenges for the ERA – the need for a grand vision

There have been several portrayals of, and aspirations for, the development of the European Research Area (ERA) articulated at the most senior policy levels. These include:

- The Lisbon European Council Presidency conclusions (March 2000) setting out a new strategic goal for the next decade “to become the most competitive and dynamic knowledge-based economy in the world”; and underlining the European Commission document on the creation of ERA with a commitment that “research activities at national and Union level must be better integrated and coordinated to make them as efficient and innovative as possible and to ensure that Europe offers attractive prospects to its best brains” and “to achieve this objective in a flexible, decentralised and non-bureaucratic manner”. <sup>(Ref.2)</sup>
- The Barcelona European Council Presidency conclusions (March 2002) calling for the adoption of FP6 and its legal instruments and agreement “that overall spending on R&D and innovation in the Union should be increased with the aim of approaching 3% of GDP by 2010” from the present 1.9 %. <sup>(Ref.3)</sup>
- The call by European Commission President Romano Prodi for “a new European Renaissance” at a conference in Brussels in June 2001 on an enlarged Europe for researchers. “Research must be the driving force behind the new European Renaissance” and “there can be no knowledge society without new knowledge” and “the main source of new knowledge is research” said Mr Prodi. <sup>(Ref.4)</sup>
- The Copenhagen European Council Presidency conclusions (December 2002) confirming agreement between the EU and the acceding States on a joint “One Europe” declaration on the “continuous, inclusive and irreversible nature of the enlargement process” to be annexed to the Accession Treaty. Europe, in terms of its intellectual capacity, will in the future go well beyond the present EU membership – a concept on which the ERA is based. <sup>(Ref.5)</sup>
- *Society, the endless frontier* – a European vision of research and innovation policies for the 21<sup>st</sup> century published by the European Commission in 1997 (EUR 17655) <sup>(Ref.6)</sup> putting the case for investing more in research and innovation or accepting a substantial fall in living standards.



A close look at the various documents listed above shows that they focus almost entirely on short- to medium-term ways to “stimulate innovation and economic growth and hence the creation of jobs”, and on “the industrial exploitation of the results of scientific research in areas such as biotechnology, information and communications technology, and soon also nanotechnology and clean energy technologies”.<sup>(Ref.7)</sup> In essence the emphasis is on turning knowledge into wealth while the essential precursor of creating the required new knowledge through the provision of public funds is largely neglected.

It can be argued that three major pillars are essential for supporting a knowledge-based Europe – **Research, Education and Innovation (REI)**. These represent broader and deeper aims of knowledge creation than just its application. This supporting REI triad coincides with that of EURAB.<sup>(Ref.8)</sup> As such, it represents the necessary underpinning for the ERA and as such constitutes **a grand vision** of what is needed as a common endeavour in Europe if we are to achieve the goal of a knowledge-based society.

## Research in Europe – some facts and figures

After endorsement of the creation of ERA at the Lisbon Council, a resolution was adopted calling on the Commission in collaboration with Member States to present a full set of indicators and methodology for benchmarking five themes, one of which was scientific and technological productivity.<sup>(Ref.9)</sup> The work of the expert group involved assessing the performance of the EU vis-à-vis the USA and Japan in scientific publishing and patenting. In the report the benchmarking data show no clear evidence that Europe is lagging behind in S&T productivity. Rather they point to an input gap, particularly in terms of private, though also in public, R&D spending.

Specifically the data show that:

- in terms of publications per inhabitant, the EU lags behind the USA (though the gap has almost halved in the period 1995-1999) and for the number of publications in relation to money spent on university research the EU appears to lead the USA;
- in terms of citations per scientific publication (one indicator of the quality of publications) the USA leads the EU although the EU represents the largest source of scientific publications – slightly ahead of the USA in absolute numbers;
- Europe lags behind the USA and Japan in terms of USA patents granted per money spent in business R&D;
- in terms of “triad patents” (patents held in the EU, Japan, and USA) per money spent in business R&D (a more appropriate indicator for USA, Japan, and EU comparisons than patent data from a national or regional patent office) some European countries (Germany, Sweden and the Netherlands) out-perform Japan and the USA, whilst the UK and France follow Japan but out-perform the USA.

From the data available the following EU performance differences can also be observed:

- two thirds of EU publications come from the UK, France and Germany;
- in terms of publications per inhabitant the Nordic countries lead, followed by the Netherlands and the UK;
- the number of publications per money spent on university R&D also shows wide divergence around the EU average, though the variation is asymmetric, with the high scorers (UK, Finland, and Denmark) over 40% above the mean, while low scorers (Germany and Portugal) are only 10% below;
- in terms of citations per paper six European countries were more than 20% above the world average in 1998, five are on or around it and only four below.

## Weaknesses in the current European science funding system

The prevailing attitude to research in Europe is driven too much by short-term needs and perceived economic and social priorities. While this is understandable and in part justified, there is an ever-present need to develop the underlying research base on which the more strategic and policy-driven research must rest. Fundamental research has therefore become a secondary target, at both the national and the wider European level. Indeed, such an approach may have a particularly deleterious effect in certain research areas, for example the humanities.

Furthermore, in emerging sectors of science and technology Europe as a whole appears to lag behind the USA and has to compete with fewer resources, for example in life sciences and nanosciences where the USA is investing far more than the EU. The gap appears to be growing more generally as a result of significant and progressive increases in research budgets for bodies such as NIH and NSF (perhaps doubling over the past five to seven years), so placing inexorable pressure on European research year by year.

**An underlying problem** is that there is at present no clear European mechanism to support fundamental research on a broad front and European support for such research suffers from particular handicaps such as:

- difficulties in mobilising funds rapidly to support emerging sectors and new research teams;
- difficulty in initiating interdisciplinary approaches;
- obstacles to the mobility of researchers;
- duplication of efforts between countries and the existence of sub-optimal competence structures.

**National research funding** currently represents the bulk of public patronage of research in Europe but:

- it is still mostly inward-looking although there has been an increasing realisation that cooperation and collaboration are a necessity – as reflected in the increasing bi- and tri-lateral approaches being taken to sourcing research funds and resources;
- national funding structures are generally closed to non-residents, especially to those who wish to work outside the country providing the funding;
- there is little coherence between national research programmes.

**The EU funding mechanisms** are often perceived as:

- complex and cumbersome with rigid procedures not conducive to encouraging fundamental research;
- having scientific quality as a necessary but not the sole requirement;
- driven by decisions taken only with certain specified advice or participation from the scientific world;
- likely to be biased as a result of the policy-driven nature of the funding;
- greatly influenced by Framework Programmes that are defined by the Treaty of Union as aiming to increase industrial competitiveness and sustain policy development;
- involving a formulation of Programmes that is lengthy and thereby creates a long reaction time, and hence is not responsive enough to a rapidly changing research world.

**Private sector investment in research** that:

- is, with some notable exceptions, normally short term and aimed at strategic or applied aspects;
- may have only a limited interest in long-term basic research;

- has tended, in the recent past, to be biased towards short-term funding of applied research aimed at addressing near-term problems;
- may have viewed university research as a cheap option, rather than an excellent option, to in-house research.

**Private funding organisations (trusts and foundations) involvements in research** are:

- less prominent in long-term research funding than is the case in the USA;
- less diversified than in the USA so there are less opportunities for researchers to approach such funding bodies, other than in the medical area.

## National versus trans-national research – current status

The following features are characteristic of the present position:

- the overall picture for Europe is not completely bleak as it shows important strengths that often represent untapped potential. For example, a network of national and European research infrastructures (large machines such as particle accelerators and neutron reactors, oceanographic vessels, museums with rare collections, libraries with archives, and similar resources), which, for most of them, have been built or developed during the last decades and support a range of research activities across a breadth of scientific communities. Such infrastructures can catalyse pan-European cooperation;
- laboratories that often approach scientific issues using complementary methods and points of view. This diversity is a real asset in addressing interdisciplinary issues and problems with a European dimension;

- imminent EU enlargement that will bring new actors from countries with a research tradition into play in the ERA. But with this will come a serious risk of an internal and external brain drain particularly in cases where scientific excellence in such countries could not be supported adequately.

Although on occasion they have had their problems, the EU Framework Programmes have contributed in a huge way to stimulating European research cooperation. In particular, recent initiatives in mobility (for example, the Marie Curie Fellowship scheme), multidisciplinary programme initiatives (for example, New and Emerging Science and Technology – NEST), and initiatives fostering access to research infrastructures have stimulated and will continue to stimulate research cooperation.

The realisation that there is a need to assemble a critical mass of researchers or to develop projects beyond the capacity of a single nation, however large, has led to the evolution of important collaborative arrangements. However, these have mainly centred on particular infrastructural facilities and/or certain European laboratories, for example CERN, ESRF, ILL, and/or organisations focused on specific areas such as EMBL in molecular biology, ESA in space research, and ECMWF in weather forecasting.

Research networking is a European strength because the necessity to work together has been recognised. Indeed, COST in 1971 and ESF in 1974 were established precisely to fulfil this need. Their coming together in the future will strengthen the research community.

In addition to networking, the ESF is now stimulating other cooperative actions including Forward Looks and the European Science Foundation Collaborative Research

Programmes scheme (EUROCORES) (now also supported through the Framework Programme) that bring the funding agencies together to promote common research priorities. Other groupings also exist in particular research areas (such as EMBO) that are very effective in bringing researchers together.

Bi- and tri-lateral initiatives are also promoted by national research funding organisations. There has been an increase in such arrangements over the recent past. However, they tend to be on the basis of each cooperating partner paying the costs of their own participants, which can limit their overall effectiveness.

## A pan-European solution

### The need for an ERC

The creation of an ERC should result in:

- a strengthening of research quality in Europe;
- developing capacity across the continent;
- promoting the best research through competition at a European level.

There are some basic principles that should define any new research funding body for Europe such as an ERC, therefore certain criteria can be devised that reflect these, namely:

- An institutional system which encourages and nurtures scientific excellence in Europe, irrespective of origin and without the expectation that all European States will necessarily receive a return proportional to their investment – so no *juste retour*.
- An institutional system which encourages the use of scarce and valuable resources,

research infrastructure and databanks within Europe for the greater good of European research thereby encouraging scientific approaches that are important to the overall well-being of Europe.

- An institutional system that attracts and retains outstanding scientists and scholars (researchers) within Europe.

The first of the three above criteria would bring a clear European dimension to a new funding body, whilst the other two can be seen as crucial operational characteristics.

The various consultations and discussions that have taken place recently in Europe at various levels have tended to support a consensus that an ERC was not only necessary but timely and so would be to the advantage of European research. This was the conclusion of the conference organised by the Danish Research Councils under the auspices of the EU Danish presidency and also reflects the views of organisations such as All European Academies (ALLEA), Academia Europaea, Euroscience, and the Marie Curie Fellowship Association (MCFA). The European Research Advisory Board (EURAB) has also recommended the creation of the ERC with a focus on fundamental research. We consider therefore that the creation of the ERC could develop a dynamic for basic research in Europe thereby promoting scientific excellence on a broad front.

### The ERC scope and mandate

(see also W. Krull, *Nature* 419, p. 249) <sup>(Ref.10)</sup>

Despite the fact that the Framework Programmes, especially in their infrastructure and mobility-related activities, provide numerous opportunities for supporting transnational research, it still holds true that apart from a few research areas such as astronomy, space research, nuclear physics and, to a limited extent, molecular biology, Europe

suffers from an almost total lack of trans-national funding for fundamental and strategic research. European research needs institutional reform at all levels if it is to keep pace with the rapid changes inherent in Europe becoming a knowledge-based economy. It is increasingly desirable, even urgent, to establish pan-European funding structures capable of creating both a cooperative climate for the development of new ideas, and an institutional environment to produce more cutting-edge results through enhanced competition among the best researchers across Europe.

An ERC, which should encompass all disciplines (including the humanities and social sciences), could act as a spearhead for institutional reform; a catalyst for new inter- and transdisciplinary research activities; a creator of new trans-national funding opportunities for young researchers; and last but not least, the provider of a more research-friendly administrative and organisational environment urgently needed to attract more foreign researchers. As a result of such involvements it would be well-placed to provide advice on research policy as another activity strand. It could also address topics of a fundamental nature related to European well-being and societal issues at a pan-European level which may well be inappropriate or too sensitive to be addressed in one country alone; for example trans-border issues such as water management or other environmental concerns that call for scientific approaches.

From a European standpoint, compensating for weaknesses in existing research training schemes and overcoming deficiencies in assessment processes of national research councils are just two of the more obvious pressing reasons for rethinking European research funding structures. But other equally important reasons also exist that justify the establishment of a research council at a European level.

These are exemplified in the candidate activities of an ERC such as:

- Setting priorities in trans-disciplinary research, and providing incentives for initiating new areas of innovative science and scholarship.
- Adding a clear European dimension to the competition for some of the most prestigious grants and awards.
- Establishing leading-edge collaborative research centres of appropriate size in basic and strategic research areas that call for integrative approaches from different disciplines.
- Making better use of existing large facilities by providing improved support for trans-national access to them.
- Offering additional funding opportunities and new career structures for young postdoctoral researchers, and thus enabling them to pursue their own ideas in an internationally supported, highly stimulating environment.
- Providing the focal point and support for European participation in large international programmes of global dimension and dealing with global problems so avoiding current difficulties where the European “voice” is dispersed and lacks a commonality of position.

These broadly defined areas of activity need to be specified in more detail but they represent initial indications of funding needs and priorities which are neither adequately covered by national research councils or their respective agencies. Nor are they adequately covered by the European Commission and its multi-faceted, predominantly pre-competitive, industry or policy-oriented R&D programmes. Furthermore these areas of activity cannot just be added to those covered by existing funding structures because they require both a different way of thinking strategically and of interacting with the specialist area concerned. They also need a

more research-friendly, less bureaucratic, but nevertheless well-organised and rigorous selection process, which cannot obviously be grafted onto existing mechanisms.

In summary, an ERC should be a platform to support research in Europe by mobilising the scientific communities in Europe to define goals, envisage new modes of European cooperation and consider their infrastructural needs. This means that an ERC has to aim for high potential, high science-gain endeavours that:

- are scientifically excellent;
- have a European dimension;
- develop long-term perspectives for funding science;
- encourage bottom-up approaches;
- give priority to emerging areas, new teams, and multidisciplinary research;
- are able to cover the whole research spectrum, including the humanities;
- have transparency in their decision-making processes;
- stimulate multipartner multinational collaborative approaches;
- stimulate capacity building.

Openness, flexibility (including recognition of the possible need for variable geometries in relation to national inputs) and speed should be assured in transparent decision-making and funding processes. To be successful an ERC must be held in high esteem by the scientific community and indeed more widely.

An ERC should be complementary to existing national and European bodies. It would exist to provide a trans-national funding opportunity thereby stimulating both collaboration and competition with teams competing for funds at a European level. The expected result would be to raise the quality of research and provide a European quality benchmark. It would focus attention on fundamental research and therefore increase the dedicated funding in this area, which is mostly public,

and which is much lower than the analogous USA federal budget.

Although an ERC should primarily be a research funding organisation its activities would make it a natural and valuable resource for providing advice on research policy. Here its involvement could make a key contribution to addressing current problems, such as:

- duplication, fragmentation and isolation of research effort;
- possible wastage of (national) funds in supporting research of questionable potential;
- constraints on researcher mobility in Europe; such as incompatibility and non-transferability of social benefits, rights and procedures.

In its activities overall ERC would need to take full account of good research practice, ethical issues and the encouragement of science versus societal relationships (for example, accountability of scientists and their professional work).

### Possible activities of an ERC

**An ERC must focus on excellence as the basis for its funding decisions.** Its activities would have to be based on well-defined funding initiatives. It would be expected to fund research programmes and researchers that qualify for support within national systems. It would not compensate for national and regional discrepancies but its actions could provide a means of focusing additional support. In funding both people and projects the importance of investigator-led exploration should be recognised in each case whether on its own, or when combined in interdisciplinary programmes.

Some anticipated areas of ERC activity are categorised below and the principles and characteristics of them outlined. The list is



not necessarily exclusive so other areas might be identified in future. Furthermore it should be recognised that in ERC activities all disciplines could be involved so there would be no a priori thematic priorities and also no exclusion of long-term research activities relating to the social and economic well-being of Europe.

### **Research programmes**

Appropriate characteristics here would include:

- support for projects in emerging areas proposed by research teams;
- facilitation of coordination of programmes in research (EUROCORES mode);
- diffusion of new ideas through conferences, workshops and similar initiatives.

### **Individual researcher support**

Essential features of this category would be that they:

- add a clear European dimension to competition for some of the most prestigious grants and awards;
- provide opportunities carrying high distinction for senior researchers to conduct research at any European research centre of their choice (for example, by instituting a Distinguished European Research Fellow award);
- support individual researchers (at post-doctoral level) through fellowships and grants to initiate new projects by offering additional funding opportunities and new career structures for young postdoctoral researchers thereby enabling them to pursue their own ideas in an internationally supported and highly stimulating environment.
- support young researchers and foster their mobility in a European context to encourage the enrichment of regions needing scientific development.

### **Research networking**

This activity should include:

- building on existing networking structures including those of COST and ESF;
- providing a focal point for European input to global cooperative research programmes and development of a European “voice” to further European research leadership.

### **Research infrastructure**

The aim here should be to:

- provide better use of existing large facilities with a European dimension (instruments, databanks, and similar) by providing enhanced support for trans-national access to them;
- assess needs and stimulate the creation of medium- to large-scale facilities beyond the scope of one country (for example, clustering of imaging techniques, establishing central animal repositories);
- aim in the longer term to help create critical mass through the establishment of leading-edge collaborative research centres of appropriate size in basic and strategic research areas that call for integrated approaches from different disciplines.

### **Research policy**

Here the aim should be to provide an important voice making an input to:

- analysing the circumstances of basic research on a continuing basis and launching new branches of research when needed in a flexible way;
- identifying new research priorities, especially those in cross-disciplinary research areas, and providing incentives for fostering new areas of innovative science and scholarship;
- providing a quality yardstick (benchmark) for researchers and research institutions across Europe;
- providing a focus for the deployment of structural funds for capacity-building.

### Dissemination of science information

In contributing to the effectiveness of scientific dissemination an ERC would be expected to:

- address and promote developments at the science-public interface;
- provide information between the research community and the public at large in an interactive manner including the use of the Internet for rapid access to science-related information.

## The environment for an ERC

### Organisational issues – founding fathers and relationships to major stakeholders

In this section of the report a vision is provided of the operating principles by which an ERC could work. These principles embrace a commitment to quality, good research practice, and ethical standards achieved through a simple and flexible structure that is not burdensome for the scientific community involved.

First, an ERC would need to be established through an initial founding document guaranteed at the highest political level in Europe. It would also require substantial trans-national funding so that it can have a real impact on research across Europe.

It is considered essential that an ERC covers all areas and operates independently of the rigid controls imposed under existing EU structures, national prejudices and bureaucratic impediments. This initiative must not lead to the creation of another bureaucratic behemoth although the ERC will have transparent and accountable structures and processes. There is substantial support for giving the role of establishing an

organisational and governance framework to one of the few existing coordinating bodies that are independent of the political structures of Europe.

### Governance of an ERC

**A** Governing Body or “Senate” with a membership limited to, say, 20-30 is advocated. Eminent researchers should be in the majority, the balance (perhaps around one third of the membership) comprising independent people and others representing various European interests such as the European Commission and appropriate social and economic sectors. The members of the Governing Body should be appointed *ad hominem* and not be *ex officio* or delegates of other bodies. They might, with advantage, be appointed by European Ministers in order to endorse legitimacy, though other options could be devised.

Such a Governing Body would have overall legal authority for the ERC and as such would be responsible for the appointment of its Chief Executive and other senior officials. It would also bear formal responsibilities with regard to the presentation of budgets and accounts and their propriety as well as ensuring both legal and ethical compliances of its officials and their activities. It would set overall strategic scientific and organisational priorities and give account of its activities and future thinking to appropriate European bodies, institutions and the public at large. Its credibility would rest on the calibre and standing of its membership. The individual members would be, in the main, eminent researchers and/or experienced research managers and the various scientific domains would need to be represented amongst them. Such a structure is well known across Europe in many research organisations and universities and its formulation should not pose a problem.



There should also be an “Assembly” of stakeholders including research councils and national research organisations (broadly comparable with the ESF Member Organisations), representatives of European states, and of other European research organisations from the wider research community. It would provide advice to the ERC through its “Senate” on general policy matters. This “Assembly” should also be the nominating body for around two thirds of the “Senate” with the other third being comprised of independent people representing various European interests.

The ERC would need to structure advisory panels for its work. Such panels, comprising acclaimed researchers, would take responsibility for the various funding initiatives. Here the trans-national and transdisciplinary nature of ERC activities should be emphasised, so rigid discipline-based committee structures would not be appropriate. The “Assembly” would be the source of names for membership of these panels. A peer-reviewed process, unimpeded by political or administrative burdens should be the principle behind the mode of operation.

The panels and their overall operation would have to be supported by an appropriately sized, but “lean”, administration to service the need for legal and financial control, personnel and IT functions in addition to scientific management and support. *(See organogram in Appendix 2).*

## Financing of the ERC

**A** key requirement for being successful and achieving a real impact is that an ERC has significant financial resources. There also has to be medium- to long-term stability in relation to both the level and sourcing of these resources. The funding involved needs to be new money or “additional money” rather than financial resourcing achieved through the re-allocation of existing funds. It is recognised that implicit in the provision of such new research funding through an ERC structure would be that it should demonstrate inherent and genuine European added value.

Clear ownership of a newly funded ERC must therefore be identifiable. To achieve this an ERC should be recognisably funded by the EU, national governments and possibly from private sources. However, a major funding source should be the EU budget. Components of the existing Framework Programme, which by their very nature would fit within the ERC, could be transferred from the Framework Programme (FP6) budget to the ERC. This is justified because reaching the Barcelona target underlines the need to shift resources from present day issues to long-term investment in science. If such a decision on repartitioning the FP budget were to be taken, and this may require changes to the Treaty and appropriate designation of financial oversight and audit responsibilities, then the use of already committed EU funding designated for R&D to the extent of several billion euros might well be under discussion and a significant element of this could become available to the ERC.

By using such an approach the ERC would not be removing financial resources from the FP or related initiatives at Commission level, other than for those action lines that would be moved to the ERC. In addition, further funding flexibility may be achieved to complement the EU core funding through a variety of additional contributions such as

from national sources, industry and private trusts and foundations. A longer-term aspiration would be to become successful in attracting financial support from private industry.

To illustrate the potential development of an ERC from start-up, a possible budget outline might be seen as involving:

- Year 0:** coordination of existing funds transferred to ERC stewardship
- Year 2-3:** 500 million euros additional money for the overall budget
- Year 5:** achieving a budget equivalent to a major Member State funding council (e.g. UK)
- Year 10:** achieving a position competitive with major global funding streams (compare USA)

### ERC positioning vis-à-vis existing European structures and national funding bodies

As indicated above, in looking at the existing Framework Programme, it can be seen that there are already component activities that would be identifiable as appropriate for inclusion in an ERC. For example, the Marie Curie Fellowship scheme supporting individual researchers, the NEST scheme, and those initiatives covering access and support for research infrastructures. Such programmes should move from the somewhat cumbersome administrative environment of the Framework Programme to the less burdensome and more flexible style of an ERC thereby providing a more effective and efficient management environment. The policy-driven and industrial competitiveness-driven parts of the Framework Programme would not be appropriate for the ERC and should remain within the present EU structure.

An ERC must remain complementary and not competitive to (or an alternative to) national research funding schemes. National research bodies could provide additional funds on an *à la carte* basis to help coordinate national endeavours. There are possibilities for voluntary contribution depending on the programme and its relationship to national science policies and strategies (as in the ESF EUROCORES scheme). In fact, in the ESF, the new EUROCORES instrument provides a useful precursor for operating research funding in fundamental science at the European level and experience with this instrument would be important. Similarly, the European Union Research Organisations Heads of Research Councils – European Young Investigators Awards (EUROHORCs EURYI) scheme is another useful precursor to the ERC, as are analogous schemes operated in different disciplinary areas, such as those of EMBO.

## The way forward

### Initial steps towards an ERC

A consensus is emerging that the formation of an ERC is the logical and essential next step for European research (*See Appendix 4: References and other relevant publications*). This was again emphasised throughout various meetings and studies that have taken place during 2002 (for example Towards a European Research Area – Do we need a European Research Council? – a conference organised by the Danish Research Councils, Copenhagen, October 2002).<sup>(Ref.11)</sup>

However, there is a need for strong political endorsement of the concept of an ERC as a necessary element of the ERA. This is crucial because the creation of an ERC has to achieve a significant early impact with a

secure basis for the resources needed to develop in the medium term into a large funding provider comparable to American funding institutions. It has to win the confidence of the research community quickly and through its funding capabilities be regarded as an attractive funding source. In short the development of an ERC must be built on the trust of the scientific community.

Initially, maximum use should be made of subsuming relevant existing EU, intergovernmental, national and other European resources and structures into an ERC in order to establish a platform of operation at an early stage. These could include support for young researchers, European Fellow Mobility and Research Grants schemes, and several existing transnational programmes such as NEST, MCF, and EUROCORES.

If an ERC is to be established, the HLWG believes that its development should be phased and that a clear evolutionary path should be agreed at an early stage so that the “vision-led” programme of developing a budget and infrastructure can be planned and managed effectively. An ERC mission, once developed, should set out a number of clear goals, which themselves would reflect the various phases through which the institution would mature and grow. Strategically, initial goals would focus on defining clear evolutionary paths, building a critical funding mass and establishing credibility and prestige. Operationally, the early phase would concentrate on investing in people and in developing programme funding. Ultimately, an ERC should be seen as one of the major funding councils in the world with substantial resources to stimulate and support major programmes of scientific exploration. To achieve this the ERC from the outset has to have a legally guaranteed autonomy and here there may be several options to be examined. As a European organisation it will also need a privileged fiscal status.

Two scenarios can be envisaged for creating an ERC :

- The *ex nihilo* creation of a new organisation which will implement the objectives that have been outlined above for an ERC. Similar approaches have been used in the past in Europe to achieve analogous objectives (such as the creation of CERN, ESO, EMBO, ILL, and JET) employing different legal instruments.
- The transformation of an existing organisation which would take responsibility for implementing the objectives of an ERC. In this case the ESF might be seen as an organisation whose goals are close to those of an ERC, thus inviting consideration of an option in which an ERC is created through a transformation of the ESF.

One possibility if the first scenario found favour could be that the ESF might constitute the Assembly of the future ERC. The second scenario would imply a fundamental transformation of the governance structure of the ESF which some might not see as desirable. The preference of those holding such a view might be that the ESF remain as an advisory voice of large European non-governmental organisations and an ERC be constituted as a new and independent body, but perhaps with strong links to the ESF acting in an advisory capacity.

However, there is a need for some urgency in the present situation. By now the ERA needs to be seen as credible and not just wishful thinking. It urgently needs tangible expression and a dynamic that an ERC could provide. More widely, the EU has to demonstrate that the Lisbon and Barcelona Council conclusions <sup>(Ref.2,3)</sup> constitute credible aims for Europe. Research is never static, so identifiable actions constituting the means of achieving such aims are now overdue. Establishing an ERC can again provide these.

To achieve its implementation with minimal delay there are attractions in building on a legal entity that already exists rather than drafting the necessary legal instruments *ab initio*. ESF is a well-established pan-European, non-political and non-governmental organisation rooted deeply in the world of science with a first-class record of initiatives and programmes. It is also a European body in which all relevant national organisations are represented. It is recognised that any proposal for transforming ESF in appropriate ways to create an ERC will involve a complete reappraisal of the ESF mission and its operating modes together with the necessary changes of legal statute. But this course of action is likely to be a speedier and more appropriate implementation route than establishing a completely new legal entity.

## Conclusions

The context of the argument for establishing an ERC as set out in this report is compelling. The contribution of RTD to economic growth and competitiveness is indisputable and so is an essential ingredient for the sustainable development of Europe. While benchmarking data show no clear evidence that Europe is lagging behind in S&T productivity as compared to the USA and Japan they do point to an input gap in terms of R&D spending. In particular fundamental research has become a secondary target especially in emerging sectors of science and technology. There is presently no clear European mechanism to support fundamental research on a broad front and so European support for it inevitably suffers.

If Europe is to address this problem then it must not only recognise the requirement for change but also establish the necessary institutional structures for achieving it. An ERC encompassing all areas (including the humanities and social sciences) could act as a spearhead for much needed institutional reform not least as a necessary element of the ERA. By now ERA needs to be seen as credible – it urgently needs the tangible expression that an ERC could provide.

So some straightforward conclusions can be formulated as a result of the discussions of the HLWG and the analysis provided in this report. These are:

- **A strong recommendation is made for the creation of an ERC which should be regarded as being the cornerstone for the ERA and the key approach to developing a locus for basic research in Europe.**
  - **The ERC mission would be to bring a European context to the support of long-term fundamental curiosity-driven research judged on the basis of excellence and merit. To achieve this it would, among other things:**
    - **provide incentives for initiating new areas of innovative science and scholarship;**
    - **bring a clear European dimension to competition for some of the most prestigious grants and awards;**
    - **establish leading-edge collaborative research centres of appropriate size in basic and strategic areas requiring integrative approaches from different disciplines;**
    - **foster better use of existing large facilities by improving support for trans-national access to them;**
    - **set priorities in transdisciplinary research;**
    - **offer funding opportunities and career structures for young postdoctoral researchers enabling them to pursue their own ideas in a stimulating international environment;**
    - **provide a focus for European participation in global programmes.**
- Such activities and involvements would provide an essential second pillar of European science that strengthens the science base by supporting fundamental (often interdisciplinary), bottom-up, longer-term research endeavours.**
- **An ERC should have a significant degree of operational freedom and employ simple and flexible management structures and procedures that are not burdensome for the scientific community that it serves. However, involvement of appropriate stakeholders (relevant national agencies) in its governance, for example through membership of its proposed Assembly, is a necessary feature for its financial overview, audit and overall public accountability.**
  - **Accepted policy imperatives endorsed at the highest level indicate that the need to establish an ERC is urgent. This is likely to be achieved most effectively through use of an already legally constituted body with the appropriate culture, characteristics, and stakeholders, such as ESF. This would require a complete reappraisal of its role and mode of operation.**



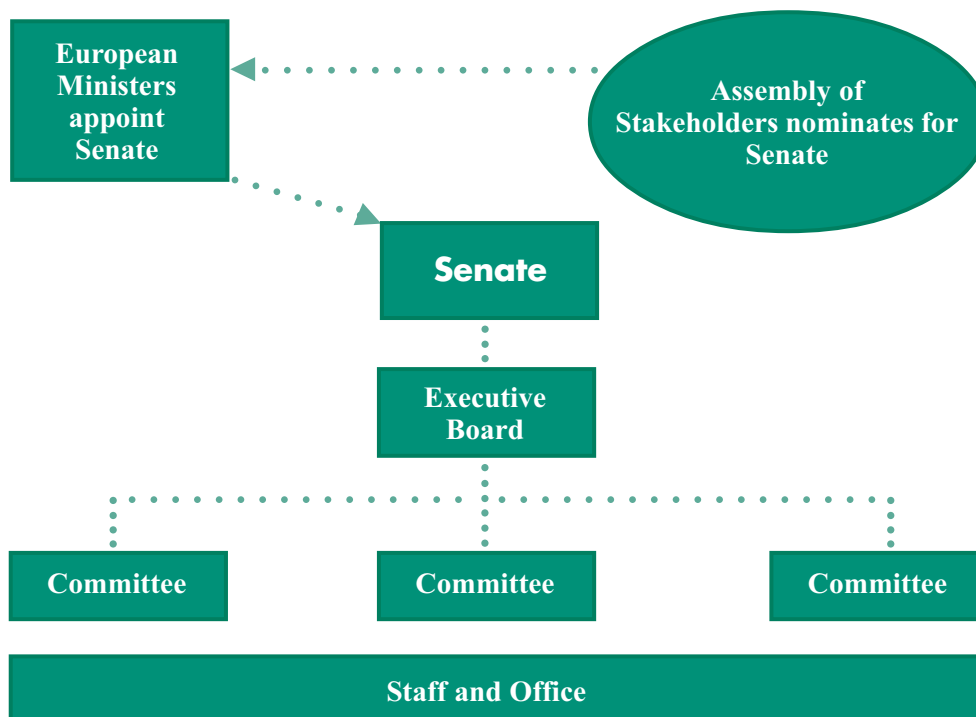
## Appendix 1: Membership of the HLWG

- Sir Richard Sykes (Chair)**, *Imperial College London*
  - Professor Bertil Andersson**, *Linköping University*
  - Professor Katherine Richardson Christensen**, *University of Aarhus*
  - Dr Jean-Pierre Contzen**, *Instituto Superior Técnico, Lisbon*
  - Dr Marion Guillou**, *Institut National de la Recherche Agronomique*
  - Professor Nicola Cabibbo**, *Università di Roma – La Sapienza and Istituto Nazionale di Fisica Nucleare*
  - Dr Wilhelm Krull\*\***, *Volkswagen Stiftung*
  - Professor Jerzy Langer\*\***, *Polska Akademia Nauk*
  - Professor Gonzalo Leon\***, *Universidad Politecnica de Madrid*
  - Professor Pierre Papon\*\***, *Ecole de Physique et Chimie industrielles, Paris*
  - the late Professor Keith Pavitt**, *Sussex University*
  - Professor Ernst-Ludwig Winnacker (Deputy Chair)**, *Deutsche Forschungsgemeinschaft*
  - Dr Chris Towler\*/\*\***, *Imperial College London*
- Professor Enric Banda** and **Mr. Tony Mayer**, *European Science Foundation*, attended Working Group meetings in support of the Group.

\* In attendance / support for team    \*\* Editorial team of the report  
 + member until his appointment to the Ministry of Science and Technology, Spain

*Final report drafting by Science Consultancy Ltd, UK*

## Appendix 2: Preliminary organogram showing possible ERC governance



## Appendix 3: Acronyms used

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<b>ALLEA</b>	_____	All European Academies
<b>CERN</b>	_____	European Organisation for Nuclear Research
<b>COST</b>	_____	European Cooperation in the Field of Scientific and Technical Research
<b>EMBL</b>	_____	European Molecular Biology Laboratory
<b>EMBO</b>	_____	European Molecular Biology Organisation
<b>ERA</b>	_____	European Research Area
<b>ERC</b>	_____	European Research Council
<b>ESA</b>	_____	European Space Agency
<b>ESF</b>	_____	European Science Foundation
<b>ECMWF</b>	_____	European Centre for Medium-Range Weather Forecasts
<b>ESO</b>	_____	European Southern Observatory
<b>ESRF</b>	_____	European Synchrotron Radiation Facility
<b>EURAB</b>	_____	European Research Advisory Board
<b>EUROCORES</b>	___	European Science Foundation Collaborative Research Programmes scheme
<b>EUROHORCS</b>	___	European Union Research Organisations Heads of Research Councils
<b>EURYI</b>	_____	European Young Investigators Awards
<b>FP</b>	_____	Framework Programmes (currently FP6)
<b>HLWG</b>	_____	High Level Working Group
<b>ILL</b>	_____	Institut Laue-Langevin
<b>JET</b>	_____	Joint European Torus
<b>MCF</b>	_____	Marie Curie Fellowship (scheme)
<b>MCFA</b>	_____	Marie Curie Fellowship Association
<b>MPG</b>	_____	Max-Planck-Gesellschaft
<b>NEST</b>	_____	New and Emerging Science and Technology Work Programme (FP6)
<b>NIH</b>	_____	National Institutes of Health (USA)
<b>NSF</b>	_____	National Science Foundation (USA)
<b>REI</b>	_____	Research, Education and Innovation
<b>RTD</b>	_____	Research and Technology Development
<b>S&amp;T</b>	_____	Science and Technology



## Appendix 4: References and other relevant publications

### References

- (Ref.1) European Science Foundation. Plan 2002-2006
- (Ref.2) Lisbon European Council Presidency Conclusions (March 2000) (<http://europa.eu.int/council/off/conclu/index.htm>)
- (Ref.3) Barcelona European Council Presidency Conclusions (March 2002) (<http://europa.eu.int/council/off/conclu/index.htm>)
- (Ref.4) Address by European Commission President Romano Prodi at a conference on: An enlarged Europe for researchers (re: COM (2001)331, Brussels, June 2001) (Prodi – researcher mobility can contribute to European Renaissance. Cordis 17001: 2001-06-28)
- (Ref.5) Copenhagen European Council Presidency Conclusions (December 2002) (<http://europa.eu.int/council/off/conclu/index.htm>)
- (Ref.6) *Society, the endless frontier – a European vision of research and innovation policies for the 21<sup>st</sup> century.* P. Caracostas and U. Muldur. European Commission (EUR 17655; ISBN 92-828-1186-7)
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