



European Economic and Social Committee

INT/286
Five-Year Assessment of
Community research
activities (1999-2003)

Brussels, 17 May 2006

OPINION

of the
European Economic and Social Committee
on the
Communication from the Commission to the Council, the European Parliament,
the European Economic and Social Committee and the
Committee of the Regions
Responding to the Five-Year Assessment of Community research activities (1999-2003)
carried out by high level independent experts
COM(2005) 387 final

On 24 August 2005 the Commission decided to consult the European Economic and Social Committee, under Article 262 of the Treaty establishing the European Community, on the

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The Section for the Single Market, Production and Consumption, which was responsible for preparing the Committee's work on the subject, adopted its opinion on 25 April 2006. The rapporteur was Mr Braghin.

At its 427th plenary session, held on 17 and 18 May 2006 (meeting of 17 May), the European Economic and Social Committee adopted the following opinion by 108 votes to one with one abstention.

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1. **Gist of the Opinion**

- 1.1 The EESC values and supports the efforts made in the third five-year assessment and the engagement on a large scale of such high-powered intellectual resources and hopes that the recommendations from the various groups of experts, and particularly the panel responsible for the overall assessment¹, will serve as a constant point of reference in the implementation of the framework programmes, in the future framing of the research and innovation policy and, more generally, in the policies implementing the Lisbon Strategy.
- 1.2 The EESC has repeatedly expressed its support for substantially increasing the European R&D budget and therefore regrets the proposed reduction of this sum because it contradicts the priority of development imposed by competitive global challenges and called for by the Lisbon strategy.
- 1.3 The EESC stresses the importance of greater commitment by industry to research and innovative development to achieve the Barcelona Council goal and hopes to see more focused efforts at communication and at involving companies and producers' organisations and associations in order, among other things, to identify strategic fields of research in which European research excellence could emerge.

¹ Five-Year Assessment of the EU Research Framework Programmes 1999-2003, European Commission, DG Research, 15.12.2004.

- 1.4 The EESC calls for instruments to be developed to encourage private funding of research and development (from risk capital and venture capital to targeted EIB funding and credit facilities for research) to smooth the path from research results to specific business initiatives.
- 1.5 The EESC agrees with the panel's position on the need to offer researchers greater autonomy and responsibility (albeit while respecting ethical principles), to give careers in science a higher profile, to guarantee greater interdisciplinary as well as spatial mobility and to integrate the Marie Curie system of grants with national and regional programmes and use them specifically to boost mobility between public and private sectors.
- 1.6 The EESC calls for priority to be given to policies aimed at developing university teaching in science and engineering, increasing the number of female researchers, making careers in science more attractive and bringing researchers working abroad back into the European Union. It would also be helpful to have more science and technical courses in upper secondary education and a policy for promoting science as a degree option at university.
- 1.7 In the interests of simplification, the EESC hopes to see calls for proposals which have clearer types of schemes and activities and categories of participants, greater flexibility and freedom of choice for the applicant, and simple guides on administrative and financial management, especially for the Contractual Agreement between participants.
- 1.8 The EESC suggests an ongoing evaluation of the effectiveness of the procedures used, including those for checking formal compliance and assessment, and, in well-defined development projects, the inclusion of checkpoints at which activities and anticipated results are monitored at precise and predetermined stages. Provision of funding and the continuation of the project itself should be conditional on such monitoring.
- 1.9 The EESC also suggests investing particular efforts into putting in place a series of indicators which would allow real measurement of performances in terms of competitiveness and development. Such research performance indicators should measure the efficacy of funded activities in terms of further scientific progress, the EU's global development and targeting the priorities in future activities.

2. **The challenges facing European research**

- 2.1 The third five-year assessment (1999-2003) of the framework research programmes is an analytical exercise of great scope and depth². In the main, the EESC agrees with the analyses and recommendations put forward by the panel of experts and endorsed by the Commission. In the light of global competition and the Lisbon Strategy and Barcelona Council goals, the

² The assessment process involved numerous documents and reports, available to the public on the site <http://forum.europa.eu.int/Public/irc/rtd/fiveyearasskb/library>.

EESC stresses the necessity and urgency of giving careful consideration to the priorities and underlying aims of Community research, particularly with a view to increasing the involvement of the production sectors.

2.2 The reality today is that scientific and technological innovation is increasingly proceeding through the cross-fertilisation of different disciplines involving extensive multidisciplinary interaction between universities, companies and the outside world, rather than exclusively according to a linear model in which innovation is the work of basic research (mostly at the academic level), while development and application compete with industrial research – a model which has governed scientific research until recent years³. The key characteristics of research today are cooperation, interactive learning, uncertainty and risk.

2.3 The interactive model explains the success of regional clusters: these form a "system" which acts beneficially on the behaviour of companies and universities, as well as creating the right social and cultural context, an effective organisational and institutional framework, an infrastructure network, and regulatory systems equipped to take on the challenges of competition.

2.4 **Global competition**

2.4.1 Europe is facing an unprecedented challenge in terms of global competition and potential for growth and is tackling this less efficiently not only than its traditional competitors, but also than the major emerging countries. Growth rates of R&D spending in India and China in particular are extremely high, reaching almost 20% p.a. in the latter country, which is expected to match the EU's R&D spending as a percentage of GDP in 2010. Many European companies invest in China not only because of lower costs, but also because of the favourable combination of highly-skilled manpower and large and dynamic markets for technologies and high-tech products⁴. Since research and innovation are key factors in responding to such challenges⁵, Europe must mobilise sufficient funds and all its intellectual resources to promote science, technology and innovation⁶.

2.4.2 The most recent figures, however, make disturbing reading, with spending on research stuck at around 1.9% of GDP since 2001. If annual growth were to remain at the 2000-2003 rate

³ See: Keith Smith, *The Framework Programmes and the changing economic landscape*, European Commission, JRC/IPTS, Seville, December 2004, pp. 11-12.

⁴ Potočník, preface to *Key Figures 2005 - Towards a European Research Area Science, Technology and Innovation*, DG Research, 2005, p. 5.

⁵ The EESC has addressed this subject at length in a number of opinions, most recently INT/269 CESE 1484/2005 Opinion on the seventh framework programme for research and training, rapporteur Mr Wolf, points, 2.2, 2.3, and 2.4.

⁶ See the introduction by the chairman, Erkki Ormala, and the Five-Year Assessment of the EU Research Framework Programmes 1999-2003, cit.

(0.7%) until 2010, the figure would be no higher than 2.2% of GDP. It must be remembered that the USA's larger GDP means that its R&D activity is far greater in absolute terms, which means it can more easily achieve the necessary critical mass. The main reason for the gap in Europe's R&D spending and that of its main competitors is the lower private sector input (55.6% of total spending in the EU in 2002 against 63.1% in the USA and 73.9% in Japan). More alarmingly still, private funding of research fell in the same period and better overall conditions seem to be attracting European private investments to other parts of the globe: in the 1997-2002 period, European businesses increased research investment in the USA by 54%, in real terms, compared with 38% in the opposite direction⁷.

2.5 The key goals

2.5.1 The EESC concurs with the analysis identifying four key goals:

- attract and reward the best talent;
- create a high-potential environment for business and industrial RTD;
- mobilise resources for innovation and sustainable growth;
- build trust in science and technology.

2.5.2 Comparing and coordinating Community and national research policies is vital to meet the key challenge laid down by the Barcelona Council – allocating 3% of GDP to research before 2010 and, in the process, increasing to two-thirds the amount of research financed by the private sector. This goal can only be achieved if a) Europe makes itself more attractive to investors in research, b) the right framework conditions are put in place to increase the efficacy of research, c) the stimulus effect of public investment in private research is boosted, and d) research policies are made more efficient and coherent at both Community and national level⁸.

2.5.3 In the light of the analyses carried out in the assessment process and the views expressed by many stakeholders, the EESC believes a more incisive intervention is needed, with actions coordinated between the Commission and the Member States, to improve the insufficiently research-friendly environment. A package of direct measures needs to be conceived to make the system more innovative and competitive at EU level: fragmentation and inadequate coordination of forces is an obstacle to achieving critical mass and the necessary focus. The very different job also needs to be tackled of comparing and coordinating not only national research policies, but also policies of education and human resources development, intellectual property protection, innovation development through fiscal leverage, constructive and synergetic collaboration between universities and companies, and so on.

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All the figures in this point are taken from: Key Figures 2005, cit. pp. 9-10.

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See the preamble and Key Figures 2005, cit., p. 3.

2.6 Recommendations concerning future European research policy

- 2.6.1 The EESC has repeatedly expressed its support for substantially increasing the European R&D budget in the future and in so doing has strongly backed the Commission's proposal for increased funding of the 7th Framework Programme and, eventually, for a subsequent long-term increase⁹. It does not welcome the prospect raised by the Council that this amount would be substantially reduced to around 5% of the EU's general budget instead of the 8% envisaged by the Commission and believes that this contradicts the priority of development imposed by competitive global challenges and called for by the Lisbon strategy.
- 2.6.2 The EESC has always supported the creation of a European Research Area¹⁰ and has endorsed the establishment of a body such as the European Research Council (ERC), which could, in particular, become a key instrument in promoting scientific excellence through frontier science areas identified via a bottom-up process. The EESC is pleased that its recommendations concerning, in particular, the autonomy of the ERC and the composition of its scientific council have been followed, and reiterates the importance of involving first-rate scientists, including ones from the world of industrial research¹¹.
- 2.6.3 The EESC agrees that a broad range of coordinated actions is needed for optimal integration of the new Member States, but does not believe adequate instruments have been put in place in this regard. The process of transition these countries have undergone in the assessment period under discussion makes it more difficult to pinpoint the best actions to take in order to build an economy firmly grounded on development of knowledge and research. The approach geared to "strengthening research" is particularly relevant in these countries, but will have to be focused on the "production of innovation" in order to activate the development levers which they require.

3. Remarks on the recommendations concerning the Framework Programme

3.1 Private sector involvement

- 3.1.1 The EESC agrees with the panel's recommendations and stresses in particular the importance of greater participation and involvement by industry as a *sine qua non* for achieving the Barcelona Council goal. It will be easier to reach this goal if the world of business plays a more active role in strategic choices and in identifying fields of research in which European research excellence could emerge more fully.

⁹ INT/269-CESE 1484/2005, point 1.4 and points 4.1 to 4.6. pp. 9-10.

¹⁰ See especially INT/246 – CESE 1647/2004 in OJ C 156 of 28.6.2005: Opinion on the Communication from the Commission Science and technology, the key to Europe's future, rapporteur Mr Wolf, and the complementary opinion on the same subject, rapporteur Mr Van Iersel, co-rapporteur Mr Gibillieri, CCMI/015 – CESE 1353/2004.

¹¹ INT/269-CESE 1484/2005, point 4.11.

- 3.1.2 To ensure such participation, the EESC thinks a more focused effort of communication is needed, involving companies and producers' organisations and associations, not least to facilitate involvement of SMEs and so raise participation from the far from satisfactory current level of 13%. Their very nature requires that the 7th FP and the competition and innovation FP must not be seen as alternatives, but as complementary and synergetic.
- 3.1.3 The EESC believes the traditional financial instruments¹² and the new ones already provided for the 6th FP should not be substantially modified, in order to avoid inadvertently erecting new barriers to access (as the experts found at the outset of the 6th FP), but should be adapted in line with experience accrued to make them more user-friendly.
- 3.1.4 The Integrated Projects (IPs) and the Specific Targeted Research Projects (STREPs) are the instruments preferred by SMEs and should therefore be improved to further facilitate their participation. There is no doubt that the Technology Platforms and - even more - the Joint Technology Initiatives will help achieve this goal. The Networks of Excellence, which universities and public research centres value and participate in on a large scale, should be developed to further encourage involvement of industry and as instruments for boosting researcher mobility, with increased and more promising exchanges between private and public sectors.

3.2 **Simplifying management and procedures**

- 3.2.1 Simplification of management and procedures is a recurring theme with every new Framework Programme: many improvements have been made down the years, from a number of documents on simplification to the sounding board of representatives of small research groups set up by Commissioner Potočnik. However, the proposals put forward appear not to have solved the difficulties and problems encountered by participants.
- 3.2.2 Drawing on experience gathered by the experts and directly by the stakeholders, the EESC suggests that the difficulties met by participants in the projects under the current Framework Programme be systematically collected and analysed so that mechanisms more tailored to the present reality can be proposed. These could be helpful to ongoing evaluation on the effectiveness of the procedures used and the procedures of formal control and assessment.
- 3.2.3 It would also be helpful, in well-defined development projects, to include checkpoints at which activities and anticipated results are monitored regularly. Provision of funding and the continuation of the project itself should be conditional on such monitoring at precise and predetermined stages.

¹² See the EESC opinion currently being prepared on dossier INT/309.

- 3.2.4 As far as the modalities of participation and administrative and financial management are concerned, it could be useful to have more detailed and unambiguous guidelines for the Contractual Agreements between participants, greater flexibility and freedom of choice for the applicant, and calls for proposals which set out more clearly the kinds of schemes and activity and the categories of participants.
- 3.2.5 It has been noted that a relatively small core of organisations has participated a number of times and in a number of programmes, often acting as prime contractor (the case in around an estimated fifth of the projects)¹³. Concentration of this kind is somewhat disturbing: on the one hand, it says something about the difficulty of participating, especially for those entering a research competition for the first time; on the other, it restricts the implementation of new projects aimed at radical innovation and greater risk (as called for in the second recommendation).

3.3 **Incentives for research**

- 3.3.1 Ways of encouraging private RDT funding still need to be better defined, while the market forces capable of triggering a virtuous cycle of synergy are not clearly identified and so are not available, as they should be, in the short term. Fiscal incentives, strengthening of intellectual property rights and facilitating interventions of risk capital are goals rather than instruments of action.
- 3.3.2 The EESC would particularly like to see instruments developed to foster the spirit of entrepreneurship among European researchers, and other instruments put into place (from risk capital and venture capital to targeted EIB funding and credit facilities for research) to smooth the path from research results to specific business initiatives.
- 3.3.3 The recommendation of ensuring greater participation of high-tech SMEs, which (as made clear in many previous opinions) the EESC fully endorses, must be supported by specific instruments in addition to the Joint Technology Initiatives, the Technology Platforms and the opportunities provided by the "Ideas" project. The EESC hopes that this will be a key objective and will accordingly receive special attention in the practice of the Open Method of Coordination.
- 3.3.4 In the EESC's view, if encouragement is to be given to more innovative research geared to improving competitiveness, unresolved intellectual property issues must be addressed, particularly the Community patent, the patentability of computer implemented inventions and inventions in new areas of knowledge, and the full implementation of the Directive on the Legal Protection of Biotechnological Inventions.

¹³ Five-Year Assessment, cit. p. 7.

3.4 **Human resources**

- 3.4.1 In the EESC's view, making careers in science and technology attractive by improving the social, as well as economic, standing of the researcher is a priority. There can be no doubt that the growing trend for people to undertake postgraduate studies and conduct research in other countries (in academia and elsewhere) is a form of mobility which helps researchers to develop, since the interchange of knowledge and working methods is a unique process of enrichment. It becomes problematic, however, when such mobility is in one direction only and the country of origin is unable to offer the conditions of work, career, social prestige and adequate economic reward to attract people back¹⁴. All European countries must be attractive for young people embarking upon a research career. In particular, there should be easier access to the EU, including organised exchanges, for new human resources coming from emerging countries, including China and India.
- 3.4.2 Programmes involving human resources and mobility do not appear sufficient to deliver that qualitative leap capable of "attracting and rewarding the best talent", as the first of the key objectives puts it. There is no clear prospect of the "European researcher" status which should be the nub of such action.
- 3.4.3 Critical situations such as these call for innovative policies: investment is needed a) to develop university teaching in science and engineering (a prerequisite for which are more science courses in upper secondary education and promoting science as a degree option at university), b) to reduce the number of those who graduated, but are not employed, in such fields (an unwelcome situation prevalent in the new Member States and in Italy, Portugal and Austria), c) to encourage more women researchers (now little over a third, despite accounting for more than 63% of graduates in science and engineering disciplines)¹⁵, and d) to make careers in science more attractive.
- 3.4.4 The EESC considers that such policies, primarily the responsibility of Member States, should receive particular attention in the Open Coordination Method, which could also be usefully applied to higher and tertiary education systems and research systems in order to identify best practices, appropriate forms of peer review, concerted action between Member States and regions, and priority transnational research topics.
- 3.4.5 Researchers constitute a far lower percentage of the labour force than is the case in competitor countries (0.54% in the EU – and no higher than 0.5% in all the new Member States and the countries of southern Europe – compared with 0.9% in the USA and 1.01% in Japan). The age of those in the science and technology sectors is also becoming a cause for concern (35% – above 40% in some MS – in the 45-64 age group, compared with 31% in the 25-34 age

14 The EESC has expressed its views on this issue in many opinions, most recently INT/269 – CESE 1484/2005, point 4.12 et seq.

15 Key figures 2005, cit pp. 55-57.

group)¹⁶. There is a thought-provoking estimate that 150 000 European researchers are currently working in the USA and a further 500 000 to 700 000¹⁷ researchers will be needed over the next ten years to achieve the Barcelona goal.

- 3.4.6 The EESC agrees with the panel's position on the need to offer researchers greater autonomy and responsibility (albeit while respecting ethical principles), to give careers in science a higher profile, to guarantee greater interdisciplinary as well as spatial mobility and to integrate the Marie Curie system of grants with national and regional programmes and use them specifically to boost mobility between public and private research.
- 3.4.7 The EESC also supports the Commission's effort to create a European Charter for Researchers¹⁸ as a first step in the right direction, but considers the Member States need to be more coordinated and committed to achieve more effective and better harmonised systems of training, career, remuneration (including social insurance, pensions and fiscal regimes) and social insurance incentives¹⁹.
- 3.4.8 Addressing the trustworthiness and legitimacy of science and technology in Europe is an issue to which the EESC attaches great importance and is a *sine qua non* for giving legitimacy to the researcher and recognition to his work: if for no other reason, an active and coordinated policy between the Commission and Member States needs to be urgently defined and allocated the appropriate means and resources.

3.5 **The assessment procedure**

- 3.5.1 The EESC notes the considerable efforts made by the Commission to improve the assessment procedure, as instanced by a series of documents focused on the work of assessors. However, the real problem lies in the logic of ex-post assessment: if it is limited to verifying formal compatibility with the goals, it risks losing sight of the real strategic objective, namely assessing the structural impact of the Framework Programmes on the EU's economy and research as a whole, the priorities to pursue and consequent allocation of funds.
- 3.5.2 The EESC suggests investing particular efforts into setting up a series of indicators which would really measure performances in terms of competitiveness and development. Such research performance indicators should make it possible to measure the efficacy of funded activities for the EU's development as a whole and to steer future activities towards the

¹⁶ Key figures 2005, cit pp. 47-51.

¹⁷ Five-Year Assessment, cit p. 12.

¹⁸ Commission Recommendation of 11 March 2005 on the European Charter for Researchers and on a Code of Conduct for the Recruitment of Researchers, OJ L 75, 22.3.2005, p. 67.

¹⁹ See CESE 205/2004, Opinion on the Communication from the Commission - Researchers in the European Research Area, rapporteur Mr Wolf, in OJ C 110, of 30.4.2004.

priorities established. The EESC is aware, however, that no automatic evaluation can take the place of delicate judgements made on a case-by-case basis by appropriate experts.

Brussels, 17 May 2006.

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European Economic and Social Committee

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