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REPORT

on the communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions "Towards a European research area"
(COM(2000) 6 – C5-0115/2000 – 2000/2075(COS))

Committee on Industry, External Trade, Research and Energy

Rapporteur: Elly Plooij-van Gorsel

Symbols for procedures

- * Consultation procedure
majority of the votes cast
- **I Cooperation procedure (first reading)
majority of the votes cast
- **II Cooperation procedure (second reading)
majority of the votes cast, to approve the common position
majority of Parliament's component Members, to reject or amend the common position
- *** Assent procedure
majority of Parliament's component Members except in cases covered by Articles 105, 107, 161 and 300 of the EC Treaty and Article 7 of the EU Treaty
- ***I Codecision procedure (first reading)
majority of the votes cast
- ***II Codecision procedure (second reading)
majority of the votes cast, to approve the common position
majority of Parliament's component Members, to reject or amend the common position
- ***III Codecision procedure (third reading)
majority of the votes cast, to approve the joint text

(The type of procedure depends on the legal basis proposed by the Commission)

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PROCEDURAL PAGE

By letter of 24 January 2000, the Commission forwarded to Parliament a communication "Towards a European research area" (COM(2000) 6 – 2000/2075(COS)).

At the sitting of 13 March 2000 the President of Parliament announced that she had referred the communication to the Committee on Industry, External Trade, Research and Energy as the committee responsible and the Committee on Legal Affairs and the Internal Market, the Committee on Culture, Youth, Education, the Media and Sport and the Committee on Women's Rights and Equal Opportunities for their opinions (C5-0115/2000).

The Committee on Industry, External Trade, Research and Energy had appointed Elly Plooi-j-van Gorsel rapporteur at its meeting of 27 January 2000.

The committee examined the Commission communication and the draft report at its meetings of 23 February, 19 April and 9 May 2000 .

At the last meeting it adopted the motion for a resolution by 34 votes to 1

The following were present for the vote: Carlos Westendorp y Cabeza, chairman, Elly Plooi-j-van Gorsel, rapporteur,; and Gordon J. Adam (for Imelda Mary Read), Ole Andreasen (for Colette Flesch), Maria del Pilar Ayuso González (for Concepció Ferrer), Guido Bodrato, Felipe Camisón Asensio (for Christos Folias), Giles Bryan Chichester, Dorette Corbey (for Erika Mann), Elisa Maria Damião (for Elena Valenciano Martínez-Orozco), Willy C.E.H. De Clercq, Claude J.-M.J. Desama, Jonathan Evans (for John Purvis), Carlo Fatuzzo (for Umberto Scapagnini, pursuant to Rule 153(2)), Giovanni Claudio Fava (for Massimo Carraro, pursuant to Rule 153(2)), Glyn Ford, Michel Hansenne, Malcolm Harbour, Bashir Khanbhai (for Anders Wijkman), Werner Langen, Linda McAvan, Hervé Novelli (for Christian Foldberg Rovsing), Yves Piétrasanta, Samuli Pohjamo (for Astrid Thors), Godelieve Quisthoudt-Rowohl, Alexander Radwan (for Peter Michael Mombaur), Mechtild Rothe, Paul Rübig, Konrad K. Schwaiger, Ioannis Theonas (for Konstantinos Alyssandrakis), Antonios Trakatellis (for Dominique Vlasto), Jaime Valdivielso de Cué, W.G. van Velzen, Alejo Vidal-Quadras Roca, Kyösti Tapio Virrankoski (for Nicholas Clegg, pursuant to Rule 153(2)).

The opinion of the Committee on Legal Affairs and the Internal Market is attached; the Committee on Culture, Youth, Education, the Media and Sport and the Committee on Women's Rights and Equal Opportunities decided on 28 March 2000 not to deliver an opinion.

The report was tabled on 9 May 2000 .

The deadline for tabling amendments will be indicated in the draft agenda for the relevant part-session.

MOTION FOR A RESOLUTION

European Parliament resolution on the Commission communication the communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions ‘Towards a European research area’ (COM(2000) 6 – C5-0115/2000 – 2000/2075(COS))

The European Parliament,

- having regard to the Commission communication (COM(2000) 6 – C5-0115/2000¹),
 - having regard to its resolution of 15 December 1998 on the fifth framework programme of the European Community for research, technological development and demonstration activities (1998 to 2002)²,
 - having regard to its resolution of 17 February 1998 on the 1997 annual report on the research and technological development activities of the European Union³,
 - having regard to its resolution of 12 June 1997 on the development and application of new information and communications technologies (ICT) in the next decade⁴,
 - having regard to its resolution of 28 November 1996 on prospects for European science and technology policy in the 21st century⁵,
 - having regard to Rule 47(1) of its Rules of Procedure,
 - having regard to the report of the Committee on Industry, External Trade, Research and Energy and the opinions of the Committee on Legal Affairs and the Internal Market (A5-0131/2000),
- A. whereas a more integrated European scientific community is essential if research and innovation are to be stimulated,
- B. whereas research not only provides fresh knowledge but is also a productive force,
- C. Whereas a prosperous Europe requires, and will be marked by, a large and active research community with a substantial output of successful research, especially but not only in such areas as high technology, health sciences, environmental sciences and biotechnology
- D. Whereas the value of research in such other disciplines as Engineering, Management, the Economic and Social Sciences and the Humanities must not be neglected in this context;
- E. whereas a better understanding of research and innovation needs to be fostered among the members of the general public (the citizens),

¹ Not yet published in the Official Journal

² OJ L 26, 1.2.1999, p. 1

³ OJ C 80, 16.3.98, p. 41

⁴ OJ C 200, 30.6.97, p. 196

⁵ OJ C 380, 16.12.96, p. 72

- F. Whereas there is a need both for increased expenditure on, and also for enhanced co-ordination and coherence in, European research to increase competitiveness;
- G. whereas research efforts account for an average of 1.8% of GDP in the EU, compared to 2.8% in the USA and 2.9% in Japan and whereas some Member States and regions of the EU invest a far larger proportion of GDP in research,
- H. whereas research efforts account for an average of 1.8% of GDP in the EU, compared to 2.8% in the USA and 2.9% in Japan, and there is considerable discrepancy between Member States,
- I. whereas the gap between total expenditure on government and private research in America and Europe widened from EUR 12bn in 1992 to about EUR 60bn in 1998,
- J. whereas in some EU countries at least unemployment among young researchers has attained explosive dimensions, thereby leaving a valuable human potential untapped,
- K. whereas research and technology account for 25 to 50% of economic growth and are major determinants of competitiveness and employment and of the quality of life of the people of Europe,
- L. whereas it is increasingly difficult to distinguish between basic and applied research, since more and more basic research is geared to possible applications,
- M. whereas it is important to maintain a balance between basic and applied research, since in the long term the development of high-quality scientific research will benefit society as a whole,
- N. Whereas the value of fundamental research is not calculable in terms of its direct or immediate transferability to industrial processes, yet such research is in the long run an absolutely necessary condition of both research competitiveness and industrial competitiveness, and undue concentration on applied or near-market research is therefore counter-productive
- O. Whereas maintenance of high-quality fundamental research is required both for the sake of its contribution to human knowledge and because it is essential if Europe is to retain its own best researchers and to be attractive to able researchers from outside the Union;
- P. whereas research in Europe is fragmented and divided into national research systems and measures to promote and develop a common research area are urgently needed,
- Q. Whereas there is an urgent need to increase scientific and technical support to various community policies,
- R. Whereas the European Research Area foresees the establishment of a common system of scientific and technical reference by aligning methods, harmonising procedures and comparing results; such a system should be established with the help of the Joint Research Center and should rely on the competence of Centers of Excellence in the member states through appropriate networks to be organised with the support of the JRC,

- S. whereas the growth in knowledge in the field of life sciences and information and communication technologies is being accompanied by the emergence of a growing number of new ethical questions and the way in which these are dealt with will influence the prospects for scientific and technological development in Europe,
 - T. whereas the European research area offers an excellent opportunity to develop the vital synergy between research and Community policies, particularly if the results of the former are made available to the latter,
 - U. whereas many recent problems or crises have illustrated the ever-increasing scientific needs of Community policies and the shortcomings of the present system in meeting those needs,
 - V. whereas the Joint Research Centres should form an integral part of the European research area,
 - W. Whereas, the Commission shall foresee in the future FP 6 the appropriate modalities (including financial ones and access to results) to ensure the efficiency and reliability of this common system of reference and its networks,
 - X. Considers that the European Union suffers from a serious lack of post-graduate students and of scientists employed by industry in comparison to the United States and Japan and that 50 % of the Europeans awarded doctorates in the US remain there for some considerable time and sometimes forever,
 - Y. whereas the framework programme of research and development, despite being the main item of expenditure among the EU's internal policies, has not succeeded in promoting genuine European research because of the inadequacy of the resources available and the cumbersome nature of the administrative procedures involved,
 - Z. whereas at present two-thirds of research and development activities in the European Union are carried out by industry,
 - AA. Recognises that a European Research Area could lead to a concentration of research facilities to the detriment of peripheral areas
1. Welcomes the Commission's communication 'Towards a European research area' as the starting point for a far-reaching political and scientific debate on the creation of a real European research and innovation community and suggests that, in addition to the steps already taken by the Commission, good use should be made of the results that will be obtained by the IPTS-JRC, for example through its 'Future Projects' Initiative;
 2. Believes that European research will be at its most efficient if there is *a joint* European research area in which joint action is taken to define *joint* objectives and to make the best possible use of resources to achieve these objectives, with due regard for the subsidiarity principle and with a view to achieving substantial European added value; observes that these joint European research efforts must not stand in the way of the pursuit of competing research programmes by the Member States;
 3. Calls on the Member States to set a target of at least 3% of their GDP to research;
 4. Believes that the European Union and the Member States must create conditions for better access of enterprises to research results and to be able to convert them into innovations, which may eventually make a greater contribution to the growth of prosperity, security, competitiveness, employment and the strengthening of the overall European market

5. Points out that there are unnecessary legal obstacles to exploiting European research, one of which is the difficulty and cost of establishing patents; the Commission should take determined action with a view to legislating for the creation of a European patent regime.
6. Notes that other obstacles include continuing failure in mutual recognition of diplomas and professional qualifications, uncertainty and lack of coherence in provisions about the status and security of those engaged in research careers, and the absence of encouragement for, or a European statute enabling, the creation of 'seed-corn' companies to develop industrial applications of research findings;
7. Emphasizes that European assistance for R&D must not only help the European Union to achieve a stronger competitive position, but R&D must contribute to the growth in knowledge and learning to improve employment, prosperity, support EU policies and answer the concerns of the citizens.
8. Stresses that the goal of European research must be to strengthen the scientific and technical foundations of other Community policies and, with this in view, welcomes the fact that the Commission is providing for the creation of a 'common system of scientific and technical reference' for the implementation of Community policies.

Urges the Commission to make provision in the future framework programme for all necessary measures, particularly in the financial field, to ensure the smooth functioning of this system which, with the support of the JRC, which is responsible for this task, should enjoy the assistance of networks comprising the most effective national bodies.

With this in view, calls on the Commission to ensure that the common reference system and the networks making it up can make use of Community research findings that are helpful for implementing EU policies via the JRC;

9. Calls on the Member States not to regard national research programmes solely as programmes intended primarily to strengthen their own economies but as programmes for promoting economic growth, competitiveness, employment and cohesion throughout the European Union; by, furthermore, operating at EU level with research programmes rather than relatively small projects in a wide range of subfields, greater coordination of research work will be fostered; this will promote economies of scale, improve competitiveness within the European Union and stimulate employment and thus the need to go on innovating, which, at macroeconomic level, may result in yet more employment and economic growth;
10. States that the Commission's commitment to the principle of subsidiarity 'in its broadest sense' as stated in para 5.1 of the Communication is much to be welcomed; the role of regions as well as member states, and of private industry as well as government is indeed important; but, beyond that, researchers and research teams adequately supported on the basis of competitive and peer-reviewed systems for research finance are the ground level of the European research effort.
11. Estimates that the simultaneous use of all official European languages, which constitutes both an inheritance of the past and a very positive element in the maintenance of a cultural diversity which is one of the trademarks of Europe, hinders globally the communicating process among European scientists, and should therefore justify European action favouring translations and communication endeavours ;

12. Recommends however that the Commission enhance means of exchange between research teams, use its powers to stimulate public and private funders of research at all level to better coordinate action at the Europe level ;
13. Considers that a biannual report of the Commission to the European Parliament would permit an adequate review of the decisions taken and of the results obtained ;
14. Calls on the Commission and the Member States to develop a new approach to the Community's research efforts which focuses on objectives and the way in which these European objectives can be achieved in a global context, and therefore urges the Commission to make the sixth framework programme an effective means of achieving these objectives; cooperation must continue to be constantly stimulated in the newly established sixth framework programme; the framework programme should be conceived sufficiently flexibly to make it possible to respond rapidly and without substantial administrative involvement to new challenges (comparable to the BSE crisis, for example), through a process of self-organisation by European science; stresses that the planned establishment of a high-speed network to facilitate European research efforts should be regarded as entailing substantial European added value;
15. Concludes that a 'European Research Area' requires a highly important contribution to be made by the European Institutions, in particular the Commission, directed to encouraging enhancement of effort and improved coherence among diverse programmes at regional and member state level, but that the contribution of the institutions should remain quite tightly focussed on those objectives that can only be achieved at the all-Union level, and ancillary activities such as:
 - Monitoring progress
 - Communicating information
 - Fostering best practice
 - Developing Framework Programmes in areas requiring Union-level support
 - Improving the legal framework, e.g. as respects patent law or company law
 - Securing freedom of movement, and discountenancing barriers to research mobility
 - Facilitating research networks, and other devices geared to realising critical mass
16. Invites the Commission and the Member States to take steps to inform the European public better on the need for research and on the results that research has produced; information will help to improve the image of and to make the European research area more attractive, thus drawing more university graduates into European research in the future;
17. Suggests the establishment of a permanent research field dealing with the question of the ethics of science and technology, with the specific aim of undertaking a comparative study of the laws and ethical criteria governing the research programmes of the EU Member States and the industrialised countries in general, with a view to encouraging the development of a coherent and common approach to these issues;
18. Urges the Commission and the Member States to develop policy which focuses not on technical research infrastructure or cooperation between existing and new institutes but on the objectives of research and innovation, the employment of researchers in the most efficient manner possible, an increase in the mobility of researchers, especially young ones, the promotion of the research climate in Europe, through which more researchers from inside and outside Europe may be attracted to the European research area, the

improvement of researchers' salaries, the improvement of training for graduates including language training in widely-used languages and the improvement of the participation of women in scientific research; the sixth framework programme should make an effective contribution in this respect;

19. Calls on the Commission, when planning joint research projects, to consult researchers themselves, users and other national and/or European institutions (such as the European Science Foundation and the Eurohorcs), as well as large firms, SMEs and universities; calls on the Commission also to take account of the ageing of research potential in the European Union and its consequences for the labour market;
20. Calls on the Commission, when formulating new research policy, to initiate a consultation process both with the scientific community (involving researchers, universities and research institutes, the views of the scientific fields concerned) and with users of the actual research findings (large companies and small and medium-sized undertakings), seeking to overcome the national bureaucratic restrictions which often hamper such processes;
21. Calls on the Commission to work more closely with industry to help establish a genuine European research area and to specify what role the European business community might play in such efforts; currently, the private sector accounts for two thirds of R&D activities in the European Union;
22. Calls on the Commission to consider how in particular exchanges of information about who does what in the field of research in the EU and what research centres excel in what fields can be stepped up and what role the concept of 'centres of excellence' could play here;
23. Calls on the Commission to consider how the networking of centres of excellence and the establishment of virtual centres might contribute to an increase in knowledge, economic growth and employment;
24. Believes that the designation of certain research centres as 'centres of excellence' must be done on the basis of jointly accepted academic criteria;
25. Calls on the Commission and the Member States to consider what the most important problems are at present as regards research facilities in the European Union and how they can be resolved;
26. Underlines that a European research area would be marked by efficient networking and easy collaboration among researchers and research institutes situated in different member states, with a greater mutual understanding between different research cultures than exists at present; this could be facilitated by enhanced use of the internet and other systems of electronic interaction, and would be of greatest value in relation to centres of highest excellence
27. Acknowledges the success of existing Europe-wide facilities and programmes, and stresses the need to develop 'critical mass' in major research fields, whether at single centres or through 'virtual centres', and urges the Commission and the Member States to give priority to the 'critical mass' requirement both in the Framework Programmes and otherwise;

28. Urges the Commission and the Member States to develop policy that forges closer links between research, universities and industry and commerce, with a view to improving the balance between supply and demand;
29. Believes that, given the differences that exist between the European Union and the USA, the Member States must make a greater effort to benefit from the favourable effects that the new knowledge-based economy has on welfare, competitiveness and employment and set a target that within two years all EU Member States are investing at least 3% of GDP in scientific research; points out that the necessary increase in resources for research cannot be generated solely by the public authorities and that considerable political efforts must therefore be made to improve the preconditions for increasing private-sector contributions in this sphere and raising public awareness of this issue;
30. Believes that the Annual Report on Community Measures in Support of Employment should regularly include a chapter on research and innovation;
31. Considers that the Member States should offer incentives to large and small businesses which invest in scientific research through tax exemption to encourage reinvestment in research, and the development of risk capital mechanisms, with a view also to creating new jobs;
32. Urges that early action be taken to introduce an inexpensive Community patent and to consider what other rules are needed to permit the transition to the new knowledge-based economy;
33. Stresses the importance of closer coordination between the systems of intellectual property rights in the Union's Member States so as to promote transparency in the field of technology, while continuing work on other types of standards or utility models;
34. Calls on the Commission and the Member States to support initiatives that bring scientists, industry and financiers together;
35. Calls on the Commission to consider what obstacles currently exist to the implementation of the Fifth Framework Programme, both within the Commission itself and on the part of applicants and those participating in the Fifth Framework Programme; calls on the Commission to submit to the Council and the EP in good time – before the Sixth Framework Programme begins – a summary of the lessons which can be learned from the implementation of the Fifth Framework Programme;
36. Points out that research may create employment in the longer term, but that this should not result in the opportunities in the shorter term being overlooked; also takes the view that existing financial resources should therefore also be made available directly for urgent, short-term research projects; the current shortages in the labour market in the European ICT sector (1 million vacancies) will lead to the loss of jobs to other parts of the world; there is a need for a policy that offers (financial) scope for ad hoc responses to trends and new market opportunities; it should be considered how far flexible training centres in the European Union can react to the reduction of shortages of skilled researchers in the areas of telecommunications, e-commerce and m-commerce, etc.;
37. Underlines that full realisation of the aim of a single market will include easy mobility of researchers in the natural, medical, social, and human sciences among universities, research institutes, government research establishments, and private industry
38. Considers in this context that it would be an enhancement of European research cultures if

deliberate steps were taken to establish or enhance contacts of various kinds between business firms of all kinds and universities and other research establishments, but with due precautions against abuse of commercial confidentiality to suppress publication of research findings that ought to be in the public domain;

39. Believes that the Marie Curie Mobility Programme (MCMP) has been one of the most effective and successful parts of the fourth and fifth framework programmes and that it should be strengthened and expanded in the future, in particular by the inclusion of countries linked to the EU by association agreements and third countries, to include longer-term fellowships for post-doctorate scientists, return fellowships to encourage reintegration in countries of origin and senior fellowships to provide opportunities for established scientists and engineers from major European research centres to engage in the foundation of start-ups or spin-offs;
40. Points out that other obstacles to free movement may arise through failure to conduct fair competitions for or recruitment to research studentships at doctoral and postdoctoral level, thus inhibiting free movement of scientists and scholars at the stage of their careers when they can profit most greatly from experience in different research cultures, and can in the longer term draw on their experience to help in breaking down barriers; underlines that regrettably, instances such as that of the Foreign Language Lecturers in Italy show that the Commission has over the years conducted itself with a certain pusillanimity in this regard, and in future it must show itself more resolute;
41. Emphasises that research infrastructure in the European Union is not yet complete and that action needs to be taken in this area to give all citizens access to the available content, and calls on the Commission to make proposals as soon as possible for action based on the decisions taken at the extraordinary summit in Lisbon in this area; Calls on the national scientific organisations to speak with one voice in the European Union;
42. Calls on the Commission to take or support all worthwhile measures in the field of communications infrastructures to promote the development of networks and enable research findings to be disseminated as widely as possible;
43. Stresses the need to secure closer coordination between the Union's R&D framework programme and large-scale intergovernmental-level science and technology initiatives, such as EUREKA, EMBL, ESA, ESO or COST;
44. Calls on the Commission to make provision for at least 5% of the Structural Funds not used by Objective 1 regions to be employed by the latter to promote scientific research in various sectors, so as to reduce the technological gap between these regions and the rest of Europe and prevent unused Structural Funds from being withdrawn;
45. Calls for the serious integration of activities between the Structural Funds and pre-accession programmes, on the one hand, and the research programmes, on the other, so that the former provide research infrastructure in less favoured regions and the latter provide the mechanisms and financial means for collaboration at high levels of scientific rigour;
46. Believes that the fifth framework programme must continue to be pursued with a view to the explicit involvement of the candidates for accession, especially the countries of Central and Eastern Europe with their good science base, but insists that scientific excellence must continue to be the decisive criterion for the eligibility of a project;
47. Is convinced that the promotion of research, technological development and innovation

needs a broader basis in European policy-making than that provided by the framework programme and urges the Commission therefore to suggest models and procedures to Parliament and the Council to allow and facilitate both at the planning and the practical implementation stage, ties of reciprocity between the framework research programme and other Community policies, and in particular the Structural Funds;

48. Continues to believe that, in view of the present Treaty context, consideration must be given for every possible means of making European research funding – particularly for the framework programme and the specific programmes – more efficient and effective; within this Treaty context; calls, therefore, on the Commission to answer the following questions in planning the sixth framework programme:
1. Could and should the framework programme and Specific Programmes firstly be extended in order to achieve greater continuity and planning security for research and for the EU budget and, secondly, be managed more flexibly by a more effective interim assessment as regards both content and the respective financial endowment?
 2. Could the adoption of the Specific Programmes as part of an ongoing process on the one hand correct distortions in the decision-making procedures and on the other make the setting of new priorities in the ongoing framework programme more flexible? What adjustments would this entail to the decision-making procedures, particularly as regards the involvement of Parliament and the Council?
49. Calls on the Commission, as part of its assessment of possible new decision-making procedures to enhance both continuity and flexibility, to examine where and how greater concentrations of financial resources might be useful and necessary; it is particularly important in this context to establish how the European added value of research funding in respect of research funding should be defined and on which technologies and/or projects the limited financial resources available should be concentrated in order to achieve optimum use of resources, for example:
- in the form of a 'big push' aimed particularly at promoting new technologies;
 - the concentrated promotion of technologies in which the European Union is world leader in order to consolidate this lead;
 - the concentrated promotion of technologies in which the European Union is able to, and wishes, to catch up and in which the specific European contribution constitutes an added value compared to individual state aid;
50. Calls on the Commission to examine the brief and the scope of the JRC and its institutes and the financial resources they require ahead of the next research programme and bearing in mind the future importance of the individual technologies and the specific added value of their work and to report to the European Parliament and the Council before the submission of first practical plans regarding the future framework programme;
51. Calls on the Commission, in broadening the basis for European research policy, to consider how it can, on its own initiative and/or in cooperation with the Member States, make a contribution to drawing up, coordinating and implementing international research activities, for instance in the case of global challenges such as examining climatic change;
52. Points out that Europe is currently the leader in a number of areas (e.g. software

development, mobile communications, development of sensors/actuators, consumer electronics, digital TV, drug development, combined cycle energy production, waste management and recycling, telematics for transport applications); it should be considered how Europe might also take the lead in the future in fields where it now lags well behind the USA (e.g. imaging and visualisation technologies, basic chip production, artificial intelligence, agrofood applications of biotechnology, photovoltaics, battery development, ceramic material developments); a constant effort must be made to establish common standards; this is where Europe's advantage lies;

53. Urges that Europe should play a leading role in the world in the key technologies and points out that the increasing links between biology and information technology pose a special challenge;
54. Refers to the benefits of more benchmark studies in and outside the European Union that indicate clearly where and why certain (European) countries are more successful in a given area of technology than other countries, after which the EU Member States can take advantage of these best practices; in this context a benchmark of R&D efforts may help to improve the coordination of national and European R&D policies and of national and European R&D programmes; considers, furthermore, that it serves no useful purpose for the Commission to develop a generally recognised system for the validation of scientific findings and corresponding analysis, inspection and certification procedure, since the validation of scientific findings is a primary task of science and cannot be determined by policy-makers;
55. Urges the Commission and Member States to consider how access to knowledge, innovation and R&D by and for SMEs can be promoted, and draws attention to the importance of closer cooperation between SMEs and regional universities and research institutes; calls on the Commission to make more resources available to improve the competitiveness of SMEs;
56. Stresses the need to encourage participation not only by high-technology SME but also by those which are potential users of R&D findings in order to increase the competitiveness of European industry;
57. Calls for common research initiatives which leave scope for both applied research and basic research in various areas of technology; and which take account of the fact that innovation often arises at the interface between different scientific disciplines; in the future new employment may emerge primarily in the areas of biotechnology and ICT; research in the human and social sciences continues to be needed in the European Union, with its still growing diversity of cultures;
58. Invites the Commission to continue with interinstitutional concerted action before submitting a proposal for a draft sixth framework programme;
59. Instructs its President to forward this resolution to the Commission, the Council and the parliaments of the Member States.

EXPLANATORY STATEMENT

From knowledge and innovation to industrial success

At first sight it would seem that the rapid technological advances in the ICT sector, such as the Internet and e-business, are wholly responsible for the emergence of the New Economy in the world. This is partly true (see, for example, the recent report entitled 'The Competitiveness of Europe's ICT Market' drawn up by Booz-Allen & Hamilton for the Netherlands Ministry of Economic Affairs and Annex 2 to the Commission's progress report on the

eEurope

initiative). Characteristic of the New Economy is that high economic growth, low unemployment and low inflation

⁶ in the USA reveals that the rapid technological progress made in the ICT sector is an important catalyst for the New Economy. The foundations of the New Economy were, however, laid earlier, when such classical macroeconomic measures as the easing of the tax burden and interest rates were taken and a better investment climate was ensured.

Competition, both national and international, has also been stimulated by the deregulation of product markets, the privatisation of government monopolies and the liberalisation of foreign trade. This increase in competition has forced the business community to reduce the prices of products and services, to save costs and to innovate. Such factors as growing globalisation, with its mergers and take-overs, less rigid legislation on dismissals and greater flexibility in employment contracts and rates of pay have also helped to reduce unemployment in the USA appreciably, without any substantial increase in wages. The number of jobs in the New Economy has risen sharply.

The European Union is lagging somewhat behind in the transition to the New Economy. There is still a noticeable difference between the USA and Europe in terms of real GDP growth. Europe can, however, be expected to narrow the gap, especially in the telecommunications sector.

As a result of deregulation market forces are playing a greater role in such product markets as telecommunications, energy, transport and financial services, which may lead to more competition and lower prices. In the EU too there is now a wave of mergers and take-overs. In 1999 they were valued at EUR 1200bn, or 20% of GDP. Owing to the expansion of the European capital markets firms find it easier to attract resources for financing these mergers and take-overs and for other purposes. Owing to the introduction of the euro good progress has been made in putting the EU Member States' government spending on a sound footing. A genuine New Economy (high growth, low unemployment, low inflation) cannot be said to exist in the EU, however, until unemployment also falls significantly. If unemployment is to be reduced – about 10% of the European workforce, or 15 million people, are out of work – greater flexibility will be needed in the EU, as in the USA, in the deployment of workers and in payment for work done. There must also be a policy of labour cost moderation and progress in reducing the tax burden. The situation in the USA shows that such measures help to create millions of new jobs in the New Economy.

Development of the knowledge-based society

⁶ Rabobank, Economic Research Group

But more is needed. The growing pressure of competition will also increase the need for innovation in the EU. Innovations are needed to improve the quality of life and to ensure sound economic growth. Innovations in recent years have resulted in society changing from an industrial society to a knowledge-based society. Clearly, this knowledge-based society is likely to develop further in the future. This will require further investment in education and training and also the type of investment that makes scientific breakthroughs possible.

In general, it can be said that in the knowledge-based society that is currently taking shape the value of the virtual component of a product is increasingly higher than the value of its physical component. Developing a technology is not enough in itself in this knowledge-based society. While the value of a product used to be largely determined by the sum of production costs, the value of products is now very largely determined by such factors as delivery on time, the development of applications for the product, the provision of additional services and production without harm to the environment. Commercialisation, or the adding of knowledge to a product, seems to far more successful in the USA than in Europe. If this is to change, a better link will need to be forged between the development of new technology and application in the market. There is a need for closer cooperation between universities and the business community among others. In the USA many innovating firms are launched with close links to universities and their scientific researchers. In the USA a great deal of economic growth is achieved by small firms. It is also common for professors to work alternately in academic posts and posts in commercial enterprises. This is far less common in the European Union.

Besides forging closer links with the market, it is important for Europe to bring about a community spirit. There is still no European Union in various areas of commerce and research. In practice, many Member States of the European Union are still islands that regard each other as competitors rather than partners. The Technological European Union is lagging behind Economic and Monetary Union. The various Member States would do well to abandon their techno-nationalism and do more to create a European Union in the technological field as well. European research efforts are currently no more than the sum of the efforts of the 15 Member States and the European Union⁷. The fragmentation of efforts, the isolation and the division into national research systems, along with the divergent nature of legislation and administration, further worsen the effect of the lower total investment in knowledge compared to a country like the USA. The elimination of this division and the better integration of the European scientific and technological area are absolutely essential if research in Europe is to be given fresh vigour. While cultural diversity in the European Union is a great asset, the various languages in Europe and the rivalry that exists among the European countries have resulted in the European Union falling behind the USA. Although advances in the ICT sector are currently creating numerous jobs, basic research continues to be needed in other areas, provided that it is (potentially) of strategic importance to the business community. The Internet is still creating many new jobs, but it is fair to ask whether this growth can continue if it emerges that many Internet companies cannot in the end achieve the profit margins that might be expected from today's share prices. Appropriate research capacities should also be devoted to solving future health care, environmental and energy-related problems. In the future there are likely to be breakthroughs in both biotechnology and ICT in particular. Some researchers also expect spectacular advances if more cross-disciplinary scientific research can

⁷ Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions, Brussels, 18.1.2000

be undertaken⁸. Innovations are possible, for example, if medicine is linked more closely to the environment as a discipline. Nanotechnology also has potential and may bring about revolutionary changes. Major breakthroughs are also possible at the interface between physics, chemistry and biology, with appropriate attention also paid to such factors as macromolecules and biological molecules. It is here that the great opportunities lie, it is to this that basic research must be geared. It is, of course, impossible to say precisely what research activities are most likely to lead to major breakthroughs or to important applications. The past has shown, however, that important applications often occur as a result of research efforts by scientists driven by scientific curiosity. Scientists must be given the space to indulge their curiosity.

Applied research should make the results of such basic research suitable for commercial uses more than is now the case. It is therefore important, where direction is concerned, for public research to be considered not only in terms of scientific interest but above all from a more commercial angle. Europe appears to be in the lead in such scientific fields as mathematics and life sciences, while the USA leads in far more and strategically more relevant fields, and especially in biotechnology and ICT. Both are areas in which many new jobs are emerging and which are making a major contribution to economic growth in the USA. Europe is competitive in such specialised fields as genomics, proteomics, neurobiology and developmental biology. Where specialised fields are concerned, it can be said that research in Europe tends to focus more on man, whereas commercial opportunities are rated more highly in America. In Europe there is no problem converting euros into R&D; what is difficult is converting R&D into euros. From this it must not, however, be inferred that the European Union should not take an interest in the human and social sciences. On the contrary. Owing to the considerable diversity in the European Union, which is bound to increase with enlargement to 25 to 30 Member States, the Union must continue to take a serious interest in the languages, cultures and legal systems of its Member States. This research is needed if Europe's diverse culture is to be so employed that there is ultimately both a strong, differentiated European culture and a common competitive advantage over such monocultures as the USA and Japan. The market and employment must not be forgotten, however. At the moment these factors are often very remote from research and researchers.

Absence of European research policy

For the moment it cannot be said⁹ that there is a European research policy. The Member States' and Union's research policies are pursued side by side without their forming a cohesive whole. If further progress is to be made, a broader and more innovative approach than hitherto will be needed. The forthcoming enlargement of the Union makes this all the more necessary. A Europe of 25 to 30 Member States is, after all, in sight, and it will not be able to function with the methods that have so far been used. The most important frame of reference for research activities in Europe has hitherto been national. The resources for the various initiatives in scientific and technological cooperation at European, Community or intergovernmental level amount to only 17% of total European government spending on civil research. The most commonly used instrument at European level to date has been the Union's framework programme for research and technical development. In financial terms, however, it is equivalent to only about 5.4% of total government efforts in the field of civil research. The

⁸ Pathways for European Research. Top European scientists talk on science

⁹ op. cit., p. 10

framework programme is a useful instrument for stimulating international cooperation, but it alone will not improve the organisation of European research efforts. Given how far the European Union lags behind the USA, it can also be said that the framework programmes do not do enough to help consolidate the Union's competitiveness. The GSM standard, for example, did not emerge from a framework programme project.

What is good about the framework programmes must, however, be retained. If a European research area is to exist in the future, there will be a continuing need for the Member States and their researchers to learn how to cooperate with one another. Cooperation will demolish current barriers. The framework programmes perform this function and also teach participants how to manage research projects. The process of learning to cooperate with one another and learning how to manage projects should not be stopped. The framework programmes should, on the other hand, be adjusted. Cooperation with firms, research institutions and universities outside Europe, for example, should be made easier in the future. It is gratifying to see a growing number of initiatives emerging among different national research institutions with a view to closer cooperation at intermediary level. Cooperation with and between such organisations as the ESF, ESA, EMBO, EMBL, CERN, ESO, ESRF, ILL, EUREKA and COST has already produced a great deal, although there is room for improvement in the cooperation between the framework programme and EUREKA. There is also increasing cooperation in the field of education. Cooperation is worth learning and should certainly be encouraged. It is in no way encouraged if it is beset with heavy administrative burdens and a forest of rules and conditions.

While the fifth framework programme is a useful instrument for promoting European cooperation, it does not at present guarantee the better organisation of the European research effort as a whole. It is too early to judge whether the programme will have a major positive impact on the restructuring of European R&I. Nevertheless, the speed of change in the developed economies, as described in the Commission's recent communication on *eEurope*¹⁰, does not allow of the option of waiting calmly for the envisaged 5-year evaluation. A major effort has to be made now to advance certain policies ahead of the current schedule. The Commission is absolutely right to launch the debate on the creation of a European research area (ERA) at this time.

Parliament attaches particular importance to the analytical collation of information on various European research centres, with special emphasis on transnational access and EU visibility and on the implementation of new financial techniques designed to enhance the yield from public investment and thus increase the resources available. The Joint Research Centre (JRC) in particular needs to develop skills in inter-linking the best expertise in national laboratories together with an added-value European perspective. An internally maintained culture of excellence should encourage young researchers from all over the EU to regard a spell at the JRC as a desirable and interesting adjunct to their evolving careers.

Infrastructure no panacea

To make European research less fragmented, the approach, i.e. the structure in which research is conducted, should be radically changed. There is an urgent need for innovation in this area.

¹⁰ An information society for all, Communication on a Commission Initiative for the Special European Council of Lisbon, 23/24 March 2000 (COM(1999)687 final of 8 December 1999)

In his communication Commissioner Philippe Busquin has indicated how a single European research area can be established. Many of the comments made, however, concern infrastructure and envisage an optimised aggregate of existing physical resources and infrastructure achieved, inter alia, by networking centres of excellence and creating virtual centres. Many of the proposed measures referred to in 'Towards a European research area' are worth adopting. What should be borne in mind, however, is that infrastructure in itself does not contribute to greater competitiveness, prosperity or employment. It is researchers who make the breakthroughs with the help of such infrastructure. A closer study should be made of ways of linking researchers to infrastructure. Infrastructure should not be linked to researchers. Scientific infrastructure, which must, moreover, be state-of-the-art, should be at the service of scientists. 'Where technical infrastructure is concerned, the cost of technical infrastructure of this kind is, with a few exceptions, such as CERN, relatively low compared to expenditure on manpower. Yet a great deal of research effort is continued because investments have been made in infrastructure, inflexible research bodies and scientists for whom the investment in infrastructure is the most important reason for going on,' says Professor Rohrer, member of the IBM Research Division in Zurich in 'Pathways for European Research'. As these are not the right considerations in the case of decisions on new investment, it would seem useful to determine which institutions satisfy the 'Rohrer criterion' and may eventually disappear. Creativity, not infrastructure, should be mobilised. More should also be done to see what applied research is still needed to enable the technology developed to be used.

For a European research area more is needed than measures relating to infrastructure. Infrastructure does not innovate, nor do electronic networks, although they should certainly be available. Up-to-date infrastructure is essential. A European research area can emerge only if advanced infrastructure is joined by a European identity and European creativity. Efforts should be directed less at bringing together infrastructure than at bringing together scientific talent in a stimulating environment with close links to the business community and potential users of the knowledge that is developed. In this context particular attention should be paid to the needs of SMEs. The mobility of researchers (especially young ones) should be increased, and more should be invested in the training and salaries of scientific researchers. The participation of women in scientific research should be promoted. Researchers must be released in greater numbers to work together in small or large groups on (basic) research projects. The European Union should invest in an open and attractive research climate. This can be achieved, for example, by doing far more than is now the case to familiarise users, the business community and the inhabitants of the European Union with what European research has produced and with the impact that research has on competitiveness, prosperity and employment. A great deal of research – in the biotechnological field, for example – has a poor image with inhabitants of the European Union. A better image, greater mobility, better remuneration will help to interest young graduates, both men and women, from the European Union and outside in taking up research posts. Interest in science and technology begins in primary education. Benchmark studies should be carried out regularly to gauge the performance of European research and the innovative system and may contribute to the closer coordination of national and European R&D efforts and policy activities. Administrative and formal obstacles to scientific research should be removed. The debate has hitherto been directed primarily at the deployment of resources. It would seem wiser to begin by discussing objectives and then to decide how resources should be used.

Common objective

As stated above, the European Union currently has 15 million unemployed. Where the euro makes for monetary unity, the reduction of this unemployment figure may act as a lever for a higher level of cooperation within the European Union. Clear objectives should be set, e.g. 10 million fewer unemployed in 2005. Other strategic objectives must be formulated from discussions with scientists, firms and end users. Once lower unemployment has been achieved, the European Union can also derive full benefit from the New Economy, although the necessary action needs to be taken in other areas. In this context it is important, for example, for the Community patent to be introduced soon. The present European patent system causes fragmentation and considerable additional costs. While certain measures will lead to higher employment in the long term, the options for the shorter term should not be overlooked. In the short term many jobs can be created through investment in the training of people capable of working on the establishment and elaboration of e-business concepts.

Currently, there are a million vacancies in the European ICT sector. However, the baby should not be thrown out with the bathwater. Jobs that cannot be filled here must be prevented from being relocated to other parts of the world. Prosperity and employment emerge not only from innovations but also through skilful reaction to trends. Flexible centres of learning might be set up in the European Union to provide applied e-training courses. Graduates might help firms to establish e-business concepts. SMEs might also receive financial help to recruit these e-experts. The aim is to create employment and prosperity not only in the long term but also in the short term. It would be wise in this respect to consider developments (benchmarking) in a country like Sweden. Sweden has various technical universities. IT education at these universities occupies a central position. There are plans for the establishment of specialised universities for training in information technology. This academic year saw the installation of the first professor of mobile e-commerce.

Summary

A debate on a new research area must consider not only improvements to infrastructure and the optimisation of existing infrastructure: it must also and above all consider the substantive qualities of the European research area. It must be a debate about the deployment of people, about talent, about creativity, about mobilising scientific talent. What major, strategically relevant research projects should be established, and what should be done to translate this scientific work into competitiveness, employment and prosperity? Only then should the debate turn to resources. A new technological research programme should be based on the outcome of this debate. It will be clear that the development of a uniform European research policy, a European Union for technology too, cannot be completed in one debate. But a start should be made. A future technological research programme must reflect the new thinking and the opportunities offered by the New Economy. Reflection on the European research policy should occur at several places in the European Union, including the European Science Foundation (ESF), the Eurohorcs, the European business community, universities and researchers. The European Parliament can be put in charge of directing this debate.

OPINION

of the Committee on Legal Affairs and the Internal Market

for the Committee on Industry, External Trade, Research and Energy

on the communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions "Towards a European research area"
(COM(2000) 6 – C5-0115/2000 – 2000/2075(COS))

Draftsman: Donald Neil MacCormick

PROCEDURE

The Committee on Legal Affairs and the Internal Market appointed Donald Neil MacCormick draftsman at its meeting of 28 march 2000.

It considered the draft opinion at its meetings of 18 April and 8 Mai 2000.

At the latter meeting it adopted the amendments unanimously.

The following were present for the vote : Willi Rothley, acting chairman; Rainer Wieland , vice chairman; Donald Neil MacCormick draftsman; Maria Berger, Brian Crowley, Jean-Maurice Dehousse, Marie-Françoise Garaud, Evelyne Gebhardt, Malcolm Harbour, The Lord Inglewood, Kurt Lechner, Klaus-Heiner Lehne, Arlene McCarthy, Toine Manders, Bill Miller, Ria G.H.C. Oomen-Ruijten, Francesco Enrico Speroni and Diana Paulette Wallis.

SHORT JUSTIFICATION

The Commission's Communication is important and somewhat alarming. It chronicles the relative decline of research expenditure and activity in the European Union by comparison with the USA and Japan in recent years, at a time at which the gap should have been reducing rather than growing wider, if the future prosperity of the Union is to rest on secure foundations in a knowledge-based economy.

The Commission proposes deliberate efforts towards realising a European Research Area. It recognises that any such efforts must respect the principle of subsidiarity 'in the broadest sense', allowing for private as well as public investment and for the role of regions as well as of member states. This is a very welcome recognition, but the point should be pressed a stage further. The quality of research is I then final analysis dependent on the enterprise and creativeness of research teams and individual researchers. There is always some danger of creating research bureaucracies aimed at improving research effort but actually a drag upon the activities of the researchers themselves.

What is clear is that, at the level of the European Union, much can be done to diminish disincentives to effective research and industrial exploitation of its output. Establishment of a regime for European patents is now a matter of urgency. Still persisting obstacles to free movement need to be dismantled, and in this respect member states must be called most rigorously to fulfil their responsibilities. Assistance with effective networking should be given priority. But substantial increases in Union-level expenditure in support of research, or increasing the extensiveness or intrusiveness of Union-level bureaucracy is probably undesirable. Research support agencies in the member states have developed their own mechanisms and methodologies for research support and for prioritisation of subjects and themes for research. Provided the Commission and Council exercise their influence to enhance levels of expenditure to a more adequate level, much of the rest of what is needed should be left to the principle of subsidiarity 'in its broadest sense'.

CONCLUSIONS

The Committee on Legal Affairs and the Internal Market calls on the Industry Committee as the committee responsible to incorporate the following points in its report:

The European Parliament,

- A. Whereas a prosperous Europe requires, and will be marked by, a large and active research community with a substantial output of successful research, especially but not only in such areas as high technology, health sciences, environmental sciences and biotechnology,
 - B. Whereas the value of research in such other disciplines as engineering, management, the economic and social sciences and the humanities must not be neglected in this context,
 - C. Whereas it is a matter of profound concern that levels of effort in research in Europe persistently lag behind those of both the United States and Japan, and that in recent years the gap has not diminished but grown,
 - D. Whereas there is a need both for increased expenditure on, and also for enhanced coordination and coherence in, European research to increase competitiveness;
 - E. Whereas the value of fundamental research is not calculable in terms of its direct or immediate transferability to industrial processes, yet such research is in the long run an absolutely necessary condition of both research competitiveness and industrial competitiveness, and undue concentration on applied or near-market research is therefore counter-productive;
 - F. Whereas maintenance of high-quality fundamental research is required both for the sake of its contribution to human knowledge and because it is essential if Europe is to retain its own best researchers and to be attractive to able researchers from outside the Union;
 - G. Considers that it must always be recognised that good research depends on good researchers who are supported generously to pursue their own judgement about research goals and strategies, subject only to such general priorities as may be set by governmental agencies or private backers. Research policy ought to be a matter of facilitating the work of scientists, not of directing it. Community research facilities should therefore be improved and there should be greater Community coordination of national programmes.
 - H. Recognises that a European Research Area could lead to a concentration of research facilities to the detriment of peripheral areas,
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- 1. Underlines that full realisation of the aim of a single market will include easy mobility of researchers in the natural, medical, social, and human sciences among universities, research institutes, government research establishments, and private industry
 - 2. 1a. Considers in this context that it would be an enhancement of European research cultures if deliberate steps were taken to establish or enhance contacts of various kinds between business firms of all kinds and universities and other research establishments, but with due precautions against abuse of commercial confidentiality to suppress publication of research findings that ought to be in the public domain;
 - 3. Underlines that regrettably, instances such as that of the Foreign Language Lecturers in Italy show that the Commission has over the years conducted itself with a certain pusillanimity in this regard, and in future it must show itself more resolute.
 - 4. 2a. Points out that other obstacles to free movement may arise through failure to conduct fair competitions for or recruitment to research studentships at doctoral and postdoctoral level, thus inhibiting free movement of scientists and scholars at the stage of their careers when they can profit most greatly from experience in different research cultures, and can

- in the longer term draw on their experience to help in breaking down barriers;
5. Points out that there are unnecessary legal obstacles to exploiting European research, one of which is the difficulty and cost of establishing patents; the Commission should take determined action with a view to legislating for the creation of a European patent regime.
 6. 3a. Notes that other obstacles include continuing failure in mutual recognition of diplomas and professional qualifications, uncertainty and lack of coherence in provisions about the status and security of those engaged in research careers, and the absence of encouragement for, or a European statute enabling, the creation of 'seed-corn' companies to develop industrial applications of research findings;
 7. Underlines that a European research area would be marked by efficient networking and easy collaboration among researchers and research institutes situated in different member states, with a greater mutual understanding between different research cultures than exists at present; this could be facilitated by enhanced use of the internet and other systems of electronic interaction, and would be of greatest value in relation to centres of highest excellence
 8. 4a. Acknowledges the success of existing Europe-wide facilities and programmes, and stresses the need to develop 'critical mass' in major research fields, whether at single centres or through 'virtual centres', and urges the Commission and the Member States to give priority to the 'critical mass' requirement both in the Framework Programmes and otherwise. Where practical, research facilities should encompass peripheral institutions and companies to prevent concentration;
 9. States that the Commission's commitment to the principle of subsidiarity 'in its broadest sense' as stated in para 5.1 of the Communication is much to be welcomed; the role of regions as well as member states, and of private industry as well as government is indeed important; but, beyond that, researchers and research teams adequately supported on the basis of competitive and peer-reviewed systems for research finance are the ground level of the European research effort.
 10. 5a. Considers that the simultaneous use of all official European languages, which constitutes both an inheritance of the past and a very positive element in the maintenance of a cultural diversity which is one of the trademarks of Europe, hinders globally the communicating process among European scientists, and should therefore justify European action favouring translations and communication endeavours;
 11. 5b. Recommends, however, that the Commission enhance means of exchange between research teams and use its powers to stimulate public and private funders of research at all levels to better coordinate action at European level;
 12. 5c. Considers that a biannual (orally modify) report from the Commission to the European Parliament would permit an adequate review of the decisions taken and of the results obtained;
 13. Concludes that a 'European Research Area' requires a highly important contribution to be made by the European Institutions, in particular the Commission, directed to encouraging enhancement of effort and improved coherence among diverse programmes at regional and Member State level, but that the contribution of the institutions should remain quite tightly focussed on those objectives that can only be achieved at pan-Union level, and ancillary activities such as:

- Monitoring progress
- Communicating information
- Fostering best practice
- Developing Framework Programmes in areas requiring Union-level support
- Improving the legal framework, e.g. as respects patent law or company law
- Securing freedom of movement and discountenancing barriers to research mobility
- Facilitating research networks and other devices geared to realising critical mass