



European Economic and Social Committee

INT/326
**Europe's potential/research,
development and innovation**

Brussels, 13 December 2006

OPINION
of the
European Economic and Social Committee
on
Unlocking and strengthening Europe's potential for research, development and innovation
(Exploratory opinion)

In a letter dated 9 August 2006, Dr Schavan, Federal Minister for Education and Research, acting on behalf of the forthcoming German Council Presidency, requested the European Economic and Social Committee to draw up an exploratory opinion on

Unlocking and strengthening Europe's potential for research, development and innovation
(exploratory opinion).

The Committee instructed its Section for the Single Market, Production and Consumption to prepare its work on the subject.

In view of the urgent nature of the opinion, at its 431st plenary session, held on 13/14 December 2006 (meeting of 13 December), the European Economic and Social Committee appointed Mr Wolf as rapporteur-general and adopted the following opinion by 125 votes to one with two abstentions.

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1. Summary and recommendations

1.1 *The Committee welcomes the request, made in preparation for the German Council presidency by the German minister for education and research, for an exploratory opinion on Unlocking and strengthening Europe's potential for research, development and innovation. It considers it important and helpful that, in this way, the views of the Committee – as the bridge to organised civil society – on this very wide-ranging and multi-faceted topic are able to play a part in shaping the future of European education, research and innovation policy .*

1.2 Bearing in mind the fact that the Commission has recently published two Communications¹ dealing with the subject of "innovation" in the full extent of the term and in the light also of the excellent Aho Report², the present opinion will focus primarily on the twin issues of

¹ COM(2006) 502 final of 13.9.2006 entitled "Putting knowledge into practice: A broad-based innovation strategy for the EU" and COM(2006) 589 final of 12.10.2006 on an innovation-friendly modern Europe.

² EUR 22005 "Creating an Innovative Europe" ISBN 92-79-00964-8.

research and development - which are regarded as the absolutely necessary prerequisites for any sustainable capacity for innovation - and on the requisite training. In this way excessively extensive overlaps with the abovementioned publications are also to be avoided.

- 1.3 Top performances in the scientific and technical field, and their conversion into a competitive, economic force, are essential preconditions to safeguarding our future, for example with regard to energy and climate issues, preserving and improving our current global position, and developing rather than jeopardising the European social model.
- 1.4 Europe's aim, therefore, must be to be aware of and revive its tradition as the leading area for research and innovation. This means doing more to enhance the skills Europeans will need to achieve that goal, investing significantly more in research and development, increasing their efficiency, strengthening industry's willingness and ability to innovate, and reducing any obstacles that stand in the way.
- 1.5 The most important prerequisite for achieving this goal is a social climate that is open to progress, in which society fully understands this and all its implications, so that politicians at all levels create the necessary conditions and take decisions that are conducive to such progress and, however, also so that jobs are created and enough confidence and optimism is built up in industry for the necessary investments to be made.
- 1.6 This includes ensuring that the public is made more familiar with science and technology than is currently the case and making better use of the existing pool of talent by providing it with more intensive support. Much greater priority needs to be given to science and technology in primary school curricula, and even more so in secondary education.
- 1.7 Children and young people must be introduced to the uses of science and technology by means of a step-by-step approach which places emphasis on concrete examples and practical experience and teaches them basic terms and laws. Those who show talent for science and technology should be encouraged to pursue a – notoriously tough – course of study in this area and be given a solid basis of knowledge with which to start a career in this field.
- 1.8 This also means that scientific and technical training in universities and technical colleges must, at the very least, match the highest international standards. The most important capital for research and innovation are top-qualified and motivated scientists and engineers of both sexes who maintain and develop their skills through lifelong learning throughout their careers.
- 1.9 Furthermore, the EU, Member States and business must offer these scientists and engineers attractive work opportunities, incentives, career perspectives and the security they need to plan their lives. These need to reflect the investment in their education by society, as well as their own personal investment in a field of study that is particularly difficult and demanding. Only in this way will a change in the mobility patterns of key achievers be attained for the benefit of Europe and away from the current and much lamented brain drain.

- 1.10 Finally, the willingness of industry, and in particular small and medium-sized enterprises, to innovate and invest in research and development needs to be promoted and made more attractive and more rewarding through appropriate legal, administrative and financial framework conditions.
- 1.11 Special efforts should be made to speed up the conversion of new scientific knowledge gained from research and development into new products and processes. Through their staffing policies, businesses must ensure that sufficient scientific and technical ability is available to them, enabling them to take part in the innovation process, or at least assess new ideas or opportunities correctly, and to adapt.
- 1.12 Besides adopting financial or fiscal measures, or measures relating to liability legislation, particular emphasis should therefore be placed on two-way mobility between academia and business. Introducing a new and attractive mobility or scholarship system which involved academia and industry in equal proportion, facilitating knowledge transfer, training and continuous professional development, would be especially helpful.
- 1.13 The system should enable top-qualified scientists to work in industry (and vice versa) for limited periods of time with a full, guaranteed right of return to their previous career, rather like the sabbaticals common to higher education. It would establish a bridge for the mutual exchange of staff between academia and business, guaranteeing an optimum transfer of knowledge.
- 1.14 Further concrete recommendations and conclusions:
 - 1.14.1 The Barcelona Goals, which were formulated with a view to implementing the Lisbon Strategy, must be taken very seriously by all the players addressed therein, if we are to avoid remaining in final position in the global R and D investment race. These goals stipulate that overall expenditure in the EU on R and D is to be increased so that it reaches a level of around 3% of GDP by 2010. Two thirds of the requisite investment is to be financed by the private sector.
 - 1.14.2 The current EU budget forecast for 2007-2013 means that, under its seventh R&D framework programme, the EU would contribute a share of only 2% towards the total investment in research and development aimed for by the Barcelona Goals. The Committee takes the view that this is insufficient to maximise the multiplier and integrating effects that EU funding has on Member States' research funding and much-needed industry investment, and thus bring about the considerable increase that is needed in these areas.
 - 1.14.3 Therefore, this part of EU funding should, as a first step, be increased to 3% as part of the revision of the EU budget planned for 2008. This would be a particularly effective step by the EU towards reaching the Lisbon and Barcelona Goals, which are still as important as ever,

more quickly than can be expected at present. This is also necessary because the research efforts of, for example, the USA and China are undergoing rapid growth.

- 1.14.4 EU law on state aid should therefore be framed in such a way as to encourage the Member States and enable them to provide more effective and less bureaucratic support than in the past, for the research and development plans of universities, research organisations and industry, and help them establish networks between them.
- 1.14.5 The budgetary laws of individual Member States should allow for a more flexible flow of funds to R&D measures. These should be adapted to the cycle of each project. For instance, it should be possible to transfer allocated funds to the following calendar or budgetary year.
- 1.14.6 Efforts to establish a Community patent should finally be brought to a successful conclusion. The outstanding language issue could be resolved by applying the long-standing practices of the international scientific community.
- 1.14.7 Innovation and progress are based on the combined effects of basic and applied research coupled with product-orientated development, though the borderline between these categories is not clearly defined.
- 1.14.8 For this reason, even closer networking of the training, research and industrial application pillars is needed. The Committee therefore welcomes the plans for the European Technology Institute (ETI), which is aimed at further developing the innovation capacity of the EU and its Member States by connecting training, research and innovation activities at the highest level.
- 1.14.9 Similarly, it also follows that sufficient EU funding for fundamental research is needed. The Ideas sub-programme in FP7 provides a good approach to this.
- 1.14.10 However, progress and continuous innovation do not depend exclusively on science and technology, but also on the motivation of all those involved, innovative business models, and the right management methods.
- 1.14.11 People need to be given the best possible opportunities to develop and take initiatives in line with their talents, skills and creativity. We must therefore also ensure that all the employees of a given firm or institute have the opportunity to contribute their own ideas and proposals and are rewarded accordingly. These are important issues of social research, the academic discipline of business management, and management culture in general.
- 1.14.12 If promoting new approaches to research, innovative technologies, business practices and business models is to be a success, one must accept that success involves a certain amount of risk. Progress and risk are two sides of the same coin.

- 1.14.13 Regulation that is too rigid and is aimed at standardising organisational structures, research programmes and working methods could impede the development of new approaches and innovation. The freedom to carry out research is a basic prerequisite for creative science, new discoveries and innovative technology, notwithstanding the limits which are imposed on it by laws relating to ethical issues and without prejudice to the appropriate use of allocated funds.
- 1.14.14 Administrative procedures for the promotion of research and development need to be simplified so as to limit the proliferation of a multitude of application, assessment, monitoring and auditing procedures - which in many cases even overlap - and to reduce them to a reasonable level.
- 1.14.15 Finally, reference is made to the detailed text of this opinion, which sets out the reasons for the recommendations and addresses – some very specific – further views and makes appropriate recommendations.

2. **General standpoints**

- 2.1 Bearing in mind the fact that the Commission has recently published two Communications³ dealing with the subject of "innovation" in the full extent of the term (see also point 4.12.1 below) and in the light also of the excellent Aho Report⁴, the present opinion will focus primarily on the twin issues of research and development – which are regarded as the absolutely necessary prerequisites for any sustainable capacity for innovation – and on the requisite training. In this way excessively extensive overlaps with the abovementioned publications are also to be avoided.
- 2.2 Europe is the cradle of modern science and research⁵. Science and research, their methods and way of thinking, were decisive in paving the way to our contemporary European society, its values, its way of life and its standard of living; they were a defining characteristic of the European cultural area⁶. The recipe for the resulting success was the free interaction of inventive craftsmanship and entrepreneurship with scientific methods and systems.
- 2.3 The key social developments that led to the modern state with separation of powers, democracy, fundamental rights and social welfare legislation went almost hand in hand with scientific and technological progress.

³ See footnote 1.

⁴ See footnote 2.

⁵ If the Greek/Egyptian cultural area is taken into consideration, along with the cross-fertilisation with the Indian-Arabic cultural area that has taken place from time to time, then it can be said to be the cradle of science generally.

⁶ A very comprehensive and detailed description of these processes can be found in the Committee's own-initiative opinion on *Science, society and the citizen in Europe* (CES 724/ 2001, OJ C 221, 7.8.2001).

- 2.4 As a consequence of these parallel processes, the living conditions of people in the countries and regions involved have changed and improved as never before in human history.
- 2.5 In the last 135 years, the average life expectancy of the population⁷ has more than doubled⁸. In the last 50 years, agricultural yield in terms of surface area has almost trebled. In the successful industrialised countries, the talk is now of obesity rather than malnutrition, of information overload rather than a lack of information, and of an ageing population rather than child mortality.
- 2.6 The capabilities and achievements of modern, mobile industrial society that have come about through research, science and innovation touch every area of human development and quality of life.
- 2.7 Although the immediate task of R and D is to seek out new and more profound knowledge - i.e. to delve into the unknown and to confirm what is suspected or already known – and also to develop new skills, the results of these endeavours have made a major contribution - to a degree which was in former times unimaginable - to promoting the well-being of mankind. In this figurative sense, the purpose of R and D is also to promote the well-being of mankind.
- 2.8 Another determining factor in the progress which has been achieved was the development and intensive use of energy-consuming industrial processes and machines. Energy freed people from the burden of the heaviest physical labour and became the "food" of modern economies.
- 2.9 This leads to a first important recommendation from the Committee: the decisive impact of these achievements on our current way of life, the conditions in which they came about, and the scientific, technical and cultural achievements associated with them, must be recognised by society and accorded the significance they deserve. This understanding must be part of general basic education. The far lower quality of life and also the poverty that can still be witnessed in parts of the Third World, and which were also present in today's industrialised countries before all these achievements came about, need to be remembered so that we are able to appreciate the standard of living we now take for granted – and the conditions on which it depends.
- 2.9.1 Accordingly, the curricula and available teaching time at all levels of education should be oriented towards gradually introducing children and young people to a scientific and technical way of thinking and to the store of knowledge⁹ that exists, by using clear and interesting explanations and teaching materials. They should also raise awareness of the significance of

⁷ In Germany.

⁸ Not least thanks to a reduction in child mortality.

⁹ This is not so much a matter of learning and understanding so many formulae, but rather of a basic understanding of technology and the fundamental laws of nature, and also of the significance of quantitative connections and the usefulness of mathematics.

science and technological development to everyday life. Gifted young men and women should be encouraged to choose a scientific or technical university course. Just as importantly, they should then be given the best possible scientific and technical education in colleges and universities and receive further education through lifelong learning programmes. What has been achieved to date forms the foundation for future progress.

- 2.10 Most of what has been said above does not just apply to Europe, though the above mentioned achievements are – sadly – not equally and sufficiently available to all people, population groups and peoples worldwide.
- 2.10.1 In this context, an important characteristic of the modern knowledge society should be highlighted: contrary to the practice in former times, when, for example, the manufacture of silk was protected by the Chinese as a strict secret, the knowledge that has been attained – our most valuable possession – is offered almost freely¹⁰, for example to students from all over the world at universities and technical institutes (even in the form of grants) and also in text books, publications, patent specifications, conferences of experts, internet publications, specialist journals, etc.
- 2.10.2 Putting attained knowledge into the public domain in this way contributes, on the one hand, to the global exchange of knowledge that is necessary for scientific progress, but, on the other, is also a unique and particularly effective form of development aid that, since as long ago as the 19th century, has enabled a country such as Japan, by its own efforts and starting from a mediaeval way of life and social structure, to achieve a similar standard of living to that of Europe.
- 2.10.3 However, there must be limits to the free availability of acquired knowledge and skills where this is necessary to get a return on the investment that has been put into research and development from its subsequent economic benefits and thus, at the same time, to provide the market with the advances needed to strengthen the competitiveness of the relevant economy.
- 2.10.4 To deal with this, most industrialised countries have developed a balanced legal system for time-limited protection of intellectual property, culminating in patent law. The Committee has issued several opinions¹¹ on this matter, and has repeatedly called for the introduction of an EU patent, but also for greater awareness of the economic and cultural importance of intellectual property. After all, the recognition and protection of intellectual property is an incentive and just reward for the inventors of new technologies and the creators of new works.

¹⁰ See, however, point 2.10.3: In certain cases (i) with its use limited for a time through patents or obtainable through licensing or (ii) treated by businesses, with varying degrees of success, as commercial secrets for a time.

¹¹ See CESE 521/2004 (OJ C 112, 30.4.2004), CESE 522/2004 (OJ C 112, 30.4.2004), CESE 1484/2005 (OJ C 65, 17.3.2006) and CESE 1350/2006 (not yet published in the Official Journal).

- 2.11 What does this mean for EU policy? First of all, this raises the important and very specific question of what fraction of gross domestic product (GDP) should be invested in research and development as part of a balanced overall policy.
- 2.11.1 The answer to this can be found in Europe's position in global competition – in other words, in the much-quoted Lisbon strategy¹².
- 2.11.2 In Barcelona in March 2002¹³, the Council took decisions¹⁴ that pointed the way, stating the 3% goal that by now is well-known. This states that total R&D expenditure in the EU should be increased such that it reaches around 3% of GDP by 2010. Two thirds of the requisite investment is to come from the private sector (Point 47 of the Council Decision). Alongside a massive increase in the EU's own R&D investment, the aim is also to create incentives for Member States and, above all, for industry to invest more in R&D. The Committee has emphatically supported this aim in numerous opinions¹⁵, but it sadly looks as though – except in a few Member States – it will not be achieved. This is a disturbing state of affairs.
- 2.11.3 In addition, the Stern Review¹⁶, entitled *The Economics of Climate Change* and published at the end of October 2006, has established that reducing global warming caused by greenhouse gases will cost around 1% of GDP, which includes further R&D activities that are necessary for this purpose.
- 2.11.4 But climate change and its relevance to the general problem of energy use, energy consumption and sustainable energy supply is not the only area to be addressed. Other important topics for research include combating physical and mental illnesses, making life easier for persons with disabilities, the impact of demographic change – including research into ageing, environmental protection, and generally securing the essentials of life and our European system of values. The Committee has made detailed recommendations on these matters in previous opinions, e.g. the one on the 7th R&D Framework Programme and its "specific programmes".
- 2.12 It is no secret that the European Union faces the very serious challenge of increasing global competition. A particular challenge for the EU is to maintain European jobs, prosperity and social and environmental standards. This is true not just because of the economic power of the USA and Japan, but more particularly because of the significant and increasingly strong industrial and research performance of countries such as China (which wants to overtake the

12 http://consilium.europa.eu/ueDocs/cms_Data/docs/pressData/en/ec/00100-r1.en0.htm.

13 http://www.consilium.europa.eu/ueDocs/cms_Data/docs/pressData/en/ec/71025.pdf.

14 These, in particular the 3% target, have regrettably only been partially implemented thus far.

15 CES 278/2003, (OJ C 95, 23.4.2003).

16 http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/sternreview_index.cfm.

United States as the most technologically advanced country in the world by 2050¹⁷), India and Brazil, and in view of the significantly lower wages and social and environmental standards in those countries.

- 2.13 It is precisely against this background of global competition and of the global race for increased investment in research and development, including global competition for the best scientists and engineers, that the European Union must better exploit and further strengthen its potential for research, technological development and innovation. Here we are talking primarily about global competition, not that within Europe.
- 2.14 Europe's competitive position can thus only be maintained if it continues in the future to maintain its lead¹⁸ in research, technological development and innovation, rooted in a socio-cultural environment of democracy, the rule of law, free enterprise, planning security, motivation and the recognition of achievements. The European Research Area must be strengthened and expanded. Whilst this is now generally recognised in political statements of intent, the reality in terms of action and specific priority-setting (e.g. research budgets) and the relevant regulatory frameworks (e.g. the structure of collectively agreed wages and working conditions¹⁹ and tax laws) shows up significant and regrettable deficiencies, both at Community level and in most of the Member States.
- 2.15 Other countries that are faced with similar problems, such as the USA and Japan, but also Switzerland, are not only managing to put significantly more resources into research, technological development and innovation, but are doing so more efficiently. This is demonstrated inter alia by the attractiveness of the USA for European scientists and engineers, which continues to lead to a brain drain: whilst two-way mobility is in principle desirable, there is a surplus of experts and talent emigrating to the USA.
- 2.16 With reference to the USA in particular, this fact is not only an indicator of financial efficiency and of a superior research system, but it also weakens Europe and strengthens the USA. Moreover, the USA's R&D policy is, in comparison with Europe, more open to and courageous with new ideas and approaches, and generally more willing to take risks. Furthermore, it is not only motivated by economic competitiveness, but equally by a coherent national security strategy²⁰ and the attendant high investment in R&D, which leads to cross-fertilisation.

17 *Bild der Wissenschaft* 9/2006, p. 109.

18 The Committee has already pointed out on several occasions (e.g. CESE 1484/2005, OJ C 65, 17.3.2006) that because of the global race for investment in research and development, the 3% target set in Barcelona is a moving target; he who reaches it too late still comes last.

19 In particular in respect of the earnings and contractual situations of young scientists and engineers.

20 The US Department of Defense provides large-scale funding for research projects in universities and research institutes.

2.17 Europe must now therefore reinvigorate its tradition as the leading area for innovation and research, invest considerably more in research and development, promote relevant skills among its people, reward their efforts and remove any obstacles.

2.18 The most important prerequisite for achieving this goal is for society to fully understand this and all its implications, so that politicians at all levels create the necessary conditions and take decisions that are conducive to such progress. This is the only way to ensure that (a) schools and universities are able to fulfil their role in the context of global competition and (b) adequate numbers of young people commit themselves to careers in science and technology. Only in this way will enough confidence and optimism be generated in industry for the necessary investments to be made.

3. **Financial matters and procedures**

3.1 **Source of investment.** Research and innovation – together with effective, appropriate training for those able to carry these out – are the preconditions for the future prosperity of society. Society must therefore provide the necessary investment. In the EU, this investment comes from the EU, the Member States, the private sector and – in small part – from private foundations.

3.2 **EU funding**

3.2.1 **7th R&D Framework Programme.** As far as the EU is concerned, the main contribution²¹ to funding for research and development will come from the 7th R&D framework programme. The budget for this, for the period 2007 to 2013, will be of the order²² of around EUR 50 billion²³, which represents about 5.8% of the total EU budget for the period.

3.2.2 This amount thus constitutes about 0.06% of the EU's gross domestic product, i.e. only around **2% of the Barcelona target value** (see appendix). The Committee takes the view that this is insufficient to maximise the multiplier and integrating effects that EU funding has on Member States' research funding and much-needed industry investment, and thus bring about the considerable increase that is needed in these areas.

3.2.3 The Committee very much regrets that its recommendation²⁴ to increase the proportion of the total EU budget available for the 7th R&D framework programme further has not been followed.

21 In addition, there are also funding programmes from various other Commission services, such as the framework programme for competitiveness and innovation (2007-2013) and the Intelligent Energy Europe programme.

22 COM(2006) 364 final; subject to a decision of the European Parliament and the Council that is still outstanding.

23 plus around EUR 2 billion from the 7th Euratom R&D framework programme.

24 CESE/1484/2005 (OJ C 65, 17.3.2006).

The Committee therefore calls on the European Council and the European Parliament to aim for significant progress on this, and to increase EU funding for the seventh R&D framework programme to **3% of the Barcelona target value, when they review the EU budget in 2008.**

3.2.4 **European Investment Bank.** The Committee also points out that European Investment Bank funding should increasingly be used to promote research, development and innovation²⁵, in particular where this serves to build up the necessary infrastructure and to transfer knowledge for use in industry.

3.2.5 **European Structural Fund.** The same applies, indeed more so, to the use of the European Structural Fund. In the new Member States in particular, there is significant ground to be made up in building the necessary research infrastructure and connecting this with the establishment of modern high-tech businesses.

3.3 **Funding from Member States and business; supporting measures taken by the European Community**

3.3.1 **More investment from business.** Given the structurally modest share of Community funding, it is of the utmost importance that both the Member States and European business²⁶ invest adequately – i.e. much more heavily than hitherto – in research, development and related training so as to unleash and strengthen Europe's potential for research, development and innovation, make use of the European Research Area, and at least come close to reaching the Barcelona Goals. In the case of the majority of Member States an enormous amount of catching-up is required in this respect and action needs to be taken as a matter of the utmost urgency.

3.3.2 **Reliable and suitable background conditions.** Alongside increased financial efforts, there also needs to be a review of all the other background conditions so that the resources invested can have the best possible impact. In particular, views and objectives that have nothing to do with research should be subjected to a cost-benefit analysis. The greatest possible planning security should be provided, and any requirements imposed by the state must be consistent.

3.3.3 **Supporting measures to be taken by the European Community.** The European Community, too, can and must provide strong support by means of its policies, in particular through appropriate regulations or directives, an optimal environment and intelligent use of the multiplier effect of its funding from the 7th R&D framework programme.

²⁵ The EESC's Consultative Commission on Industrial Change (CCMI) is in the process of preparing an opinion on this matter.

²⁶ A recent study by the European Commission showed that, in 2005, European businesses increased their R&D investment by 5.3%. This is to be welcomed.

- 3.3.4 **Community law on state aid.** Community law on state aid interprets EC Treaty Articles 87 and 88 to determine the type and scope of and administrative procedures for state aid²⁷ from Member States that is permissible for R&D. The way in which this law on state aid is framed²⁸ is thus another important lever with which to influence research funding by Member States, but also to make best use of funding from the EU's 7th R&D Framework Programme. EU law on state aid must therefore be framed in such a way as to encourage and enable Member States to support, in the most efficient and least bureaucratic way possible, the research and development plans of universities, research organisations and industry, and the synergies between them, to a greater extent and more effectively than in the past.
- 3.3.5 **Priority to global competitiveness.** In particular, it is important to avoid a situation where restrictions on state funding for research and development that are too narrowly drafted, associated with high administrative costs, and concerned only with the competitive situation within Europe impair the European Union's global competitiveness. On the contrary: precisely because of the very small relative contribution of EU funding²⁹, the Member States must be able to support the networking of universities, research institutes and industry that is necessary within the European Research Area generously and without being obstructed by red tape.
- 3.3.6 **SMEs and start-ups.** It is also important to further strengthen the potential of SMEs, and especially of start-up companies, for innovation and, more generally, to provide stronger incentives for industry to invest in this area. The Committee also refers to its recommendations³⁰ on the EU *Multiannual programme for enterprise and entrepreneurship, and in particular for small and medium-sized enterprises (SMEs)* and to the support for the knowledge-based economy that is especially important in this context. The fact that 98% of all firms in the EU are SMEs makes it particularly clear how important it is to strengthen the capacity for innovation of this category of enterprise.
- 3.3.7 **The example of the USA.** Inspiration should be drawn from global competitors' funding policy in this area, in particular that of the USA.
- 3.4 **Member States' budget rules.** Another significant finance-related question is whether individual Member States' budget rules are conducive to the aim of the effective use of

27 See also CESE 1588/2003 (OJ C 80, 30.3.2004) and CESE 1483/2005 (OJ C 65, 17.3.2006).

28 On 22 November 2006 the European Commission published a press release on this matter (IP/06/1600) on its website, together with a document (which lacked both a date and a reference number) on a "Community Framework for State Aid for Research and Development and Innovation". The EESC has not yet been able to take a stand on this document or to examine it in the light of the abovementioned recommendations.

29 See point 3.2.2.

30 CESE 245/2005 (OJ C 234, 22.9.2005).

resources. If not, the Community should work towards making the relevant Member States' budget rules more helpful to the requirements of research and development than has hitherto been the case.

- 3.4.1 **More flexible funding-release timetables and budget rules.** For large development projects, and for research and development investment in general, it is important to prevent arbitrarily set state funding-release timetables (as happens with government accounting) leading to decisions that are inappropriate to the project. Since when charting new technological territory it is not always possible to predict, with sufficient accuracy, the total cost, let alone the funding requirements for a particular calendar year, project funding may lapse due to state funding release timetables being linked to the calendar year. This leads to inappropriate optimisation procedures and inefficiency. Better solutions, such as permitting the transfer of part of the allocated funds to the next calendar or budget year, should therefore be found and incorporated into Member States' budget rules.
- 3.5 **Member States' tax and liability laws.** Similarly, the Community should work to encourage Member States to frame their tax and liability laws so that they do more to provide incentives for industry to increase investment in research and development and to keep the financial risks of introducing innovative technologies or products manageable.
- 3.6 **Sufficient core funding by Member States.** In addition, the Member States should ensure that their research institutes have sufficient core funding to be able to take advantage of co-financing from the seventh R&D framework programme.
- 3.7 **Accounting, costing and evaluation.** Similarly, the accounting, costing and expense evaluation procedures of recipients of state funding, in this case the various research institutes, should be assessed as to whether they are really appropriate to the particular characteristics of research and development. In particular, it should be established whether business-based approaches that have been optimised for manufacturing industry can be transferred wholesale to organisations whose product is knowledge, where they may lead to distortions in terms of cost, presentation and evaluation.
- 3.8 **Political and social priorities.** In general terms, politicians – and the media as opinion formers – should raise awareness that sufficient and effective research and development are the necessary foundation for future prosperity, i.e. also for jobs, social services and competitiveness, and they should act accordingly. This applies to the necessary budget decisions in favour of the required investment, as well as to the basic conditions in respect of training, employment law, working conditions, tax law, collective bargaining law, etc. It also applies to the basic attitude of society as a whole to scientific and technological progress, which carries with it significant opportunities, but also – despite all the precautions which are taken - an unavoidable element of residual risk. Excessive risk-aversion leads to stagnation, and eventually even to a loss of knowledge skills and to retrogression.

4. **Structural aspects and basic conditions**

- 4.1 **General standpoints.**³¹ A matter of overriding importance is therefore the economic, political, social and cultural environment in which creativity and inventiveness, together with entrepreneurial initiatives, can develop to an optimal degree³² and which makes it possible to secure the services of the best scientists and engineers for the European Research Area and also to retain them in this area. Such an environment also includes, in particular, the requisite measures for maintaining or establishing optimal operating conditions for good science and research.
- 4.2 **Testing of new ideas and concepts.** Science and research endeavour to come up with the best and the newest ideas, procedures and results. This also includes the independent reproduction (or refutation) – i.e. "certification" – of new knowledge, in addition to the dissemination and more in-depth and broader study of such knowledge, whereby the primary aim must be to venture gradually into new territory. It is therefore essential to facilitate and foster pluralistic³³ and inter-disciplinary approaches to research, assessment procedures and research structures in order to stimulate and exploit the evolutionary process³⁴ so as to achieve the best ideas, findings and forms of organisation in the respective cases.
- 4.3 **Evaluation criteria and room for manoeuvre.** So, evaluation criteria must promote innovation, thereby accepting the risks of failure since there can be no a priori guarantee of success. We should avoid overly rigid "top-down" regulations or bodies of rules designed to standardise forms of organisation, research programmes and working methods; such provisions may impede evolution towards new ideas and innovation. Innovation requires sufficient entrepreneurial freedom so that the new idea does not wither under the burden of too many restrictive regulations. Scientific freedom – inter alia the freedom from restrictive³⁵ or indeed ideological requirements – is a fundamental prerequisite for creative research and new discoveries, without prejudice to a) the limits placed by legislative answers to ethical problems and b) the proper use of allocated funds.

31 Based in part on CESE 288/ 2003 (OJ C 95, 23.4.2003).

32 See also point 3.4.

33 However, see also the point on "Cooperation projects" below.

34 See also CES 724/2001 (OJ C 221, 7.8.2001), *Science, society and the citizen*, Point 4.7: "Research is a step into the unknown and the approaches adopted by the individual or by the group vary and complement each other according to need, talent and temperament. Researchers are managers, engineers, collectors, hair-splitters or artists. Research is groping in the mist, hunches, surveying an unknown landscape, collecting and collating data, finding new signs, tracing underlying connections and patterns, recognising new correlations, developing mathematical models, developing the necessary concepts and symbols, developing and building new equipment, searching for simple solutions and harmony. But it is also confirming, making sure, expanding, generalising and reproducing."

35 See also CESE 1484/2005 (OJ C 65, 17.3.2006), point 4.13.2 on the Charter and footnote.

- 4.3.1 **Bottom-up.** Every research policy should therefore be based on the following principle: a "bottom-up" approach should be adopted wherever possible, whilst a "top-down" approach should be pursued wherever it is essential and there should be the maximum possible level of decentralisation whilst centralisation should be pursued only insofar as it is necessary. Ultimately this is a matter of achieving a balance between, on the one hand, individual capacity to generate new ideas and individual creativity, and, on the other, the necessary planning, harmonisation and steering when carrying out the bundling of resources necessary to carry out larger projects that require division of labour.
- 4.3.2 **Cooperation projects.** It is precisely those R&D projects or high-tech projects which are particularly demanding and promising that are, in the final analysis, the very ones which often require even international cooperation between the various research organisations, companies, etc., including funding by a variety of contributors. Especially in cases where the internal organisational structures, evaluation systems, staff policies and budgetary rules³⁶, etc. of the bodies in question show clear divergences, this may impede the desired success of such cooperation. What is important here is that all relevant stakeholders should be prepared to take each other's needs into account and, for the purposes of the specific project, to agree common rules that may deviate from their usual customs, to refrain from making specific demands for preferential treatment and to reach workable agreements.
- 4.3.3 **Open method of coordination.** Thus, whilst the point entitled *Testing of new ideas and concepts* advocates plurality and sets out the disadvantages of excessive uniformity for evolutionary progress, it is necessary to have within the cooperating institutions a minimum of uniformity of applicable rules and benchmarks for cooperation projects and for cooperation within Europe generally. In this context, the instrument of open coordination should be used carefully, in order to achieve the necessary balance between these conflicting standpoints.
- 4.4 **Simplification³⁷ and reduction of administrative procedures: Avoiding the creation of overlapping or parallel bodies³⁸.** Research and development inevitably also require work in the following fields: planning, enterprise, administration and evaluation, which has to be carried out by recognised, experienced scientists and engineers. However, the required administrative procedures have become so numerous and burdensome that significant resources are taken away from actual research activities. In particular, we have witnessed inflationary growth in the volume of application, appraisal, monitoring and auditing processes which have to be carried out; this has resulted in unproductive activity which diverts energy

36 See also the point under the heading "More flexible flow of funding and more flexible budgetary law".

37 See also CESE 956/2006, e.g. point 1.2 (not yet published in the Official Journal).

38 Cf. CESE 1674/2004.

away from real research work³⁹. Furthermore, a lack of investment in training, research and development cannot be replaced by stepping up the number of evaluation procedures.

- 4.4.1 The EESC would therefore reiterate its pressing request⁴⁰ that both the Commission and the Member States make an in-depth examination of this subject and seek to bring about more efficient and better coordinated procedures (in particular also involving and between the bodies concerned in the Member States). The EESC recommends, in particular, that steps be taken to reduce the excessive number of separately-acting, vertical (and also horizontal/parallel) authorising, guidance and monitoring bodies (and processes).
- 4.5 **Promoting excellence and competition.** The Committee welcomes the efforts made by the Commission, the Member States and research organisations to promote, in particular, excellence in respect of achievements or proposed programmes. These efforts are generally in line with the goal of bringing about top achievements in R&D and also tie in with the efforts either to keep the most successful researchers in Europe or to bring them to Europe. This is of course, going to entail a further increase in administrative procedures. This makes it all the more of a priority requirement to bring about massive reductions in the overall volume of these procedures and to rationalise and simplify them. The slogan "Less is more" is particularly applicable in this case.
- 4.6 **Blurring of the borderlines between research categories.** There is no sharp distinction between the categories of basic research, applied research and development; it is rather the case that they are linked by fruitful networking and feedback. Insofar as a distinction between these categories should continue to be made in bodies of rules, the organisations concerned must be given sufficient discretionary powers and room for manoeuvre in decision-making with regard to the determination of the respective shares. The fact does however, remain that, the findings of basic research are hardly predictable or capable of being planned in advance; a properly targeted, thoroughly planned approach can only come into play in cases where the goal can be defined and the route to be followed is sufficiently clear.
- 4.7 **Moving from enhancing our knowledge of nature to the creation of innovatory products, processes and services.** Special efforts need to be devoted to the goal of speeding up the translation of new findings in the field of basic research and also of applied R&D into the creation of new products, processes or services. Although this is one of the central problems, there are, unfortunately, no all-embracing patent remedies for resolving it. A number of principles can, however, be defined and several measures can be recommended.

³⁹ The Association of German Universities has just published a concise comparative study on this subject: *Forschung und Lehre* 9/06, p. 516 (www.forschung-und-lehre.de).

⁴⁰ CESE 305/2004, Point 5.1.8 (OJ C 110 of 30.4.2004).

- 4.7.1 The most important measure is no doubt to improve staff mobility between **academia and industry** (see point 5.5 et seq. below) and also generally to promote mutual understanding and **reciprocal interchange** between these two "cultures"⁴¹.
- 4.7.2 With these aims in view, **private industry** does, however, have a duty to develop the requisite entrepreneurial culture, to concern itself to a greater degree with the findings of R&D and to become more courageous as regards the introduction of innovatory products (see also point 4.9). Businesses need to gear their personnel policies towards acquiring or building up at least the requisite amount of scientific and technical competence to enable them to make sound judgments and to be ready to adapt. They must also seek to bring about a climate which promotes innovation with a view to fostering and exploiting the creative potential of their workforces. "Know-how can only be transmitted if it is available, recognised and understood"⁴².
- 4.7.3 A contribution to this could also be made by **information systems publicly accessible on the Internet**, which would make it possible for potentially interested parties to follow the path back from a general index to the results of European research as well as the original publications and their authors and to find the necessary contacts. This is partly done already by Cordis⁴³. Such information systems should if possible also be accessible to disabled people⁴⁴ and take account of the ageing society.
- 4.7.4 At least as important, however, is the question of the requisite cooperation between research institutes and companies working in related fields. Such cooperation may be promoted by direct physical proximity⁴⁵; the establishment of "**clusters**" results in both inevitable and deliberately sought-after meetings and partnerships. The establishment of clusters should be further promoted by introducing appropriate programmes. But all efforts at municipal and regional level to promote knowledge transfer and establish connections should be recognised and promoted. As an example the "Science Cities" initiatives⁴⁶ should be mentioned here.
- 4.7.5 The Committee thus welcomes most particularly the planning⁴⁷ currently under way with a view to establishing a **European Institute of Technology (EIT)**; the goal of the EIT is to expand the capacity for innovation of both the EU and its Member States by linking top-level

41 Not to be confused with the "Two cultures" referred to by C.P. Snow: Science and Humanities.

42 Quotation from the EESC opinion on the European Research Area, CES 595/2000 (OJ C 204, 18.7.2000).

43 <http://cordis.europa.eu>

44 See also the ERDF rules on this subject.

45 This is similarly also the case with regard to inter-disciplinary research topics.

46 www.sciencecities.eu

47 The EESC will draw up a separate opinion on this matter.

activities in the field of training, research and innovation. The EIT is to carry out its work primarily through Knowledge and Innovation Communities (KICs) based on partnership. The Committee recommends here, too, that in particular "bottom-up" initiatives and processes should be proposed, promoted and given priority.

4.7.6 From an overall standpoint, the Member States should also introduce stronger support measures in this context. Such measures should cover both the abovementioned "**start-ups**" and also cooperation⁴⁸ between research bodies and already **established companies**.

4.8 **Importance of basic research.** Such support programmes must, however, by no means be introduced at the expense of basic research. The EESC therefore reiterates its support for the highly important "Ideas Programme" in the seventh Framework Programme and for the *European Research Council* set up in this connection. A single new idea can unleash an avalanche of innovation, cascading into many different areas of technology⁴⁹. The importance of basic research and the promotion of this research is also recognised and supported by industry⁵⁰.

4.8.1 This is in line with the recommendation expressed on numerous occasions by the EESC to the effect that, when considering the **Innovation Triangle, comprising basic research, applied research and development** (product- and process-development), due weight must be given to all three of the essential pillars, including adequate support for basic research.

4.9 **The innovative product.** Even if all these recommendations are acted upon, it is the responsibility of private industry to realise, exploit or produce and market innovative products, innovative processes and innovative services based on the discoveries and capacities brought about by R&D. This process requires considerable prior investment and adequate time and also involves considerable risks for the market economy and SMEs in particular. Here, too, the EU and the Member States can, however, provide a decisive level of

48 There are, however, also a number of fundamentally contrasting interests which were already mentioned in point 7 of CES 595/2000, as epitomised by the following examples:

- Basic research, and indeed any longer-term research and development, thrives on early publication of findings so that other research groups have the chance to conduct control studies. It is also necessary to harness the synergies generated through immediate interaction within the scientific community, in particular where a large number of laboratories are cooperating in a joint research and development programme.
- Government must generally also insist on publication of findings from research it has funded in order to ensure a level playing field.
- On the other hand it is generally in a company's interests - in view of the competition situation - that the findings from its product development remain confidential at least until a new product is ready for the market.

49 See also CES 595/2000, points 1.7 and 8.

50 cf. The Economic Returns to Basic Research and the Benefits of University-Industry Relationships. A literature review and update of findings. Report for the UK Office of Science and Technology* by SPRU - Science and Technology Policy Research. Alister Scott, Grové Steyn, Aldo Geuna*, Stefano Brusoni, Ed Steinmueller, 2002.

assistance by pursuing generally consistent policies, by removing administrative barriers, providing economic – and, in particular, tax – incentives and an adequate amount of risk capital, introducing clever, effective and unbureaucratic support programmes and, in particular, by constantly endeavouring to create a social climate which is technology- and innovation-friendly.

- 4.9.1 A contribution to placing innovative products (techniques, services) on the market could also be made by **public procurement**, which in this way would provide the opportunity to stimulate modernisation of public installations⁵¹.
- 4.10 **Intellectual property and Community patent.** One weakness of the EU is the fact that there is no Community patent. This shortcoming leads to much higher costs and other barriers for those wishing to safeguard their intellectual property. This situation thus gives rise to two serious drawbacks: on the one hand, higher costs associated with the patent process and patent protection and, on the other hand, even the loss of possible patent protection as a result of delays and discouragement.
- 4.10.1 **The language problem.** One of the obstacles which stands in the way of reaching agreement in the EU on the introduction of a Community patent is the language problem. The Committee therefore recommends that the language question be solved according to the long established practice of the international science community. This should however by no means be used or understood as an effort to hinder or limit European multilingualism, which is a valuable indicator of the cultural breadth of Europe and therefore supported by the Committee⁵².
- 4.10.2 **Period of grace prior to publication which does not infringe novelty status.** The EESC also draws attention once again to its desire to see the authorisation of a period of grace prior to publication which does not infringe novelty status⁵³, with a view to resolving the conflict between the necessity on the part of research workers to publish their findings without delay and the qualification that it should only be possible to patent new, hitherto unknown inventions.
- 4.11 **Particular situation of the new Member States.** Whilst, on the one hand, the new Member States generally possess the competitive advantage of having lower wage levels – the corollary of which, of course, is that most of their citizens have to contend with the

51 It is however well known that innovative leaps always involve risks of delay, higher costs or indeed failure; this can lead to public criticism, and can ultimately be measured only by long-term success. [(Examples: Airbus 380, German toll system or UMTS licences) (Universal Mobile Telecommunications System)].

52 CESE 1372/2006 on a new framework strategy for multilingualism (not yet published in the Official Journal).

53 This implies that, within a given period of grace, the publication of new research findings by the inventor concerned cannot be deemed to infringe novelty status in any subsequent patent application by the inventor. See also CESE 288/2006 (OJ C 95, 23.4.2003), point 5.2 and CESE 319/2004, points 2.5.1 and 2.5.2 (OJ C 110, 30.4.2004).

disadvantage of a lower standard of living – these Member States do, on the other hand, suffer from the shortcoming that the infrastructure required for R&D remains less developed in their countries.

- 4.11.1 The EESC has therefore recommended on numerous occasions⁵⁴ that a much larger part of the resources of the EU's **Structural Funds** be used for the development of scientific infrastructure. The use of funding from the **European Investment Bank** for this purpose could also be highly beneficial.
- 4.11.2 The new Member States, too, for their part, should, however, do their utmost to make good the abovementioned shortcoming as soon as possible and then gradually to achieve the 3% objective. Overall, providing strong support to the new Member States to help them develop their research systems and to foster the next generation of scientists must be a priority objective of the EU.
- 4.12 **Innovation⁵⁵ in the general sense.** Whilst the observations and recommendations set out up to now have considered "innovation" mainly in terms of a consequence of scientific and technical activity and initiatives, attention is drawn here expressly to the entrepreneurial, commercial and social aspects⁵⁶ and the scope for innovatory ideas and processes. These latter aspects and possibilities undoubtedly complement the abovementioned scientific and technical aspects and are equally important in terms of prosperity, competitiveness and the Lisbon Strategy. As employed in this exploratory opinion, these aspects and possibilities relate primarily to economic and social policy issues, which are to be dealt with separately in a future opinion on the Lisbon Strategy (see also the following chapter).
- 4.12.1 In this context the Committee welcomes the **Commission Communications⁵⁷** (see also point 1.2) of 13 September 2006 "Putting knowledge into practice: A broad-based innovation strategy for the EU" and of 12 October 2006 on an innovation-friendly Europe, the main thrust of which it fully supports and some points of which it develops in this opinion. (The first of the Communications refers to the Aho Report⁵⁸), which is likewise deserving of

54 For example in CESE 1484/2005 (OJ C 65, 17.3.2006).

55 According to the Commission's Proposal for the establishment of the European Institute of Technology: "Innovation means the process and the outcomes of this process through which new ideas respond to societal or economic demand and generate new products, services or business models that are successfully introduced in an existing market or that are able to create new markets." In the present exploratory opinion, the term "innovation" refers primarily to scientific and technical processes or products.

56 See footnote 55 above. A more concise definition which has been coined in English is as follows "Innovation is the successful exploitation of new ideas".

57 COM(2006) 502 final and COM(2006) 589 final as well as footnotes 1 and 2.

58 Esko Aho/EUR 22005. <http://europa.eu.int/invest-in-research/>.

support. The Committee also refers to its own proposals⁵⁹ for an innovative employment policy.

5. **The human factor – Human capital - Scientists and engineers⁶⁰**

5.1 **Personal aspects - motivation.** In this context the EESC would draw attention to its opinion dealing specifically with this issue⁶¹ and would reaffirm and underline the comments set out in this opinion. As it had already done on earlier occasions, the EESC pointed out in the abovementioned opinion that human capital was the most delicate and most valuable research, development and innovation resource. The most important task is therefore to motivate talented young people to embark upon a scientific or technical education and to provide them with the best possible such education.

5.2 **Universities and institutes of technology.** The existence of the requisite training bodies is therefore a key prerequisite for meeting requirements as regards good scientists and engineers. It is therefore essential to establish and maintain – working in liaison with research and teaching bodies⁶² - an adequate number of properly equipped, top-quality attractive universities and, above all, institutes of technology, possessing excellent teaching staff. These universities and institutes of technology must be able to stand up to competition with the best universities in the USA or other non-European states. They must consequently also be sufficiently attractive to draw the best students from non-European countries. In this context, too, the EIT could play a helpful role.

5.3 **Mobility.** In view of the fact that, following a successful university education, mobility, both within Europe and involving countries outside Europe, is now already regarded almost as part of the necessary further training for scientists and engineers, two further demands consequently need to be made, namely:

5.3.1 **Mobility must be rewarded rather than being penalised.** Regrettably there are still a large number – and even some quite new⁶³ - wage, tax, insurance and pension provisions which bring about exactly the opposite effect. There is a need for a systematic and targeted review/correction of all the aspects/barriers concerned. Furthermore, account needs to be

59 E.g. CESE 740/2006 "Flexicurity: the case of Denmark" (OJ C 195, 18.8.2006).

60 Both men and women.

61 Opinion on Researchers in the European Research Area: one profession, multiple careers - CESE 305/2004 (OJ C 110, 30.4.2004).

62 With this aim in view, the achievement of even better networking between universities and non-university research bodies could be helpful, particularly in order to include in such networking the equipment and infrastructure of such research bodies.

63 For example in the case of Germany.

taken of the fact that, in view of the need to maintain family cohesion, the measures in question will have to be applicable to families as a whole.

- 5.3.2 Mobility must not lead to a one-way **brain drain**. The prospects of achieving success based on the equipment provided and the working environment, together with levels of income and career opportunities for research workers and engineers must thus be geared to those which are on offer in the non-European countries which provide particular competition to the EU Member States.
- 5.4 **Careers.** By virtue of the investment carried out by society, on the one hand, and individual researchers, on the other hand, with a view to acquiring the desired broadly-based and not readily accessible fundamental knowledge and high-grade special knowledge, society – as represented by politicians – assumes responsibility for making optimal use of this investment. This responsibility must be reflected in a concern to ensure that trained research workers are provided with **suitable career paths**, with attractive options for branching out into other fields, without running the risk of being professionally sidelined. If qualified scientists and engineers are unemployed or underemployed, this represents a wastage of economic investment and serves as a deterrent for the next generation of top-level scientists and engineers, with the result that they opt for non-scientific and non-technological careers or emigrate to countries outside Europe.
- 5.4.1 **Doctoral students.** In view of the necessary duration of a complete course of scientific and technical study, followed by a doctoral thesis and bearing in mind that dissertations in scientific and technological fields require students to be able to work independently and demonstrate total professional commitment, such commitment should be properly recognised and rewarded (as regards engineers, this is also sometimes the case). It is harmful, for a variety of reasons, to condemn particularly the most talented young scientists to financial dependency for too long a period during their **doctoral studies** by providing them with inadequate **payments**⁶⁴. Engineers and scientists who have completed a full course of academic study are not to be regarded as apprentices or trainees.
- 5.4.2 As regards the subsequent career path, it is important to develop attractive "**Tenure-track**" models and alternative options for branching out into other professional activities. The observations made at the end of the preceding chapter also apply – even more forcefully – in this context.
- 5.4.3 **Providing people with the right opportunities.** Progress and ongoing innovation also depend on motivating all the parties concerned and introducing new social models and the right management methods. We have to provide people, including all employees in firms and research institutes, with the best possible opportunities - in the light of their talents, capabilities and levels of creativity - to develop their gifts and display initiative and we also

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See also CESE 305/2004 (OJ C 110, 30.4.2004).

need to bring about a social climate which promotes their creativity. These are all very important matters of social policy and social research, family policy, business management teaching and management culture in general. In this context the importance, with a view to promoting creativity and productivity, of having a good "work-life balance" has also now been recognised⁶⁵.

- 5.5 **Interchange between academia and industry.** The best channel for transferring knowledge and exchanging experience is via the respective scientists themselves. Efforts have therefore been made over a long period of time to organise more exchanges of personnel between universities and research bodies, on the one hand, and industry, on the other hand. Despite the difficulties and obstacles which have to be contended with, it is absolutely necessary to step up these efforts.
- 5.5.1 Regrettably, little success has indeed been achieved⁶⁶ so far in overcoming a variety of barriers, such as **collective bargaining law, the appeals culture, career criteria**, etc. In view of the fact that the problems which exist are essentially well known, fresh attempts should be made to bring an influence to bear on the procedures or to modify them and to remove barriers in respect of salary levels. It is, however, not only a matter of salary levels and very different levels of income; a further factor is the differences as regards **enterprise culture as between industry and the academic world**. Even though some of these differences are likely to be of an intrinsic nature, it is nonetheless important to endeavour to bring about much more interchange and cooperation between the personnel involved. The EESC recommends that new ideas be put forward for achieving positive results in this key issue.
- 5.5.2 In addition to stressing the financial, tax law and liability law aspects, special emphasis should therefore be placed on promoting reciprocal mobility between academia and industry. The EESC would accordingly reiterate its recommendation that a **system of grants or support** be introduced with a view to providing incentives for limited (e.g. lasting one to three years) **reciprocal mobility** between industry and scientific bodies (with guarantees being provided that participants can subsequently return to their previous careers) along the lines of the arrangements governing academic **sabbaticals**. Such mobility could lead not only

⁶⁵ See Frankfurter Allgemeine Zeitung, edition number 257 of 4 November 2005, Section C1.

⁶⁶ See, for example, the publication entitled *Forschung und Lehre* (published by the Association of German Universities; www.forschung-und-lehre.de) 4/06 p. 208 *Forschung und Lehre* 7/06; p. 402.

to promoting better acquaintance on a personal level and a better understanding of the conditions under which the respective parties work and bring about a transfer of knowledge but could, of course, also pave the way for longer-term exchanges. Whilst the Committee recognises that return arrangements under such schemes could also be problematical for participants from both academia and industry⁶⁷, the benefits of such a system of grants should be of a sufficient order as to make it possible to overcome these problems. This scheme could indeed also open up additional career prospects.

Brussels, 13 December 2006

The President
of the
European Economic and Social Committee

The Secretary-General
of the
Economic and Social Committee

Dimitris Dimitriadis

Patrick Venturini

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N.B. Appendix overleaf.

⁶⁷ See, for example, the article on careers and prospects ("Beruf und Chance") in the Frankfurter Allgemeine Zeitung, edition number 251, of 28 October 2006, Section C1.

Appendix

Amount of support provided under the Seventh Framework Programme for R&D and the Barcelona Goal

EU-Financial Frame 2007-2013

(European Council 15/16 December 2005)

- EU Financial Frame EUR 862.3 billion,
- that is ca. 1.045% of EU total GNP
- (EU total GNP ca. EUR 82 516 billion)
- for FP7 ca. EUR 50 billion (to be finalised),
- that is ca. 5.8% of EU financial frame
- that is ca. 0.06% of EU total GNP
- that is ca. 2% (!) of the Barcelona Goals.
