Opinion of the Economic and Social Committee on:

— **the 'Fifth Framework Programme for Research and Technological Development (1998-2002) Commission Working Paper on the Specific Programmes: Starting Points for Discussion',**

— **the 'Eight proposals for Council Decisions concerning the specific programmes implementing the Fifth Framework Programme of the European Community for research, technological development and demonstration activities (1998-2002)', and**

— **the 'Two proposals for Council Decisions concerning the specific programmes implementing the Fifth Framework Programme of the European atomic energy community (Euratom) for research and training activities (1998-2002)'** [1]

(98/C 407/24)

On 10 November 1997 the Commission decided to consult the Economic and Social Committee, under Article 198 of the Treaty establishing the European Community, on the 'Fifth Framework Programme for RTD (1998-2002)',

and on 9 July 1998 the Council decided to consult the Economic and Social Committee under Article 130 I (4) of the Treaty establishing the European Community and Article 170 of the Treaty establishing the European Atomic Energy Community, on the above-mentioned proposals.

The Section for Energy, Nuclear Questions and Research, which was responsible for preparing the Committee's work on the subject, adopted its opinion on 22 July 1998. The rapporteur was Mr Bernabei and the co-rapporteurs were: Mrs Cassina, Mr Colombo, Mr Hernández Bataller, Mr Lyons, Mr Malosse, Mr Morgan, Mr Nilsson.

At its 357th plenary session of 9 and 10 September 1998 (meeting of 10 September) the Economic and Social Committee adopted the following opinion by 66 votes to one, with one abstention.

1. Recommendations

The Economic and Social Committee

having regard to:

1.1. the general framework of the Commission's proposals on the specific programmes of the fifth framework programme, the Council's common position of 23 May 1998 on the proposals on the fifth framework programme and the European Parliaments' opinions on the matter;

1.2. the new structure based on four specific thematic programmes, three specific horizontal programmes and the JCR-related programme, which is designed to provide an integrated approach and a break with the formula applied by previous framework programmes;

1.3. the fact that the innovative key action is the principal and defining element in the new approach, aimed at giving heightened focus, greater flexibility and more direct purpose to the practical objectives of solving problems faced by the public, companies and society in terms of new skills, new jobs, new services, new companies and new forms of competitiveness;

1.4. the fact that the 'quality of the Community product' is essential for winning back researchers' confidence in fifth framework programme implementation mechanisms by means of new management methods, procedures, bottom-up advisory processes and ex ante impact assessments for short- and medium-term key actions;

1.5. the need to dedicate appropriate financial resources to meet the internal and external challenges facing European research and in particular to give a positive signal through the trend in overall Community spending, in spite of the constraints of the general budget framework;

1.6. the need to predefine a strategic framework to back decision-making on technological choices in the European institutions and to provide a systematic monitoring system, using performance indicators to validate, integrate and steer the key actions, with a view to solving problems effectively, efficiently and openly, while generating genuine European value added;

[1] OJ C 236, 28.7.1998, p. 10.

1.7. the need for open cooperation in the field of RTDD with third countries and international organizations, based on finding remedies for common problems, while ensuring close links by means of consistency and synergy through the international strand in the key actions and national and Community scientific and technological cooperation policies, also for the purposes of implementing Articles 130K, L and N of the EU Treaty as recommended;

1.8. the necessity of ever closer cooperation between the specific programmes of the fifth framework programme and non-Community European bodies and initiatives in the field of research, and especially with Eureka, Cost and the ESA;

1.9. the crucial importance for the success of the Fifth Framework Programme of promoting innovation and SME participation, through the active dissemination and exploitation of RTDD results, particularly in terms of the impact on competitiveness, growth and employment in the EU, with to definitively reverse the European innovation paradox;

1.10. the importance of bolstering the new role of the Joint Research Centre as the Community's prime vantage point, able to anticipate emerging scientific and technological priorities, support Community interinstitutional decision-making, boost the development of a European and international dimension to RTDD and ensure proper standards of support for Community policies — particularly regarding legislation-, measurements and testing, and public health and safety;

calls on the European Parliament, the Council and the Commission to:

1.11. dedicate a substantially higher share of overall Community resources to the 5th framework programme than that proposed by the Council in its common position;

1.12. allocate the resources required by each key action to trigger the critical mass of global resources needed to solve complex problems in the short, medium and long term, on the basis of measurable objectives within fixed timeframes, concentrating and if necessary merging various key actions;

1.13. launch effective technological and industrial assessment systems, trend charts for Community and national measurements to facilitate joint action, and a framework of performance indicators for monitoring programmes and key actions, in close collaboration with the key actions designed to improve the socio-economic basis.

1.14. provide for efficient bottom-up advisory systems by backing up the European Advisory Group with up a network of national advisory groups for reference, monitoring and checking that the results conform to the strategic aims, not least to avoid the establishment of exclusive clubs.

1.15. ensure the integrated approach is efficient and transparent by means of forecasting units, innovation units and coordination units;

1.16. specify responsibilities for each key action, with clear and unambiguous management structures, by means of permanent platforms for dialogue and collation for the voluntary formation of clusters, centred on specific, set objectives within a given timeframe and with predetermined internal relationships;

1.17. define assessment criteria and procedures for proposals, in transparent, fixed, predefined and declared terms, sufficiently harmonized to facilitate straightforward access for all;

1.18. provide for training in new skills for managing the wide variety of disciplines and sectors — applied, generic, basic and demonstration research must be founded on the principles of aggregation and simultaneous engineering — while taking account of SMEs, end-users, and standardization, innovation and human resource development initiatives;

1.19. launch assessment initiatives, particularly in the international field, to precede, accompany and follow projects in each region, with a view to reaping practical benefits, solving real common problems and making greater use of concerted action and joint initiatives;

1.20. implement innovation and SME participation instruments, by specifying the role of the innovation cells in coordinating each of the key actions, streamlining and simplifying management procedures and participation rules for SMEs and their support and representation bodies, promoting 'intelligent' mediation networks with benchmarking for best practice, a mobility scheme for researchers in companies and the 'enterprise

in Europe' network, and enabling simplified cooperative research activities.

1.21. gear initiatives to exploit human research potential to match the key actions of the various thematic programmes, radically changing the direction of initiatives with a view to tightening the links, integrating the academic world with industry and also to developing new job profiles, linked more closely to the acquisition of new productive technologies.

1.22. redirect the Euratom programme towards a greater emphasis on the key action on nuclear fission, to ensure the safety of European nuclear plants, to review the orientation of its programme for nuclear waste disposal and improve the competitiveness of the European industry and continuing to support the fusion programme notwithstanding its current difficulties;

1.23. specify the new strategic role of the JCR, stepping up its brief to provide scientific and technological support in defining, implementing and monitoring EU policies, from a position of independence and neutrality, to support the decision-making process in the institutions and to promote quality, standards and consumer protection measures, while focusing activities on a few areas of excellence to guarantee a critical mass, a high profile and practical results.

2. General considerations

2.1. *Introduction*

2.1.1. On 10 June 1998, the European Commission submitted its formal proposals for decision on the specific programmes implementing the 5th EC and Euratom Framework Programme (FP) for Community-based RTDD [1]. The Commission has therefore now completed the set of legislative proposals envisaged in Title XV of the EU Treaty.

2.1.2. The European Parliament adopted the Commission's opinion at first reading in its December 1997 session and the Council adopted the common position on 23 May 1998. The Parliament later adopted a series of amendments following the second reading in its June 1998 plenary session.

2.1.3. The Committee has expressed several opinions on the preparatory documents and on the formal proposals for the Fifth Framework Programme, as follows: February 1997 — opinion on the Communication 'Inventing tomorrow'; October 1997 — opinion on the working document 'Specific technological objectives' and on the proposals for decision regarding the Fifth EC and Euratom Framework Programme; December 1997 — opinion on the amended proposals for decision on the Fifth EC and Euratom Framework Programme; April 1998 — opinion on the proposals for decision on the rules for sharing and divulging the results of research.

2.1.4. The Committee placed particular emphasis on:

— the urgent need to redefine the 1998-2002 programme for research, technological development and demonstration activities (RTDD) to pursue a true common European strategy;

— the need to directly involve researchers and end-users, particularly SMEs, in the devising, application and implementation of the FP;

— the need to focus energies on a limited number of key actions to enhance European added value in terms of visibility and tangibility of results, thus gaining public consensus; this would involve a minimum critical threshold of public and private resources, equivalent to 1 000 MECU per key action;

— the need for the programme to be transparent, interrelated, flexible and economical;

— the need for an integrated approach by public and private research centres, at national, Community and European level;

— the need to guarantee Community funding of 17 000 MECU for the FP;

— the benefits of monitoring the application of the specific programmes continuously and of conducting intermediate assessments.

2.1.5. Consequently, the Economic and Social Committee voted in favour of an FP funding of 15 533 MECU for Community action and 1 467 MECU for the Euratom programme. It also pinpointed about ten key actions on which to focus in order to fulfil measurable objectives within a set period, which, in the short and medium term, would resolve the problems of the people, of companies and of society in general.

2.1.6. The Committee also stressed that one of the top priorities of the entire Community programme should be to put an end to the European innovation paradox. It also emphasised the urgent need to set up cooperation and consultation schemes between Community programmes and the relevant national programmes — only by making joint efforts at various levels was it possible to respond positively to the challenge of globalization, market liberalization and the increasingly rapid innovation process.

[1] COM (98) 305 and 306.

2.2. *General outline of the proposals*

2.2.1. The Committee notes the Commission's decision to divide the 5th Framework Programme's first project into 4 specific programmes on:

I. Quality of life and management of living resources;

II. user-friendly information society;

III. competitive and sustainable growth;

IV. preserving the ecosystem.

In addition, there are the three horizontal programmes for the second, third and fourth key actions, as well as the specific programme regarding the JRC. The Euratom framework programme includes two specific programmes.

2.2.2. The Committee has already endorsed the break with the past, particularly with regard to the definition of the new instrument of key action as 'a cluster of large and small projects of applied, generic or (if appropriate) basic research targeted on a common European problem or challenge, with precise objectives and a firm timetable. Each key action should be of a limited duration, and depend on concrete results — in other words, achieving market targets. It should bring together work on standardization, innovation, exploitation and dissemination of results, and, in particular, include the participation of SMEs as a vital, visible component'.

2.2.3. In the light of the concentration objectives, the Committee believes that the number of key actions which have obtained interinstitutional consensus (20 for the EC Framework Programme and 2 for Euratom) is excessive. The Committee thus confirms its concern about an exaggerated proliferation of key actions which could render them meaningless as short and medium-term solutions to problems to make companies more competitive and to foster employment, at the service of the citizen, companies and society in general.

2.2.4. With regard to flexibility in setting out priorities, the Committee believes that it may be necessary to adjust the budget, mainly within each specific programme. It also reiterates the need to prevent a 5-year stagnation and compulsory funding of activities with a low uptake which would diminish their scientific prestige and, consequently, European competitiveness in the global market. Flexibility should be used on set objectives, however, and not just haphazardly.

2.2.5. The Committee can only, therefore, repeat what it has already strongly emphasised in its previous opinions on the lack of instruments for technological and industrial assessment and of systematic performance indicators as a whole.

2.2.6. In principle, performance indicators should, if appropriate, show the extent to which each programme and each key action meets the following requirements: global competition and improvement of basic socio-economic conditions; strategic capacity and uptake by the relevant industrial sector; visibility and a European dimension; interaction between Community, European and national projects; the creation of innovative enterprises, new skills and new markets.

2.2.7. In the Committee's view, the Commission should be able to clearly set out the content of the key actions in the form of problems to be resolved and concrete, measurable short-, medium- and long-term objectives. It should not relapse into the old pattern of drawing up long lists of priority subjects, including 20-30 'priority' subjects for each key action, in no particular order of importance. If this cannot be done directly by the Commission in its decisions on specific programmes, the Committee believes it is fundamental that, when the working programmes are defined, they should include an ex ante impact assessment on all the above indicators, stating the quality-based selection criteria and giving an indication of timespans and quantities.

2.2.8. The Committee feels it must express its concern for the possible consequences of the new Community approach, in view of the following:

— the lack of a pre-established decision-making strategy with regard to the technological options of the European institutions;

— a concentration, with more form than substance, in four specific programmes; this is due to the proliferation of more than 20 key actions with over a hundred scientific and technological objectives contained in several hundred RTD priorities;

— the lack of distinction between key actions and generic research activities;

2.2.9. The Committee is convinced that the Commission's management systems must be consistent with an integrated approach, and key actions geared towards the fulfilment of set objectives within a given timeframe, while checking that the taxpayers are getting real value for money with regard to investment in Community research.

2.3. *Procedural and management structure*

2.3.1. The Committee, on more than one occasion, has emphatically stressed the need to radically change tack with regard to the management and procedures of EC RTD programmes. This also emerged from the latest report by the independent assessors [1] and from the Davignon report, which stated that the quality of Community research strongly depended on transparent and effective management.

2.3.2. It is essential to resolve the management problem in order to restore researchers' confidence in the 'value of the Community product'. The problems are manifest in the activation mechanisms of the 5th FP — unless great changes are made to management methods and procedures, the complexity of the programme's new structure and the uncertainty as to whether it will be capable of effectively increasing competitiveness and employment, risk jeopardizing the very future of the 5-year Community programme.

2.3.3. There is a patent bureaucratic overload both in the time it takes to reach the final signing of the contract once interest has been expressed and in the burdens of administrative charges relating to programme management (now almost 8 % in the 5th FP). The Committee believes that the selection procedures should be given a time limit of six months at most, against the current average of over a year and that management expenses should be curbed.

2.3.4. As regards the reform of the advisory management structures, the Committee is glad to note that with the reduction in the number of specific programmes, the number of programme committees will also be reduced (from 18 to 8); the welcome streamlining of management that this will hopefully entail must not, however, detract from the need for the committees to meet more frequently. It would also be advisable for each committee to set up a sub-committee for each key action, at least for the specific programmes of the first action.

2.3.5. The Committee strongly supports the idea put forward by the Commission to set up European Advisory Groups (EAGs) for individual key actions or for clusters of homogeneous key actions, ensuring equal representation for both researchers and end-users of all nationalities. The renewal of their two-year mandate should, however, be partial and staggered in order to maintain continuity.

2.3.5.1. The EAGs must play a practical role in drawing up working programmes and contract notices and in structuring the projects ('clustering') with an eye to innovation and to the market. They must not, however, use *ad hoc* criteria for assessing proposals, neither must they pick and choose the information available to potential participants. They must, on the other hand, get the Commission to make ex ante 'impact declarations' once the contract notices for individual key actions have been issued. They must also monitor the progress of the key actions and assess their intermediate results in order to set priorities.

2.3.5.2. Each specific horizontal programme, as well as a programme committee, must also have an EAG, which would not only set guidelines and draft the working programmes and contract notices, but would also act as coordinator between the key actions of the thematic programmes and the JRC.

2.3.6. In the Committee's view, it is extremely important that for each Community EAG a network of national advisory groups also be set up for reference, monitoring and for checking that the results conform to the strategic aims, also to avoid the creation of exclusive 'clubs'.

2.3.7. The Committee believes that if Community policies and actions are linked by forecasting units innovation units and coordination units, to aid in defining priorities for the specific programmes, then the integrated approach of the 5th Framework Programme will be effective, attractive and transparent.

2.3.8. With regard to management responsibilities, the Committee is in favour of appointing a manager for each key action, to manage them in a clear, unambiguous manner and to act as an interface with the other key action managers, with those responsible for other Community policies and with researchers and end-users. In the Committee's view, therefore, transparent and streamlined procedures which ensure equal access and involve less red tape and hence lower costs, are just as important as the strategic objectives. Such a complex Community structure can only be justified if it is effective — failing this, the entire system could be gradually renationalized.

2.3.9. In view of the ratification of the Amsterdam Treaty, which allows the European Parliament to consult the Committee also on Community research policy and technological innovation, the Committee is preparing itself to take on an active role, particularly with regard to on-site monitoring of the results of the RTD actions under the framework programme.

2.3.10. In this regard, the Committee could be actively associated with a systematic monitoring structure pro-

[1] COM(97) 149, 16.4.1997.

vided by a European monitoring unit on research and innovation, which would:

— monitor the key actions or clusters of homogeneous key actions, in close collaboration with the EP, to ensure that the researchers and end-users are being actively involved and that progress has effectively been made in resolving the priority problems already identified;

— actively foster permanent dialogue between experts, industry, decision-makers, end-users and social and economic interest groups, with the support of the Seville Institute for Prospective Technological Studies, acting as an interface between supply and demand in order to better understand market needs and to advocate, if necessary, readjustments of the programmes and actions on an annual basis;

— help carry out benchmarking procedures to create a positive interaction between technology, innovation and employment; collating and distributing the results in industry, in the workplace and among the end-users of the organized civil society that the Committee represents, with a view to improving society's relationship with technology;

— participate in the technological and industrial assessment process, sharing its experience in the real economy, based on performance indicators, and encouraging an exchange of relevant, comparable information on future prospects and different scenarios, in close collaboration with the new ETAN network;

— help draw up a trend chart of systematic comparison of national, Community and non-EC measures in the field of research and innovation to allow researchers and end-users to establish joint instruments at different levels and, if necessary, to use the instruments provided for in Articles 130 K, L and N of the EU Treaty, according to the rules laid down *a priori* by the European Commission.

2.3.11. Furthermore, the Committee strongly recommends that an ESC delegation participate — even in the role of observer — in the new, bicameral organization that is to replace ESTA and IRDAC and that will help the Commission to implement the programmes, particularly the key actions.

2.4. *Financial aspects*

2.4.1. The Committee has already recommended flexibility in the appropriation of funds for monitoring the attainment of the intermediate research action objectives. Flexibility has already, in fact, been shown in the funding allocated in instalments over the periods 1998-1999 and 2000-2002 according to the availability of resources in the long-term budget.

2.4.2. Nevertheless, the Committee reiterates its concern with regard to the considerable reduction in the funds earmarked for the 5th FP by the Council in its common position (14 000 MECU), in view of the fact that the Committee had proposed a total of 17 000 MECU, the Commission 16 300 and the European Parliament 16 700 in its first reading.

2.4.3. The Committee also expresses renewed concern over the importance of coherence in the defining of key actions and the resources allocated to such actions, which should mobilize Europe and individual nations to fulfil concrete and visible objectives. For this reason, the Committee considers it inappropriate and unrealistic to grant funding of between 120 and 200 MECU to key actions such as 'the city of tomorrow and cultural heritage', 'land transport and marine technologies' and 'the ageing population', which address numerous complex problems of vital importance for society, enterprises and the citizen, while the key action on aeronautics has been granted almost the same amount of funding as all four key actions on the environment.

2.4.4. The Committee fears that key actions with resources of less than 200 MECU and with a multiplicity of declared priorities will have the same weaknesses as the specific programmes of the past — namely, a proliferation of limited resources in a myriad of micro-projects which, being unable to resolve such complex problems, end up by being self-perpetuating and self-justifying.

2.4.5. Moreover, the Committee hopes that the level of funding for the JRC programme will be maintained. If it is lowered to the level indicated in the Council's common position, some of the JRC's departments will have to be closed down and its role as a neutral, supernational research centre of the European Communities will be diminished.

2.4.6. With regard to the horizontal programmes, the Committee believes that those on innovation, SMEs and international cooperation should on no account be pushed under the 5th FP's minimum threshold. On the contrary, they should adapt to the crucial challenges presented by the European innovation paradox on the one hand and market globalization and interaction with all other European cooperation projects on the other.

2.4.7. Lastly, the Committee stresses the absolute need for systematic interaction between the actions of

the Framework Programme and those of the structural funds, the EIB, the EIF and the Phare, Tacis and Meda technical cooperation and assistance projects. This is vital in order to ensure greater coherence and ever closer coordination among European policies.

SPECIFIC ISSUES

EC FRAMEWORK PROGRAMME FOR RESEARCH, TECHNOLOGICAL DEVELOPMENT AND DEMONSTRATION

3. First action: implementation of research, development and demonstration programmes

The Economic and Social Committee wishes to highlight the following points with regard to the general implementation of the specific programmes upon which the First Action is based:

— while the focus may be on objectively top-priority growth in the research actions, it is important that the intermediate and final results of the shared research projects be verifiable and proven in order to control and redirect that research, which must be suitably flexible, though not just on a discretionary basis;

— the questionable proliferation of key actions and themes based on RTD priorities must be accompanied by new ways of managing the wide variety of disciplines and sectors. Applied, generic and basic research, as well as demonstration activities, must also be all-encompassing in terms of clustering and simultaneous engineering, and SMEs and end-users must work together to standardize, innovate, exploit and divulge, as well as to train. All this must be integrated by European and international cooperation — particularly Eureka — for each key action;

— turning from the concept of individual competitiveness to that of joint competitiveness, in which all researchers are joined in a common effort to provide multi-technology solutions to the problems common to the citizen, enterprise and society alike, it is necessary to create permanent platforms for dialogue and comparison also (in response to clear contract notices focused on economic and social problems) to encourage the voluntary formation of 'clusters' of researchers and projects geared to specific set objectives with a specific timeframe. The internal relations and intellectual property regulations within the 'clusters' would be pre-established, as in the Eureka 'protocols of agreement'; these integrated and complementary groups of projects would enable resources to be concentrated on just a few clusters of projects, thus enabling the latter to be managed more independently and encouraging greater administrative simplification and decentralization, with the contribution of and under the supervision of the relevant EAG;

— this new culture of participation in the actions of the specific thematic programmes must be accompanied by changes in assessment criteria and methods which must be transparent, certain, pre-established and sufficiently uniform to provide easy, safe access for all. They must also, however, take greater account of the market conditions and of the social and economic impact of the research; likewise, assessors should be selected on the basis of whether or not they conform to the new multidisciplinary, intersectoral approach that this problem-solving technique entails;

— the allocation of Community resources to the four specific programmes reflects the original proposals of the Commission when they were centred on three themes, upon which the Committee has already expressed its opinion (CES 1407/97). In fact, the resources of the first current specific programme (2 635 MECU) and the environmental component of the 4th specific programme (1 340 MECU) are equivalent to those in the old proposal for the first programme, 'Discovering the resources of life and the ecosystem'; the second programme, 'A user-friendly information society' (3 925 MECU) has remained the same, while the resources of the third current specific programme (2 895 MECU) and the energy component of the 4th programme (980 MECU) are equivalent to those in the old proposal for the programme on 'Competitive and sustainable growth';

— lastly, with regard to the resources allocated to each key action, to generic RTD actions and to the support of infrastructure, it should be a priority to set aside, for the former, funds providing a critical mass in order to respond rapidly and effectively to the problems they address. This is not the case for the key actions on 'The ageing population', 'Land and sea transport technologies' and 'The city of tomorrow'. Some of the distinctions between generic RTD themes and key actions appear unclear, however, though generic research per se manages to obtain far greater resources than the key actions themselves, as in the case of the programme on 'Competitive and sustainable growth';.

— particular importance should be placed on how each specific programme is to be implemented with regard to the accompanying and coordinating measures, as well as those regarding technological prospects and social and economic impact assessment. It is also essential that the actions be accompanied by an

appropriate recourse, that concerted action be taken to link national actions, pursuing the same objectives as the key actions, and that consideration be given to the actions with shared costs and the relevant actions organized by the JRC.

3.1. *First specific programme 'Quality of life and management of biological resources'*

3.1.1. Strategic objectives

3.1.1.1. The reference to the quality of life and to health creates the preconditions for an integrated overall approach and for more rapid positive effects in practice responding to the needs of society and consumers and promoting competitiveness and employment through the widespread presence of relevant enterprises in the user sectors.

3.1.1.2. It also responds to the general criteria underlining the Commission proposal and endorsed by the ESC in its earlier opinions, such as:

a) transparency and tangibility for the citizen;

b) absorption capacity of the industrial sectors concerned, which already have an established structure and include a generous sprinkling of SMEs;

c) European added value, through the already intensive circulation of products and the globalization of productive sectors whose scientific excellence has already been demonstrated;

d) capacity to mobilize international, European and national programmes;

e) full use of the results in industrial areas, where the presence of all types of undertaking (small, medium and large) and of many university, public and private research centres opens up the prospect of a large number of users and of dissemination to sectors where there is still relatively little research (agro-industry and food production).

3.1.1.3. The Community contribution, comprising considerable national activity and activity generated by private investment, with enterprises investing high percentages of their turnover in research, is an essential factor in creating new sites for research activity, resulting in new jobs based on old and new skills, and encouraging through its multi-national programmes the mobility of the researchers concerned.

3.1.1.4. Internationally valuable publications, the number of patents and their contribution to the total number of patents deposited, Europe's competitive position in relation to the rest of the world, and the capacity to create jobs and to make a positive contribution to the trade balance, would be further strengthened by such concentration on more homogeneous, inter-linked sectors (bio-technology, pharmaceuticals, agro-industry and health).

3.1.2. Key actions

3.1.2.1. Health, food and environmental factors

3.1.2.1.1. The general aim of improving public health by providing safe, healthy and balanced food must not lead to a lessening of the focus on health issues, as this is a priority area for research and one by which the European public sets great store.

3.1.2.1.2. Improving the production systems must include improving the quality of food products, reducing potential risk factors linked with the excessive use of chemicals as fertilizers, and combating any pathogenic organism. These aspects are underestimated in the present draft.

3.1.2.1.3. The proposal for research on the interactions between food and health should be orientated towards studying the effects of natural food, with non-specific organoleptic characteristics, in stimulating the natural specific immune system of the living organism, on organic imbalances, and in terms of mental and nervous disorders.

3.1.2.2. Control of infectious diseases

3.1.2.2.1. The change in the title underlines the Commission's wish to distance itself from the original approach concentrating on vaccines, and is to be welcomed since it makes it possible to cover a wider range of new or re-emerging diseases, excluding nothing and therefore involving a selection which will necessarily favour projects of even greater scientific value.

3.1.2.2.2. The Committee appreciates the greater detail and concentration of action deriving from the explanation given in the various indents of the specific research activities regarded as most useful.

3.1.2.2.3. However, the list of objectives could be further developed with regard to the prevention aspect, which is not only of enormous importance in the field of viral and other infectious diseases, but constitutes the most promising approach for reducing health costs, especially at the European rather than the merely national level.

3.1.2.2.4. The Committee thinks it advisable to re-insert an explicit reference to the fight against Aids because of the epidemiological importance and the viral mutation/adaptation aspects which can open up new approaches to combating viral diseases.

3.1.2.3. The cell factory

3.1.2.3.1. The general objectives of this key action, in the broader wording now adopted, are fully endorsed by the Committee. There is however a risk that the specific plan concentrates too much on productive processes and the production of individual substances.

It is desirable to bring out the need for a deeper knowledge of biological processes in order to assess every possible impact of their modification — ranging from ecological to economic.

3.1.2.3.2. The research activities listed in the individual indents are well coordinated, but consideration has not been given to the possibility of identifying unconventional approaches, natural processes and products, rather than just synthetic ones: this branch of research has proved to be promising, with a potential for useful multi-disciplinary applications; it should therefore be explicitly mentioned.

3.1.2.3.3. Particularly welcome is the final sentence which implies the study of new models replacing experiments on animals with cell cultures.

3.1.2.4. Environment and health

3.1.2.4.1. This key area, which appears only in the Common Position, covers research activities which the Commission had more properly included in the first key action, with the aim of a better understanding of the interactions between the genetic, physiological, environmental and social factors which maintain a state of good health.

3.1.2.4.2. Confirming the view it expressed in its opinion of 1 October 1997 [1], the Committee calls for the number of key actions to be reduced, starting by incorporating this key action in the first one or by giving them joint management and structures.

3.1.2.5. Sustainable management of agriculture, fisheries and forestry, including integrated development of rural areas

3.1.2.5.1. The broadening of the scope does not appear to bring with it any improvement in the definition of strategic objectives, since the research activity involved now covers so many diverse subjects that it could become a thematic programme rather than a key action.

3.1.2.5.2. This broadening signifies in the Committee's view the lack of a clear strategic vision of the research sectors which would most assist the development of the competitiveness of European enterprises, and that of employment; this had already been criticized in the earlier opinion [1].

3.1.2.5.3. Aware that an integrated multi-disciplinary approach cannot be achieved through a listing of subjects, the Committee calls for a further drafting effort in order to respond better to the general criteria laid down so as to ensure a European added value.

3.1.2.6. The ageing population

3.1.2.6.1. The general objective of prevention and treatment of diseases linked to age and situations of disability was better expressed in the first Commission proposal. The emphasis in the Council common position has shifted towards policies and actions which would reduce the social cost. This choice seems to partly conflict with the retention of every aspect of health and social security policy within the competence of individual Member States.

3.1.2.6.2. The ageing of the population involves immediate challenges, such as the fight against degenerative — in particular Alzheimer's and Parkinson's — cardiovascular and chronic diseases, the incidence of which is rising significantly among the older segment of the population. For this reason such diseases should be mentioned under the specific key action rather than under the generic activities.

3.1.2.6.3. More emphasis should be placed on clinical research which is essential in order to understand absorption mechanisms of medicaments and their interaction with food, so as to achieve a more rational use of medicines in the population segment which uses them most.

3.1.2.6.4. Some research activities indicated in the indents would be more properly listed under the generic activities, partly because of their horizontal nature and partly because they provide knowledge to support a whole range of key actions on other subjects (e.g. demographic and epidemiological research on elderly people with a view to transport, housing, energy sources, etc.).

3.1.2.6.5. The Committee calls on the Commission to maintain the original version of this key action radically, bearing in mind that the importance of the subjects covered is worthy of a specific research action.

3.1.2.6.6. The Committee reiterates that the appropriation for this key action is inadequate and calls on the Commission to raise it to at least 12 % of the sum earmarked for the first specific programme.

3.1.3. Generic activities

3.1.3.1. The generic activities should have a dual function: identifying new areas of research, and

[1] OJ C 355, 21.11.1997, p. 38.

developing 'pervasive' technologies with wide applications for final users [1], as well as support for the key actions which they complement.

Their aim is to help maintain and develop the flow of ideas and knowledge in the European Union, as well as its technological capability, in a limited number of priority areas of research and generic technologies.

3.1.3.2. The working proposals found in the first of the thematic programmes do not all seem to correspond to these priority requirements, but appear to be identified in residual terms, in the sense of accommodating sectors not covered by the key actions, or simply extending specific programmes launched under the Fourth Framework Programme.

3.1.3.3. The proposed generic activities

3.1.3.3.1. The Committee notes significant differences between the Commission proposal and the Common Position; it therefore intends to analyse points individually, without neglecting the opinion issued after a first reading by the European Parliament.

3.1.3.3.2. Chronic and degenerative diseases (especially cancer and diabetes), cardiovascular diseases and rare diseases: these research themes, as rightly pointed out, imply a multi-disciplinary approach ranging from aetiology to diagnosis, from prevention to therapy and the application of sophisticated technology using instruments, and correspond to an important immediate health requirement, are strategic and highly visible to the citizen; they can mobilize resources (technology and experience) from various areas, in which the EU is in the forefront of applied research and development, and the practical results of which can have an immediate impact in terms of employment and competitiveness.

All these features would justify placing the subject under key actions rather than generic activities.

3.1.3.3.3. Maintaining the principle stated in its opinion of 1 October 1997, the Committee calls on the Commission to propose the inclusion of these research activities in the key actions already identified: e.g. chronic and degenerative diseases under key action (iii), cardiovascular diseases under (iv), rare diseases under (ii) (taking up the EP's suggestion).

3.1.3.3.4. Research into genomes and diseases of genetic origin: the subject is correctly included under generic activities because of its long-term potential, its horizontal links with a number of key actions of this theme, and its links with other thematic programmes in view of the technology and instruments utilized.

3.1.3.3.5. Neurosciences: this activity too has all the characteristics to qualify it as a specific key action. For the same reasons as above, the Committee calls on the Commission to revise the present classification, inserting these activities in the most appropriate key actions, even under other thematic programmes (e.g. new diagnostic methods using images), leaving under generic activities only subjects which really fit the definition of generic activity, such as the inter-relation between biological and psychological processes.

3.1.3.3.6. Public-health and health-services research: The themes listed are undoubtedly of social importance, but do not fit in well with research activities proper, or with the features indicated in the Commission's own documents. The Committee suggests revising their content to bring them more in line with citizens' needs and the possibilities of industrial use, so as to avoid wasting resources and energies on subjects which do not meet the basic criteria identified and can end up being of purely informative interest (e.g. effectiveness and cost-effectiveness of health promotion; assessment of health care models).

3.1.3.3.7. Study of problems relating to biomedical ethics and bioethics in the context of respect for fundamental human values: The ESC fully agrees with the 'reasons' set out by the Commission.

The 'objectives and RTD activities' indicated seem to be more based on past experience than extrapolated to possible future areas. The ESC suggests that the ethical dimension should become the basis of all the research activities, with appropriate references inserted in the preambles of the programmes.

3.1.3.3.8. Study of the socio-economic aspects of life sciences and technologies within the perspective of sustainable development (the impact on society, economy and employment): the objective of this study is fully endorsed, explicitly linked as it is with the perspective of sustainable development, and hence of the economic and employment repercussions. However, the Committee wonders whether it would not be more correct, given the presence in the document of a specific thematic programme on sustainable growth, to include under its generic activities an attempt to assess the socio-economic impact, particularly on economic growth and employment, of every research activity carried out under the individual specific programmes of the Fifth Framework Programme.

[1] OJ C 355, 21.11.1997, p. 38.

3.1.4. Support for research infrastructures

3.1.4.1. The ESC fully agrees with the 'reasons' given in the document of 5 November 1997. However, it would seem desirable to include a reference to adequate protection for intellectual property, since that is prerequisite for the dissemination of knowledge and is becoming essential in the process of enlarging the EU.

3.1.4.2. The last phrase of the paragraph on 'Biological data and resources' — 'pre-clinical and clinical research facilities' — is unclear. This area has already been covered by a number of rules at Community level, and by attempts at international harmonization culminating in the recent directive on 'Good Clinical Practices' (GCP), on which the ESC recently gave its opinion [1] currently being examined by the European Parliament.

3.1.4.3. The ESC therefore suggests amending the point in question so as to make it focus more correctly on the epidemiological aspects linked with the research activities of the present specific programme.

3.2. *Second specific programme 'User-friendly information society'*

3.2.1. Scientific and technological scope and objectives

3.2.1.1. General Remarks

3.2.1.1.1. The Information Society Technologies (IST) Programme introduces a new approach to the Information Society theme of the Framework Programme. On the one hand the convergence of telecommunications, information technology, media and other content have been recognized in a converged and integrated approach to technologies, systems, applications and services. On the other hand, the strategic possibilities of the Information Society are recognized via action programmes designed to achieve the potential of the technologies.

3.2.1.1.2. The ESC is very supportive of this overall approach. Three of the four key actions defined in support of the theme are aimed at ensuring that the needs of individuals and enterprises are met by the IST programme. We believe that this is the right way for Europe to derive economic benefit and competitive advantage from Information Society Technologies. Europe needs to make a reality of the Information Society.

3.2.1.1.3. As far as the essential technologies, systems and infrastructure are concerned, there is a fourth key action together with an additional generic activity on longer term and/or higher risk research on future and emerging technologies. Throughout all four key actions, the over-riding emphasis is on software, systems and applications which build on the base architectures and infrastructures. It is via these new software and systems implementations that information society benefits are to be delivered and the key issues of usability, interoperability, dependability and affordability will be addressed. The ESC is very much in favour of this approach which exploits Europe's systems and software capability and gives it the possibility of a leading edge in the world of Information Societies.

3.2.1.1.4. The first three key actions for the Information Society will each receive 17 % of the Theme budget, with the key action on essential technologies at 36 %, and the general activities of future technologies at 10 %. The ESC agrees that this is an appropriate division of the budget, while noting that IST gets the biggest theme budget. This is appropriate at a time when the Information Society in Europe must become a reality.

3.2.1.2. Specific issues

3.2.1.2.1. The intentions of the IST Theme are fully endorsed by the ESC. The achievability of the programme must remain a question. It is recognized that the novel programme structure is a departure from previous practice so that more tangible results can be achieved. To achieve this, a proper strategy and a new management system will be needed.

3.2.1.2.2. The strategy states that 'clustering and concentration will be used to focus, co-ordinate and integrate activities' across the key actions. It is essential that this is done, otherwise there is a danger that projects within only one key action will not have the critical mass for success. However, achieving project critical mass will be a challenge for the management system.

3.2.1.2.3. The strategic statement puts an emphasis on European competitiveness and makes the point that 'the programme integrates actions to stimulate the take up of information society technologies with the research and technological development to ensure that the conditions and requirements for this use can be met.' The Commission document goes on to state that 'in addition to demonstrations and trials, these include actions to stimulate the development and diffusion of the skills necessary to take up research and development results

[1] OJ C 95, 30.3.1998, p. 1.

(such as validations, assessments, awareness building, first user actions and best practice initiatives) and consensus building and standardisation activities.'

3.2.1.2.4. The ESC is deeply concerned about the actions outlined in 3.2.1.2.3 above because they are easy to articulate and very difficult to achieve. This could prove to be the Achilles heel of the whole user friendly information society programmes and it can only be avoided by a very effective management system.

3.2.1.2.5. For the management system to be effective, certain minimum conditions will need to apply. These could include:

— project selection will need to be made on objective evaluation of relevance and replicability. Token political awards will have to be avoided;

— exploitation possibilities will have to be among the primary criteria for project selection;

— exploitation funding will have to rank as high as project funding, if not higher;

— project objectives must be measurable in time and result. The feasibility of such measurements must also be part of the selection criteria.

— specific consideration for SMEs. In view of the limited resources available, SME training, participation and dissemination of results will need special consideration.

3.2.1.2.6. Logically the Framework Programme should build on the existing IST base. There is no reference to or assessment of this base in the document. The ESC would like to make three points about the existing base:

3.2.1.2.6.1. For the Information Society to be realised, there must be universal access — domestic, business, institutional and government — to a broadband network. This point was developed in the ESC Opinion on Convergence [1]. There is no universal broadband access today, nor the prospect of it. This position needs to be taken into account.

3.2.1.2.6.2. There is a considerable IST base not yet exploited. What is required is often not further research, but a development program based on applications and regulatory freedom. The proposals for information security within the Electronic Commerce programme provide a case in point.

3.2.1.2.6.3. Given that many of the technologies are already under development and considering the very long development time, the restriction to precompetitive collaboration will be a major handicap. This may give other regions with other rules a competitive advantage against Europe.

3.2.1.2.7. For the average European citizen to benefit from the key actions, it is clear that he or she must have IT training in the national language, and easy-to-use national language interfaces in order to access the various services proposed. The present PC is very user unfriendly for the non professional. Digital TV delivered services are in their infancy; interfaces are still under development. The future wireless broadband telecommunications system, UMTS, will enable a new magnitude of multimedia applications and will require development of new interfaces. Across all the key actions there needs to be a coherent approach to communication with the average citizen. Solutions for the elderly and disabled should, in their simplicity, also provide facilities for the 'average' citizen. Without this emphasis on usability, the average citizen will be excluded from the information society.

3.2.1.2.8. With the enlargement of the EU in prospect, the opportunity to work with market players from candidate countries seems to have been ignored. The range of issues extends from accommodating additional national languages to investment in future broadband infrastructures.

3.2.2. Key action: Systems and services for the citizen

3.2.2.1. Health

3.2.2.1.1. The principles describe a generalised approach which could be interpreted as national. As European citizens increasingly cross borders there will be a greater need for international medical care with interoperability between the general and personal health databases.

3.2.2.1.2. The approach is very demanding because it also involves the coordinated development of many non-IST factors. The multilingual and multicultural environment will cause difficulties; so will the health

[1] OJ C 214, 10.7.1998.

and medical environment because the pharmacology varies a great deal between regions in the community.

3.2.2.1.3. For local/national use the distribution of medical information between medical centers using only a fixed broadband network will not be enough as remote medical treatment of individuals (telemedicine) will require a broadband wireless communication system with a high degree of connection security.

3.2.2.1.4. New personal health systems may undergo a revolutionary change in the next decade. A strong coordination will be needed with electronics and micro mechanical developments. This is one area where pre-competitive collaboration may not go far enough.

3.2.2.2. Administration

3.2.2.2.1. The main areas to address are access to services and systems and to make the information understandable and usable to the citizen.

3.2.2.2.2. There is clearly a danger that increased IST linkage between administrations and private citizens could severely limit individual rights and liberties. Consideration should be given to preserving the autonomy and privacy of the individual against the state and the union.

3.2.2.3. Transport and tourism

3.2.2.3.1. The RTD priorities are basically well defined, but for business and the citizen it would be beneficial to put more emphasis on navigation systems and other road telematic services with a special focus on those which would make re-routing etc. possible in order to minimize road traffic congestion, to shorten the travelling time and to minimize pollution.

3.2.2.3.2. The linkage between transport and tourism is pragmatic but not logical. These topics should be separated. The development and promotion of tourism, which makes the attractions of any region of Europe accessible in any region of the world, is closely linked to cultural and heritage issues, and needs more consideration. The solution lies in software and content scalability.

3.2.3. Key action: New methods of work and electronic commerce

3.2.3.1. Flexible, mobile and remote working methods and tools

3.2.3.1.1. Tools for remote learning should be considered in the context of remote working systems.

3.2.3.1.2. For remote working to fulfil its potential, there is again a major dependency on universal broadband access, training of the workers concerned and proper safe own management of safety standards (above all, length of exposure to terminals and ergonomic features of work stations).

3.2.3.2. Management systems for suppliers and consumers

3.2.3.2.1. We must include warehousing within Electronic Commerce. There is nothing in the text on automatic warehousing, or automatic ordering technologies, even though there are major developments underway. The electronic commerce linkage to distribution will often be not only remote, but cross border.

3.2.3.2.2. Electronic commerce will be an essential service in the user friendly information society. It involves not only the commerce in physical products, but also products with digital content, e.g. music, video and information. Many unsolved problems still need to be addressed, such as copyright, copy protection, filtering etc., particularly since E-commerce will be global business which needs global standards.

3.2.3.3. Information security

3.2.3.3.1. Electronic commerce and other transactions need strong security, particularly authentication and encryption. Many technologies are available, but their use is inhibited by existing national regulation. Therefore there is a need for convergence between RTD actions, the implementation process and the development of appropriate regulatory measures.

3.2.4. Key action: Multimedia content and tools

3.2.4.1. Interactive electronic publishing and digital heritage and cultural content

3.2.4.1.1. Generally there is only discussion of video-on-demand. RTD should also look at the dimensions of

news-on-demand, music-on-demand, games-on-demand, information services on demand etc. In many cases the information required cannot be accessed by a simple search function, and may need new intelligent agent based technologies. There is also scope to develop technological solutions to the copyright issues.

3.2.4.2. Education and training

3.2.4.2.1. This topic is of highest priority because there is an increasing shortage of the required skills. Secondary and tertiary educational institutions are not producing enough people of the right kind. There is still a trend in many of these Institutions to over emphasise the humanities at the expense of physics, mathematics and engineering. Moreover they do not seem to be able to react to the changes needed in the time available. However, this is an opportunity for remote learning institutions. They can change their programmes almost over night; there is no limit on number of students. The education and training programmes can easily be made adaptive to each student for maximum efficiency. The resulting qualifications should be accredited in all member states.

3.2.4.3. Human language technologies

3.2.4.3.1. These technologies are urgently needed in order to create a more universal European Community. It is a way to bridge cultures without distorting, destroying or restraining their natural evolution. However the text does not mention the basic technologies needed.

3.2.4.4. Information access, filtering, analysis and handling

3.2.4.4.1. One major obstacle is the missing bandwidth of available access networks. The development of affordable and valuable services should be developed hand in hand with access network technologies. With the converged IST programme we now have the opportunity for a coordinated effort.

3.2.4.4.2. The proposals to support development activities of categorization, labelling and filtering to achieve the enabling of selective information retrieval and filtering will be extremely difficult in a multicultural European environment. This will be a particular challenge for the key action.

3.2.5. Key action: Essential technologies and infrastructures

3.2.5.1. Technologies for and the management of information processing communications and networks, including broadband, together with their implementation, interoperability and application

3.2.5.1.1. Multimedia will have a central role in the Information Society. We must ensure that via the 5th Framework Programme cross platform interoperability is developed and standardized between services and networks. Since the Information Society is global these developments must also be global.

3.2.5.2. Technologies and engineering for software, systems and services, including high-quality statistics

3.2.5.2.1. This paragraph takes an overly generic approach to software. There are basically three categories of software to be considered: general office applications, operating systems, and specific applications.

3.2.5.2.2. In the first category Europe is generally weak, but examples like SAP demonstrate that this need not be the case.

3.2.5.2.3. The second category can be subdivided into two types:

a) the first type involves general PC or similar computer operating systems. This is a very important fast growing category in which Europe seems to have no stake and no skill today.

b) the second type involves applications in embedded software. Here it is essential that Europe develop a skill level as most discrete solutions are found in this category. Typical applications are in TVs and VCRs, set-top boxes, remote controls, handheld/palmtop computers, all kinds of instrumentation, car electronics (not only the entertainment systems, but also vehicle electronic management), navigation systems etc.

3.2.5.2.4. The third category is signal processor control. In a way it is close to (b) above, but is dependent on different people skills. This process includes a high degree of knowledge in mathematics, software and semiconductor technologies. The number of people with such skills is limited. This is a field where Europe could and should create a strong position, since these applications will have an important place in the creation of the user friendly information society. A large number of applications will need to be developed with the 5th Framework programme.

3.2.5.2.5. Technologies which may play an important role in the linguistic processing such as neural computing,

artificial intelligence etc. are not mentioned in the paper but are of great interest for research today and may become application technologies within the next five years.

3.2.5.3. Mobile and personal communications and systems, including satellite related systems and services

3.2.5.3.1. The word mobile in the heading should be written mobile/wireless. This is because there is expected to be a significant requirement for fixed wireless communications in the future.

3.2.5.4. Interfaces making use of the various senses

3.2.5.4.1. This paragraph should be expanded to include technologies related to the user interface. Speech synthesis and speech recognition systems are missing. These will play an important role in making systems easier to use, as well as providing speech output to replace written text. This is not a technology for the disabled alone, it can expand the usability of equipment by the average user.

3.2.5.5. Micro-electronics

3.2.5.5.1. The development of a European competitiveness in the field of microelectronics is not sufficiently emphasised. Microprocessors, memories and signal processors will play decisive roles, as will smart power electronics. In many applications programmable signal processors will take over from less flexible hardware solutions. Related embedded software technologies including new object oriented programming languages have to be developed.

3.2.6. Generic activities: Future and emerging technologies

3.2.6.1. The long-term development of critical technologies is crucial for successful building of the future European competitiveness in IST. Even when it is not yet possible to describe the various topics, a continuous monitoring and evaluation system should be established. This is an issue for not only the Commission and industry, but also universities and research institutes.

3.2.6.2. A disciplined approach to emerging technologies will provide a basis for the key actions to be regularly reviewed and updated in the light of new developments.

3.3. *Third specific programme 'Competitive and sustainable growth'*

3.3.1. Strategic aims

3.3.1.1. The Commission indicates four strategic aims for the third thematic programme and develops a 'rationale' for each:

— socio-economic needs;

— European value-added;

— European competitiveness;

— Ethical principles.

3.3.1.2. The specific programme 'Competitive and sustainable growth' is the essential tool to boost a European-wide answer to forthcoming and future industrial challenges. Its importance is not just related to the needs of specific industrial sectors but to the enhancement of the overall European production and transport system performance. To this end, priority must be given to research activities that have major horizontal and multiplying effects and widest cross-fertilisation impact.

3.3.1.3. The third programme focuses on growth in Europe. It encompasses products, organization processes (key action 1), sustainable mobility and intermodality (key action 2) land and maritime transport technology (key action 3) and new prospects for aeronautics (key action 4).

3.3.1.4. The Commission assumes, theoretically, the 'system approach' as a main guideline. But this does not look consistent with the proposed budget breakdown. Generic research area, not structured by definition, is overfunded in respect of 'Products, processes and organisation' key action. On the contrary, 'Land transport and marine technology' key action has resources inadequate to develop any 'system approach'.

3.3.1.5. By way of introduction, attention should be drawn to the significant duplication and overlapping between the third and fourth specific programmes; these need to be clarified for purposes of definition and demarcation.

3.3.1.6. All key actions are closely interlinked with the fourth specific programme since they not only emphasise competitive and consumer-friendly innovative processes but also energy-efficient and environmentally sustainable processes and transport systems.

3.3.1.7. The matters raised in this connection under the fourth programme (energy contingency measures and energy use) are also important considerations for the third one.

3.3.1.8. Either the third and fourth programmes must be co-ordinated or else carefully-considered, overall co-ordination will be necessary when projects are published, implemented and assessed.

3.3.1.9. In particular, 'Transports' are considered in different key actions and programmes. Each 'transport' key action must have clearly identified scopes and linkages. Appropriate co-ordination mechanisms must guarantee functional integration between these key actions.

3.3.1.10. Further, the order of priority of the various points is not clear from the Commission's paper. This matter also needs to be clarified.

3.3.1.11. Specific attention must be paid on identifying new professional/educational profiles linked to the development of European production and transport systems ('manufacturing' engineer, mobility manager,...). This is a crucial issue in terms of job creation and should be evaluated in terms of immaterial asset provided by each EU-funded innovation activity.

3.3.2. Key actions

3.3.2.1. Products, processes, organisation

3.3.2.1.1. This key action concerns integrated production processes but is framed in very general terms. It is not clear whether special production processes or products can be designated on the basis of the results and answers produced by the Fourth Framework Programme. The action should not consider industrial sectors as stand-alone research areas but should identify where most important added value chains are. In this respect industrial zones or 'districts' and sectors having large-scale spin-offs should be regarded as a favourable environment. Moreover, a large number of SMEs are active in this kind of industrial systems.

3.3.2.1.2. The reference to micro-scale and nano-scale technologies, though naturally appropriate, is not sufficient to provide acceptable guidelines.

3.3.2.1.3. A methodological approach to sustainable innovation needs to be explicitly based on tools supporting, among others: life cycle analysis (see below), total energy balance, design for dismantling/recycling, cost management, need of human resources. 'Life cycle analysis' (LCA) is only touched on despite its importance in evaluating the ecosystem, especially in the case of materials whose 'ecobalance' — encompassing all stages from raw material to recycling or waste management — is incorporated into new production processes.

3.3.2.1.4. Catalysis research is another major component that could be included in the key action, with particular reference to encouraging low-temperature processing with high product 'value added'. At low temperatures it is possible to use materials which are both simpler and cheaper .

3.3.2.2. Sustainable mobility and intermodality

3.3.2.2.1. This action is a major prerequisite for quality of life and in optimising the production process as well as in wealth distribution.

3.3.2.2.2. Here both the physical infrastructure and systems management need to be developed.

3.3.2.2.3. However, the key action's effectiveness also depends (see third priority in the text of 16 February 1998) on the way the advantages of the new mobility system in pan-European technical and socio-economic scenarios are presented. Such systems analysis merits particular attention.

3.3.2.2.4. Since mobility in densely populated areas is also mentioned in this action, a clear distinction must be drawn between it and the fourth programme's 'city of tomorrow' campaign. Improvement of urban quality of life also has a close bearing on infrastructure and traffic management.

3.3.2.3. Land transport and marine technology

3.3.2.3.1. Unlike previous papers, the Commission now specifically includes land transport (road and rail), which is a welcome change.

3.3.2.3.2. Unfortunately, as underlined above, the budget proposed is negligible. It is worth to note that it corresponds to just half the budget allocated within the IV Framework programme. No significant result, other than waste of funds, can be expected if the present amount is confirmed.

3.3.2.3.3. The aim is to promote rational, environmentally friendly maritime and land transport systems, and to strengthen passenger/mode of transport and road/rail interaction. Here special emphasis must be placed on European integration and compatibility.

3.3.2.3.4. This key action is linked with other key actions and programmes: each of them must contribute to the development of European sustainable mobility in an integrated way without overlapping. The scope of this key action is the technological development of land and marine transport means. This should include also technological development for urban transport. The key action provides technological solutions to be integrated in urban transport solutions that are proven and assessed in the key action 'City of tomorrow'. The connection with energy conservation and use is also important. It is not clear how it is intended to achieve such co-ordination or synergy.

3.3.2.3.5. As regards the reference under this key action's sixth priority to 'sustainable exploitation of the seas' energy and mineral resources', here again there is a clear link with the fourth programme's 'energy' component. The significance of this activity is neither clear nor obvious.

3.3.2.3.6. Constructive, purposeful co-ordination of the third and fourth specific programmes' key actions is therefore necessary when projects are published, administered and evaluated — unless a new overall co-ordination of the two specific programmes is carried out.

3.3.2.4. New perspectives in aeronautics

3.3.2.4.1. Advances made in European aeronautics must receive direct support. This area is therefore deliberately delineated and excludes space travel and satellite technology. However these areas will, appropriately, be coordinated on an 'ad hoc' basis within the Fifth Framework Programme and will be linked to ESA activity.

3.3.2.4.2. This key action does not cover matters relating to assessment of the environmental impact of local and international air traffic. However, specific provision should be made for this aspect under the fourth programme's key actions.

3.3.2.4.3. The aspects mentioned and described under this key action involve many practical points ('priority subjects') which are closely connected with other programme areas.

3.4. *Fourth Thematic Programme 'Preserving the ecosystem'*

3.4.1. Analysis of the overall framework

3.4.1.1. This programme is a complete revision not only of the Fourth Framework Programme for RTD but also of the Commission's initial proposals for the Fifth Framework Programme. The formulation of a specific programme of actions in the field of energy and environment suggests that the Commission has responded favourably to the comments made by the European Parliament, the Council and the Economic and Social Committee.

3.4.1.2. The thematic programme focuses on two interrelated themes: environment and sustainable development and energy, and six key actions: sustainable management and water quality; global change, climate and biodiversity; sustainable development of marine ecosystems; the city of tomorrow and cultural heritage; cleaner energy systems, including renewables; and economic and efficient energy for a competitive Europe.

3.4.1.2.1. The first key action, sustainable management and water quality, comprises four lines of action on water (both surface and ground water), namely management, treatment, pollution monitoring and prevention, with a separate section on arid and generally water-deficient regions.

3.4.1.2.2. The second key action, comprising four lines of action, aims to promote research into global change with a view to predicting, mitigating and preparing for its possible effects. Special attention is paid to developing the European contribution to global observation systems for the climate and terrestrial and marine ecosystems.

3.4.1.2.3. The third key action, devoted to marine ecosystems, focuses on four areas: interaction with the marine environment, monitoring and managing coastal life and predicting the potential anthropogenic impact on marine ecosystems and resources.

3.4.1.2.4. The fourth key action, also divided into four sections, focuses on the sustainable development of cities and the rational management of their resources, the conservation of the cultural heritage, the care of the environment, in particular where there are large concentrations of buildings, and the management of sustainable transport systems in the urban environment.

3.4.1.2.5. The fifth action, cleaner energy systems, including renewables, focuses on four lines of action for improving the efficiency of energy conversion processes whilst reducing their cost and environmental impact; developing conversion technologies for the main new and renewable energy sources; integrating these into established energy systems and developing cost-effective environmental abatement technologies for power production.

3.4.1.2.6. The sixth and final key action, economic and efficient energy for a competitive Europe, focuses on six lines of action. These cover the rational and efficient end use of energy, energy transmission, distribution and storage, more efficient exploration, extraction and production technologies for fossil fuels, improved efficiency of new and renewable energy sources and the drawing up of supply and demand projections for economic development and social and environmental needs, in conjunction with analysis of the cost effectiveness and efficiency of all energy sources.

3.4.2. Evaluation of the overall framework

3.4.2.1. The Committee welcomes the inclusion of this new specific programme, which is fully consistent and compatible with the Fifth Environmental Action Programme and which will make it possible both to focus actions in this field more effectively and to allocate the necessary funds in accordance with the importance

and potential multiplier effects of the actions, in terms of improving the environment, reducing external energy dependence, boosting competitiveness, creating both direct and indirect employment, and improving social cohesion by facilitating economically viable solutions for isolated or less densely populated regions and areas.

3.4.2.2. The Committee has repeatedly stressed the need to give security of energy supply and social cohesion (in terms of public service obligations and environmental protection) equal consideration when framing Community energy policy, so that alongside the search for the sustainable development and competitiveness of the Community economy, a coherent framework compatible with the internal energy market is established. The specific programme is fully consistent with these objectives and the Committee can therefore only welcome it.

3.4.2.3. The structure of the programme is typical, but the Committee notes a degree of overlapping in some of the activities, particularly for renewable energy sources, within the two key actions devoted to energy and transport propulsion technologies and the city of tomorrow programme.

3.4.2.4. Moreover, the Committee notes that the generic RTD activities are not sufficiently clear with regard to the environment and sustainable development.

3.4.2.5. Similarly, the wording of the action for support for research infrastructures is not sufficiently clear and leaves too much room for interpretation in deciding which areas are deserving of support. The Committee only partly supports the objectives for energy and considers that the socio-economic impact study should be extended to include the instruments used to promote more rational use of energy (RUE).

3.4.2.6. Finally, there is a need to monitor the interaction and compatibility of this programme with other specific actions within the same programme or other programmes, such as sustainable mobility and intermodality, the city of tomorrow and cultural heritage, and integrated development of rural and coastal areas.

3.4.3. Analysis of the various key actions

3.4.3.1. In the field of the environment, the Committee finds no reference to the important question of industrial and residential waste and sustainable soil management. Both are very important aspects of the Fifth Environmental Action Programme and are not reflected here. This is particularly urgent in the cases of geophysical and geochemical analysis, and technologies for the treatment and recovery of contaminated soil, which is a growing problem, and one which will be further exacerbated by the accession of the CEEC.

3.4.3.2. As regards water management, two additional activities should have been included, concerning the specific problems of identifying and treating cross-border watercourses, and surface and ground water There should also be a line of action on sea water desalination.

3.4.3.3. With regard to global change, the Committee would have liked to see specific mention made of endocrine modulators in relation to biodiversity and of the relationship between forest fires and climatic change and biodiversity.

3.4.3.4. As for marine ecosystems, the Committee would have included two further actions relating to hydrocarbon spillages at sea and the impact of tourism on coastal areas.

3.4.3.5. Finally, the key action on the city of tomorrow should cover atmospheric and noise pollution in relation to all aspects of city life and not exclusively in relation to traffic. The lack of a proven scientific base makes research into the impact of particulates on health especially urgent.

3.4.3.6. The fifth key action, cleaner energy systems, has the single, albeit very broad, objective of developing technologies which will help minimize the environmental impact of the production and use of energy, reducing emissions and increasing the competitive share of new and renewable energies. A shortcoming here is the failure to mention the environmental impact of these forms of energy which, logically, ought to be studied and minimized.

3.4.3.6.1. Within this action closer attention should be paid to decentralized and isolated systems. Reference should also be made to combined power generation, sea water desalination, and trigeneration (power/heat/cooling). Finally, the title of the fourth key action should be changed to 'Cost-effective technologies reducing pollution caused by the energy industry'. There is no sense in excluding other energy-sector industries, such as the oil refining industry, which may have pollution-elimination problems on a scale similar to those of the electricity generating industry. Nor should the action be limited to atmospheric pollution, but should be extended to cover residential waste water, residues, particularly toxic ones, and soil.

3.4.3.6.2. Finally, the programme should contain a section on fuel technology. There is a growing legislative trend towards setting ever lower limits for pollutants in energy products. But it is sometimes impossible or

economically impracticable to achieve the required levels, even using the best available technologies.

3.4.3.7. The objective of the sixth key action, which completes the energy section, is to provide Europe with a reliable, clean, efficient, safe and economic energy supply.

3.4.3.7.1. Economic energy should not be an EU objective. The cost of energy should be equal to its real value, comprising the internal costs of obtaining it and the external costs of its life cycle.

3.4.3.7.2. Although the limitation of consumption is dealt with clearly in the first activity of this key action, the Committee feels that the programmes for energy saving at all levels, industrial, domestic, transport etc., should be dealt with in a more precise and forceful way. Taking into account the enormous growth of the information society, greater efforts need to be made to research technologies making it possible to reduce, either directly or indirectly, the consumption associated with this growth.

3.4.3.7.3. Moreover, the competitiveness of renewable energy sources should be dovetailed more closely with the development of new technologies. The Committee considers it more urgent to make existing technologies competitive than to develop new technologies which, however scientifically brilliant, are not economically viable in the short to medium term.

3.4.3.7.4. Research into new thermal insulation materials should be one of the priorities of this action. Dependence on external sources of energy supply, which we consider the most important component of the key action in terms of achieving its objectives, is not given sufficient consideration. We feel, therefore, that the title of the action should be changed to 'A secure and efficient energy supply'.

3.4.4. Analysis of the research and technological development activities of a generic nature

— In the first action, 'The fight against major natural and technological hazards', the establishment of an extensive Community-wide database of accidents and natural disasters should be considered.

— The Committee advocates the establishment of a new action dealing with the research needed to identify products which could be substituted for highly environmentally-damaging products, such as PCBs, PCTs, CFCs, asbestos etc.

— It is also recommended that a system be established for promoting the standardization at European level of pollutant measurement systems and experimental methods.

3.4.5. Analysis of research infrastructure support activities

The following changes should be made:

3.4.5.1. Include references to the existing network of research centres, examining renewable energy and desertification and to the involvement of private-sector laboratories in research into the clean use of solid fuels and into the reduction of energy losses during transport and distribution. The setting up of an advanced urban studies network should also be looked at.

3.4.5.2. Establish a specialized database for the use of new design techniques, materials and renewable energy sources in the construction of new buildings and for the renovation of historic parts of cities.

3.4.5.3. Coordinate research activities, present and future, to ensure that these are complementary and not redundant.

4. **Second action: promotion of cooperation with third countries and international organizations in RTD matters**

The Committee has repeatedly stressed the importance of international cooperation, particularly in the face of increasing globalization of the markets and growing international competition based on the quality and innovative nature of new products and services on a world scale; it would therefore emphasize the following points:

— the specific programme entitled 'Confirming the international role of Community research' forms the point of contact par excellence between Community research and the rest of the world, either directly through its own lines of action or by coordinating the international aspects of the actions under the other specific programmes of the framework programme: what is therefore needed is a detailed definition of the arrangements and areas for cooperation with the various scientific and cultural contacts in the geographical areas covered; the needs and possibilities for participation in international RTD projects vary enormously;

— it is essential, especially at the international level, to initiate technological and industrial assessment actions which precede, accompany and follow projects undertaken in each area, in order to ensure practical contributions to solving real problems in the mutual interest of both sides — Community and non-Community;

— an essential action under the INCO programme must be that of ensuring close coordination — in consistency and synergistic terms — between the international aspects of the key actions and between

national and Community scientific and technological cooperation policies, making more use of the concerted action instrument or of joint initiatives such as the European initiative on agronomic research in the service of development;

— at the same time as the specific programmes of the Fifth Framework Programme are launched, a start must be made on formal frameworks for cooperation with other bodies and European non-Community initiatives operating in the research field, especially Eureka and COST, following up the initiatives for systematic promotion of synergy between different areas, particularly those taken by the Eureka high-level group;

— the Community funds allocated to the INCO specific programme must be maintained at a level higher than that initially proposed by the Commission (ECU 491 million), which the Council's Common Position subsequently reduced to ECU 458 million; at all events, it is necessary to maintain the resource threshold of the programme above 3,5 % of the total appropriation, not least in order to retain the external visibility and tangibility of optimum, self-contained coordination activity which can support the activities under each thematic programme on the basis of an integrated approach.

4.1. *Specific horizontal programme 'Confirming the international role of Community research'*

4.1.1. General framework of the programme

4.1.1.1. The programme is intended to form the point of contact par excellence between Community research and the rest of the world: a detailed definition is therefore needed of the arrangements for and fields of cooperation under the various scientific and cultural conditions prevailing in the geographical intervention areas, involving very different needs and potential for participation in international RTD projects.

4.1.1.2. The Committee stresses the importance of a technological and industrial assessment which should precede, accompany and follow the projects set up in each area, to identify practical contributions to the solution of real problems for both Community and non-Community partners.

4.1.1.3. At the same time it is necessary to organize 'one-stop entry' access for areas according to the KIT (keep in touch) model, to ensure that information and training meet local needs.

4.1.1.4. For each geographical area, those responsible for managing the programme must, wherever possible, establish short-, medium- and long-term objectives, on the basis of dialogue with the economic and social representatives of the world of research and with final users. Moreover, they must make a prior assessment of the likely impact of the Community action described, in the timescale laid down, with a view to solving common problems, and of spin-off in terms of new jobs, new enterprises and joint ventures which they regard as feasible under the project itself.

4.1.1.5. It is necessary for all the activities regarding a specific geographical area to be carried out consistently with the general cooperation and technical assistance activity of the Community, with appropriate transparency and concentration. In this context there should be provision for demonstration and innovation activities, and flanking measures which ensure full use, dissemination and exploitation of the results.

4.1.1.6. Finally, a fundamental action in the INCO programme must be that of ensuring close coordination in terms of consistency and synergies brought into play — between the international aspects of the key actions and between national and Community policies on scientific and technological cooperation, for which purpose the Committee recommends greater use of the instrument if concerted action involving joint initiatives, with the European initiative on agronomic research in the service of development.

4.1.1.7. In the Committee's view, the two forms of participation in specific programmes envisaged for bodies in third countries — on a full association or project-by-project basis — must be defined clearly, transparently and unequivocally to ensure certainty about rules of access and immediate understanding of the operating rules on the part of all the interested bodies in third countries. The Community stresses that information and training action is essential in this context in order to enhance the EU's image.

4.1.2. Geographical cooperation areas

4.1.2.1. States in the pre-accession stage

4.1.2.1.1. Community RTD action should have two objectives — to help to speed up the reform of scientific structures, thereby avoiding the 'brain-drain' which might otherwise cause a crisis in high-skilled RTD infrastructures; and, at the same time, to redirect the programmes and structures of such countries towards industrial and applied research with a potential for helping to solve the problems posed by economic transition and by the need to satisfy growing needs in terms of jobs and a consumer market.

4.1.2.1.2. This strategy would be confirmed by the adoption of Agenda 2000, on which the Committee has

already given an opinion. Concentration on centres of excellence to associate local skills with international excellence and to train young people for full integration in the European economy should be accompanied by the organization of such centres in regional and sub-regional networks, linked with corresponding networks in the European Union, to strengthen support measures for research activity with a view to innovative and productive effects in economic and employment terms.

4.1.2.1.3. Special effort and attention must be devoted to pan-European technical standards, making it possible to give immediate follow-up to research results in terms of innovation and demonstration, thus achieving economies of scale in an integrated European market.

Moreover, flanking measures should be envisaged for those countries which may find it difficult to adhere to particularly important specific programmes or key actions such as those in the sectors of the environment, food and public health.

4.1.2.2. NIS and CEEC which are not in the pre-accession stage

4.1.2.2.1. With these countries there should be joint research actions and concerted actions in sectors not covered by the other specific programmes. The Community officials responsible for these activities should identify, in consultation with the economic and social representatives of research and the final users in those countries, the common problems on which an urgent contribution to a solution is needed — such as those of desertification, water treatment, rational use of energy, management of the environment, combating and preventing disease and industrial reconversion.

4.1.2.2.2. It is also necessary to maintain the NIS' immense potential for research, increasing the effectiveness and transparency of cooperation with these countries, identifying clear and transparent guidelines for selection of projects, and to develop intensive training of researchers and scientists with a view to developing a new scientific and project culture, oriented towards research/industry cooperation internally and internationally, involving the European Training Foundation in Turin and the International Centre for Science and Technology in Moscow.

4.1.2.2.3. It is necessary to strengthen the Cordis, Cosine and EIMS networks and extend them to the NIS, along with the experience of the 'Relais' centres, especially with a view to the search for partners, and to develop technological and industrial cooperation joint venture possibilities with the Community countries and create enterprises using new technologies in the NIS.

4.1.2.3. Mediterranean partner countries

4.1.2.3.1. Euro-Mediterranean scientific and technological cooperation must go hand in hand with the creation of the Euro-Mediterranean socio-economic area. This requires a clear definition of specific cooperation arrangements and the identification of joint RTD sectors and fields of activity which would promote the creation of common and joint-venture enterprises, partly through the committee for Euro-Mediterranean monitoring of RTD.

4.1.2.3.2. On the basis of the Euro-Mediterranean dialogue and the follow-up to the Barcelona Declaration, transparent, coordinated actions must be initiated, particularly with regard to water management, energy, health, management of natural resources on a sustainable growth basis, innovative measures for tourism management, conservation and restoration of the cultural heritage, transport, and support for the development of the Euro-Mediterranean information society.

4.1.2.3.3. A special effort must be made with regard to the training of scientific staff, which in the Mediterranean partner countries is currently at only a tenth of the level in the EU. Moreover, the considerable efforts made in recent years by these countries in non-material investment encouraging the training of trainers and teachers — must be continued. There is a need to develop networks of databanks accessible to the Mediterranean partners, and to strengthen regional infrastructures for development and transfer of technology. In parallel, consistency should be ensured between the MEDA programme and the RTD cooperation activities under the horizontal programme.

4.1.2.4. Developing countries

4.1.2.4.1. For this group of countries, too, the guiding principles should be joint analysis of needs, identification of areas of mutual interest, quantifying and timing of the actions to be undertaken. Sectors could be identified on the basis of a prior assessment of likely impact: examples are sustainable growth, full use of agricultural production, improvement of health systems, rational use of energy, support for and improvement of research and technological development capacities, including human resources, and respect for the political obligation undertaken by the EU as regards sustainable growth and in particular the recommendations of the Rio Conference on research in developing countries.

4.1.2.4.2. Sufficient scope should be given to continuing the STD (science and technology for development) initiative for the ACP countries and Apas initiative (promotion, assistance and support action) for the countries of Latin America and Asia. The latter should be pursued in tandem with the ALPHA regional action

for academic training in Latin America and post-graduate exchanges and training programme networks. For specific subjects of high importance to the developing countries, appropriate links should be developed with the key actions covering food, health, agriculture and forestry in particular, also in connection with the European initiative on research to encourage development in the agricultural sector.

4.1.2.4.3. Growing in importance is scientific and technological cooperation with China, which plans to spend 1.5 % of its GDP annually on RTD by 2000, and with India which has already taken significant initiatives in the fields of agri-food technology, telecommunications and manufacturing. Moreover, there is a need for better coordination of the RTD cooperation initiatives conducted with these countries by certain Member States of the EU, especially the United Kingdom, France and Germany.

4.1.2.5. Emerging economies and industrialized countries

4.1.2.5.1. Given that more than two-thirds of scientific discoveries and innovation take place outside Europe, it is a matter of priority for the EU to promote increasing cooperation with the leading countries in the RTD field, on the basis of mutual interest and reciprocal access to scientific activities.

4.1.2.5.2. In the context of the bilateral and multilateral political dialogue, and in particular of the G-7 and OECD initiatives, cooperation initiatives on research should be strengthened, establishing priorities of reciprocal interest and access to know-how, not least in order to divide up the costs and benefits of world-scale research actions on subjects such as the information society, combating the great diseases of the century, the human genome, intelligent manufacturing systems, and cooperation to solve problems arising at world level, such as climate change, and especially in the environmental field.

4.1.2.5.3. In the Committee's view, scientific cooperation agreements should be developed with industrialized third countries and with the main emerging economies, in specific scientific and technical sectors, so as to achieve a proper balance between cooperation and competition. In terms of exchanges of researchers and contacts in the form of high level conferences and seminars within the international scientific community, the EU should take flanking and coordination measures, and provide for study scholarship systems which would enable the EU's young researchers to carry out doctoral and other research in these countries in sectors of particular interest to the Community.

4.1.3. Training of researchers

4.1.3.1. The system of scholarships is a new activity provided for under the Fifth Framework Programme, offering on the one hand to young researchers from developing, Mediterranean and emerging-economy countries the opportunity to participate in specific projects in EU laboratories, and on the other hand to limited number of Community researchers the possibility of working in industrial laboratories in third countries, in fields of special interest.

4.1.3.2. The Committee takes the view that this activity corresponds to the interests of an open Community and would stimulate the establishment of a cooperative scientific community at international level. Moreover, it recommends the definition and dissemination of clear criteria for admission and transparent selection procedures on the one hand, and on the other a systematic monitoring of the action carried out and results achieved; the results should be made public throughout the Community.

4.1.4. Coordination activity

4.1.4.1. The Committee regards this direct activity under the programme as being of the highest importance for ensuring close integration, while respecting the separate roles of the framework programme and of non-Community European cooperation frameworks, particularly Eureka and Cost; it strongly recommends that protocols of understanding be concluded as soon as possible to place this cooperation on a basis of certainty, continuity and easy access, along the lines of the process instigated for ESA-EU relations, at the Research Council of 22 June 1998.

4.1.4.2. As regards international initiatives, such as the whole 'big science' sector, the ITER programme, or to an even greater extent the Intelligent Manufacturing Systems (IMS) programme — which should also be open to participation by SMEs, with suitable flanking measures — the Committee stresses the importance of a more active role for the Community in drawing up frameworks for cooperation and coordination of Member States' actions on the bilateral and multilateral levels.

4.1.4.3. In this connection, the mechanism of periodic meetings between directors-general from the Member States and their counterparts from relevant directorates-general from the Commission would in the Committee's view be especially useful for following up Treaty Article 130h and ensuring the consistency of policies and initiatives.

4.1.5. Financial prospects

4.1.5.1. In the Committee's view, the crucial importance of cooperation activities in a global market involving the EU and third countries, and close interaction with non-Community European and international cooperation networks, requires a larger financial effort than the amount initially proposed by the Commission (ECU 491 million), which in the course of the legislative

process was reduced by the Council in its common position of 12 February 1998 to ECU 458 million.

4.1.5.2. However, the Committee stresses the need to maintain the threshold of resources to be allocated to the INCO specific programme above 3,5 % of the total appropriation, in order to maintain an optimal self-sufficient coordination activity to support the activities of the thematic programmes themselves as part of an integrated approach.

4.1.5.3. Moreover, the Committee thinks it advisable that the funds be divided up from the outset among the various activities, maintaining an adequate percentage for cooperation with the five geographical intervention areas (countries coming up to accession, other CEEC and NIS, Mediterranean partners, developing countries, countries with an emerging economy and industrialized countries): at least 70 % of funds.

4.1.5.4. The major part of the next 15 % should be reserved for non-Community European cooperation, not least to lay the foundation for closer coordination with Eureka and Cost in a framework formalized by protocols of understanding such as the protocol between CERN and the EU. Such resources must also be subject to the necessary coordination with the other European [1] and international [2] RTD cooperation networks.

4.1.5.5. Coordination of international cooperation must also concern the international actions of the programmes covered by the framework programme, consistent and fully integrated with the Phare, Tacis and Meda programmes and the cooperation activities of the Member States.

The action for training of researchers, for its part, must be consistent with the actions envisaged for the various geographical areas, and must have adequate resources amounting to 15 % of the overall budget for the programme, with particular attention given to mobility in the Mediterranean basin, towards the economically dynamic countries of Asia and Latin America and the industrialised countries.

5. **Third horizontal programme: dissemination and exploitation of the results of Community RTDD activities**

The third horizontal programme is a critical factor in the success of the fifth framework programme, particularly in terms of its impact on competitiveness, growth and employment in the European Union.

In highlighting the following aspects, the Economic and Social Committee:

— emphasizes the benefits of applying technological development plans to all projects and is of the view that their continuation is a vital component in Union action in the area of exploitation;

— welcomes the inclusion of economic intelligence in the objectives of the third horizontal programme, and considers that monitoring, compiling and disseminating technological information should be an integral part of innovation support policy and include a firm move to remove the barriers between national measures;

— proposes specifying the role of innovation units by defining their function in relation to each key action, integrating them into a genuine horizontal coordination mechanism and mirroring their impact in an annual 'trend chart';

— considers that to give SME participation a real boost, the management procedures and rules for participation must be reviewed, namely by:

  • decentralizing back-up and screening procedures;

  • radically simplifying processes and generalizing post-auditing;

  • widening the participation rules, to enable enterprise support and representation bodies to present themselves alongside firms in order to help identify needs, particularly at the 'call for expression of interest' stage;

— proposes strengthening support for mediation networks, researcher mobility in firms, an 'enterprise in Europe' network to back business start-up or expansion initiatives, and, lastly, a 'JEV Innovation' initiative to promote joint ventures;

— considers 'vanguard' SMEs with untapped innovation potential to be priority targets;

— is of the view that a bid must be made to steer the search for complementary elements between Member State activities and the Eureka initiative which are leaning increasingly towards innovative SMEs, in order to establish a genuine European market for innovation and translate the results of common research efforts into industrial and commercial success;

— emphasizes that set priorities should take account of major European strategies in the areas of competitiveness, employment and economic and social cohesion;

[1] CERN, ESA, EMBO; ESO, ESF, ILL, Eiscat etc.
[2] ITER, IMS etc.

— supports the proposal to enable cooperative research projects to be conducted jointly by two independent SMEs from two Member States, with the option of either handing over shared technological problems to be dealt with by third parties or developing research activities themselves if they are capable.

5.1. *Specific horizontal programme: 'Promoting innovation and encouraging SME participation'*

5.1.1. Introduction to the 'SME innovation and participation' issue

5.1.1.1. The fifth framework programme was designed to break with the past, with a view to:

— implementing mechanisms for innovation and the exploitation of scientific results;

— placing the innovative fabric of various types of business, especially SMEs, at the centre of the research/innovation/market dynamic for the implementation of key actions.

5.1.1.2. The horizontal programme 'Innovation and participation of SMEs' is a critical factor in the success of the Fifth Framework Programme, since, in spite of many attempts, the Commission has never been wholly successful in enlisting the meaningful participation of SMEs in research programmes and converting the RTD results of that business category into industrial and commercial success.

5.1.1.3. The ESC is aware of the critical role of the technical and financial framework for industrial RTD, particularly regarding the innovation and participation of SMEs, and the resulting impact on growth and employment in Europe, and has already made proposals in its opinions on the following subjects:

— The impact on SMEs of the steady, widespread reduction in funds allocated to research and technological development in the EU (at Community and national level) (own-initiative opinion) [1];

— The draft Council Decision concerning rules for the participation of undertakings, research centres and universities and for the dissemination of research results for the implementation of the Fifth Framework Programme of the European Community 1998-2002 [2];

— Towards the fifth framework programme — scientific and technological objectives [3].

5.1.2. The coordination of activities and internal consistency

5.1.2.1. To deal with this vital factor in the application of the horizontal programme in the specific programmes, the Commission document refers to the innovation units that are to be established under the thematic programmes.

5.1.2.1.1. The ESC recommends clarifying projects set up by European SMEs, within the new priorities of the third horizontal programme, all the operational data relating to the innovation units: organization, procedures, establishment, role, etc. The ESC also suggests that those units should have direct responsibility, beyond thematic programmes to key action level, and make provisions in each instance for the SMEs and their representatives to be involved in running the units.

5.1.2.1.2. It will also be necessary to determine how the various innovation units are to be coordinated. The Committee calls for a structure along the lines of the 'groups of director-generals' to avoid a situation where matters relating to SME and innovation are isolated in a marginalized department of DG XII or DG XIII. It also calls for an annual trend chart to be established in order to monitor SME participation in the key actions and the impact in terms of innovation of the specific programmes.

5.1.2.2. To encourage SME participation, the fourth framework programme contained a high number of technology promotion measures for SMEs: feasibility bonuses and Craft procedures for cooperative research. These are included in the new framework programme, but there is no mention of extending their scope. In a previous opinion 'Towards the fifth framework programme — scientific and technological objectives', the Committee, while agreeing that such instruments are necessary, recommended a more targeted approach with particular regard to the Community definition of the SME.

5.1.2.2.1. In its opinion on the impact on SMEs [1] of the steady, widespread reduction in funds allocated to research and technological development in the EU, the ESC proposed that the efforts of the fifth framework programme should focus on the 'vanguard' enterprises, between 1 and 1.5 million European firms that have untapped potential for technological development. Once tapped, by means of back-up, information and monitoring, that potential could have a significant impact on European competitiveness.

5.1.2.3. In view of the limited resources likely to be allocated to the horizontal programmes in general, and the third programme in particular, the problem of internal coordination between the various framework actions is also a problem of generating the multiplier effects necessary for the integrated approach which will determine the programme's capacity to meet its

[1] OJ C 355, 21.11.1997, p. 31.
[2] OJ C 214, 10.7.1998.
[3] OJ C 355, 21.11.1997, p. 38.

objectives. In the Committee's view, the establishment of innovation units does not solve the problem entirely. Clarification of the innovation/SME priorities of each key action, a dynamic description of the role of the 'innovation units' with credible internal coordination mechanisms and the concentration of efforts on technological development plans would make for a more effective response.

5.1.3. Specific activities of the horizontal programme

5.1.3.1. On innovation

5.1.3.1.1. With regard to innovation and with reference to several of its earlier opinions, the ESC proposes that the innovation dimension should be determined by the analysis of SME needs and expectations. That involves implementing a practical structure for supplying innovation-related services, geared to requirements in the field, rather than continuing to operate on the basis of the characteristics of the innovation function, offering services in a disorganized, haphazard fashion.

5.1.3.1.2. One new element in the fifth framework programme is the onus on project promoters to provide 'technological implementation plans'. The Committee welcomes that initiative but regrets its marginal position in the structure of the future third horizontal programme. The ESC calls for innovation mechanisms to be centred on the implementation of such plans, with a view to providing appropriate assistance: the search for industrial alliances, the allocation of risk capital, market opportunities, etc.

5.1.3.1.3. Furthermore, the Commission's plans do not give a high enough profile to the requisite synergy between the fifth framework programme and Community enterprise policy and financial engineering mechanisms, the JEV instrument in particular.

5.1.3.2. On SME participation

5.1.3.2.1. Apart from the proposed establishment of a one-stop office for all Commission research programmes (for project proposals forwarded specifically by SMEs), the programme appears to be modelled very closely on the fourth framework programme for RTD. Furthermore, greater detail is needed regarding the powers and role of the one-stop office and its practical impact in terms of meeting the demands and requirements of the users. The ESC has doubts as to the genuine potential of the measures proposed in their current state.

5.1.3.2.2. In order to participate in the RTD framework programme, SMEs need new measures, and these should feature in the programme's proposals:

5.1.3.2.2.1. In the form of new rules giving intermediaries access to the fifth framework programme for RTD as 'technological mediators' alongside enterprises in order to assist in identifying and expressing SME-specific requirements as regards products; markets and technologies.

5.1.3.2.2.2. By strengthening the advisory and back-up role of information networks in the field, for the particular purpose of helping SMEs to assess the benefits participating in Community RTD actions. It is hard to see in what respect the 'one-stop entry points' proposed by the Commission are innovative and to what extent this measure complements the numerous existing networks: Euro-info-centres, 'Craft contact points', VALUE relay centres, etc. In a draft initiative on the subject [1], the Committee proposes the integration and coordination of those support networks on the basis of specialized networks and 'one-stop shops' for guidance, entrusted to the Euro-info-centres. The Committee also recommends establishing a 'Users' Group' to monitor the smooth running of the networks and assess their relevance to needs.

5.1.3.2.2.3. By genuinely simplifying and decentralizing screening procedures and cutting red tape. In this respect, the Committee calls for a substantial reduction in the formalities required in the contract process, particularly in terms of guarantees (bank guarantees, etc.). On the other hand, it favours a much more detailed examination of the objectives of running projects, the monitoring of technological development plans, and financial post-auditing. It also advocates the strict application of payment deadlines set by the European Commission itself at European level, i.e. 60 days maximum, or in default, the automatic application of European Central Bank late payment interest rates plus 8 percentage points.

5.1.4. Joint SME innovation/participation activities

5.1.4.1. With regard to the proposed survey of technological requirements, the ESC refers to the current debate on ways and means of strengthening information and exploitation networks for applied RTD programmes in Europe [1]. In this respect, having consulted all the Commission's networks, the Committee recommends that priority be given to opening up national and regional networks.

5.1.4.2. The technological development of the European-wide market depends on a strategy of alliances, with a view to establishing clusters of undertakings. European firms, particularly SMEs with untapped innovation potential, have a tendency to outsource for skills

[1] Draft initiative on 'Ways and means of strengthening the networks for the provision of information on and the exploitation of applied RTD programmes in Europe' in preparation, OJ C 284, 14.9.1998.

and areas of complementarity in order to avoid the dangers of excessive internal growth: original entrepreneur losing control, take-over bids, poorly managed rapid growth, etc. Moreover, expanding firms have great difficulty finding qualified personnel, and surveys would suggest that is the primary obstacle to growth. The Committee therefore recommends incorporating the concept of 'clusters of undertakings' into the third horizontal programme, while supporting the networks of cooperation mediators and recording their best practice.

5.1.4.3. In the area of innovation, firms, particularly those using technology, need to identify the innovations that could help them win markets and sharpen their competitive edge. This is known as economic intelligence and technology watch. These subjects are quite rightly included in the fifth framework programme — oddly enough under SME participation although they have more to do with innovation. The Committee takes the view that they should be given ongoing attention and that projects should be launched to open up or strengthen activities that remain highly national or local. The Committee suggests coordinating the fifth framework programme with the sectoral competitiveness plans implemented by DG III: chemical, construction, textiles/clothing industries, etc.

5.1.4.4. Since firms, and particularly SMEs with untapped innovation potential, lack the human resources they need to develop and adapt technologies, the Committee suggests promoting researcher and engineer placements to work on innovation in SMEs.

5.1.4.5. The Committee welcomes the reference to the issue of access to finance. It suggests initiatives of a more practical nature than those mentioned in the project, namely:

5.1.4.5.1. A specific Community initiative to help SMEs join forces to tap the results of research or innovation developed by firms, as part of the 'JEV — Innovation' programme.

5.1.4.5.2. The implementation of a European innovation support network 'Enterprise in Europe', on the basis of various initiatives taken by the EU and other bodies, especially private organizations, including big business, in association with banking and professional networks, with a view to setting up a Europe-wide system for sponsoring initiatives. This would fit in with the communication on encouraging a spirit of entrepreneurship [1], recently adopted by the European Commission, and upon which the Committee delivered an opinion on 27 May 1998 [2].

5.1.5. Consistency of the third horizontal programme with the EU's other programmes and priorities

5.1.5.1. The ESC points out the prime importance of consistency, both in the content of the administrative and management bodies and between the third programme and the EU's policy guidelines.

5.1.5.2. In the area of employment, the Committee recommends making reference to long-term employment prospects compulsory in the technological implementation plans, which are one positive innovation of the Fifth Framework Programme. Furthermore, the Committee advocates promoting genuine synergy with the training and education programmes (ESF, Leonardo, etc.), with a view to improving the qualifications of staff in SMEs and developing the professions of 'technological mediator' and 'alliance mediator'.

5.1.5.3. With regard to economic and social cohesion, the Committee draws attention to the benefits of using the European Structural Funds more regularly to build up innovation support structures in poorer countries and regions: research centres, technical centres, SME and innovation support bodies, regional innovation support plans. This would be better than the direct support of companies, which may distort competition.

5.1.5.4. The Committee is of the view that competitiveness should be made one of the basic project selection criteria. Special attention must be paid to the Union's large industrial sectors, including traditional branches (automobiles, construction, chemicals, textiles/clothing, agri-food, etc.), which have strong development potential, and for which the best antidotes to international competition from low-wage countries are innovation, creativity, qualifications and research.

5.1.5.5. The Committee would very much like to see the Union establish a hierarchy of priorities regarding international relations. First, the third programme should be extended to the applicant states using partnership tools for membership. Priority should also be given to other European countries and the Euro-Mediterranean area, with a view to identifying areas of complementarity and promoting the Union's social and environmental standards. It would be worth developing 'Interprise' type sectoral instruments or industrial cooperation centres in those countries, with support from European trade associations.

5.1.5.6. Focusing more closely on development, in its opinion on the future of the Lomé Conven-

[1] COM(1998) 222 final.
[2] OJ C 235, 27.7.1998.

tion [1], the Committee has already recommended the establishment of decentralized ad hoc cooperation instruments, directly open to operators in the EU and the ACP countries. The aim would be to assist those countries in adjusting to new technologies and, in particular, to encourage the development of SMEs and small-scale industry.

5.1.5.7. Cooperation projects with developed countries, which are to be encouraged, should always be rooted in reciprocity and mutual interest.

5.1.6. Coordinating with the research policies and activities of the Member States

5.1.6.1. The Committee therefore suggests concentrating the fifth framework programme's innovation measures on the objective of breaking down divisions rather than on implementing new mechanisms that overlap with existing provision. This endeavour should be targeted at the area of technology watch, the priority area added to the fifth framework programme by the Council of Ministers.

5.1.6.2. The need for complementarity applies equally to the links to be set up with Eureka and other international initiatives such as the OECD's innovation programmes.

6. **Fourth (thematic) action: Supporting training and mobility of researchers in the Community**

While the Committee endorses the broad aims of the specific programme 'Improving the human research potential and the socio-economic knowledge base', as a response to the need to speed up investment in research and training, a key prerequisite for EU competitiveness and future employment opportunities, it would draw attention to the following points:

— the need to coordinate the aims of the proposed actions closely with the key actions identified under the thematic programmes since resources will otherwise be distributed over such a broad arena that concentration will be impossible and the requisite critical mass of research will be lacking to give the Community's action a European value added;

— the urgency of a far-reaching change in strategy to forge close links between university centres and industry and facilitate the training of technologists and professionals, including engineers, involved in the productive processes underlying the acquisition of new technology, with particular emphasis on the role of disseminating best practices among academic circles and enterprises, especially SMEs;

— the need to target the key action 'improving the socio-economic knowledge base' on specific objectives for supporting areas and subjects identified by other key actions so as, on the one hand, to improve impact assessments and determine performance indicators to back development of priority activities and, on the other, to highlight the impact of technological research and the application of such research results in terms of evaluating conditions for boosting competitiveness, employment and development;

— the need to define a European researcher/trainee statute with a view to facilitating mobility in networks for exchanges of experience by removing existing tax, administrative and social obstacles;

— the expediency of experimenting with a decentralized system for management of the 'Marie Curie' research fellowships, by selecting the local host institutions capable of evaluating needs most accurately and defining the fellowship holders' working conditions with greater flexibility — as the introduction of this new scheme permits. Concurrently, more effective monitoring is needed of the targeting of the activities and results in terms of their practical contribution to the 'problem solving' component of the relevant key actions. This is indispensable in order to justify operations involving such substantial spending, which account for around 10 % of the entire Framework Programme and do not merely constitute a 'fair return' designed to secure political consensus.

6.1. *Specific horizontal programme: 'Improving the human research potential and the socio-economic knowledge base'*

6.1.1. Introduction

6.1.1.1. The specific programme on 'Improving the human research potential and the socio-economic knowledge base' specifies five general aims:

— to develop the Community's human research potential, making special efforts to ensure equality of access and a better balance between men and women, notably through the training and mobility of researchers so as to contribute, inter alia, to efforts for creating new jobs;

— to enhance access to research infrastructures;

[1] OJ C 296, 29.9.1997.

— to help make the Community an attractive location for researchers and to promote European research in the international arena and to promote a European scientific and technological culture;

— to strengthen, through a specific key action, the socio-economic knowledge base for a better understanding of key problems facing European society;

— to help develop scientific and technological policies and other Community policies.

6.1.1.2. These aims are to be pursued under three specific activities (supporting training and mobility of researchers, enhancing access to research infrastructures, promoting scientific and technological excellence), a key action (improving the socio-economic knowledge base) and support for the development of scientific and technology policies in Europe.

6.1.1.3. Subject to the following general and specific comments, the ESC fully endorses the above aims.

6.1.2. General comments

6.1.2.1. The link between this programme and the Fifth Framework Programme as a whole does not seem sufficiently established and the priorities set by the specific programme should be more closely coordinated with both the objectives and the machinery for implementing the projected actions. The text would then become more transparent and the programme itself would be underpinned by a more clear-cut strategy.

6.1.2.2. In order to boost the European scientific community's potential and boost cohesion, it is essential both to raise the standard of Europe's researchers and to produce more of them, so as to put European research in a better position to compete with the United States and Japan in terms of quality and to improve the balance between the various EU regions. It must be remembered that there are only 10 regions (the most industrially developed) in which advanced technology activities [1] provide over 9 % of employment; in the other regions the figure is under 6 % and, in huge areas of the Community, even below 3 %.

6.1.2.3. Hence, a general questionmark arises as to the adequacy of the resources earmarked for the programme, the procedures to ensure that the available resources are properly distributed and safeguards so that the distribution system allows resources to be concentrated, within the various actions, in such a way as to create the critical mass necessary to boost the added value of Community research while giving free rein to the human resources potential.

6.1.2.4. One strategic priority of this programme should have been to provide back-up for the other programmes with a view to promoting the emergence of new professional profiles (the technological mediators for SMEs are one interesting example), thereby lending political consistency to the 'human resources' programme and centring it more firmly on job creation.

6.1.2.5. The methodology should be spelled out in greater detail and the strategical link-up between this specific programme and the Community training programmes run by DG XXII should be clarified.

6.1.3. Special comments

6.1.3.1. Supporting training and mobility of researchers

6.1.3.1.1. Research training networks: Networking is becoming increasingly necessary in all spheres of activity. Though this approach obviously remains relevant for the training of researchers, the proposal should be accompanied by particulars of the resources (of all kinds) which it is intended to mobilize and ways of promoting these networks.

6.1.3.1.2. System of Marie Curie fellowships: this scheme is centred on individual fellowships for young high-quality researchers and is taken over from previous Framework Programmes, but with a view to more effective deployment of Community funding.

The Commission proposal does not, however, indicate which areas of research or categories of researcher are to be given priority. Failing this, it is difficult to reconcile this programme with more effective use of Community funding. It is also debatable whether it is possible to identify young postgraduates (first category) as 'high-quality researchers'. Further, despite the well defined categories of fellowship, neither the apportionment of funding among these categories nor the action and thematic priorities are defined. In particular, it is not evident whether the system operates inside or outside the thematic programmes.

6.1.3.1.3. Individual fellowships would seem a particularly good way of enhancing the potential of researchers who are not always able to find suitable research outlets in their university of origin. However, in the case of individual fellows originating and wishing to return to a less-favoured region, it is hard to see how a young researcher can be useful to the region just because he/she has spent two years at a foreign research

[1] Eurostat statistics, categories NACE 24 and NACE 29-34.

establishment. In such cases, the researcher's full experience should be appraised, including for instance, work experience outside the research field in the region of origin.

6.1.3.1.4. On industry host fellowships, a number of conditions need to be specified:

— the host enterprises should give proof of their research capacity in respect of specific pre-established projects;

— the researcher should be employed in the agreed research programme and be given the minimum rights applicable to researchers already working within the enterprise (medical care, social security contributions, health and safety standards, etc.);

— SMEs should be instantly informed as to what type of facility they will be able to benefit from, and a particular effort should be made to meet their qualitative needs (programming support, assistance with the purchase or leasing of equipment, easier access to data banks and networks, etc.), rather than merely handing out money.

6.1.3.1.5. The development host fellowships scheme also sounds very interesting. However, it is necessary to specify what exactly is meant by 'young researchers with the necessary research experience'; in order to facilitate the development of research centres in less-favoured areas and, by extension, promote scientific and technological cohesion within the Community, the researcher's quality and length of experience are both important factors. The Committee would like to see these criteria more clearly defined. It should also be specified whether this scheme solely concerns public institutions or whether private ones are included.

6.1.3.1.6. The Committee fully agrees with both the aim and the methodology specified for experienced researchers but a set of guidelines needs to be added so that national rules make special mention of the interchange between industry (particularly SMEs) and universities.

6.1.3.1.7. Lastly, in all schemes to promote mobility, researchers must receive equal tax treatment. Unfortunately, in many cases, national tax systems tend to penalize researchers who move from one establishment to another, thereby discouraging them from seeking experience abroad.

6.1.3.2. Enhancing access to research infrastructures

6.1.3.2.1. This particular activity is a very important one but the definition provided of research infrastructures is too broad.

6.1.3.2.2. Further, the need for transnational cooperation between key research infrastructures should be clearly stated as a prerequisite for access to the planned facilities for researcher exchanges.

6.1.3.2.3. Community support should be given to infrastructure cooperation networks in their capacity as managers of RTD projects of Community importance and not just for 'more effective use and exploitation of present infrastructures'; otherwise, the end result will be a waste of money and resources.

6.1.3.3. Promoting scientific and technological excellence

6.1.3.3.1. The promotion of scientific excellence should be regarded not so much as an activity but as one of the priorities of the Community's entire RTD drive. Leaving aside the high-level scientific conferences, which are very valuable, especially if properly publicized, the proposed distinctions for high-level research work — the 'Descartes Prize' and European Union Contest for young scientists — seem to fall far short of the aim of promoting scientific excellence. In particular, the European Union competition for young scientists (age range 15(!) to 20 years) sounds far from convincing since the candidates' research is entrusted to the current school systems, which are essentially generalist and virtually incapable of mobilizing the capacity and potential for excellence of a handful of young people; schools are rarely open to the outside world, and even more rarely in touch with each other. A 'talent scout' drive could, if need be, warrant a small-scale, but strategic, ad hoc Community research programme.

6.1.3.3.2. The proposals for raising public awareness are also unsatisfactory since they seem to be public relations exercises rather than genuine schemes to increase awareness and promote dialogue between the various protagonists.

6.1.3.4. Key action: Improving the socio-economic knowledge base

6.1.3.4.1. This key action should be seen in the light of the comments made by the external Monitoring Group, in particular its view [1] that the success of socio-economic research ultimately depends on the capacity to pinpoint the most important socio-economic issues and to suggest suitable solutions to the decisionmakers.

[1] 1997 External Monitoring Report on the Specific Programme for Research and Technological Development in the Field of Targeted Socio-economic Research.

6.1.3.4.2. However, while research inevitably involves 'problem solving' and European culture lacks the capacity to analyze and forecast the future of the European socio-economic model, it is equally true that a socio-economic research key action could have been centred on certain priorities and methods which would have given it a specific identity and possibly boosted its effectiveness. For instance, the research performance indicators could have been assessed in terms of their social 'problem solving' potential.

6.1.3.4.3. The proposed key action, in its present form, encompasses the entire vast range of socio-economic issues and it is hard to see how attention, to an even greater extent than resources, can be concentrated on vital European social problems such as the 'two-tier society' (a subject which the External Monitoring Group's report recommended for continued in-depth study).

6.1.3.4.4. It would therefore be helpful to determine well-defined priority themes (e.g. demographic patterns; ageing population) in a context in which at least two strategical factors will condition the medium-term social and human integration of the Community: implementation of EMU (and its impact on citizens and state) and enlargement (impact on all Community policies but especially on the European socio-economic development model). These two processes immediately bring to mind the need for reflection and research on the EU's institutional development and the corollaries for European society (problems which are considered under the heading 'governance and citizenship' but in the same way as under any other heading and split up into a long list of sub-components).

6.1.3.4.5. On the other hand, perhaps for the very reason that the proposed themes are rather general, this key action lends itself to an extensive range of 'bottom up' initiatives by interested parties, in which they can display their own dynamism and creativity. This can prove very constructive, provided that ongoing dialogue exists at all levels between users and experts and that the research aims to facilitate high-quality mediation between politicians and citizens, especially in the case of complex problems and decisions.

6.1.3.5. Actions contributing to the development of scientific and technological policies in Europe

6.1.3.5.1. The Commission stresses the need to step up forwardlooking strategy to be in a position to anticipate the scientific and technological challenges which Europe will be required to face in the future; it points to the difficulty of achieving this aim when there is such lack of coordination between national research programmes in a context in which the complexity and scale of problems are assuming increasingly transnational proportions. The solution must lie in developing information and data networks. With this in mind, two activities are proposed: analysis of specific political issues and a joint base of scientific, technological and innovation indicators.

6.1.3.5.2. The ESC fully supports these proposals, especially the drive to forecast all the major social implications of future scientific developments (an area in which the JRC is called on to make a special contribution), and regards the establishment of a joint base of consistent, complete indicators, accessible to political decisionmakers and to the various users and citizens, as being of fundamental importance.

6.1.3.6. Interrelationship with activities carried out under other Framework Programme actions

6.1.3.6.1. This specific programme will play a key role in coordinating and ensuring the consistency of the socially relevant aspects and activities of other Fifth FP actions. Though the ESC agrees with this methodological approach, the Commission's efforts alone will not achieve results. Close and open involvement of all players concerned (ranging from Community authorities to Member States, research centres to individual researchers, enterprises to socio-economic interest groups) will be vital to secure the balance of interests and responsibilities which is the cornerstone of the European socio-economic development model.

EURATOM FRAMEWORK PROGRAMME FOR RESEARCH AND TRAINING ACTIVITIES

Introduction

— The programme for nuclear research is placed under the heading of 'Preserving the ecosystem: Euratom', and covers research under the headings of both nuclear fission and nuclear fusion. For the first time there will be a single management committee for the whole programme of Indirect research.

— Introducing its original proposals, the Commission writes:

'Given the expected growth in demand for energy, continuing use will need to be made of

all potential sources. Strategic considerations will, however, favour the use of energy sources that offer greater sustainability and have lower health and environmental impacts. Nuclear energy has the potential to provide Europe with a secure and fully sustainable electricity supply at a competitive price' (1).

— The Committee notes the Commission's position. The Committee's views on nuclear energy were set out in its opinion (2).

Funding

— As with the overall budget, the amount of money which will be allocated to the Euratom Programmes has not yet been decided. The amount allocated by the Research Council in adopting its Common Position at its February meeting was a total 1 260 MECU. If finally adopted, this figure would represent a cut in real terms.

— Against this, the Commission is maintaining its own proposal for an overall allocation to Euratom of 1 467 MECU. Adding together its figures for the Indirect and Direct allocations for fusion research, the sum comes to 938 MECU, a 12 % increase over the original allocation to fusion for the Fourth Framework Programme (840 MECU). The Commission's figure for the combined Indirect and Direct allocations to fission research is 529 MECU. This is a 27 % increase over the original allocation to fission for the Fourth Framework programme (414 MECU).

— There will therefore be a real increase in the funds allocated to fission research under the Commission's proposals, principally because of a substantial proposed real increase in the amount allocated to nuclear safeguards work (87 MECU for the Fourth Framework Programme, 142 MECU for this). However none of these figures have yet been agreed. The proportionate provisions for all Euratom research remain 9 % of the total funds, as was the case in the Fourth Framework Programme, under both the Council's and the Commission's proposals.

— It is regrettable, of course, that neither the overall nor the detailed allocation of finance for the research activities of Euratom, as for the rest of the programme, are yet agreed between the Commission and the Council this late in the planning process.

— It would be an advantage if for presentation purposes the distinction between Direct and Indirect Action research were abandoned. It would make the Commission's overall financing of their research programme much more easily accessible to the public. The existing distinction, which is between 'in-house' (i.e. Joint Research Centre) and external research, is irrelevant so far as the overall programme is concerned. It as all the Commission's programme. Most of it is apportioned externally, but some of it is not. There is a shared and concerted action content to Direct Action research as well as Indirect Action research. There is no difference in principle between the quality, or the results, of these two sources of research. They should be presented as part of one coherent programme as they used to be, for example, at the time of the Third Framework Programme.

7. Specific programme 'Preserving the ecosystem (Euratom)'

7.1. *The proposals for nuclear fission research*

7.1.1. The aim of the Key Action (3) 'is to help ensure the safety of Europe's nuclear installations and to improve the competitiveness of Europe's industry; to ensure the protection of workers and the public from radiation; and to support the application of international safeguards on nuclear materials; to help ensure the safe and effective management and final disposal of radioactive waste'.

7.1.2. The bulk of the research programme will continue in similar vein to the existing programme. It will focus on the following main areas of investigation — the operational safety of existing installations, safety of the fuel cycle (which includes the handling of nuclear waste), safety and efficiency of future systems, safeguards of nuclear materials, radiation protection. Activities of a generic nature will focus on radiation protection and health, environmental transfer of radioactivity, enhancing the safety and efficacy of medical and industrial uses of radioactivity, improvements in internal and external dosimetry.

7.1.3. In comparison with the research planned for the Fourth Framework Programme, there is not the undue emphasis into research into severe accidents which, in its opinion (4), the Committee criticised as mistaken. Another criticism made by the Committee about that programme has also been attended to; namely, this time the nuclear industry is broadly satisfied

(1) Page 39 (English text) of the Commission's Working Paper on the Fifth Framework Programme (1998-2002), COM(1997) 553 final, published 5.11.1997. Identical words are used in the Introduction to the Commission's Specific Programme.

(2) Opinion on the Communication from the Commission on the nuclear industries in the European Union (an illustrative nuclear programme according to Article 40 of the Euratom Treaty, OJ C 206, 7.7.1997.

(3) Set out in the Common Position adopted by the Research Council, 23.3.1998.

(4) OJ C 393, 31.12.1994.

with the amount of prior consultation which the Commission has afforded it.

7.1.4. A new element in the programme is the introduction of a 'problem solving' approach, by which is meant placing a greater focus on solving problems of a more practical or pressing nature within, if possible, the four year span of the programme. Just what this means in practice in the fission research programme, a lot of which cannot be parcelled up in this way, will be difficult to determine, but the Committee welcomes the approach provided it is applied with sense and balance.

7.1.5. There are three broad areas in which this more practical approach to the programme is already discernible. The first is a greater emphasis on research into the possibilities of prolonging the working life of the existing reactor stock within the EU. This is connected with the environmental problem of CO_2, and with the EU's long term security of supply. The safe prolongation of the life of the EU's nuclear power station capability will be of material assistance in both respects.

7.1.6. The second and third areas are innovation and competitivity. Both are concerned with helping the Union's nuclear industry to compete more effectively in overseas markets. Nuclear plants are being ordered by overseas countries and there is both economic and safety benefit if the EU's nuclear industry is in the best position to compete for them. Developing innovative concepts which could improve the design, performance, safety characteristics or utility of EU designed reactors will all be relevant to improving competitivity. The Committee sees no reason to quarrel with the Commission about these developments, and will be interested to see how they will work in practice.

7.1.7. The Committee notes that safety of the fuel cycle will continue to be one of the main areas of research. This will include continuing attention being given to the possibility and efficacy of transmuting long-lived isotopes into short-lived ones. The disposal of its radioactive waste products is probably the area of the public's greatest anxiety about the nuclear industry. In its proposal for a specific programme the Commission writes that: 'Research will focus on developing a scientifically founded approach to the management and disposal of radioactive waste that is both cost effective and acceptable in a broader social context' [1].

7.1.8. The Commission goes on to write that an RT priority will be 'to develop a common understanding and consensus on the management and disposal of radioactive waste'. The central research proposal is 'to test and demonstrate the technical feasibility of deep disposal in underground laboratories, including the assessment of repository performance and long-term behaviour of repository components'.

7.1.9. On this subject the Commission gives every impression that it has got itself into a rut. The words quoted above bear a marked similarity to words the Commission used in introducing the Third Framework Programme back in 1987. What progress has been made? There is no doubt that informed scientific opinion takes the view that deep final disposal is the best method of disposing of long-term nuclear waste, but as the Committee has pointed out on more than one occasion, public opinion has not yet been persuaded to settle for final disposal on this basis. Public opinion wishes long-term nuclear waste to be stored where it is retrievable, and to have the associated option of possible long-term surface storage. That may change in future decades, but it is the present reality.

7.1.10. It is essential that public opinion on this subject should be heeded, and that the research programme involved with nuclear waste should be shaped accordingly. The Commission says it wants to work 'in a broader social context'. The Commission should look again at its proposals on waste disposal.

7.1.11. It is clear that a substantial amount of work will continue to be done on radioprotection. That will be generally welcomed. It is a very large field of study. It is unfortunate however that all the work on radiation is lumped together under the Euratom label. This gives credence to the public perception that almost all radiation arises from the activities of the nuclear power industry, whereas in fact the great bulk of radiation people experience comes from natural sources and, in so far as it is man made, from medical services and industry.

7.1.12. It is of the greatest importance that the EU's research work on nuclear issues in the civil field (including fusion as well as fission research) is widely, professionally and frequently reported to the public. At present public opinion knows almost nothing about it.

7.2. *The proposals for fusion research*

The Key Action for fusion research set out in the common position adopted by the Council in February [2], states:

> 'The long-term objective ... is the joint creation of prototype reactors for power stations to meet the needs of society ....

[1] Proposal for a Council decision adopting a specific programme (Euratom) for research and training on 'Preserving the ecosystem' (1998-2002) — COM(1998) 306.

[2] Set out in the Common Position adopted by the Energy Research Council, 23.3.1998.

The proposed strategy ... includes the development of an experimental reactor ... followed by a demonstration reactor .... Construction of an experimental reactor seems technically feasible during the next decade (and) should take place within the framework of international collaboration, such as ITER (International Thermonuclear Experimental Reactor).

The aim of this Key Action is to further develop the necessary basis for the possible construction of an experimental reactor. This Key action should thus enhance the Community's preparedness, from a scientific point of view, to decide on and support such a future experimental reactor'.

7.2.2. The impression given by these words is that work on the ITER, the centrepiece of the fusion programme, is being taken forward in a measured way and that, subject to ironing out the remaining technical problems, it could be possible to start construction in the next decade.

But this is misleading. As the Committee understood when it was considering the Fourth Framework Programme, it had been the Commission's intention for several years to start the construction of the ITER during the period of the Fifth Framework Programme. This was of course subject to the completion of a satisfactory design, but the design had been completed in its main essentials 18 months ago. The Fusion Evaluation Board, set up to advise the Commission on whether it should go ahead with the ITER and, having access to the design, reported at the end of 1996 and concluded unequivocally that 'Starting the construction of ITER is ... recommended as the first priority of the Community under the Fifth Framework Programme' [1].

7.2.3. What has happened is that the Research Council meeting in June 1997 decided that the construction of ITER could not after all be afforded, and it is not possible at present to see the time when it might be affordable. Circumstances had changed out of recognition since the ITER had first been conceived early in the decade. The upshot is that the fusion programme has taken a body blow, and the Key Action for fusion really describes the reverse of plans for further progress.

Background

7.2.4. At this point a little background information is necessary, since the ITER was not simply another experimental reactor, the delay in the construction of which is merely a temporary hiccup. The ITER was designed to demonstrate that fusion power could achieve the key breakthrough which would establish its claim to offer a technology, not just a science, capable in time of producing electricity on a large, sustainable and commercial basis. The key breakthrough is described in fusion circles as achieving ignition.

7.2.5. Up to now the best the fusion programme has achieved was last year, when JET (the Joint European Torus) attained an output of 17 MW (thermal) for a period of one second, and — in the same series of experiments — an output of 5 MW over a period of four seconds. These results are both 'firsts' in fusion research, and required the attainment of temperatures of over 100 million degrees centigrade. They were exciting achievements.

7.2.6. But they had a serious limitation. Their achievement required a much bigger input of power than was extracted. That situation must not only be reversed, but the aim is to get a self-sustaining reaction, no longer requiring any input of heat from external sources. It is this state of affairs which is described as ignition. JET is not capable of achieving ignition. Fusion scientists estimate that to get to this point, and then sustain it, will require the construction of a very much larger machine — i.e. one capable of achieving a megawatt output of approximately a hundred times that of JET. This was what ITER (the one that has already been designed) was designed to do. If it cannot be constructed, the central aim of the entire fusion programme, now just about forty years old, cannot be reached.

Cost is the problem

7.2.7. The explanation for this situation is very simple. The cost of the ITER which has been designed is too great — or, to qualify that statement, was too great in the circumstances in which the final decision (to go ahead with the construction of ITER) had to be made.

7.2.8. The estimates were that ITER would cost 700 MECU a year for the ten years it would take to complete. This figure has to be judged against a current annual expenditure on the fusion programme of some 500 MECU, of which about 225 MECU is paid for by the European Union out of the Framework fund. An extra 700 million p.a. was of course very substantially more than Member States of the EU could be expected to pay, probably in any circumstances, but certainly not in the early years of monetary union, when public finances would inevitably still be under considerable strain.

7.2.9. It was, however, never the intention that the EU would have to meet the full cost of ITER. It was conceived and designed as a joint venture by Europe,

[1] Report of the 1996 Fusion Evaluation Board, chaired by Professor Barabaschi, published by the Commission in December 1996.

Japan, Russia (originally, it was the Soviet Union which was involved), and the USA. By an unexpected conjunction of events none of these partners would have been able (or, in one case, willing) to share the cost of constructing ITER. Japan has been hit by recession, but remains willing to pay its share (possibly rather more than its share), but not yet. Russia cannot afford to pay. The USA can afford to pay, but its fusion community is not currently of one mind about ITER, and its government shows no current disposition to participate in the cost of its construction [1].

7.2.10. Given these circumstances the Council had no alternative but to shelve the construction of ITER to the design which had been completed. Instead, a fresh look at the design of ITER is very likely to be sanctioned in the near future (with the continued participation of the four major participants) on the basis that a design costing about half as much as the original design might become acceptable some time in the future, hopefully in the next decade, when a decision may be able to be taken. That is the meaning of the language of the Key Action.

New questions

7.2.11. No blame attaches to the Council, the Commission, or anyone else for this development. But, the implications are nevertheless serious. For fusion scientists do not think that an ITER half the size of the original one will be able to achieve ignition. It will be able to get a lot nearer to it than JET, but not be able to achieve it.

7.2.12. If that is so, the question will arise of whether a smaller ITER should be built at all? Assuming the cost of it is 350 MECU a year, this may appear to be a great deal of money to spend while still being unable to demonstrate that ignition can be achieved. It is argued on the other hand that a half size ITER should be able to demonstrate (unlike with the JET experiment) an output of power substantially greater than the power input. It might follow that it would not be necessary to demonstrate, via yet another experimental reactor, that ignition could be produced. Perhaps it would be possible simply to assume, from the experience by then gained, that ignition could be obtained, and so go straight to the construction of a demonstration (or prototype) reactor.

7.2.13. These questions cannot be answered at the present time. But the fusion programme now faces a future in the next few years in which the political and financial problems will be serious, and may well be greater than the scientific ones. For many years now, it has gained and maintained momentum from the drive to build a machine large enough to be able to demonstrate that fusion science and engineering can achieve ignition, and until about 12 months ago the community of fusion scientists were looking forward to the Fifth Framework Programme to be the launch-pad for this endeavour. Will it be able to maintain public and political support if it no longer appears to be making progress?

7.2.14. Not the least of the problems will be the effect on the morale and dedication of the scientists who have been involved. Many of them have devoted themselves to the fusion programme for most of their working lives, and now they see the central project for the next crucial phase of the fusion programme stood down. The attraction of fusion research to young scientists will be much diminished. These are major management problems in their own right, to which there will be no easy answers.

The responsibility of Council and Commission

7.2.15. Both Council and Commission need to address the overriding political problem. Even though it has had certain reservations from time to time about the scale of its financing, the Committee has always strongly supported the fusion programme and continues to do so. It understands the long-term need for new sources of power for the world's peoples in the next century and after. It is convinced that nuclear fusion has the potential to provide this energy supply, but its scientific and technological viability have still to be demonstrated. Nevertheless, notwithstanding the difficult phase through which the fusion programme is at present forced to go, the Council and Commission are urged to give it their support.

8. **Direct RTD actions — 'Joint Research Centre'**

8.1. *Introduction*

8.1.1. The Council guidelines of 26 April 1994 on the role of the Joint Research Centre (JRC) gave a much more precise definition of its objectives, making it more open and externally accessible and stepping up its support for Commission departments and Union

[1] It is right to report, however, that at the Heads of Government Summit of the G8 in Birmingham in May, the Governments of Japan, Russia, the USA and the EU considered it 'desirable to continue international cooperation for civil nuclear fusion development'. And at the June 1998 meeting of the Research Council the Commission was authorised to sign an Amendment to the quadripartite agreement between Euratom, USA, Russia and Japan in the Engineering Design Activities (EDA) for ITER, thus extending the cooperative activities in relation to the design (in this case, probably a revised design of ITER) for another 3 years.

policies. The centre also extended its cooperation networks, not only with research institutes and public authorities, but also, increasingly, with industry through joint ventures, raising the profile of its scientific and technical work and making it more transparent and accessible.

8.1.2. The centre has supplemented its institutional role with competitive activities including both participation in Community research programmes and Community development and cooperation programmes, and increased contract work, which now accounts for 15 % of its budget — in the Committee's view the maximum sustainable proportion of external activities if the JRC is to fulfil its mandate in terms of independence and neutrality.

8.1.3. Notwithstanding the results confirmed by external assessments conducted by independent experts ([1]), the Committee would emphasize the need to give the JRC a new and clearly-defined inter-institutional role, to provide strategic scientific support for the implementation of research policy and other Union policies. That support should centre, in particular, on bolstering Community decision-making; assisting in the development of a European and international dimension for research, technological development and demonstration (RTDD); ensuring the right standard of support for Community policies, in particular by developing measurements and testing, pan-European technical standards and measures for the fight against fraud and the protection and safety of the general public.

8.1.4. Furthermore, the Committee is of the view that the JRC should avoid involvement in too many areas and, in keeping with the philosophy of the Fifth Framework Programme (5th FP), focus on high-profile initiatives of European and international significance, applying a healthy dose of subsidiarity to areas that could be dealt with more effectively by national structures.

8.1.5. In addition, in the Committee's opinion, coordination between the various constituent Institutes should be reviewed, with a view to merging some and possibly establishing new ones, to avoid maintaining elements that are no longer in line with the new thrust of the framework programme, or activities that have become routine.

8.1.6. In view of the above, the Committee recommends assessing the quality of the various activities in the light of the new general approach of the 5th FP and broadening opportunities for external exchanges, using networks and developing the European and international dimension of RTDD activities.

8.1.7. The JRC must develop a capacity to link up the best skills of the national research centres, with a view to generating European value added. It should also encourage European researchers to complete traineeships within the centre as an essential step in their career paths.

8.2. *JRC research activities within the 5th FP*

8.2.1. The Committee concurs with the mandate and general objectives that the Commission intends for the JRC within the 5th FP, i.e. providing scientific and technological support for the framing, implementation and monitoring of EU policies. The JRC should become the Community's prime vantage point, able to anticipate emerging scientific and technological priorities. Its activities should centre on the priorities of the 5th FP and contribute to the achievement of the objectives of the key actions and general research activities.

8.2.2. In order to preserve its scientific excellence, the JRC should avoid the random diversification of its RTD activities and home in on a limited number of fields in which it should be a driving force, coordinating research at all levels. The centre must assert its role vis à vis the national research centres, and its research priorities must be underpinned by the subsidiarity principle and the need to provide European value added.

8.2.2.1. To meet the requirements of the public and the institutions, the Board of Governors should be flanked by an inter-institutional consultative body ensuring that the Community Institutions, in particular the European Parliament and the Economic and Social Committee, and representatives of the users (industry, including SMEs, as well as research centres and laboratories) are equally represented.

8.2.3. The Commission's intention to concentrate its research activities on three main areas seems to comply with the new approach taken in the 5th FP:

8.2.3.1. Serving the public: this should involve support measures for the implementation of health and consumer protection policies, and for the campaign to combat food-related fraud. These would be implemented in connection with the key actions of the first and second thematic programmes of the 5th FP.

8.2.3.2. Developing sustainability: the JRC should contribute to the mainstreaming of environmental issues into other Community policies, in line with the Community's fifth environmental action programme (1992-2000) and in connection with the key action initiatives

([1]) COM (1997) 149, 16.4.1997.

of the fourth thematic programme. In particular, it should assist in defining sustainable environmental pollution thresholds and designing monitoring systems, identifying the best available technologies for improving industrial processes and reducing their environmental impact, and conducting studies on climate change. The main focus of its activities will be the energy and transport sectors.

8.2.3.3. Building up European competitiveness: here, the JRC should step up activities to promote and develop European and international rules, standards and codes of good practice. Support for policies relating to the major infrastructures of the EU and the regions of the Mediterranean basin and Eastern Europe should focus on initiatives for technology transfer from the JRC to Community industry, SMEs in particular. It should also centre on measures to stimulate the competitiveness of sunrise industries in global markets, and to develop scientific networks in Mediterranean third countries. The effectiveness of those activities will be assessed through studies to measure the quality and quantity of technology transferred from research to industry and the resulting impact on employment.

8.2.4. The Committee, however, is of the view that provision should be made for the JRC to examine its research themes regularly, with a view to refocusing its activities throughout the framework programme, as part of its own brief to redefine the RTD priorities of the EU on an ongoing basis.

8.2.5. On several occasions the Committee has noted the lack of effective European mechanisms for technological and industrial assessment to define scenarios on which to base common choices regarding priorities at regional, national and Community level and, consequently, RTD strategies. With the appropriate instruments and procedures, the JRC could become a tool for analysing technological trends in relation to socio-economic requirements at Community level, by means of the Seville-based Institute for Prospective Technological Studies.

8.2.6. In this respect, initiatives relating to technical-economic and strategic forecasting must be given appropriate tools and resources and granted the same importance as the three main themes for the JRC's research activities, in close connection with the key action to improve the socio-economic knowledge base. This would provide EU institutions with real-time indicators on the development of new technologies and the emergence of new social challenges, thus enabling them to make joint decisions on priorities at all levels.

8.2.7. To this end, the JRC should establish a network for systematically pooling relevant and comparable information on research and technological innovation activities in the Union. It should also establish trend charts, similar to those used by the European employment observatory, in close connection with the innovation units in each of the key actions and with the network of coordination units, to give an outline and overall picture of measures taken in each EU Member State and enable systematic comparisons to be made.

8.2.8. The involvement of all national authorities in defining strategic scenarios would facilitate agreement on Community priorities for RTD, in turn generating genuine European value added. That would focus joint research on firm common objectives and would provide the 5th FP with a versatile tool to guide and refocus emerging research priorities, mirroring the changing demands of society, the public and companies.

8.2.9. There has been a net reduction in the proportion of the JRC's activities in the nuclear field. This is because nuclear energy is considered to be mature technology, as indicated in the Illustrative Nuclear Programme on which the Committee adopted an opinion.

8.2.10. However, in the field of nuclear energy, the JRC must fulfil precise obligations, placed on the Commission by the Treaty. The work on the fusion programme is to be reduced and will mainly be concerned with materials research. On the fission side, more room will be given to activities relating to safety, accident prevention, commitments arising from the non-proliferation treaty and the management of radioactive waste.

8.2.11. The Committee supports that approach, and calls for coordination between networks of public and private laboratories and European research consortia, in cooperation with industry, SMEs in particular, as well as special cooperation with research institutes and laboratories in the countries of central and eastern Europe and the former Soviet Union.

8.3. *Financial component*

8.3.1. The Committee shares the Commission's great concern over the significant reduction in financial resources allocated to the JRC by the Council common position [1], which may effectively restrict its capacity to carry out its brief.

[1] Communication from the Commission on the Council common position with a view to adopting European Parliament and Council Decision concerning the 5th Framework Programme of the European Community (EC) for research, technological development and demonstration activities (1998-2002) (SEC (1998) 540).

8.3.2. The Council's funding proposal of ECU 688 million for JRC activities falls far short of the ECU 815 million sum proposed by the Commission. The Council has also agreed a reduction on the amount proposed by the Commission for the Euratom framework programme, from ECU 326 million to ECU 281 million. The Committee had expressed its support for the resources proposed by the Commission, which would effectively strengthen the JRC's strategic inter-institutional role in providing scientific and technological back-up for the implementation of EU policies.

8.3.3. This cut would undermine the JRC's role as an efficient and independent research centre, able to provide support in the form of neutral, supranational analysis in the face of often conflicting demands from the Member States, the Commission, Parliament and Council.

8.3.4. If the Council maintains its position in this respect, the Committee takes the view that for the activities of the JRC to acquire the critical mass needed to guarantee a high profile and practical results it will have to focus its efforts on just a few spheres of excellence, in accordance with the new approach of the 5th FP, cutting down the number of institutes. Besides hampering the JRC in carrying out its brief effectively, the dispersal of limited resources over a plethora of research sectors could also erode the centre's prestige and practical purpose at Community level.

8.3.5. However, the Committee agrees with the view expressed by the European Parliament, though not included in the common position adopted by the Council, that the activities of the JRC should be subject to regular assessments, on the basis of a list of set criteria, to appraise its effective contribution to EU research objectives. The sum of Community funding for the JRC and its main research sectors would be reviewed every two years on the basis of that appraisal. In this way, the JRC's RDT activities could be refocused constantly to match the new development demands of the EU.

8.3.6. While taking account of the demand for flexibility which is a feature of the new Community approach, the Committee takes the view that an equal balance must be kept between the three themes: serving the public, promoting sustainable development and supporting European competitiveness. The Committee draws attention to the severe lack of backing for activities to support competitiveness, when they must in fact be pursued at sufficient levels (also within the JRC) with regard to the fundamental areas of technological and industrial assessment to back decision-making at Community level and in European industry, the definition of areas for the development of joint ventures, and the implementation of Articles 130 k, l and n of the EU Treaty, in accordance with the provisions of Article 3 of the Decision on the Fifth Framework Programme.

8.3.7. With regard to the Euratom strand, in line with the views expressed in points 8.2.9 et seq., the Committee agrees that the lion's share of resources should be allocated to nuclear fission safety and materials testing, the fight against the illegal trafficking of materials, prevention of damage to the environment caused by radioactive materials, and the training of inspectors and operators. Meanwhile, a higher percentage, no less than 10 % of the overall ECU 326 million proposed by the Commission, should be earmarked for decontamination and radioactive waste management.

Brussels, 10 September 1998.

The President

of the Economic and Social Committee

Tom JENKINS