

FIVE YEAR ASSESSMENT REPORT

RELATED TO THE

SPECIFIC PROGRAMME:

COMPETITIVE AND SUSTAINABLE GROWTH

COVERING THE PERIOD 1995 - 1999

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THE GROWTH PROGRAMME'S FIVE-YEAR ASSESSMENT PANEL

We, the undersigned, the Growth Programme's Five-Year Assessment Panel,
are pleased to present our report to the European Commission

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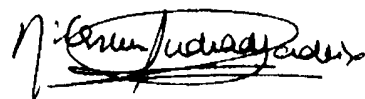
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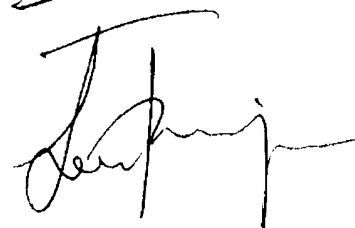
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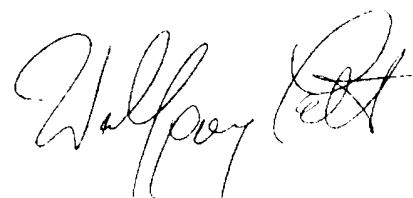
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“COMPETITIVE AND SUSTAINABLE GROWTH“ - FINAL REPORT**

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1 Executive summary

- The Panel considers that the general objectives of the programme are highly relevant, but a more systematic formulation of these objectives is recommended. While the Panel thinks that the variety of objectives is in principle useful, there might be, with the increasing scope, an increasingly difficult trade-off between the different objectives (scientific and technological excellence, industrial competitiveness, broader socio-economic goals, contribution to European cohesion, SME participation).

The concepts of 'European Dimension' and 'European Added Value' have to be further clarified and translated into programme objectives and corresponding project selection criteria. The Panel appreciates that efforts have been undertaken in some parts of the programme to specify the socio-economic objectives in a quantifiable and verifiable way. It recommends this practice to be spread to other parts, where possible. This would help overcome present difficulties in formulation and evaluation of project proposals.

Despite extensive consultation in the process of formulation of objectives, they are too general in some KAs. We recommend that a few specific and challenging targets are selected for each KA.

The 'problem-oriented approach' adopted by FP5 is appreciated.

- External evaluations and Impact assessments of finished projects in FP3 and FP4 describe the respective Programmes as being quite effective. Most performance indicators show improvements in FP 4 as compared to FP3. The Panel endorses these findings, yet raises one serious policy issue for the future:

There has been a shift in the project portfolio in BRITE-EURAM/IMT from FP3 to FP4 towards more market-oriented, more applied, and less risky projects. The share of projects achieving 'technological breakthroughs' has declined, the share of projects resulting in incremental innovation has risen. This raises questions about additionality.

In the long run the need to maintain strong basic, but oriented research serving industry is of utmost importance if Europe is to compete with the rest of the world. There needs to be a better balance between applied and basic research, and between 'technological breakthrough' projects and 'incremental innovation' projects. This is a lesson to be kept in mind during the discussions on FP6.

One way of doing this may be special calls, incorporating different requirements and evaluation criteria for high profile, high risk projects with potentially high rewards.

- The merger and re-organisation of activities under FP5 was not achieved without some disturbances and discontinuities, but most of the immediate management difficulties seem to have been resolved. The new structure of the Programme has brought about an increasing breadth of scope, less homogeneity (e.g. the specific character of KA2), more complexity (at all levels of implementation) and hence an increased need for co-ordination. This has increased the demands on Programme management and project officers considerably.

The present organisation structure for the GROWTH programme has some drawbacks. More transparency based on job descriptions and management performance criteria should be established. The organisation structure of FP4 had advantages in comparison with the present structure in terms of clarity of responsibility and division of tasks.

Activities on Standards, Measurement and Testing have seen various changes in the FPs. While it was a specific programme in FP3 and FP4, some of the activities have now been devolved into several programmes of FP5. Given the specific needs and the horizontal character of measurement and testing, the Panel recommends the instatement of SMT as an independent, co-ordinating SP.

It seems that the interaction and synergies between the KAs have remained limited so far. KA2 especially is different from the others. Given the differences in types of projects, time horizon of effects, management procedures etc, and the complexities associated with the administration of such diverse Key Actions, the merger of all activities related to 'Sustainable Mobility' into a separate activity should be considered.

- The establishment of the External Advisory Groups (EAGs) has proven to be useful. Their composition (Knowledge Producers, Knowledge Users and End Users) facilitates the proper targeting of the research activities towards real needs, and eases the utilisation of results. EAGs should also be set up for the activities outside the Key Actions. In GROWTH, the business sector is better represented in EAGs than in other areas, but, there should be more representatives of users, particularly for KA2 (Sustainable Mobility and Intermodality).
- Against the background of increasing demands on the Commissions staff and the apparent decision of the Council not to devote more resources to the management of the Programme, there should be stronger efforts, where appropriate (e.g. National Focal Points) and efficient, to outsource or decentralise to national levels more administration and decision making. Besides increasing efficiency it would also strengthen feelings of being involved in the European research.
- Project management has become increasingly efficient and transparent, the modes of action have diversified by combining the bottom-up of open calls and top-down of dedicated calls as well as accompanying measures. The introduction of 'Expressions of Interest' has proved a valuable source of bottom-up ideas.

The delay between the end of negotiation and the effective signature of the contract should be further reduced. Proposal evaluation procedures have improved and are fairly well harmonised. The evaluation process and the quality of the evaluators can be further improved by the acquisition of best evaluators through an early planning of the evaluation period and through raising the number of evaluators coming from business and industry.

- With a view to increasing transparency, project application procedures have been changed, but these changes have resulted in increasing complexities. Application forms should be shortened. Administrative forms should be reduced at least to previous levels. The information packages have to be shortened and made more concise in order to be digestible for SMEs. All administrative and information entry barriers have to be lowered.
- Most of the Evaluation and Impact Assessment Reports have been very useful and of good quality. BRITE-EURAM/IMT were the first Programmes to look systematically into the assessment of impacts. It is important to diffuse the lessons learned, and to spread the 'best practices' to all thematic programmes. There needs to be a structured, systematic process set up to do this.

Future annual monitoring reports should assess some critical issues for the conduct of the programme, e.g. the preparation of calls, the clarity of the stated objectives, the appropriateness of the evaluation criteria or the distinction between Key Actions and Generic Technologies. Related improvements would substantially aid the task of the 5YA panels.

- The quality of the technical and scientific work is considered high and the Panel considers it important to maintain this status.
- The increased involvement of users throughout the programme is seen as very beneficial, but the Panel believes that, although difficult, the involvement of users in KA2 (Sustainable Mobility and Intermodality) should be further extended. This would enhance the 'problem-oriented approach'.
- The results of the RTD projects must be more widely disseminated through a specific co-ordinated action between the EU Commission and the Member-States so that the different users (or decision makers) get the information in a user-friendly manner.

- At present, the rules discourage the participation of larger enterprises in CRAFT consortia. Their inclusion was a novelty introduced in FP3 and was particularly helpful in linking value chains and promoting interaction between different types of enterprises. The termination of large companies' participation is judged by the Panel as a point likely to reduce effectiveness. It is recommended that the rules be changed accordingly, thus facilitating real user-producer interaction.
- Measures to improve the mobility among researchers and to support the access to large-scale research facilities have changed in FP5. The Panel supports these changes, which are intended to strengthen the infrastructure and the competitiveness of European research. The Panel recommends, however, a follow-up to ensure that the intentions are fulfilled.
- With a view to FP6, the Panel has the opinion, that one of the main lessons learned from the current GROWTH Programme is that there needs to be some continuity in terms of objectives and underlying approach. The concepts underpinning the problem solving approach of FP5 have to be further developed and tested in practice.

Notwithstanding this request for continuity, the Panel does see some need to improve the organisation and management, in line with the recommendations of this report. Another main suggestion is to look for the right balance between applied and basic, incremental and breakthrough and high/low-medium risk RTD. FP6 has to strive to strike the right balance.

2 Introduction

2.1.1 Task and Scope of the Assessment

The task of this Panel was to assess the activities now combined under the Specific Programme Competitive and Sustainable Growth and „to report in a systematic manner on the results and impacts achieved under FP3 and FP4. The focus of the exercise was:

- (i) For FP3, important results, their dissemination and impact;
- (ii) For FP4, programme execution, main results, their dissemination and identifiable impact;
- (iii) For FP5, progress in implementation;
- (iv) Recommendations for future orientation, based on the conclusions of the assessment.

The assessment followed the structure of FP5 and was carried out according to the criteria set out in Annex I and the S&T objectives set out in Annex II of the EC and Euratom FP5 Decisions and of the Specific Programmes' objectives.“ [8, p.1]

The report is structured in the following way:

- In chapter two we give a brief overview of the task ,the scope of the assessment and some basic information about the Programme under consideration;
- In chapter three we present an assessment¹ of the Specific Programmes, Industrial Materials and Technologies (IMT)², Standards, Measurement and Testing (SMT), and Transport systems as well as assessments of activities under these Programmes;
- In chapter four we present recommendations based on the findings and conclusions;
- Finally, in the Annexes, we provide information about the sources of information used (references, interviews and invited presentations) by the Panel members, give a list of abbreviations and present some basic statistics about the Programme.

2.1.2 General Description of the Programme

This Assessment Report spans a 5 year period (1995-1999) extending from the completion phase of FP 3, through the whole duration of FP 4, to the first year of implementation of FP 5. The total funding dedicated to these Programmes increased substantially, from an average of about 185 MEuro per year during FP3 to about 670 MEuro per year for FP5 and from 748 MEuro to 2.705 MEuro in total in FP5 (see below for details, see also Statistical Annex). The activities carried out in the realm of these Programmes cover a wide range of RTD projects. These projects differ considerably regarding the type of R&D (e.g. technology vs. policy-oriented, generic vs. sector-oriented, diffusion-oriented vs. mission-oriented), size of projects (large 'technology platforms' vs. smallish projects), and stakeholders (different types of enterprises, countries, users, policy makers).

In all three Frameworks, the Programme has been implemented by:

¹ The assessment essentially follows the evaluation criteria set out in the ‚Broad Guidelines‘.

² In FP3 and FP4, these activities are comprised in the Areas 1 and 2 of the IMT Programmes, in FP5 they have been included in the GROWTH Programme under the heading: Generic activities and Key Action 1 (KA1).

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- Shared Cost Research
- SME-specific measures i.e. Feasibility Awards and Co-operative Research (CRAFT)
- Concerted Actions
- Thematic Networks (FP4 and FP5)
- Accompanying Measures

Table 1: Volume of the Programmes in FP 3-5

FP 5 (1998-2002)

Competitive and Sustainable Growth	M €2.705
Key Actions	
KA1 Innovative Products, Processes and Organisation	731
KA2 Sustainable Mobility and Inter-modality	371
KA3 Land Transport and Marine Technologies	320
KA4 New Perspectives for Aeronautics	700
Generic Activities / Technologies	546
- Materials and their technologies for production and transformation (Including new and improved materials and production technologies in the steel field)	410
- Measurements and Testing	136
Support for Research Infrastructures	37

FP 4 (1995-1998)

Industrial and Material Technologies (IMT)	M €1.617
Area 1 Production Technologies	590
Area 2 Materials and Technologies for Product Innovation	566
Area 3 Aeronautics	230
Technologies for Surface Transport Means	231
Standards, Measurements and Testing (including JRC)	288
Transport R&D	240
- Strategic research for Trans-European multimodal network	48
- Network optimisation	192

FP 3 (1991-1994)

Industrial and Materials Technologies	M€748
Area 1 Raw materials and Recycling	80
New and improved Materials / Processing	228.8
Area 2 Design and Manufacturing	301.5
Area 3 Aeronautics	53
Measurement and Testing	140
Transport R&D (EURET)	25
- Optimum Transport network exploitation	16.5
- Logistics	7.5
- Reduction of harmful external effects	1.0

2.1.3 Objectives of the Programme

Over the successive Framework Programmes, the main overall objective was, as defined in the EC Treaty art.163 (ex-article 130f), "to strengthen the scientific and technological basis of European industry and to encourage it to become more competitive at international level". The specific objectives and priorities of the programmes evolved over time in line with the overall Framework programmes' objectives and in response to changing needs, new challenges and opportunities related to industry [see 9, 10, 11, 12 and 13].

Under FP 3, the focus of the specific programmes was on demand-driven basic and applied research projects to develop critical technologies important for industrial competitiveness, on a material and product life cycle approach, on project teams involving suppliers, producers and users, and socio-economic cohesion. It was also under FP3 that specific measures to stimulate the participation of SMEs and policy-oriented research in the field of Transport systems were initiated.

The specific programmes under FP 4 reflected in many ways the priorities of the Maastricht Treaty of 1992, integrating objectives such as industrial competitiveness, economic growth, quality of life, respect for the environment and industrial safety. It encouraged a multi-sectoral approach coupled with a commitment to testing and demonstrating the technologies in industrial environments so as to ensure the adoption of results in as many different industries and countries as possible. It is under these programmes that actions were developed to promote co-ordination between projects and with research funded at national levels (via Thematic Networks).

Consistent with the overall approach of FP5, the thematic programme GROWTH is constructed around

- problem-solving ,Key Actions' focussing on important socio-economic needs,
- actions on ,Generic Technologies', and
- support of research infrastructures (including virtual networks, data bases, etc).

The combination of sustainable industrial growth, integrating competitiveness, employment and environmental aspects is the overall objective underpinning the programme. A large part of the resources are concentrated on critical size actions in the form of Targeted Research Actions and Technology Platforms. Co-ordination and synergies between projects addressing a common strategic objective is sought through project clustering and Thematic Networks. Transport systems related research constitute a major part of the programme (3 out of 4 Key Actions)

During this period of successive programmes emphasis has been continuously placed on research for and by SMEs from a wide range of industrial sectors.

3 Assessment of the Specific Programme „Competitive and Sustainable Growth“

This assessment of the Specific Programme „Competitive and Sustainable Growth“ (GROWTH), is based on a variety of sources: various annual monitoring reports [22-28], previous 5 Years Assessments [30-32], Evaluations and Impact assessments of finished projects [3, 18-20, 34], reports on specific questions [1, 29], the simultaneous work of the FP5 assessment panel and the surveys carried out for that panel. Furthermore, the members of this Panel have conducted interviews with Programme managers, member-states' representatives, members of consortia and users (see Annex for a list of references and sources of information).

3.1 Relevance of objectives of the Programme

3.1.1 General findings and Key Issues

The Panel thinks that the objectives of the GROWTH Programme are highly relevant and should be maintained. The first goal of the Programme should indeed be to give to Europe pre-eminence in science and technology whilst underpinning industrial competitiveness. An equally important goal is the solution of common problems especially in support of European policies.

Nevertheless, the Panel recommends a more systematic formulation of these objectives. While the Panel thinks that the variety of objectives is in principle useful, with the increasing scope, there might be an increasingly difficult trade-off between the different objectives (scientific and technological excellence, industrial competitiveness, broader socio-economic goals, contribution to European cohesion, SME participation). In addition, despite extensive consultation in the process of formulation of objectives, they are too general in some KAs. We recommend that a few specific and challenging targets are selected for each KA.

The ‚problem-solving approach‘ behind the KAs is considered to be useful and appropriate. However, its implementation has raised some problems:

The concepts of ‚European dimension‘ and ‚European added value‘ have to be further clarified and translated into programme objectives and corresponding project selection criteria. The Panel appreciates that efforts have been undertaken in some parts of the programme to specify the socio-economic objectives in a quantifiable and verifiable way. We recommend that this practice be spread to other parts, where possible. This would help overcome present difficulties in formulation and evaluation of project proposals.

In addition, some of the objectives are inherently difficult to assess or measure (especially those related to broader socio-economic goals and ‚European Added Value‘). First indications for FP5 (mainly in KA1) are that in fact the socio-economic objectives have not yet been sufficiently integrated into many projects [42]. More thorough research on ways to conceptualise these goals, on how to measure impact in terms of these objectives and on how to achieve better integration of these objectives into the RTD projects is worth undertaking. The Panel considers it important to have clear, realistic and measurable objectives. Only clear and verifiable objectives will allow a sound assessment of achievements and impacts.

One of the main objectives of the GROWTH programme is to strengthen the innovative behaviour and competitiveness of SMEs. Recent achievements in SME participation and satisfaction with the programme are recognised, but the objective remains very relevant, especially with the increasing importance of SMEs in recent economic development.

The objectives of the activities in the field of Standards, Measurements and Testing (SMT in FP4 and MT in FP5) have been appropriate to the objectives of the EU. These activities are essentially of a horizontal nature with inherently high European Added Value.

Transport systems RTD is also of very high European Added Value, as it is closely linked with the Common Transport Policy, and has substantial effects on welfare in all Member states. It aims at interoperable and intermodal Trans European Networks and Transport systems, the reduction of congestion and increase in safety.

3.2 Efficiency

3.2.1 General findings and Key Issues

The merger and re-organisation of activities under FP5 was not achieved without some disturbances and discontinuities, but most of the immediate management difficulties seem to have been resolved.

In terms of the *structure of the Programme*, it has brought about an increasing breadth of scope, less homogeneity (e.g. the specific character of KA2), more complexity (at all levels of implementation) and hence an increased need for co-ordination. This has increased the demands on Programme management and project officers considerably.

The need to create ad hoc committees among the national representatives (in particular for KA1) in order to improve things from the first to the second call in FP5 is indicative of the complications. Things now look better. The situation also improved after the decision of the Commission to organise an awareness campaign in the member states.

It seems that the connection and synergies between the KAs have remained limited so far. KA2 especially is different from the others. There are but few projects spanning over IMT and Transport and KA2 is working with its own ad hoc groups and networks. Also procedures differ across the KAs (e.g. rules for access to research results are handled differently in KA2 than in the rest). Given the differences in types of projects, time horizon of effects, management procedures, the complexities associated with the administration of such diverse Key Actions, and the need for integration of different technologies for the optimisation of Transport systems, the merger of all activities related to 'Sustainable Mobility' into a separate activity should be considered.

The present *organisation structure* of the GROWTH programme is complex, not easy to understand and has some drawbacks. More transparency based on job descriptions and management performance criteria should be established as an immediate answer. The organisation structure of FP4 (one responsible director for the Programme with an 'advisor') had advantages in comparison with the present structure in terms of clarity of responsibility and division of tasks and should be re-installed.

First experiences with the *External Advisory Groups* (EAGs) indicate that they play a positive role in formulating the content and in the distribution of funding, but their role and their relation with the Programme Committee needs further clarification. There should also be a system for a regular change of membership in the EAGs. In addition, the information exchange between EAGs and Programme Committees should be improved.

Against the background of increasing demands on the Commission's staff and the apparent decision of the Council not to devote more resources to the management of the Programme, there should be stronger efforts, where appropriate and efficient, to outsource or decentralise to national levels as much as possible of the administration and decision making. Besides increased efficiency it would also strengthen the feeling of being involved in the European research. E.g., the National Focal Points (NFPs) could be screened regarding their scope of current activities, using common criteria to evaluate their activities and their potential for taking over new activities.

Project management has become increasingly efficient and transparent, the combination of bottom-up of open calls and top-down of dedicated calls with accompanying measures has diversified the modes of action, and the participation of SMEs in projects is encouraged. Dedicated calls, Expressions of interest and pre-screening have proven to be useful tools for the management of Programmes and projects. Expressions of Interest are also a valuable source of bottom-up input of ideas.

In recent years the Commission's services have launched several concrete actions regarding proposal preparation to avoid vain efforts on the side of applicants:

- information campaigns to explain the objectives of the calls, participation rules and criteria;
- efforts to define the objectives and priorities in the workprogramme as precisely as possible;
- provision of a pre-proposal check service to potential participants.

All these actions are aimed at reducing the number of "out of scope" proposals.

The average success rate for IMT in FP4 was 28 percent. For the first call of the GROWTH programme in 1999, the success rate was 34 percent, higher than in the other FP5 thematic programmes, and higher than the average 28 percent for the FP4. The success rates varied substantially between Key Actions/Generic Activities from 21 percent for KA1 to 43 percent for KA4. Actions have been taken to improve the situation for KA1 by clarifying the objectives and priorities in the 2000 workprogramme. The success rate for SME specific measures is generally between 40 percent and 50 percent (even higher, e.g. 58 percent in 1998).

The pre-screening of proposals, introduced in the IMT programme during FP4 and continued in the GROWTH programme (FP5), is an action which proved its efficiency by helping proposers to meet the requirements of the programme. During this period, around 50 percent of proposals were pre-screened. This contributed to the increased success rate during FP4 and a reduction of the number of "out of scope" proposals which dropped from about 60 in 1995 to 15 in 1999.

While the introduction of a pre-screening process has helped to reduce the 'out-of-scope' proposals, it has not addressed the fundamental issue of 'poor' proposals not being rejected before a lot of work has been invested on them. However, the Panel recognises the difficulties of implementing a two-stage evaluation process recommended by previous panels as a remedy to this problem. An effective two stage process would, however, maintain a similar overall success rate but significantly reduce the workload for unsuccessful consortia, the evaluators and the Commission. More research should therefore be undertaken on the possibilities to develop an effective two-stage process.

With a view of increasing transparency, application procedures were changed, but these efforts have resulted in increasing complexities. This makes the application difficult – especially for SMEs. A greater clarity of calls and description of the targeted groups would facilitate the application procedure. The information packages have to be shortened and made more concise in order to be digestible for SMEs. Application forms should be shortened. Administration forms should, at minimum, be reduced at least to previous levels.

Proposal evaluation procedures have been improved and fairly well harmonised. The technical and economic *assessment of proposals* by the external evaluators is seen as rigorous, fair and in the first call for FP5 also as quick. The evaluation process and the quality of the evaluators are important issues in the management of the programme, and a priority effort should be devoted to the acquisition of best evaluators through an early planning of the evaluation period, as well as by a non-bureaucratic procedure. As a general rule, the Panel recommends to increase the share of evaluators from business and industry to 30-50 percent.

Previous project assessments have clearly shown that the clarity of project objectives is critical for success. Proposal evaluation procedures now place sufficient emphasis on this aspect.

The *procedures concerning contracts* have been improved from FP3 to FP4, but there were some problems at the transition to FP5. The delay between the end of negotiation and the effective signature of the contract can be further reduced, provided the Commission undertakes to alter long established rules. To reduce delay the Panel suggests that the Commission delegates the responsibility of project selection to the DGs.

Proposals, which have reached final contract negotiation, should be allowed to start at the risk of the consortium while the formal approval process continues. This is normal practice in industry.

Although many of the recommendations stemming from the various monitoring, assessment and evaluation exercises have been taken up there is a lack of *coherent mechanisms for monitoring and follow-up of the implementation of recommendations* stemming from the various monitoring, assessment and evaluation exercises. Where recommendations were not taken up it is partly due to the fact that they often are addressed at the same time to the Council, the Commission, the DG and the Programme Management. At the level of the Commission and the DGs some recommendations

were followed, others not. Most recommendations were taken on board at the level of the Programme Management.

A follow-up report to the 5 year assessments, explaining the degree and basis of acceptance or rejection of recommendations by relevant body, would improve transparency and performance.

The *reporting system for projects* is perceived by participants to be very extensive. This project reporting system should be simplified by requiring shorter reports targeted to planned vs. actual achievements in terms of time, cost, quality and risk of the project. Formal reporting should be complemented by more frequent contact with the Commission's project officer.

It is suggested that the Commission should undertake a study comparing in each key action the ideal minimum timing per phase (preparation, launch, ex ante evaluation, time to signature), the real average time per phase, the number of contracts monitored per project officer. Based on such findings, the Commission should monitor and publish regularly these indicators per call and Programme.

3.2.2 IMT Specific Issues

Many of the Evaluation and Impact Assessment Reports have been very useful and of good quality. BRITE-EURAM/IMT were the first Programmes to look systematically into the assessment of impacts. Five years ago impact assessment was also started in SMT and is now being applied to Transport Systems RTD projects as well. It seems important to diffuse the lessons learned, and to spread these 'best practices' to all thematic programmes.

'Exploratory awards' and CRAFT have turned out to be very effective instruments to improve the innovative behaviour of SMEs. On the other hand, these instruments have increased the workload of the Commission's services considerably. In order to increase efficiency and to maintain the capacity to attract new SMEs, advantages and disadvantages of alternative management structures have to be systematically studied (outsourcing, involvement of NFPs, etc.)

3.2.3 SMT Specific Issues

Project management has become increasingly efficient and transparent, the modes of action have diversified by combining the bottom-up of open calls and top-down of dedicated calls as well as accompanying measures. The introduction of 'Expression of Interest' should prove a valuable source of bottom-up input of ideas and should be spread to other parts of the Programme.

3.2.4 Transport Systems Specific Issues

The optimisation of Transport systems needs the integration of different technologies (materials, concepts, production, energy, telematics, etc.) as well as organisational and political framework conditions. A merger of all activities related to 'Sustainable Mobility' could be appropriate to simplify the co-ordination inside the Commission.

In Transport systems RTD, two External Advisory Groups are already in existence. Their real influence will be apparent later and should be monitored carefully. Lessons learnt should be implemented in all other areas.

3.3 Effectiveness

3.3.1 General findings and Key Issues

Previous assessments have consistently found that the overall quality of the technical and scientific work is high throughout the Programme, the Panel believes that it is very important to maintain this status.

The ‚problem-oriented approach‘ adopted by FP5 is appreciated by the Panel as a means to effectively target common European problems, However there is a perception in industry that this has been at the expense of their involvement in the formulation of the programme.

The impact of many projects could be further increased by a greater involvement of users of the research, particularly in Transport systems and SMT/MT. Involvement of relevant users or user-groups must be actively sought, e.g. through demonstration projects and thematic networks. This would enhance the ‚problem-oriented approach‘.

As the FPs have developed there has been a tendency towards more applied and less risky RTD projects (see e.g. the findings for BRITE-EURAM/IMT in chapter 3.3.2). In the long run, the maintenance of strong basic research serving industry is of utmost importance if Europe is to compete with the rest of the world. There needs to be a better balance between applied and basic research, and between ‚technological breakthrough‘ projects and ‚incremental innovation‘ projects. This suggestion refers to ‚oriented basic research‘ (i.e. basic research addressed to identified problems) and not to curiosity driven basic research.

One way of doing this may be special calls, incorporating different requirements and evaluation criteria for high profile, high risk projects with potentially high rewards. If more risky projects are included then failure must be an acceptable outcome and there must be a robust way of early identification of projects that are failing and of killing them.

In the light of RTD projects within GROWTH having become more applied, the role for EUREKA must be re-defined [see also 40].

There is a need to be more flexible in the size of consortia, enabling smaller (2-5 partners) and larger (10+ partners), depending on the nature, importance and speciality of each particular project. Although in reality this flexibility is already perfectly possible, perceptions among applicants seem to be that the most successful proposals are those of consortia of intermediate size and wide geographic coverage irrespective of whether the subject demands this size or spread.

Another factor limiting potential impacts is the average funding of many projects in IMT: the average size per project and per participant is too low to allow for high expectations. The average funding in these small projects is roughly the equivalent of one person-year per participant (e.g. latest available figures show that for FP5 the average funding per partner per year is 136KEURO for RTD, 16KEURO for Craft and 53KEURO for thematic networks). The Panel believes that more attention should be devoted to the appropriate critical size of projects in the proposal evaluation process.

On the other hand, if competitors collaborate in a project, this could also have detrimental effects on the product markets, reducing competition and helping to create oligopolistic market structures. This might happen especially with the very large projects that are more applied and led by large enterprises and where the market is already concentrated. The Panel recommends that in cases of such projects an ex-ante cost-benefit evaluation of the effects (including those on market structure) should be undertaken.

There is increased emphasis on the valorisation of results under FP5 (one of the prime objectives) through the new schemes (the technology implementation plans in the projects, the establishment of the Innovation Cell in the Programme, the support of patents). GROWTH is probably among the

programmes most successfully linking to INNOVATION. This increased emphasis is considered positive but the synergies are not yet obvious. More emphasis and work is needed.

There is a need to better co-ordinate other policy instruments outside the FPs with the objectives of the RTD projects. For example, public procurement can generate innovation by 'market pull', by demanding performances beyond the available state-of-the-art. Besides the financing of innovation, this would also lead to product validation. In that sense possibilities for the combination of public calls for tenders by national authorities combined with specific R&D content have to be carefully studied. The case of Transport systems may be a good case study.

In general, the *dissemination of the results* of the RTD projects has been improved, but according to the mid-term monitoring report, a more specific dissemination should be organised towards different categories of users. The Panel acknowledges a good infrastructure (CORDIS, ELTIS) exists, making public domain information easily accessible to interested parties but the challenge of better exploitation of proprietary results remains, and it would contribute highly to European competitiveness if new ways in this direction could be found.

3.3.2 IMT Specific Issues

External evaluations and Impact assessments of finished projects in BRITE-EURAM/IMT and CRAFT in FP3 and FP4 describe the Programme as being quite effective. Most performance indicators show improvements in FP4 as compared to FP3 [see e.g. 7, 36]. The Panel endorses these findings, yet raises one serious policy issue for the future:

There has been a shift in the project portfolio in BRITE-EURAM/IMT from FP3 to FP4, which apparently continued in FP5 towards more market-oriented, more applied, and less risky projects. The share of projects achieving 'technological breakthroughs' has declined, the share of projects resulting in incremental innovation has risen. This raises questions about effectiveness as well as additionality. Research is by definition a risky process and from a risky process one would expect a different distribution, i.e.: a higher share of technical failures, balanced with a higher share of spectacular successes.

The share of projects producing technologies that might be used across a number of industrial sectors ('generic technologies') went down from FP3 to FP4. There was also a lower share of projects recording upgraded R&D personnel abilities. These point to a lower degree of 'technological learning' associated with FP4 projects.

FP3 helped to initiate co-operation and networking in the European Aerospace industry. FP4 led to an improved competitiveness and further contributed to the cohesion goals. FP5 has gained increased significance for European Aerospace RTD due to the establishment of the Key Action and the size of its budget, which was considerably increased. After initial reservations, the Aerospace industry recognised the possibilities of the Key Action, and now strongly supports it.

At present, the rules discourage the participation of larger enterprises in CRAFT consortia. Their inclusion was a novelty introduced in FP3 and was particularly helpful in linking value chains and promoting interaction between different types of enterprises. The termination of large companies' participation is judged by the Panel as a point likely to reduce effectiveness. It is recommended that the rules be changed accordingly, thus facilitating real user-producer interaction.

3.3.3 SMT Specific Issues

Activities on Standards, Measurements and Testing have seen various changes in the FPs. While it was a specific programme in FP3 and FP4, some of the activities have now been devolved into several programmes of FP5. Given the specific needs and the horizontal character of measurement and testing, the Panel recommends the re-instatement of SMT as an independent, co-ordinating SP.

Among the standardising bodies, CEN and increasingly CENELEC are well served, while other bodies like ETSI, but also scientific or industrial bodies, should be more involved.

The SMT and MT activities are fulfilling an important role, but these activities are not yet sufficiently recognised in industrial and scientific communities. Outside the SMT community there is insufficient awareness of the activities and of the necessity of metrologically traceable results. There is also insufficient national infrastructure for the exploitation and application of SMT results. Actions to address these awareness and infrastructure problems should be considered.

The encouragement and selection of SMT projects achieving critical mass and clustering of projects should be intensified. Help to SMEs in formulating project proposals is important as shown in the MOTOR project [37].

3.3.4 Transport Systems Specific Issues

The effectiveness of the Transport systems RTD programme has been good in air, rail, road and waterborne transport and it remains of high relevance in the various fields of Transport systems. The Programme produced a variety of different outputs such as contributions to policy papers, tools for policy makers, exchange of good practice guidelines, promotion of the Trans European Networks, traffic management systems, application and integration of new information and communication technologies, experiments and demonstrations etc. These outputs have laid the basis for substantial improvements in the various fields of Transport systems.

Though there have been significant improvements from FP3 to FP4 the impact of many projects could have been even further improved by higher involvement of users, and closer co-operation between the Commission and Member States. This would also improve the dissemination of results.

The transfer of scientific/technical improvements into Transport means (vehicles, aeroplanes etc.) is comparable to other IMT-areas, whereas the transfer of system improvements (infrastructure, organisations etc.) into reality is often significantly more time consuming (many actors, lack of financial resources, political and legal barriers etc.). A time period of 5 years is therefore rather short for a comprehensive assessment of Key Action 2 and its impacts.

With respect to the key problem areas of land and air Transport systems (congestion, emissions, energy consumption, safety), all other barriers for the implementation of the results (legal, organisational, political) have to be removed to reap the full benefits of Transport systems RTD.

To find fundamental solutions for these problems is a challenge for all responsible actors in Europe. This is especially to be seen with respect to the goal of intermodality of Transport systems, where several of the above mentioned barriers still prevent success.

3.3.5 Support for Research Infrastructures

Measures to improve the utilisation and quality of European research infrastructures have come into focus in FP5. In Growth, the support of infrastructure in FP5 is more relevant and focused through the Expressions of interest and dedicated call mechanisms. The Panel supports these changes, which are intended to strengthen the infrastructure and the competitiveness of European research. The Panel recommends, however, a follow-up to ensure that the intentions are fulfilled. So far, the impact seems to be limited due to the modest size of the budget and insufficient awareness among researchers. It is recommended to raise awareness for this activity and increase the budget, if necessary.

3.4 Achievements

3.4.1 General findings and Key Issues

European collaboration in RTD has been further enhanced by the FPs, as can be seen by the sustained effects of networking in RTD in Europe. These effects continue to be one of the most important outcomes of the Programmes.

3.4.2 IMT Specific Issues

BRITE-EURAM has been a very innovative and sound programme in terms of programme/project management. E.g., it was the first to introduce CRAFT and Exploratory awards. Also, in BRITE-EURAM/IMT the most systematic evaluation mechanism have been developed, from which the other FP5 programmes can learn a lot. These 'best practices' should be disseminated as much as possible across the FP.

In IMT, examples of specific project successes include:

- Non destructive X-ray testing of welds in real time
- New filters for filtration and separation in the biotechnology and food industries
- Development of Physical Vapour Deposition process for the hardening of machine tools
- Development of inexpensive techniques for recovering polluting metals from flue emissions of steelmaking
- Development of software to monitor the state of health of mobile machinery, such as in open cast mines
- Development of safer alternatives to asbestos for gaskets
- Development of jet printing techniques for the textile industry

Among the technological achievements in the automotive industry, progress has been made towards the use of batteries in electric cars (benchmarking of all existing battery concepts, further development for use in normal vehicles). Also, with respect to the development of 'Low weight vehicles', many results were obtained.

3.4.3 SMT Specific Issues

SMT and MT have become a major factor in metrology both on the European and global scene, especially in the production of CRMs [14]. The Programmes also have been successful in achieving an increased involvement of SMEs in the projects.

Encouraging achievements have been made in outlining the infrastructure of chemical and biological metrology (Metrology in Chemistry and Biology [15]; Metrology in chemistry [16]).

Also the mutual acceptance of calibration certificates between EUROMET and NIST is a substantial achievement.

The collaboration with the International Olympic Committee on the Harmonisation of methods and measurements in the Fight against Doping [HARDOP, 17] is a breakthrough that could be followed up.

The production of CRMs is an effective way of monitoring and raising the measuring capability of selected laboratories in the Member States.

Dedicated calls, Expression of Interest and pre-screening of project proposals have turned out to be useful tools.

3.4.4 Transport Systems Specific Issues

In Transport systems RTD, a number of substantial policy relevant achievements and technological developments have been realised:

- The Air Transport Management System in Europe
- The Waterborne Transport Information and Safety System
- The European Rail Traffic Management System whose first deployments are being implemented in the United Kingdom and the Netherlands
- The advanced European crash test dummy and the EURO NCAP to improve road safety
- The Maritime Black Box will allow a reliable investigation of maritime accidents
- The development of Quality Indicators and Standards on public Transport tendering
- The preparation of an operational platform for the validation of the VTMS (Vessel Traffic Management Systems) components
- The knowledge obtained on external Transport costs and the new concepts developed for their internalisation.

3.5 Lessons learned

Several main lessons can be learned regarding the operation of the programmes: design, decision and implementation, up-take of recommendations of previous monitoring and assessment exercises, and good practices to be disseminated:

- The ‚problem-solving approach‘ adopted in FP5 is considered as useful and appropriate. However its implementation has raised the problems described previously. Especially the guiding concepts of the ‚European Dimension‘ and the ‚European Added Value‘ have to be further clarified, and broader socio-economic objectives have to be made more operational.
- Dedicated calls, Expressions of interest and pre-screening have proven to be useful tools for the implementation of Programmes. Expressions of Interest are also a valuable source of bottom-up input of ideas.
- The establishment of the External Advisory Groups has proven to be useful. Their composition (Knowledge Producers, Knowledge Users and End Users) will facilitate the proper targeting of the research activities towards real needs, and ease the utilisation of results. EAGs should also be set up for the activities outside the Key Actions. In GROWTH, the business sector is better represented than in other areas, but there should be more representatives of users, particularly for the second Key Action: Sustainable Mobility and Intermodality.

From assessing the quality of previous reports, lessons can be learned for future monitoring assessment and evaluation procedures:

- Although a lot of the recommendations have been taken up, there is a lack of *coherent mechanisms for monitoring and follow-up of the implementation of recommendations* stemming from the various monitoring, assessment and evaluation exercises. This is partly due to the fact that recommendations often are addressed at the same time to the Council, the Commission, the DG and the Programme Management. At the level of the Commission and the DGs some recommendations were followed, others not. Most recommendations were taken on board at the level of the Programme Management. A follow-up report to the 5 year assessments, explaining the degree and basis of acceptance or rejection of recommendations by the relevant body, would improve transparency and performance.
- Many of the Evaluation and Impact Assessment Reports have been very useful and of good quality. Also other innovations (e.g. the 'Expressions of Interest') ought to be spread as 'best practices' to all thematic programmes.

4 Recommendations

This chapter is structured in the following way: Recommendations are presented concerning the objectives (recommendations regarding the choice and formulation of objectives), the efficiency (recommendations for the improvement of the management of the programme) and the effectiveness of the Programme (recommendations to increase the impacts of the programme). Sub-headings indicate the (main) addressee for the recommendation, although sometimes more than one institution is concerned. Recommendations that the Panel feels are especially important are highlighted.

4.1 Recommendations related to the objectives of the Programme

Recommendations addressed to the Council

- 1) The objectives of the GROWTH Programme are highly relevant and should be maintained, but the Panel recommends a more systematic formulation of these objectives. Despite extensive consultation in the process of the formulation of objectives, these are too general in some KAs. We recommend that a few specific and challenging targets are selected for each KA.

The concepts of 'European dimension' and 'European added value' have to be further clarified and translated into programme objectives and corresponding project selection criteria. The Panel appreciates that efforts have been undertaken in some parts of the programme to specify the socio-economic objectives in a quantifiable and verifiable way. It recommends this practice to be spread to other parts, where possible. This would help overcome present difficulties in formulation and evaluation of project proposals. In the view of the Panel, this is a point of major importance.

- 2) There needs to be a better balance between applied and basic research, and between 'technological breakthrough' projects and 'incremental innovation' projects. One way of doing this may be special calls, incorporating different requirements and evaluation criteria for high profile, high risk projects with potentially high rewards. In this context, project failure (for risky projects) must be considered acceptable, however mechanisms must be put in place for early identification, assessment and closure of failing projects. Also the complementarity with EUREKA must be re-defined accordingly. In the view of the Panel, this is a point of major importance.
- 3) There is in many cases a need to better co-ordinate other policy instruments outside the FPs with the objectives of the RTD projects (e.g. in Transport systems).

4.2 Recommendations related to efficiency of management

4.2.1 Recommendations addressed to the Council

- 4) Given the specific needs and the horizontal character of measurement and testing, the Panel recommends the instatement of SMT as an independent, co-ordinating SP with a larger budget. In the view of the Panel, this is a point of major importance.
- 5) The optimisation of Transport systems needs the integration of different technologies (materials, concepts, production, energy, telematics, etc.) as well as organisational and political framework conditions. A merger of all activities related to 'Sustainable Mobility' could be appropriate to

simplify the co-ordination inside the Commission. In the view of the Panel, this is a point of major importance.

- 6) Given the resource constraints on the side of the Commission, there should be, where appropriate and efficient, stronger efforts to outsource or to decentralise to national level more administration and decision making. Advantages and disadvantages of alternative management structures have to be systematically studied (e.g. outsourcing, involvement of NFPs, etc.)

4.2.2 Recommendations addressed to the Commission

- 7) The organisation structure of FP4 (a single director responsible for the Programme with an ,advisor') had advantages in comparison to the present structure in terms of clarity of responsibility and division of tasks and should be re-installed. In Programme management, more transparency based on job descriptions and management performance criteria should be established. In the view of the Panel, this is a point of major importance.
- 8) The introduction of the EAGs is judged positively, but the roles of and relations between the EAGs and the Programme Committees needs further clarification. In addition, the information exchange between EAGs and Programme Committees should be improved There should also be a system for regular change of membership in the EAGs.
- 9) The development of an effective two stage proposal process should be reinvestigated, not with the aim of improving the overall success rate but of weeding out unsuccessful proposals before significant amounts of effort are expended.
- 10) We recommend the streamlining of the process leading to finalisation of the contract:
 - The delay between the end of negotiation and the effective signature of the contract should be further reduced. To reduce delay the Panel suggests that the Commission delegates the responsibility of contracting to the DGs.
 - Proposals which have reached the final contract negotiation should be allowed to start at the risk of the consortium while formal approval process continues.
 - It is suggested that the Commission should undertake a study comparing in each key action the ideal minimum timing per phase (preparation, launch, ex ante evaluation, time to signature), the real average time per phase, the number of contracts monitored per project officer. Based on such findings, the Commission should regularly monitor and publish these indicators per call and Programme (in time and deviation from optimum).

In the view of the Panel, this is a point of major importance.

- 11) A systematic process leading to a follow-up report to all monitoring and assessment panels, explaining the degree and basis of acceptance or rejection of recommendations by the relevant bodies, would improve transparency and performance of up-take of recommendations.
- 12) BRITE-EURAM has been a very innovative and sound programme in terms of programme and project management. E.g., it was the first to introduce CRAFT and Exploratory awards, the most systematic evaluation mechanism have been developed, Expressions of Interest have proved to be a valuable source of bottom-up input of ideas. These best practices should be disseminated as much as possible to other parts of the Programme and across the FP. In the view of the Panel, this is a point of major importance.

4.2.3 Recommendations addressed to the Management of the GROWTH Programme

- 13) A priority effort should be devoted to the acquisition of the best evaluators, through an early planning of the evaluation period and by allocating more time and resources to the selection of evaluators and proposals. As a general rule, the Panel recommends to increase the share of evaluators from business and industry to 30-50 percent.

- 14) Streamlining of application procedures is recommended at all levels: A greater clarity of calls and description of the targeted groups would facilitate the application procedure. The information packages have to be shortened and made more concise in order to be digestible for SMEs. Application forms should be shortened. Administration forms should, at minimum, be reduced at least to previous levels. The efforts to help SMEs with project proposals by information, courses, screenings and economic support could be intensified. The project reporting requirements should be simplified by requiring shorter reports targeted to planned vs. actual achievements in terms of time, cost, quality and risk of the project. In the view of the Panel, this is a point of major importance.

4.3 Recommendations related to the effectiveness of the Programme

4.3.1 Recommendations addressed to the Council

- 15) The possibility of using public procurement at the European level should be carefully studied. Public procurement can generate innovation by demanding performances beyond the state-of-the-art. In order to increase the effectiveness of the Programmes it is recommended that opportunities be given to combine public calls for tenders by national authorities with specific RTD contents. Transport could be a good case in this direction. In the view of the Panel, this is a point of major importance.

4.3.2 Recommendations addressed to the Commission

- 16) The results of the projects must be more widely disseminated. E.g. in SMT, it should be required to have an effective dissemination plan to user groups outside the SMT community as part of the proposal. Encouragement by presentations, general publications and meetings, training courses, contact with large companies and electronic networks could reinforce such active dissemination. The impact of many Transport systems RTD projects could be further improved if higher involvement of users is assured, and closer co-operation between the Commission and Member States to improve the dissemination of results is achieved. In the view of the Panel, this is a point of major importance.
- 17) Despite the Council decision to limit CRAFT to SMEs only, we recommend that one large company (customer or supplier of the SMEs) per consortium be allowed, thus facilitating interaction within the supply chain.

4.3.3 Recommendations addressed to the Management of the GROWTH Programme

- 18) The quality of the technical and scientific work is high throughout the Programme and it is very important to maintain this status.
- 19) More attention should be devoted to the appropriate critical size of projects in the proposal evaluation process. In SMT, the search for projects achieving critical mass and clustering of projects should be intensified.
- 20) The awareness for support of infrastructure in FP5 should be raised. In parallel the objectives and evaluation criteria should be clarified. The Panel also recommends that the measure be followed up to ensure that the intentions are fulfilled.

5 References and Annexes

5.1 References

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5.2 Statistical Annex³

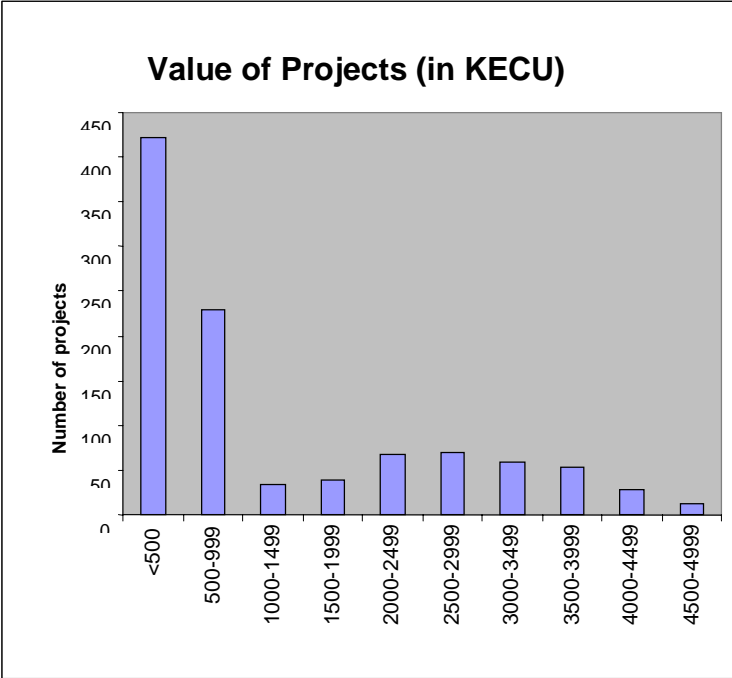
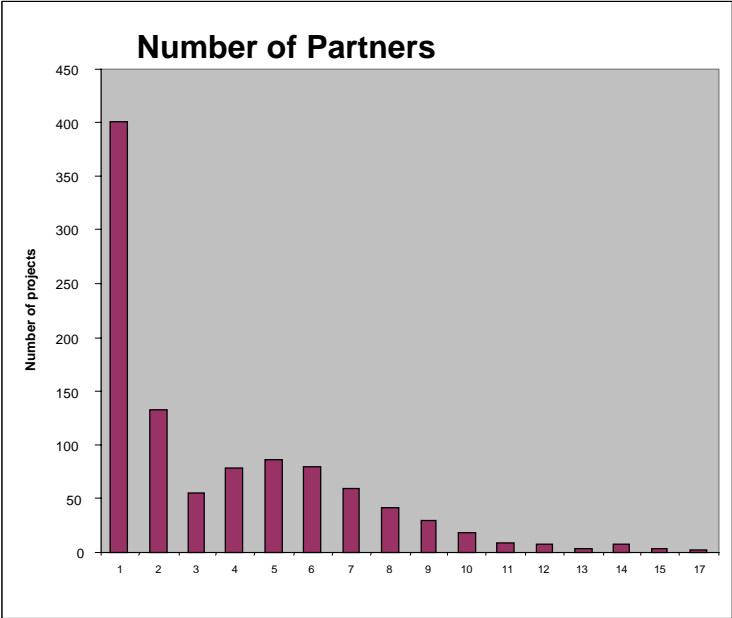
Framework Programme 3 (1990-1994): Main Figures

Programme	Number of proposals	Number of projects	Number of Patents (*)	Number of Publications (*)
BRITE-EURAM II	2383	454	246	3621
CRAFT Step1 (Brite-Euram)	885	390		
CRAFT Step2 (Brite-Euram)	323	171		
MAT1 (SMT 3)	963	201		147
CRAFT (SMT 3)	0	0		
Transport (DG VII/E)	0	0		

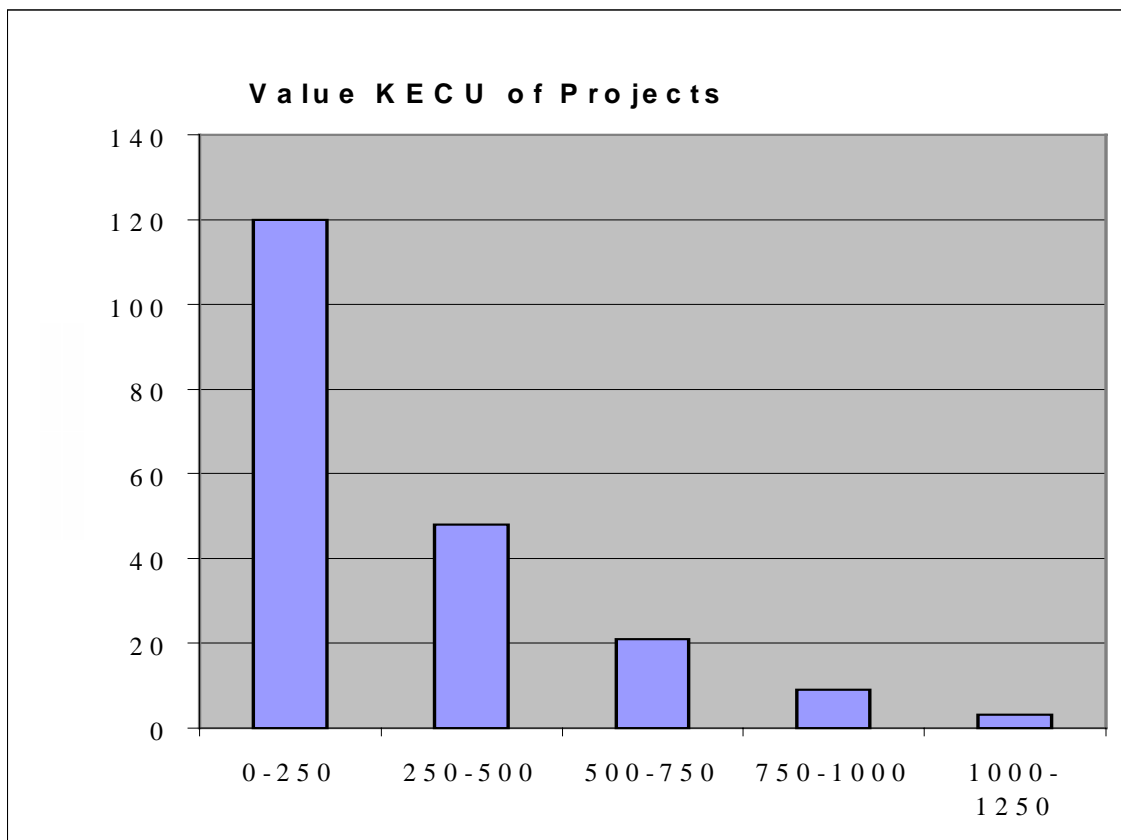
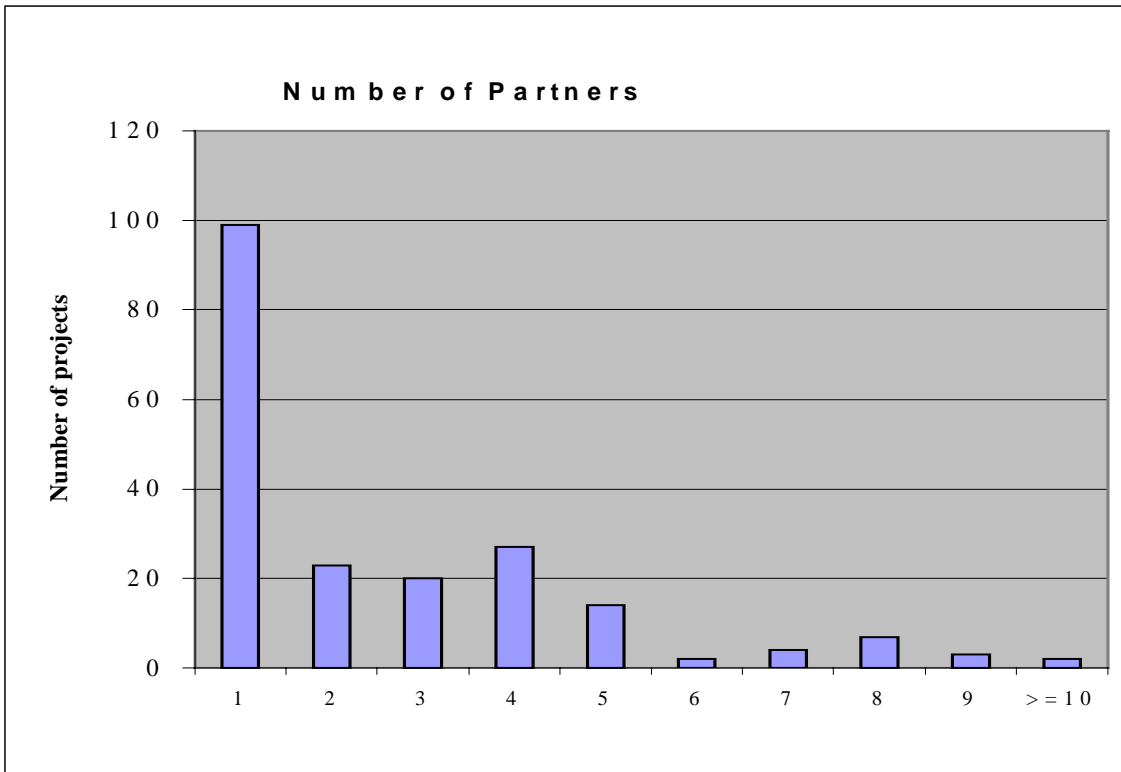
(*) Not exhaustive, based on information provided by projects' participants.

³ Source for all statistics presented below is the European Commission

FP3 IMT: General Characteristics of Projects



FP3 SMT: General Characteristics of Projects

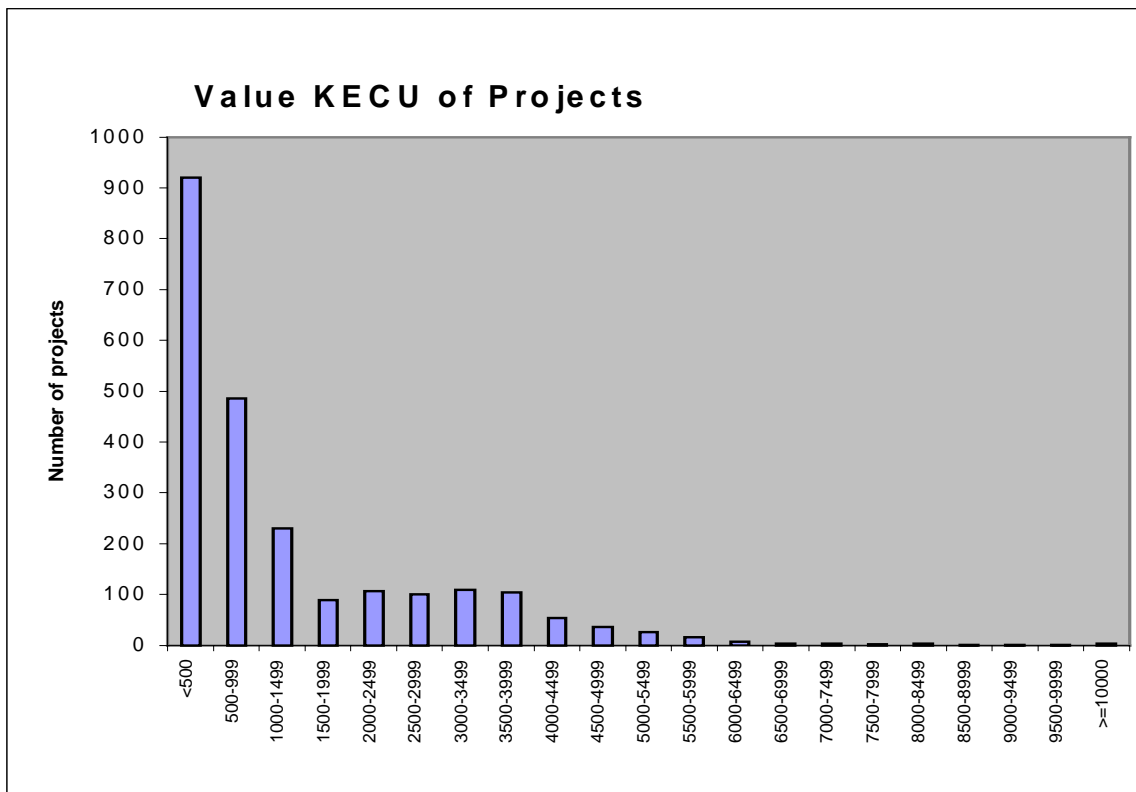
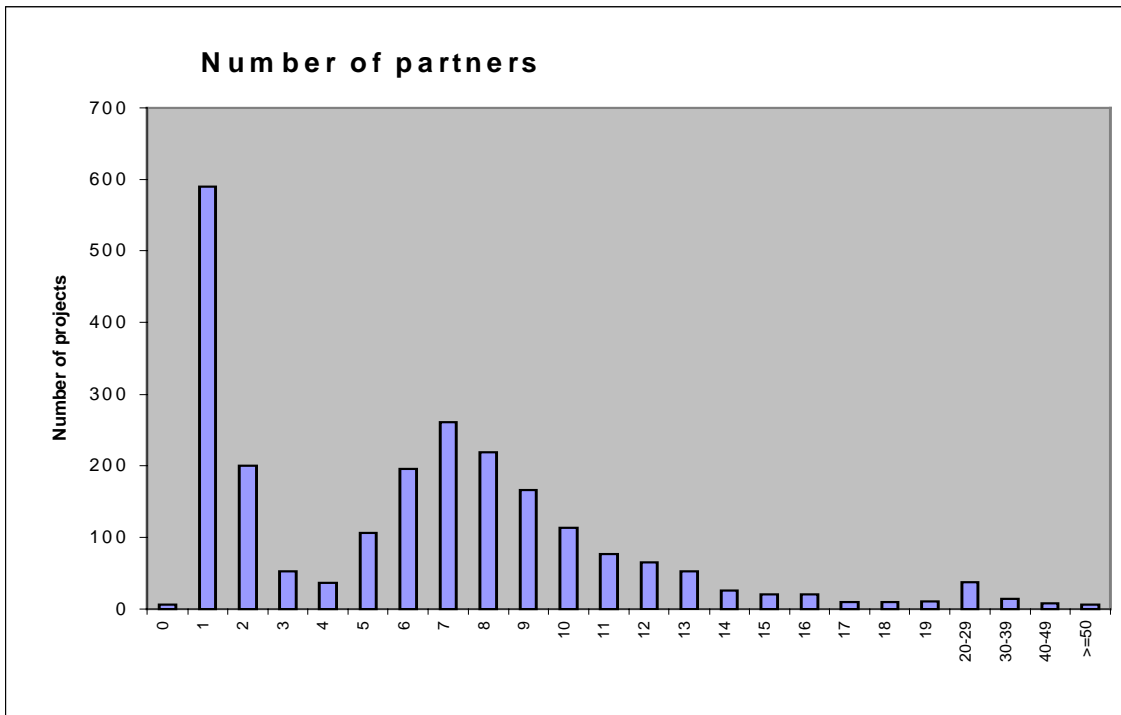


Framework Programme 4 (1994-1998): Main figures

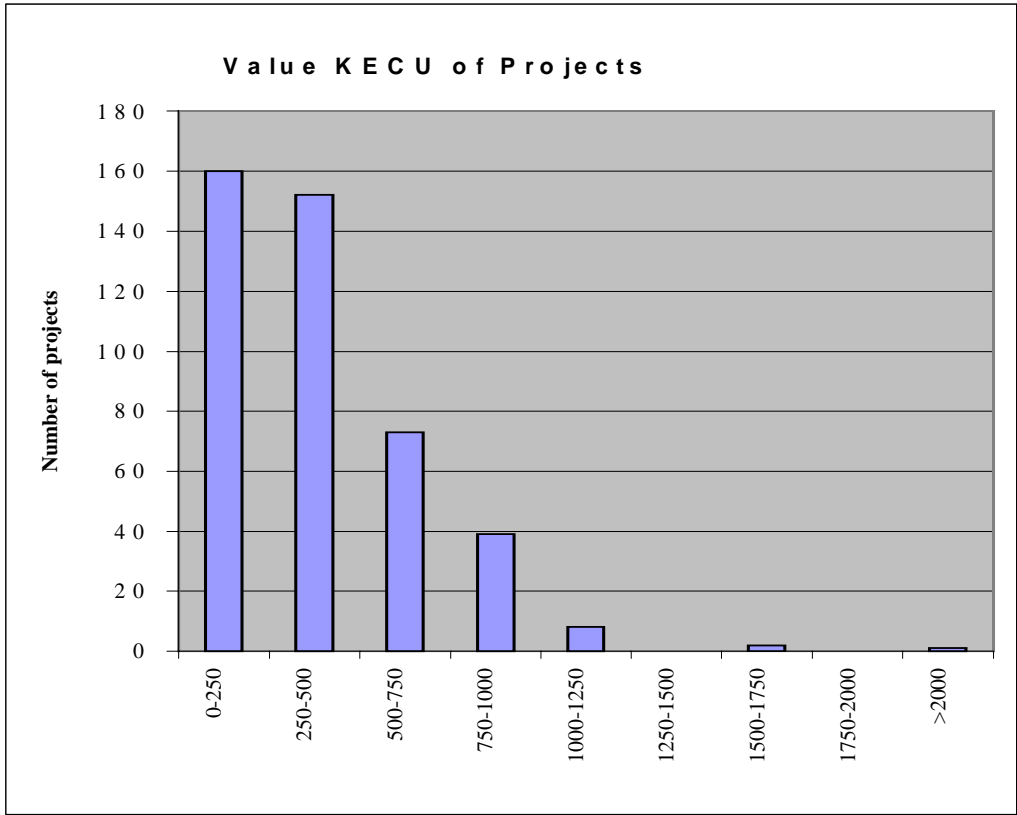
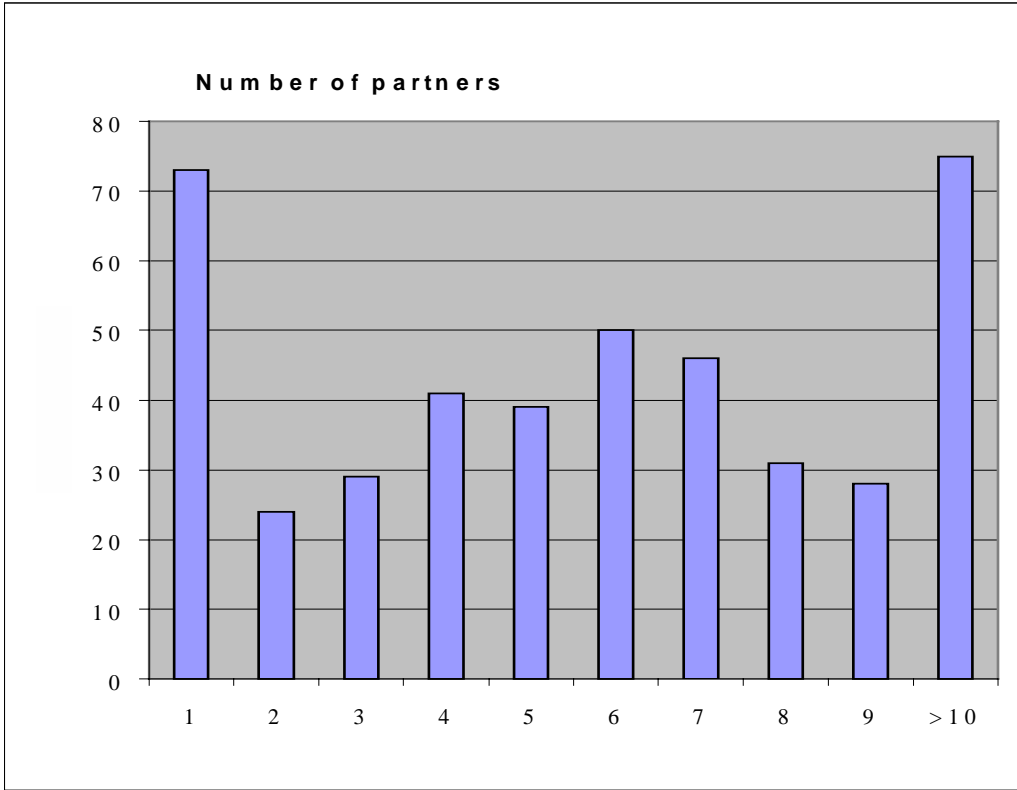
Programme	Year	Number of proposals	Number of selected projects	EC Budget (Ml)	Number of Patents (*)	Number of Publications (*)
IMT (Brite-Euram III)						
Shared-cost projects	1995	1.180	211	405,89		
	1996	940	243	395,46		
	1997	1.142	359	542,00		
	1998	31	13	39,33		
<i>Sub-Total</i>		<i>3.293</i>	<i>826</i>	<i>1.382,68</i>		
CRAFT step 1 projects	1995	466	211	7,55		
	1996	413	211	7,67		
	1997	613	316	12,85		
	1998	0	0	0,00		
<i>Sub-Total</i>		<i>1.492</i>	<i>738</i>	<i>28,07</i>		
CRAFT step 2 projects	1995	118	49	19,10		
	1996	145	62	25,78		
	1997	227	110	45,25		
	1998	670	292	113,79		
<i>Sub-Total</i>		<i>1.160</i>	<i>513</i>	<i>203,92</i>		
Thematic Networks	1995	42	25	0,78		
	1996	106	77	25,65		
	1997	156	89	40,60		
	1998	114	31	21,73		
<i>Sub-Total</i>		<i>418</i>	<i>197</i>	<i>88,76</i>		
TOTAL IMT		5.203	1.761	1.499,50		
SMT 4						
Shared-cost projects	1995	1.071	49	31,85		
	1996	129	100	48,05		
	1997	321	66	32,78		
	1998	0	70	30,09		
<i>Sub-Total</i>		<i>1.521</i>	<i>285</i>	<i>142,77</i>		
CRAFT step 1 projects	1995	34	6	0,25		
	1996	43	12	0,46		
	1997	70	44	1,69		
	1998	0	0	0,00		
<i>Sub-Total</i>		<i>147</i>	<i>62</i>	<i>2,40</i>		
CRAFT step 2 projects	1995	2	0	0,00		
	1996	6	4	1,27		
	1997	33	4	1,18		
	1998	63	27	9,41		
<i>Sub-Total</i>		<i>104</i>	<i>35</i>	<i>11,86</i>		
Thematic Networks	1995	31	7	0,88		
	1996	28	14	0,91		
	1997	43	17	2,15		
	1998	0	11	2,51		
<i>Sub-Total</i>		<i>102</i>	<i>49</i>	<i>6,45</i>		
TOTAL SMT		1.874	431	163,48		
Transport (DG VII)						
Shared-cost projects	1995	333	97	117,02		1.358
	1996	225	71	51,20		994
	1997	284	76	59,65		1.064
	1998	100	25	12,07		350
<i>Sub-Total</i>		<i>942</i>	<i>269</i>	<i>239,94</i>		<i>3.766</i>
CRAFT step 1 projects	1995-1998	0	0	0,00		
CRAFT step 2 projects	1995-1998	0	0	0,00		
TOTAL Transport		942	269	239,94		

(*) Not exhaustive. Based on information provided by projects' participants.

FP4 IMT: CHARACTERISTICS OF PROJECTS



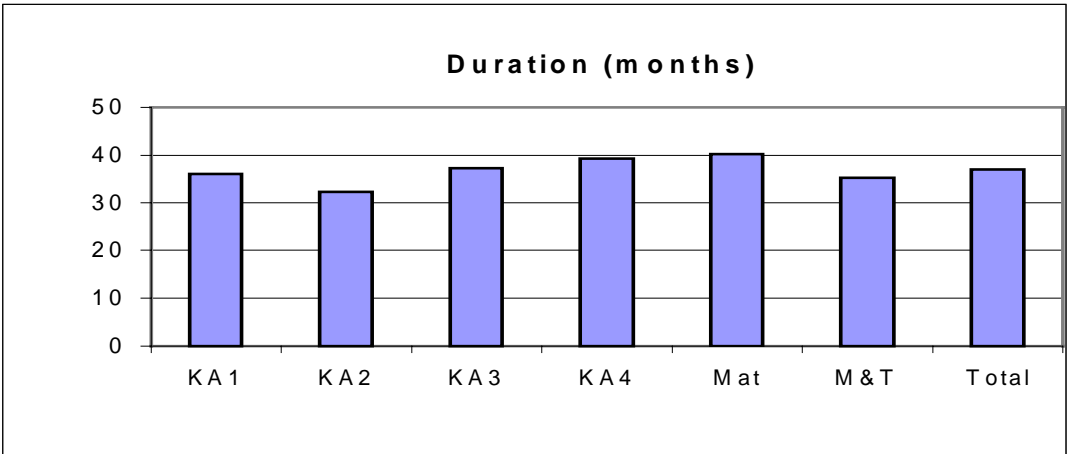
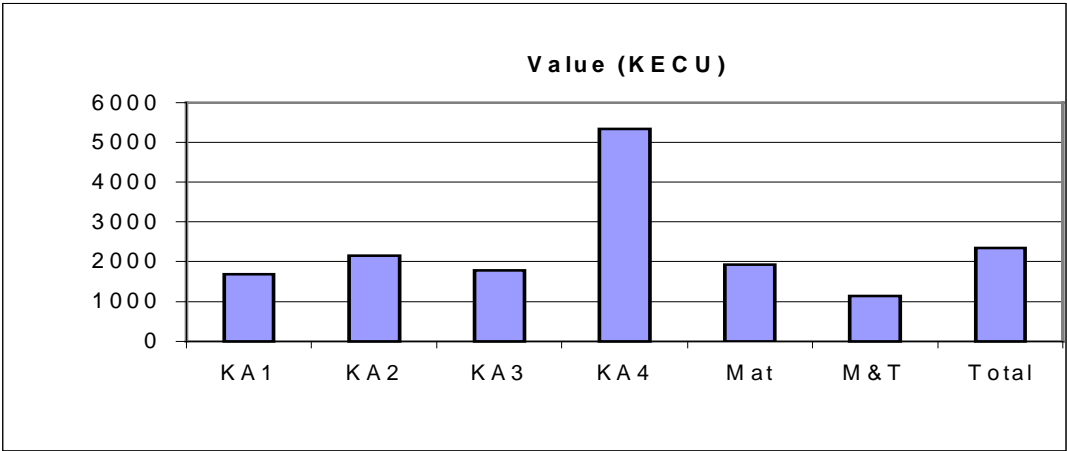
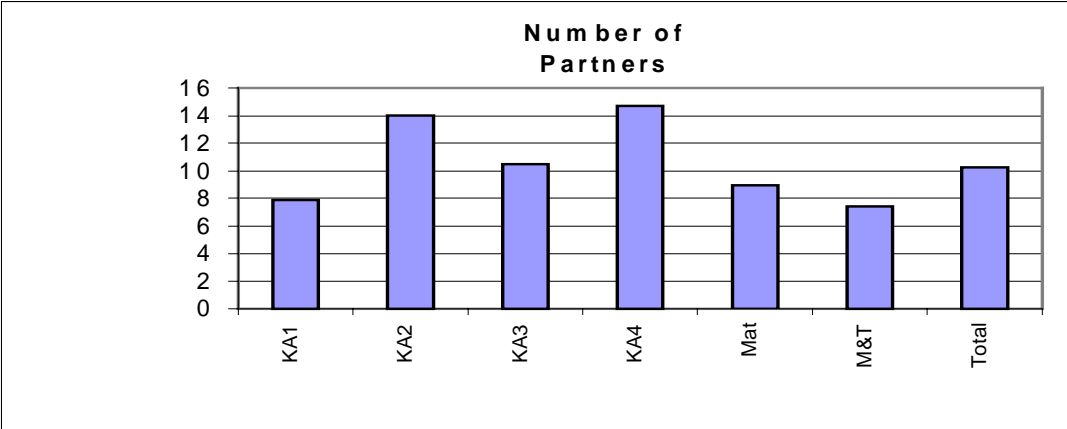
FP4 SMT: CHARACTERISTICS OF PROJECTS



Framework Programme 5 (1998-2002): Main figures of first calls

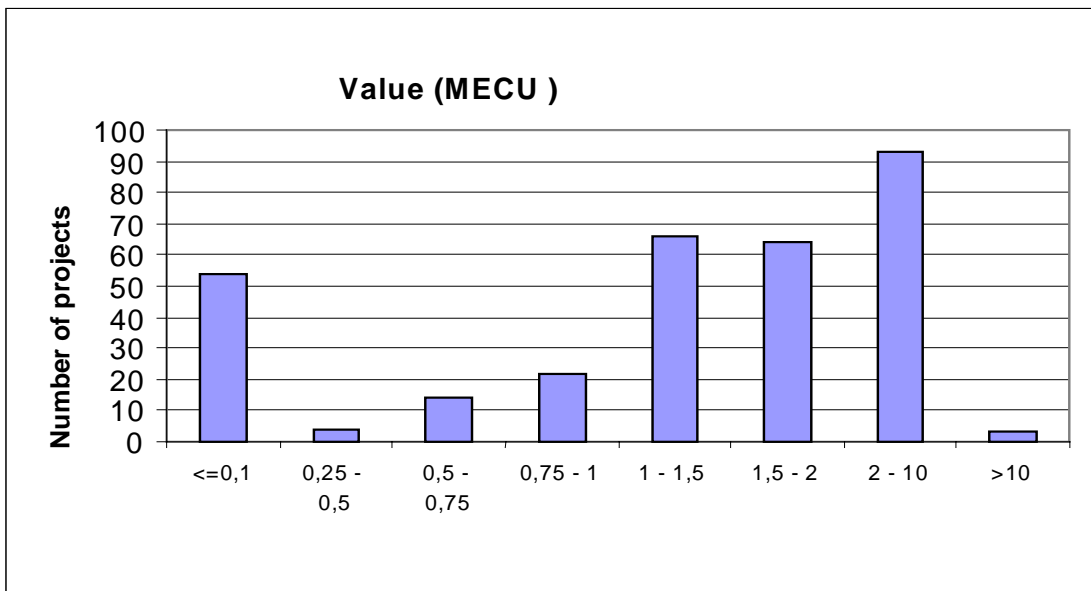
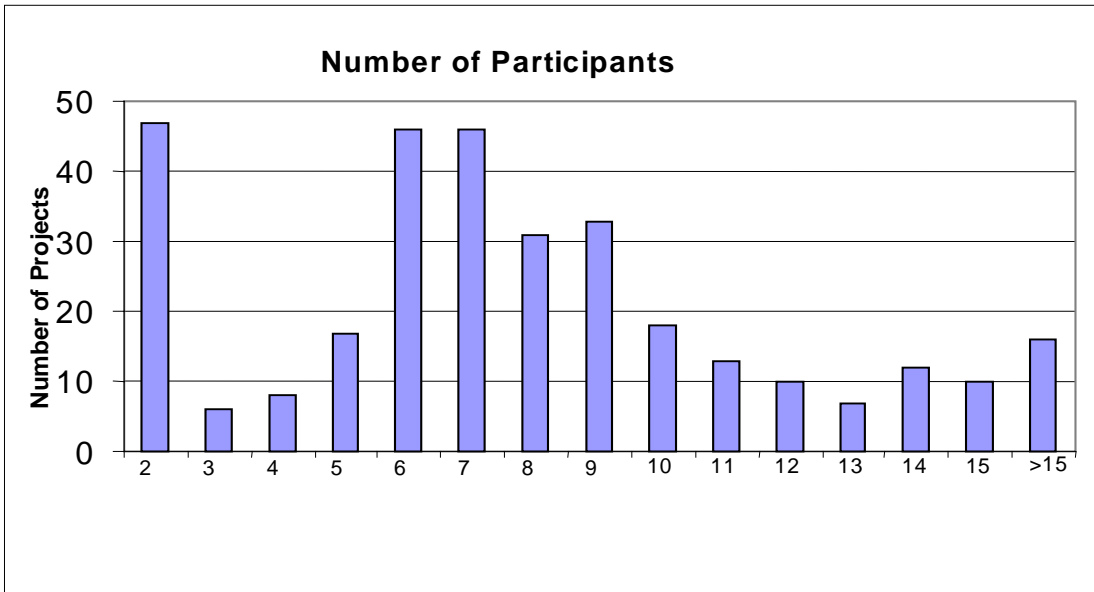
Type of project	KA/GT	Number of projects	Average total cost (Keuro)	Average EC contribution (Keuro)	Average number of participants	Average duration (month)
RTD	KA1	71	3002,53	1685,81	7,84	35,94
	KA2	36	4098,54	2150,95	14,03	32,24
	KA3	45	3201,55	1794,70	10,48	37,25
	KA4	47	10084,58	5346,79	14,69	39,24
	Mat	60	3557,01	1938,61	8,95	40,05
	M&T	31	1986,84	1131,81	7,40	35,20
	Total	<i>290</i>	<i>4307,20</i>	<i>2339,12</i>	<i>10,27</i>	<i>37,01</i>
CRAFT (step 2)	KA1	9	278,75	106,98	8,63	24,00
	KA2					
	KA3					
	KA4					
	Mat					
	M&T					
	Total	<i>9</i>	<i>278,75</i>	<i>106,98</i>	<i>8,63</i>	<i>24,00</i>
Thematic Networks	KA1					
	KA2	15	1221,56	1206,82	6,87	38,80
	KA3					
	KA4					
	Mat					
	M&T					
	Infra	3	795,45	579,24	9,00	36,00
	Total	<i>18</i>	<i>1194,93</i>	<i>1167,60</i>	<i>7,00</i>	<i>38,63</i>

FP5 – RTD projects characteristics



FP5 – Shared cost projects characteristics

The average duration of the projects was 30,64 months



FP5 - number of participations by type of organization and activity in contracts signed in 1999

Activity 2)	Number of participations 1)							Total	Among which small and medium sized enterprises 4)
	Enterprise sector	Higher education establishments	Research centres 3)	Non research public sector	Non research private non profit	Unknown			
Key action 1	335	110	162	25		35	667	155	
Key action 2	110	57	99	26	5	35	332	71	
Key action 3	113	58	101	16		24	312	45	
Key action 4	245	119	145	28		19	556	45	
Actions of generic nature	321	156	228	24		19	748	136	
Infrastructures	0	0	0	0		0	0	0	
GRAND TOTAL	1124	500	735	119	5	132	2615	452	

1 Contractors and associate contractors, but excluding subcontractors.

2 Including shared cost actions, training fellowships, support for research training networks and thematic networks, concerted actions and accompanying measures.

3 Research centres include:

- private commercial research centres,
- private not for profit research centres,
- public research centres,
- EC Joint Research Centre.

4 SME may include all previous kinds of organizations, except public research centres and the non-research public sector; SME definition: according to the harmonized glossary, an SME is defined as an entity which has no more than 250 full-time-equivalent employees, an annual turnover not exceeding 40 MECU or an annual balance-sheet total not exceeding 27 MECU, and that is not owned for at least 25% by an enterprise that is not an SME.

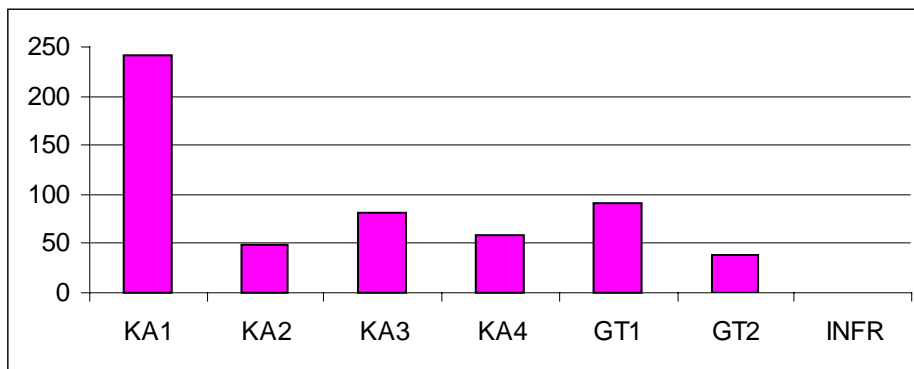
Information concerning the Pre-Proposal check¹

Statistics on PPC received:

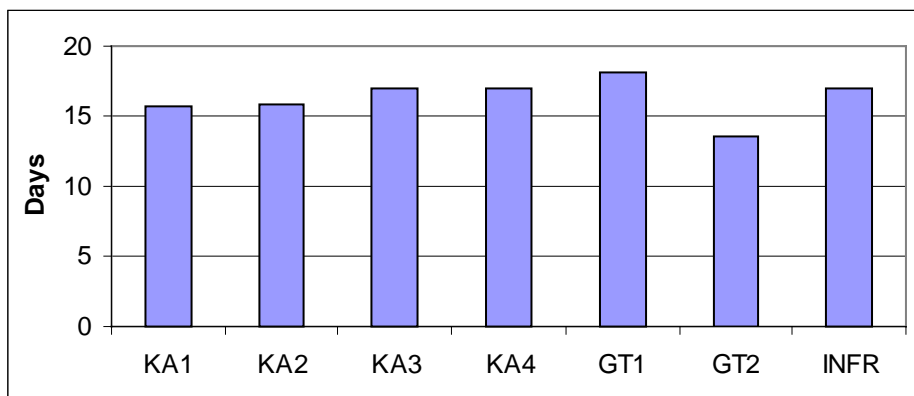
Number of PPC received: 573

Number of PPC replied to: 540

Subdivision by KA, GT (GT1 = materials, GT2 = M&T), INFR



Average time for answer by KA, GT, INFR



¹ Last updating on: 09.6.1999

5.3 Interviews and Invited Presentations

INTERVIEWS

The Panelists conducted interviews with the following persons:

Mr. M. Baur	Project Leader Materials, BMW AG
Ms. Birgit Blasch	Austrian Ministry of Education, Science, and Research, Delegate to the Programme Committee of GROWTH
Mr. Peter Brewin	Secretary of European Powder Metallurgy Association
Mr. S. de la Concha	Head of Department of R&D of CDTI. Spanish Ministry of Science and Technology
Mr. Carlo de Paw	Principal Coordinator of the European Targeted Research Action - Environmentally Friendly Construction Technologies (TRA-EFCT)
Ms. Fetsi	Greek Delegate to the Programme Committee of GROWTH
Mr. Trevor Fraser	UK Department of Trade and Industry
Prof. B. Friedel	German Administration of Road Research
Mr. Louis Gallois	President SNCF, former President Aerospatiale
Mr. Yves Geffrin	French Ministry of Transport, Directorate of Research
Mr. Jean-Pierre Giblin	French Ministry of Transport, Director of Research
Mr. Pierre Graff	French Ministry of Transport, General Director of Civil Aviation
Mr. W. Hang	Project Coordinator, BMW AG
Mr. Ulf Holmgren	NUTEK, Expert in the Swedish Delegation, Delegate to the Programme Committee of GROWTH
Mr Christian Jamet	Deputy Director General, Voies Navigables de France (Inland Waterways)
Prof. H. Keller	Technical University Munich
Mr. H. Kollmannsberger	German Railway AG
Mr. A. Korsgaard	Danish Ministry of Research, Delegate to the Programme Committee of GROWTH
Mr. J. Kjems	Research Centre RISOE, Danish delegate to the Programme Committee of GROWTH
Mr. Yves Lambert	Director General, EUROCONTROL
Mr. Martens	UNICE, Solvay
Mr. Michelone	Vice-President of FIAT
Mr. Chris Moore	Head of Technical Strategy, Rolls Royce plc.
Prof. K. Papailliou	Technical University Athens, EAG Aeronautics
Mr. Michel Pasquier	French Ministry of Research, European Affairs
Mr. H.J. Pedersen	DANFOSS (DEN), Chairman External Advisory Group in KA 1
Mr. W. Raldow	Head of unit MTI
Mr. Jean-Claude Raoul	Director of Research, Alstom (France)
Mr. H.D. Reimers	Daimler Chrysler Aerospace Airbus

Mr. J. Rodriguez	Vicepresident of ENCORD (European Network of Construction Research and Development)
Mr. Olof Sandberg	Swedish Ministry of Industry, Employment and Communications, Delegate in the Programme Committee GROWTH
Ms. E. Spyropoulou	Organisation for Greece SMEs, Greek representative in CRAFT
Mr. Klaus Urban	German Ministry of Education and Research, Delegate in the Programme Committee GROWTH
Mr. A. Wurm	German TÜV 'Energy and Environment'

INVITED PRESENTATIONS

The Panel invited presentations from the following persons:

Ms. BULMAN, Halcrow Fox Consultants, presented the preliminary results of a project looking into the impacts of transport R&D projects (SITPRO).

Mr. DURIEUX (Evaluation Unit DG Science) explained the background, mandate and the broad guidelines for the 5-year assessment exercise.

Mr. GARCIA-ARROYO (Programme Director of GROWTH) gave an overview of the Growth programme and the development of the activities covered by this programme under previous FPs.

Mr. METTHEY (Acting Director, Competitive and Sustainable Growth II) gave an overview of the activities in the field of Aeronautics.

Mr. SCHMITT, Chair of the Panel for the External Specific Programme Monitoring 1999 for the GROWTH programme under FP5 presented a summary of results.

Mr. SPAEY (Consultant / Bureau van Dijk) presented the results from the evaluations and impact assessments of IMT, SMT and Craft projects of FP 3 and 4.

Mr. TROUSSON (DG Science, GROWTH Programme) presented the documentation and information available for the 5-year assessment.

5.4 Abbreviations

BRITE-EURAM	Basic research in Industrial Technologies for Europe – European Research in Advanced Materials
CEN	European Committee for Standardization
CENELEC	European Committee for Electrotechnical Standardization
CRAFT	Cooperative Research
CRM	Certified Reference Material
DG	Directorate General
EAG	External Advisory Group
ETSI	European Telecommunications Standards Institute
EUROMET	European collaboration in measurement standards
FP [1, 2, ...]	Framework Programme [1, 2, ...]
GA/GT	Generic Activity / Generic Technology
HLEG	High Level Expert Group
INNOVATION	Innovation Programme of DG Enterprise
IMT	Industrial and Materials Technologies
IPTS	Institute for Prospective Technology Studies (part of the Joint Research Centers of the EU)
KA [1, 2, ...]	Key Action [1, 2, ...]
M&T	Measurement and Testing (FP 3)
MT	Measurements and Testing (FP 5)
MTI	Measurements and Testing, Infrastructure (FP 5)
NFP	National Focal Point
NIST	National Institute for Standards and Technology (USA)
RTD	Research and Technological Development
S&T	Science and Technology
SME	Small and Medium Size Enterprises
SMT	Standards, Measurements and Testing Programme (FP 4)
SP	Specific Programme
5YA	Five Year Assessment

5.5 Curriculum Vitae of Panel Members

Carmen Andrade

Dr. in Industrial Chemistry, Research Prof. of the National Research Council of Spain in the Construction Sciences Institute "Eduardo Torroja". Current field of research is concrete service life and durability. Director of the Institute, Vicepresident of the International Union for Building Materials and Structures (RILEM) and President of the Liaison Committee grouping the six international

organizations of structural civil engineers. Former President of the European Union for the Agreement in Construction (UAEtc).

Sergio Barabaschi (Chairman)

Master in applied Physics, University of Milano, PhD in Automatic Control, University of Rome. Published extensively on Automatic control / Automation Management and Management of Technology. Currently President of CISAI/FAST Milano-Italy and Vice-President of the European Council for Applied Science and Engineering. Former Undersecretary of State for Science and Technology in Italy, past president of EIRMA (European Industrial Research Management Association), as well as past president of ESTA.

Hans-Hermann Braess

Prof.Dr.-Ing., Dr.Ing. e.h., till 1996 Head of Research at BMW AG in Munich, since 1992 Honorary Professor at the Technical Universities in Munich and Dresden and at the University of Applied Sciences in Dresden (HTW), member of several scientific institutions.

Georges Dobias

General Civil Engineer, Executive Vice-Chairman of the Syndicat des Transports Parisiens in charge of passenger transit in the Region of Paris since 1995, Vice Chairman of the French Research and Development Program (PREDIT) in charge of the scientific and strategic research since 1996, Member of the French High Board for Research and Technology since 1997, Director General of the French National Institute for Transport and Safety Research (INRETS) (1985-1995).

René Dybkaer

Received his M.D. at Copenhagen University. Currently, he is heading the Department of Standardization in Laboratory Medicine at the H:S Frederiksberg Hospital in Copenhagen. Publications on clinical, biochemical and clinical chemical subjects. IFCC Vice-President, President and immediate Past President (1973-90). President of the European Confederation of Laboratory Medicine (1994-97), Chairman of the European Community Bureau of Reference's Certification Committee (1983-1994). Currently Convenor of ISO and CEN working groups on Reference systems for metrology in laboratory medicine. Member of the 1998 Monitoring Panel for the Specific Programme 'Standards, Measurements and Testing'.

Greta Fossum

M.Sc, Lic.Eng; Senior Research Advisor, Modo Paper Research and Development, Örnköldsvik, Sweden. She is past chairman of the Swedish Association of Pulp and Paper Engineers (SPCI) and is a member of the Royal Swedish Academy of Engineering Sciences (IVA). She is also a member of the board of several national research funding authorities and the board of the Swedish Office of Science and Technology.

Allan Parker

Owns and runs Hanwell Consulting, and also leads the New Product Introduction practice of Bourton Group, the international group of management consultants. He has taught in an American university, formed and led development teams in a government research laboratory, been technical director of three companies including a multinational high tech engineering company, been technical/marketing director and practice leader in a substantial consultancy and successfully delivered major change programmes in New Product Introduction (NPI). Past Chairman of the Manufacturing Division of the Institution of Electrical Engineers (IEE) and has served on many IEE committees, including being a member of their Council. He is an Industrial Advisor to several Universities in the UK and has been a member of several UK Department of Trade and Industry (DTI) advisory panels.

Wolfgang Polt (Rapporteur)

Economist; Head of the Vienna office of the Institute for Technology and Regional Policy (INTEREG) of Joanneum Research Ltd.. Lecturer for Industrial Economics and Technology Policy at the University of Business and Economics in Vienna. Former full time consultant for the Directorate for Science,

Technology and Industry of the OECD in Paris. He has carried out evaluation studies both on national and international level. Actually involved in the European Network for RTD Evaluation and co-leading a EU-project on the assessment of socio-economic impacts of public RTD programmes.

Lena J. Tsipouri

Trained in economics and computer applications in Athens, Vienna, Paris and Cambridge (Mass.). Teaching at the University of Athens, Department of Economic Sciences, specialising in industrial policy and economics of technological change. Previous jobs were in the Ministry of National Economy and international organisations. Involved in a variety of EU projects in the areas of technology policy and regional development policies, as well as in work for the OECD and the UN. Recent publications and research concentrate in the areas of technological change, in particular the role of infrastructure and public policy, while her consulting work refers to the role of technology for regional development and the emerging importance of the information society.