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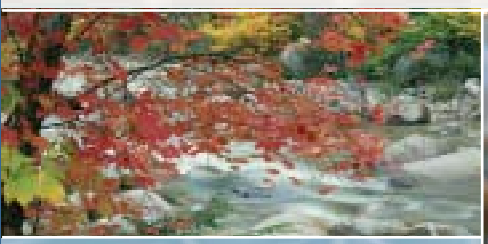
Community research

The overall socio-economic dimension of community research in the fifth European framework programme



A synthesis report on the integration of the socio-economic related research activities of the European Community (1998-2002)

IMPROVING HUMAN RESEARCH POTENTIAL
AND THE SOCIO-ECONOMIC KNOWLEDGE BASE

EUR 20577

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A synthesis report on the integration of the socio-economic related research activities of the European Community (1998-2002)

Directorate-General for Research

Improving Human research Potential
and the socio-economic knowledge base

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EUROPEAN COMMISSION RESEARCH

Commissioner: Philippe Busquin

Directorate-General for Research

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The Directorate-General for Research initiates, develops and follows the Commission's political initiatives for the realisation of the European Research Area. It conceives and implements the necessary Community actions, in particular the Framework Programmes, in terms of research and technological development. It also contributes to the implementation of the "Lisbon Strategy" regarding employment, competitiveness at international level, the economic reform and the social cohesion within the European Union.

The Directorate 'Knowledge-based economy and society' (Directorate K) contributes to the realisation of the European Research Area in the fields of the social sciences, economic, science and technology foresight, and the respective analyses. To this end, it monitors and encourages science and technology foresight activities, conducts the economic analyses necessary for the work of the Directorate-General, and co-ordinates policy as regards the relevant political, economic, human and social sciences. It prepares the European reports on science and technology indicators, and it contributes to the development and implementation of the Framework Programmes in these fields. It monitors the progress made in the implementation of the Lisbon Strategy. It is responsible for encouraging investment in research and technological innovation. To this end, it develops policies and measures to improve framework conditions (e.g. Intellectual Property Rights) for private investment and the effectiveness of public financing instruments.

As part of implementing the Framework Programme, the Directorate also ensures co-ordination of the integration of social, political sciences and humanities in the various thematic and horizontal priorities of the specific programmes. This task is implemented with the support of the internal group of socio-economic correspondents and through the production of periodic reports on the integration of the socio-economic dimension in the Framework Programme.

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Foreword

Building a knowledge-based Europe – our common challenge

Overall, knowledge stands out as the common reference point and the unifier of the three major areas of activity and investment, which comprise research, education and training, and innovation. It is also the key to industrial competitiveness and employment.

Europe is playing an important role in the process of developing a knowledge-based society which must face major economic and social challenges.

First of all, the external challenges are the globalisation of the economy which modifies the sphere of international competitiveness, and the continual increase in research effort by our main competitors.

The enlargement of Europe towards new Member States and the social objectives linked to improving employment are other internal key challenges for Europe.

With a direct link to research, democratic governance must ensure that social and economic issues are taken into consideration in research activities, and that citizens are informed about and are aware of the social aspects with regard to scientific and technological progress.

In order to meet the European challenges associated with the transition to a knowledge-based society, the Fifth European RTD Framework Programme was designed in a different way to its predecessors in terms of both content and operation. The intention was to move away from research for its own sake and to turn the research towards current socio-economic problems, that is, research with the potential to accomplish the changes expected by the general public. In this respect, the Fifth Framework Programme was the first to significantly reinforce European support with regard to socio-economic related research activities.

This synthesis report highlights how the socio-economic dimension has been integrated into the specific programmes of the Fifth Framework Programme to take full account of the needs of European society and of the economic and social challenges it faces.

Establishing a common vision on the socio-economic dimension around the strategic goal set by the European Union in Lisbon of becoming "the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion" by 2010, is a constant challenge for scientists, socio-economists and politicians alike.

The Sixth Framework Programme and the broader purpose of creating a European Research Area, mobilising and enhancing the European potential for research in the field of social sciences and humanities, will permit the pursuance of this approach which addresses socio-economic issues related to research in the context of the Lisbon Strategy.

Finally, I hope that this report will be a valuable contribution to the scientific and political debate on what is at stake within the European Union's research and technology policies.

Philippe Busquin
European Commissioner for Research

The context

In the Decision of the European Parliament and the Council adopting the Fifth Framework Programme (FP5) of the European Community for research, technological development and demonstration activities (1998-2002), the **Human Potential** programme has been assigned the task to "*...ensure, through appropriate monitoring and co-ordinating mechanisms, the adequate incorporation of socio-economic considerations into the research activities of the thematic programmes*"[1].

In addition, the Council Decision which adopted the specific programme for research, technological development and demonstration on "Improving the Human research Potential and the socio-economic knowledge base"[2] (IHP), stipulates that the *Human Potential* programme will co-ordinate and support relevant activities throughout the Framework Programme. In relation to socio-economic research, it is stated that "co-ordination will be achieved through participation in the elaboration of the work programmes, support in the creation of appropriate evaluation mechanisms, in particular through the participation of socio-economic scientists, and collection and dissemination of relevant information, in order to ensure that the socio-economic dimension is consistently taken into account in the specific programmes".

The monitoring, co-ordination and support of the socio-economic related research activities in the various specific programmes of FP5 have been carried out by the Directorate K of the Directorate-General for Research by means of the Key Action on "the improvement of the socio-economic knowledge base" in the IHP programme.

This synthesis report covers the whole period of FP5 and follows two annual reports (1999 and 2000) already published. It provides an analysis and overview of the socio-economic aspects integrated in all relevant specific FP5 programmes before proposing some recommendations for future European research activities in this area.

The external expertise of Mr Andrea Ricci has contributed to the conception and analysis required for the production of this synthesis report. Sincere thanks is also given to all European Commission staff members of the socio-economic Group who have given their support in the realisation of this report.

[1] *European Parliament and Council Decision 182/1999/EC, OJ L26 of 1.2.1999, p. 27.*

[2] *Council Decision 1999/173/EC, OJ L64 of 12.3.1999, p. 118.*

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Executive summary

The creation of the European Research Area (ERA) has become the central axis of today's European research policy and also represents the main component of the Lisbon Strategy setting the ambitious goal for the Union to become, by 2010, "*the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion*". Assessing the social and economic (SE) dimension of European research programmes is, however, an extremely challenging exercise, due primarily to the lack of commonly agreed definitions, consistent datasets and robust assessment methods.

As explained in **Chapter 1**, this report summarises the findings of a review that was carried out to appraise the socio-economic relevance of the Fifth Framework Programme (FP5) of the European Community for research, technological development and demonstration activities (1998-2002).

Although a significant sample of individual Research and Technological Development (RTD) projects are featured, the findings presented in this report are based mainly on evidence related to Programmes and Key Actions as laid out in **Chapter 2** and in the relevant annexes.

Chapter 3 highlights the main conceptual issues to be addressed when devising an appropriate framework for the assessment of the SE contents of research programmes.

- Socio-economic impact should not be considered as just one among other components of a multi-criteria evaluation framework (along with, for example, technical, organisational and other criteria), but rather as *the* criterion by which to assess the ultimate success (or failure) of research activities, whereby societal problems drive the identification of research needs.

- On the other hand, the SE effects of a given research activity may not be visible in the short term, and their materialisation may depend on the deployment of further targeted initiatives (dissemination, exploitation, additional research): impact assessment should be carried out within a time frame which can be extended accordingly.

- Furthermore, research can only achieve the desired SE impacts to the extent that appropriate means (in both quantitative and qualitative terms) are committed. This leads to the distinction between the *SE dimension* of research (the inputs) and its *SE impact* (the outputs). Both must be appraised, and a tentative set of basic indicators (qualitative and quantitative) is proposed for reference.

Chapter 4 discusses the extent to which the current organisation of RTD monitoring and evaluation (in FP5) allows for documentation of the above indicators.

- The explicit reference to *SE topics and disciplines* (e.g. in the description of work in individual projects, when available) provides a basic indication of their socio-economic relevance, and an appraisal of the *degree of multi-disciplinarity* can supplement the qualitative evaluation of projects' SE dimension. However, even such basic evidence requires that the corresponding information is made available in a systematic, harmonised and consistent way, which is not always the case within FP5.

- On quantitative grounds, the SE dimension of projects could be analysed through the *amount of resources* that are explicitly committed to SE-relevant objectives, provided such information is made available at the outset.

- As for SE impacts, *no systematic quantitative assessment* can be credibly carried out in the current state of play, owing primarily to the lack of appropriate datasets. It is stressed, however, that within FP5 itself, significant progress has been made in the development of specific methods and tools for impact assessment as a whole. These will undoubtedly prove extremely useful in establishing a dedicated framework for SE impact evaluation of research.

- On the other hand, a qualitative approach to impact assessment can be attempted following the well-known method of the socalled "*citation index*": searching for research activities that have inspired policy actions (directives, legislation, etc.) then allows it to be ascertained whether the results of research have been effectively transferred outside the scientific community and, more importantly, if they have been concretely recognised as useful in the process of policy formulation.

In **Chapter 5**, the report reviews the principal FP5 Programmes and Key Actions (KAs) with a view to highlighting their

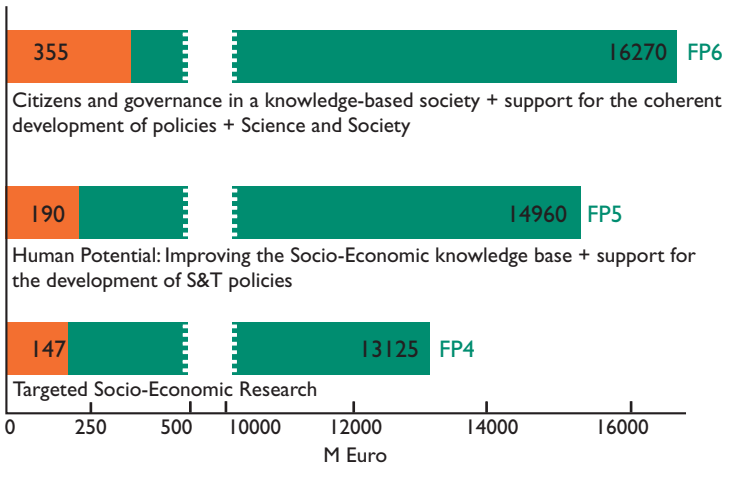
main SE-relevant features and achievements. Given the highly heterogeneous availability of information across Programmes and KAs, no systematic comparison is provided at the disaggregate level.

- The IHP Programme (*Improving the Human research Potential and the socio-economic knowledge base*) is inherently focused on SE-relevant research. In this programme, socio-economic methods, tools and issues are the central object of the Key Action, while in the other parts of the programme they are instrumental, or consequential, to research activities that primarily aim at developing innovation in other areas. With reference to its FP4 predecessor (TSER - Targeted Socio-Economic Research), the funds available for SE-relevant research activities in IHP have increased significantly, resulting in a total budget of about 190 MEuro (see Figure 1 below). Within IHP, both the *Improving the socio-economic knowledge base KA* and the *Support for the development of scientific and technological policies* action are deemed to devote the entirety of their budgets (165 and 25 MEuro respectively) to SE-relevant research. Other IHP budget lines include training activities (through the *Marie Curie fellowships and the Research Training Networks*), financing the *Access to Research Infrastructures*, and the organisation of *High Level Scientific Conferences*. Within those, the share attributed to prevailing SE topics varies considerably from one activity to the other (i.e. between 2% and 20% approximately), with a total expenditure of approximately 98 MEuro. By comparison, in FP6 priorities addressing, on the one side, the *Citizens and governance in a knowledge-based society* and, on the other, the support for the coherent development of policies and the interactions between *Science and Society*, are inherently focused on SE-relevant research. In addition, this effort will be complemented by socio-economic research and innovation carried out within the other thematic and horizontal priorities of the Sixth Framework Programme (FP6).

- Throughout FP5, the QoL Programme (Quality of Life) has funded some 160 projects with direct and prevailing SE relevance, corresponding to a total budget of ca. 200 MEuro. Socio-economic projects can be found in each of the six Key Actions in QoL, as well as within those activities of a generic nature. Within the latter, a specific action line on socio-economic studies has allowed for the funding of ten projects (ca. 10 MEuro in total).

- Within the GROWTH Programme (Competitive and Sustainable Growth), all Key Actions have a strong and immediately recognisable SE-relevance: innovation in company organisation impacts on the quality of the working environment, the health of the workforce, their quality of life and ultimately their welfare; the design of new production

Figure 1: Evolution of socio-economic relevant research activities in FPs



processes, along with the development and use of new materials, inducing a reduction in pollutant emissions and a more rational use of natural resources, while product innovation (safer consumer products, cleaner vehicles, etc.) directly targets people's needs and improvements in their quality of life, also by promoting changes in consumption patterns. However, direct quantitative analysis is impossible because of the overall lack of specific SE-related data.

- Within the IST Programme (Information Society Technologies), an important innovative effort has been deployed in FP5 to integrate socio-economic research with technological RTD. A number of major thematic areas have emerged where explicit socio-economic research is carried out, namely: i) Industrial organisation, ii) Legal and regulatory aspects, iii) Work and employment issues, iv) Regional aspects, v) Corporate social responsibility, and vi) Statistical indicators. Altogether, the IST Programme has funded about 60 individual projects (throughout FP5) with a clearly prevalent SE dimension. Two Cross-Programme Action lines (CPA) have played a significant role therein, focusing respectively on cross-cutting IST issues, and on statistical methods, tools and indicators for the Information Society.

- The EESD Programme (Energy Environment and Sustainable Development) includes two main streams, the first concentrating on sustainable development, the second on energy issues. Both have provided visible and abundant input to policy-making, thanks in particular to their continuing effort in developing and using analytical methods and tools (e.g. models) for policy support. In Part A (sustainable development), some 160 MEuro (i.e. 15% of the total budget) have been devoted to SE-relevant research, with the KA *City of Tomorrow* playing a prominent role. As for Part B (energy), research is under the responsibility of two different DGs (RTD and TREN), which makes it difficult to issue an overall consistent estimate of SE contents. In DG RTD alone, SE-relevant projects have received some 24 MEuro during FP5.

Chapter 6 presents the results of an extensive search carried out on the EURLEX[3] database in order to identify RTD projects that have provided direct input to policy formulation (i.e. projects which are quoted explicitly in EU policy documents). Although the findings cannot be considered as exhaustive, this search has allowed some 20 major references to be identified, spread across the Programmes and KAs, ranging from sustainable development policies to the security of networks, from the fight against communicable diseases to the promotion of 'intermodal' transport options, etc. The references identified are summarised in this chapter, while additional details are presented in the relevant annex.

Finally, **Chapter 7** outlines the main conclusions and formulates recommendations in view of future RTD programmes. As a general remark, and despite difficulties in providing quantitative evidence on the role of socio-economic sciences in EU research, it was found that the SE relevance of projects funded within FP5 is generally high. When looking at future prospects, therefore, efforts would appear necessary not so much on increasing the amount of SE-related research, but rather on the enhancement of the SE value that can be drawn from research programmes, and of its visibility. This calls for a multifold action, focusing primarily on the development and systematic use of:

- tools and procedures for SE content representation that will allow for the monitoring (in progress) and assessment (*ex post*) of the actual achievements of research in solving societal problems. Proposals for a basic set of assessment indicators are set out.

- advanced impact assessment methods, to guide policy- and decision-makers in the priority and target setting process, and to establish the necessary yardsticks for *ex-post* assessment exercises.

[3] *http://europa.eu.int/eur-lex/fr/index.html*

1. Objectives

Assessing the socio-economic dimension of research programmes is an extremely complex exercise. Evaluating their socio-economic impact possibly represents an even higher challenge, calling for an assessment of the nature and characteristics of the interaction between society and RTD activities, as illustrated schematically in Figure 2 below.

Addressing societal needs requires an appropriate set of policies. Consequently, policy-makers must be able to translate their perception of *societal needs* into specifications for the RTD community (the *policy needs*). The *RTD response* then allows policy-makers to formulate the most appropriate feedback (the *policy response*). Moreover, the continuing progress of scientific and technological knowledge allows the research community to shape its own policy vision, serving as further input to policy formulation. In such a process, policy-makers play the role of mediators between society and the RTD community. But what is the nature (if any) of the direct interaction between them? And is it possible to assess the value of the impacts of RTD on society?

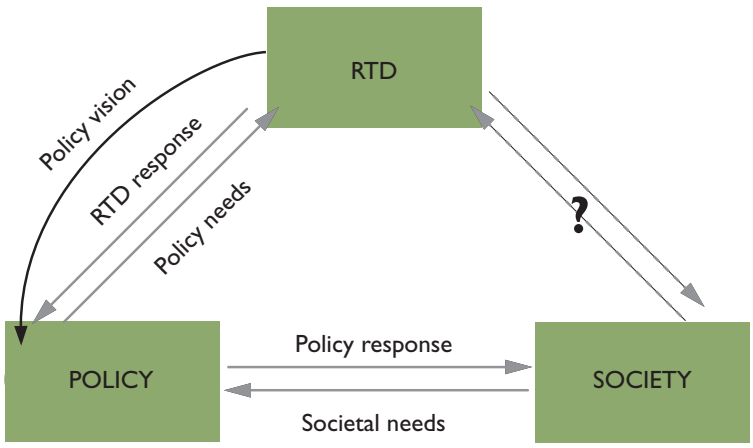
This report is an attempt to provide a series of assessment and evaluation inputs, notably through:

- the review of FP5 and its main SE-related features
- the tentative design of a framework for the evaluation and monitoring of the SE content of future RTD activities

It deals, at varying depths, with the following main issues:

a) Defining the basic concepts ("SE dimension", "SE impact");
b) Interpreting these concepts in the context of EU research activities;
c) Discussing the qualitative and quantitative FP5-related evidence available from various sources;
d) Discussing the SE contents and implications of the various FP5 research programmes;
e) Providing examples of FP5 projects with high SE content; and
f) Sketching the general framework for future monitoring and evaluation of the SE implications of EU research.

Figure 2: Integration of RTD and society



2. Methodology

A series of tasks have been undertaken to produce the present assessment report. Despite the intrinsic difficulties outlined above (identification of the impact variables, insufficient relevant information on past RTD), a systematic analysis of individual RTD projects and activities, including the evaluation of specific, SE-related project deliverables, would have certainly allowed for the gathering of more detailed information on both the SE dimension and, to some extent, the SE impacts. Clearly, such an undertaking was way beyond the scope of this report, so extensive use was made of secondary sources.

More specifically, the following main tasks were carried out:

- acquisition and analysis of readily available documentation on FP5 and on previous SER-related assessments (both qualitative and quantitative)[4];
- interviews with RTD officers in the most relevant Units and Key Actions;
- extensive web searches to supplement and update the available information[5]; and
- a considerable amount of time was devoted to drawing an extensive list of FP5 activities for which explicit quotations can be found in official EU policy communications.

[4] *See Annex 1*

[5] *See Annex 2*

3. Defining the basic concepts associated with SE assessments

There have been many attempts to provide a non-ambiguous definition of SER, and the debate is still open.

Literally, SER could be defined as *every research activity that has the potential to induce changes in societal values, in the organisation and welfare of society, e.g. through changes in the overall availability of economic resources, in their allocation and in their use.* This, however, raises a number of issues of interpretation.

3.1 SE impact and impact *tout court*

The explicit objective of research – in general – is to identify new ways and means (technologies, methods, tools, etc.) that will induce an increase in the performance of systems (production systems, consumption systems, etc.). To assess the full range of impacts of a given research activity, one can therefore refer to such concepts as, for example, the degree of technical/technological innovation, the efficiency in the use of resources (natural, human, financial), the contribution of research to the acceleration of desired changes, etc. However, all such impact assessment criteria are ultimately instrumental in achieving an improvement in the quality of life within a sustainable framework (whereby immediate improvements must not be achieved at the expense of long-term performances).

When turning to the so-called SE impact, therefore, it appears that this is not just one among other components of a multi-criteria evaluation framework (along with, for example, technical, organisational, and other criteria), but should rather be considered as *the* criterion to assess the ultimate success (or failure) of research activities: technological innovation is only useful if it contributes to solving societal problems, and if it does so under acceptable economic conditions; changes in the organisation of production systems are only viable if they are compatible with the needs and objectives of individuals and of society as a whole; etc.

In one way, the evaluation procedures adopted in FP5 recognise the prominent role of SE criteria, as they generally assign a prevailing weight – within the overall evaluation score – to SE parameters. Also, the use of thresholds helps to ensure that projects with an insufficient SE potential are not retained, irrespective of their technical value. However, these procedures do not explicitly reflect the logical hierarchy between technical performance and SE performance, whereby the former is instrumental to the latter.

3.2 Assessing SE impacts

The issue of SE impact assessment is intrinsically problematic and extends well beyond the evaluation of research activities. Policy decisions, investment programmes, legislation, and all other actions that interfere with the behaviour and performance of systems must also be assessed in terms of their SE implications. The methodological challenge of defining an SE-evaluation framework is, in fact, a general one which, to date, has not been resolved in a consensual, unambiguous way. Neoclassical economists are quick to claim that changes in welfare provide a comprehensive and efficient measure of socio-economic effects. However, it must be recognised that both the economic theory as such and, even more importantly, the operational tools currently available for its translation into practice (models, indicators), often fail to capture the full set of constraints and implications encountered in real life. Within FP5, targeted initiatives have been undertaken (e.g. in the EESD Programme, or in the KA Sustainable Mobility and Intermodality) to advance the methodological state of the art in the area of impact assessment in general (e.g. welfare changes assessment with General Equilibrium Models, externality analysis). The SE evaluation of future research programmes appears to be a natural candidate for the immediate application of the corresponding findings.

3.3 Direct and indirect SE impacts

The extent to which SE impacts of a given research activity can be measured depends largely on the early stages of project design and evaluation: ideally, the statement of project objectives should provide an explicit representation of the expected SE effects. Measuring the latter then amounts to assessing the degree to which the expected SE impacts have been achieved. In addition to the above conceptual and methodological

obstacles, a further difficulty arises here, geared to the time frame of RTD impacts and the process of innovation diffusion. In case the expected SE effects (e.g. an increase in welfare, or an improvement in air quality) cannot be observed once the research has completed its planned cycle, this might be interpreted in a variety of ways:

a) the research has failed, and the expected SE impacts will never appear;
b) the research has been successful, but it is too early for the expected SE impacts to appear; and
c) the research outcome is technically successful, but no SE impacts will be achieved unless additional actions are taken (e.g. further research, and/or complementary actions such as dissemination, policy formulation, etc.).

This shows that an effective SE impact assessment framework must account for direct (i.e. immediate and explicit) effects as well as for indirect ones (i.e. differed and/or conditional).

3.4 SE impact and SE dimension

Impact assessment methodologies have been designed in a variety of contexts, usually leading to the specification of evaluation processes that are presented as a series of steps, each corresponding to an action to be taken in view of the actual measurement of impacts (e.g. specification of the impact variables, data collection, elaboration of impact indicators and/or calculation of secondary variables, etc.). In the context of the present exercise, two concepts are often evoked: SE *impact* on the one hand, and SE *dimension* on the other. Borrowing from the typical System Analysis representation, we shall consider that the latter (SE dimension) can be associated to the measurement of the inputs into the RTD process, while the former (SE impact) corresponds to its output.

Inputs as well as outputs should be analysed in both quantitative and qualitative terms.

Table 1 below provides a rough classification of quantitative and qualitative terms.

The greater difficulties in documenting the above indicators are associated to the quantitative measurement of outputs (the bottom right cell) for which, as outlined above, conceptual and methodological problems are still partially unresolved. As for the other cells, the main obstacle lies in the availability and consistency of the information and data required to document the various indicators.

Later in this report is a section discussing the extent to which the current organisation of RTD monitoring and evaluation (in FP5) either allows – or may allow – for the provision of the necessary inputs.

Table 1: Measuring the SE dimension and impacts

	QUALITATIVE INDICATORS	QUANTITATIVE INDICATORS
INPUTS (SE *DIMENSION*)	• SE topics addressed • Multidisciplinarity of research teams	• Amount of resources - Staff - Budget • Other input variables
OUTPUTS (SE *IMPACT*)	• Societal changes induced • SE systems affected • Policy actions generated • Identification of further research needs	• Changes in SE performance - Welfare - Other SE performance variables (economics, environment, health, etc.) • Efficiency in the use of resources (i.e. Inputs/Outputs ratios)

4. Analysing the SE contents of FP5

This section briefly discusses the extent to which the current organisation of RTD monitoring and evaluation (in FP5) allows for the documentation of the above-mentioned assessment items. In fact, the picture varies considerably across Programmes and Key Actions, and a more detailed account of specific situations is provided in Chapter 5 below.

4.1 SE Dimension (inputs)

4.1.1 Qualitative indicators

• Topics addressed

Identifying the SE topics addressed by a project is not always straightforward. While certain programmes have developed a disciplinary classification scheme, which is then systematically used for both evaluation and monitoring purposes, such a classification is not used in most Key Actions, or at least not used explicitly, and by all means no formal record is kept of how projects relate to SE disciplines. In those cases where a classification is used, it provides a consistent – although rough – account of which and how many projects deal explicitly with SE themes. Moreover, thanks to the "hierarchical multiple entry" approach to project classification, whereby each project may be related to one or more (up to four) different disciplines, it is then possible to elaborate more detailed assessments, such as, for example, how many projects relate exclusively, or primarily, to SE disciplines; how many projects with a primary technological focus also include explicit (although secondary) SE concerns; which SE disciplines are more often addressed; and so on.

On the other hand, in the (majority of) cases where no such indications are readily available, it becomes difficult to provide a meaningful account of the SE intensity of projects, based on some disciplinary classification. A number of fall-back options can be considered, such as, for example, searching for SE-related keywords in the project title, or in its abstract, etc. Such a purely mechanistic approach is, however, both highly demanding (in terms of sheer time needed to carry it out) and of limited value: while many projects include explicit references to SE relevance in their statement of objectives, it must be recognised that this often amounts to little more than a declaration of intent, which does not then automatically generate a concrete SE-related added value.

It should also be noted that much depends on how the programme objectives and the calls for proposals are formulated at the outset. A clear distinction must be made in this respect between, on the one hand, programmes that follow a top-down approach in the establishment of objectives and tenders, whereby the specification of RTD needs is directly and explicitly driven by policy objectives and strategies and, on the other, programmes that are prepared using a bottom-up approach, where the starting point is the identification of gaps in scientific knowledge, which can be then more or less loosely or implicitly related to specific societal issues. As to the former (top-down), one could boldly assume that, from the SE viewpoint, all projects are directly relevant as they are only funded if they commit in a credible way to addressing specific policy goals. This is probably a rough approximation of reality, but in the absence of better and more specific evidence it can provide a basic assessment input. As for the latter (bottom-up), policy inputs are often explicit at programme level, but a certain amount of individual project review would seem unavoidable to provide a credible account of how – and to what extent – actual projects really address SE issues (for example through the identification of SE-relevant deliverables, work packages, etc.).

• Multi-disciplinarity

It is often assumed that highly specialised, monothematic research teams are prone to keeping the added value of their work within the limits of the corresponding scientific community. Although there are clearly exceptions, one can assume conversely that multi-disciplinary teams have a higher propensity to promote horizontal communication (across scientific disciplines, but also between the scientific community and the outside world). Multi-disciplinarity can therefore be taken as a meaningful indication of the SE potential of research activities. As and when (see above) the reference to a disciplinary classification is explicit, it becomes straightforward to assess the degree of multi-disciplinarity of a given RTD activity, and the role of SE topics therein. In all other cases, multi-disciplinarity can only be assessed through more indirect approaches which, however, require a certain effort in carrying out individual project reviews: the composition of the research team could be assessed and matched against its institutional specialisation

(a standard set of disciplinary codes is used to this effect across FP5); also, the propensity of a given project to achieve concrete results in SE terms can be assessed through its organisational structure, by means of the establishment of user groups, policy advisory groups, the staging of seminars, workshops and conferences involving participants from outside the scientific community, and similar organisational features, and so on.

4.1.2 Quantitative indicators

• Amount of resources

An obvious quantitative indication of the importance assigned to SE issues is the amount of the research budget (in both absolute and relative terms) devoted to the corresponding projects. However, conferring its true meaningfulness to this variable is only possible if the previous discussion on qualitative assessment leads to conclusive evidence: only when the relevant activities (i.e. those with high SE intensity) have been identified, can their quantitative weight be evaluated (whether in terms of financial budget, of person.months or of other similar variables). The reliability and consistency (across programmes) of such an evaluation is therefore directly geared to the availability of the necessary qualitative evidence.

• Other input variables

As for qualitative information, additional evidence can be sought in the specific project material, through the detailed analysis of resource allocation. Certain programmes require that each project deliverable is quantified at the outset in terms of the comparative share of the project budget absorbed for its production. In the current organisational framework for the monitoring and evaluation of FP5 activities, these and other variables cannot be extracted immediately and their assessment therefore requires a considerable amount of time.

• Project typology

The best part of the FP5 budget is devoted to the funding of research projects (as opposed to the funding of other research-related activities such as conferences, fellowships, access to infrastructure, etc.). However, within the general category of research projects, a major distinction is made between the so-called Shared Cost (SC) projects, on the one hand, and Accompanying Measures (AM) and Thematic Networks (TN) on the other. This distinction is particularly relevant within the context of SE assessments although, in specific cases, AM and at times TN are *de facto* research projects in their own right, the genuine role of these two typologies being to promote the uptake, diffusion, enhancement, etc. of the results achieved by innovative research carried out previously, or in parallel or, possibly, to help identify further research needs and priorities. Among the explicit objectives of TN, for instance, there is one on bridging the gap between the research community and policy-makers. Other typical goals are to build Europe-wide consensus on the interpretation and subsequent adoption of new technologies, methods, etc. Therefore, irrespective of the disciplinary focus of AM and TN, it is often assumed that their main, and possibly their exclusive justification is to ensure that research actually generates the expected (desired) socio-economic effects.

To some extent, a similar argument could be used when discussing RTD projects funded within certain specific programmes, for example the INCO (International Co-operation) initiative: as will be discussed further in Section 5.1.7, the main objective of such programmes is to create a multiplier effect whereby the outreach potential of RTD is enhanced through specific actions aiming at dissemination, validation, adaptation and upgrading of the results produced by previous or ongoing RTD projects. If one assumes that transferring scientific knowledge into practice is a precondition for achieving a series of targeted societal changes, then this kind of programme should be seen as making a major contribution to increasing the SE dimension of EU RTD spending.

4.2 SE impact (outputs)

4.2.1 Qualitative assessment

• Societal changes induced

Borrowing from the traditional distinction between *effectiveness* and *efficiency*, the capability of research to induce societal changes is the most obvious measure of its effectiveness. Here again, however, assessing the actual performance of

specific projects is much easier as and when its SE goals have been identified at the outset. Measuring their effectiveness then amounts to comparing the statement of objectives with the results achieved. As previously mentioned, it is seldom possible to proceed in such a straightforward manner because of the lack of immediately available relevant information from the projects.

A fall-back option can be envisaged and is proposed here, along the lines of the well-known method of the so-called "citation index". Searching for research activities that have inspired policy actions then means it can be ascertained whether the results of research have been effectively transferred outside the scientific community and, more importantly, if they have been concretely recognised as useful in the process of policy formulation. The rationale behind this approach is to assume that:

(i) policy actions are basically prompted by the need to address societal needs and, as such, are expected to produce direct SE changes;

(ii) only those projects that have been successful are likely to provide direct input to policy-making; and

(iii) an explicit quotation of RTD results in a policy document can therefore be taken as a concrete indication that the corresponding research has – at the very least – a significant SE impact potential.

• Identification of further research needs

FP5 has marked a significant change compared to previous FPs by strongly advocating a major switch from research driven by knowledge-increase objectives to research driven by problem-solving objectives. To a large extent, the visibility of the SE value of research activities in FP5 depends on the degree to which the various programmes and Key Actions have adapted to the problem-driven philosophy. The distinction between top-down and bottom-up approaches (see above) is directly relevant here, as it can be assumed that the former have adopted the new principles more readily.

In terms of output evidence, however, measuring project performance in identifying future research needs would, once again, require a major effort in individual project review.

4.2.2 Quantitative assessment

This is by far the most ambitious component of the proposed assessment scheme, and it must be acknowledged that the difficulties in proceeding are such and so numerous that it is extremely difficult, at this time, to provide usable evidence. For historical reasons, quantitative assessments have mainly been developed in the framework of the energy and environment research programmes (EESD), the need for a scenario on energy consumption or on emissions of pollutants being particularly important for policy definition in these areas; macro-economic and sectoral impacts, cost-effectiveness analysis or cost-benefit analysis of policies and measures, and monetary valuation of damages are areas for which tools have been developed and are currently being used. Nevertheless, the recourse to such impact assessment methods and tools is far from generalised across FP5 programmes and Key Actions, and much remains to be done in this perspective.

The main reasons behind this statement of facts are both conceptual (complexity of the matter, orientation of the SE research towards more social and qualitative aspects, difficulty in measuring research and innovation impacts), and technical (tools and data availability). However, it must be stressed that significant efforts have been made within FP5 to develop specific methods and tools for impact assessment in general. As requested by the Göteborg Council, impact assessment activities carried out in recent months within EESD have allowed the basis for a generalised assessment platform to be set down, particularly in the area of sustainable development and climate change.

Overall, the ideal assessment framework that was devised at the outset[6], while retaining its theoretical validity, cannot be appropriately documented at this time. Later in this report is a section outlining basic proposals to improve the impact assessment prospects in future FPs.

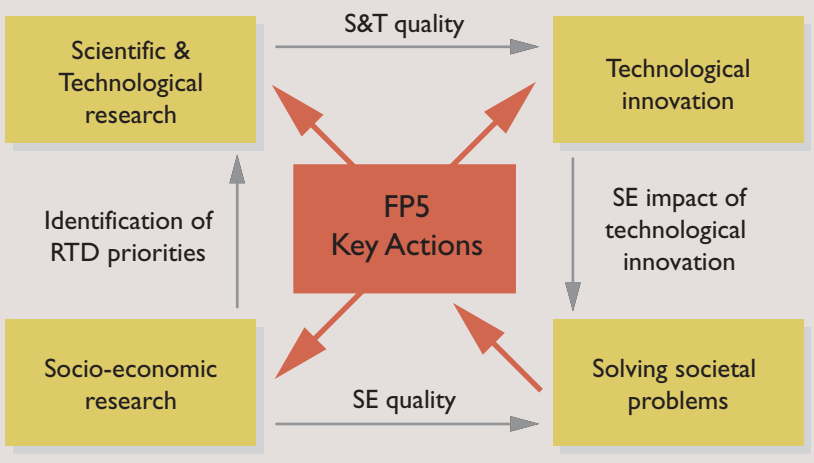
[6] *See Annex 3*

5. Discussing the SE-dimension of the main FP5

Drawing on the above, Figure 3 below provides a schematic representation of the main components of an ideal assessment framework, and of how FP5 appears to fit into such a picture. Socio-economic research plays a dual role therein: on the one hand, it increases and improves the body of knowledge in SE sciences (sociology, economy, political sciences, law, etc.), thereby directly contributing to solving societal problems through a better understanding of SE phenomena and the identification of tools and methods to address them. On the other hand, it helps in translating societal needs into RTD requirements, therefore feeding directly into the identification of research priorities. In turn, scientific and technological research (sometimes referred to as *hard research*) has the responsibility of producing the innovation required to generate the most effective technical response to societal needs. At the outset, it is important to note that FP5, through its various Key Actions, is explicitly addressing all the components of this assessment framework. Moreover, based on the "problem solving prescription" inaugurated with FP5, the work programmes of the various KAs can be traced back directly to the identification of societal needs. In fact, adopting the problem-solving prescription immediately leads to recognising that the scope of socio-economic research extends beyond the traditional SE disciplines (sociology, economics, political sciences), as it must also drive innovation in policy practice. In turn, this can only be achieved through multi-disciplinary efforts embracing both technological (hard) and socio-economic (soft) research, and seeking the active involvement of practitioners and stakeholders in RTD projects.

However, as referred to repeatedly in previous sections, the overall approaches to SER development and evaluation, and the corresponding availability of information are highly heterogeneous from one programme to another. This applies to all assessment components (i.e. both qualitative and quantitative, inputs and outputs). As a result, it is highly dangerous to venture into a comparative assessment. The bulk of the review illustrated in the sections below therefore follows a case-by-case logic.

Figure 3: Socio-economic assessment of RTD

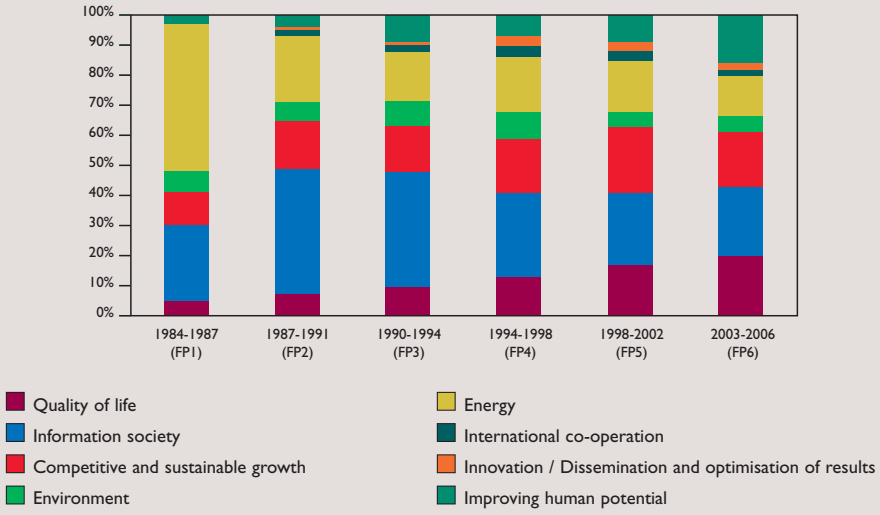


Programmes and Key Actions

Evolution of priorities of RTD Framework Programmes

Since the implementation of the first European RTD Framework Programme in 1984, the research effort allocated to priorities has made substantial progress in some research areas. The figure below indicates the evolution of the priorities since FP1, distributed along the research areas and priorities of FP5[7]. It shows that during the 1990s right up to today, the relative shares of the "*Improving the Human Potential*" activities with an inherent prevailing SE emphasis, increased considerably.

Figure 4: Evolution of Priorities of RTD Framework Programmes



[7] **Note:** *In preparing this graph, as many elements of the FP6 budget as possible have been broken down and regrouped along the main lines of FP5. It has not been possible to perform this exercise for certain activities of a horizontal nature, therefore the equivalent budget elements have not been taken into account.*

5.1 Improving the Human Research Potential and the socio-economic knowledge base (IHP)

5.1.1 Overall

The IHP programme is implemented through a variety of actions which can be structured in three main categories:

- Improving socio-economic knowledge and support to the development of S&T policies;
- Training and mobility of researchers, promotion of scientific excellence, and raising public awareness of S&T; and
- Access to research infrastructures.

As regards the first main line of actions, whilst for most other programmes and Key Actions (KA) the challenge is to identify research that *induces SE changes*, the KA Improving socio-economic knowledge base (KA/SE) is *about SE research*. The difference is conceptually straightforward: socio-economic methods, tools and issues are the central object of IHP-KA/SE, while in the other programmes they are instrumental, or consequential, to research activities that aim primarily at developing innovation in other areas (mainly scientific and technological).

Therefore, the main outcome from IHP-KA/SE research should be an advancement in SE sciences, in the form of increased and improved availability of concepts, structures and, in general, knowledge, in disciplinary areas such as sociology, political sciences, economics, etc.

When analysing the SE *dimension* of IHP-KA/SE (the inputs), it makes sense therefore to assume that all research funded under this programme has a prevailing, or even exclusive SE content. This obviously does not amount to concluding that all research in IHP-KA/SE has measurable SE *impacts*. Ultimately that will depend on the quality of research, and therefore on its capability to produce innovative added value.

5.1.2 The KA Improving the socio-economic knowledge base

This KA has awarded research contracts for 165 MEuro throughout FP5, which represents approximately 13% of the IHP programme's total budget. For this KA, it is indeed fair to consider that 100% of the research carried out is devoted to the advancement of SE sciences. The focus is primarily on social sciences, with a lesser emphasis on quantitative analyses. The main key thematic areas forming the basis of research supported by the IHP-KA/SE are very explicit in this respect, and refer to:

1. Societal trends and structural changes
2. Technology, society and employment
3. Governance and citizenship
4. New develop models fostering growth and employment

In the last call for proposals for the Key Action, preparing the research community to function effectively within the ERA was a key concern in facilitating the transition to FP6, in particular to help the researchers to prepare the ERA. In this respect, proposals were requested to:

- increase the impact of existing Community and national research activities on the development of the European Research Area;

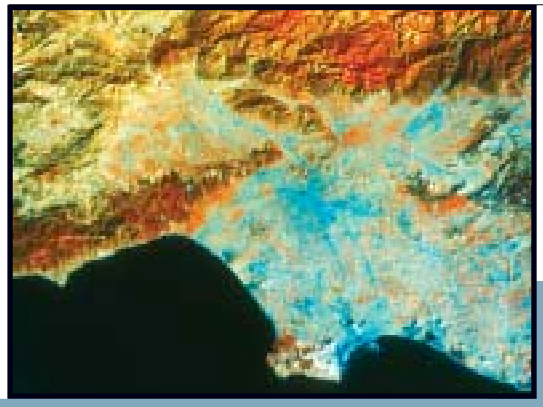
Fighting social exclusion with Geographical Information Systems and the Digital City

The development and use of digital information and related handling technologies are key themes in FP5, and a major feature of all policies related to the development of the Information Society, such as, for example, the e-Europe initiative launched by EU heads of state at the Lisbon Summit in 2000.

The GIS Data project, funded by the IHP programme, organises two High Level Scientific Conferences on the development of these technologies in European cities. Urban areas are recognised both as the loci for EU innovation and development and as milieux in which pockets of high technology, innovation and wealth sit side by side with those of social exclusion and deprivation. The use of spatial information and communication technologies to support public participation, as well as understanding social processes and targeting policy, are key areas of research that transcend national boundaries and require an all-European approach to minimise social divides and maximise regional cohesion.

In this context, GIS Data organises two major conferences. The theme of the first is the Digital City, focusing on the use of advanced representation technologies to enhance the quality of urban management and promote greater public participation. The second conference concentrates on the use of geographic information systems for health and the environment. It focuses on the opportunities created by GIS to link health events to the social and physical environment in which they take place, thus increasing the effectiveness of both needs assessment and service-provision targeting.

GIS Data was initiated in 2001 under the coordination of EURESCO, the European Science Foundation. It has allowed the involvement of some 140 participants from a variety of disciplinary fields.



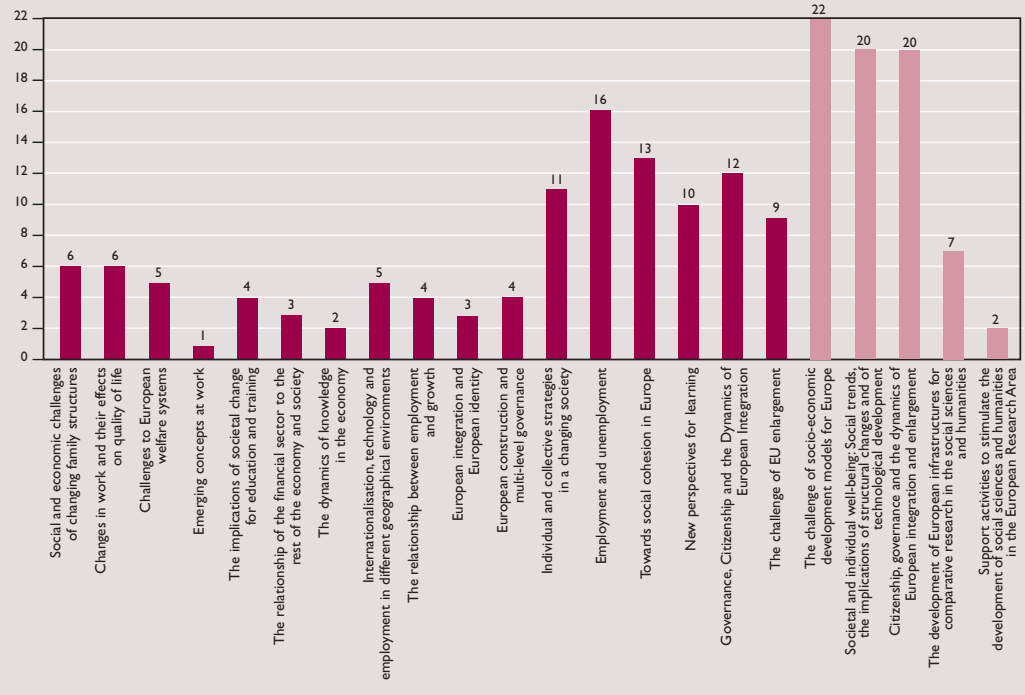
- increase the efficiency of the social sciences and humanities in the European Research Area; and
- structure the social sciences and humanities in the European Research Area.

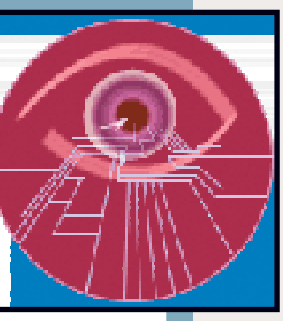
Many of the projects funded in 2002 constitute an important step towards the ERA, and some are particularly outstanding in this respect.

The total number of funded projects (research projects, thematic networks and accompanying measures) from the Key Action is 286, which corresponds to almost 20% of the total number of projects within IHP, and implies that the average size of projects in the KA (ca. 0.55 MEuro) is more than double the size of the average IHP project (slightly less than 0.2 MEuro). This is easy to explain in view of the peculiar nature of the other IHP activities (see Figure 5). Overall, however, as will be seen in later sections, this average size of less than half a million Euro is well below the size of the average FP5 project as a whole, mainly because SE research is largely of the *soft* type, whereas research in other programmes and KAs entails a significant amount of expenses (and investments) in hard sciences, where the purchase and/or development of a variety of equipment, tools and technology-related services that are highly capital-intensive often weigh heavily in the overall project budgets. In fact, it could be deduced from this observation that an additional criterion to help identifying SER could be the capital intensity of projects and activities.

Furthermore, today in the field of social sciences and humanities, the research is largely carried out at the national level, often by individual researchers. Thus, the scientific Community in social sciences and humanities has limited experience in entering into partnerships within large consortia and, consequently, in the perspective of FP6, the challenge for social sciences and humanities to use the 'new instruments' (Integrated Projects and Networks of Excellence) for SER will, in principle, be greater than for other sciences.

Figure 5: Number of contracts in the Key Action between 1999 and 2002, distributed by topic





5.1.3 Support for the development of scientific and technological policies

Two main initiatives (STRATA "Strategic Analysis for specific political issues" and CBSTII "Common Basis of Science, Technology and Innovation Indicators") have received a total of 25 MEuro from FP5. As for the KA Improving the socio-economic knowledge, it seems fair to consider that 100% of this amount is directly relevant to SE topics.

5.1.4 Supporting training and mobility of researchers

5.1.4.1 Marie Curie fellowships

This action (and those that follow) is one of the few for which a comprehensive project-encoding system, based on a disciplinary classification, has been devised and is consistently applied[8]. Altogether within FP5, fellowships amounting to a total of 858 MEuro (ca. two-thirds of the entire IHP budget) have been awarded by this action. However, based on the above-mentioned disciplinary classification, it appears that only some 10% of this amount relates directly to SE sciences, while the vast majority of fellowships have been awarded within the so-called hard sciences. In the ca. 300 fellowships relating to SE sciences, the balance between economics, on the one hand, and other social sciences, on the other, is approximately the same, while within the latter the majority of grants have been awarded to political sciences and psychology.

5.1.4.2 Research Training Networks (RTN)

This action is directed towards supporting the training of young researchers within the frame of a high-level research and training project carried out by an international research consortium. The current average level of funding is 1.5 MEuro, the bulk of which (60%) must be spent on the appointment of young researchers. Similar to the Marie Curie fellowships, the share of SE-related funding is ca. 9% of this action's total budget. With 30 SE-related RTN projects being funded throughout FP5, and a corresponding budget of about 41 MEuro, more than 7 500 person.months of training will be offered to young researchers in this area. As much as 60% corresponds to economics and management science, followed by law, sociology and psychology. It should be noted that, as for all other IHP actions, no pre-set share of the budget is earmarked by disciplines.

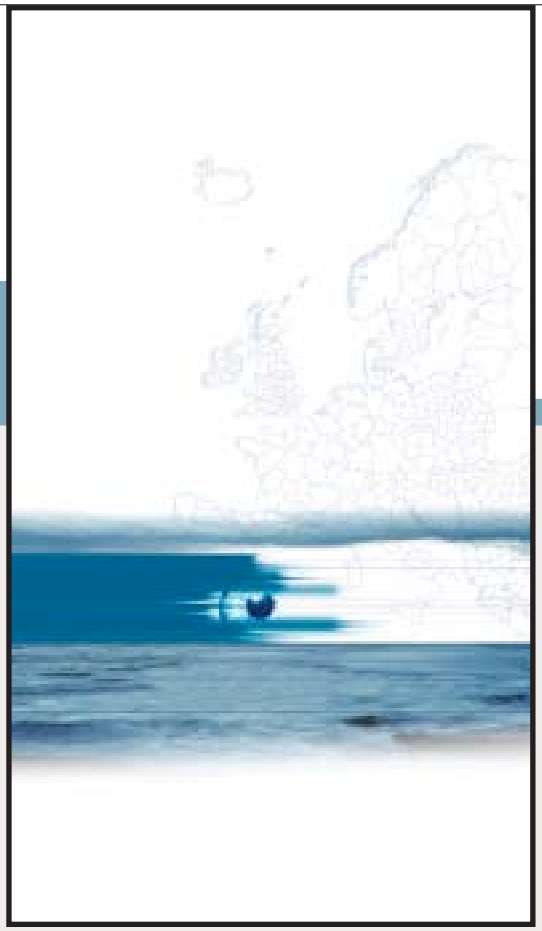
[8] *See Annex 4*

Promoting regional development best practices through the exchange of experiences

Experience in regional development and consequent successful best practices in one community can be 'transferred' to another community in order to enhance knowledge and improve the skills of its policy-makers and the other stakeholders or players who deal with regional development as a whole.

The aim of the thematic network **FOREN** (*Foresight for Regional Development Network*) – funded under IHP's STRATA – is to gather together two communities of policy research, one on foresight activities and the other on regional development. The network aims to create a forum where participants can interchange experiences of "best-practice approaches" in the two fields, and bridge the existing gap between their respective communities. The final aim is to identify "good practices" which could be used to guide and inform specific Foresight activities at regional level in different parts of Europe. The project is intended to generate knowledge, and to lay foundations for concrete pilot projects, between policy researchers, policy-makers and other players.

The project website http://foren.jrc.es features a practical guide to regional foresight, as well as other useful documents on the successful implementation of "networked regions through foresight".



5.1.5 High Level Scientific Conferences

This action has a total budget of 35.5 MEuro within FP5. Given the nature of the projects, the average amount of funding awarded to successful proposals is below 60 000 euro. When it comes to SE representation, the rate is higher than in the previously described actions, and reaches ca. 20% of the total (projects with a prevailing emphasis on SE sciences). This corresponds to 118 funded conferences, of which 39 (ca. one-third) focus exclusively on SE sciences, while the other 79 also address non-SE disciplines. Within SE-related conferences, the top-ranked discipline (budget-wise) is law, receiving almost 20% of the total funding, followed by political sciences (ca. 13%).

5.1.6 Raising public awareness in S&T

Stimulating knowledge and interest in science

The will to enhance knowledge is both a challenge and an exciting element of the world of science to young people around Europe. Science and technology, stimulating interest in scientific research, simple or complex, is the core target of a six-day event held in November 2002 – funded as an accompanying measure under the IHP *Raising public awareness of sciences and technologies*.

This event, known as **European Science and Technology Week**, aims at rekindling scientific education, providing a beacon for the future of science and technology in Europe and beyond. Through thought-provoking activities and a pan-European approach, the European Science and Technology Week's mission is to create a totally new perspective on science. The emphasis is on *showing* Europeans how science and technology affects them, from the simplest gadgets to the most sophisticated satellite technology and how it can be used to improve our lives, lifestyles, and our living world.

The website of this project, http://www.cordis.lu/scienceweek/home.htm selected in 1999, provides a more accurate description of a whole range of activities scheduled throughout Europe during that week (4-10 November 2002).

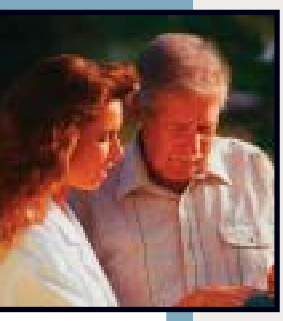
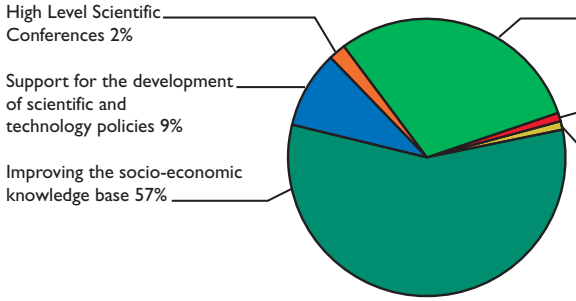


Figure 6: Socio-economic related activities within the IHP Programme



% of funded SER out of the overall SER budget of the IHP Programme and according to classification of RTD topics by discipline

5.1.7 Enhancing access to research infrastructure

Funds to enhance the access to research infrastructure (RIS) are available in most FP5 programmes. IHP has committed ca. 180 MEuro, representing more than 30% of the total FP5 spending in this field. Three main strands of activities are considered, namely:

a) transnational access to major RIS, which aims at opening-up national facilities to transnational users and alone covers almost two-thirds of the total expenditure in this action (in terms of both budget and the number of funded proposals);
b) RIS RTD projects, to develop new technologies for the enhancement of existing RIS (RIS construction and operation are not eligible and must be funded by national authorities), representing some 25% of the total expenditure; and
c) infrastructure co-operation networks, whose purpose is to bring together infrastructure operators and users, has been awarded ca. 8% of the overall budget.

Discipline-wise, a user survey has shown that SE sciences have very little prominence in the overall picture, with as few as 2% of those interviewed users actually involved in SER, whilst the lion's share goes to physics (almost 50%) and other hard sciences. Again, the same remark as made above on the low capital intensity of SE research provides a sensible although gross explanation of this imbalance.

The graph above summarises the SE dimension of the IHP Programme. It shows the contribution of each main line of actions out of the overall SE-related budget of the IHP programme (ca. 288 MEuro) by taking into consideration SER-related activities and the classification in relevant disciplinary areas such as sociology, political sciences, economics, etc.

5.2 Quality of Life (QoL)

The very title of the QoL programme is a clear indication of the direct SE relevance of research undertaken therein. In fact, in the rough definition proposed above in Section 4, *improving the quality of life* appears as the ultimate common goal of all SE research. It does not come as a surprise, therefore, that SE-relevant projects are found in all programme Key Actions, whether they concern food, nutrition and health, the control of infectious diseases, cellular biology, the relationship between environment and health, the future of agriculture, fisheries and forestry, or the impact of an ageing population.

On the other hand, within the Generic Activities the QoL programme includes a specific section (Action line 13) dealing exclusively with SE issues. The three main headings within Action line 13 are very explicit in this regard, as they refer to:

- 13.1 Development of indicators and knowledge bases relevant to public policy-making (RTD strategies/technology forecasting/perceptions of new technologies)

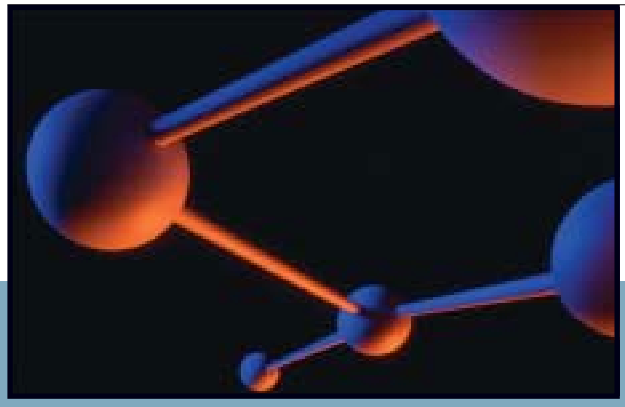


Table 2: Number of QoL projects with high SE relevance		
Key Actions		
KA1	Food, nutrition and health	11
KA2	Control of infectious diseases	22
KA3	The cell factory	17
KA4	Environment and health	12
KA5	Sustainable agriculture, fisheries and forestry. And integrated development of rural areas including mountain areas	14
KA6	The ageing population	33
RTD activities of a generic nature		
Area 10	Public health and health services research (including drug-related problems)	19
Area 11	Research related to persons with disabilities	3
Area 12	Bioethics	17
Action line 13	Socio-economic studies	10
Total		**158**

Optimising marrow donors' registries: a socio-economic evaluation

Although 6 million potential donors are registered worldwide, finding a donor compatible for allogenic stem cell graft is hard because of HLS polymorphism. The **MADO** project (*MArrow DOnors*), funded within Action line 13 of the QoL programme, aims at optimising marrow donors' registries in Europe by increasing the proportion of donors with rare HLA types in order to reduce inequality among patients in a cost-effective way. The main concept is an evolving filter to screen potential donors, at low cost, before full HLA typing for the likely presence of frequent types, using new markers and techniques. MADO will then design organisational scenarios.

MADO is an outstanding example of a multi-disciplinarity research effort, involving sociologists, economists, public health units, immunogenetics/molecular laboratories, bioinformatics and industry. Its overall achievement will be the development of a number of well-documented possible scenarios to support the information of coherent strategies for registry management.

MADO was launched in 2002 under the coordination of INSERM (Toulouse, France).

- 13.2 Managing technology in society (impact of genetic information/health technology from a societal viewpoint/implications of new technologies for policies)

- 13.3 Analysis of social and economic driving forces and of new opportunities in the bioindustries (impact of life sciences and technologies on industrial and economic growth/competitiveness and job creation/innovation systems/intellectual property rights/availability of investment capital and human resources/regulations).

In the absence of specific, commonly agreed criteria to weigh the SE dimension of RTD, it is once again highly hazardous to venture into quantitative assessments. However, a review of the programme's achievements provides a number of useful indications.

Within the six Key Actions (see Table 2), some 160 projects have been identified as particularly relevant in terms of their SE dimension. The total budget for these projects amounts to ca. 200 MEuro, representing approximately 10% of the total QoL budget (2.200 MEuro). This figure includes the ten projects funded within Action line 13, for an approximate total budget of 10 MEuro. It should be noted that the latter have been selected from 61 proposals received throughout FP5, pointing at the relative weakness of this research area, both in terms of the overall number of proposals and, equally importantly, in relation to the quality of the proposals received (whereby the success ratio is as low as 1 in 6, i.e. well below the current averages of most programmes and KAs).

As was highlighted by the programme managers and by the evaluators themselves, there are several reasons for this mitigated response, including the implicit competition of Action line 13 with the IHP programme and with other KAs and Action lines within QoL itself, with particular regard to Action line 10 (Public health and health services) and Action line 12 (Biomedical ethics and bioethics). While this multiplicity of entry points should be seen as an intrinsic quality element of the programme, it would appear that it has created a certain degree of confusion within the research community, leading to uncertainties in the identification of the best channel to submit proposals offering an integrated balance of pure and applied sciences. Evaluators stressed that the work programme formulation only provided very generic guidance and that, in general, the information provided to the RTD community proved insufficiently convincing. These weaknesses are possibly also responsible for the relatively low quality of the proposals themselves, whereby a frequent feature was found to be a lack of in-depth methodological inputs (reflecting the overall uncertainty of the objectives).

Enhancing the quality of life of European haemophiliacs

The appraisal of the quality of haemophilia care in Europe, in order to enhance the quality of life of European haemophiliacs and to estimate the costs needed to attain this higher quality, is the goal of the *European study of clinical, health economic and quality of life outcomes in haemophilia treatment* project. It involved about 2 040 patients who were recruited from haemophilia comprehensive care centres from 22 countries, in order to perform an in-depth evaluation of issues relevant to haemophilia care.

The overall work consists of a QoL study, cost-of-illness, cost-effectiveness and cost-utility analysis to ascertain total costs due to haemophilia, to compare alternative treatments, and to determine patients' preferences. Subsequently, haemophiliac patients of four years' standing will be classified according to a range of characteristics, including the severity of haemophilia, presence of inhibitors, and treatment schemes. Clinical and health economic data are assessed at the baseline and prospectively over a six-month follow-up period. In addition, the patients are required to fill in a diary during the follow-up period.

A contribution of 1 828 840 Euro has financed the teamwork, involving several institutions and universities from all over Europe, and coordinated by the Ludwig-Maximilian-University in Munich, Germany.

5.3 Competitive and sustainable growth (GROWTH)

All Key Actions (see also Table 3) within the GROWTH programme have a strong and immediately perceivable SE relevance: innovation in company organisation has an impact on the quality of the working environment, the health of the workforce, their quality of life and ultimately their welfare; the design of new production processes, along with the development and use of new materials, inducing a reduction in pollutant emissions and a more rational use of natural resources, while product innovation (safer consumer products, cleaner vehicles, etc.) directly targets people's needs and improvements in their quality of life, as well as through the promotion of changes in consumption patterns.

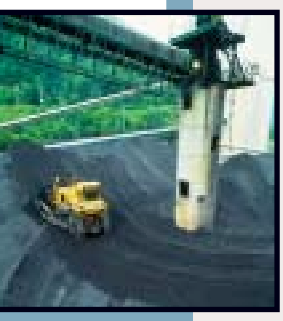
Within the GROWTH programme, research is being conducted by various units in different Directorates-General (DG) of the European Commission. In particular, it should be noted that both DG Research (RTD) and DG Transport and Energy (TREN) are involved, and their overall approach to the design, evaluation and monitoring of research activities differs markedly (as discussed below). Direct quantitative analysis is impossible due to the overall lack of specific SE-related data.

One measure of the importance of the SE dimension in the GROWTH programme could be drawn from the results of the project evaluation process. Across the programme, the average evaluation score for the seven socio-economic criteria (see Table 4) is almost identical to that awarded to the other eight criteria (RTD quality, management,

Table 3: The SE relevance of the Growth Key Actions

KA1 Innovative products, processes and organisation	SE objectives are closely related to industry's competitiveness, the reduction of material content, the increase in service value, the development of innovative, safer, cleaner and less natural resource-intensive processes and products-services. The development of new methods for organising production aims at the improved use of human resources and at the improvement of quality of life at work.
KA2 Sustainable mobility and intermodality	Policy-driven KA, reconciling increased demand for transport and the need to reduce the transport intensity of economic growth, and thus the impacts on the physical, social and human environment. It is designed to involve all stakeholders concerned with the process of enhancing the value of innovation (new technologies, services, concepts and policies).
KA3 Land transport and marine technologies	Within the overall ambition of devising and implementing the future concept and means to consolidate European competitiveness in the transport technology area, the measurable SE impacts of this KA are linked to significant reductions in energy consumption and emissions, as well as to large increases in overall safety, reliability and accessibility.
KA4 New perspectives in aeronautics	While striving to strengthen European competitiveness in the aeronautics sector, this KA puts considerable emphasis on the sustainable growth of air transport, with particular regard to environmental and safety issues. A major challenge is in ensuring that SMEs can play a visible role, with all the SE implications this entails in terms of employment and quality of the working environment.
Generic activities: "Materials" and "Measurement and testing"	The main target is the development of advanced materials applications to improve quality of life, safety and reliability of products, along with the testing methods and data required to define and assess performance thereof.
Accompanying Measures	They play a significant role in ensuring the effective implementation of RTD projects, through *ad hoc* studies for the adaptation of objectives and priorities, the assessment of impacts, as well as a wide variety of coordination initiatives and the preparation of future initiatives. The prevailing focus is on technological objectives. However, some projects are studies of a prospective nature with a mainly socio-economic focus, and KA1 alone has spent some 10 MEuro on 15 such SE studies throughout FP5.

resources, etc.): 3.63 for the former, 3.7 for the latter (5 is the maximum score in both cases), reflecting the comparable level of emphasis that both the research community and the evaluation teams have assigned to SE, on the one hand, and to technical objectives on the other. Furthermore, evaluators have recognised technical excellence in ca. 70% of projects ultimately funded (i.e. a score of 4 or 5 assigned to the corresponding criteria), while SE excellence was awarded to almost half of those projects, which confirms the expected prevailing role of technological innovation without dwarfing the importance of SE potential impacts.



Two significant examples are KA1 (Innovative products, processes and organisation) on one hand, and KA2 (Sustainable mobility and intermodality) on the other. Although they both conform to the problem-solving prescription, their approaches differ:

- KA1 follows a bottom-up approach in programme design, but nevertheless fully and explicitly recognises the importance of SE objectives and of the link between research activities and expected societal changes. While the ultimate SE objectives therefore systematically underlie the definition of research priorities, programme design appears to follow a science and technology-related pattern. In the absence – so far – of end results from FP5 projects (which started in late 1999 at the earliest), a qualitative appraisal of SE relevance is provided by the outcome of evaluation

Table 4: Evaluation criteria in FP5

Scientific/technological quality and innovation

1. The quality of the research proposed;
2. The originality, degree of innovation and progress beyond the state of the art; and
3. The adequacy of the chosen approach, methodology and work plan.

Community added value and contribution to EU policies

4. The European dimension of the problem
5. The European added value of the consortium
6. The project's contribution to the implementation or the evolution of one or more EU policies.

Contribution to Community social objectives

7. The contribution of the project to improving the quality of life and health and safety
8. The contribution of the project to improving employment prospects
9. The contribution of the project to preserving and/or enhancing the environment.

Economic development and S&T prospects

10. The possible contribution to growth
11. The strategic impact of the proposed project and its potential to improve competitiveness
12. The contribution to European technological progress.

Resources, Partnership and Management

13. The quality of the management and project approach proposed
14. The quality of the partnership;
15. The appropriateness of the resources.

Improving the safety and environmental cost-effectiveness of mine waste treatment

Mining has been a principal industry in Europe for thousands of years and continues to provide growth potential and associated socio-economic benefits. The safe and environmentally sound storage of process wastes in the tailings facility (TSF) is an important cost for most mining projects, both during operation and after closure. Recent EU Landfill Directive COM (93) 275 is currently being adopted by regulators and, potentially, TSF will represent a high proportion of capital expenditure at start up and significant liability post closure.

The study, called CLOTADAM (Treatment of mine waste to achieve cost-effective engineered closure of tailings dams), aims to develop technologies that can be incorporated into the operational phase to achieve cost-effective tailings closure systems. In some cases the closure of a TSF may represent more than 50% of the overall closure cost. It is expected that the employment of cost-effective closure technologies may reduce costs by at least 15%. The potential savings have been estimated at 1.2 billion euros in the EU region.

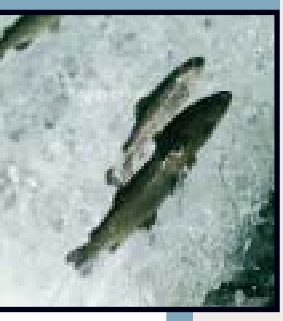
The project was launched in September 2002 and is coordinated by the British company Knight Piesold Ltd, together with two Greek, one Romanian and one Polish universities and businesses. The results are expected to be disseminated in late 2005.

Table 5: Industrial technologies

Projects with a strong socio-economic (SE) dimension

Examples of ongoing GROWTH projects (mainly KA1) in Industrial technologies with an outstanding scoring in the three "Community and social criteria" (improvement of quality of life, health and safety; improvement of employment prospects; preservation and enhancement of the environment), as evaluated by external experts:

- Rethink the construction process through extensive research into drilling for the execution of foundations, in order to reduce the potential of buildings to pollute groundwater resources (TOPIC);
- An end-of-cycle approach enabling the industry a wide non-destructive dismantling process, increasing the ability to separate toxic and dissimilar components and materials economically (ADSM);
- A novel alternative lead-free welding technology, using simple and low-cost materials, to meet forthcoming legislation (DROPLET WELD);
- Technologies for cost-effective storage of process wastes in the mining industry. They will support its competitiveness and its employment capability, and observe new environmental directives (CLOTADAM);
- Major improvements in air-quality control and wastewater treatment on industrial sites by using several technological innovations (YTRID);
- New and non-toxic processes, avoiding the use of cancerigenic materials in chromium coatings, and providing guarantees to employees and the environment for engineering industries, aeronautic, steel and paper-makers (ECOCHROM);
- Provide an environmental friendly surface treatment (remote plasma), simultaneously answering wear and corrosion problems, to replace hard chromium plating which is very polluting and represents 50% of total coatings in a 150-billion-euro EU market (PLASCO);
- Protect and ensure water quality by increasing marine fuel efficiency by up to 30% using an innovative underwater hull-cleaning process (CLEANHULL);
- Shift from wet chemistry to dry-gas-phase chemistry, minimising use of chemicals, water, energy and waste production for the manufacturing of tissue products with enhanced properties and human contact friendliness (ECOTISSUE);
- Low-cost high-performance ductile cast iron for lightweight design of automotive components, achieving total weight reduction of 120 000 T/year and fuel consumption reduction of 0.6 litres per 100 km (DILIGHT);
- Strategies and methods to detect and quantify mammalian tissues in feeding stuffs through the availability of new tools (DNA technology, near-infrared), in application of a Commission decision for consumer protection (STRATFEED);
- New medical imaging system for nuclear medicine, performing clinical analysis in real-time (cardiology and oncology), minimising the radiation dose and performing successive analyses over a short time period (CaRDIS).



Air-quality control and wastewater treatment

Overcoming drawbacks of both conventional and advanced technology for air-quality control and wastewater treatment is the core target of the project called YTRID (Remediation of aqueous and gaseous waste streams using pulsed corona discharge in heterogeneous media).

This RTD claims the following major innovations will be implemented: the use of a pulsed corona discharge in heterogeneous media for creation of highly reactive non-thermal plasma on a large scale; development of an efficient and affordable nanosecond, high-power pulsed power supply (PPS); and the enhancement of the chemical efficiency of the plasma process through additional pre-treatment enriching pollutant content in the stream.

The technology will be developed by a consortium consisting of the most competent partners for this multi-disciplinary mission, and will be tested by the end-user partner on real wastes.

The project was launched in June 2002 and is coordinated by the Israeli firm Soreq Nuclear Research Centre, and includes three additional German research institutions and two Belgian and one Dutch private companies. Results are expected to be achieved in 2005.

exercises carried out during project implementation. For example, the assessment of the External Advisory Group (EAG) for KA1 pointed out that the problem-solving approach has helped European researchers to extend their interpretation of research activities beyond the purely technical level, e.g. by coupling technological solutions with societal and economic approaches. The EAG considered that the programme evidently contributes to a greater sustainability and quality of life by promoting new technologies and materials capable of producing goods that are safer, faster, more reliable, recyclable or biodegradable, cheaper, less polluting, and consume less energy.

- On turning to the KA Sustainable mobility and intermodality, a different picture emerges: DG TREN, which is in charge of this KA, has adopted a fully top-down approach, and has done so since FP4. As a result of the policy-oriented nature of the DG, transport research programmes were designed at the outset to address previously identified policy goals. A clear sign of this approach is provided by the very structure of work programmes, where each individual task is directly related to a policy objective, and the specification of the problem(s) to be solved is explicit and unambiguous. While this can be seen as imposing a limitation on the creativity of research teams, who are basically left to demonstrate that they have the scientific and technical capability to carry out the required task, it certainly ensures that the expected SE issues are addressed. In terms of SE relevance, this leads to a fairly simplistic – although straightforward – conclusion, whereby ALL research funded under this KA should be considered as directly SE relevant in terms of expected *impacts*. On the other hand, this does not mean that a similar statement is applicable to the SE dimension of research carried out in KA2, as a majority of projects (whether in terms of project count or budget-wise) focus on technological developments, and the SE *input* to these projects is negligible, if any. A further signal of the emphasis given by this KA to SE issues is the abundant recourse to Accompanying Measures (AM) and Thematic Networks (TN): of a total budget of 871 MEuro, ca. 30-35% has been used in FP5 to fund AMs, and 15-20% is assigned to TNs. However, it should be noted that DG TREN uses the AM instrument to fund activities that

Preparing pricing reform in the transport sector

Transport is responsible for a large share of uncovered environmental and other social costs, which are not reflected in current prices and are borne by society at large. The EU has initiated an ambitious process of pricing reform, with the aim of increasing the fairness and efficiency of the charging and taxation mechanisms associated with the use of transport infrastructure.

The immediate priority of this reform is to introduce new pricing schemes in the freight transport sector, where the systematic internalisation of external costs is expected to produce significant shifts in modal demand from road to other, more environmentally friendly modes, and therefore contribute to easing congestion and other negative impacts associated to the prevailing use of roads.

RECORDIT *(Real Cost Reduction of Door-to-door Intermodal Transport)*, funded within the FP5 Key Action Sustainable mobility and intermodality, has developed a comprehensive accounting framework of freight transport costs in order to understand the mechanisms of cost and price formation, and to identify policy options to reduce intermodal costs while promoting the increasing recourse to sustainable transport solutions. By comparing the external costs of freight transport with the taxes and charges currently paid by the users, RECORDIT provides direct input into the formulation of pricing reform.

RECORDIT was launched in 2001 under the coordination of ISIS, Institute of Studies for the Integration of Systems (Rome, Italy).

The project has been instrumental in the formulation of the new MARCO POLO programme which will grant Community financial assistance to improve the environmental performance of the freight transport system.

are, in a significant number of cases, research projects in their own right. On the other hand, TNs are systematically geared to the enhancement of previous research, and to the establishment of mechanisms to ensure that the research results are transferred into policy and practice. Significant examples are found in various policy areas with an obvious and highly visible SE impact, such as for example the pricing of transport infrastructure use, the strategic environmental assessment of transport investments, the identification and promotion of best practices in urban transport system reforms, etc.

Improving passenger safety in private road transport

In the EU, approximately 20 000 coaches weighing more than 5 000kg are involved in accidents resulting in personal injuries. Every year more than 35 000 people are injured in these accidents. Over 250 occupants of buses and coaches suffer fatal injuries annually. During recent years no trend towards any significant reduction has been observed.

The general objective of the ECBOS (Enhanced Coach and Bus Occupant Safety) project is to generate new knowledge, based on accident studies, in order to minimise the incidence and cost of injuries caused by bus and coach accidents. This target will be achieved by developing cost- effective test and evaluation methods for assessing the protection offered to the bus passenger and driver in frontal, side and roll-over accidents.

Emphasis will be put on a wide range of passengers' weights, including children. M2, M3 and city buses will be investigated. The project will finally produce a European bus accident database, written regulations and suggested test methods. Coordinated by the Technical University of Graz, Austria, ECBOS is scheduled to be completed in December 2002.

5.4 Information Society Technologies (IST)

A large part of the IST programme addresses major societal and economic challenges directly. The Key Actions where this effort is more visible are:

- KA1: Systems and services for the citizen
- KA2: New methods of work and electronic commerce
- KA3: Multimedia content and tools

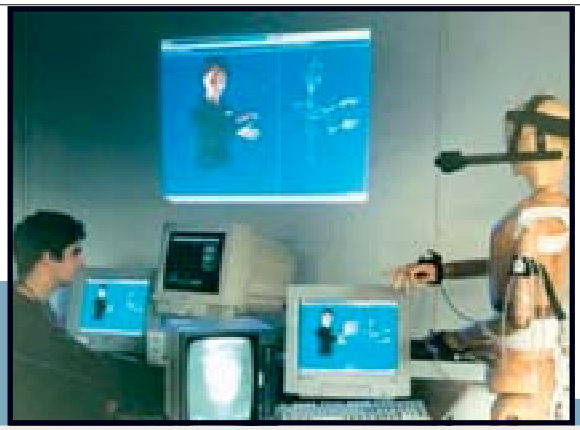
which globally represent almost 50% of the total programme budget (i.e. over 1.75 MEuro of a total of 3.6 MEuro for IST as a whole).

A major innovative effort has been deployed in FP5 to integrate socio-economic research with technological RTD, which reflects on both the overall strategy and the practical structure of the programme, at three different levels:

a) At project level, key socio-economic themes are directly addressed in many projects, with subsequent input provided by project findings to policy formulation (e.g. Commission Communications on subjects such as the security of networks, the accessibility of information services, etc.);

b) At KA level and, in addition to the SE dimension of individual RTD projects, the IST work programmes also include specific Action lines explicitly dedicated to research on SE topics. In fact, the SE ambition of the IST Key Actions was made clear at the outset: quoting from the KA 2 work programme, "*this Key Action requires a strong interplay between the technical, economic, social and legal issues. Integrated socio-economic and technological research is therefore necessary to monitor and assess the development and impact of new technologies [...]*";

c) Finally, at the programme level, two Cross-Programme Action lines (CPA) were introduced to deal with, respectively: i) Socio-economic research on issues cutting across the IST programme, and ii) Research on statistical tools, methods and indicators for the Information Society.



Accordingly, and cutting across the various research streams, a number of major thematic areas have emerged where explicit socio-economic research is being carried out, namely:

- Industrial organisation
- Legal and regulatory aspects
- Work and employment issues
- Regional aspects
- Corporate social responsibility
- Statistical indicators.

Altogether, the IST programme has funded about 60 individual projects (throughout FP5) in which the SE dimension prevails.

However, in light of the above-mentioned effort to systematically seek the integration of technological and SE research, it would be largely reductive to consider that the total SE effort of the programme is limited to these projects, while a quantification of the total SE dimension is impossible.

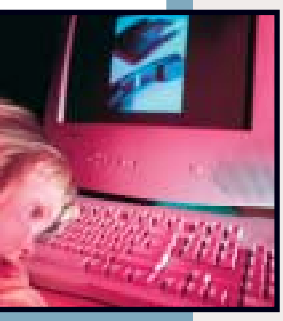
Beyond project work, the IST programme has actively contributed to a number of high-profile events and initiatives focusing on strategic SE priorities, such as the launching and implementation of the eEurope 2002 initiative and 2005 Actions Plans, and the Romano Prodi conference on eEconomy.

New tools for sign languages for the deaf

Technology research into sign languages for the deaf has evolved during the last few years through a wide range of electronic devices, services and tools which now allow deaf people to communicate and interact with the outside world much more easily.

The objectives the IST project **ViSiCAST** *(Virtual Signing: Capture, Animation, Storage and Transmission)* aims to achieve is the development, evaluation and application of realistic "virtual humans" (avatars), generating European sign languages for the deaf. The project is targeting the development of systems for the generation, storage and transmission of Virtual Signing Systems. It will devise user-friendly methods to capture signs where appropriate. It will also develop a machine-readable system to describe sign-language gestures (hand, face and body), which can be used to retrieve stored gestures or to build them from low-level motion components. The project will use this descriptive language to develop translation tools from speech and text to sign. By building applications for the signing system in television, multimedia, web and face-to-face transactions, ViSiCAST will improve the situation of Europe's deaf citizens, their access to public services and entertainment, and enable them to develop and consume their own multimedia content for communication, leisure and learning.

The project, launched in January 2000 and scheduled for completion in December 2002, has a website (http://www.visicast.co.uk) of its own, where a more detailed and accurate description of all activities and research being carried out is available.



Measuring citizens' usage of IST

Information Society Technologies (ISTs) have strongly affected the habits, fashion and lifestyle of European citizens during the last decade, since the massive diffusion of the internet, computer and digital equipment in both households and workplaces.

The project E-LIVING (Life in a digital Europe) will attempt to create a coordinated set of pan-European longitudinal household panel studies to generate quantitative data on time-use, uptake of ISTs, IST competencies, environmental impact and the perceived quality of life. These data will lead to an accurate description, explanation and modelling of relationships between the uptake and usage of ISTs and changes in citizen's lives, and an understanding about how these patterns contribute to changes in lifestyles and/or quality of life. The results will be made available as a resource for future analysis or for use in subsequent projects via a website, publications and a managed programme of workshops to engage public and commercial policy-makers. Finally, the consortium will work towards an ongoing pan-European household panel study aimed at measuring and testing the hypothesised benefits of ISTs.

This cost-sharing project, involving several EU universities and consultancies led by British Telecommunications Plc, is scheduled for completion in 2003.

5.5 Energy, Environment and Sustainable Development (EESD)

Two main sources of information have been used to analyse the SE dimension and impacts of EESD research within FP5.

- On one hand, a recent DG RTD publication[9] presents an outline of the main EESD projects with high SE relevance. Although it only includes those projects that had actually been launched at the time of the publication (2001), it provides a solid basis for understanding the overall SE scope and relevance of RTD in this programme, and of its policy implications.

- On the other hand, a bottom-up analysis has been attempted through a project-counting exercise based on the statistics made available for the various Key Actions.

Both approaches are meaningful, and they provide evidence that is, in fact, mutually complementary.

However, a general remark should be made at the outset. The qualitative assessment of the programme's impact indeed demonstrates that the SE research undertaken therein is being used for policy support purposes, and that many of the tools developed under EESD are providing direct input to the policy formulation process. Comprehensive identification of all such inputs is nevertheless extremely difficult to carry out: later in this report (chapter 6), the results of a bottom-up approach to such identification are presented, whereby FP5 projects explicitly mentioned in policy documents are listed. While it has the merit of ensuring that all programmes and KAs are examined using the same approach, this methodology is likely to underestimate the contribution of research to policy. This is certainly the case for the EESD programme, for which many such inputs can be identified that do not however appear explicitly in policy documents. A case in point is that of the development and/or further elaboration of a series of analytical models in the areas of energy, environment and sustainable development, whereby policy documents usually refer to the name of the model itself rather than to that of the RTD project within which it has been developed. Meaningful recent examples include:

[9] *Socio-economic Projects in Energy and Environment – EUR 19886*

- The Guidelines for Impact Assessment following the EC Communication on Impact Assessment [COM(2002) 276 final];
- Proposal for a Directive of the European Parliament and of the Council Establishing a Scheme for Greenhouse Gas Emission Allowance Trading within the Community and Amending Council Directive 96/61/EC [COM(2001)581 final];
- The European Climate Change Programme (ECCP) - DG ENV;
- The Action Plan for Environmental Technology following the EU Strategy on Sustainable Development [COM(2001)264]- DG ENV and DG RTD;
- The Directive on the Promotion of Electricity produced from Renewable Energy Sources in the Internal Electricity Market [OJEC, L 283 (27/10/2001)];
- The Community Guidelines on State Aid for Environmental Protection [COM(2001)370]; and
- The energy scenarios which have been produced regularly since 1985 by DG TREN ("Energy in Europe").

These all include explicit references to models such as POLES, PRIMES, SAFIRE, GEM-E3, developed or/and enhanced within EESD projects (see section 6).

Additional references can be found in non-EU policy documents, such as the IEA/OECD reports ("Energy outlook") and the UNDP reports (World Energy Assessment).

Furthermore, in areas such as town planning, urban land use, municipal waste management, and others that are highlighted in the KA City of Tomorrow, policy quotations should be sought at the national or sub-national level, because of the well-known limitations of the EU legislative mandate in relation to the subsidiarity principle.

5.5.1 Part A: Environment and sustainable development

Based on the above-mentioned project-counting approach, the overall budget allocated by this programme to SER is estimated at 160 MEuro throughout FP5, representing ca. 15% of the total research spending. As much as 75% of this sum has been attributed to the KA 'City of Tomorrow and Cultural Heritage'. In fact, SER plays the prominent role within that KA because of the very nature of the KA objectives (of a total of 170 MEuro, 120 MEuro are considered to be directly relevant

An applied integrated environmental impact assessment for the EU

National accounts, although used to measure economic performance, fail in many ways to describe fully the impacts of economic activity on human wellbeing and on the environment.

The GREENSENSE project is the latest of a series of three projects financed by DG RTD on Green Accounting and applies the "Impact Pathway Analysis" developed under the ExternE project for the estimation of physical impacts and monetary damages.

GREENSENSE aims to make two major contributions to environmental impact assessment for policy purposes. The first is to update and extend the availability of data on the major impacts of the environmental damage caused by economic activity, both in physical and monetary terms. The categories of environmental pressure considered in the project include: Air Pollution, Climate Change, Biodiversity, Natural Resources, Toxic Substances, Urban Environmental Problems (Noise), Waste, and Water Pollution. The second is to develop and apply an environmental accounting framework that explicitly incorporates sustainability issues - in addition to welfare effects - including estimating the reductions in impacts required for sustainability. GREENSENSE looks both at the national/global impacts of economic activity as well as the costs associated with different thresholds of sustainability. By comparing the two, and taking account of future impacts and uncertainty in a careful way, it will provide some guidance on how adequate current policies are and where they need to be strengthened.

The project, funded by the EESD programme, is co-ordinated by the University of Bath together with the University of Hamburg, IER/University of Stuttgart and Universidad Pontificia Comillas.

to SE sciences). The two KAs on water management and marine ecosystems globally account for 16 MEuro in SE-relevant research, corresponding to less than 4% of the total KA budget, while the KA on global change and biodiversity has assigned 4 MEuro to SE projects, representing less than 1.5% of the total KA budget. Finally, a significant amount of SER has taken place within the so-called Activities of generic nature, with a SER budget estimated at 20 MEuro (including the Accompanying Measures), corresponding to almost 17% of total spending of a generic nature.

These figures, however, show that the evaluations carried out by the different units involved are not always based on the same concepts and approaches, and they do not ensure comparability. Several remarks can be made to illustrate this statement:

- According to the above figures, the total SER budget for Part A is 160 MEuro, of which 120 MEuro is associated to KA4 alone (City of Tomorrow). This leaves some 40 MEuro for all other actions, of which approximately half is allocated to such elements as Activities of a generic nature and Accompanying Measures on SE aspects. The remaining 20 MEuro correspond to the socio-economic activity of the KAs on water management, global change and marine ecosystems.

- Drawing from the above-mentioned DG RTD publication, during the first two years of FP5, socio-economic projects funded in FP5 in the area of Environment and Sustainable Development received a total budget of about 12 MEuro of which about one-third has been dedicated to the development

Assessing climate change policies

As a consequence of the mechanisms established at the Kyoto conference and in subsequent international agreements, climate change policies must be assessed and evaluated against their ability to meet the agreed targets.

The **GECS** project (*Greenhouse Gas Emission Control Strategies*), funded within the FP5 Environment and Sustainable Development programme, aims to develop and evaluate a set of global scenarios for 2030 in order to analyse the impact of alternative policy options under flexibility mechanisms for emission reduction – including options to reduce emissions resulting from land-use changes and agricultural activities – and for strengthening carbon sinks. The main priority is the identification of emission-reduction strategies that can achieve the Kyoto objectives, taking emission trading and flexibility mechanisms into account.

On the methodological side it allows for a significant improvement in the scope and relevance of the partial and general equilibrium models that, up to now, have been used in Europe for the economic assessment of climate policies. These methodological improvements, based on the co-ordinated use of different models (POLES, GEM-E3, coupled with satellite models such as the IMAGE model developed by RIVM and the AGRIPOL model developed by CIRAD-AMIS), enhance the capability of each modelling system and open up the way for further developments. Secondly, the GECS project is producing analyses of the consequences of introducing multi-gas flexibility at world level in different long-term policy settings, and helping define EU climate strategies, both in terms of international negotiation and domestic policies, as well as measures on R&D and agriculture and land use.

GECS was launched in 2000 under the coordination of the Institut d'Economie et de Politique de l'Energie – CNRS (France) in co-operation with seven European research centres.

of quantitative tools and methods. Although detailed statistics are not yet available, it is anticipated that this share has been increased significantly during the second part of the FP5, thus allowing the achievement a good overall balance between qualitative and quantitative approaches.

5.5.2 Part B: Energy

As for Part A, top-down figures are available for the energy strand of this programme. They point at an SER budget of 24 MEuro, that is ca. 2.4% of the total research spending on energy issues. However, similar considerations should be made concerning the meaningfulness of such estimates:

- As in the GROWTH programme, research in the energy area is managed by two different DGs (DG RTD and DG TREN), raising the same methodological and interpretation issues formulated previously. Specifically, of the ca. 500 MEuro of which DG TREN is in charge, some 20% has been devoted to the funding of AM and TN, giving a rough estimate of no less than 100 MEuro, which is well above the 24 MEuro reported above.
- The previously quoted report from DG RTD gives an estimate of SE-relevant projects managed by DG RTD in the energy field of slightly over 2.5 MEuro, which seems disproportionate to the total 24 MEuro (or possibly much more) reported above, calling for a thorough check of the basic assumptions behind these figures.
- Once again, extreme caution in handling these quantitative indications is essential.

Courtesy of CIEMAT

Energy and environment policies: providing a scientific basis for EU decision-making

European decision-makers in the energy and environmental fields rely increasingly on scientific evidence to support their choices. Whether it is a renewable electricity target, an energy tax, a quantified objective to reduce greenhouse gases emissions, a voluntary agreement between public authorities and industries, a state aid exception for clean energies, or a standard for energy efficiency, an evaluation of the impact of the adopted measures will be requested by policy-makers.

The project **NEWEXT** (*New Elements for the Assessment of External Costs from Energy Technologies*), funded within the FP5 EESD programme, is the latest follow-up to the ExternE series, a major RTD effort initiated in the early 90s. ExternE has pioneered the development of a comprehensive accounting framework for the assessment of external costs, which has since become the undisputed worldwide reference in this field. The ExternE methodologies have been successfully applied to the support for decision-making in energy and environmental policy. NEWEXT aims to improve the assessment of externalities by providing new methodological elements for integration into the existing accounting framework of external costs.

NEWEXT, launched in 2001 and coordinated by IER, University of Stuttgart (Germany), has been explicitly quoted by Ms Loyola de Palacio in her answer to a written question posed by Mr Moreira da Silva, MEP.

Raising awareness of the potential of renewable energy sources

Although the potential of renewable energy sources (RES) is enormous, they still face a series of barriers hindering their effective take-off. Many of these barriers are non technical, namely political, social, economic and administrative factors. Furthermore, a lack of approaches stimulating continuous discussions and opinions flow amongst all actors involved in the decision-making process on RES exploitation is preventing them from receiving substantial support.

SIREN (*Scenarios for Integration of Renewables in a European Cities Network*) aims to overcome these non-technical barriers to the dissemination of R&D projects in different local contexts by raising public awareness on the potential of selected R&D projects at European level. The core of the project work is the creation of a network of EU cities sharing an innovative consensus-building process involving the major socio-economic parties and aiming at analysing, through a rigorous methodological approach, the impact of the selected R&D projects at local level. A major support to the R&D projects will be provided in order to: a) simulate by scenarios the evolution of the projects to identify barriers, factors for the success of the technologies/results selected; and b) promote a new culture for the penetration/dissemination of projects, facilitating a favourable response to and acceptance of RES by local communities.

The project was coordinated by the Italian consultancy INNOVA and gathered together a cluster of seven additional participants, working on both the simulation scenarios approach and the European Awareness Scenarios Workshop (EASW) methodology, already in use since 1995 in more than 100 cases all over Europe.

5.6 Confirming the international role of Community research

FP5's INCO2 programme is the continuation of the previous INCO initiative set up in FP4, when all EU activities focusing on RTD cooperation with Less Developed Countries were merged into a unique programme. The projects funded through INCO2 fall roughly into two main categories, whose main objectives are, respectively:

- to share with non-EU member countries the results of RTD developed within the Union; and
- to devise and implement RTD applications addressing the specific needs of non-EU member countries.

The first can take different forms, including the setting up of networks of research organisations, the training of research staff, the organisation of events, and any other initiative that might contribute to the establishment of *common RTD platforms*. They represent approximately 60% (budget-wise) of the total financial effort of the Commission within INCO2 (which amounts to ca. 500 MEuro throughout FP5).

The second group (research *for* development) – absorbing the remaining 40% – aims to develop original added value through the *application of current RTD knowledge* to specific problems faced by non-EU members, with particular regard to the less developed states.

The range of RTD topics addressed by INCO2 is extremely wide and, in fact, mirrors the all-encompassing scope of the full set of FP5 programmes and Key Actions. At the outset, RTD co-operation initiatives find their *raison d'être* in the problem-solving approach, whereby the EU's ultimate goal in funding this kind of activity is to help the less-favoured countries face the many challenges with which they are confronted on their way to improving welfare. The nature of those challenges (poverty, health and hygiene, availability and access to water and other basic natural resources, ethics, etc.) is such that the SE relevance of the INCO2 response is immediately perceivable. One could say that the links between RTD and socio-economic performance, which are at times difficult to visualise in developed economies, are more evident in co-operation projects due to the sheer magnitude of the societal challenges in the targeted regions of the world. Quoting directly from a recent INCO publication[10]: "Perhaps the greatest task for the coming years is linking knowledge more effectively with policy formulation and action in order to revert to sustainable pathways [...]".

[10] *INCO2 brochures published under the general title. "Ten years of EC scientific co-operation for the transition towards sustainability".*

Supporting governance of land in Sub-Saharan Africa

Access to collectively managed resources plays a centrally important role in the lives of many rural households in Sub-Saharan Africa, yet many governments continue to pursue policies aimed either at privatisation or their maintenance under state control. The Concerted Action Programme named **CO-GOVERN** (*Promoting Common Property in Africa: Networks for Influencing Policy and Governance of Natural Resources*) seeks to inform and influence policy concerning common property resource management through a range of networking advocacy and communication activities.

This networking activity aims at building more realistic policies and programmes to support governance of land in sub-Saharan Africa, and in particular to promote institutions for the management of common property resources (CPRS). This will be achieved by encouraging sub-regional exchange, pan-African networking and dialogue between African and European stakeholders working on influencing the governance of CPRS, through several interlinked activities. A series of working papers, policy briefs and website material will be produced by African partners in collaboration with European participants.

The action is coordinated by the International Institute For Environment and Development, a British firm in partnership with the Roskilde University and the Agricultural University of Norway, and four African partners (Groupe De Recherche et d'Action Sur le Foncier – Burkina Faso, Resources Conflict Institute – Kenia, University of the Western Cape – South Africa).

6. The (potential) SE impact of the main FP5 Programmes and Key Actions

As previously mentioned, attempting a quantitative assessment of SE impact appears to be a daunting task for a variety of reasons. Also, several of the EU officers interviewed in the process of preparing this report made it clear they do not believe that such an attempt could produce conclusive evidence per se. This notwithstanding, a series of proposals and recommendations aiming to establish a reference system for the monitoring of a limited set of basic variables and indicators is proposed in Chapter 7 below. At this time, however, the emphasis is on the qualitative assessment of the potential SE implications of FP5 research, and the main instrument adopted to proceed in this direction is the search for references to RTD results in policy documents (Communications, Directives, etc.).

The main sources used to this end have been:

- direct and explicit input provided by EC officers
- the EURLEX database, on which an extensive search has been performed[11].

A major issue in presenting and interpreting the results of this search relates to the time factor: it is well known that the uptake of RTD results requires a sequence of successive steps, including publication, dissemination, matching with policy objectives, translation into policy formulation, followed by the actual decision process itself. Typically this entails time lags of several years between the moment a research project has completed its life cycle and the moment it is concretely used in policy actions. FP5 was launched some four years back and the projects funded therein have only just started to produce their final deliverables. It should not come as a surprise therefore that the number of explicit references found was rather limited. On the other hand, one could expect that, should a similar search be carried out on FP4 and previous RTD projects, it would probably yield a larger number of quotations.

As it stands, the search on FP5 projects has allowed identification of some 20 meaningful references. Table 6 summarises the main features of this outcome.

Once again, this does not pretend to be an accurate and exhaustive count: as repeatedly mentioned above (e.g. in the section discussing the EESD programme), additional quotations can be found in numerous EU and other policy documents although, at times, they do not explicitly quote the project acronym itself.

[11] EURLEX does not incorporate, among its features, a ready-made procedure to perform such a search. It was in fact necessary to query the EURLEX system on a project-by-project basis. This has entailed the acquisition of all known RTD project acronyms (several thousands), and the subsequent query where acronyms were used as keywords. Obviously, this implies that the search cannot be guaranteed to be completely efficient and exhaustive, and reference to RTD results might be found that do not explicitly refer to project acronyms; furthermore, the long list of project acronyms that was used may be incomplete.

Table 6: RTD references in policy documents

RTD project identification	Programme/Key Action	Type	End date	Policy reference
ECBOS (Enhanced Coach and Bus Occupant Safety)	**GROWTH**/KA2 - Sustainable mobility and intermodality	SC	December 2002	**COM(2000) 125 final –** COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS - Priorities in EU road safety progress report and ranking of actions. Brussels, 17.03.2000, page 41.
SAFIRE (Strategic Assessment Framework for the Implementation of Rational Energy)	**Energy, Environment and Sustainable Development**	Preparatory, accom-panying and support measures	July 2002	**COM/2000/0279 final – COD 2000/0116.** Proposal for a Directive of the European Parliament and of the Council on the promotion of electricity from renewable energy sources in the internal electricity market. Brussels, 10.5.2000, page 26.
EMVI (European Malaria Vaccine Initiative)	**Confirming the International Role of Community Research**/ INCO2	Preparatory, accom-panying and support measures	June 2005	**COM(2000) 585 final –** COMMUNICATION OF THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT. Accelerated action targeted at major communicable diseases within the context of poverty reduction. Brussels, 20.9.2000, page 13. ***Official Journal of the European Communities*** of 16.05.2002, C115 E/9-10. Written Question E-1684/01. Answer given by Mr Nielson on behalf of the Commission (3 September 2001). **COM(2000) 585 final –** COMMUNICATION OF THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT. Accelerated action targeted at major communicable diseases within the context of poverty reduction. Brussels, 20.9.2000, page 35.

Table 6: RTD references in policy documents

RTD project identification	Programme/Key Action	Type	End date	Policy reference
EUROCJD (Creutzfeldt-Jakob Disease: Epidemiology, Risk Factors, Diagnostic Tests and Genetics)	**Quality of Life**/KA2 - Control of infectious diseases	Coordination of research actions	January 2005	**COM(2001) 323 final –** COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT on research activities in Europe related to Transmissible Spongiform Encephalopathies. Brussels, 12.6.2001, page 10.
EUROPEAN SCIENCE AND TECHNOLOGY WEEK	**Improving Human Potential**/Raising public awareness of sciences and technologies	AM	November 2002	**COM(2000) 6 final –** COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS - Towards a European research area. Brussels, 18.1.2000, page 18. **COM(2001) 714 final –** COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS - Science and Society Action Plan. Brussels, 4.12.2001, page 11.
EUROVAC (European vaccine effort against HIV/AIDS)	Quality of Life/KA2 - Control of infectious diseases	SC	December 2002	**COM(2000) 585 final –** COMMUNICATION OF THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT. Accelerated action targeted at major communicable diseases within the context of poverty reduction. Brussels, 20.9.2000, page 34. **COM(2000) 346 final –** COMMUNICATION FROM THE COMMISSION. The International Dimension of the European Research Area. Brussels, 25.06.2001, page 19.
FOREN (Foresight for Regional Development Network)	**Improving Human Potential**/STRATA	TN		**COM(2001) 549 final –** COMMUNICATION FROM THE COMMISSION - The Regional Dimension of the European Research Area. Brussels, 03.10.2001, page 26.

Table 6: RTD references in policy documents

RTD project identification	Programme/Key Action	Type	End date	Policy reference
HIP-HIP (House Integrated Pv - High-tech in Public)	**Energy, Environment and Sustainable Development/part B - Energy**/KA2 - Economic and efficient energy for a competitive Europe		December 2002	**COM(2001) 69 final –** COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS - The implementation of the Community Strategy and Action Plan on Renewable Energy Sources (1998-2000) Brussels, 16.02.2001, page 25.
IRIS (Incorporating Requirements of People with Special Needs or Impairments to Internet-based Systems and Services)	**Promoting a User-Friendly Information Society - IST**	SC	June 2003	**COM(2001) 529 final –** COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS - eEurope 2002: Accessibility of Public Websites and their Content. Brussels, 25.09.2001, page 9.
NESSIE (New European Schemes for Signature, Integrity, and Encryption)	**Promoting a User-Friendly Information Society - IST**	SC	December 2002	**COM(2001) 298 final –** COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS - Network and Information Security: Proposal for a European Policy Approach. Brussels, 6.6.2001, page 22.
NEWEXT (New elements for the assessment of external costs from energy technologies)	**Energy, Environment and Sustainable Development**	SC	June 2003	***Official Journal of the European Communities*** of 06.06.2002, C134 E/89. Written Question E-2742/01 by J. Moreira Da Silva to the Commission. Answer given by Mrs De Palacio on behalf of the Commission (14 December 2001).
Physics On Stage	Improving Human Potential/Raising Public Awareness of Sciences and Technologies	AM		**COM(2001) 714 final –** COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS - Science and Society Action Plan. Brussels, 4.12.2001, page 11.

Table 6: RTD references in policy documents

RTD project identification	Programme/Key Action	Type	End date	Policy reference
RECORDIT (REal COst Reduction of Door-to-door Intermodal Transport)	**GROWTH**/KA Sustainable mobility and intermodality	AM	June 2003	**COM(2002) 54 final – 2002/0038 (COD)**. Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the granting of Community financial assistance to improve the environmental performance of the freight transport system (presented by the Commission). Brussels, 04.02.2002, page 10.
SAPIENT (System Analysis for Progress and Innovation in Energy Technologies)	**Energy, Environment and Sustainable Development**	SC	February 2002	**COM/2000/0769 final –** GREEN PAPER - TOWARDS A EUROPEAN STRATEGY FOR THE SECURITY OF ENERGY SUPPLY. Annex 2, page 8. **COM/2000/0087 final –** GREEN PAPER ON GREENHOUSE GAS EMISSIONS TRADING WITHIN THE EUROPEAN UNION. Brussels, 8.3.2000. Annex 1 - Economic Analysis, page 27.
TB VACCINE CLUSTER (A cluster for tuberculosis vaccine development)	**Quality of Life**/KA2 - Control of infectious diseases	SC	January 2003	**COM(2000) 585 final –** COMMUNICATION OF THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT. Accelerated action targeted at major communicable diseases within the context of poverty reduction. Brussels, 20.9.2000, page 35.
ViSiCAST (Virtual Signing: Capture, Animation, Storage and Transmission)	**Promoting a User-Friendly Information Society - IST**	SC	December 2002	**COM(2001) 529 final –** COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS - eEurope 2002: Accessibility of Public Websites and their Content. Brussels, 25.09.2001, page 9.

Table 6: RTD references in policy documents

RTD project identification	Programme/Key Action	Type	End date	Policy reference
WAI-DA (Web Accessibility Initiative - Design for All)	**Promoting a User-Friendly Information Society - IST**	SC	September 2002	**COM(2001) 529 final –** COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS - eEurope 2002: Accessibility of Public Websites and their Content. Brussels, 25.09.2001, pages 8-9.
WAVE ENERGY NET-WORK - Establishment of a European thematic network on wave energy	**Energy, Environment and Sustainable Development/part B - Energy**/KA1 - Cleaner energy systems, including renewables	TN	March 2003	**COM(2001) 69 final –** COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS - The implementation of the Community Strategy and Action Plan on Renewable Energy Sources (1998-2000) Brussels, 16.02.2001, page 24.
WWAAC (World Wide Augmentative and Alternative Communication)	**Promoting a User-Friendly Information Society - IST**	SC	December 2002	**COM(2001) 529 final –** COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS - eEurope 2002: Accessibility of Public Websites and their Content. Brussels, 25.09.2001, page 9.

The references above are reasonably spread across programmes and Key Actions:

Programme	Number of references
EESD	5
IST	5
QOL	3
IHP	3
GROWTH	2
INCO	1

Per type of contract:

Contract type	Number of references
SC	11
AM	4
TN	2
Coordination of research actions	1
Non specified	1

It is also interesting to note that a large number of referenced policy documents are addressed to the Economic and Social Committee.

The figures above correspond to the number of projects that have been explicitly quoted in policy documents. It is however important to note that some of these projects (or/and the tools developed therein) are quoted in several documents, which indeed provides a further measure of their relevance.

A case in point is that of E^3 models (Energy - Economy - Environment models), for which a summary of citations is provided hereafter in Table 7.

Table 7: E³ model references in policy documents

RTD PROJECT IDENTIFICATION	POLICY REFERENCE	QUOTATION
PRIMES model	1. **COM(2000) 87 final** - Green Paper on greenhouse gas emissions trading within the European Union.	1. Several quotations in Annex I: Economic analysis.
	2. **COM(2001) 581 final - 2001/0245 (COD)**. Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC.	2. Several quotations in section 1.1 of the exploratory memorandum and in the impact assessment form ("The analysis made use of the most appropriate tool in Europe, the **PRIMES** model.")
	3. **COM(2002) 321 final** - Green Paper - Towards a European strategy for energy supply security.	3. In Annex II ("The **PRIMES** model database was also the source for the technico-economic data on the different technologies ...").
	4. **COM(2001) 708 final** - REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL under Council Decision 93/389/EEC as amended by Decision 99/296/EC for a monitoring mechanism of Community greenhouse gas emissions.	4. In section 6.3 ("The energy related CO^2 emissions were projected using the energy system model PRIMES...").
	5. **COM(2001) 226 final** - 2001/0098 (COD). Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the energy performance of buildings.	5. In section 4 ("Studies using the **PRIMES** model and Ecofys bottom-up approach indicate that the cost-effective potential for emission reduction could be between 130 Mt/year and 160 Mt/year, respectively.")

Table 7: E^3 model references in policy documents

POLES model	1. **COM(2000) 87 final** - Green Paper on greenhouse gas emissions trading within the European Union.	1. Several quotations in Annex I: Economic analysis.
	2. **COM(2000) 212 final** - COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT: The European Community's Development Policy.	2. In section 3.2 ("Current trends show that in 2010, developing countries' carbon dioxide emissions will surpass those of developed countries, including eastern Europe (EC, Poles Model, 1999).")
	3. **COM(2001) 581 final - 2001/0245 (COD)**. Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC.	3. Several quotations in section 1.1 of the exploratory memorandum.

A more detailed description of the exact references outlined in this section is provided in Annex 6, together with the full text of the quotations.

7. Conclusions and recommendations

7.1 Socio-economic research in FP5

7.1.1 Basic concepts and tools for SE assessment

As could be expected, it has proved extremely difficult to carry out a comprehensive and consistent assessment of the weight and impact of SE research in FP5, owing to the combination of two main factors:

- The intrinsic, conceptual difficulty of such an exercise, whereby basic knowledge that would allow for a description and understanding of the causal chains linking a specific RTD effort to the evolution of complex systems such as environment, welfare, health, etc. is still lacking. Impact variables such as disposable income, air quality, fatalities resulting from road accidents, etc. do not relate to one another in a linear fashion, nor are they traceable in a direct and unambiguous way to the availability of innovative technology. The well-known phenomenon of "rebound effects" is a typical illustration of this complexity: for example, advancements in vehicle technologies will reduce the energy consumption of the individual vehicle, and are therefore expected to yield a decrease in overall pollutant emissions and a subsequent improvement in air quality. However, it may be observed that improved energy efficiency of vehicles makes it cheaper to travel thus increasing mobility demand. Such "rebound" is, in turn, likely to offset, at least partly, the expected benefits to air quality. Measuring the net effect - on society as a whole - of the RTD effort that has produced the innovation in the first place is far from easy, and in many instances still requires major advancements in the sheer understanding of physical and economic mechanisms. On the positive side, it should be noted that such advancements are being actively pursued in the current mainstream of research, with FP5 featuring a wide range of projects, in many programmes and KAs, whose main purpose is precisely to develop tools and methods for a better understanding of complex socio-economic dynamics.

- A second major difficulty in carrying out the SE assessment of FP5 is geared to the lack of clear and harmonised tools to monitor the performance of FP5 projects from the SE perspective. Monitoring tools are needed to measure both the intensity of the effort devoted to SE advancements (the inputs), and their effects (the outputs). Despite the conceptual obstacles outlined above, if systematically and effectively conducted a series of basic observations could provide useful, although rough indications on major impact areas. The almost complete lack of such monitoring tools within FP5 currently makes it impossible to proceed in that direction. In particular, it makes it highly hazardous to attempt a cross-programme comparison, because of the different definitions, programme structures and operational procedures. On the positive side, the visible progress made in the harmonisation of project evaluation procedures must be mentioned which, in FP5, are found to be highly homogeneous across programmes and Key Actions: the basic set of evaluation criteria is the same for all programmes, although it is applied with differing weights and thresholds in order to reflect specific, programme-related priorities.

7.1.2 The limits to harmonisation

In reviewing the SE intensity of the main programmes and KAs, it becomes clear that the lack of harmonised approaches in this area also reflects the intrinsic differences in scope, background and mandate that characterise the various units responsible for RTD activities. A major distinction should be made between research activities carried out within policy-driven DGs and units on the one hand, and research developed under the responsibility of DG RTD. At the outset, the former appears to be directly linked to SE targets, while the latter is perceived as more focused on the increase of scientific and technical knowledge *per se*. However, jumping to conclusions should be avoided.

- Both approaches are indeed compliant with the problem-solving prescription, whereby policy-driven research targets problems that are directly represented in terms of their ultimate societal impact, while knowledge-driven research tends to express the targeted problems in terms of the scientific and technical advancements that must be achieved to address societal issues.

- The difference, therefore, appears to lie not so much in a higher or lower capability of ultimately addressing societal issues, but rather in the more or less explicit visibility of SE drivers in the formulation of work programmes, tasks and, subsequently, project proposals.

As will be discussed below, harmonisation should not aim at erasing the above differences, but rather at ensuring that the ultimate SE impacts of research can be assessed through similar and comparable mechanisms.

7.1.3 Quantitative vs qualitative performance

Quantitative assessments are usually seen as providing firmer and more objective grounds for evaluation than purely qualitative appraisals. When it comes to SE impacts, however, the reality is somewhat different. In fact, and despite many difficulties in measuring SE intensity, a few quantitative indications were gathered in the course of this review[12]. They refer to such variables as:

- the number of projects with explicit SE objectives;
- the frequency of occurrence of SE thematic disciplines in the portfolios of funded projects;
- the number of Accompanying Measures, Thematic Networks and of similar RTD projects whose primary aim is to transfer RTD results into practice;
- the corresponding budgets;
- etc.

A purely quantitative approach to SE assessment would then lead to discuss such figures whereby, for instance, certain KAs exhibit SE shares of 2% while others boast 100% values for similar parameters. It is easy to point out how flimsy the evidence provided by such figures is because of the above-mentioned lack of a harmonised framework of evaluation.

Specifically, one should note that:

- these figures are assembled *ex post:* as in all situations where no specific evaluation framework is devised at the outset, the value of *ex-post* interpretation is limited, especially in the context of a cross-programme assessment;

- even assuming that the figures thus assembled would be reliable, and comparably so, this represents no guarantee whatsoever that the SE impact of the various RTD programmes bears a direct relationship with these quantitative performances: as previously stressed, most projects do include explicit or implicit references to their ambition of contributing to societal problem solving. However, this is hardly a guarantee that such contributions will prove effective. In fact, a similar consideration could be formulated for the declarations of intent included in most work programmes, whereby defining a target does not amount to ensuring that such a target can be reached.

As a result, the recourse to qualitative assessments is not only a necessary complement to partially compensate for the weakness of the quantitative evidence, but it is a major part of the evaluation, in that it provides input that even the most efficient quantitative framework will never be able to offer.

7.1.4 Evidence provided by the project evaluation process

As outlined above, the structure and homogeneity of the criteria system used for project evaluation purposes is a major feature of SE assessment in FP5: SE criteria play a prominent role therein, reflecting the strong policy drive towards socio-economic problem solving. It was noted, however, that the practical application of these evaluation criteria can lead to evidence that is, at times, hardly conclusive:

[12] *See Section 5 above.*

- for RTD projects focusing on technological advancements, the SE evaluation criteria should be used to assess the potential SE impact of the main project outcome (i.e. technological innovation), and the ability of the project team to ensure that such impacts are actually pursued and achieved;

- for projects whose main object is an advancement in SE sciences, methods and tools, on the other hand, SE criteria are a means of ascertaining whether the proposers have well understood the nature and depth of the SE problems set out in the work programme and in the task description, and whether their core competence is up to the required standards of excellence.

In other words, a high SE score for the former is an important added value with respect to the main project focus, while for the latter it is the very essence of project evaluation.

Also, as a consequence of the above, comparing the SE scores achieved by different KAs or, for that matter, those achieved by RTD projects and by Accompanying Measures, can be misleading. Evaluators have often noted that when it comes to SE criteria the statistical distribution of scores is highly concentrated around the mean value (e.g. around three-fifths), reflecting the difficulty in using these evaluation criteria effectively.

7.2 Recommendations for future RTD Framework Programmes

The newly adopted Sixth Framework Programme has been substantially redesigned in the perspective of meeting the ambitious goal of constructing the European Research Area. The major challenge of European research policy is to contribute to the socio-economic objectives and other policies of the Union, and within this framework, socio-economic related research activities respond by evidence to the economic, social and therefore political needs of policy decision-makers. In turn, this challenge can only be effectively met if a close co-operation is established between the various thematic and horizontal priorities of FP6, calling for a horizontal integration and coordination of research in social sciences and humanities including economics and political science, as well as for support for improving the interactions between science and society.

Building on the findings of the review carried out for FP5, a series of recommendations can be issued in order to enhance the SE value of future RTD Framework Programmes.

7.2.1 Increasing SE visibility

As a general remark, and despite the difficulties in providing quantitative evidence of the role of socio-economic sciences in EU research, it was found that the SE relevance of projects funded within FP5 is generally high.

- In many instances (the IHP Programme, Action lines in other programmes explicitly featuring SE studies, Accompanying Measures and Thematic Networks, the International Co-operation programme), societal problem solving is the main focus of projects and programmes. Addressing societal needs is thus the main motivation driving the identification of priorities and the drafting of work programmes and task descriptions. The issue, in these cases, is not so much whether SE concerns are being addressed, but rather how they are being addressed, and what the quality level of the funded projects is in this regard.

- In other cases (mainly represented by RTD programmes under the responsibility of policy-driven DGs and units), policy formulation drives the selection of RTD priorities directly: the need to launch research projects is thus immediately geared to the recognition that insufficient knowledge is available to tackle the societal problems targeted by policy objectives, and the specification of the expected outcome from RTD is assessed as a function of the potential capability of additional research to generate the required solutions.

- In most other cases (technological research), the "problem solving prescription" introduced with FP5 has set the ground rules whereby increasing the level of scientific and technical knowledge is not an objective per se, but rather a means whose effectiveness is directly related to the possibility of linking knowledge advancement to the provision of innovative and efficient solutions to socio-economic challenges. The work programmes and task descriptions largely comply with the spirit of the problem-solving

approach, although in many instances the problem is described in terms of knowledge-gap to be filled, and only indirectly associated to a direct societal challenge.

Whether explicitly or implicitly, one can thus conclude that SE concerns are deeply and systematically embedded in FP5. When looking at future prospects, therefore, it is not so much on increasing the amount of SE-related research where efforts appear necessary, but rather on the enhancement of the SE value that can be drawn from research programmes. The keyword here is ***visibility***: in fact, what was often found was that even in those cases where SE concerns are at the heart of RTD actions, the general awareness of the corresponding potential, and the capability to measure it, are worryingly low.

All parties involved should be targeted by a systematic campaign to increase the visibility of SE research and of the contribution it provides to facing societal challenges:

- policy-makers in charge of RTD programme design and priority setting;
- the research community;
- public and private stakeholders (industry, national, regional and local authorities, interest groups); and
- citizens at large.

7.2.2 Devising effective tools and procedures for SE contents representation

The visibility campaign advocated above requires the availability of a wide range of instruments at various stages of the process.

7.2.2.1 Work programme design

Notwithstanding the distinction between policy-driven (top-down) and S&T-driven (bottom-up) programmes, it is advisable that all work programmes and task descriptions make explicit reference to their overall SE objectives, and to the EU policies that target them. To a large extent this is already the case in FP5. An improvement could be envisaged through the establishment of a taxonomy of societal problems/issues to serve as a common basis for the identification of programme and task priorities. As and when possible, such priorities should be represented also in quantitative terms (such as a reduction of x% in pollutant emissions), and by all means through concrete references, with targeted deadlines. The existence of official policy documents (Green and White Papers, Directives, etc.) facilitates this task, and many examples of such an approach towards the statement of RTD objectives are already available in FP5. The inclusion of quantitative targets proves extremely useful not only to ensure that the objectives are not perceived as purely conceptual (e.g. "promoting sustainable development", or "reducing accident fatalities"), but also, and more importantly, in providing yardsticks against which the validity of proposals can then be measured.

7.2.2.2 Instructions to proposers

The current call for proposals process requires proposers to identify which SE benefits can be expected from project implementation. Proposers should be invited to explain how the expected achievements of their projects will translate into tangible contributions to the solution of societal problems. The taxonomy advocated above could again serve as a reference but, in addition, and more importantly, proposals should include a dedicated section where the causal chain linking the envisaged RTD activity with the attainment of SE objectives must be convincingly laid out and justified, and the tools and instruments to ensure that this chain is activated should be explained.

Ideally, therefore, the proposals will include statements whereby their concrete contribution to solving societal problems is described. This should help in measuring the *SE impacts (outputs)* of any given project. Realistically, however, not all projects lend themselves to such a quantitative measurement. In particular in the area of research focusing exclusively on SE issues (such as developing a system of indicators to monitor the penetration of e-activities), such a direct quantification may prove impossible. It is then suggested that a quantitative measure be requested concerning the intensity of the effort to which the project commits in addressing SE problems. This amounts to attempting a quantification of the *SE dimension (inputs)*, through, for example, indicators such as the amount of financial resources devoted to the production of project deliverables with a prevailing SE value, or the amount of staff resources (person.months) assigned by the project to SE specialists.

Finally, proposers should be invited to list the S&T disciplines addressed by their project. A common classification, including both hard disciplines and SE specialisms, should be established to this effect, such as that already used by several actions within the IHP programme. The hierarchical multiple-entry system could be generalised whereby each proposal would be asked to exhibit one or more disciplinary references, ranked in descending order of importance. The frequency with which SE disciplines occur, and their relative position in the overall hierarchy of importance would thus provide an additional, although approximate indication of the SE dimension of research.

7.2.2.3 Project evaluation

As discussed above, the evaluation grids used in FP5 incorporate a wide range of SE criteria whose overall weight in the evaluation process is high (it is in fact often higher than the sum of all other criteria). While this approach appears commendable, it has been found that in many instances the obligation to assign disaggregated scores to each of the SE criteria proposed may lead to distorted assessments: the SE value of a given project may be considerable for only one of the proposed criteria, while that same proposal might score low on other SE criteria simply because the very nature of the innovation proposed has no direct relationship with specific societal problems: a given project may, for example, lead to a substantial breakthrough in terms of environmental performance, while having no tangible effect on employment. However, the contribution to environmental improvements may be so important as to justify the project funding per se. The evaluators should then be given the opportunity to assign a high overall SE score to such a project, notwithstanding its poor performance (or rather, its irrelevance) in some areas.

It is suggested the system of evaluation be reformed in such a way that:

- the overall weight of SE criteria remains high;
- a detailed list of all possible SE criteria is provided as a reference (again, inspired from the taxonomy of societal problems above), however; and
- the SE score is assigned at the aggregated level, and obviously justified by appropriate arguments.

The Commission has established a roster of experts that is consistently used to form the *ad-hoc* panels in charge of project evaluation. The selection process relies on the information provided by this roster as regards the thematic specialisation of the registered experts. This process could be improved, or at least streamlined, thanks to the suggested inclusion of disciplinary references in the proposals. Moreover, keeping track of the disciplinary specialisation of the experts thus recruited would provide additional information on the SE intensity of proposals (including those which are ultimately rejected).

7.2.2.4 Monitoring and ex-post evaluation

An effective and efficient system for the monitoring of SE contents and impacts of EU research can only be established if the relevant information is consistently gathered throughout the process (i.e. the three previous steps outlined above), and if the corresponding technical and organisational instruments are devised and put into operation.

This would further ensure that a consistent monitoring database is maintained, thus allowing not only for homogeneous assessments across programmes and Key Actions, but also for paving the way to analyses of the evolution of SE contents and impacts over time.

Should the above suggestions be retained, the following system of SE indicators could then be established:

a) **Number of RTD projects with a prevailing SE emphasis** (at the various levels of disaggregation, i.e. within a given KA, within a thematic programme, for the entire FP). This indicator would be built on the basis of the disciplinary classification and of the corresponding information provided in each proposal on a standard basis. It could be monitored both in relation to projects that ultimately receive EU funding, and for the entire set of proposals submitted (i.e. including those that are ultimately rejected).

b) **Total budget of the projects with a prevailing SE emphasis** (as qualified through the previous indicator, and with the same levels of disaggregation).

c) **Relative weight of individual SE disciplines included in RTD projects**. This indicator is built on the basis of the frequency with which each SE discipline occurs, and can also be applied to funded projects and to proposals received. Using the hierarchical multiple-entry concept, this indicator could be refined so as to distinguish, for instance, between occurrences where the discipline in question appears in the first position vs all other occurrences.

d) **Multi-disciplinary index**. Also based on the disciplinary classification, this indicator records the multi-disciplinary focus of individual projects. It could be further refined by distinguishing between multi-disciplinary projects with prevailing SE focus and the others.

e) **Resources specifically allocated to SE issues**. This indicator is mainly relevant for projects whose primary focus is on hard S&T innovation. It is built on the information provided by proposers concerning either the amount of financial resources allocated to the production of project deliverables with a prevailing SE content or, alternatively, the amount of person.months assigned to researchers with a prevailing SE specialisation.

f) **Policy citation index**. Through a continuous monitoring of policy documents (Communications, Green and White Papers, Directives, etc.), this indicator records the number of RTD initiatives (projects, programmes, etc.) that have fed directly into policy formulation. Ideally, such an indicator should include policy references not only at the European level, but also at national and sub-national levels. However, this would require a considerable effort in coordinating the relevant monitoring campaigns.

g) **SE evaluation scores**. This indicator records the performance of project proposals in relation to the SE evaluation criteria. It is relevant both in absolute terms (average SE scores out of the maximum attainable mark for those criteria) and in comparison with the scores achieved on the other, non-SE related criteria. Monitoring this indicator would allow the validity to be checked of the commonly shared view that the average proposal scores better on technological criteria than it does on SE issues.

h) **Capital intensity**. It is often argued that SE research is less capital intensive than hard RTD. On the other hand, the ever-increasing recourse to advanced IST methods and tools (databases, software, and the associated hardware, for example, for automating complex data entry operations, etc.) could well prove this belief wrong in the near future. Monitoring the capital intensity of SE research (based on the various classifications suggested above) could provide useful insights in this respect.

It should be noted that indicators a) through to e) – along with indicator h) – all require the same set of basic data which can only be made available if the suggested innovations are introduced. As for indicators f) and g), they can be documented already, based on the information available through the current system of project monitoring.

Finally, one cannot hide that most of the suggested indicators – with the exception of f) – relate to the assessment of the SE dimension, rather than impacts. Assessing the latter is indeed a more ambitious and hazardous exercise which, however, could be initiated through the introduction of the innovation proposed in section 7.2.2.2. above, for example.

7.2.3 Enhancing the effectiveness and the role of ex-ante impact evaluation tools and methods

The above section addresses the issue of how to monitor (in progress) and to measure (*ex post*) the SE relevance of research, and the value of its contribution to solving societal problems. A major challenge remains that of designing (*ex ante*) RTD and other policies that will maximise, at the outset, the chances of achieving the desired SE effects. Developing/refining tools and methodologies for *ex-ante* assessments, and

promoting their systematic use, can play a major role in enhancing the value of EU research, in that such tools:

- are needed to explore the range of possibilities in future, thereby lending increased credibility to reference and policy scenarios;
- provide direct input to target setting, and therefore scientific evidence supporting the definition of RTD priorities; and
- simulate and forecast the expected/desired effect of policies, thereby allowing for:
- validation of the objectives' credibility
- setting the necessary reference for meaningful ex-post assessments, when the observed achievements must be compared to the expected impacts.

Historically, EU research has devoted important resources to the development of such tools and methods, and several sections of this report point at meaningful and valuable examples and achievements in this respect. What now appears to be needed is a further effort to allow for:

- the refinement, validation and testing of the existing methods and tools;
- an increased harmonisation of methods, or at least of the basic datasets and assumptions behind them;
- the development of original methods and tools in areas that are so far insufficiently covered (sustainable development, very long-term forecasting, intersectoral analyses, etc.); and
- the widespread diffusion of the actual use of *ex-ante* assessment methods in policy-making, through a more systematic involvement of the stakeholders and targeted communication and cultural campaigns.

8. Annexes

Annex 1: Main documentary sources and references

References
Socio-Economic Dimension in the Fourth and Fifth Framework Programmes

Fourth Framework Programme

TSER (Targeted Socio-Economic Research)

- Targeted Socio-Economic Research. Project Synopses 1994-1998. European Commission DGXII-Science Research and Development, 2001.
- Five-Year Assessment of the Specific Programme: Targeted Socio-Economic Research. Report EUR 17596, European Commission DGXII-Science Research and Development, 1997.

Fifth Framework Programme

- Gender in Research - Gender Impact Assessment of the Specific Programmes of the Fifth Framework Programme - An Overview. Synthesis Report, European Commission and Directorate-General for Research, 2001.

QoL (Quality of Life)

- Catalogue of Socio-economic Studies, edited by Mr Ragucci, European Commission, May 2002.
- Catalogue of Socio-economic Studies, edited by Mr Ragucci and Alessio Vassarotti, European Commission, October 2002 (restricted version).
- Ethical, Legal and Socio-Economic Aspects of Agriculture, Fisheries and Food Biotechnology. A Review of Research Activities 1994-2002. Project Synopses, European Commission, 2002.
- Biotechnology Programme (1994-98). Projects Reports vol. 2. Community Research, European Commission, 2001.

IST (Information Society Technologies)

- Implementation of the Information Society Technologies Programme: A Qualitative Assessment, European Commission, October 2000.
- Third Socio-Economic Evaluation of Cultural Heritage Projects Under the IST 2001 Work Programme. Report of the Evaluation Panel, September 2001, Office for the Publication of the European Communities.
- Gender in Research - Gender Impact Assessment of the Specific Programmes of the Fifth Framework Programme – User-Friendly Information Society (IST), European Commission and Information Society Directorate-General, 2001.
- IST 2001. Technologies Serving People. European Commission, 2001.
- Report on Socio-Economic Research in KA2 of the IST Programme - Draft, European Commission, November 2002.

EESD (Energy, Environment and Sustainable Development)

- Socio-economic Projects in Energy and Environment, European Commission, 2001.
- Socio-economic Tools for Sustainability Impact Assessment. The Contribution of EU Research to Sustainable Development, M. Tamborra (ed.), EUR 20437, European Commission, 2002.

- L'ERA et les décisions politiques européennes. Le cas de l'énergie et de l'environnement. Dimensions socio-économiques dans le 5ème et le 6ème PC, M. Poireau, D. Rossetti.

- ENER Forum 2: Monitoring the Progress of the Implementation of the EU Gas and Electricity Directives: Are European Markets Becoming Competitive?, ENER Bulletin 24.01.

- L'Europe et le changement climatique: actualité et prospective, D. Rossetti, in Revue de l'Énergie, February 2002.

- Gender in Research - Gender Impact Assessment of the Specific Programmes of the Fifth Framework Programme - Environment and Sustainable Development Sub-Programme, Final Report, European Commission, 2001.

GROWTH (Competitive and sustainable Growth)

- Evaluation of Finished Projects of the EC Research Programmes in the Fields Covered by the Present GROWTH Programme, Report submitted to the DG Research of the European Commission, EVIMP Consortium, March 2002.

- BRITE-EURAM - Making a Lasting Impression on Europe, European Commission, 2002.

IHP (Human Research Potential and Socio-Economic Knowledge Base)

- Map of Socio-Economic Elements Integrated in the Specific Programmes of the Fifth Framework Programme, European Commission - DGXII, 2001.

- Map of Socio-Economic Objectives in the Fifth Framework Programme - A Map of the Research Priorities and Socio-Economic Objectives of the Specific Programmes Comprising FP5 for the year 2000, European Commission - DGXII, 2001.

- Building the European Research Area in the Social Sciences. The Key Action "Improving the Socio-Economic Knowledge Base" - Annual Report, European Commission, 2001.

- Enhancing Access to Research Infrastructures. Technical Review Manual, Final Draft, European Commission - DGXII, 29 March 2002.

- Information On the Third Call for Proposals for the Key Action "Improving the Socio-Economic Knowledge Base", chapter extracted from the Council Decision on the Specific Programme "Improving Human Research and the Socio-Economic Knowledge Base". European Commission, 2001.

- Gender in Research - Gender Impact Assessment of the Specific Programmes of the Fifth Framework Programme - Improving Human Research Potential and the Socio-Economic Knowledge Base - Final Report, European Commission, 2001.

- Gender in Research - Gender Impact Assessment of the Specific Programmes of the Fifth Framework Programme - Improving Human Research Potential and the Socio-Economic Knowledge Base. Study for the European Commission by Mary Braithwaite, Tacitus sprl, April 2001.

INCO (Confirming the International Role of Community Research)

- Ten years of EC scientific co-operation for the transition towards sustainability – INCO2, series of four brochures, 2002.

- Gender in Research - Gender Impact Assessment of the Specific Programmes of the Fifth Framework Programme - Confirming the International Role of Community Research, Executive Summary, European Commission and Directorate-General for Research, 2001.

Other references

Reports

- 1999 Annual Report on the Socio-Economic Dimension in the Fifth Framework Programme - General Information. European Commission, 2000.

- 2000 Annual Report on the Socio-Economic Dimension in the Fifth Framework Programme - General Information. European Commission, 2001.

- Catalogue of Socio-Economic Impact Studies. Biotechnology (1994-1998), European Commission-DGXII Life Science and Technologies - Biotechnology Programme, November 1998.

- Studies on the Socio-Economic Impact of Biotechnology. Consumer Acceptability of Biotechnology in Relation to Food Products, with Special Reference to Farmed Fish, European Commission, 1998.

- Studies on the Socio-Economic Impact of Biotechnology. Genetic Fingerprints: Scientific Truth and Filiation Law, European Commission, 1996.

- Studies on the Socio-Economic Impact of Biotechnology. Cultural and Social Attitude to Biotechnology: Analysis of the Arguments, with Special Reference to the Views of Young People, European Commission, 1998.

- Science and Society - Action Plan, European Commission, 2002.

Annex 2: websites and electronic sources of information

Websites

a) **CORDIS** and the Fifth Framework Programme web pages

- http://www.cordis.lu/en/src/d_001_en.htm *CORDIS - Databases and Web Services*. Information on CORDIS databases, partners, projects, programmes, library, COM-documents, publications, acronyms and contacts.

- http://www.cordis.lu/en/src/d_010_en.htm *CORDIS - RTD Projects Database*.

- http://europa.eu.int/comm/research/fp5.html *Fifth Framework Programme* of the European Community for research, technological development and demonstration activities (1998 - 2002). General information.

- http://www.cordis.lu/fp5/about.htm *Fifth Framework Programme Homepage*. Information resource on all aspects of the Fifth Framework Programme including background and general information, access to programme-specific web services, information and tools to assist participation, calls for proposals, contract preparation and management materials, Commission helpdesks and national sources of assistance.

- http://www.cordis.lu/rtd2002/home.html *RTD Beyond 2002*. Information and documents on the Sixth Framework Programme.

b) European Laws and Directives Database

- http://europa.eu.int/eur-lex/en/index.html EURLEX - The Portal to European Law. Database of EU legislation, legislation in preparation treaties, case-law, Parliamentary questions and documents of public interest.

c) **Quality of Life** Database

- http://www.cordis.lu/life/src/proj_browse.htm. *Quality of Life and Management of Living Resources* Projects Database.

- http://dbs.cordis.lu/fep-cgi/srchidadb?CALLER=PROJ_LIFE&QF_EP_SPF_A=1.1.1.-13.&USR_SORT=EP_PJA_A+CHAR+ASC Projects under the sub Key Action "Socio-Economic Aspects of Life Sciences and Technology" (*Research and technological development activities of a generic nature*).

- http://dbs.cordis.lu/fep-cgi/srchidadb?CALLER=PROJ_LIFE&QF_EP_SPF_A=1.1.1.-11.&USR_SORT=EP_PJA_A+CHAR+ASC Projects under the sub Key Action "Research related to persons with disabilities" (*Research and technological development activities of a generic nature*).

- http://dbs.cordis.lu/fep-cgi/srchidadb?CALLER=PROJ_LIFE&QF_EP_SPF_A=1.1.1.10.&USR_SORT=EPPJAA+CHAR+ASC Projects under the sub Key Action "Public Health and Health Services Research" (*Research and technological development activities of a generic nature*).

d) **GROWTH** Database

- http://dbs.cordis.lu/fep/GROWTH/GROWTH_PROJI_search.html *GROWTH Projects Database*.

- http://www.cordis.lu/growth/src/proj-fp5.htm Projects Funded under the **GROWTH** programme.

- http://www.cordis.lu/growth/src/library.htm Various information sources on the **GROWTH** programme.

e) **IST** Database

- http://www.cordis.lu/ist/projects.htm *IST (Information Society Technologies)* Projects Database.

- http://www.cordis.lu/ist/activit.htm Programme activities.

- www.cordis.lu/ist/ka2/ser.htm KAII SER activities.

f) **EESD** Database

- http://www.cordis.lu/eesd/src/projects.htm *Energy, Environment and Sustainable Development (EESD)* Projects Database.

- http://dbs.cordis.lu/fepcgi/srchidadb?CALLER=PROJ_EESD&QF_EP_SPF_A=EESD@1.1.4.-8.1$&USR_SORT=EP PJA_A+CHAR+ASC Projects under the sub Key Action "Socio-Economic Aspects of Energy within the Perspective of Sustainable Development: Tools for technology assessment" (**Research and technological development activities of a generic nature**).

- http://dbs.cordis.lu/fepcgi/srchidadb?CALLER=PROJ EESD&QF_EP_SPF_A=EESD@1.1.4.-8.2$&USR SORT=EP_PJA_A+CHAR+ASC Projects under the sub Key Action "Socio-Economic Aspects of Energy within the Perspective of Sustainable Development: methodologies for Global System Analysis" (*Research and technological development activities of a generic nature*).

g) **IHP** Database

- http://www.cordis.lu/improving/code/sitemap.htm *Improving Human Potential (IHP)* Projects Database.

- http://www.cordis.lu/improving/fellowships/selected.htm *Supporting training and mobility of researchers (MARIE CURIE)* Database and general information.

- *http://www.cordis.lu/improving/infrastructure/search.htm Enhancing access to research infrastructures (ARI)* database.

- http://improving-ser.sti.jrc.it/default *Key Action Improving the Socio-Economic Knowledge Base* Homepage and Database.

- http://dbs.cordis.lu/fepcgi/srchidadb?CALLER=PROJ_IHP_STRATA&QF_EP_SPF_A=1.4.1.-5.1$&USR_SORT=EP_SDA_A+CHAR+DESC Support for the Development of Scientific and Technology Policies in Europe (STRATA) Homepage.

- http://www.cordis.lu/improving/science/basis.htm Supporting Science and Technology Policies Common Basis for Science, Technology and Innovation Indicators *(CBSTII) Database*.

- http://www.cordis.lu/improving/public-awareness/selected.htm *Raising Public Awareness Projects Synopses Homepage*.

Measuring SE impacts (*the outputs*)

Annex 3: Theoretical framework for SE assessment of research

The community at large

- Reduced damages on the environment (air quality, noise, ecosystem damages, etc.)
- Improvement of health (mortality, morbidity)
- Improvement in quality of life (life expectancy, other indicators)
- Reduction of social exclusion
- Better access to education and culture

Policies and legislation

- Priority shifts
- Directives
- Legislation (European, national, local)

Consumers' behaviour

- Market shifts
- Price shifts
- Better information

Industry and services

- New products and services
- Shift in production costs (and market prices)

Research and education systems

- Shift in disciplinary focus
- New programmes and projects

Measuring the SE dimension (*the inputs*)

Quantitative assessment

- Number and % of RTD projects addressing SE issues as their main focus
- Total budget of the above
- Number and % of RTD projects with an explicit and significant SE component (to be defined, possibly in terms of one of the indicators below)
- SE share of budget of the above
- Person.months of researchers with an explicit and prevailing SE background
- Alternatively (the latter is probably difficult to assess): number of SE researchers involved in RTD projects
- Number of EC, EP Directives (or other pieces of legislation) explicitly quoting RTD inputs
- Number of evaluators with an SE background (in the database)
- Number of evaluators with an SE background (actually participating in panels)
- Number of RTD projects cutting across Key Actions or programmes

Quali-quantitative assessment (indicators)

- Interdisciplinarity (index to be designed)
- Involvement in RTD projects of interest groups (consumers, unions, professional and industrial associations, etc.), and nature of the involvement (partners, co-funders, etc.)
- Conferences and other information and dissemination events directed to non-specialists
- Thematic Networks and Accompanying Measures
- Publications of a non-technical nature
- Researcher mobility in SE disciplines

Annex 4: Classification of RTD topics by discipline

Mathematics and Information Sciences

M-01	Statistics and Probability
M-02	Algebra and Number Theory
M-03	Geometry and Topology
M-04	Analysis and Partial Differential Equations
M-05	Applied Mathematics and Mathematical Physics
M-06	Discrete Mathematics and Computational Mathematics
M-07	Logic and Semantics
M-08	Algorithms and Complexity
M-09	Signals, Speech and Image Processing
M-10	Computer Graphics, Human Computer Interaction, Multimedia
M-11	Information Systems, Software Development and Databases
M-12	Knowledge Engineering and Artificial Intelligence
M-13	Systems, Control Modelling and Neural Networks
M-14	Parallel and Distributed Computing, Computer Architecture
M-99	Other Mathematics and Information Sciences

Physics

P-01	Elementary Particles and Fields
P-02	Nuclear Physics
P-03	Atomic and Molecular Physics
P-04	Optics and Electromagnetism
P-05	Fluids and Gases
P-06	Plasmas and Electric Discharges
P-07	Statistical Physics and Thermodynamics
P-08	Astronomy, Astrophysics and Cosmology
P-09	Condensed Matter – Mechanical and Thermal Properties
P-10	Condensed Matter – Electronic Structures, Electric and Magnetic Properties
P-11	Condensed Matter – Optical and Dielectric Properties
P-12	Surface Physics
P-13	Physics of Superconductors
P-14	Physical Chemistry, Soft Matter and Polymer Physics
P-15	Biophysics and Medical Physics
P-16	Non-Linear Dynamics and Chaos Theory

Life Sciences

L-01	Macromolecular Structures and Molecular Biophysics
L-02	Metabolism of Cellular Macromolecules
L-03	Biological Membranes
L-04	Enzymology
L-05	Bioenergetics
L-06	Metabolic Regulation and Signal Transduction
L-07	Genomics and General Genetics
L-08	Computational Biology and Bioinformatics
L-09	Genetic Engineering
L-10	Developmental Biology
L-11	Physiology
L-12	Cell Biology
L-13	Microbiology and Parasitology
L-14	Virology
L-15	Immunology
L-16	Cancer Research
L-17	Pharmacology and Toxicology
L-18	Neurosciences (incl. Psychiatry and Clinical Psychology)
L-19	Biomedicine, Public Health and Epidemiology
L-20	Medical Pathology
L-99	Other Life Sciences

Environment and Geosciences

E-01	Pollution, Waste Disposal and Ecotoxicology
E-02	Ecology and Evolution (incl. Population Biology)
E.03	Biodiversity and Conservation
E-04	Agriculture, Agroindustry and Forestry
E-05	Fisheries and Aquaculture
E-06	Environmental Engineering and Geotechnics
E-07	Natural Resources Exploration and Exploitation
E-08	Soil and Water Processes
E-09	Stratigraphy, Sedimentary Processes and Palaeontology
E-10	Geophysics, Tectonics, Seismology and Volcanology

P-99	Other Physics

Chemistry

C-01	New Synthesis, Combinatorial Chemistry
C-02	Homogeneous and Heterogeneous Catalysis
C-03	Reaction Mechanisms and Dynamics
C-04	Biological, Pharmaceutical and Medicinal Chemistry
C-05	Instrumental Techniques, Analysis Sensors
C-06	Theoretical and Computational Chemistry
C-07	Surface Science and Colloids
C-08	Molecular Aspects of New Materials, Macromolecules, Supramolecular Structures, Nanochemistry
C-09	Environmental Chemistry
C-99	Other Chemistry

E-11	Geochemistry and Mineral Sciences
E-12	Marine Sciences
E-13	Climatology, Climate Change, Meteorology and Atmospheric Processes
E-14	Physical Geography, Earth Observation and Remote Sensing
E-99	Other Environment and Geosciences

Engineering

I-01	Mechanical Engineering
I-02	Transport Engineering
I-03	Civil Engineering
I-04	Electrical Engineering
I-05	Electronics
I-06	Telecommunications
I-07	Automation, Computer Hardware, Robotics
I-08	Chemical Engineering
I-09	Bioengineering
I-10	Materials Engineering
I-99	Other Engineering Sciences

Economic, social and human sciences

S-01	Law
S-02	Political Sciences (European or Comparative National)
S-03	Sociology
S-04	Psychology (Social, Industrial, Labour, or Education)
S-05	Education and Training
S-06	Linguistics (applied to: Education, Industrial Efficiency or Social Cohesion)
S-07	Media and Mass Communication
S-08	Philosophy of Science
S-09	Other Social and Human Sciences
S-10	Microeconomics
S-11	Macroeconomics
S-12	International Economics
S-13	Financial Sciences
S-14	Industrial Economics (incl. Technology and Innovation)
S-15	Public Sector Economics
S-16	Urban and Regional Economics (incl. Transport Economics)
S-17	Natural Resources and Environmental Economics
S-18	Labour Economics
S-19	Social Economics
S-20	Management of Enterprises (incl. Marketing)
S-21	Quantitative Methods
S-22	Other Economics Sciences
S-99	

Annex 5: Sample of SE-relevant FP5 projects

IHP

Project Name: AITEG *(Assessing the impact of technology and globalisation: the effects on growth and employment)*

Reference: HPSE-CT1999-00043

Programme and Key Action: Improving Human Potential – KA "Socio-economic knowledge base"

Coordinator: Birkbeck College/University of London - School of Management and Organisational Psychology – London, United Kingdom.

Participating Organisations: Department of Agricultural and Food Economics - Centre for Food Economics Research/University of Reading – United Kingdom; Departamento de Economia Aplicada Ii/Facultad de Ciencias Economiscas y Empresariales/Universidad Complutense de Madrid – Spain; Centro Interuniversitario di Ricerca CUSTOM – Italy; TEMA Institut/Department of Technology and Social Change/University Of Linkoeping – Sweden; Centre for Technology, Innovation and Culture/ University of Oslo – Norway.

Contract Type: Cost-sharing contracts

Duration: *June 2002 – August 2004 (27 months)*

Status: Execution

EU Contribution: €786 657

Description of Work: Technological change and globalisation are two of the key forces of change that will shape the future of the EU economy in the new millennium. How these forces influence the overall growth and employment performance of the EU remains a largely neglected issue. Current explanations for the EU's disappointing performance have tended to focus on macroeconomic factors, such as monetary and fiscal constraints, while analysis of the causes of unemployment tends to be limited to the operation of the labour market alone. Much can be learned from an investigation of changes in the structure of the EU economy, in terms of the pace, direction and nature of the parallel processes of technological change and globalisation of production. This project aims to provide new understanding of the impact of these two major processes on economic growth and employment in EU countries, in comparison with the US, Japan and other advanced economies.

Further Information: Project papers can be found at:
http://www.econ.uniurb.it/zanfei/convegno-/papers.htm

IHP

Project Name: Physics On Stage

Reference: HPRP-1999-00001

Programme and Key Action: Improving Human Potential/Raising Public Awareness of Sciences and Technologies

Coordinator: Dr Richard WEST - European Southern Observatory - Education and Public Relations Dept. – Karl-Schwarzschild-strasse 2, 85748 Garching, Germany.

Contract Type: Accompanying Measure

Total Cost: €880 000

EC Contribution: €432 000

Major Features: The overall goal is to draw attention to the need to improve the general public's understanding of physics and to propose specific measures promoted by means of a highly visible series of activities. ESO, ESA, CERN will interact with organisations such as the national branches of the European Physical Societies and the EAAE National Representatives in individual Member States to select innovative ideas and projects for physics education, e.g. interactive experiments, theatre, video, web application, and classroom demonstrations. These contributions will be presented at national events in September 2000 and the participants with the best contributions will then be invited to the international meeting in Geneva in November.

Main Event: The central event is a five-day conference during Science Week at CERN, Switzerland, which will be attended by European physics teaching bodies and the media. Day 1: Leading figures in physics research, teaching, communication, employment and administration highlight the importance of physics in modern European culture and economy. Days 2 and 3: Interactive presentation by Member State delegates of innovative teaching techniques and material. Day 4: Morning visits to CERN accelerators and experiments, and a presentation on "CERN as the birthplace of the World Wide Web". Afternoon workshops on topics such as "physics and technology", "hands-on experiments", "physics leads to jobs", and "exploiting the web in teaching. Day 5: Overview of contributions and workshops, round-table panel discussions and closing address by a leading European Union decision-maker. The meeting will be public and broadcast on the web and through a European television channel.

Quoted in: COM(2001) 714 final. COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS – Science and Society Action Plan. Brussels, 4.12.2001, page 11.

Action 15 ***The Commission, in co-operation with the Member States, will support education research and development projects specific to science and technology. The dissemination of results will be promoted by exchanges of experience among teachers, conferences and public debates on the teaching of science and technology. Useful information will be made available on internet sites.***

What is Physics on Stage? Physics on Stage was one of a number of initiatives launched under the European Science and Technology Week, 2000. During the course of that year a wide variety of national activities took place to identify outstanding projects and individuals in the field of physics teaching. National Steering Committees were set up in 22 European countries to select the best projects, which were then brought together during a five-day festival held at CERN in Geneva during the Science Week, 6-10 November. In addition to a physics fair, demonstrations and presentations, a number of working groups considered key issues facing physics teaching across Europe today. The project was initiated by the European Organisation for Nuclear Research (CERN), the European Space Agency (ESA) and the European Southern Observatory (ESO).

Taking advantage of SOCRATES-related actions and operations

Other initiatives such as the SOCRATES programme (in particular the Minerva action) and media events such as Netd@ys 20 (Internet Week) or eSchola (week focusing on innovative uses of the internet in schools) can also aid dissemination. Such events will concentrate on developing projects of a high educational quality backed by adequate teaching resources.

IHP

Project Name: Full Employment in Europe

Reference: ERBSOE2-CT97-3045

Programme and Key Action: Improving Human Potential – KA "Socio-economic research"/Task "Research into social integration and social exclusion in Europe".

Coordinator: Universität Bremen/Institut für Europäische Wirtchaft und Wirtschaftpolitik – Bremen, Germany.

Participating Organisations: Technical University of Denmark - Lyngby/Department of Technology and Social Sciences – Denmark; Freie Universität Berlin/FU Berlin Fachbereich Politische Wissenschaft – Germany; Universitat Autonoma de Barcelona/Departament d'Economia Aplicada – Spain; TU Delft WTM/Department of Economics – The Netherlands; Universität Wien/Economics Department – Austria; South Bank University School of Urban Development-London – United Kingdom; CEPREMAP/Paris – France; University of London/Queen Mary Westfield College – United Kingdom; TU Wien/Instituts für Finanz und Infrastrukturpolitish – Austria; Université de Paris I/Séminaire d'Economie du Travail-Mutations Espace Travail Industrie Stratégies – France; Université de Paris 13/Centre d'Etudes de Dynamiques Internationales – France; National Technical University of Athens/Department of General Studies – Greece; University of Bologna/Dip. Scienze Economiche – Italy.

Contract Type: Thematic Network contracts

Duration: December 1997 to unknown

Status: Execution.

Description of Work: The general objective of the thematic network *Full Employment in Europe* is to reintroduce and substantiate the concept of full employment (FE) into the economic policy discussion in the European Union, at the Community as well as at the national and regional/local level. The project will focus on the development of an analytical understanding of the endogenous and external reasons why full employment has been widely abandoned as an economic policy goal; the elaboration of the necessary modifications and differentiations which must be made in a full employment strategy in contemporary Europe as compared to the three decades after World War II; and, lastly, the concretisation of the instrumental and institutional side of an appropriate full employment strategy as a multilayered policy at European, national and regional/local levels, paying particular attention to the mutual links between the different levels. The TN will proceed in four working groups exploring conceptual, historical and institutional dimensions of full employment and the development of these dimensions since WWII, thus dealing with the macroeconomic requirements for a sustainable strategy for FE and appraising the role of working-time arrangements in a strategy for full employment. Finally, structural aspects of FE policies will be analysed, such as EU regional policy on both a national and a European level, then the field of technology policy will be addressed. Working group meetings will be arranged to which interested experts will be invited, along with public annual conferences which will discuss and synthesise the findings of the working groups.

Further Information: http://www.memo-europe.uni-bremen.de/tser/

IHP

Project Name: European Science and Technology Week

Reference: not available: Project selected in 1999

Homepage: http://www.cordis.lu/scienceweek/home.htm

Programme and Key Action: Improving Human Potential/Raising Public Awareness of Sciences and Technologies

Contract Type: Accompanying Measure

Duration: 4-10 November 2002

Major Features: Through thought-provoking activities and a pan-European approach, the European Science and Technology Week's mission is to create a totally new perspective on science. The emphasis is on *showing*, rather than *telling*, Europeans how science and technology affects them, from the simplest gadgets to the most sophisticated satellite technology. Science is, above all, a quest for knowledge and how it can be used to improve our lives, lifestyles, and our living world.

Quoted in: COM(2000) 6 final. COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS – Towards a European research area. Brussels, 18.1.2000, pages 17-18.

The Member States and the Union should rapidly undertake a joint in-depth study of the room made for science subjects in education systems and how the teaching of sciences in the Union can be improved at levels of education, primary, secondary and further.

Using the experience gained at national level, awareness-raising campaigns should also be stepped up to create conditions conducive to the sharing of experience and good practice. The Research Ministers of the Union met to explore the possibility of better coordination of the different "science weeks" organised in the Member States, both between one another and with the Union's "European Science and Technology Week". Organisation of events at the same time in all the Member States and on a European scale would markedly increase the awareness-raising effect.

Also quoted in: COM(2001) 714 final. COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS – Science and Society Action Plan. Brussels, 4.12.2001, page 11.

IHP

Project Name: FOREN *(Foresight for Regional Development network)*

Reference: HPV1-1999-00008

Programme and Key Action: Improving Human Potential/STRATA

Coordinator: Institute for Prospective Technological Studies – Joint Research Centre – S/N Isla de la Cartuja s/n, World Trade Centre 41092 – Sevilla, Spain.

Contract Type: Thematic network contract

Duration: 24 months

Status: Completed

Project Cost: €728 467 00

Project Funding: €728 467 00

Project website: http://foren.jrc.es

Major Features: The aim of this proposal for a thematic network is to gather two communities of policy research, one in Foresight activities and the other one on Regional Development. The network aims to create a forum where participants can interchange experiences of "best-practice approaches" in the two fields, and bridge the existing gap between their respective communities. The final aim is to identify "good practices" which could be used to guide and inform specific Foresight activities at regional level in different parts of Europe. The project is intended to generate knowledge and to lay the foundations for concrete pilot projects, between policy researchers, policy-makers and other players (regional).

Quoted in: COM(2001) 549 final. COMMUNICATION FROM THE COMMISSION – The Regional Dimension of the European Research Area. Brussels, 03.10.2001, page 26.

4.2.2. Improve communication between experts and policy and makers

The Commission will support the establishment of joint work and communication platforms between experts and policy-makers at regional level. For example, groups of experts could be established in the field of technology foresight at regional level. The existing experience of projects like FOREN[1] could be used to guide further exercises in this direction.

4.2.3. Introduce a regional dimension in research and innovation information systems

The Commission will develop an integrated information system covering national and regional research and innovation programmes, targeted at policy- and decision-makers as well as researchers. This system, for which a feasibility study has already been launched, is a response to a specific demand by the Council and is expected to improve substantially the conditions for transregional/ transnational co-operation in the areas of research and innovation, as well as the process of transferring best practice.

[1] *FOREN (http://foren.jrc.es) is a thematic network under the Commission's RTD Framework Programme (STRATA, Strategic Analysis of specific policy issues) that aims at promoting effective integration of Foresight processes into regional development policy and strategy planning. It consists of a platform of experts and policy-makers comprising representatives from two communities which are not used to working closely together: the technology Foresight community and the regional development policy community. Its objective is to create and exploit synergies and action-oriented co-operation between actors in the two fields, primarily through the simulation of Foresight-type activities. Experts and decision-makers representing both communities come from universities, research centres and other Foresight centres, as well as policy/decision- makers from regional development agencies and regional/local authorities.*

QOL

Project Name: MADO *(Optimisation of Typing Policies for European Marrow Donors Registries: Socio-economic Evaluation of Molecular Techniques and Recruitment Strategies)*

Reference: QLG7-2001-00065

Programme: Quality of Life

Coordinator: Inserm U 558/Epidemiology and Analyses in Public Health: Risks, Chronic Diseases and Handicaps – Toulouse, France.

Participating Organisations: Institut National de la Santé et de la Recherche Médicale – France; Université Toulouse Le Mirail – France; Université Des Sciences Sociales de Toulouse 1 – France; Stichting Europdonor Foundation – The Netherlands; Leiden University Medical Centre – The Netherlands; The Anthony Nolan Bone Marrow Trust – United Kingdom; Italian Bone Marrow Donor Registry – Italy; Centre National De Genotypage – France; Centre Hospitalier Universitaire de Montpellier – France; International Genetic Technologies – France.

Contract Type: RTD Shared Cost

EU Contribution: €743 000

Duration: 24 months

Status: Execution

Description of Work: Although 6 million potential donors are registered worldwide, finding a donor compatible for allogenic stem cell graft is hard because of HLA polymorphism. MADO (MArrow DOnors) aims at evaluating optimisation of registries in Europe by increasing the proportion of donors with rare HLA types registered to reduce inequality of patients in a cost-effective way. The main concept is an evolving filter to screen potential donors at low cost before full HLA typing for the likely presence of frequent types, using new markers and techniques. Organisational scenarios will then be designed. MADO involves nine work programmes over two years and involves 12 partners in EU countries: four European registries, sociologists, economists, public health units, immunogenetics/molecular laboratories and bioinformatics, and industry. The overall expected achievement is a number of well-documented possible scenarios to help decision-making on the organisation of coherent strategies for registry management.

Further Information: Ms Cambon-Thomsen Anne cambon@cict.fr

QOL

Project Name: European Study of Clinical, Health Economic and Quality of Life Outcomes in Haemophilia Treatment

Reference: QLG7-2002-02475

Programme: Quality of Life

Coordinator: Ludwig-Maximilian-University/Dept. of Haemostaseology and Transfusion – Munich, Germany.

Participating Organisations: University of Milan/Dpt. of Internal Medicine Haemophilia and Thrombosis – Italy; Oxford Radcliffe Hospitals/Oxford Haemophilia Centre Churchill Hospital – UK; University of Lund Paediatrics/University Hospital – Sweden; National Medical Centre and National Haemophilia Centre – Hungary; University of Medicine and Pharmacy "Victor Babes" III Paediatric clinic – Romania; University of Hamburg/Dpt. of Medical Psychology - University clinics, Hamburg – Germany; Medical Economics Research Group GmbH – Germany; University of Milan - Centre of Pharmacoeconomics – Italy.

Contract Type: Shared Cost

EU Contribution: €1 828 840

Duration: 24 months (starting date is under negotiation)

Description of Work: This study has been designed to evaluate the quality of haemophilia care in Europe to describe the quality of life of European haemophiliacs and to estimate the costs needed to attain these levels of quality. About 2 040 patients will be recruited consecutively from haemophilia comprehensive care centres from 22 countries. The study will consist of a quality of life study, a cost-of-illness, cost-effectiveness and cost-utility analysis to perform total costs due to haemophilia, in order to compare alternative treatments and to determine patients' preferences. Haemophiliac patients of four years' standing will be classified according to following characteristics: severity of haemophilia, presence of inhibitors, and treatment schemes. Clinical and health economic data will be assessed at baseline and prospectively over a six-month follow-up period. In addition, the patients will fill in a diary during the follow-up period.

Further Information: Mr Schramm Wolfgang wolfgang.schramm@medinn.med.uni-muenchen.de

QOL

Project Name: TB VACCINE CLUSTER *(A cluster for tuberculosis vaccine development)*

Reference: QLK2-1999-01093

Programme and Key Action: Quality of Life/KA2 - Control of infectious diseases

Coordinator: Institut Pasteur - Rue du Docteur Roux 28 – 75724 Paris, France

Contract Type: Cost-sharing contracts

Duration: 36 months (February 2000 – January 2003)

Status: Execution

Major Features: The overall objective of the *Cluster* is to establish a framework for preclinical development of novel tuberculosis vaccine candidates. We aim to identify optimal strategies for the generation of *vaccine* candidates by comparing innovative approaches based on the identification of novel protein antigens, characterisation of non-protein antigens that elicit T-cell responses in man, and construction of live attenuated strains of mycobacteria. The work plan for the *Cluster* is based on five interactive component projects. Project 1 will focus on the establishment of a standardised protocol for preclinical assessment of *vaccine* candidates in a series of animal challenge models. Projects 2 and 3 are directed towards discovery of new *vaccine* candidates which will subsequently feed into the preclinical screening programme established in Project 1. Project 4 will study the mechanisms underlying the pathological manifestations of tuberculosis and the protective immune responses induced by the different vaccine candidates.

Quoted in: COM(2000) 585 final. COMMUNICATION OF THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT. Accelerated action targeted at major communicable diseases within the context of poverty reduction. Brussels, 20.9.2000, page 35.

"With the Fifth Framework Programme, the Key Action 'Control of Infectious Diseases' has embraced a global view in its programme objectives. 40% of its currently committed budget (total budget over four years is €300 million) is on projects linked to the three major communicable diseases. A novelty is the successful implementation of large cluster projects, in particular for HIV, TB and malaria vaccines, as well as for TB drug development. So far, €21.8 million have been committed for HIV, €8.8 million on malaria, and €9.9 million on TB research, with approximately two-thirds of the budget being reserved for vaccine research and one-third for drug development."

QOL

Project Name: EuroVac *(European vaccine effort against HIV/AIDS)*

Reference: QLK2-1999-01321

Programme and Key Action: Quality of Life/KA2 - Control of infectious diseases

Coordinator: Centre National de la Recherche Scientifique - Allée d'Italie 46, Ecole Normale Superieure de Lyon – 69364 Lyon, France.

Contract Type: Cost-sharing contracts

Duration: 36 months (1 January 2001 – 31 December 2002)

Note: a second project named **EuroVac II** (QLK2-2001-01316) was funded from 1 November 2001-31 October 2004 and coordinated by Academisch Ziekenhuis Bij De Universiteit Van Amsterdam - Meibergdreef 15 – 1105 AZ Amsterdam, The Netherlands.

Status: Execution

Major Features: *Vaccine* candidates that show most promise in simian AIDS models are based on a prime-boost strategy, applying naked DNA or alpha viruses as prime and pox viruses as a boost. The objectives of the *EuroVac* project are to demonstrate in a phase I trial of humans: First, the ability of Semliki Forest virus (SFV) to prime anti-HIV immune responses, compared to the attenuated poxvirus NYVAC, using a recombinant gp140 protein boost. Secondly: the ability of SFV priming; using DNA priming as benchmark; to improve the immune responses elicited by NYVAC + rgp140 vaccination.

Quoted in: COM(2000) 585 final. COMMUNICATION OF THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT. Accelerated action targeted at major communicable diseases within the context of poverty reduction. Brussels, 20.9.2000, page 34.

"Specific sponsored actions to date include:
1. Funding for the EuroVac cluster project, through the Commission's Directorate for Scientific Research Framework Programme. This three-year collaboration between European research institutions and industry will identify potential candidate vaccines for developing countries and develop new techniques for vaccine delivery and funding of enabling projects for HIV vaccine development."

Also quoted in: COM(2000) 346 final. COMMUNICATION FROM THE COMMISSION. The International Dimension of the European Research Area. Brussels, 25.06.2001, page 19.

"In this way, large-scale integrated projects were launched in order to develop new vaccines and medicines, including the EuroVac project bringing together the majority of European researchers working on the HIV vaccine and a "tuberculosis vaccine" cluster. Other projects funded include, for example, the development of suppositories with a new anti-malarial treatment (artenusate) expected to be more widely effective in the treatment of infant malaria. Thanks to the networks developed by the INCO programme in Africa, many research teams in the countries of the South took an active part in this project."

QOL

Project Name: EUROCJD *(Creutzfeldt-Jakob Disease: Epidemiology, Risk Factors, Diagnostic Tests and Genetics)*

Reference: QLK2-2001-02248

Programme and Key Action: Quality of Life/KA2 - Control of infectious diseases

Coordinator: Department of Clinical Neurosciences - National CJD Surveillance Unit - University of Edinburgh - Western General Hospital – Crewe Road, EH4 2XU Edinburgh, United Kingdom.

Contract Type: Coordination of research actions

Duration: 48 months (1 October 2001 – 1 October 2005)

Status: Execution

Major Features:
1. The identification of all cases of VCJD in participating countries;
2. Examination of risk factors for the development of VCJD;
3. The study of sporadic CJD with specific reference to atypical phenotypes;
4. Study and comparison of distribution of prior protein (PrP) genotypes in normal populations of participating countries;
5. Studies of distribution of PrP genotypes with age and gender in normal population groups;
6. CSF protein analysis: harmonisation of methods and continuing research.

Quoted in: COM(2001) 323 final. COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT on research activities in Europe related to Transmissible Spongiform Encephalopathies. Brussels, 12.6.2001, page 10.

" C. OBSERVATIONS ON THE MAJOR RESEARCH AREAS:

a) Epidemiological research and surveillance

Human TSE

Epidemiological research and surveillance in human TSEs are coordinated at EU level through the network projects (EUROCJD and NEUROCJD), successfully established by the CJD Surveillance Unit and complemented by the neuropathology network (PRIONET) coordinated by the Institute of Neurology of University of Vienna. All countries (except LU) participate in these networks coordinated by the UK and AT. However, in order to achieve a harmonised surveillance within each country and hence achieve harmonisation of national programmes across the EU, there is, in some countries, considerable room for improvement for the provision of the necessary financial, personnel and structural means to perform the tasks required by the networks."

GROWTH

Project Name: YTRID *(Remediation of aqueous and gaseous waste streams using pulsed corona discharge in heterogeneous media)*

Reference: G1RD-CT-2002-00693

Programme and Key Action: GROWTH/KA1 "Innovative Products, Processes and Organisation"

Coordinator: Soreq Nuclear Research Centre – Yavne, Israel.

Participating Organisations: De Neef Chemical Recycling Nv – Belgium; Institute for Sanitary Engineering, Water Quality and Solid Waste Management/Universität Stuttgart – Germany; Eindhoven University of Technology – the Netherlands; Abb Semiconductors AG – Switzerland; Plasmaair AG – Germany.

Contract Type: Cost-sharing contracts

Duration: June 2002 – May 2005 (36 months)

Status: Execution.

Description of Work: This ambitious project intends to overcome drawbacks of both the conventional and advanced technology for air-quality control and wastewater treatment. This RTD claims the following major innovations: a) Using pulsed corona discharge in heterogeneous media for the creation of highly-reactive non-thermal plasma on a large scale; b) Developing an efficient and affordable nanosecond, high-power pulsed power supply (PPS) because of the revolutionary switching components that are to be developed specially for this RTD; and c) Enhancing the chemical efficiency of the plasma process because of additional pre-treatment enriching pollutant content in the stream. The technology will be developed by a unique consortium comprising the most competent partners for this multidisciplinary mission and will be tested on real wastes by the end-user partner.

Further Information: Dr Pokriyailo Alex alex@soreq.gov.il

GROWTH

Project Name: CLOTADAM *(Treatment of mine waste to achieve cost-effective engineered closure of tailings dams)*

Reference: G1RD-CT2001-00480

Programme and Key Action: GROWTH/KA1 "Innovative Products, Processes and Organisation"

Coordinator: Knight Piesold Ltd – Ashford, United Kingdom.

Participating Organisations: National Technical University of Athens – Greece; Tvx Hellas Sa of Mines and Gold Manufacturing – Greece; Aurul S.A. – Romania; Imperial College of Science, Technology and Medicine – United Kingdom; Kghm Polska Miedz S.A. – Poland.

Contract Type: Cost-sharing contracts

Duration: September 2001 – August 2005 (48 months)

Status: Execution

Description of Work: The safe and environmentally sound storage of the process wastes in the tailing facility (TSF) is an important cost factor for most mining projects, both during operation and post closure. The recent EU Landfill Directive COM (93) 275 is currently being adopted by regulators, and, potentially, TSF will represent a high proportion of capital expenditure at start up and significant liability post closure. In the proposed study the aim is to develop technologies that can be incorporated into the operational phase to achieve cost-effective tailings closure systems. In some cases the closure of a TSF may represent more than 50% of the overall closure cost. It is expected that the employment of cost-effective closure technologies may reduce costs by at least 15%. The potential cost savings have been estimated at 1.2 billion in the EU region.

Further Information: Mr Michael Cambridge mcambridge@knightpiesold.co.uk

GROWTH

Project Name: ECOSIT *(External Costs of Innovative Industrial Technologies)*

Reference: GMA1-2000-27006

Programme and Key Action: GROWTH

Coordinator: ISIS-Istituto di Studi per l'Integrazione dei Sistemi – Italy.

Participating Organisations: Ad Hoc Consultants – Belgium; AEA Technology – United Kingdom; IER Stuttgart – Germany; EKONOEnergy – Finland.

Contract Type: Accompanying Measure

Duration: April 2001 – September 2002 (18 months)

Status: Completed

Description of Work: This project is an Accompanying Measure whose final objective is to evaluate the major externalities related to some specific innovative industrial technologies. The methodology proposed comprises the extension and application of assessment methods developed in the ExternE research project (JOULE programme) for energy and transport technologies. The project will quantify – for several specific industrial technologies – what burdens (emission of pollution, etc.) associated with operation, the health and environmental impacts are likely to be most significant, and will make a monetary valuation of the damage costs. The knowledge of externalities associated with industrial technologies will allow cost-benefit analyses to be conducted leading to estimations of their "total" costs (i.e. the sum of market costs and externalities). Such estimations will be particularly useful for the EU industry in its effort to pursue increased efficiency (which entails the reduction of both internal and external costs), and for Community environmental policies, as new and innovative technologies have a crucial role in reducing environmental problems.

Further Information: Mr Stefano Faberi (sfaberi@isis-it.com), or http://www.isis-it.com/doc/progetto.asp?id=46 for the project findings, or the ExternE project website http://externe.jrc.es/ for the externalities evaluation theory.

GROWTH

Project Name: ECBOS *(Enhanced Coach and Bus Occupant Safety)*

Reference: G2RD-1999-11130

Programme and Key Action: GROWTH/KA2 - Sustainable mobility and intermodality

Coordinator: Technical University of Graz – Kopernikusgasse, 24 8010, Graz, Austria.

Contract Type: Cost-sharing contracts

Duration: 36 months (1 January 2000 – 31 December 2002)

Status: Execution

Major Features: In the EU, approximately 20 000 coaches weighing more than 5 000kg are involved in accidents resulting in personal injuries. Every year more than 35 000 people are injured in these accidents and over 250 occupants of buses and coaches suffer fatal injuries. In recent years there has been no trend towards any significant reduction. Therefore the general objective of this project is to generate new knowledge, based on accident studies, for minimising the incidence and cost of injuries caused by bus and coach accidents. It will be achieved by developing cost-effective test and evaluation methods for the assessment of the protection offered to the bus occupant and driver in frontal, side and roll-over accidents. Emphasis will be put on the various passenger sizes, including children. M2, M3 and city buses will be investigated. The project will result in a European bus accident database, written regulations and suggested test methods.

Quoted in: COM(2000) 125 final. COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS – Priorities in EU Road Safety Progress Report and Ranking of Actions. Brussels, 17.03.2000, page 41.

Crash-worthiness of vehicles Cars	Crash-worthiness minimum standards for new cars have been introduced for the first time at EU level as from 1998 by type approval Directives on side impact and frontal impact. However, there are still considerable differences between cars from the same classes as regards crash-worthiness.	Research by EEVC in preparation for the amendment of Directives 96/27/EC ("side impact") and 96/79/EC ("frontal impact") in order, *inter alia*, to broaden their scope of application, amend certain assessment criteria, and increase the collision speed. Final report: February 2000. EuroNCAP (on going).
Buses	The Communication on type approval for buses (Com (97) 276) includes standards for roll-over, and evacuation procedures.	The Communication is under consideration by the Council and the Parliament. ECBOS project in FP5 will examine crash tests and other safety issues.
ADRIA (Fourth Framework Programme)	Design of an advanced, biofedelic crash dummy for injury assessment in frontal test conditions.	Project started in Feb. 1997. Final report June 1999.

GROWTH

Project Name: RECORDIT *(REal COst Reduction of Door-to-door Intermodal Transport)*

Reference: GRD1-CT1999-11047

Programme and Key Action: GROWTH/KA Sustainable mobility and intermodality - Modal and intermodal transport management systems

Coordinator: ISIS - Istituto di Studi per l'Integrazione dei Sistemi – Via Flaminia 21, 00196 Rome, Italy.

Contract Type: ACM (Preparatory, accompanying and support measures)

Duration: 24 months (1 January 2000 – 31 December 2001)

Status: Completed

Major Features:

1) Design a comprehensive methodology for the calculation of real (internal+external) costs of intermodal freight transport and for the understanding of cost formation mechanisms;
2) Validate this methodology through its application to three meaningful European corridors (including CEEC);
3) Analyse current charging and taxation systems to understand price formation mechanisms;
4) Carry out a systematic cost comparison for intermodal and all-road alternatives;
5) Assess current imbalances and inefficiencies;
6) Develop a decision support module to foster generalisation;
7) Identify and analyse technical and organisational cost reduction options;
8) Formulate recommendations on public policies and business actions to reduce real costs and to internalise external costs;
9) Promote consensus building among operators and users; and
10) Disseminate project findings (two workshops, a website).

Quoted in: COM(2002)54 final – 2002/0038 (COD). Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the granting of Community financial assistance to improve the environmental performance of the freight transport system (presented by the Commission). Brussels, 04.02.2002, page 10.

39. If no decisive action is taken, total road freight transport in the European Union is set to grow by about 50% until 2010. Cross-border traffic is expected to double by 2020[1]. For cross-border road freight, this means a foreseen growth of about 12 billion tkm[2] per year, which translates into further congestion, pollution and accidents. The socio-economic cost of the additional 12 billion tkm on roads has been estimated at more than €3 billion per year[3].

40. This is not acceptable. Coping with this growth implies using alternatives to road transport more intensively and systematically than hitherto. The Commission White Paper "European transport policy for 2010: time to decide" of 12 September 2001 therefore proposes more than 60 concrete and effective measures for a more performing transport system. More specifically, as a benchmark, it sets the ambitious objective to maintain the traffic share between the various transport modes for the year 2010 at its 1998 level. The Marco Polo programme is one of the measures to achieve this objective in the international freight transport sector.

[1] Final report of SCENES – European Transport Scenarios, project funded under FP4, http://europa.eu.int/comm/transport/extra/home.html.

[2] tkm = tonne-kilometre; the transport of one tonne (1 000 kg) of cargo over the distance of one kilometre.

[3] RECORDIT – External cost calculations for selected corridors. Deliverable 4. Project funded under FP5.

IST

Project Name: E-LIVING *(Life in a Digital Europe)*

Reference: IST-2000-25409

Programme and Key Action: IST-Promoting a User-friendly Information Society – KA 2 "New Methods of Work and Electronic Commerce"

Coordinator: British Telecommunications Plc – London, United Kingdom.

Participating Organisations: University of Essex – United Kingdom; Industrial Development and Education Centre – Greece; Telenor Communication As – Norway; Virtech Ltd – Bulgaria; Legambiente Onlus – Italy; Centre d'Etudes de Populations, de Pauvreté et de Politiques Socio-économiques/International Networks for Studies in Technology, Environment Alternatives, Development – Luxembourg; Deutsches Institut für Wirtschaftsforschung E.V. – Germany; ICTAF - Interdisciplinary Centre for Technological Analysis and Forecasting – Israel.

Contract Type: Cost-sharing contracts

Duration: January 2001 – December 2003 (36 months)

Status: Execution

Description of Work: This project will create a coordinated set of pan-European longitudinal household panel studies to generate quantitative data on time-use, uptake of IST, IST competencies, environmental impact and perceived quality of life. It will conduct analysis of this data to describe, explain and model relationships between the uptake and usage of IST and changes in citizens' lives and to understand how these patterns contribute to changes in lifestyles and/or quality of life. The results will be made available as a resource for future analysis or for use in subsequent projects via a website, publications and a managed programme of workshops to engage public and commercial policy-makers. Finally, the consortium will work towards an ongoing pan-European household panel study aimed at measuring and testing the hypothesised benefits of IST. Thus, E-LIVING will: a) review best practice in longitudinal panel study methods together with best advice on suitable parameters for measuring the information society which match the project's analytic aims; b) implement a set of data collection instruments and recruit a stratified sample of European households from a range of Member and Associated States; c) collect a first wave of data on the time use, uptake of ISTs, IST competencies, environmental impact and perceived quality of life of individuals within these households, and conduct analysis on the cross-sectional patterns of distribution of these parameters across contrasting socio-economic groups and contexts; d) collect a second wave of identical data on the same individuals after 12 months, and conduct casual analysis to describe, explain and model trends in these critical parameters and then relate these trends to changes in the uptake and usage of information society technologies.

Further Information: Mr Ben Anderson ben.anderson@bt.com

IST

Project Name: ViSiCAST *(Virtual Signing: Capture, Animation, Storage and Transmission)*

Reference: IST-1999-10500

Programme and Key Action: Promoting a User-Friendly Information Society - IST

Coordinator: Independent Television Commission Standards and Technology – Kings Worthy Court, Kings Worthy, SO23 7QA Winchester, United Kingdom.

Project Website: http://www.visicast.co.uk

Contract Type: Cost-sharing contracts

Duration: 36 months (1 January 2000 – 31 December 2002)

Status: Execution

Major Features: ViSiCAST will develop, evaluate and apply realistic Virtual Humans (avatars), generating European sign languages for the deaf. The project will develop systems for the generation, storage and transmission of Virtual Signing Systems, and user-friendly methods to capture signs where appropriate. It will also devise a machine-readable system to describe sign-language gestures (hand, face and body) which can be used to retrieve stored gestures or to build them from low-level motion components. It will use this descriptive language to develop translation tools from speech and text to sign. By building applications for the signing system in television, multimedia, web and face-to-face transactions, ViSiCAST will improve the situation for Europe's deaf citizens, their access to public services and entertainment, and enable them to develop and consume their own multimedia content for communication, leisure and learning.

Quoted in: COM(2001) 529 final. COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS – eEurope 2002: Accessibility of Public Websites and their Content. Brussels, 25.09.2001, page 9.

More and more research and technological development projects within the Fifth Framework Programme's Information Society Technologies programme are using **the Guidelines** developed by the Web Accessibility Initiative. The Commission also sponsors other projects such as IRIS, ViSiCAST, and WWAAC.[1]

IRIS is enhancing and evaluating internet services in fields such as electronic commerce, and teleworking/online learning with several groups of users with special needs. ViSiCAST is oriented largely towards the needs of deaf people who use signing. It is developing virtual human and language processing technologies to be deployed, in broadcast television, in face-to-face retail transactions and in web-based and multimedia interactions. WWAAC supports a series of activities that will make internet-based activities accessible to people with cognitive difficulties, particularly symbol system users, and to elderly people with language disorders.

[1] *The full titles of these three projects are: Incorporating Requirements of People with Special Needs or Impairments to Internet-based Systems and Services (IRIS); Virtual Signing: Capture, Animation, Storage and Transmission (ViSiCAST); and World Wide Augmentative and Alternative*

Communication (WWAAC). See http://www.cordis.lu/

IST

Project Name: WWAAC *(World Wide Augmentative and Alternative Communication)*

Reference: IST-2000-27518

Programme and Key Action: Promoting a User-Friendly Information Society - IST

Coordinator: Handicom – Oranjelaan 29, 3843 AA Harderwijk, The Netherlands.

Contract Type: Cost-sharing contracts

Duration: 36 months (1 January 2000 – 31 December 2002)

Status: Execution

Major Features: The project will make several internet services accessible for people with language and/or cognitive impairments, including symbol users and a part of the elderly population. A universal coding system will be developed for message encoding which can be used for e-mail, e-chat or enhancing web page information. This will be promoted as a public standard. Six national and three symbol languages will be involved. Additional support for handling information and navigation by people with cognitive, motor and/or language disorders will be developed. Software applications will be made with appropriate user interfaces, presenting the message content in multiple ways such as by text, speech or by symbols. Web guidelines and an authoring tool will be developed for information providers. Educational and rehabilitation centres, organisations for the elderly involved in ICT, several AAC-focused companies, are all involved in the user platform. Representing a wide geographical spread (at least six countries) they will ensure optimal user-focused design, qualitative evaluation of the results and a coherent and realistic exploitation planning.

Quoted in: COM(2001) 529 final. COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS – eEurope 2002: Accessibility of Public Websites and their Content. Brussels, 25.09.2001, page 9.

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IRIS is enhancing and evaluating internet services in fields such as electronic commerce, and teleworking/online learning with several groups of users with special needs. ViSiCAST is oriented largely towards the needs of deaf persons who use signing. It is developing virtual human and language processing technologies to be deployed, in broadcast television, in face-to-face retail transactions and in web-based and multimedia interactions. WWAAC supports a series of activities that will make internet-based activities accessible to people with cognitive difficulties, particularly symbol system users, and to elderly people with language disorders.

[1] *The full titles of these three projects are: Incorporating Requirements of People with Special Needs or Impairments to Internet-based Systems and Services (IRIS); Virtual Signing: Capture, Animation, Storage and Transmission (ViSiCAST); and World Wide Augmentative and Alternative*

Communication (WWAAC). See http://www.cordis.lu/

IST

Project Name: IRIS *(Incorporating Requirements of People with Special Needs or Impairments to Internet-based Systems and Services)*

Reference: IST-2000-26211

Programme and Key Action: Promoting a User-Friendly Information Society - IST

Coordinator: European Dynamics S.A.E-Commerce Division – Kifissias Avenue 209 & Arkadiou 15124, Athens, Greece.

Contract Type: Cost-sharing contracts

Duration: 30 months (1 January 2000 – 30 June 2003)

Status: Execution

Major Features: IRIS will: {i} Identify the suitability of a range of tools and methods, including metadata, for delivering media and alternating content formats relevant to multimodality in the service of accessibility; {ii} Develop models of user requirements, involving large and international groups of users with special needs relevant to media, and translate these models into technical characteristics of communication channels so that services may be configured to these characteristics; {iii} Specify, design and develop the information infrastructure (e.g. user models – profiles, content descriptions, alternating media capabilities) that is required to adapt the delivery of media and content to user preferences and characteristics, making use of relevant standards, based on state-of-the-art directory services technologies, as part of the design aid environment; {iv} Specify, design and develop user-centred techniques and mechanisms for adaptation of media and content to user preferences and characteristics, based on state-of-the-art intelligent agent technologies, as part of the design aid environment; {v} Further develop existing internet services, based on the above findings and tools, in the selected areas of electronic commerce and teleworking/online learning, contributing to several Community Social Objectives and Policies with a focus and very specific impact on the social objective for "Employment" and improved "Quality of Life". {vi} Perform user-centred evaluation and validation of the enhanced designs and services, involving large, international groups of users with special needs, which will enable **IRIS** to make the best use of their varying requirements and insight; and {vii} Offer generic recommendations for enhancements of internet-based services, addressing the IT professionals community, based on the above findings and experience.

Quoted in: COM(2001) 529 final. COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS – eEurope 2002: Accessibility of Public Websites and their Content. Brussels, 25.09.2001, page 9.

More and more research and technological development projects within the Fifth Framework Programme's Information Society Technologies programme are using **the Guidelines** developed by the Web Accessibility Initiative. The Commission also sponsors other projects such as IRIS, ViSiCAST, and WWAAC.[1]

IRIS is enhancing and evaluating internet services in fields such as electronic commerce, teleworking/online learning with several groups of users with special needs. ViSiCAST is oriented largely towards the needs of deaf people who use signing. It is developing virtual human and language processing technologies to be deployed, in broadcast television, in face-to-face retail transactions and in web-based and multimedia interactions. WWAAC supports a series of activities that will make internet-based activities accessible to people with cognitive difficulties, particularly symbol system users, and to elderly people with language disorders.

[1] *The full titles of these three projects are: Incorporating Requirements of People with Special Needs or Impairments to Internet-based Systems and Services (IRIS); Virtual Signing: Capture, Animation, Storage and Transmission (ViSiCAST); and World Wide Augmentative and Alternative*

Communication (WWAAC). See http://www.cordis.lu/

IST

Project Name: WAI-DA *(Web Accessibility Initiative -Design for All)*

Reference: IST-1999-13470

Programme and Key Action: Promoting a User-Friendly Information Society - IST

Coordinator: Institut National de Recherche en Informatique et en Automatique – Domaine de Voluceau, Rocquencourt 78153, Le Chesnay, France.

Project Website: http://www.w3.org/WAI/WAIDA/

Contract Type: Cost-sharing contracts

Duration: 24 months (2 September 2000 – 1 September 2002)

Status: Execution

Major Features: The overall objective of this project is to increase the accessibility of the web in Europe. This will be accomplished by supporting and accompanying the technical and guidelines development work done at W3C/WAI with educational and tools-related activities that are specific to the European context. This is an Accompanying Measure for the technical activities of W3C/WAI. Two important goals of this project, detailed in this proposal, are to sensitise European content creators through education and outreach and help implementers facing difficulties with web access today by providing them with tools that illustrate the concepts put forward by the WAI.

Quoted in: COM(2001) 529 final. COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS – eEurope 2002: Accessibility of Public Websites and their Content. Brussels, 25.09.2001, pages 8-9.

Within the Fifth Framework Programme's Information Society Technologies programme, as part of its continuous commitment to improving and promoting the concept of web accessibility, the European Commission gives financial support to the project entitled Web Accessibility Initiative-Design for All (WAI-DA).

Key objectives of the WAI-DA project involve increasing the extent of participation of European organisations in international activities promoting web accessibility through the World Wide Web Consortium's (W3C) Web Accessibility Initiative; enhancing awareness and implementation of the Web Content Accessibility Guidelines on websites throughout EU Member States; and increasing implementation of the Authoring Tool Accessibility Guidelines version 1.0. Public administrations in the Member States are specifically encouraged to co-operate with the WAI-DA project. The project may be contacted via its website: http://www.w3.org/WAI/WAIDA

IST

Project Name: NESSIE *(New European Schemes for Signature, Integrity, and Encryption)*

Reference: IST-1999-12324

Programme and Key Action: Promoting a User-Friendly Information Society - IST

Coordinator: Katholieke Universiteit Leuven – Groot Begijnhof 59, 3000 Leuven, Belgium.

Contract Type: Cost-sharing contracts

Duration: 36 months (1 January 2000 – 31 December 2002)

Status: Execution

Major Features: The project will put forward a portfolio of strong cryptographic primitives that has been obtained after an open call and been evaluated using a transparent and open process. The project intends to contribute to the final phase of the AES (Advanced Encryption Standard) block cipher standardisation process (organised by NIST, US), but will also launch an independent open call for a broad set of primitives providing confidentiality, data integrity, and authentication. These primitives include block ciphers, stream ciphers, hash functions, MAC algorithms, digital signature schemes, and public-key encryption schemes. The project will develop an evaluation methodology (both for security and performance evaluation) and a software toolbox to support the evaluation. The project goal is to disseminate the project results widely and to build consensus based on these results by using the appropriate fora. A final objective is to maintain the strong position of European research while strengthening the position of European industry in cryptography.

Quoted in: COM(2001) 298 final. COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS – Network and Information Security: Proposal for a European Policy Approach. Brussels, 6.6.2001, page 22.

3.4. Technology support

Investment in network and information security solutions is currently sub-optimal. This is the case both in terms of technology uptake and research into new solutions. In a context where emerging new technologies inevitably bring with them new risks, ongoing research is vital.

Network and information security is already included in the Fifth Framework Programme's Information Society Technologies (IST) programme (representing 3.6 billion over four years), with approximately 30 million to be spent in collaborative research on security related technologies in 2001/2002.

Research on cryptography at technical level is well advanced in Europe. The Belgian algorithm called 'Rijndael' won the Advanced Encryption Standard competition organised by the US standardisation institute (NIST). The NESSIE (New European Schemes for Signature, Integrity and Encryption) IST-project has launched a larger competition on encryption algorithms, fulfilling the requirements of new multimedia applications, mobile commerce and smart cards.

EESD

Project Name: SIREN *(Scenarios for Integration of Renewables in a European Cities Network)*

Reference: ENG1-CT-2000-80146

Programme and Key Action: Energy, Environment and Sustainable Development – KA "City of Tomorrow and Cultural Heritage"

Coordinator: Innova SpA – Rome, Italy.

Participating Organisations: Universidade Nova de Lisboa – Portugal; Agenzia per l'Energia e l'Ambiente della Provincia di Perugia – Italy; Netherlands Agency For Energy and Environment – the Netherlands; Ecoazioni S.N.C. – Italy; Leicester City Council – United Kingdom; Agencia Municipal de Energia de Lisboa – Portugal; Dialogic Innovation and Interaction – The Netherlands.

Contract Type: Preparatory, Accompanying and Support Measures

Duration: February 2001 – July 2002 (18 months)

Status: Completed

EU Contribution: €420 000

Description of Work: SIREN wants to overcome the non-technical barriers to the effective dissemination of R&D projects in different local contexts raising public awareness on the potential of R&D projects at European level by: a) creating a network of EU cities sharing an innovative consensus-building process involving the major socio-economic parties and aiming at analysing, through a rigorous methodological approach, the impact of the selected R&D projects at local level; and b) fostering a policy-formulation process promoting the dissemination of R&D projects, testing and integration at technical, economic and environmental level. The accompanying measure will support the R&D projects to: a) simulate by scenarios the evolution of the projects to identify barriers and factors of success for the technologies/results selected; and b) promote a new culture for the penetration/dissemination of projects, facilitating a favourable acceptance of RES by local communities.

Further Information: Ms Paola Di Giovanni p.digiovanni@innova-eu.net

EESD

Project Name: SUSTAINABILITY LABEL

Reference: EVG1-CT2000-00031

Programme and Key Action: Energy Environment and Sustainable Development

Coordinator: Universitat de Barcelona/Departamento de Derecho y Economiá Internacionales Area de Derecho Internacional Publico – Barcelona, Spain.

Participating Organisations: Institute For Environmental Studies/Vrije Universiteit Amsterdam - Vereniging Voor Christelijk Wetenschappelijk Onderwijs – the Netherlands; Centro Interdipartimentale Ricerche sul Diritto delle Comunità Europee/University of Bologna – Italy.

Contract Type: Cost-sharing contracts

Duration: December 2000 – November 2003 (36 months).

Status: Execution

EU Contribution: € 401 984

Description of Work: The adoption of the concept of sustainable development has led social actors to adopt various schemes in relation to product and service labelling and certification. All these initiatives indicate diverse systems with diverging approaches. The objective of this project is to develop an analytical framework for assessing ecologically, economically and socially responsible labelling and certification schemes. The project will use a combined policy, legal, political and economic approach to analyse existing and relevant schemes and their compatibility with the rules of the GATT/WTO, the EU, ISO/ISO 14000, ILO and other such schemes. The project will employ the comparative case-study approach in order to analyse the key issues in the different schemes.

Further Information: Ms Victoria Abellan samir@pcb.eb.es

EESD

Project Name: NEMESIS *(New Econometric Model for Environment and Strategies Implementation for Sustainable Development)*

Reference: EVG1-CT1999-00014

Programme and Key Action: Energy, Environment and Sustainable Development

Coordinator: Equipe de Recherche en Analyse des Systèmes et Modélisation Economique/ Centrale Recherche SA – Châtenay-Malabry, France.

Participating Organisations: Bureau Fédéral du Plan – Belgium; Institute of Communication and Computer Systems – Greece; Chambre de Commerce et d'Industrie de Paris – France.

Contract Type: Cost-sharing contracts

Duration: March 2000 – April 2002 (24 months)

Status: Completed

Description of Work: The NEMESIS model provides macroeconomic results, both at European and country level (GDP, exports, imports, factor demands, employment, R&D expenditures, state of the environment, etc.). As a detailed sectoral model, NEMESIS also provides some results at the sectoral level. Thus, the main characteristics of this model are: 1) macro-sectoral econometric detailed model (30 sectors) for 16 European countries; 2) Annual, dynamic for the medium-long term (two to 15 years); 3) supply-side module with endogenous R&D decisions; dual costs functions estimated by pooling methods; 4) energy-environment module using activity indicators from the economic part: pollutants, CO2, SO2, NOX; and 5) analysis of interdependencies by so-called "convert matrices" of investment goods, intermediate goods and technological transfers. The model is aimed at forecasting scenarios on short to medium term (two to eight years) or coherent baseline scenarios up to 15 years, including sustainable development scenarios and, moreover, assessing environmental policies or energy policies, especially CO2 mitigation policies. The model will make use of several inputs, including about 90 000 equations, 30 productive sectors, 27 household consumption categories (i.e. allowing for a differentiation of taxation), and energy products detailed in 15 categories. Its consequent outputs will be at the macro level for each European country and Europe as a whole (GDP, investment, consumption, imports, exports, price of energies, energy consumption by category, pollutant emissions, direct energy and environmental costs), at the sectoral level (production, value added, prices, employment), plus outputs from the Energy-environment module (energy consumption, price of energy, pollutant emissions, investment in plants, direct energy and environmental costs).

Further Information: Mr Francis Van den Bussche fvandenb@ads.ecp.fr

EESD

Project Name: GREENSENSE *(An applied integrated environmental impact assessment framework for the European Union)*

Reference: EVG1-CT-2000-00022

Programme and Key Action: Energy, Environment and Sustainable Development

Coordinator: Department of Economics and International Development/University of Bath – United Kingdom.

Participating Organisations: Universidad Pontificia Comillas – Spain; Zentrum Für Meeres- und Klimaforschung/University of Hamburg – Germany; Institute for Energy Economics and Rational Use of Energy (IER)/University of Stuttgart – Germany.

Contract Type: Cost-sharing contracts

Duration: December 2000 – April 2003 (29 months)

Status: Execution

Description of Work: The project is the latest in a series of projects dealing with 'green accounting', using the impact pathway analysis methodology developed under the EXTERNE project series. GREENSENSE aims to make two major contributions to environmental impact assessment and regulatory policy. These are: to improve the availability of data on the major impacts of environmental damage caused by economic activity to human health, well-being and the economy; and to develop and apply an environmental accounting framework that, unlike the standard green accounting framework, incorporates sustainability issues. The project's scientific objectives are thus: a) to develop a framework of economic and environmental reporting that accounts for both economic efficiency and sustainability. That is, the reporting framework will both report the resulting effect of environmental damage on economic well-being, and estimate the net effect of proposed policies in terms of sustainability criteria; and b) extend the methodology by which physical environmental damage is measured. This involves updating and extending pollution databases, extending the ECOSENSE software for emissions impact assessment ("Characteristics of the model used"), and estimating the effects of biodiversity loss, resource extraction, noise and waste. The current and future effects of greenhouse gas emissions are estimated by incorporating recent research on climate change into the FUND model. Further objectives include: a) estimate the reductions in impacts required in order to satisfy a definition of sustainable development; and b) attach economic costs to the environmental impacts and actions required to meet sustainability standards (abatement costs), and use this data to apply the reporting framework.

Further Information: http://www.bath.ac.uk/Departments/EconDev/

EESD

Project Name: REGIONET *(Thematic Network: Strategies for Regional Sustainable Development, An Integrated Approach beyond Best Practice)*

Reference: EVG1-CT2001-20003

Programme and Key Action: Energy, Environment and Sustainable Development

Coordinator: Interdisciplinary Centre for Comparative Research in the Social Sciences – Vienna, Austria.

Participating Organisations: Dipartimento di Ingegneria Civile e Ambientale - Facoltà di Ingegneria/University of Trento – Italy; The Victoria University of Manchester – United Kingdom; Laboratory of Environmental Planning Department of Environmental Studies/ University of The Aegean – Greece; Université François Rabelais De Tours – France; General Direction of Environmental Planning Ministry of Environment/Government of Catalonia – Spain; Department of Environmental Economics/University of Prague – Czech Republic; Centre Interdisciplinaire de Recherche en Sciences Sociales – France; Centre for Industrial Management Polish Academy of Sciences – Poland; Institute of Sociology - Bulgarian Academy of Sciences – Bulgaria; Institute for Ecological Economy Research – Germany; Programme For Research And Documentation for a Sustainable Society/University of Oslo – Norway; Department of Environmental Engineering - Faculty of Building and Environmental Engineering/Szechenyi Istvan University of Applied Sciences – Hungary; Graz University of Technology – Austria; Departamento De Filosofia - Faculdade De Letras/University of Lisbon – Portugal; South-East Regional Authority – Ireland; University of Thessaly – Greece; Centre per a l'Empresa i El Medi Ambient – Spain.

Contract Type: Thematic Network contract

Duration: February 2002 – April 2004 (24 months)

Status: Execution

Description of Work: The overall objective of REGIONET is to provide an integrated approach to support the implementation of sustainable development in regions across Europe. The promotion of regional and social cohesion, as well as of environmental protection and sustainability are among the most important Community social objectives. REGIONET will contribute knowledge that helps to better integrate environmental concerns in regional development plans and management and to integrate environmental protection with economic development and employment. REGIONET will explicitly address the above-mentioned issues by organising four workshops bringing together various stakeholders. The workshops will address relevant aspects which need to be developed in order to effect a comprehensive implementation of sustainability in regional development. REGIONET will act as a network of institutions and individuals but also as a 'network of networks'. Amongst others the project will link the following networks: ENSURE – an interdisciplinary network of researchers in regional sustainable development with members in 19 countries, The European Conference of Regional Environmental Ministers, The Network of EU Structural Funds pilot regions, The European Sustainable Cities Project and The International Council for Local Environmental Initiatives.

Further Information: Dr Ronald J. Pohoryles - Interdisciplinary Centre for Comparative Research in the Social Science – 14-20 Schottenfeldgasse 69/11070, Vienna, Austria.

EESD

Project Name: HIP-HIP *(House Integrated Pv - Hightech in Public)*

Reference: NNE5/430/1999

Programme and Key Action: Energy, Environment and Sustainable Development/part B – Energy/KA2 - Economic and efficient energy for a competitive Europe

Coordinator: Innovation Energie Développement – 46 rue de Provence 75009, Paris, France.

Contract Type: no information available

Duration: 36 months (1 January 2000 – 31 December 2002)

Status: Execution

Major Features: The objective of the project is to foster the market penetration of grid-connected PV systems in Europe by removing these barriers. The project will focus on the integration of Pv elements in commercial and domestic buildings. The aim is to reduce the cost of PV systems from €7/WP to €5 to 4.5/WP in the third year. It will be achieved through an up-front integration of Pv option in the building sector, based on a strong collaboration with building designers and promoters, and building material manufacturers for the improvement and enhancement of quality of 'Pv products' (tiles, roof components, façades, window panes, etc.). The project also aims to strengthen European industry's know-how and capability in the perceived system.

Quoted in: COM(2001) 69 final. COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS on the implementation of the Community Strategy and Action Plan on Renewable Energy Sources (1998-2000) Brussels, 16.02.2001, page 25.

1 000 000 PV systems

This target is equivalent to an installed capacity of 1 000 MWp , only 650 MWp of which are to be installed in the EU. The other 350 MWp are to be developed in Third Countries. The installed capacity in the EU was more than 100 MWp in 1998.

New national programmes – in Germany, Italy, etc.– can foster PV market penetration. In addition, pioneering projects are taking place such as the Hesse project in Germany (1 MW installed in one building) or the HIP-HIP project (an EU consortium installing 3MWp under FP5). Cities like Barcelona have included an obligation of installing PV systems in new buildings and a 3-4 MWp is planned. A target action will be launched in the frame of FP5 on ECO- buildings where both PV and solar thermal will be prioritised.

EESD

Project Name: NEWEXT *(New elements for the assessment of external costs from energy technologies)*

Reference: ENG1-2000-00129

Programme and Key Action: Energy, Environment and Sustainable Development

Coordinator: Institute for Energy Economics and Rational Use of Energy (IER) – Universität Stuttgart – Pfaffenwaldring 31, 70550 Stuttgart, Germany.

Contract Type: Cost-sharing contracts

Duration: 30 months (1 January 2001 – 30 June 2003)

Status: Execution

Major Features: The objective of NEWEXT is to improve the assessment of externalities by providing new methodological elements for integration into the existing accounting framework of external costs. The external costs accounting framework developed by the ExternE projects has been widely accepted and successfully applied for support decision-making in energy and environmental policy. However, there are areas for which the need for further research was identified. Uncertainties result from a lack of empirical data on the monetary valuation of mortality effects, from the omission of impacts on ecosystems due to acidification and eutrofication, and from the insufficient knowledge about the impacts of global warming. In addition, contamination of water and soil, and accidents in energy chains other than nuclear have not been taken into account. It is the aim of this project to close these gaps and so improve the quality of external cost estimates.

Quoted in: *Official Journal of the European Communities* of 06.06.2002, C134 E/89. Written Question E-2742/01 by J. Moreira Da Silva to the Commission. Answer given by Mrs De Palacio on behalf of the Commission (14 December 2001).

In the first instance it is the Member States who are responsible for ensuring that environmental and other external costs of nuclear energy, such as those resulting from authorised radioactive discharges to the environment, waste disposal and security of installations are internalised. However, in general the costs of storing and long-term management/disposal of the spent fuel and waste from nuclear electricity production are partly covered by a charge which is included in the price of the electricity. This includes, where necessary, safe transport of the material from one site to another. The risk of accidents/radioactive pollution is normally internalised in two ways. One way is the in-depth defence of nuclear facilities that reduces the risk of any accidental releases of radioactivity in Western reactor technologies. The other way is through the adhesion of all Member States to the Paris Convention on Nuclear Liability that would come into force in the event of any accident.

Building on the results of the ExternE study, the Commission has recently launched a follow-up research project (NEWEXT – new elements for the assessment of external costs from energy technologies). In its future analysis of this subject the Commission will review the internalisation of environmental costs with regard to the prices of all sources of energy. In addition, the Commission announced in its Green Paper on energy security that it will make a systematic inventory of state aid in the energy sector in order to avoid distortion of competition. This inventory will, of course, include nuclear energy which should no longer benefit from aid.

EESD

Project Name: EDEN *(Establishment of a European Energy Data Exchange Network)*

Reference: ENG2-CT-2000-80331

Programme and Key Action: Energy, Environment and Sustainable Development

Coordinator: Institute for Energy Economics and Rational Use of Energy (IER) – Universität Stuttgart – Pfaffenwaldring 31, 70550 Stuttgart, Germany.

Contract Type: Preparatory, Accompanying and Support Measures

Duration: 18 months (1 February 2001 – 31 July 2002)

Status: Completed

Major Features: Several European and global energy system models including PRIMES, POLES, **SAFIRE**, MARKAL and TIMES have been developed during the last decade. Increased harmonisation of scenario assumptions, and easier accessibility of input data and results would improve future modelling activities and increase the value of obtained results for advising on policy. The key element of this proposal is the establishment of a European energy data exchange network (EDEN) with the common European energy database accessible via the internet. It will contain model-related energy data including energy technology data for conventional, renewable and new technologies, documented scenario assumptions and detailed results from energy system models as well as historical data on energy consumption and conversion for all EU countries.

The **SAFIRE model** used by the project concerned is quoted in: **COM/2000/0279 final - COD 2000/0116**. Proposal for a Directive of the European Parliament and of the Council on the promotion of electricity from renewable energy sources in the internal electricity market. Brussels, 10.5.2000, page 26.

In order to establish a set of indicative Member State targets which are compatible with the objective of the White Paper, an updated version of the energy model used for the preparation of the White Paper has been employed as the principal analytical basis, taking into account the latest available figures (EUROSTAT figures from 1997 together with figures for gross electricity consumption from the baseline scenario have been used in the modelling process; furthermore, recent technological developments, such as progress in wind energy technologies, market penetration curves, etc. have been included in the calculation).

The energy model used is SAFIRE (Strategic Assessment Framework for the Implementation of Rational Energy), which has already been used in the TERES II study and was originally developed under the Joule II programme[1].

SAFIRE is a highly sophisticated database and computer model that contains, among others, country-specific databases with information on energy demand by sector, energy prices, technology costs and available renewable energy resources. For this exercise, SAFIRE has been run on a country-by-country basis for the 15 EU countries, using the best practice scenario of the TERES II study which is the scenario that lies behind the 12% objective of the White Paper.

[1] *SAFIRE, European Commission, Directorate-General XII, Science, Research and Development, 1995.*

EESD

Project Name: WAVE ENERGY NETWORK *(Establishment of a European Thematic Network on Wave Energy)*

Reference: ERK5-1999-20001

Programme and Key Action: Energy, Environment and Sustainable Development/part B – Energy/KA1 - Cleaner energy systems, including renewables

Coordinator: AEA Technology Plc. – 329 Harwell Laboratory, OX11 0RA Didcot, Oxfordshire, United Kingdom.

Contract Type: Thematic Network contract

Duration: 36 months (1 April 2000 – 31 March 2003)

Status: Execution

Major Features: The key objective of this Thematic Network is to ensure the benefits and results from the full range of R&D activities are effectively exchanged and disseminated to a wider audience. The Network will include members from nearly all the countries with wave energy activities. Its aim will be to promote the development and deployment of *wave energy* devices by addressing the main barriers to implementation. The Network comprises 14 members, run by a co-ordinator and assisted by a steering committee of three other members. Each of the members will be responsible for completing a series of tasks divided between six key areas:

- Integration with electricity grids
- Social, planning and environmental issues
- Financing and economic issues
- Device-specific R&D
- Generic R&D including development of standards and guidance
- Promotion of wave energy

Quoted in: COM(2001) 69 final. COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS on the implementation of the Community Strategy and Action Plan on Renewable Energy Sources (1998-2000) Brussels, 16.02.2001, page 24.

6.3. Other support measures

Several accompanying measures in the framework of other Community programmes such as FP5 (see point 5.4) are focusing on the implementation of the White Paper and the Campaign for Take-Off.

Such Accompanying Measures are normally funded jointly by the Commission and either private or public sector organisations in the Member States. They typically include the drafting and publication of brochures, best practice stories, and other reports, as well as conferences, seminars and workshops. In addition, FP5 supports a number of networks which contribute their shared experience to stimulate RES markets and to accelerate their growth – for example, the OPET network and the Wave Energy Network.

EESD

Project Name: JOINT *(Joint Implementation for International Emissions Reduction Through Electricity Companies in the European Union and in the Central and Eastern European Countries)*

Reference: ENG2-CT1999-00004

Programme and Key Action: Energy, Environment and Sustainable Development

Coordinator: Energy for Sustainable Development Ltd – Overmoor Farm, Neston, SN13 9TZ Corsham, United Kingdom.

Contract Type: Cost-sharing contract

Duration: 18 months (1 March 2000 – 31 August 2001)

Status: Completed

Major Features: This project is designed to meet these challenges by initiating the process of Joint Implementation as defined in the Kyoto Protocol as one of the major 'flexible mechanisms' by which to tackle issues of climate change under the United Nations Framework Convention on Climate Change (UNFCCC). Its aim is to research and develop a well-defined framework for private electricity and combined heat and power (CHP) companies from the EU to work with their counterparts in the Central and Eastern European Countries (CEECs) to identify commercial projects that result in measurable, quantifiable greenhouse gas (GHG) emissions reduction. Two models will be used to assess this potential: SESAM and **SAFIRE**.

The **SAFIRE model** used by the project concerned is quoted in: **COM/2000/0279 final - COD 2000/0116.** Proposal for a Directive of the European Parliament and of the Council on the promotion of electricity from renewable energy sources in the internal electricity market. Brussels, 10.5.2000, page 26.

In order to establish a set of indicative Member State targets which are compatible with the objective of the White Paper, an updated version of the energy model used for the preparation of the White Paper has been employed as the principal analytical basis, taking into account the latest available figures (EUROSTAT figures from 1997 together with figures for gross electricity consumption from the baseline scenario have been used in the modelling process; furthermore, recent technological developments, such as progress in wind energy technologies, market penetration curves, etc. have been included in the calculation).

The energy model used is SAFIRE (Strategic Assessment Framework for the Implementation of Rational Energy), which has already been used in the TERES II study and was originally developed under the Joule II programme[(1)].

SAFIRE is a highly sophisticated database and computer model that contains, among others, country-specific databases with information on energy demand by sector, energy prices, technology costs and renewable energy resources available. For this exercise, SAFIRE has been run on a country-by-country basis for the 15 EU countries, using the best practice scenario of the TERES II study which is the scenario that lies behind the 12% objective of the White Paper.

[(1)] SAFIRE, European Commission, Directorate-General XII, Science, Research and Development, 1995.

EESD

Project Name: SAPIENT *(System Analysis for Progress and Innovation in Energy Technologies)*

Reference: ENG2-CT1999-00003

Programme and Key Action: Energy, Environment and Sustainable Development

Coordinator: Institute of Communication and Computer Systems – Patission Street 42, 10682 Athens, Greece.

Contract Type: Cost-sharing contract

Duration: 24 months (1March 2000 – 28 February 2002)

Status: Completed

Major Features: A key feature of the SAPIENT approach is the development of a small meta-model which will explore the links between policies related to R&D (public and private) and the benefits from technological progress. These benefits will be modelled through reduced-form relationships reproducing approximately the relevant behaviour of existing large-scale models for the European and world systems and obtained by consecutive runs of these models. The large-scale models will also be used to evaluate the consequences of policy on energy demand and supply, the state of the environment and the economy. The role of the meta-model will be to explore a domain of optimal R&D strategies in a context of uncertainty (e.g. incorporating notions of hedging) and in the presence of multiple objectives, as is appropriate when considering public sector participation in R&D initiatives. The large-scale models involved in SAPIENT are complementary to each other, either because of their approach, or their regional coverage: the models POLES, **PRIMES**, MARKAL, MESSAGE and ERIS-MERGE will handle endogenous technology progress, scenario building and the evaluation of benefits from energy technology progress. The SAPIENT project will elaborate complete energy demand and supply scenarios for the world and the EU, including a baseline scenario and global warming strategic scenarios that integrate the induced technology progress mechanisms. The project plans to collect data to update existing estimations on technology characteristics, historical learning data and R&D spending information, so as to estimate causal relationships linking technology performance, learning and R&D policy.

The **PRIMES model** used by the project concerned is quoted in: **COM/2000/0769 final.** Green Paper - Towards a European Strategy for the Security of Energy Supply. Annex 2, page 8.

The analysis presented here utilises the latest data available on fuel taxation in EU Member States (as published by the European Commission in March 2000) and provisional data for fuel prices in 2000. Data on subsidies on coal are taken from the PRIMES model database (as they were determined after discussions with experts from the different Member States in the context of the Shared Analysis project).

The PRIMES model database was also the source for the technico-economic data on the different technologies used by energy consumers in computing the average production cost for the different energy uses.

Alternative fuels and technologies are examined in the following sectors:
1. Power generation
2. Steam generation by industrial boilers and CHP plants
3. Space heating in households
4. Private cars

EESD

SAPIENT continued

The methodology adopted for carrying out the comparison was to assume for each sector that a 'typical' energy consumer requiring new energy consuming equipment – either to replace old equipment or in the form of new energy needs – was faced with 'average' conditions concerning the main parameters for the choice. It is important to note that the calculations do not refer to the economics of using existing equipment which in most cases could be cost effective irrespective of whether the consumer would have chosen to replace it by the same type of equipment or not.

The **PRIMES model** used by the project concerned is also quoted in: **COM/2000/0087 final**. Green Paper in Greenhouse Gas Emissions Trading within the European Union. Brussels, 8.3.2000. Annex 1-Economic Analysis, page 27.

Annex 1: Economic analysis

Empirical estimates of the reductions in cost to comply with the Kyoto Protocol
The Commission services have analysed[1] how economically important EU-wide trading would be if carried out in addition to emissions trading at the individual Member State level.

If each Member State implemented its specific target under the "burden sharing" agreement individually, the total annual cost for the EU to reach the Kyoto target could reach some €9.0bn 44.

1. Emissions trading among energy intensive sectors in the EU reduces compliance costs
If the energy supply sector and energy intensive industries participated in an EU-wide trading regime the annual cost to comply with the Kyoto Protocol would be €6.9bn in 2010. If only energy suppliers participated in the emissions trading scheme, the annual compliance cost would be slightly higher, i.e. €7.2bn.

In both cases the price of emissions allowance would be about €33 per tonne of carbon dioxide which is well within the range of €5 and €58 that has been estimated by other emission trading models.

[1] The analysis has been carried with an EU-wide energy systems model called PRIMES. Source: E3M Lab, National Technical University of Athens (forthcoming): "The Economic Effects of EU-wide Industry-Level Emission Trading to Reduce Greenhouse Gases"
http://europa.eu.int/comm/environment/enveco/studies2.htm

INCO

Project Name: CO-GOVERN *(Promoting Common Property in Africa: Networks for Influencing Policy and Governance of Natural Resources)*

Reference: ICA4-CT2001-10084

Programme and Key Action: INCO2 – Confirming the Role of International Community Research

Coordinator: International Institute for Environment and Development – Edinburgh, United Kingdom.

Participating Organisations: Department of Geography and International Development Studies - North Atlantic Regional Studies/Roskilde University – Denmark; Centre for International Environment and Development Studies/Agricultural University of Norway – Norway; Groupe de Recherche et d'Action sur le Foncier – Burkina Faso; Resources Conflict Institute – Kenya; Programme for Land and Agrarian Studies School of Government/University of the Western Cape – South Africa; Caledonia Centre for Social Development – United Kingdom.

Contract Type: Coordination of Research Actions

Duration: January 2002 – May 2005 (41 months)

Status: Execution

Description of Work: This concerted action proposal aims at building a basis for more realistic policies and programmes to support governance of land in sub-Saharan Africa, and in particular for the management of common property resources. This will be achieved by promoting sub-regional exchange, pan-African networking and dialogue between African and European stakeholders working to influence the governance of common property resources, through several interlinked activities. A series of working papers, policy briefs and website materials will be produced by African partners in collaboration with European participants.

INCO

Project Name: BIOCORES *(Biodiversity Conservation, Restoration and Sustainable Use in Fragmented Forest Landscapes)*

Reference: ICA4-CT2001-10095

Programme and Key Action: INCO2 – Confirming the Role of International Community Research

Coordinator: UNEP-WCMC – Cambridge, United Kingdom.

Participating Organisations: Instituto de Silvicultura - Facultad de Ciencias Forestales/Universidad Austral de Chile – Chile; Ufz-Umweltforschungszentrum Leipzig-Halle Gmbh – Germany; Laboratorio Ecotono/Centro Regional Universitario de Bariloche/Universidad Nacional de Comahue – Argentina; Institute of Ecology/Departamento de Ecologia Vegetal – Mexico; Centro Interdisciplinario de Investigacion para el Desarollo Integral Regional/Instituto Politecnico Nacional – Mexico; Departamento Interuniversitario de Ecologia Seccion Ua/University of Alcala – Spain; Departamento de Ecologia y Sistematica Terrestre/Division de Conservacion de la Biodiversidad y de Sistemas de Produccion/El Colegio de la Frontera Sur – Mexico; Laboratory of Forest Ecology Facultad de Ciencias/Universidad de Chile – Chile.

Contract Type: Cost-sharing contracts

Duration: June 2002 – May 2005 (36 months)

Status: Execution

Description of Work: The maintenance of biodiversity in areas subjected to human use is a major challenge to sustainable development. This project aims at identifying sustainable approaches to land use by analysing the impact of human activity on biodiversity, and by examining the potential for ecological rehabilitation of degraded sites. This will be achieved by multidisciplinary research in rural areas of Mexico, Chile and Argentina. Research will investigate the key processes influencing biodiversity in native forests subjected to clearance and fragmentation, using field-based, laboratory and computer modelling approaches. This will enable the impact of different land-use options on biodiversity to be predicted, and will enable indicators of sustainable development and ecological rehabilitation to be identified. The project will generate scientific information and practical tools for the sustainable development of native forest landscapes by local communities.

Further Information: Mr Adrian Newton adrian.newton@unep-wcmc.org

INCO

Project Name: EMVI *(European malaria vaccine initiative)*

Reference: ICC1-2002-50001

Programme and Key Action: INCO2/Confirming the International Role of Community Research

Coordinator: Centre for International Health – Faculty of Medicine - University of Bergen – 10 Armauer Hansen Building, 5021 Bergen, Norway.

Contract Type: Preparatory, Accompanying and Support Measures

Duration: 36 months (1 July 2002 – 30 June 2005)

Status: Execution

Major Features: To contribute to the European Commission's Accelerated Action for Control of the Poverty Related Diseases by sustaining and expanding a European Clinical Trials and Development Platform for Malaria vaccines, enabling coordination of EC and EU efforts. To ensure international coordination and collaboration in malaria vaccines development and testing. To put in place a structure needed to ensure rapid and flexible reaction to technological and scientific breakthroughs in malaria vaccine development. To provide a mechanism for EU Member States' financial contributions towards achieving the common goal of developing affordable and accessible vaccines in endemic areas.

Quoted in: COM(2000) 585 final. COMMUNICATION OF THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT. Accelerated action targeted at major communicable diseases within the context of poverty reduction. Brussels, 20.9.2000, page 13.

"(…) The European Malaria Vaccine Initiative (EMVI) combines efforts of the Commission, EU Member States and industry in malaria vaccine development 17." The note reports: "The initiative has already produced tangible results: two European developed malaria vaccines are entering clinical trial this year. EMVI is participating in the Global Alliance for Vaccines and Immunisation (GAVI)."

Quoted in: *Official Journal of the European Communities* of 16.05.2002, C115 E/9-10. Written Question E-1684/01. Answer given by Mr Nielson on behalf of the Commission (3 September 2001).

"There has been significant progress on malaria vaccine research since the Honourable Member's Written Question E-1790/99 (1). With Community support, 14 candidate vaccines have been studied. This represents a major share of the global effort. The Quality of Life and the International Co-operation programmes of the Directorate-General for Research have considerably increased resources dedicated to malaria vaccine and malaria drug development. It is expected that at the end of the Fifth Framework Programme for Research and Technological Development (R &D) of the Community more than €30 million will have been spent on malaria research alone. In addition, major integrated research consortia 'Clusters', including major European vaccine manufacturers, have been established. The European Malaria Vaccine Initiative (EMVI) has capitalised on these Community research strengths. EMVI is a response to an acknowledged bottleneck in publicly funded vaccine research, whereby R &D efforts frequently stop at the late pre-clinical stage and do not move into clinical validation, due to a lack of funds and technical know-how.(..)"

INCO

EMVI *(European malaria vaccine initiative)* continued

Also quoted in: COM(2000) 585 final. COMMUNICATION OF THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT. Accelerated action targeted at major communicable diseases within the context of poverty reduction. Brussels, 20.9.2000, page 35.

"(…) INCO supports the European Malaria Vaccine Initiative (EMVI) and the African Malaria Vaccine Testing Network (AMVTN). Under the Fifth Framework Programme INCO-DEV (1999-2002), 10 million were committed for vaccine research, and 15 million could be allocated to drug and diagnostics development (2000). A forthcoming call (2001) will be targeted at the three major communicable diseases."

Note: Confirming the International Role of Community Research/INCO2 programme also supported the **AMVTN Network – African Malaria Vaccine Testing Network** (see above), through the funding of a "Workshop of the African Malaria Vaccine Testing Network on the molecular biology and immunology of malaria vaccines" in Franceville, Gabon from 8-14 May 2000.

The project has a special partnership with **EMVI** and is quoted in the same documents as above. The Official Journal of the European Communities of 16.05.2002, C115 E/9-10. Written Question E-1684/01. Answer given by Mr Nielson on behalf of the Commission (3 September 2001) reports:

"The Community's support to the African Malaria Vaccine Testing Network (AMVTN) represents a critical opportunity to link the Commission with partners in the South. It links long-term and ongoing investments in malaria vaccine development with capacity building in developing countries. The specific partnership between EMVI and AMVTN, which was conceived to move promising vaccine candidates further down the development pipeline, has added a great deal of credibility to the endeavour. The AMVTN, under the ownership of developing countries, represents a major opportunity over the coming years to further develop and assess efficacy and field effectiveness of malaria vaccines. (..)AMVTN is now developing trial sites based on earlier extensive epidemiological ground-work carried out by three African countries with support from the Community and Member States. The current effort to establish itself as a legal body under Tanzanian law is an important prerequisite to play an active role in supporting the expansion of clinical trials in the region. Following a positive evaluation of a malaria vaccine candidate in adults, the Community funded Gambia pilot project is now conducting trials of safety, tolerance, immunogenicity and protective efficacy in children living in endemic areas."

Annex 6: Glossary of acronyms

AM	**A**ccompanying **M**easure
CPA	**C**ross **P**rogramme **A**ction lines
DG RTD	**D**irectorate-**G**eneral **R**esearch and **T**echnological **D**evelopment
DG TREN	**D**irectorate-**G**eneral **TR**ansport and **EN**ergy
EAG	**E**xternal **A**dvisory **G**roup
EESD	Within FP5, the Programme **E**nergy, **E**nvironment and **S**ustainable **D**evelopment
ERA	**E**uropean **R**esearch **A**rea
FP5 (resp. 4, 6)	**F**ifth (resp. **F**ourth, **S**ixth) **F**ramework **P**rogramme of RTD
GROWTH	Within FP5, the Programme Competitive and Sustainable Growth
IHP	Within FP5, the Programme **I**mproving the **H**uman **P**otential and socio-economic knowledge
INCO	Within FP5, the Programme Confirming the International Role of Community Research
IST	Within FP5, the Programme **I**nformation **S**ociety **T**echnologies
KA	**K**ey **A**ction
QoL	Within FP5, the Programme **Q**uality **o**f **L**ife
RIS	**R**esearch **I**nfrastructures
RTD	**R**esearch and **T**echnological **D**evelopment
SC	**S**hared **C**ost project
SE	**S**ocio-**E**conomic
SER	**S**ocio-**E**conomic **R**esearch
TN	**T**hematic **N**etwork
TSER	Within FP4, the Programme **T**argeted **S**ocio-**E**conomic **R**esearch

European Commission

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In the Decision adopting the Fifth RTD Framework Programme (FP5), the Human Potential programme has been assigned to ensure an adequate incorporation of socio-economic considerations into the research activities of the thematic programmes. This brochure provides an analysis and synthetic overview of the integration of the socio-economic dimension in the specific programmes of FP5. The report covers the whole period of the FP5 and makes also recommendations for the future European research activities in this area.

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