

## PIANIST - Programme Impact Assessment in National IST Initiatives



Report on CISTRANA Workshop  
Paris, 13 - 14 December 2005



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## Executive summary

In the frame of workshops organised by the CISTRANA coordination action to exchange best practices between the national policy makers and programme managers in the field of ICT, the present document reports on the Workshop on "Programme Impact Assessment in National IST Initiatives" (PIANIST) that was organised on December 13-14, 2005 in Paris by ANRT, French partner of the CISTRANA project. This report can be disseminated.

### 1. Tutorial presentations

The three half-day sessions were all introduced by five well known European experts in the field of evaluation and impact assessment who presented complementary pieces of information to the audience on the basis for modelling and implementing evaluation methodologies. Major concepts like "policy cycle", "logic model approach" or "programme additionality" were explained and illustrated by examples for the benefit of the present policy maker representatives. The most concrete part of these presentations addressed the key point of the choice of appropriate evaluation indicators.

### 2. Testimonies of large institutions (European Commission, Eureka, ESF)

The huge experience of evaluation and impact assessment developed by the EC after the implementation of six successive Framework programmes was described in detail by a number of contributions focusing on different aspects of the EC methodology (general policy, indicators, pilot actions). Other large programme managing bodies like ESF reported on their experience in

the frame of their own programmes. In the first round table, the Head of the Eureka Secretariat provided some key information on the way ICT Eureka clusters are considering the impact assessment issues.

### 3. National interventions

Some nine EU countries reported on their national initiatives and the way they had - or intend to have - their programmes assessed. The comparison of the methods differing from each other in many respects, led to lively discussions on the best practice to adopt.

### 4. Recommendations

The presentations made by the academic experts complemented by the testimonies of national representatives generated an interesting debate organised in such a way that the discussions may be synthesised through the statement of a limited number of commonly agreed recommendations:

#### Recommendation 1:

Develop a pertinent methodology for the evaluation before the programme starts

#### Recommendation 2:

Evaluation and monitoring must be considered as a management tool and a learning process for structuring information

#### Recommendation 3:

Early design of the evaluation process on clearly pre-defined targets



**Recommendation 4:**

The construction of an "intervention logic model" is recommended at an early stage to design the research investment

**Recommendation 5:**

Select suitable indicators

**Recommendation 6:**

Take into account the nature of the programme objectives (basic research or innovation technologies) in the evaluation design.

**5. Outcome of the workshop and follow-up**

The PIANIST workshop roughly met the objectives that were initially assigned to it that is to create a forum where programme managers can exchange information on their mutual practices on different issues of common interest (evaluation and impact assessment is clearly one of them).

**Introduction**

This workshop was aimed at reviewing existing monitoring and impact assessment for evaluating Research and development programmes in order to improve the culture of evaluation in Europe and support the best evaluation practices.

Reliable and complete evaluation procedures among European Countries have proved to be able to demonstrate the added value of transnational collaborative projects through immediate, intermediate and long term impacts.

The need for monitoring and evaluating the programmes is strongly linked to the need to make the assessment of a past programme and to find the best way to design a future programme.

This event was organised to set up common grounds for identifying the best practices in monitoring and evaluation design. The main objective was to come up at the end with a set of commonly agreed recommendations to European countries both for their current research programmes and for the new transnational activities that are likely to be launched in the coming years in the ERA context.

PIANIST enabled concrete conclusions that were translated into a set of commonly agreed recommendations summarized above. But that is not enough: those matters are rather technical and the evaluation/impact assessment theory cannot be assimilated that simply. The workshop presentations (freely accessible on the CISTRANA website <http://www.cistrana.org/>) will offer precious support for the policy makers who need to understand the main concepts and design rules of a good evaluation methodology. One can also refer to basic review articles for more details (examples are cited in the bibliography).

The workshop should become a reference concerning the guidelines to policy managers for improving the national programme evaluation methodology in the future, not only for the next planned continuations of existing programmes but hopefully for transnational calls that are likely to be launched in the near future.

The workshop was organised on December 13-14, 2005 (one and a half day) in three sessions:

- Impact assessment session
- Monitoring session
- European interventions and wrap-up session

Each session was introduced by tutorial presentations, then followed by interventions from typical country cases and ended by a round table.

The distinction between Monitoring and Impact Assessment proved to be in fact rather artificial since the experts often insisted that the whole programme evaluation process could not be cut into separates slices but has to be considered globally. That induced some repetitions between Session 1 and 2 that were not detrimental to the overall understanding.

The workshop was attended by 36 attendants with a good balance between the experts – among the best in Europe – and the representatives of national authorities (11 countries).

## Programme

**Tuesday December 13, 2005 (afternoon)**

### **14.00 Session 1: Programme impact assessment (ex-post)**

Chairperson: A. Brenac (ANRT)

Keynote speakers:

L. Georghiou (Manchester Univ.-PREST)  
*Measuring the Returns on Research, Science and Technology*  
 P. Johnston (EC/DG INFSO)  
*A European perspective on research evaluation*

### **15.00 National interventions**

#### **Germany**

J. Wessels (VDI/VDE)

*Ex-post-Evaluation in Germany: Experiences and Conclusions*

#### **Norway**

P. Gretland (Min. of Trade & Industry)

*Experiences from a macro-economic perspective to research evaluation*  
*Advantages and risks when applying a cost-benefit methodology*

#### **Spain**

V.M. Izquierdo Loyola (Min. of Industry)

*Impact assessment of the Spanish Programme for the Promotion of Technical Research in the IST area (2000-2003)*

### **16.30-18.00 Round table: *Methodology for impact assessment***

Introduced by M. Matt (Strasbourg Univ.-BETA)

*The assessment of socio-economic impacts of public R&D programmes: the BETA method.*

Moderator: P. Johnston (EC/DG INFSO)

**Wednesday December 14****9.00 Session 2: Programme monitoring**

Chairperson: A. Quevreur (ANRT)

Keynote speaker:

B. de Laat (Technopolis)

*Indicators for (IST and other) Programmes Monitoring and Management*

**9.30 National interventions****Finland**

E. Hietanen (Tekes)

*Tekes technology programmes evaluation practices;*

*Case NETS - Network of the Future 2001 - 2005.*

**France**

J. Mariani (Min. of Higher Education & Research)

*The evaluations of the French ICT Technological Research and Innovation Networks*

**United Kingdom**

P. Simmonds (Technopolis)

*R&D programme evaluation in practice: the case of the UK*

**11.15 Round table: Indicators for programme monitoring**

Introduced by C. Paleologos (EC/DG INFSO)

Moderator: B. de Laat

**12.45 Lunch****14.00 Session 3: Wrap up session**

Chairperson: W. Polt (Joanneum Institute)

Keynote speakers:

M. Mina (EC/DGINFSO)

*Impact analysis in DG INFSO*

*Pilot experiences and future plans*

N. Kancewicz- Hoffman (ESF)

*Ex-post impact evaluation and Implementation monitoring of international networking schemes. Experiences of the European Science Foundation*

**15.00 Round table: Elaboration of recommendations to Programme Managers.**

Moderator: W. Polt (Joanneum Institute, Vienna)

**16.30 Conclusions of the workshop (ANRT)**

## MONITORING AND EVALUATION: CONTEXT AND GENERAL PRINCIPLES

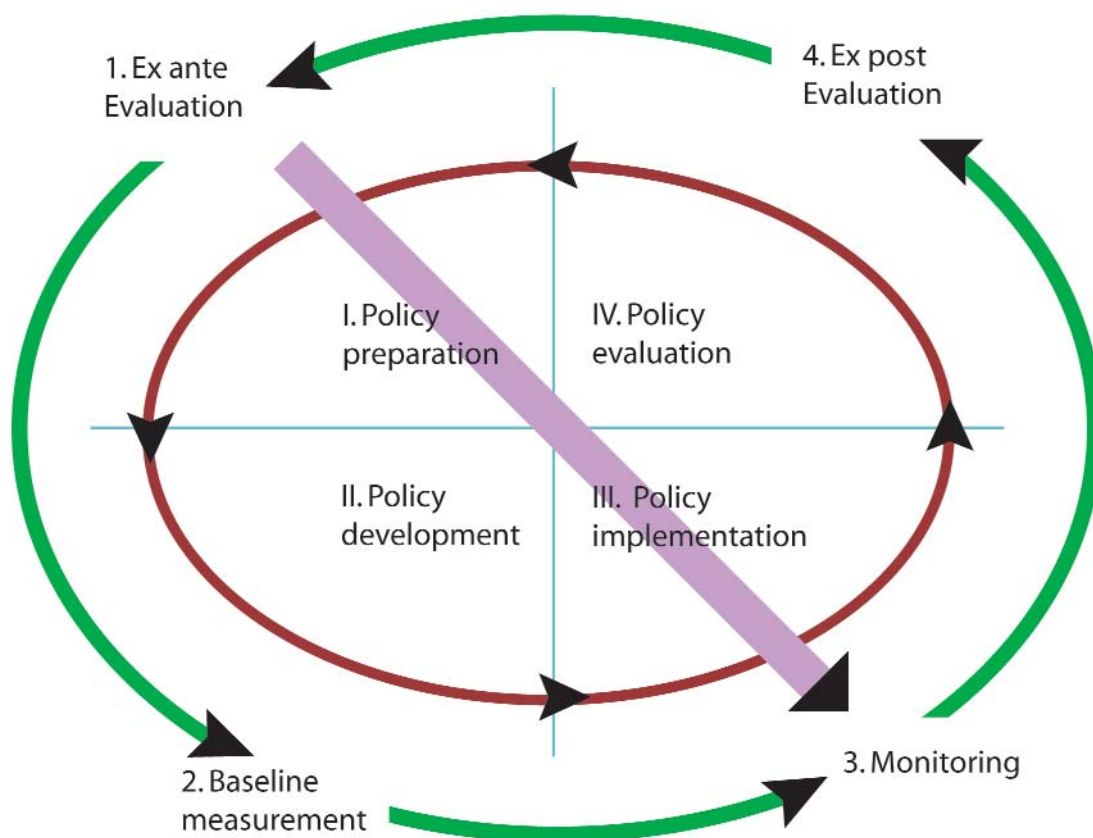
### Evaluation trends in a historical context

Evaluation is a rather recent concept which has grown with the increase of the public support to research and development programmes. To evaluate is to ascertain value, to judge the worth of programmes or institutions, to measure the returns on research, science and technology.

The last 40 years have seen considerable changes in the evaluation methods from case by case procedures to global approaches applied to broader and broader research programmes.

The history of evaluation can be divided into four decades from 1970 to 2000:

- ▶ 1970s: modification of the simple academic peer review system extending the criteria to other issues than scientific excellence and bringing people from industry into the evaluation panels.
- ▶ 1980s: the concept of evaluation really starts to be considered and applied to collaborative R&D programmes.
- ▶ 1990s: the emergence of performance indicators, emphasis is put on knowledge transfer indicators and institutional evaluations. The approach for programme evaluation is organised in a more contractual basis by setting objectives, milestones and deliverables.
- ▶ 2000s: growing interest in evaluation of system capabilities (e.g. national or regional systems) by considering aggregates or interactive effects of policies ("policy mix"). The use of "soft" policy tools is promoted such as foresight studies and/or examination of strategic and persistent effects of public support ("behavioural additionality"). More and more evaluation approaches tend to co-evolve cumulatively with policy development.



Source: Technopolis - B De Laat

*Embedding of monitoring and evaluation processes into the policy cycle*



## The policy cycle

To evaluate is to ascertain value, to judge the worth of programmes and institutions, to measure the returns on research, science and technology. Monitoring is a periodic measurement of a defined set of quantitative indicators. Monitoring and evaluation are strongly linked and may be included in a cycle where programme design and policy preparation are made according to the ex-post evaluation of the previous programmes or policies.

As policy learning has often been associated with evaluation and monitoring practices at the end of the cycle, and their feedback in the cycle for analysis and prioritization, it is commonly admitted that policy learning includes the management of learning processes throughout the cycle. Hence, while the cycle itself may be seen as steps to be taken by governments in formulating and implementing policy, policy learning may be considered as the particular ways and means that governments may use in the production, dissemination and use of policy relevant knowledge.

## Additionality – what difference does the intervention make?

The concept of additionality was formulated in the mid-1990s to help explain consistent evaluation findings such as impact of funding support on strategies and capabilities of funded organisations.

European countries are increasingly interested in the evaluation and monitoring of R&D programmes making efforts at the same time to boost business R&D spending in order to meet the EU's R&D spending target of 3%. Hence, questions about the effectiveness of government financing in producing enduring changes in business R&D strategy are key issues for policy makers. Work on behavioural additionality should be seen as influencing not only policy evaluation, but also policy design and

development. If links can be found between behavioural effects and programme design, policy makers can improve the design of future policy instruments to produce desired effects and avoid the undesirable ones.

In simple terms, the range of additionality perspectives may be summarised as follows:

**Input additionality** – are resources being spent on desired targets?

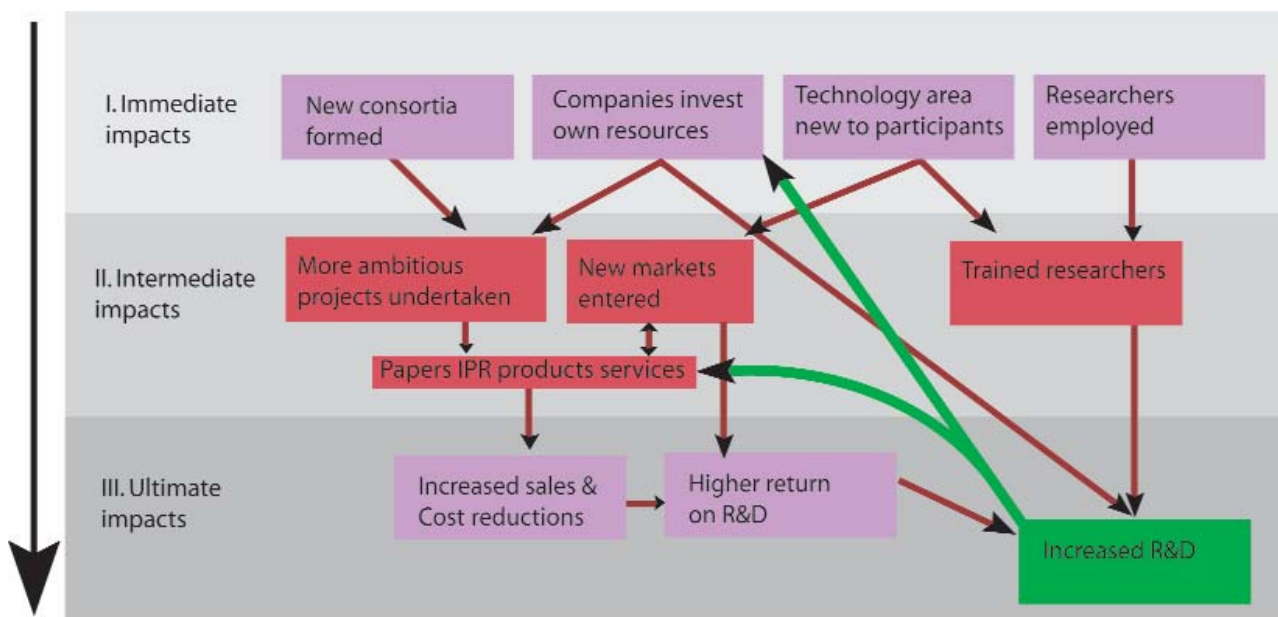
A major concern with whether resources provided to a firm are additional, that is to say whether for every Euro provided in subsidy or other assistance, the firm spends at least an additional Euro on the target activity (leverage effect).

**Output additionality** – what proportion of outputs result from a particular intervention? And conversely, what is the proportion of outputs which would not have been achieved without public support?

**Behavioural additionality** – what difference in behaviour results from the intervention?

Behavioural additionality looks closely at mode of delivery of support for research (e.g. fiscal incentive versus collaborative research grants) and puts the emphasis on persistent changes (subsequently implemented after the financial support).

The concept of behavioural additionality emerged when it was found that traditional formulations of additionality did not capture well the effects of programmes on a firm's performance. It can be described as the difference in a firm's behaviour resulting from the intervention. The assumption is that the behaviour is changed in a desirable direction, though an evaluation should also be sensitive to perverse effects, for example the unintentional encouragement of firms to take risks they cannot afford.



Source: PREST - L Georghiou

Expected impacts and outcomes to increase R&D with collaborative projects

## ELEMENTS TO DESIGN A PROGRAMME EVALUATION

### Choice of evaluation methods

The choice of the evaluation method is crucial and must be set in context. Evaluation design is often realized on aggregate performance indicators. This design must be done in full awareness of what to measure, when to measure, how to interpret what is dependent upon an implicit or explicit underlying model of innovation.

Evaluation of R&D draws upon two streams which are accountability and learning. Tensions may be provoked by evaluation between these two streams. Evaluation is a part of the general practice of science such as career progression, editorial judgment (number of publications), award of grants. A most complete evaluation needs a broader approach to quantify publicly funded activities driven by constraints on funding, requirement to demonstrate value-for-money and increasing competitiveness of science.

Evaluations must be located in the systemic context. To make performance indicators an opportunity, a clear understanding of context, goals and relationships between goals and effects is needed. The logic model approach in evaluation is a useful tool in this context.

### Logic model approach

The logic model approach is a tool that has been used for more than 20 years by programme managers and evaluators to describe the effectiveness of their programmes. The model describes logical linkages among programme resources, activities, outputs and short-, intermediate-, and long-term outcomes. In terms of RTD Programmes, indicators usually relate inputs and activities to fairly immediate outputs and then longer-term outcomes often called impacts.

### Horizontal logic

The method aims at exploring the interdependence between high level objectives or between intermediate level actions. Horizontal logic tends to emphasise connections within a particular layer of objectives, and the

interdependence of these objectives. This approach is useful but could become unreadable in case of a complex system (FP7 for example).

### Vertical logic

The interdependence between an objective and the relevant part of the programme is explored. This "vertical approach" starts from a specific objective up to the programme or main policy goals. The vertical logic can isolate interdependencies as binary links, or consider the combined effects of all aspects of the programme upon that objective. It may also try to identify the multiple effects on different objectives of a single programme activity. It is termed "vertical" because it tends to trace causality from operational level to a more strategic level. These chains can become extremely complex and contain important feedback loops.

### Systemic logic

The systemic causality logic forms part of the step-wise process from the objectives hierarchy to the eventual extraction of vertical and horizontal chains from which to provide indicator development. This methodology is used for an ex-post impact assessment situation when the system is already in place (reconstruction of the programme design phase). In the case of a new programme design (ex-ante), the methodology is reversed to identify the chains in order to build up all the elements that one would expect the programme to address.

### The assessment of socio-economic impacts of public R&D programmes: the participant point of view

The approach described by BETA labs does not focus on a macro economic scale but mainly on programme participants and tries to identify those learning processes and the related knowledge to evaluate the actual or potential value (impact) of the programme for the participants.

Direct effects correspond to the objectives of the projects such as sales or cost reduction. The BETA method is considering indirect effects

corresponding to all the other different learning processes experienced by the participants during the projects such as:

**Technological effects:** transfer of scientific and technical knowledge acquired or developed during the evaluated project to other activities of the participant. The nature of what is transferred can be very diverse: scientific expertise, workers know-how, artefact, new theories etc. The transfers lead to the design of new or improved products, processes or services which allow the participant to achieve new sales, to get new revenues from technologies, to protect existing market shares, to obtain new research contracts, or lead to the granting of new patents.

**Network effects:** refer to the impact of projects on the creation and/or the reinforcement of cooperation with project partners or other entities resulting in other cooperation than the evaluated project itself.

**Reputation effects:** by working on behalf of a given public programme, participants sometimes acquire a quality label or a good image which is used afterwards as a marketing tool.

**Organisation and method effects:** transfer of organisational or procedural knowledge acquired or developed during the evaluated project to other activities of the participant. That occurs when experience gained through the project allows the participant to modify its internal organization and/or to apply new methods in project management, quality management, industrial accounting and so on.

**S&T critical mass effects:** describe the impact of the project on the 'critical mass' relative to the human capital of the partner i.e. the range of competences related to more or less diversified scientific and technological fields, which are considered to be critical for the future development of the organisation.

## ELEMENTS TO DESIGN A PROGRAMME MONITORING

### The five challenges to design a monitoring system

A programme monitoring must be able to measure periodically a defined set of quantitative indicators. To set up a programme monitoring system, five challenges should be considered:

#### a. Embed monitoring in the policy cycle

The monitoring system with specific indicators must be set up when the programme is designed (before start). Too often evaluation is thought of only once the programme is running. The challenge that the program aims to achieve must be quantified before the start.

#### b. Intervention logic or "programme theory"

Vertical and horizontal coherence must be considered, within and between interventions from the first input such as financial, human and organisational resources put into a programme until the last expected outputs like indirect effects on beneficiaries (social impacts).

#### c. Verifiable objectives

An objective is a statement of effects that a public intervention aims to achieve. A success criterion translates an objective into a more operational form to which an indicator can be assigned. A target is a precisely quantified level that a programme indicator needs to reach over a stated time period. The monitoring process must be precise about what indicators are to be measured.

#### d. Causalities and context

Key indicators measure progress in relation to the objectives defined in the programme or policy. Context indicators support the analysis of programme or policy context. What would happen without the additional gains through the public support? Indicators permit to quantify the added value of a programme. There is a difference between correlation and causality: a monitoring system aims to look at causality rather than a statistical correlation.

#### e. Monitoring system design

Users and suppliers of data should be involved in the construction of an indicator system. The number of indicators should be limited as much as possible to avoid the need for complex information systems, excessive demands to data suppliers or swamping users with too much information. Requests for data should be minimised in order not to disturb the normal functioning of programme implementation and information channels.

### Indicators for programme impact assessment and monitoring

An indicator must be a tool for the measurement of an objective to achieve, a resource mobilised, an output accomplished, an effect obtained or a context variable (economic, social or environmental).

The necessity to have indicators for R&D from programme operations through impact (indirect effects) is obvious. Most of the R&D evaluations are based on theories and academic hypotheses about potential economic and social outcomes that are asserted to be true, but may in fact turn out to be false. The economic and R&D contexts may easily change. The dynamics and the high degree of complexity generate innovation system level impacts that can be difficult to measure or attribute accurately. This is particularly true for the case of public R&D investment since it usually represents a modest proportion of the total resources. The initially anticipated impacts can only be observed in the medium to long-term often well beyond the end of the supported research activities.

Appropriate indicators should indeed fulfil some main requested characteristics to contribute to a reliable programme monitoring system by being SMART:

1. An indicator must be 'Specific', precise and concrete in order to avoid multiple interpretations.
2. An indicator must be 'Measurable' referring to a desired future situation.



3. An indicator must be 'Accepted' by those responsible for its attainment and in terms of its limits.
4. An indicator must be 'Realistic', translating what can be attained without excessive ambition and without being underambitious.
5. An indicator must be 'Time-dependent', integrating appropriate delays for its attainment.

Three types of indicators can be roughly distinguished:

- ▶ **Implementation indicators** giving basic information like budget execution, time to contract, time to payment.
- ▶ **Output indicators** gathering information like number of patents, trademarks and registered designs, number of peer-reviewed publications authored by project participants.
- ▶ **Outcome indicators** revealing world leadership improvement as a result of the project work, benefits to the citizens. The medium/long term indicators are difficult/expensive to quantify and strongly influenced by the context and weakly influenced by the programme.

### Outstanding questions about indicators

Before launching a new programme monitoring, the programme manager has to try to answer the following points:

- The right number, level of sophistication and mix of indicators (i.e. composite vs. simple indicators, effects vs. implementation indicators).
- The best place where to put emphasis to make the indicator clearly understandable and without any ambiguity.
- The best alternative when quantification is not possible.
- Is there a real need for adopting a common system of R&D performance indicators? (common to EU and European countries for instance).
- How can we minimize the costs and overheads associated with primary data collection?

## EVALUATION AND MONITORING KEY PROBLEMS

This section concentrates on possible errors or artefacts frequently observed that can be avoided by a careful examination of the ex-ante situation.

### Project fallacy

The evaluation of support brought to R&D (industrial or academic) may encounter key problems such as confusion or different understanding of the scope and timing between the unit of research and the contracting entity.

Research impacts are often cumulative over series of projects. Do not consider the new programme "from scratch" but consider the objectives to reach in continuity with the previous experience of participants.

The effects of research policies result from an interaction between the intervention and the strategy of the research performer. The contract specifies deliverables expected by the policy makers. The fallacy is produced by the gap occurring during the project life between the contract and the reality. For most companies (small and large) a project effectively starts before the contract and finishes after with a wide stream of work resulting from a different set of deliverables planned by policy makers originally. The specific contracted piece of work indeed contributes to a broader effort. Policy makers should better understand the strategy of the organisations they are supporting, the evaluation should go beyond strictly what policy makers are supporting.

### Inappropriate comparison

The internationalisation of the evaluation by constant cross-reference to international frames of reference is more and more exploited without considering the limit of such a comparison. For example, the dubious methodology of league tables, the mix and confusion between evaluation and benchmarking (Shanghai

universities league for example) may come to inappropriate conclusions or cause false interpretations.

### Underlying innovation model

One must take care not to evaluate according to an innovation model that is not relevant to the evaluated innovation process (distortion). Programme managers are designing a programme according to their own view of the innovation model. It is important to note that the contractors may have their own model in mind not necessarily compatible to the underlying innovation model. Therefore there is a major risk to select the easiest way to measure what is quantifiable without caring so much about critical milestones towards an effective innovation.

### Limitations of performance indicators

The lack of commonly agreed concepts and definitions for indicators results in different, inconsistent, fragmented and non co-ordinated information and databases. Badly defined or inadequately presented and explained indicators, the excessive numbers of complex indicators and excessive demands for data on suppliers are seriously hindering the quality of many programme evaluations.

Performance indicators often measure what is measurable rather than what is needed. The number of patents, for example, is an indicator easy to produce but taken alone, it is not relevant enough to measure an innovation process or programme. Crudely constructed indicators may create perverse incentive structures and distort the expected performance (Goodhart's Law)<sup>1</sup> or be subject to manipulation. In the R&D field, pure quantitative targets such as research assessment exercises take academic centres away from their engagement with industry or from teaching.

<sup>1</sup> 'Goodhart, a member of a monetary Committee, observed that when monetary targets are established, the economy responds to the target rather to the broader economic objectives.'

## EUROPEAN COMMISSION: PERSPECTIVE ON RESEARCH EVALUATION

### Context and Lisbon objectives

The ICT sector is very crucial to the realisation of the Lisbon Strategy. The role of the evaluation process is to try to see how the investment made in this area will contribute to increase the European growth rate but also address the social and environmental objectives of the 2010 framework.

In November 2004, the Kok report<sup>2</sup> confirmed that the EU needs "a comprehensive and holistic strategy to spur on the growth of the ICT sector and the diffusion of ICTs in all parts of the economy".

The Commission's proposal to the Spring Council (22 and 23 March 2005) made the following diagnosis:

- The EU's innovation performance is crucially dependent on strengthening investment and the use of new technologies, particularly ICTs.
- Investments in ICTs in Europe have been lower and later than in the US.
- An increased investment in research and innovation in ICTs is essential to boost innovation, growth and jobs creation.
- A new initiative i2010 will be proposed as a comprehensive ICT policy.

### European Commission: new orientations for research evaluation

For the 7th Framework programme, DG Information Society and Media (DG INFSO) and DG Research reformulated some new ambitions for the evaluation and monitoring process. To realise these new targets, EC aims to go beyond "outputs" to "impacts", in order to consider "societal benefit", rather than "private return" and to have a "systemic" analysis, rather than an aggregation of "project-level" results. That new approach may be qualified as follows:

- More focus on outputs and impacts;
- Verifiable objectives and indicators;
- Higher-quality "evidence-base";
- More focus on "systemic" effects, notably in the research-innovation-competitiveness links, and on "knowledge networks";
- Create a critical mass by bringing together enough intellectual and financial resources for the next breakthrough stimulating innovation by cross disciplinary linkage;
- More attention on the EU "added-value" contributing to the strengthening of the European Research Area;
- Linked ex-ante and ex-post evaluation to make a continuous process;
- Adequate resources and an expanded programme of evaluation studies.

### Impact analysis in directorate general Information Society and Media

DG INFSO recently launched two pilot studies: the first one was based on project deliverables, the second one on the participants covering three IST domains in FP4 and FP5 (health applications, mobile communications & systems and microelectronics & microsystems). These two studies gave different conclusions.

Lessons learnt from the first pilot study:

- ▶ Difficulty to validate information in available documents.
- ▶ Project deliverables provide only an indication about expected impacts.
- ▶ The methodology relied on experts' views regarding the possible expected impact.
- ▶ Difficulty to aggregate results at the domain level.

<sup>2</sup> Wim Kok, former Prime Minister of The Netherlands, presented *Facing the Challenge*, the report of the High Level Group on the Lisbon strategy that he chaired. The report concludes that the disappointing delivery of the strategy has been due primarily to a lack of determined political action. The agenda has been overloaded, coordination has been poor and there have been conflicting priorities.

### Lessons learnt from the second pilot study:

- ▶ For meso-level analysis, the use of survey questionnaires with stakeholders' interviews is effective, but needs to include a study on the competitive characteristics of the sectors.
- ▶ The stakeholders' sample should be wider than in that study, segmented in order to achieve a qualitative representativeness of main constituencies in the relevant market sector.

### Future plans

DG Information Society and Media recently launched a framework contract to allow the systematic impact analysis of all RTD activities financed by DG INFSO, starting from FP5.

A common methodological approach aims at taking into account the specificities of each area but allows for the aggregation of results. This methodology is based on participant questionnaire surveys, stakeholders' interviews, competitiveness studies, etc.

## NATIONAL INTERVENTIONS

### Germany

*Jan Wessels, VDI/VDE-IT, Germany*

VDI/VDE-IT is active in the field of research funding, technology politics and innovation management, covering the entire spectrum of the innovation process, from research through application all the way up to the introduction and use of new technologies. VDI/VDE-IT implements innovations in the high-tech sector bringing its knowledge and experience to bear in important key technologies. It also works as an evaluating body in innovation and technology policy. In particular it had the opportunity to evaluate the Eureka cluster MEDEA, the FP5 Growth priority and the national navigation and marine technology programme managed by the BMBF.

VDI/VDE-IT is also an agency responsible for programme management – integration of monitoring and evaluation in funding programs (Microsystems, multimedia...).

#### **Evaluation process**

According to the VDI/VDE-IT experience in evaluation processes, it appears that ex-post impact assessment cannot fulfil all the expectations but is likely to give important information on public-funding programmes. The conclusions appear necessary to prepare the ex-ante impact assessment of the following programme. Ex-post impact assessment will produce worthless data if they are not interpreted in context with qualitative information and will not work properly if it is not implemented in close cooperation with the programme agency or the programme manager.

### Norway

*Pål Gretland, Ministry of Trade and Industry, Norway*

The speaker has reported on research evaluation experiences from a macro-economic perspective. He particularly stressed the advantages and risks encountered when applying a cost-benefit methodology.

Since 1995, the same Norwegian research institute (Møreforskning) has been charged by the Research Council of Norway to carry out the yearly ex-post evaluation of Norwegian applied

research funded by the Council. Recently, this institute included a societal cost benefit approach by calculating the net present value of the investment to evaluate the net benefits to the company, to the whole society, to the research community or to the consumers. A cost-benefit approach is used in many areas in Norway and the Research Council has been experimenting with this approach for evaluation. Results indicate a poor reliability of this method when applied to a research programme. Averages of a few extremely high results and many more mediocre results are unstable and difficult to interpret. Furthermore, a net present value of zero is not a sign of failure, but simply indicates that this project achieves break-even.

Net present value is a method recognizing that the money received today is preferable to money received at some date in the future. It discounts the cash flow to take into account the time value of money. This approach finds the present value of expected net cash flows of an investment, discounted at cost of capital and subtracting the initial cost outlay from it.

300 research projects completed between 1995 and 2001 were examined. The conclusion of the analysis was only partly satisfactory. The assessment was positive since it assumed a present value twice the size of the initial R&D investment but the calculation contained a lot of uncertainties.

When the individual criteria were addressed separately, the analysis showed some interesting findings such as the fact that expected results decrease from ex-ante to ex-post (except for competency).

### Spain

*V. M Izquierdo Loyola, Ministry of industry, Spain*

Ex-post research programme evaluation is a quite recent concept in Spain since the government decided on launching a study called PROFIT focussing on the ICT R&D programme for the period 2000-2003. This study focussed only on industrial R&D.

It combined quantitative and qualitative techniques and aimed at comparing the situation of a company before and after receiving public support.



Information was gained at different levels:

- The "first cycle" of information gives directly the outputs of projects (direct effects).
- The "second cycle" concerns the impact on the organization in terms of turnover, employment, strategy, competitiveness.
- The "third cycle" measured the indirect effect on the society such as socio-economic impacts, improvements of the quality of life, the economic development, etc.

The designed methodology also allows for the valuation of the management and administration of the Programme.

## Finland

*Erkki Hietanen, TEKES, Finland*

TEKES is funding 2400 projects per year, 50% of these projects being funded through one of the 22 running programmes dedicated to technology areas.

TEKES technology programmes are always evaluated by a steering group at the end of the programme and often also halfway through. The aim of the evaluation is to provide feedback on how the programme aims have been realised, to find out how relevant the programme is and to produce information to support the strategic development of programme activities and TEKES activities in general.

The impact analysis unit is using external experts to carry out the evaluation of technology programmes in order to compile varied and independent effectiveness data. The evaluation provides information and understanding on the dynamics of research and development practice and the factors contributing to its success or failure.

One evaluation can cover several programmes if they belong to the same field of technology or a cluster of programmes if they have similar goals or some other common denominator.

Impact assessments also try to provide answers to current queries and to ease the assessment process for all those concerned to respond to changes.

## France

*Joseph Mariani, Ministry of Education, Higher Education and Research, France*

The intervention described the evaluation process prevailing up to 2004 before the creation of the new National Agency for Research (ANR) now in charge to manage the utilisation of public money for R&D at the national level. New rules and procedures are being presently discussed on different Programme issues, in particular the programme and project evaluations. These procedures have progressively been implemented since 2005.

Funding used to be delivered through the Technological Research and Innovation Networks (RRIT), which bring together academic and industrial partners to benefit from the public sector research results in a particular technology area. In the ICT sector 4 Networks have been implemented:

- **RMNT** (National Micro-Nanotechnologies Network),
- **RNRT** (National Telecommunications Research Network),
- **RNTL** (National Software Technologies Network), (all co-funded by the Ministry of Research and the Ministry of Industry);
- **RIAM** (Research and Innovation in Audio-Visual and Multimedia), co-funded by the Ministry of Industry, the Ministry of Culture and the Ministry of Research.

Network steering committees prepare calls for collaborative academia/industry R&D projects, select the proposals, ensure the follow-up of the projects and organize the scientific and industrial community.

Evaluation of the networks is already planned at the launch of the programme and done by Independent Consulting Companies chosen after a call for tenders on the last year of the 5-year duration programs.

The selection of the Company is realized by a Committee composed by Ministries' administrations.

A Pilot Committee including Ministries' and Agencies' project officers, representatives of professional organizations, foreign participants, representatives of large public organizations or companies, representative of the European Commission is set up.

Before the evaluation, some networks produced white books with recent data collection or cartography to feed the evaluation process.

The analysis and recommendations have been submitted to the ministries, after a first presentation and discussion with the networks' bodies. Many findings were similar for the 4 networks. Decisions to continue, modify or stop the networks have been based on those reports.

### **United Kingdom**

*Paul Simmonds, Technopolis, United Kingdom*

#### **Current situation**

UK public research administrations have a long tradition of programme evaluation, it is an integral part of modern public management and

it aims at satisfying both public accountability and a duty of continuous improvement.

There is no legal requirement to evaluate programmes. Responsibility for R&D evaluation is distributed across ministries and agencies: There is no national governing body and no prescribed questions or process.

R&D budget holders define their own strategy for evaluation and monitoring: evaluation questions, scope and methods tend to vary from one budget holder to another.

#### **Outstanding questions**

Monitoring is becoming stronger, encroaching on areas where evaluation was previously performed.

Good impact assessment will need commitment to greater specificity as regards needs and targets and commitment to ongoing measurement and monitoring a decade after the programme has completed periodic, wide-ranging surveys of the EU research-performing and research-using communities.

## Strengths, weaknesses and opportunity to improve the evaluation system

Strengths	Weaknesses	Opportunities and challenges
<ul style="list-style-type: none"> <li>- Clients confident in execution of R&amp;D programme evaluation</li> <li>- Open and flexible as regards scope &amp; timing</li> <li>- Quick and efficient process</li> <li>- Non-bureaucratic execution</li> <li>- Strong supply base with plenty of competition, counts of direct outputs and benefits (to the grantholders)</li> <li>- Evidence base as regards value for money is fit for purpose</li> </ul>	<ul style="list-style-type: none"> <li>- Design choices</li> <li>- Evaluation tends to be tackled at end of programme</li> <li>- Not part of programme design</li> <li>- Programmes rarely define baseline or measurable targets and indicators</li> <li>- Evaluations tend to be summative rather than formative except on administration issues</li> <li>- Independence: R&amp;D budget holders define evaluation specifications and approve conclusions</li> </ul>	<ul style="list-style-type: none"> <li>- Measuring/testing the connection between particular R&amp;D projects and programmes and the achievement of meso-level objectives</li> <li>- Decision makers poorly served by evaluation as regards where/how to invest in R&amp;D</li> <li>- Practical things R&amp;D administrations might do to improve M&amp;E arrangements</li> <li>- Tackle evaluation design at outset, including definition of measurable objectives</li> <li>- Strengthen programme monitoring</li> <li>- Establish baseline</li> <li>- Employ control groups to understand net additionality</li> <li>- Develop better academic underpinning (proofs) of the potential of R&amp;D, better empirical evidence as regards when to use given instruments (calibration)</li> <li>- Database/archive of international benchmarks for key parameters</li> </ul>

## RECOMMENDATIONS FROM THE EXPERTS FOR PROGRAMME MANAGERS AND POLICY MAKERS

Main recommendation extracted from tutorials and from discussions in the round tables maybe summarised as follows:

### ***R1 Developing a pertinent methodology for the programme evaluation is a must: under-evaluation brings under-investment***

Public authorities and private stakeholders need to know and to evaluate the impact of their R&D support policies started some time before in order to increase and rationalise the efficiency of implementation of the new support policies.

- ▶ The failure to appreciate the full extent of both the private and the social returns to R&D is a key reason for the international decline in government investment in research.
- ▶ A complex framework must attempt to address the full benefits on a sliding scale from quantitative to qualitative.
- ▶ The knowledge and human capital must be understood and taken into account in the knowledge economy.
- ▶ Methods rarely give precise or complete answers to policy questions, so major elements of expertise lie in their positioning, combination and interpretation. Policy makers must have confidence in evaluation to use it to drive major resource allocation and system shaping decisions.

### ***R2 Evaluation and monitoring must be mainly considered as a management tool and a learning process by structuring information***

A clear distinction has to be made between the two main motivations for programme evaluation: a management tool and/or a means for controlling the use of public funds. Today, in most of the cases, evaluation is considered as a legal obligation when an external body requires an evaluation. It is essentially a matter for those who are managing the programme.

The link between the programme manager and the evaluator will be tighter and more friendly if the evaluation process is considered more like a management tool than a legal obligation. In the first instance, the evaluation can and should be designed as a co-construction between the programme manager and the evaluator (or

evaluating panel) in order to share a common view on the way the programme was expected to work at the beginning.

Nevertheless, some conflicts of interest between evaluated and evaluators can appear when the two roles are mixed, especially when the evaluation conclusions are not as positive as the programme manager had expected before the evaluation takes place.

The recommendation is therefore not to externalize the evaluation but to integrate it into the daily practice.

Another point has been stressed during the discussions: one has to be careful that the evaluation process is not felt by proposers or by managers as a judgment of their own activities (their research for the first or their management for the second), but as a necessary and imperfect tool to control and monitor the efficiency of public funds. But it must be clear that is not the ultimate goal of the evaluation. Evaluation should mainly be a learning process, that is to say a way to structure information on the basis of projects, programmes and policies to increase collective learning effects.

### ***R3 It is necessary to design the evaluation process at an early stage on clearly pre-defined targets***

To avoid possible conflicts of interest between evaluated programme managers and evaluators, the evaluation process should be designed before the beginning of a programme when the objectives are defined.

Policy makers have to pay attention not to run after too general objectives such as the political 3% target and to invest public funding when and where it is the most relevant. Appropriate and intermediate objectives lead to avoid loss and unfruitful public funding use.

### ***R4 Each time it is achievable, an "intervention logic model" is recommended at an early stage to design the research investment***

That exercise must be done from the very beginning of the programme design since it cannot be easily made retrospectively to evaluate the effectiveness.

- ▶ When different "Strategic Themes" appear to be present in a single vast programme (like the IST priority in FP6), they may have different intervention logics. No single "logic model" applies and indicators of output and impact cannot simply be aggregated;
- ▶ The different "Strategic Themes" constitute a portfolio of synergetic interventions, which requires a systemic approach for the evaluation of the whole programmes effectiveness.

### **R5 Choice of suitable indicators**

That issue is in practice one of the most important since the correct definition of indicators at the start of a new programme will condition the quality of the evaluation performed afterwards.

The recommendations made by the experts are already mentioned in previous chapters and may be listed as follows:

- Define carefully the different types of indicators: implementation indicators, output and outcome indicators.
- Respect the five conditions to be fulfilled by a "good" indicator (SMART rule), i.e. they must be:
  - S**pecific to the concerned programme (not too general);
  - M**easurable;
  - A**ccepted by the concerned stakeholders;
  - R**ealistic (ambitious but not out of reach!);
  - T**ime-dependent (the initial objectives have to be updated in the course of the programme).

### **R6 In terms of evaluation, it is necessary to distinguish between application-oriented technologies and fundamental research**

The ex-post impact assessment is essential for public authorities who have to justify the use of

public funds, but less critical for stakeholders (industrialists especially). For instance in the Eureka ICT clusters where short term innovations are targeted, the project assessment is looking at the products and the added value in the industrial chain likely to be created by the project. Applied research is mainly conducted by industrialists and SMEs, so ex-ante assessment is preferred to ex-post because it makes the investment decision.

The situation is quite different with basic research so that different approaches must be considered according to whether applied or fundamental aspects of research are concerned. Two main differences may be stressed:

- ▶ The stakeholders are different
  - Private organisations have no time available to evaluate the indirect results. They do not have the same information needs as governmental bodies.
  - Fundamental research involves mainly public authorities: research centres or universities with a long term approach and less focussed on the market.
- ▶ The expected results are different
  - Innovation technologies or applied research aim at concrete and measurable results such as increase of benefits, increase of market share or productivity (direct effects and indirect effects).
  - Fundamental and long term research targets more qualitative results.

In each case indeed, the impact assessment issues will have to be treated separately.



## Conclusion

The PIANIST workshop roughly met the objectives that were initially assigned to it. It was attended by a mix of policy managers in charge of national R&D programmes in the ICT field and distinguished academic experts in the management of innovation systems, namely evaluation/impact assessment issues. The list of participants shows that the audience was well balanced between the two categories. The target of programme managers was well reached since 11 European countries sent representatives, some of them being at the upper level of responsibility in the field.

Very lively discussions took place after the expert tutorial presentations or national interventions and during the three round tables. It allowed a good exchange in two directions:

- ▶ Delivering the basics of evaluation theory and impact assessment modelling by the experts to the policy representatives, with a special emphasis on the mistakes to avoid from the early stage of the design of a new programme.

- ▶ Exchange of evaluation best practices between programme managers through the case reports of a significant number of countries.

The workshop enabled to reach concrete conclusions that were translated into a set of commonly agreed recommendations stated in the Recommendations chapter of the present report and recalled in the executive summary.

The workshop should become a reference concerning the guidelines to policy managers for improving the national programme evaluation methodology in the future, not only for the next planned continuations of existing programmes but hopefully for transnational calls that are likely to be launched in the near future.

## **Annex A: Useful information concerning programme evaluation and monitoring**

- Evaluation Plan of DG Information Society and Media, the Commission's Evaluation Policy  
[http://europa.eu.int/comm/dgs/information\\_society/evaluation/index\\_en.htm](http://europa.eu.int/comm/dgs/information_society/evaluation/index_en.htm)
- Supporting the monitoring and evaluation of innovation programmes  
<http://cordis.europa.eu.int/innovation/en/smeip.htm>
- Using Logic Models: the results of a study to explore how logic models could be used in developing a methodological framework for the high-quality assessment of IST-RTS effects at the Strategic Objective Level  
[http://europa.eu.int/comm/dgs/information\\_society/evaluation/data/pdf/studies/2004\\_indicators\\_d03\\_v2.pdf](http://europa.eu.int/comm/dgs/information_society/evaluation/data/pdf/studies/2004_indicators_d03_v2.pdf)
- Assessing the Socio-economic Impacts of the Framework Programme  
[http://www.forskningsradet.no/CSStorage/Flex\\_attachment/PrestSocioEconomicImpact.pdf](http://www.forskningsradet.no/CSStorage/Flex_attachment/PrestSocioEconomicImpact.pdf)
- What the Evaluation Record tells us about Framework Programme Performance  
[http://www.technopolis-group.com/downloads/506\\_Final\\_050718.pdf](http://www.technopolis-group.com/downloads/506_Final_050718.pdf)
- Workshop on Measuring the Behavioural Additionality Effects of Government Financing of Business R&D: Lessons from Country Studies 31 January -1 February 2005. Vienna (Austria)  
[http://www.oecd.org/document/0/0,2340,fr\\_2649\\_34273\\_34538432\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/0/0,2340,fr_2649_34273_34538432_1_1_1_1,00.html)
- Workshop on "Evaluation of publicly funded research", Berlin (Germany) 26 and 27 September 2005, Berlin (Germany)  
[http://www.oecd.org/document/37/0,2340,fr\\_2649\\_33703\\_35450213\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/37/0,2340,fr_2649_33703_35450213_1_1_1_1,00.html)

## Annex B: Abstracts and Curriculum Vitae

### SESSION 1: PROGRAMME IMPACT ASSESSMENT

Title: Measuring the Returns on Research, Science and Technology  
by L. Georghiou (University of Manchester/PREST)

#### Abstract:

The presentation will first consider evaluation trends in a historical context. The limitations of performance indicators and the project fallacy will be discussed.

Two European efforts in evaluation are discussed, one concerned with intervention logic and the other with assessing the full value of project effects. A brief consideration is made of the additionality issue and recent work on behavioural additionality.

*Luke Georghiou*

Professor Georghiou obtained his doctorate at the University of Manchester where he is currently Professor of Science and Technology Policy and Management.

He has held numerous research grants and contracts and was a co-awardee of the £5.7 million JIF Grant to house the Institute of Innovation Research. In the field of research evaluation he co-authored the first international review of the field by OECD in 1986, a report which set up many definitions still in use today. An international conference on foresight in Tokyo was named after his concept of Third Generation Foresight. Policy impacts of his work have resulted in substantial shifts in direction in the UK and elsewhere, including the decision by the incoming Labour government to invest over £1 billion in research infrastructure.

Pr.Georghiou is a frequent keynote speaker at international conferences (for example this year the only foreign plenary speaker at the AAAS Policy Forum in Washington DC) and has chaired several international peer review and evaluation panels and study groups including evaluations of the EU's Framework Programme and the multi-national Eureka Initiative. He advises ministers, government departments and companies in several countries. He is on the editorial board of 6 journals.

### SESSION 1: PROGRAMME IMPACT ASSESSMENT

Title: A European perspective on research evaluation  
by P. Johnston (European Commission /DG INFSO)

#### Abstract:

There has been a major shift towards "evidence-based" policy making in the European Commission, reinforced by the enlargement to 25 Member States. In this, there is a recognised need to balance, in a more transparent way, the economic, social and environmental impacts of new policy proposals in the context of the "sustainable development strategy". These shifts are now translated into formal requirements for evaluation and impact assessments.

The ambitions for research evaluation have been increased for the 7th FP, with a stronger focus on the linkages between public interventions and policy objectives. We therefore need a wider set of tools, soundly based in theory and evidence. This presentation reviews three avenues of development: "network analysis", "causalities between RTD, innovation and growth" and high-level simulation of the complex RTD-innovation system to policy changes. Of these, the "network analysis" approaches appear to offer the most immediate opportunity to assess impacts at the intermediate goals of "critical mass" for breakthrough leadership, and the effectiveness of measures to maximise integration into research and innovation networks. They still need to interface with econometric models of innovation and growth, which will be benchmarked in 2006, and eventually to link into complex-system simulations at the macro-economic level. The latter still already provide some "framing" for research evaluations, and force us to recognise the interdependencies between RTD investments and other policies, and between Europe and the US.

The views expressed are those of the co-author and do not necessarily reflect those of the European Commission.

*Peter Johnston*

Dr. Johnston is Head of Unit G3, responsible for evaluation and monitoring in DG-Information

Society. He has worked with the European Commission since 1988, and has been responsible for research on new methods of work and for strategic planning of communications research (the RACE and ACTS programmes). He has also had responsibilities for rural development, telework stimulation, electronic commerce, multi-media access to cultural heritage, and for sustainable development in a knowledge economy.

Dr. Johnston worked at the OECD from 1976-84, and with the UK Department of Environment from 1984-88. He read physics at Oxford University, was a Fulbright-Hays scholar and is a founder Member of the Brussels Chapter of the Club of Rome.

## **SESSION 1: PROGRAMME IMPACT ASSESSMENT**

National intervention

Title: Ex-post Evaluation in Germany: experiences and conclusions

by J. Wessels (VDI/VDE Innovation + Technik, Germany)

Abstract:

VDI/VDE Innovation + Technology (VDI/VDE-IT) is working in the field of innovation and technology funding since 1979. A major part of work is focused on the implementation and administration of technology funding programmes such as Microsystems Technologies (MST), but evaluation of funding programmes is getting more and more important.

VDI/VDE-IT prepared, accompanied and implemented several evaluation processes for the microsystems technology programme. The last external evaluation took place in 2001/2002 and was realised with an ex-ante and an ex-post-evaluation part. In the ex-post-part, a team of evaluators analyzed German MST funding since 1990. Main topics in this analysis were: status of the technology and technology diffusion, main results of funded projects (prototypes, patents, new products ...), qualification issues, competitiveness and employment effects, networking and the quality of funding instruments. The ex-ante -part analyzed the future fields for MST funding. Both analyses have been leading to the development of a new funding programme which started in early 2004. One of the main findings of the evaluation has

been the need for more clustering and interaction between projects. As a consequence, the new programme introduced for the first time thematic calls in the funding procedure.

Since 2004, VDI/VDE-IT has been also running an internal, formative Evaluation of the new Microsystems technology programme "Mikrosysteme". The main objective is to give continuous information about the implementation process and give input information for adjusting the programme. As the thematic focus of different calls in this programme was not completely fixed from the beginning, the internal evaluation will help to identify new challenges and good practice in addressing communities and support networking within these communities. In 2003, VDI/VDE-IT started, together with a partner, a midterm assessment of the EUREKA programme Medea+. This midterm assessment was designed as an important input for the discussions on the continuation and the design of the second phase of the programme.

Since 2003, VDI/VDE-IT has been also responsible for an impact analysis of the European GROWTH Programme. The results are meant to identify projects which would benefit from wider dissemination of information (e.g. as success stories or as technology offers), identify projects of which the results might not be exploited and identify any issues to be retained as (positive or negative) "lessons learnt".

*Jan Wessels*

After studying political sciences at the Free University of Berlin and the Institute of Political Sciences of Paris (IEP), Dr. Wessels wrote his doctoral thesis on national patterns of perception of European politics. Since year 2000, Mr. Wessels is a consultant at VDI/VDE Innovation + Technik GmbH. One of his main subjects is the formative evaluation of technology funding programmes. Recent projects focussed the funding programme "Mikrosysteme", as well as the "Information and Communication Technologies" funding programme of Bavaria. Furthermore, Dr. Wessels works in the field of qualification, competence development and vocational training. Recent projects focussed the vocational training system of the chemical sector in Germany and the competence development along the value creation chain. Further sectors

of Dr. Wessels' work are innovation policies of the European Union and studies on innovation funding.

### SESSION 1: PROGRAMME IMPACT ASSESSMENT

National intervention

Title: Experiences from a macro-economic perspective to research evaluation. Advantages and risks when applying a cost-benefit methodology

by P. Gretland (Ministry of Industry, Norway)

Abstract:

In a context of almost uncritical acclaim of any research expenditures that can contribute to the European 3 percent of GDP target, there is a risk of losing sight of criteria for successful research. Since 1995, a Norwegian research institute has produced a yearly ex-post evaluation of Norwegian user oriented research. In its most recent report, a cost-benefit methodology has been added. Results so far indicate that although interesting findings are made, uncertainties are high and it is difficult to communicate these results.

From this exercise, we learn that a few research projects are hugely successful while most others do not appear to have achieved significant economic results. Thus, average data will be perceived as questionable. Furthermore, the expected net present values of even successful projects are consistently set lower after project completion than based on ex-ante information. In spite of this, only a small proportion of the benefit is realised at the time the ex-post survey is conducted. On the other hand, some projects result in a positive net present value, even though those in charge responded that they did not expect a financial success when they started. Actually the proportion of those not expecting success was surprisingly high. Another issue left behind is what happens to projects not approved for public funding. These uncertainties raise some questions about whether application of a cost-benefit methodology is appropriate for such an evaluation.

*Pål Gretland*

Pål Gretland is appointed by the Norwegian Ministry of Trade and Industry as an Assistant

Director General, Department for Research and Innovation Policies. His portfolio includes the theoretical economic foundation for research policies, the policy towards research institutes and a continuation of ICT research related issues from his previous assignment. He has been the Delegate to the EU Information Society Technology Committee since September 2000.

His educational background is a Degree in economics from the University of Oslo.

Positions:

- ▶ 2005- Assistant Director General.
- ▶ 2000-2005 Assistant Director General (Adviser until June 2001) at the Norwegian Ministry of Trade and Industry, IT Policy Department, Portfolio included ICT research, use of ICT in industries and ICT internationalisation.
- ▶ Adviser at the Ministry of Trade and Industry, Department for Internationalisation, Bilateral Section.
- ▶ Positions in the Norwegian Foreign Service, including postings in Norwegian Embassies in Kuala Lumpur, London and Tokyo.

### SESSION 1: PROGRAMME IMPACT ASSESSMENT

National intervention

Title: Impact assessment of the Spanish Programme for the Promotion of Technical Research in the IST Area (2000-2003)

by V.M. Izquierdo Loyola (Ministry of Industry, Spain)

Abstract:

The presentation will include the methodology used for the impact assessment, based on the analysis of the project database and interviews to participants, as well as the main conclusions and recommendations. The impact assessment will be repeated on a yearly basis as a part of the Integral System of Evaluation and Monitoring that has been put in place for the Spanish National R&D Plan (2004-2007).

*Victor M Izquierdo Loyola*

Victor Izquierdo Loyola is Deputy Director General of Information Society Enterprises at the Ministry of Industry, Tourism and Trade in Spain.



- Civil Engineer, Madr.id Polytechnic University, 1970.
- Master in Software Engineering, Madr.id Polytechnic University, 1990.
- Since 1980 he has been working for the Spanish Administration (Ministries of Education, Culture, Public Administrations, Science and Technology) in functions related to the ICT sector: IT management, procurement, coordination, e-government, R&D ...
- In his current position, he is responsible for the policies in favour of the competitiveness and innovation of the Spanish IST sector promoted by the Ministry of Industry, Tourism and Trade, namely R&D.
- He has written several books and papers on subjects related to his professional activities.
- He has been Vice-president for Western Europe of the Informatics Intergovernmental Programme of UNESCO (1990-1994) and member of various Committees in the European Commission, OECD, etc.
- He is the Chairman of the Standardisation Technical Committee "Information Technology" of AENOR, the Spanish Association of Standardisation and Certification.

## SESSION 1: PROGRAMME IMPACT ASSESSMENT

Introductory talk to the Round Table

Title: The assessment of socio-economic impacts of public R&D programmes: the BETA method by M. Matt (Université Louis Pasteur-BETA, Strasbourg)

Abstract:

The objective of this presentation is to underline the scope of the evaluation method developed by BETA to assess the socio-economic effects of large public R&D programmes. We will first define the context of application (R&D activities carried out by participants in public R&D programmes funded by the state, ex-post evaluation at the firm level, impact of a specific project on the participating organization) and some general principles (interview based, confidentiality issues, etc.).

Then we will present the scope of effects (direct vs. indirect effects) that the method allows to quantify and we will develop further the

typology of indirect effects (technological effects, commercial effects, organisation & method effects, human capital effects) measured. We will briefly introduce the general quantification procedures and principles. This methodology was applied in a variety of contexts, giving rise to a rich set of results. We will provide some examples to illustrate the type of analysis that may be derived with this methodology. Finally, we will conclude this presentation by underlining the main limitations of the method and some challenge for the evaluation community.

*Mireille MATT*

Since 1996, Dr. Matt is Maître de Conférences in Economy and Management Sciences at the University Louis Pasteur in Strasbourg. She is doing research at BETA (Bureau d'Économie Théorique et Appliquée), Joint CNRS Unit 7522, located in the University. Her thesis submitted in 1996 was on the Technological policies and R&D cooperation agreements: theory and application to European Programmes.

Teaching domains

- Microeconomy – Technology policies – Evaluation – Cooperation agreements – Economy of the uncertainty – General Economy

Research domains

- Economy of Innovation, Science and Knowledge.
- Evaluation and strategic management of R&D programmes.
- Participation in a number of European, national or international projects.(e.g.) participation in the evaluation of Brite-Euram and Esprit EU programmes.

## SESSION 2: PROGRAMME MONITORING

Title: Indicators for (IST and other) Programme Monitoring and Management.  
by B. de Laat (Technopolis- France)

Abstract:

The keynote address will deal with indicators and monitoring of research and innovation programmes and policies. After some brief

"theory" on indicators I will give some examples of monitoring to show the different approaches underlying this concept. The talk will then address the questions "why monitor?" "what to monitor?" and "how to monitor?"

*Bastiaan de Laat*

Dr. de Laat created the French subsidiary of the Technopolis Group in 1998 and has since been its Director. He has a long track record in evaluation of public policies and programmes, in particular related to R&D and innovation. Recent activities in the field of Information Society include an address on technology road mapping to the ITEA annual conference in Seville; a study into the relevance of ICT related research in traditional manufacturing industries; the evaluation of the French software technologies research network RNTL, the French telecommunications research network RNRT and the French transport research network Predit. He was rapporteur of the 5-Year Assessment Panel (1999-2003) of the Information Society Technologies programme of the European Commission (DG INFSO, 2004) and participated in the evaluation of the Eureka Cluster MEDEA+ on Semiconductors and in the evaluation of the Flemish IMEC.

Apart from these assignments he has lead numerous evaluations and studies outside the area of IST, such as the evaluation of French ANVAR's loan scheme for innovative companies; the recent study into evaluation use at the European Commission for DG BUDGET and a study on synergies in non-nuclear energy research in Europe in view of the construction of the European Research Area in that domain. He provides evaluation training to the European Commission since 2001 and has trained around 1000 Commission officials.

## SESSION 2: PROGRAMME MONITORING

National intervention

Title: TEKES technology programmes evaluation practices; Case NETS – Network of the Future 2001 - 2005.

by E. Hietanen (TEKES, Finland)

Abstract:

Tekes, the National Technology Agency, is the main public financing and expert organisation for research and technological development in

Finland. Tekes finances industrial R&D projects as well as projects in universities and research institutes. Tekes especially promotes innovative, risk-intensive projects.

Tekes uses technology programmes to allocate its financing, networking and expert services to areas that are important for business and society. Programmes are launched in areas of application and technology that are in line with the policies in Tekes' strategy. Tekes allocates about half the financing granted to companies, universities and research institutes through technology programmes.

In order to boost collaboration in network technologies, Tekes launched a technology programme called, NETS – Networks of the Future 2001 - 2005.

NETS programme focused on research and development on future wireless systems' architecture, implementation technologies and applications; broadband network technologies and applications; plus a number of service concepts and applications utilising new networks. The programme ended at the beginning of 2005 and the total investment by participating industry, research units, and Tekes exceeded EUR 250 million.

The presentation covers an overview of Tekes technology programme activities and general evaluation practices at Tekes. NETS is used as a case programme.

*Erkki Hietanen*

1983 - 1996	Hewlett Packard Finland, Consultant at Computer systems organisation
1996 - 2003	Tekes, Programme Manager
2001 - 2005	NETS Technology programme, Programme supervisor
2004 - 2005	Technology Manager

## SESSION 2: PROGRAMME MONITORING

National intervention

Title: The evaluations of the French ICT Technological Research and Innovation Networks.

by J. Mariani (Ministry of Research and Higher Education, France)

**Abstract:**

The four French Technological Research and Innovation Networks (RRIT) in the field of Information and Communication Technologies (ICT) have been evaluated at the end of their term, as initially planned. Despite the fact that different consulting companies have been selected for conducting the four evaluations, the conclusions and recommendations were very similar and resulted in the renewal of those RRIT, in the actual implementation of actions to address the major findings and in the adoption of the Best Practices which have been identified.

*Joseph Mariani*

Since 2001 Joseph Mariani is the director of the "Information and Communication Technologies" department at the French Ministry of Research, where he is responsible for the national research programs in Telecommunications, Software technologies, Audiovisual and Multimedia, and Micro and Nanotechnologies.

Dr. Mariani was the director of the Laboratoire d'Informatique pour la Mécanique et les Sciences de l'Ingénieur (LIMSI) and the head of its "Human-Machine Communication" department, from 1989 to 2001, a member of the Scientific Council of the Centre National de la Recherche Scientifique (CNRS), the chair of the CNRS "Information Science and Technology" national Advisory Committee and a member of the national Evaluation Committee of the Institut National de Recherche en Informatique et Automatique (INRIA). He was the coordinator of the FRANCIL Network of the French-speaking University Association (AUF).

His research activities relate to language technology, multimodal human-machine communication, oral dialogue, speech recognition, spoken language resources and evaluation. He was president of the European Language Resources Association (ELRA), president of the European Speech Communication Association, now the International Speech Communication Association (ISCA), and a member of the office of the European Network on Language & Speech (ELSNET).

**SESSION 2: PROGRAMME MONITORING**

National intervention

Title: R&D programme evaluation in practice: the case of the UK

by P. Simmonds (Technopolis-UK)

**Abstract:**

The presentation will cover the organisation of R&D programme evaluation in the UK, including governance arrangements, as well as characterising the typical evaluation questions and research methods being used and the factors determining the choices made by commissioning bodies as regards questions and methods. The speaker will then use this simple template – evaluation questions and methods – to profile the approach taken on five recent R&D programme evaluations as a basis for offering a more personal view on the strengths and weaknesses of the typical arrangements, and conclude with two or three questions for delegates.

*Paul Simmonds*

Paul Simmonds is British and was born on 14 April 1960. He holds an HND in marine engineering from Portsmouth Polytechnic, a BA (Hons) in Geography from the University of Sussex and a MSc in Science & Technology Policy from the Science Policy Research Unit (SPRU), University of Sussex.

Paul Simmonds is a director and co-owner of Technopolis Limited. He has led numerous international studies, foresight exercises, strategic evaluations and management support contracts for government departments and research councils around Europe. He was the Director responsible for three multi-annual contracts to provide management support to DTI (DETR and DOE before that) in the design and operation of the Partners in Innovation collaborative research programme. Paul Simmonds was formerly a member of the BNSC Earth Observation Programme Board.

Paul Simmonds was the independent expert on the HSE Science and Innovation Strategy Working Group, providing advice on the organisation and good practice in R&D

management. Technopolis continues to provide management support to the UK HSE on R&D management, on demand.

With Erik Arnold, he developed an R&D programme-management benchmarking tool that has been used on 40+ programmes in national agencies across Europe, for example in Greece, Finland, Norway, Portugal, Sweden and the UK as well as being applied to a selection of FP4 programmes on behalf of the European Parliament. This methodology was adapted for use by the MAP Thematic Network (MAP TN, StarMAP, DiscoMAP) an FP5-supported network of R&D managers that has operated for three years and for which Technopolis provided both the core measurement tools, a member programme and the network website. The network spanned 14 European countries, Canada and Australia and reviewed 16 national collaborative (industry science) R&D programmes, benchmarking procedures, tools and costs across the programme life cycle, from programme design to impact evaluation.

## FINAL SESSION

Title: Impact analysis in DG INFSO. Pilot experiences and future plans.

by M. Mina (European Commission/DG INFSO)

### Abstract:

The Directorate General for Information Society and Media (DG INFSO) has already funded two pilot studies in the area of impact analysis of the IST RTD programme.

The first study, "Study on the impact of the IST Programme and its predecessors" was implemented between April 2003 and May 2004 by a consortium led by IZET and including MTA and Archimedia. The study was based mainly on the analysis of all documents available for about 900 IST RTD projects funded under FP4 and FP5, with a specific focus on business and economic impact.

The second "Impact study" was implemented by DATABANK in 2004. The aim of this study was twofold: to develop a pragmatic methodology for the systematic impact analysis of all IST RTD activities and to allow testing of the methodology on three specific domains: "Microelectronics and microsystems", "eHealth"

and "Mobile communications". According to the study, the IST priority in FP5 and its predecessors in FP4 contributed substantially to the increase of the knowledge base, the skills of researchers and the development of research and knowledge networks in the Microelectronics and Microsystems, Mobile Communications and Health research areas, leading to enhanced competitiveness for most organisations.

In January 2005, DG INFSO published a Call for Tenders for setting up a Framework Contract for Impact Analysis to provide a systematic, structured, coherent and rolling process of data collection and analysis of the impact of completed IST RTD projects. In September 2005 DG INFSO signed the Framework Contract with a consortium composed of Databank Consulting and Technopolis, with the participation of several subcontractors: Atlantis, Cefriel, Circa, Empirica, Icons, Idate, Merit, PLS Ramboll, VDI/VDE and Wiseguys. The initial duration of the Framework Contract is one year with the possibility of extension up to a maximum of three years.

The Framework Contract for Impact Analysis will allow the measurement and analysis of the impact of RTD projects in IST that are already completed, starting from FP5. The activities covered by the framework contract will be based on a common methodological approach which takes into account the specificities of each domain in IST. A first group of 6 domain studies should be launched before the end of 2005.

*Massimo Mina*

M. Mina was born in Turin, Italy, in 1967. His academic background is in civil engineering. After a professional experience with a private contractor in the field of civil works in Nigeria and Morocco from 1992 to 1994, he joined the European Commission Delegations in Kenya and Albania for the management of development projects. Between 1998 and 2001 he worked in the external relations services of the Commission in Brussels, where he was responsible for the management of cooperation projects in the Western Balkans. Between 2001 and 2003 he was responsible for the coordination of RTD activities in the Directorate General for Transport and Energy. Since May 2003 he has joined the Directorate General for Information Society and Media, where he is responsible for the impact

analysis of IST RTD projects. He is also the project officer for IST Result, an on-line editorial service aimed at raising the awareness and visibility of the IST Programme and its results.

## FINAL SESSION

Title: Ex-post impact evaluation and implementation monitoring of international networking schemes experiences of the European Science Foundation by N. Kancewicz-Hoffman (ESF)

*Nina Kancewicz-Hoffman*

Dr. Kancewicz-Hoffman is presently Scientific Secretary to the CEO Unit, European Science Foundation, Strasbourg, France (on leave from Warsaw University, Poland).

### Key Qualifications:

- ▶ Research and higher education policy and management in the international context.
- ▶ Organisation and management of international cooperation in research and higher education.
- ▶ Project and programme design, planning, management and monitoring in research and higher education.

### Selected Professional Experience Record:

- |             |   |
|-------------|---|
| 1997 - 2003 | Warsaw University; Director, Office for University Advancement, responsible for development of external (third flow) funding, both from private / corporate and public donors, with focus on EU programmes;                                     |
| 1993 - 1996 | Foundation for Polish Science; Director for International Co-operation; managed the EU Phare 'Reform Programme for the Science and Technology Sector in Poland – SCI-TECH' with a budget of 7 million EUR; led an international team of experts |

advising Polish authorities and the R&D community on systemic reforms and preparing Poland for participation in the EU Framework Programme;

1990 - 1991	Ministry of National Education; Deputy Director, Department for Higher Education and Research; launched and headed the EU Phare TEMPUS Programme in Poland;
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1973 - 1990	High school teacher and manager; free lance literary critic and translator.
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### Recent publication:

Mary Canning, Nina Kancewicz-Hoffman, Dorota Holzer-Zelazewska, Albert Tuijnman, 'Review of Polish Tertiary Education, Policy Note'; European Investment Bank and The World Bank; Warsaw, 2004.

## FINAL SESSION

Final round table: Recommendations to Programme Managers concerning Programme evaluation methodologies moderated by W. Polt (Joanneum Research Ltd)

*Wolfgang Polt*

Economist; Head of the Vienna office of the Institute of Technology and Regional Policy (INTEREG) of Joanneum Research Ltd. (since 2000). Lecturer for Industrial Economics and Technology Policy at the University of Economics and Business Administration in Vienna. Former Senior Research Fellow at the Department of Technology Studies of the Austrian Research Center Seibersdorf. Former full time consultant for the Directorate for Science, Technology and Industry of the OECD in Paris.

His work included work on evaluation methodology and approaches. He has carried out innovation research and evaluation studies both on national and international level.



## Annex C: Participants

Bastiaan DE LAAT	FRANCE	Speaker	TECHNOPOLIS
Luke GEORGHIOU	UK	Speaker	PREST- UNIVERSITY OF MANCHESTER
Paul GRETLAND	NORWAY	Speaker	MINISTRY OF TRADE & INDUSTRY
Erkki HIETANEN	FINLAND	Speaker	TEKES
Víctor M.IZQUIERDO LOYOLA	SPAIN	Speaker	MINISTRY OF INDUSTRY
Peter JOHNSTON	EC	Speaker	CEC- DG INFORMATION SOCIETY
Nina KANCEWICZ-HOFFMAN	ESF	Speaker	EUROPEAN SCIENCE FOUNDATION
Mireille MATT	FRANCE	Speaker	BETA- LOUIS PASTEUR UNIVERSITY
Joseph MARIANI	FRANCE	Speaker	MINISTRY OF RESEARCH
Massimo MINA	EC	Speaker	CEC- DG INFORMATION SOCIETY
Constantin PALEOLOGOS	EC	Speaker	CEC- DG INFORMATION SOCIETY
Paul SIMMONDS	UK	Speaker	TECHNOPOLIS
Jan WESSELS	GERMANY	Speaker	VDI/VDE
Alain BRENAC	FRANCE	Moderator	ANRT
Wolfgang POLT	AUSTRIA	Moderator	JOANNEUM Ltd
Alain QUEVREUX	FRANCE	Moderator	ANRT
Michel ADIBA	FRANCE	Participant	MINISTRY OF RESEARCH
Constant AXELRAD	FRANCE	Participant	ANRT
Martine COMBEROUSSE	FRANCE	Participant	MINISTRY OF RESEARCH
Olivier COME	FRANCE	Participant	EUROPEAN COURT OF AUDITORS
Sylvie COURT	FRANCE	Participant	ANRT
Helga EBELING	GERMANY	Participant	GERMAN EMBASSY IN FRANCE
Afonso FERREIRA	COST OFFICE	Participant	COST OFFICE
John GRAFFMAN	SWEDEN	Participant	VINNOVA
Gaétan HAINS	FRANCE	Participant	AGENCE NATIONALE DE LA RECHERCHE
Louis LAURENT	FRANCE	Participant	AGENCE NATIONALE DE LA RECHERCHE
Alain MARCHAL	FRANCE	Participant	MINISTRY OF RESEARCH
Michèle MARIN	FRANCE	Participant	AGENCE NATIONALE DE LA RECHERCHE
Edina NEMETH	HUNGARY	Participant	NKTH
Hannu NURMI	FINLAND	Participant	TEKES
Stojan PECLIN	SLOVENIA	Participant	SLOVENIAN RESEARCH AGENCY
Patrick SCHOULLER	FRANCE	Participant	MINISTRY OF ECONOMY FINANCE & INDUSTRY
Michel VIEILLEFOSSE	EUREKA	Participant	EUREKA
Nakita VODJDANI	FRANCE	Participant	AGENCE NATIONALE DE LA RECHERCHE
Mathieu DOUSSINEAU	FRANCE	Rapporteur	ANRT



## Acknowledgements

The project team and workshop organisers would like to thank the following persons for their help and active contribution:

The Speakers	Country	Organization/ Project
Bastiaan DE LAAT	France	TECHNOPOLIS
Luke GEORGHIOU	United Kingdom	PREST- UNIVERSITY OF MANCHESTER
Paul GRETLAND	Norway	MINISTRY OF TRADE & INDUSTRY
Erkki HIETANEN	Finland	TEKES
Víctor M.IZQUIERDO LOYOLA	Spain	MINISTRY OF INDUSTRY
Peter JOHNSTON	EUROPEAN COMMISSION	CEC- DG INFORMATION SOCIETY
Nina KANCEWICZ-HOFFMAN	ESF	EUROPEAN SCIENCE FOUNDATION
Mireille MATT	France	BETA- LOUIS PASTEUR UNIVERSITY
Joseph MARIANI	France	MINISTRY OF RESEARCH
Massimo MINA	EUROPEAN COMMISSION	CEC- DG INFORMATION SOCIETY
Constantin PALEOLOGOS	EUROPEAN COMMISSION	CEC- DG INFORMATION SOCIETY
Paul SIMMONDS	United Kingdom	TECHNOPOLIS
Jan WESSELS	Germany	VDI/VDE

### The moderators

Alain BRENAC	France	ANRT
Wolfgang POLT	Austria	JOANNEUM Ltd
Alain QUEVREUX	France	ANRT

### The rapporteur

Mathieu DOUSSINEAU	France	ANRT
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### **For more information**

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