

**The Five-Year Assessment of
the Joint Research Centre
2003**

Ex-post evaluation of the implementation of
the JRC Multi-Annual Work Programme 1999-2002
and early mid-term evaluation of the
JRC Multi-Annual Work Programme 2003-2006

Final Report, April 2004

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Chairman's Introduction

This report forms the 5-year Assessment of the Joint Research Centre (JRC) Work Programme activities for the period 1999-2003. It is in three sections. In Section I, as Chair of the Evaluation Panel, I offer an overview of the JRC's performance. This evaluation is elaborated in the more detailed commentary in Section II. This latter section reports the findings from the work of the Evaluation Panel's expert groups, which was undertaken between September and December 2003. Section III collects together background and reference materials associated with our work.

I was particularly fortunate in having the support of a distinguished Panel with an impressive range of experience covering the whole of the JRC portfolio, and I thank them for their invaluable assistance. The principal recommendations given below are unanimous.

The Panel was impressed with the progress made since the last 5-year Assessment in realising the JRC's new mission as a service to the Commission. In the Panel's view the clarity of this mission has re-invigorated the JRC, giving a clear purpose to its work. The main recommendations in Section I, and the detailed commentary in Section II, are designed to advance this progress. In formulating the principal recommendations, the Panel drew heavily on their experience of laboratories that have successfully passed through similar transitions.

In our judgement, this is not the time to heap further radical recommendations on the JRC. It is the time to consolidate the progress being made in recent reforms and improve internal systems. The thrust of our principal recommendations is aimed at strengthening JRC's capability to deliver a service to the Commission, but without compromise to the JRC's future scientific vitality or integrity. We are particularly concerned to see more progress in integration within the JRC and increased recognition by relevant Commission policy services. If our recommendations were carried through, this would be a major step towards fulfilling the JRC's role as a reference centre across its whole range of activities. Even more important, it would be a major step towards improving the European Union's (EU) own internal processes, in a world in which technology is becoming all-pervasive in both the development and execution of policy.

David Fisk

Section I OVERVIEW

I.1 The Panel's Approach

The Panel's terms of reference and working method are described in detail at Section III, Annex 1. For the first time, this 5-year Assessment was invited to look at the JRC's work categorised by Priority Areas of research, rather than by constituent Institutes. This approach ensured that the Panel took a cross-cutting and integrative view of the JRC's work. It was fully in accord with the spirit of the previous 5-year Assessment, which recommended stronger integration of the JRC's research. A record of the reviews and other internal changes that significantly affected the JRC's work over the evaluation period is also recorded in Section III.

Working in terms of Priority Areas required a new and intensive working method. In brief, small Expert Groups, selected from the Panel, met with the Director and staff of every Institute, whenever logistically possible, on site. The membership of these Expert Groups purposefully overlapped and, as far as was practical, the Panel Chairman joined the groups at all the sites during some part of their visit¹. The Expert Groups determinedly focussed their study at the level of the Priority Areas. Consequently, when the Panel met in Brussels on 8 December, 2003 to assess their findings, they were able to construct a unique cross-cutting picture of the JRC and its work over the period 1999-2003. The Panel would wish to express their appreciation of the assistance of JRC staff who, without exception, provided a very professional level of input to its work. Vera Calenbuhr, Colette O'Loan and Barbora Jezerčáková deserve special mention as the Panel's technical and logistical secretariat support, which enabled the complex process to run so smoothly.

I.2 The Multi-Annual Work Programme

The Panel's level of review was at that of the Multi-Annual Work Programme (MAWP). The 4 Core Areas and 11 Priority Areas of the 2003-2006 MAWP were used to structure the Panel's work (see Section III, Annex 5). These relate well to the structure of the 1999-2002 MAWP. The Panel's detailed report on these Areas is in Section II.

Overall, it is the Panel's assessment that the JRC delivered the research goals that were set out in 1999. This was despite the disruption related to re-organisations and responding reviews chronicled in Section III. Where goals were not achieved, this was almost invariably because work ceased as a result of the re-organisation in 2000, following the Scientific Audit, or because of changes in Commission customer priorities taking place on a faster time scale than the Work Programme review. The Panel endorses the reasoning behind these changes to the 1999-2002 MAWP.

At its first full meeting on 9 October, 2003 the Panel had the opportunity to meet with Directorate-General (DG) customers from DG Transport and Energy (DG TREN),

¹ The Chairman, Professor David Fisk, was unable to visit the Institute for Transuranium Elements (ITU), where Dr. František Pazdera acted as his Vice President.

DG Environment (DG ENV) and DG Health and Consumer Protection (DG SANCO) to discuss customer satisfaction with the JRC's work. The Panel was impressed with their robust defence of their programmes at the JRC; something that the Panel suspected would not have happened 10 years ago. Research customers should not normally expect that having work at the JRC should mean they would be subject to our intense interrogation, and the Panel is grateful for their patience. The Panel was also heartened during their visits by signs in other JRC programmes of both sharpening and broadening the customer base within the Commission. This impression was reinforced by the results of an EOS-Gallup Europe (The European Omnibus Survey s.c.r.l.) User Satisfaction Survey amongst JRC customers. The Panel's first principal recommendation echoes that of the previous 5-year Assessment:

Recommendation I.1

The Panel was impressed with the invigoration of the JRC since the Fourth Framework Programme (FP4), which had resulted from a more focussed mission on serving the Commission. The Panel recommends strongly that the JRC continues to deepen the process through further dialogue with the Commission.

I.3 Quality

The quality of work in different Priority Areas is reviewed in Section II. Overall, the Panel was satisfied with the general scientific quality of work and its relevance to matters of concern to the Community. Where there were concerns they related to risks that the scope of the study was narrow in comparison to its objectives; or that benefits from integration within the JRC had not been fully exploited; or that too limited resources appeared to be available considering the challenge.

The Panel's affirmation of the JRC mission raised an important methodological issue in addressing the quality of the research. A service mission implies that quality must be 'fit for purpose' and that the quality criteria vary with customer needs. The Panel found work in the JRC's programme ranging from 'bureau' work supporting processes arising from Community legislation, through standards work, to cutting-edge exploratory research. These are each challenging - but in different ways. Each therefore needed a different assessment of quality based on fit for purpose criteria. The MAWP had no formal typology that identified what type of project was being undertaken. The Panel believed this to be a weakness that could lead to internal confusion as to the standard of work and experimental design that should be required. It was often possible to identify topics in the MAWP that would migrate from exploratory research, to work underpinning European reference standards, to bureau work. A clearer explicit typology would give better focus to the management of such transitions.

The Panel was particularly concerned that, given the finiteness of the JRC resource, it should avoid accreting continuing activities from earlier programmes. This was particularly true where the scientific methodology was now mature enough to be carried out elsewhere. A more explicit project typology would raise the issue of transfer to a higher priority. Given the JRC's mission, the Panel would envisage that

any typology would strongly reflect the intended impact of the work (exploratory, capacity building, industrial or legislative standard, bureau etc.). A good example of managed transfer was the development of a LISAR (LInear Synthetic Aperture Radar) system to measure the risk of imminent volcanic eruptions and avalanches. This was the outcome of earlier JRC work and exploited some of its skills in precision radar measurement. Visiting researchers had worked with the equipment and this had now facilitated its move to the private sector. Similarly, the JRC should have an important role in preparing the ground for future European operational Agencies. The Panel accordingly recommends:

Recommendation I.2

The JRC should operate with a clearer typology of its projects so that it more explicitly manages the resources spread across research, internal capacity building and bureau work. The rationale for work within future MAWPs should, in addition to existing research milestones, identify the milestones for the research's impacts (e.g. a possible CEN² (European Committee for Standardisation) standard). This should help focus management attention on when a project should be transferred out of the JRC to be operated by other entities. There was no reason to stop such projects, but every reason to plan their transfer to other operating agents.

The handling of Intellectual Property Rights (IPR) is an important element in the management of knowledge and technology transfer from the JRC to outside. While the Panel had no specific criticism of the current arrangements for IPR, many of the recommendations have significance for the role of IPR creation in the JRC's customer-orientated mission. This area could well merit a review.

Much of the work the Panel saw, and the customer satisfaction that was reported to the Panel, was a direct result of exploiting many years of earlier intellectual investment by the JRC. There is always a risk that research customers under the pressure of the moment will be tempted not to re-invest in the future capabilities of the JRC. Experience elsewhere suggests that if this issue is not attended to, in a customer-focussed research body, its vitality and capacity will gradually decline to the point where it is not able to carry out its mission.

The Commission as research customer is currently reaping the rewards of earlier investments in research. In the Panel's detailed commentary a number of areas are identified where investment is needed to give the JRC the required flexibility to meet future needs. For example, the JRC, in common with comparable centres in some Member States, has a problem maintaining its nuclear expertise in the absence of major activity in the industry. In other areas of the programme, projects are faithfully modelled on earlier EU policy approaches to issues and now need to anticipate the direction of new policy thrusts. The Panel was particularly concerned about the need to take a less compartmentalised approach to issues, and in particular to increase the life science dimension of some 'chemico-physical' programmes, for example in food and environment.

² CEN is the acronym for the French 'Comité Européen de Normalisation'

Over the duration of the MAWP, the issue of research related to security acquired increasing importance. The JRC has shown considerable flexibility in developing security-related activities but, following the events of '9/11' and the definition of the EU security strategy, the JRC's approach must now reflect the new needs of the "comprehensive security" area. At the beginning of the 1999-2003 MAWP, the JRC activities were only limited to "civil" security issues. Global terrorism has meant that the civilian security agenda has now to handle the potential for a wider, and much more aggressive, context. This change in context has both organisational as well as content implications for the MAWP.

The JRC management has shown wisdom in investing in exploratory work and in internal capacity building over the review period. The Panel's typology recommendation will assist in the management of the balance of the overall Work Programme, but the Panel makes a further recommendation to reinforce the importance of new research activity for the future servicing of Commission needs. Rather than place such work outside of the customer service mission, the Panel believes that the Director General of the JRC should be accountable for this forward-looking investment and be seen as the 'research customer'. The Panel does not believe it would be useful to recommend any particular proportion of the JRC's portfolio to be devoted to this category, only that such work should relate defensibly to this specific mission of retaining future relevant competence. Such an approach creates a uniform customer focus across the organisation, while at the same time protecting future capability. The Panel accordingly recommends:

Recommendation I.3

The Director General, perhaps on recommendations made by the Institute Directors, should be designated as the 'customer' for exploratory and capacity building work, justified by its contribution to future issues within the JRC's mission. This proposal will lead to an improved distinction between work designed to meet the specification of a customer DG and research designed to build future competence.

I.4 Relevance

Over the review period the JRC demonstrated, in areas such as the regulation of existing chemicals (REACH - Registration, Authorisation, Evaluation and Restriction of Chemicals - legislation), or the regulation of Genetically Modified Organisms (GMOs), that its reports could have immediate and important impact on EU business. As the JRC's work re-orientates towards the Commission as research customer, the research report becomes an increasingly important interface between the JRC and its clients. While customers may be reassured by the knowledge that a piece of JRC research has been accepted in a prestigious and peer reviewed scientific journal, they are more likely to be principally concerned with its significance in their own context. The Commission as a whole should not underestimate the difficulty in correctly interpreting the significance for policy of a piece of research.

JRC reports currently range from preliminary laboratory results released for reaction within a limited part of the scientific community, to definitive scientific assessments

supported by both the JRC as a whole and the important expert players in Member States. The Panel therefore believes that it would be timely to introduce a much clearer classification of JRC written reports that make its status absolutely clear to the policy customer and to news media. The JRC already has some research activity in the field of quality of scientific information, and this and other experience puts it in a good position to define a classification scheme for its own reports. Such a scheme would have underlying protocols for the interpretative element for each class (e.g. the degree of intra-mural peer assist and extra-mural peer review appropriate for each level). The Panel accordingly recommends:

Recommendation I.4

The JRC's reports to customers range from preliminary laboratory reports, to reports whose interpretation is endorsed by the whole JRC family and its networks. There is a strong need for the JRC's reports to be clearly classified by status, each class having associated protocols for their interpretative element. The Panel recommends that the JRC's Directorate for Programme and Resource Management begin this work, in conjunction with JRC colleagues.

As the JRC's science is integrated, and as a clearer status of its reports emerges, it becomes even more important for active protection of the JRC 'quality mark'. Work in some areas at the JRC is at the policy frontline and in engagement with dynamic opponents of Commission policy. Here, making imputations against the JRC's reputation could be a negotiating tactic with a serious contagious element. The JRC management needs to keep a close watch on the resourcing of such 'hotspots' to ensure that they are able to meet their quality objectives even under pressure. The Panel accordingly recommends:

Recommendation I.5

As a JRC 'quality mark' emerges through greater integration there should be more active management of the JRC's collective reputation. Reputation risk should be included in central JRC management.

I.5 Staffing

On a number of occasions JRC staff expressed their concerns about the consequences, for specialist staff recruitment, of the Commission Reforms. The Panel looked into these concerns in some detail because the human capital within a research body is its most important asset. In the Panel's view the Reforms lead to a new recruitment regime that, while posing potential threats to the JRC's approach to recruitment if not handled correctly, could also offer opportunities to improve its links with customers. For example, the Reforms would require a member of the Commission staff to stay in post normally for only 5 years. If this was strictly followed at the JRC, and experts were moved this frequently, the JRC would provide a poor quality of service to the Commission. On the other hand, a general culture of mobility in the Commission would be an advantage, particularly for moving experienced JRC staff into customer DGs, enriching the latter's technical base. The problem appeared to be, that the new

procedures for short- and long-term staff needed to be better understood by the JRC line staff, so that they could adapt recruitment strategies to a new and more appropriate career model. The Panel accordingly recommends:

Recommendation I.6

Several elements of the Commission Reforms, if applied rigidly, would undermine the effectiveness of the JRC. For example, in order to maintain and increase competencies, the Panel strongly recommends that scientific experts should not be obliged to rotate posts every 5 years. The JRC-Brussels Support Services needs to give more support and advice to the Institutes' Management Support Units, to streamline processes of recruitment. The new arrangements also offered an opportunity to facilitate staff transfer and secondments to the customer policy DGs.

I.6 Efficiency

Amongst the high level indicators of efficiency, the Panel looked at the degree of integration of the science. In several fields the activities are relatively free-standing. However, in Priority Areas like environment or energy there are very strong synergistic factors. The JRC should have been exhibiting competitive advantage because of its wide internal scope of activities.

The Panel found limited effort at integration over the period of their review. What effort there was, had been very often directed at avoiding overlap rather than in winning the benefits of an integrated view. The Panel was surprised to find that there was no senior manager accountable for the progress of each of the Priority Areas that were addressed. The Panel had not expected to see a lead Institute for each area, but had expected that the JRC's senior management team would have shared the integration task more effectively between themselves. The Panel accordingly recommends:

Recommendation I.7

In future MAWPs, the senior managers within the JRC should be accountable and appropriately empowered for the overall integration and management of each Priority Area.

The Panel does not recommend any further major geographical relocation of programmes, but does recommend other means of improving inter-Institute integration. A more central location for IPTS (the Institute for Prospective Technological Studies) would be helpful, if the host Government is unable to provide better infrastructure support at Seville. However, the JRC is not the only organisation facing problems in the integration of a widely dispersed operation. Others have seen this as the occasion to invest in the advantages of modern information and computing technology. The Panel found that over the Assessment period, the JRC's internal connections seemed no better than its communication networks with the external world. Given the JRC's own advocacy within its Work Programme of the revolutionary impact of information technology and its development of new intra-

Commission facilities, it should now start to implement internal ICT (Information and Communications Technologies) structures appropriate to a high technology institution. The Panel accordingly recommends:

Recommendation I.8

The JRC should invest in cutting edge ICT systems that enable staff to effectively network and integrate between Institutes and Units throughout the JRC. The Panel recommends that the JRC invest in new and imaginative ICT systems as a matter of urgency.

Moving to more general efficiency issues, the Panel's work flagged up two more areas that needed improvement. The distribution of laboratory space on the large Ispra site, even within sections, would benefit from initiating strategic site management. Co-location is universally recognised as an important tool in both managing researchers and ensuring productive interaction. The Panel accordingly recommends:

Recommendation I.9

The current fragmentation of the Ispra site has a negative effect on efficiency. There should be a firm strategic plan to rationalise Ispra laboratory space to improve management efficiency and productive interaction of scientific staff.

Finally, the Panel was concerned at the large number of reviews and management system changes that had taken place over 1999-2003. While the new systems had much to commend them, they needed to be streamlined and keyed together to be a management benefit and not a penance. If this could be completed it would also reduce the burden of effective reviews of the work. The Panel would hope that the work of servicing the next 5-year Assessment would be made easier by the existence of clear goals and performance indicators set out at the beginning of the programme. The Panel accordingly recommends:

Recommendation I.10

The JRC has risked being over-reviewed in the period 1999-2003, and the reviews and internal progress monitoring systems did not seem to key tightly into each other. There needs to be one senior official accountable to the Director General for the review and monitoring burden who is tasked with keeping an account of the effort deployed and ensuring its efficiency and effectiveness.

I.7 Concluding Remarks

This overview, taken with the detailed commentary in Section II, gives a fair view of the JRC's performance over the period 1999-2003. Progress is evident since the last review. While there are still adjustments to be made, the Panel believes that the JRC is on the right track. In several important cases it has been a champion of technical innovation in the EU's work and brought about effective implementation of policies that would not otherwise have happened. As its science becomes more integrated, and its mission more focussed, the Panel would expect the name of the JRC to take on a significance within the work of the Union that would be more than an umbrella term for a group of research Institutes. While the commercial analogy is not totally appropriate, customers should begin to understand what the JRC 'brand' means in terms of independence and quality of work. Some of the earlier principal recommendations point to issues relating to sharpening the focus of the JRC. In the Panel's view it is time to take the step that naturally follows from a customer-orientated mission. The values of the organisation need to be stated in a way that makes operational the organisation's realistic scope, the kind of work it does and does not do, and the quality of work that it intends to deliver.

Recommendation I.11

In order to achieve its unique policy-support service mission, the next step is to ensure that the JRC has clear corporate values. This would help the JRC decide with customers the work that it should do, how it would defend and protect the integrity of its findings, and what customers could expect from the JRC. The Panel recommends that the Director General submits, to the JRC Board of Governors, a draft value statement. The Panel commends values that draw on the JRC's high standing in analytical reference work.

Section II DETAILED COMMENTARY

II.1 Core Area 1: Food, Chemical Products and Health

II.1.1 Priority Area 1 - The Food Chain

This work was evaluated following the visit of the Panel's relevant Expert Group to each of the three JRC Institutes working in this Priority Area (IRMM, IPSC and IPTS).

It seems likely that food standards will be an area of controversy for some while, from which increasing demands may be expected. Research supports not only difficult negotiations within the EU, but also supports the Commission negotiating on behalf of the Union in international fora such as the World Trade Organisation (WTO). As a consequence, the quality of the JRC's work may on occasions be probed deeply. Staff are currently hard pressed, and JRC management should be alert to the risks, not only to European health but also to the JRC's general reputation, of any under-resourcing.

The materials reference programme has met its objectives, and is highly regarded internationally. Activities should focus on the preparation of reference materials (especially "fit-for-purpose" test materials) along with rapid response in the food and feed sector, i.e. fit-for-purpose validated analytical methods, proficiency tests, etc... There would be limits to work on reference materials relating to veterinary issues, unless access to specialist knowledge was made available.

In the longer term it will be necessary to increase the life science dimension of the research area to include microbiology, immunology and in vitro testing. So, investment is needed for laboratory space and equipment. Furthermore, capillary electrophoresis/mass spectrometry is missing for the analysis of polar compounds, metabolites and proteins.

The Panel commends the early warning system for reference material customer needs in the area of prospective Directives. This approach enabled considered input into the development of Community legislation. There was otherwise concern that in high profile issues, in the food area in general, the need for urgent political consensus might override the need to identify issues of practical implementation, until it was too late.

Excellent work has been done in the Monitoring Agriculture with Remote Sensing (MARS) programme. This is an imaginative use of JRC expertise in an area of Community policy. The effects have been impressive, though, given the sums of money at stake, it would always be necessary to be alert to possible counter measures by fraudsters, which are likely to become more sophisticated.

The Panel considers that in view of the reform of the Common Agricultural Policy (CAP), future JRC strategy should include more pro-active work carried out by the Institutes on behalf of both the European Commission and the Member States. In particular, this should aim at defining realistic scenarios and control procedures, which could be applicable to future CAP. Furthermore, the JRC should remain aware

that the area of food safety and quality is one in which social perceptions and assessments of risk are viewed by some as nearly as important as the scientific work. The Panel accordingly recommends:

Recommendation II.1

While endorsing the chemical science underpinning the Priority Area for Food, future expertise needs to include microbiological and immunological issues to reflect likely future developments. For similar prospective reasons, the JRC needs to develop its competence in the social dimension of agro-chemical and agro-biological issues.

II.1.2 Priority Area 2 - Biotechnology

This work was evaluated following the visit of the Panel's relevant Expert Group to each of the three JRC Institutes working in this Priority Area (IHCP, IRMM and IPTS).

The Panel has a very positive impression of the work in this Area. It is dominated by the issue of GMOs, their detection in crop products and their agricultural significance. This work is being undertaken in a politically high profile arena where there is a risk of unconstructive scientific dispute delaying difficult political consensus. Consequently, the JRC has an opportunity to play a unique role in resolving within the EU the emerging technical issues of detection and measurement. The JRC has responded well with rapidly increasing resources.

The reference material element of the programme is a unique, highly regarded programme with an excellent external network. There has been a wise use of the skills developed in bovine spongiform encephalopathy (BSE) work, as a basis for the provision of reference material capability for GMOs. The storage facilities should be enlarged and specified regarding storage conditions, e.g. temperature.

However, current biotechnology policy operates in a very aggressive policy context, both within the EU and internationally. For example there are large stakes at risk in the international trade dimensions of biotechnology. The Panel is not convinced that the JRC as a whole fully appreciates the “reputation risk” to the JRC created by this context. This is an area where there is no room for error, and where resources deployed need to be monitored continuously to ensure that they are appropriate to the external pressures being applied. The Panel supports the need for a third laboratory to accommodate the Community Reference Laboratory (CRL).

The relationship between IRMM (the Institute for Reference Materials and Measurements) and IHCP (the Institute for Health and Consumer Protection) appeared effective for this Work Programme, but the units in IRMM and IHCP should aim to improve their liaison, as well as that with IPTS, as far as possible. There has been an influential analysis of European plant biotechnology, but the inference the Panel drew was that biotechnology issues in the EU are unlikely to remain limited to plant-related technology for long. The Panel expects this to be an area of further

growth in work. The newly expanded area would be a good basis to realise the JRC's commitment to integrative working. The Panel accordingly recommends:

Recommendation II.2

There will be a need to answer future research questions on biotechnology in general, in particular in the GMO area (e.g. in the animal husbandry sector) and new expertise needs to be developed. The Panel recommends that IHCP take a co-ordinating role in the further development of this area for the whole of the JRC.

II.1.3 Priority Area 3 - Safety of Chemicals

This work was evaluated following the visit of the Panel's relevant Expert Group to the JRC Institute working in this Priority Area, (IHCP).

This Area relates predominantly to the safety of chemicals. It has had a high profile during the Work Programme because of the controversy accompanying publication of the draft REACH Regulation. The work on ECB (European Chemicals Bureau) /REACH is very important and extremely necessary. Some important achievements have been accomplished to date. However, given the high expectations and heavy workload still remaining, the Panel considers that a stronger initiative to develop the capacity of ECB should have been undertaken at an earlier stage. The Panel is concerned at the uncertainty created by any hiatus in the transfer of activities from the ECB to the Chemicals Agency. This could begin to bleed enthusiasm and vitality.

The work on ECVAM (European Centre for the Validation of Alternative Methods) is very impressive and the Panel was struck by the enthusiasm of the group. The training effort with respect to young scientists is very commendable. This suggests to the Panel that the possibility of also incorporating PhD (Doctor of Philosophy) students into ECB should be considered, in order to enhance the creativity and innovative aspects in method development.

The Panel is convinced that the approach adopted by ECVAM, including the use of Human Embryonic Stem Cells (HESC) is necessary, but nevertheless endorses the development of other complementary approaches. This is an area where external links are important to ensure the full added value of the JRC's work. IHCP have a strong advantage in their close links with external partners and the Panel commends its networking activities, which should be continued.

As with some other areas, the JRC needs to broaden its view on air pollution beyond the physiochemical perspective to form a rounded view. The JRC needs to find access to epidemiological resources to complement its physical and chemical work on air pollution. The Panel endorses the Indoortron (a laboratory facility for measuring indoor air composition and exposure effects) as a unique European facility. However, more care is required in extrapolating exposure results to the generality of the European population. This was an area where there could have been more active collaboration between IHCP and IES (the Institute for Environment and Sustainability) on air pollution. This is particularly acute for work on aerosols.

The "Total Human Exposure Assessment Study - Chemical Agents" (THEXAS-Chem) group is correctly placed within the JRC, particularly in this Institute, as it links with the chemicals group. In view of the REACH legislation the subject areas are relevant because of the lack of knowledge regarding exposure pathways. The Panel accordingly recommends:

Recommendation II.3

Recognising the magnitude of the task to create a Chemicals Agency following agreement on the REACH legislation, the Panel invites DGs Environment and Enterprise to begin immediately allocating the necessary resources. The JRC Institutes IHCP and IES should take the opportunity to improve the necessary research activities in connection to the REACH legislation.

II.1.4 Priority Area 4 - Contributions to Health

This work was evaluated following the visit of the Panel's relevant Expert Group to each of the five JRC Institutes working in this Priority Area (IHCP, IRMM, IE, ITU and IPTS).

This Area is very wide in scope. While health in a broad sense is a major European issue, it is not necessarily always a European Union issue. A realistic JRC strategy needs to recognise the scale of both industrial research and research supporting policy operating under subsidiarity within Member States. There is concern that work on the health implications of biotechnology lacks a holistic approach to health and related ethical issues. The running down of the standards-work for biomedical devices and work on vehicle accidents, during the Work Programme, is seen as a correct prioritisation under the JRC's mission.

The Panel acknowledges that nanobiotechnology is an important new area, where the JRC needs to develop internal expertise. The Panel was impressed by the quality of the work. However, the Panel would like to have seen more evidence of planned links through to applications in the JRC-family, and a clear focus and strategy for application, especially with other Institutes. The work on medical applications of plasma technology is similarly impressive, but will need to be financed eventually by external sources.

Reorganisation has impacted heavily on the "Total Human Exposure Assessment Study - physical agents" (THEXAS-Phys) group and therefore the research activities should be focused on the basis of a strategy, which must be developed. At present, in view of the current work in the areas of asthma studies, kidney cancer studies, cell culture studies and solid state nuclear magnetic resonance (NMR) metabolic profiling studies, the work shows a distinctly splintered approach. There are gaps regarding the research on exposure to physical and chemical agents and the impact on health.

There is substantial experience in the JRC, especially regarding NMR- and ultra violet- (UV) spectroscopic techniques. However, impact studies and selection of

patients should be carefully designed in co-operation with epidemiologists and physicians.

The efforts regarding networking and standardisation at European level are appreciated. The relationship between the different responsibilities at IRMM and IHCP are clear and operate satisfactorily.

Production of radioisotopes is an agreed activity of the JRC, and it is important for the medical needs of the EU. Boron Neutron Capture Therapy (BNCT) is looked upon as a potential new therapy, and this work contributes to the European Research Area (ERA) through networking activities in the use of nuclear technologies for health applications. With the "European network on Medical radio-Isotopes and beam Research" (EMIR) activity, time available on the reactor is put to use through production of radioisotopes. Alpha-immunotherapy work needs to increase the number of partners, particularly from Member States, to bring research results faster into practical applications. The Panel accordingly recommends:

Recommendation II.4

There is an absolute need for the JRC to co-ordinate the choice of topics to be researched with an overall health strategy. The Panel recommends that the Director of IHCP take the lead in co-ordinating, with all other Institute Directors, the development of a more realistic and pragmatic strategy for the JRC.

II.2 Core Area 2 : Environment and Sustainability

II.2.1 Priority Area 5 - Protection of the European Environment

This work was evaluated following the visit of the Panel's relevant Expert Group to each of the three JRC Institutes working in this Priority Area (IES, IPTS and IRMM).

Environment policy requires integrated thinking across various environmental media. The new challenge of sustainable development is that this integration has to be taken further to include economic and social dimensions. The Panel has few concerns about the value of individual projects, but viewing the Area as a whole, it is concerned that the full JRC potential for this integrated perspective has yet to be realised. The term 'sustainability' in the IES title raises expectations, even perhaps amongst external customers, that cannot presently be met in the absence of social and economic analysis. The Institute's work is closer to 'environmental sustainability'. This is not a criticism of the projects themselves, but there is a need both for some new internal competence on sustainability and for more deliberate collaboration with other JRC skills, principally with IPTS, on economic and social dimensions.

Turning to specific projects, the Panel considers that the work on vehicle emission standards is a beneficial and important task, which has the objective of providing an appropriate service to the Commission, as well as to the Council and European Parliament. In this field of growing importance, the Work Programme has to recognise both the limited resources of the JRC, and the fact that other European Institutes are active in similar themes. Due to the high impact of such work in the regulatory domain, a careful strategy is needed to find unique niches and appropriate synchronisation with other groups that have already been active in this area for a long period.

The Panel recognises the significance of a European Union-level view of the environment and the technological advantage of realising this through the JRC's expertise in Geographical Information Systems (GIS) and satellite technology. Integrated data for an area or a region is not the same as an integrated understanding of the consequent environment. It was not always clear where in the Commission process the latter analysis is supposed to take place.

The Panel understands that work on waste issues has evolved out of work on soil protection. There is already a very large research effort in Member States on wastes, and the JRC should be realistic. The Panel recognises that soil protection must become an increasingly important element of European policy and, the focus should remain on threats from waste to soil protection. Modern soil science has moved from geochemistry to microbiology. If this area is to be sustained in the future, thought should be given to broadening the JRC's expertise through internal developments and networking in microbiological science.

There was a very high standard of work on reference materials for environmental measurements that compared well with international peers. However, there are many other uncertainties associated with practical environmental measurements. The case has yet to be made that there is the customer-base for such high quality material,

given the other uncertainties in environmental measurements. The Panel accordingly recommends:

Recommendation II.5

The JRC needs to guard against compartmentalisation within its Work Programme activities, especially as many of the relevant issues are systemic in nature. This holds true for the connections between the environmental, health and broader global change issues. Consequently, the Panel recommends a more visible use of the Sixth Environmental Action Programme as the integrating framework, particularly joint activities in the area of environment and health. The Panel invites the Directors of IES, IPTS and IRMM to suggest jointly appropriate modifications for incorporation into the MAWP.

II.2.2 Priority Area 6 - Global Change

This work was evaluated following the visit of the Panel's relevant Expert Group to each of the two JRC Institutes working in this Priority Area (IES and IPTS).

This is another very broad Priority Area, where the JRC could not possibly make an impact in all the areas that could be embraced by the title. To help staff and customers understand the JRC's role, there needs to be a clearer strategy.

The Panel endorses the contribution to climate change science being made by the JRC's work on aerosols. This is a logical extension of earlier JRC expertise in air pollution. However the JRC, rightly, does not retain in-house expertise on other areas of climate change meteorology and it needs to have a strategy for the best use of its specific expertise in assisting international consensus. The JRC should consider configuring its work so that it could be a generally available input to European, United States, and other international models, reflecting its 'neutral' position.

The JRC's remote sensing capability met the objectives in the MAWP. It has gained peer acceptance, but it needs to guard against being only an advocate for a particular approach. Rather, the JRC's mission should be to accelerate European consensus of remote sensing algorithms and the products derived from them. Based on the JRC's space application and remote sensing competencies, it should play a key, driving role in the GMES (Global Monitoring of Environment and Security) programme for its environmental aspects. The JRC could be the facilitator and the interface with the user- and future user-DGs of GMES. In addition, especially in areas to be covered by GMES, the JRC needs to reinforce its co-operation with the EEA (European Environment Agency).

Given the commitment of DG FISH to technology in other JRC areas, there is some surprise that global scale remote sensing has not featured in work carried out for them to date.

With such a broad area there was an inevitable problem of guarding against a diffuse mission, and a need to find a sharper definition of the JRC's added value beyond

simply exploiting the serendipity of existing research expertise. The Panel accordingly recommends:

Recommendation II.6

The ‘Global Change’ priority Area, covering not only climate change issues, implies work over a very wide scope. Taking into account the sustainability context, the Director General of the JRC is invited to identify a role for the JRC as a whole, realistic within available resources.

II.2.3 Priority Area 7 - Energy

This work was evaluated following the visit of the Panel's relevant Expert Group to each of the three JRC Institutes working in this Priority Area (IE, IES and IPTS).

Energy seems likely to be a growing area of European Commission interest, and the creation of a specific Institute is viewed as timely. This is an area where systemic relationships between technologies are of growing importance. The IE (the Institute for Energy) vision to become “The European Community Reference for Safer and Cleaner Energy” is supported. The Panel recognises that this has involved a considerable change in the mission and that this puts strong requirements on management. The first steps are judged to be good. However, due to the need to build up expertise, the Institute has a major task ahead in undertaking its energy activities, and the Panel stresses the need for the JRC to recognise the long-term character of many energy research programmes. The Panel also considers that the very ambitious objectives are not commensurate with allocated staffing levels. For this reason, and also because it is an important area, they need to rely on extensive quality networking in the future. An example is hydrogen and fuel cell technology, where new work has sensibly built on existing materials science expertise. However, compared with the scale of international effort in these areas, IE should realise its limitations.

The Panel is impressed with the work on solar energy, which seems realistic in scale and appropriately positioned as a reference centre in the technological roadmap of this technology. The Panel considers however, that some programmes, legitimately building up areas of existing expertise, are being presented prematurely as ‘centres of excellence’. Recruiting essential, highly experienced experts for key new energy areas would help in establishing competence more quickly and would increase immediately the credibility of this reorganisation. In such new areas it may not be reasonable at this stage to establish JRC-led European networks/centres of excellence. It would be more appropriate to first build JRC research teams able to participate in international collaborations.

The Sustainable Energy Technologies Reference & Information System (SETRIS) initiative is aimed in the right direction, and is already effective in managing interfaces of activities. However, neither full integration nor the practical implementation of SETRIS is clear to the Panel. The SETRIS network needs a more formal process to gain the economies of scale possible within the JRC-family. This was disappointing, as energy research is more than a catalogue of technologies, and

the Panel believes that the JRC is not extracting the full potential from its various programmes.

Some additional aspects should be considered in the future. In particular, energy saving and efficiency deserves more attention and the Commission will be working on many Directives in this area. This is classically an area for setting standards and therefore a legitimate area for JRC involvement. It has, however, to be recognised that in the energy domain, as elsewhere, demand side research is very different in character from supply side research. The Panel accordingly recommends:

Recommendation II.7

The JRC's energy research needs the addition of a significant systemic component. This could be within the SETRIS area. The Panel recommends that the Director of IE, together with the Directors of IES and IPTS build up SETRIS for the task.

II.3 Core Area 3: EURATOM

II.3.1 Priority Area 8 - Nuclear Safety and Security

This work was evaluated following the visit of the Panel's relevant Expert Group to each of the four JRC Institutes working in this Priority Area (ITU, IE, IRMM and IPSC).

In the Nuclear Safety and Security Area, activities are based on proven scientific achievements and long experience, with highly relevant results and impacts clearly demonstrated. The Panel believes that the major challenge is to focus activities dynamically to changing priority problems. Unique facilities (in addition to new strategies in certain areas, competent staff and access to external competence and resources through networks) are a major strength for the JRC. It is necessary to pay more attention to risk analysis and risk management, in order to protect these facilities. IE, in particular, should continue its work on developing effective public communication with regard to the High Flux Reactor (HFR).

The results are strongly amplified by the very active operation of networks within the nuclear research community, supported by both institutional and competitive funds. The European networks of IE seem to provide continuity and broader access to information than many other international networks. Due to the specific nature of ITU (the Institute for Transuranium Elements), their networks primarily help in transferring the Institute's services to others, whereas IE networks typically co-ordinate members' research and augment IE's own capabilities that are required in serving customer needs (particularly the Commission). However, in spite of the potential benefits of co-ordinating EU research on plant-life management, the Panel is concerned about rationalising 6 networks and projects in the area of structural integrity into a single large project (SAFELIFE "An Integrated IE Approach to Plant Life Management") in FP6. In such a large network it may take longer for ideas to surface, and they are much more difficult to manage. The Panel understands the JRC's wish to reduce administrative load, but recommends that management monitors this carefully so as not to jeopardise proven networking success in this area.

The new activities on the safety of high-level waste casks, as well as on data management and dissemination (generic system as well as specific applications) are based on existing expertise and are judged to be important.

The Panel also supports future IE work on new generation of reactors, which is based on HFR resources and High Temperature Reactor (HTR) networks. However, the JRC's role in implementing the Euratom-GIF (International forum on Generation IV nuclear systems) Agreement (July 2003), access to GIF information by Member States and, how Member States can participate in the Euratom contribution to GIF is unclear to the Panel. This work should form part of any future Priority in Energy, given its systemic links to the general energy system.

Safeguards research, basic actinide research and pyro-chemistry for partitioning are judged to be at a very high level globally and almost unique in Europe. The JRC should establish a highly interactive network to develop and improve analytical models for computer codes for new, more complex problems. As an example,

advanced models are needed to support their activities in developing fuels carrying minor actinides. ITU alone cannot have the necessary expertise and resources.

Studies on spent fuel behaviour under long-term storage and final repository conditions are very important for the Community and Member States. The JRC's work in this field, focused on spent fuel characterisation, has had limited scope so far (source term), although using efficiently the high, existing expertise of the Institute. This limited scope also reflects the current situation, in that Member States have different (or missing) strategies and variable status of progress in their spent fuel management programmes. A broader scope of activities expected under FP6 is welcome (such as activities planned in the NF-PRO Integrated Project). The lack of consensus on reprocessing in Europe explains the relatively low activity in the field of partitioning and transmutation, where ITU can potentially contribute more.

Objectives for the provision of reference materials have been met with a noticeable improvement in customer networks. However, the Panel has doubts about the realism of under-pricing the reference materials produced. Radioactivity in the environment and illicit trafficking of nuclear materials are good examples of novel areas into which JRC has expanded. These are areas where the Institute responds directly to the evolving needs of the Community and Member States. Undertaking many activities such as those under TACIS³ and PHARE⁴ financed separately from the Framework Programme has proved to be a good service to the Commission as well as participants in the projects.

There has been continued progress in the non-proliferation work, which has grown in response to customer requirements and a changing agenda. This is an increasingly important area. The programme has its origins in a time when the role of technology was to assist confidence building about proliferation issues relating to nuclear material present in the civil sector. However, the Panel considers that in the new climate of global terrorism, the work needs to be addressed in a broader perspective, recognising that next to a civilian aspect, some of these issues are now closer to a military context. This implies an appropriate level of confidentiality and security, especially as regards the sensitive information generated and updated by the JRC. These systems, including appropriate security measures and protection of the results and information generated, are not yet in place and may compromise the JRC's capability in the international (especially trans-Atlantic) security agenda. The Panel accordingly recommends:

Recommendation II.8

In the Area of Nuclear Safety and Security the JRC, like similar organisations in Member States, faces major challenges in maintaining essential skills and facilities. The Panel commends the JRC's efforts at training, but recommends that the JRC Board of Governors pay close attention to the staffing issue in their strategic oversight. The Panel believes that the consequences of failure could be severe, if the staffing issue is not planned sufficiently in advance.

³ Programme of Community aid to the New Independent States and Mongolia

⁴ Programme of Community aid to the countries of Central and Eastern Europe

II.4 Core Area 4 : Horizontal Priorities

II.4.1 Priority Area 9 - Technology Foresight

This work was evaluated following the visit of the Panel's relevant Expert Group to each of the two JRC Institutes working in this Priority Area (IPTS and IPSC).

The Panel welcomes the new understanding between DGs RTD and JRC on technological foresight. This has the potential to be a very constructive relationship. The panel feels that the ESTO (European Science and Technology Observatory) network has served the JRC well, but that it is time to refresh its membership, and bring new blood and a degree of shrewdness about technological futures into the work. There is still opportunity for more active two-way flow of ideas within the JRC itself, with technological studies informing the development of expertise (as the Panel has identified in the need for a Director General's Programme), and laboratory experience providing 'ground-truthing' for technological speculation. The Panel singles out the small programme of activities in IPSC (the Institute for the Protection and Security of the Citizen) in this respect as excellent. It provides the capability to test some new research topics. More links with the academic sector outside the Institute are recommended in order to help identify future topics, but it could be a pattern for a Director General's Programme. The Panel accordingly recommends:

Recommendation II.9

The ESTO network needs strengthening, to reflect the new role of DG RTD. This should include more self-reflection and critique of existing methodologies and approaches. JRC internal networks should be strengthened, as should the JRC's links with corresponding competence centres in Member States. The Panel recommends that the Director of IPTS propose this for inclusion in the next MAWP.

II.4.2 Priority Area 10 - Reference Materials and Measurements

This work was evaluated following the visit of the Panel's relevant Expert Group to each of the two JRC Institutes working in this Priority Area (IRMM and IHCP).

The Work Programme objectives have been met by a highly regarded team, working to prominent international standards. There is a need for new storage facilities for reference materials, and the Panel commends this investment.

The Panel found some difficulty in formally assessing the relevance of some of the work 'at the margin'. This was not because the JRC was failing to meet customer requests. Rather, in contrast to other areas reviewed, there was no long-term strategy in the Commission for metrology at the EU level. The firmest customer requirements were requests for reference materials reactive to other policy needs. Metrology is at the foundation of European industrial activity, and there are some key strategic issues to be resolved for the future. For example, it is not evident whether the JRC should be producing competing reference materials to the U.S.A. National Institute for

Standards and Technology. The JRC has served the EU by suggesting how the agenda could be developed, but this ‘ideas-push’ is no substitute for true ‘customer-pull’. The Panel accordingly recommends:

Recommendation II.10

In the absence of a metrology policy for the EU, the JRC has to second-guess its role. The Panel recommends that the JRC raise this issue within the forum of the High Level User Group (HLUG). At this meeting DG Enterprise, in consultation with other DGs, should be invited to draw up a Commission consultative paper for discussion with Member States on the Commission’s role within the European Measurement and Standards System. This should pay particular reference to its strategic impact, and the importance of this system to European industry, to international competitiveness and to the reduction of international technical barriers to trade.

II.4.3 Priority Area 11 - Public Security and Anti-Fraud

This work was evaluated following the visit of the Panel's relevant Expert Group to each of the five JRC Institutes working in this Priority Area (IPSC, IPTS, IES, IHCP and IE).

The Panel is concerned about the sheer variety of different ‘risk-based’ activities undertaken in this Area - each one requiring very diverse competencies. The wide research customer interests are recognised, but in order to provide genuine added value in specific areas, the Panel recommends that the JRC focus on a limited number of priorities, which could then be addressed in depth and with the appropriate networks.

The Major Accident Hazards Bureau (MAHB) is a long-standing bureau database with a legitimate existence within the JRC. However, the JRC should not just rely on existing legislation as the customer base for its work. As an advanced research laboratory the JRC should be prepared to anticipate future developments in this area - including the future adoption of a different approach by the EU.

The use of the GIS-based data has met the MAWP objectives. The Panel considers that the development of flood prediction and assessment systems is an interesting project, showing the full capability of GIS data, but that it should be transferred as soon as possible to the relevant Member State authorities and riparian commissions for routine operations. The setting up of the BEVABS⁵ (Europe Office for Wine, Alcohol, and Spirit Drinks) isotopic database has achieved its objectives and continues to have an important EU regulatory function, though there are now commercial laboratories active in this field.

⁵ BEVABS is the acronym for the French ‘Bureau Européen des Vins, Alcools et Boissons Spiritueuses’

The Panel considers that in development of the activities on public security, more thought should be given to possible future frauds and to the development of appropriate counter-measures. The JRC is assisting the Commission in fighting an active, not a passive 'enemy'. The Panel has similar concerns in the nuclear area as to whether the JRC has fully absorbed the consequences for its own working practices, of the emergence of 'civilian' terrorism. The Panel accordingly recommends:

Recommendation II.11

In view of the heightened terrorist risks to civilians there needs to be an appropriate security culture at the JRC. Additionally, the appropriate security systems framework at EU level needs to be implemented in order to get full value from JRC competencies in the future. The Panel invites the JRC's Director-General to clarify the issues with the relevant DGs and to work with the Council to agree an appropriate framework.

II.5 European Research Area

II.5.1 Introduction

The JRC established a strategy for the ERA in 2001. An Action Plan for 2003-2006 was published in July 2003. There are no specific recommendations made by the Panel under this heading, although many of the recommendations made in this Report bear on the JRC's capability to reinforce the ERA. The Panel particularly emphasises those relating to internal integration within the JRC. It is the Panel's view that improved internal integration would both improve the JRC's status as a player within the Area and help ensure that external networks are of high quality.

II.5.2 Networking

The JRC has used networks extensively over many years, and was arguably a prototype for this type of ERA activity. Over the period of this Assessment, the JRC has shown the effective use of networks to achieve EU goals. Examples are BSE, GMOs, chemicals, pollution control equipment performance, and nuclear safety. In some cases the Panel was concerned that the relevant network might be showing signs of ossification (e.g. the European Science and Technology Observatory), or was too exclusive (e.g. climate change). An exclusive network may be valid where it is serving only to complement gaps in the JRC's own expertise, but within the ERA context, the JRC's networks should be as open to high quality entrants as is feasible. In the Panel's view it is legitimate for the JRC to use the ERA to build up its own expertise in a new area, and so not necessarily always be the hub of a network. It is better for the JRC, and consequently for the ERA, to be the partner in a first rate network, rather than the hub of a second division grouping. The Panel considers that a closer networking with universities would stimulate the scientific development of the JRC, would facilitate human capacity building for the benefit of the JRC recruitment process and would give university researchers a deeper knowledge of the possibilities of seeing research as a service to the Community.

II.5.3 Training & Mobility

The JRC is not a teaching institution and this dimension of the ERA is more appropriately assessed as 'knowledge transfer'. There is a clear logic to such an activity within the customer-orientated mission of the JRC. When the JRC has helped perfect a reference system it is self-evident that it should devote effort to transferring its knowledge to other laboratories. This is particularly important where there is a risk that the JRC itself would become encumbered with providing a reference service to the EU when the Commission's own priorities for research had moved elsewhere. Activities that related to transition in Candidate Countries are reviewed under Enlargement Activities.

The Panel commends the positive approach towards achieving gender balance, and in some areas this was showing fruit. However, elsewhere in the evaluation the Panel draws attention to the need to bring in new blood in nuclear physics and closely related skills. This is a discipline where the external pool of expertise itself has both

severe gender imbalance and declining entry. Any future target on gender of JRC trainees needs to be handled intelligently or it risks being counter-productive to maintaining the nuclear capability.

II.5.4 Infrastructure

It is not evident from the JRC's new mission that it should be the perpetual guardian of large infrastructure facilities. The Panel's other recommendations point to a need to manage the transition of such facilities out of the JRC, once they cease to be central to the JRC's mission. The Panel visited all the large Research Infrastructures in the JRC, and was impressed with the commitment of staff to maintaining a high level of performance and utilisation. However, the uniqueness of a JRC facility within the ERA does not of itself guarantee that it is needed. The Panel therefore commends the Action in the 2003-2006 ERA strategy to peer review each large infrastructure facility, and to increase the 'trainee' content of its use.

The JRC operates a number of European databases. Access restrictions to these databases (e.g. the Major Accident Reporting System) are fully consistent with the original objectives. However, this access is more 'physical' and less 'virtual' than would be the norm under the objectives of the ERA. Researchers wishing access to a database would not now normally expect to have to travel to a remote laboratory to analyse data. Accordingly, the Panel welcomes the review of access in the 2003-2006 strategy.

II.6 Enlargement Actions

The JRC initiated an Enlargement Activity at the beginning of the Assessment period. It consisted of a number of activities aimed at stimulating collaboration within research projects, hosting temporary staff at the JRC premises, organising workshops and training courses, and disseminating information and enhancing communication with the Candidate Countries. While the other Directorates-General within the Commission, along with Member States, have played an active part in Enlargement, the JRC has clearly a key role to play in strengthening the underpinning scientific infrastructure of the Candidate Countries.

The activities were built upon 18 of the JRC actions reviewed in this Section, with a view to extending the projects' activities towards serving the needs of the Candidate Countries in relation to the enlargement process.

The early decision to focus priorities on a number of key areas has proved a good decision. The predominance of projects in the environment and nuclear safety field was rational, given the legacy from the 1990s and the demands of European environmental legislation. So too, was the clustering of activities around 'bureau' processes, since Directives or Regulations often require future participation by Candidate Countries. The Panel's single surprise was that only two projects in the area of agricultural policy and food were thought worthwhile.

The Panel was less persuaded by the cost-effectiveness of the 'information days' held in Candidate Countries. These apparently cost the JRC considerable effort to organise, yet the 'reach' was relatively small. The Panel does commend the intention to make greater use of the Marie Curie action networks.

Section III BACKGROUND AND METHODOLOGY

III.1 Legal Basis

A 5-Year Assessment of Community research activities is required in accordance with Article 6 of both Decisions on the EC and Euratom Sixth Framework Programmes and with Decisions on the specific programmes⁶.

The Commission regulation 1687/2001 amending the rules for the implementation of certain provisions of the Financial Regulation⁷ confirms this requirement for a multi-annual evaluation. Community activities not specifically covered by the Framework Programme, such as some ERA activities, have therefore also to be covered in the Assessment.

The Terms of Reference (Section III, Annex 1) provided for the 5-Year Assessment (1999-2003) of the JRC activities are guided by the Decisions mentioned above. The Assessment incorporates an end-of-term evaluation of FP5, and an early mid-term evaluation of FP6.

III.2 Background

The current 5-Year Assessment covers the activities of the JRC during the period 1999–2003. In undertaking this assessment the Panel has paid attention to the environment in which the JRC was operating, both leading up to and during this period, during which the JRC had undergone substantial change.

Several important reports produced during the Assessment period provided observations and recommendations, which have been instrumental in shaping the JRC. These documents were made available to the Assessment team, and are listed at Section III, Annex 2.

⁶ “Before submitting its proposal for the next Framework Programmes, the Commission shall have an external assessment carried out by independent highly qualified experts of the implementation and achievements of Community activities during the five years preceding that assessment. The Commission shall communicate the conclusions thereof, accompanied by its observations, to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions”.

Decision 1513/2002/EC of 27 June 2002 (JO L 232 of 29/08/2002 p.1) and Decision 2002/668/Euratom of 3 June 2002 (JO L 232 of 29/08/2002 p.34) (Framework programmes) and Decision 2002/834/EC, Decision 2002/835/EC, Decision 2002/836/EC, Decision 2002/837/Euratom, Decision 2002/838/Euratom (JO L 294 of 29/10/2002).

⁷ “The results obtained in carrying out a multi-annual programme shall be periodically evaluated in accordance with a timetable which will allow the findings of this evaluation to be taken into account for any decision on the continuation, modification or suspension of the programme. Actions financed on an annual basis shall have their results evaluated at least every six years.”

Commission Regulation (EC) No 1687/2001 of 21 August 2001 amending Regulation (Euratom, ECSC, EC) No 3418/93 laying down detailed rules for the implementation of certain provisions of the Financial Regulation of 21 December 1977 (JO L 228 of 24/8/2001 p.8).

A substantial reorganisation of the JRC Institutes took place in 2001. Following the premature departure of the Santer Commission in 1999, the incoming Prodi Commission implemented a series of general reforms, which resulted directly in the forced reduction of 175 posts from the JRC staff table. These staff cuts were realised by merging 3 Institutes into 2 new ones, reducing the total number of JRC Institutes from 8 to 7. The intention was to create a more streamlined organisation with Institutes serving policies rather than a particular technology. Furthermore, important management changes were also implemented with the appointment of a new Director General and a new Deputy Director General in 2001 and 2002 respectively.

A final change in the external environment of the JRC came with the launch of the ERA as a leading theme for the Sixth Framework Programme in 2003-2006.

III.3 JRC Multi-Annual Work Programme Structure: 1999-2002 and 2003-2006

To emphasise the organisation's new focus on policies and its reinforced link with Commission user-DGs, the JRC adopted a new mission statement in 1998. In order to carry out the tasks assigned to the JRC in its new mission, a restructuring of the Work Programme was undertaken. This resulted in the introduction of 4 recognised Programme Lines, under which the institutional activities - over the period these comprised 112 well-profiled projects - were placed to form the new Multi-Annual Work Programme (MAWP) 1999-2002.

A further effort to concentrate research into key domains relevant to EU-policies was made in the subsequent JRC MAWP (2003-2006). This resulted in the elaboration of these Programme Lines into 4 "Core Areas", across which were distributed 8 vertical priorities and 3 complementary horizontal priorities. It is these 11 "Priority Areas" which house the 105 activities of the MAWP 2003-2006.

Core Area 1: Food, Chemical Products and Health

1. Food Chain
2. Biotechnology
3. Safety of Chemicals
4. Contributions to Health

Core Area 2: Environment and Sustainability

5. Protection of the European Environment
6. Global Change
7. Energy

Core Area 3: Euratom Programme

8. Nuclear Safety and Security

Core Area 4: Horizontal Activities

9. Reference materials and measurements
10. Technology Foresight
11. Public Security and Anti-Fraud

III.4 Methodology

In contrast with earlier reviews, where the assessment was carried out at the level of individual JRC Institutes⁸, the current Assessment attempts to review the JRC as a whole. This is in direct response to the recommendations of the earlier 5-year review and Scientific Audit that emphasised the need for the JRC to have a more holistic vision.

To accommodate this holistic approach, it was decided to conduct the assessment within the framework of the 4 above-mentioned Core Areas and their constituent Priority Areas. Although the Core Areas were not introduced until the 2003-2006 MAWP, all the activities begun in 1998 can be attributed to one of these Core Areas (Section III, Annex 3). An idea of the relative weight of each Priority Area is provided in Section III, Annex 4, which compares staff and budget (specific credit) allocation by Priority Area for 2003.

As can be seen from Section III, Annex 5, the number of JRC Institutes involved in each Priority Area ranges from 1 ('chemicals' priority) to 5 (the 'health' and 'public security and anti-fraud' priorities). Due to the potentially complicated logistics involved, the working method finally adopted divided the assessment Panel (Section III, Annex 6) into 7 small Expert Groups (Section III, Annex 7), each visiting one JRC Institute and meeting with staff over a 2-day period. The composition of these expert task forces was designed to ensure that expertise relating to each of the Priority Areas, to which a particular JRC Institute contributed, was represented. After completion of the individual Institute visits, the full Panel then came together during a 2-day workshop in Brussels to discuss and review their findings. The Panel avoided reviewing individual projects, but focussed instead on the broad impact of work undertaken in each Priority Area.

III.5 Issues Addressed

As required by item 2 of the Terms of Reference (Section III, Annex 1), the criteria applied in evaluating the performance of the JRC followed the evaluation guidelines of the Commission. This necessitates that the evaluation should take account of, inter alia, the effectiveness, relevance, quality, impact and efficiency of the activities examined. In addition, other relevant issues pertinent to this evaluation were assessed, including:

- contribution to the European Research Area (ERA),
- contribution to enlargement,
- management issues, tools, practices and structures,
- relevance of instruments for achieving FP6 objectives.

⁸ There are 7 JRC Institutes:

- Institute for Reference Materials and Measurements (IRMM), Geel, Belgium
- Institute for Transuranium Elements (ITU), Karlsruhe, Germany
- Institute for Energy (IE), Petten, the Netherlands
- Institute for the Protection and Security of the Citizen (IPSC), Ispra, Italy
- Institute for Environment and Sustainability (IES), Ispra, Italy
- Institute for Health and Consumer Protection (IHCP), Ispra, Italy
- Institute for Prospective Technological Studies (IPTS), Seville, Spain

List of Abbreviations

AR	Annual Report
BEVABS ⁹	European Office for Wine, Alcohol and Spirit Drinks
BNCT	Boron Neutron Capture Therapy
BSE	Bovine Spongiform Encephalopathy
CAP	Common Agricultural Policy
CEN ¹⁰	European Committee for Standardisation
CRL	Community Reference Laboratory
DG	Directorate-General
DG JRC	Directorate-General Joint Research Centre
DG ENV	Directorate-General for Environment
DG FISH	Directorate-General for Fisheries
DG RTD	Directorate-General for Research
DG SANCO	Directorate-General for Health and Consumer Protection
DG TREN	Directorate-General for Transport and Energy
EC	European Community
ECB	European Chemicals Bureau
ECVAM	European Centre for the Validation of Alternative Methods
EEA	European Environment Agency
EMIR	European network on Medical radio-Isotopes and beam Research
EOS	European Omnibus Survey
ERA	European Research Area
ESTO	European Science and Technology Observatory
EU	European Union
FP4	Fourth Framework Programme
FP5	Fifth Framework Programme
FP6	Sixth Framework Programme
GIF	International Forum on Generation IV Nuclear Systems
GIS	Geographical Information Systems
GMES	Global Monitoring for Environment and Security
GMO	Genetically Modified Organism

⁹ BEVABS is the acronym for the French 'Bureau Européen des Vins, Alcools et Boissons Spiritueuses'

HESC	Human Embryonic Stem Cells
HFR	High Flux Reactor
HLUG	High Level User Group
HTR	High Temperature Reactor
IE	JRC Institute for Energy
IES	JRC Institute for Environment and Sustainability
IHCP	JRC Institute for Health and Consumer Protection
IPR	Intellectual Property Rights
IPSC	JRC Institute for the Protection and Security of the Citizen
IPTS	JRC Institute for Prospective Technological Studies
IRMM	JRC Institute for Reference Materials and Measurements
ITU	JRC Institute for Transuranium Elements
LIDAR	Light Detection And Ranging
MAHB	Major Accident Hazards Bureau
MAWP	Multi-Annual Work Programme
MARS	Monitoring Agriculture with Remote Sensing
NMR	Nuclear Magnetic Resonance
OJ	Official Journal of the European Union
OJ L	Official Journal of the European Union – Legislation series
PhD	Doctor of Philosophy
REACH	Registration, Authorisation, Evaluation and Restriction of Chemicals
SETRIS	Sustainable Energy Technologies Reference & Information System
THEXAS-Chem	Total Human Exposure Assessment Study – Chemical Agents
THEXAS-Phys	Total Human Exposure Assessment Study – Physical Agents
USA	United States of America
UV	Ultra Violet
WP	Work Programme
WTO	World Trade Organisation

¹⁰ CEN is the acronym for the French ‘Comité Européen de Normalisation’

Summary of Recommendations

Recommendation I.1

The Panel was impressed with the invigoration of the JRC since the Fourth Framework Programme (FP4), which had resulted from a more focussed mission on serving the Commission. The Panel recommends strongly that the JRC continues to deepen the process through further dialogue with the Commission.

Recommendation I.2

The JRC should operate with a clearer typology of its projects so that it more explicitly manages the resources spread across research, internal capacity building and bureau work. The rationale for work within future MAWPs should, in addition to existing research milestones, identify the milestones for the research's impacts (e.g. a possible CEN (European Committee for Standardisation) standard). This should help focus management attention on when a project should be transferred out of the JRC to be operated by other entities. There was no reason to stop such projects, but every reason to plan their transfer to other operating agents.

Recommendation I.3

The Director General, perhaps on recommendations made by the Institute Directors, should be designated as the 'customer' for exploratory and capacity building work, justified by its contribution to future issues within the JRC's mission. This proposal will lead to an improved distinction between work designed to meet the specification of a customer DG and research designed to build future competence.

Recommendation I.4

The JRC's reports to customers range from preliminary laboratory reports, to reports whose interpretation is endorsed by the whole JRC family and its networks. There is a strong need for the JRC's reports to be clearly classified by status, each class having associated protocols for their interpretative element. The Panel recommends that the JRC's Directorate for Programme and Resource Management begin this work, in conjunction with JRC colleagues.

Recommendation I.5

As a JRC 'quality mark' emerges through greater integration there should be more active management of the JRC's collective reputation. Reputation risk should be included in central JRC management.

Recommendation I.6

Several elements of the Commission Reforms, if applied rigidly, would undermine the effectiveness of the JRC. For example, in order to maintain and increase competencies, the Panel strongly recommends that scientific experts should not be obliged to rotate posts every 5 years. The JRC-Brussels Support Services needs to

give more support and advice to the Institutes' Management Support Units, to streamline processes of recruitment. The new administrative arrangements, resulting from the Commission Reforms, also offer an opportunity to facilitate staff transfer and secondments to the customer policy DGs.

Recommendation I.7

In future MAWPs, the senior managers within the JRC should be accountable and appropriately empowered for the overall integration and management of each Priority Area.

Recommendation I.8

The JRC should invest in cutting edge ICT systems that enable staff to effectively network and integrate between Institutes and Units throughout the JRC. The Panel recommends that the JRC invest in new and imaginative ICT systems as a matter of urgency.

Recommendation I.9

The current fragmentation of the Ispra site has a negative effect on efficiency. There should be a firm strategic plan to rationalise Ispra laboratory space to improve management efficiency and productive interaction of scientific staff.

Recommendation I.10

The JRC has risked being over-reviewed in the period 1999-2003, and the reviews and internal progress monitoring systems did not seem to key tightly into each other. There needs to be one senior official accountable to the Director General for the review and monitoring burden who is tasked with keeping an account of the effort deployed and ensuring its efficiency and effectiveness.

Recommendation I.11

In order to achieve its unique policy-support service mission, the next step is to ensure that the JRC has clear corporate values. This would help the JRC decide with customers the work that it should do, how it would defend and protect the integrity of its findings, and what customers could expect from the JRC. The Panel recommends that the Director General submits to the JRC Board of Governors a draft value statement. The Panel commends values that draw on the JRC's high standing in analytical reference work.

Recommendation II.1

While endorsing the chemical science underpinning the Priority Area for Food, future expertise needs to include microbiological and immunological issues to reflect likely future developments. For similar prospective reasons, the JRC needs to develop its competence in the social dimension of agro-chemical and agro-biological issues.

Recommendation II.2

There will be a need to answer future research questions on biotechnology in general, in particular in the GMO area (e.g. in the animal husbandry sector) and new expertise needs to be developed. The Panel recommends that IHCP take a co-ordinating role in the further development of this area for the whole of the JRC.

Recommendation II.3

Recognising the magnitude of the task to create a Chemicals Agency following agreement on the REACH legislation, the Panel invites DGs Environment and Enterprise to begin immediately allocating the necessary resources. The JRC Institutes IHCP and IES should take the opportunity to improve the necessary research activities in connection to the REACH legislation.

Recommendation II.4

There is an absolute need for the JRC to co-ordinate the choice of topics to be researched with an overall health strategy. The Panel recommends that the Director of IHCP take the lead in co-ordinating, with all other Institute Directors, the development of a more realistic and pragmatic strategy for the JRC.

Recommendation II.5

The JRC needs to guard against compartmentalisation within its Work Programme activities, especially as many of the relevant issues are systemic in nature. This holds true for the connections between the environmental, health and broader global change issues. Consequently, the Panel recommends a more visible use of the Sixth Environmental Action Programme as the integrating framework, particularly joint activities in the area of environment and health. The Panel invites the Directors of IES, IPTS and IRMM to suggest jointly appropriate modifications for incorporation into the MAWP.

Recommendation II.6

The 'Global Change' priority area, covering not only climate change issues, implies work over a very wide scope. Taking into account the sustainability context, the Director General of the JRC is invited to identify a realistic role for the JRC as a whole, within available resources.

Recommendation II.7

The JRC's energy research needs the addition of a significant systemic component. This could be within the SETRIS area. The Panel recommends that the Director of IE, together with the Directors of IES and IPTS build up SETRIS for the task.

Recommendation II.8

In the Area of Nuclear Safety and Security the JRC, like similar organisations in Member States, faces major challenges in maintaining essential skills and facilities. The Panel commends the JRC's efforts at training, but recommends that the JRC Board of Governors pay close attention to the staffing issue in their strategic oversight. The Panel believes consequences of failure could be severe, if the staffing issue is not planned sufficiently in advance.

Recommendation II.9

The ESTO network needs strengthening, to reflect the new role of DG RTD. This should include more self-reflection and critique of existing methodologies and approaches. JRC internal networks should be strengthened, as should the JRC's links with corresponding competence centres in Member States. The Panel recommends that the Director of IPTS propose this for inclusion in the next MAWP.

Recommendation II.10

In the absence of a metrology policy for the EU, the JRC has to second-guess its role. The Panel recommends that the JRC raise this issue within the forum of the High Level User Group (HLUG). At this meeting DG Enterprise, in consultation with other DGs, should be invited to draw up a Commission consultative paper for discussion with Member States on the Commission's role within the European Measurement and Standards System. This should pay particular reference to its strategic impact, and the importance of this system to European industry, to international competitiveness and to the reduction of international technical barriers to trade.

Recommendation II.11

In view of the heightened terrorist risks to civilians there needs to be an appropriate security culture at the JRC. Additionally, the appropriate security systems framework at EU level needs to be implemented in order to get full value from JRC competencies in the future. The Panel invites the JRC's Director-General to clarify the issues with the relevant DGs and to work with the Council to agree an appropriate framework.

ANNEX 1

Terms of Reference

5-Year Assessment of the Joint Research Centre 1999-2003

1. Background

A 5-Year Assessment of Community research activities is required in accordance with Article 6 of both Decisions on the EC and Euratom Sixth Framework Programmes and with Decisions on the specific programmes¹¹.

The Commission regulation 1687/2001 amending the rules for the implementation of certain provisions of the Financial Regulation¹² confirms this requirement for a multi-annual evaluation. Community activities not specifically covered by the Framework programme, as are some European Research Area (ERA) activities, have therefore also to be covered in the assessment

The Terms of Reference given below for the 5-Year Assessment (1999-2003) of the JRC activities are guided by the Decisions mentioned above. The Assessment will include an end-of-term evaluation of FP5, and an early mid-term evaluation of FP6.

2. Issues to be addressed in the 5-Year Assessment Report

The evaluation will cover all activities of the JRC during the period 1999-2003. The criteria to be applied for evaluating JRC performance will follow the standard model of the evaluation guidelines of the Commission. This model involves the assessment of effectiveness and efficiency in relating the achievement of intended results, budget spent, impact and sustainability of activities

These criteria will be applied to the following core research areas of the JRC:

- Food, chemical products and health
- Environment and Sustainability
- Nuclear safety and security
- Horizontal activities:
- Technology foresight
- Reference materials and measurements
- Public security and anti-fraud

¹¹ “Before submitting its proposal for the next Framework Programmes, the Commission shall have an external assessment carried out by independent highly qualified experts of the implementation and achievements of Community activities during the five years preceding that assessment.

The Commission shall communicate the conclusions thereof, accompanied by its observations, to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions”,

Decision 1513/2002/EC of 27 June 2002 (OJ L 232 of 29/08/2002 p.1) and Decision 2002/668/Euratom of 3 June 2002 (OJ L 232 of 29/08/2002 p.34) (Framework Programmes) and Decision 2002/834/EC, Decision 2002/835/EC, Decision 2002/836/EC, Decision 2002/837/Euratom, Decision 2002/838/Euratom (OJ L 294 of 29/10/2002).

¹² “The results obtained in carrying out a Multi-Annual programme shall be periodically evaluated in accordance with a timetable which will allow the findings of this evaluation to be taken into account for any decision on the continuation, modification or suspension of the programme. Actions financed on an annual basis shall have their results evaluated at least every six years.”

Commission Regulation (EC) No 1687/2001 of 21 August 2001 amending Regulation (Euratom, ECSC, EC) No 3418/93 laying down detailed rules for the implementation of certain provisions of the Financial Regulation of 21 December 1977 (OJ L 228 of 24/8/2001 p.8).

- Additional activities;
- Promotion of innovation, technology transfer and management of intellectual property rights;

and cover also issues of cross-cutting relevance such as:

- Contribution to the European Research Area (ERA)
- Contribution to Enlargement
- Management issues, tools, practices and structures

This results in the following tasks for the evaluators:

2.1 Ex-post assessment of the achievements of Framework Programme 5/6 objectives (during the period to be assessed)¹³.

2.1a Effectiveness

- Have the stated objectives been achieved and were they appropriate

2.1b Was the delivered work relevant?

- Did the achieved work support the needs and/or answer the questions of the users of the JRC?
- Did the achieved work strengthen the future knowledge base of the JRC in the light of its mission?

2.1c Assess the following questions relating to the scientific quality of the JRC work:

- Was the scientific work of the JRC of a sufficient quality?
- Are there scientific areas, where the JRC is just below a critical threshold of becoming the scientific reference, or where the JRC can become a leader?
- Are there scientific areas, where the JRC despite its best efforts is far from becoming a recognised expert?
- Is the structure and size of the scientific portfolio balanced between reactive activities, prospective and preparatory work as well as background research?

2.1d Assess in the light of the JRC's objectives and mission the following issues/questions relating to user orientation and impact of its work:

- Was the achieved work effectively used and appreciated by the JRC's users?
- How well did the JRC identify scientific and technical issues for supporting the conception, implementation and monitoring of EU policies?
- Assess the JRC's capacity to quickly and flexibly respond to urgent user needs as e.g. in the case of crisis (e.g. BSE, recent floodings) and provide relevant support.
- Assess the capacity to channel and integrate information exchange between users and providers of information.
- Assess the degree to which the JRC is on the way to becoming a scientific and technical reference centre for the conception, implementation and monitoring of Commission policies

2.1e Efficiency

- Were results achieved in a cost-effective manner?
- Was the level of financial means adequate?
- Were the roles of the involved actors and the processes relating them well defined?

¹³ Including the implementation of recommendations from previous evaluations:

- The previous 5-Year Assessment (1995-1999)
- The Scientific Audit (1999)
- The Activity Prioritisation Audit (2001)

2.2 Assessment of the relevance of instruments for achieving FP6 objectives

- Assess the networking- and co-operation strategy, including the contribution to and involvement with the European Research Area,
- Assess the use of and the external access to the JRC's large scale facilities
- Assess the JRC's research training and mobility strategy
- Assess flexibility, adaptability and anticipation issues, including:
- the capacity to flexibly adapt structurally to external changes, such as the political environment, portfolio of users, users' needs etc. in terms of strategy, organisation, and competence
- the early detection of and preparation for emerging scientific and technical needs

2.3. Recommendations

3. References and procedure

The main reference documents for the 5-Year Assessment (1999-2003) are:

- The Council Decisions for the JRC Specific Programmes (1999-2002);
- The 1999-2002 JRC Multi-Annual Work Programme;
- The Council Decisions for the JRC Specific Programmes (2003-2006);
- The 1998-2002 JRC Work Programme;
- Previous 5-Year Assessments of the Joint Research Centre, COM (97) 164 final (1992-1996, "Rojo report") and the "Barabaschi report" (1995-1999);
- The JRC 1999, 2000, 2001 and 2002 Annual reports;
- The Scientific Audit Reports of the JRC Institutes (1999);
- Report of the Commission's Peer Group (2000);
- The Davignon Report (2000);
- The Activity Prioritisation Audit Reports of the JRC Institutes (2001);
- The 1st JRC Benchmarking Network Profile Report (2002);
- The JRC Corporate User Satisfaction Survey Report (2003);
- The 'Review Report on the implementation of previous evaluations' (2003);
- The 'Achievement of Objectives in FP5 Report' (2003).

Additional documents (e.g. Institute Annual Reports), useful for assessing the individual institutes or illustrating a particular facet of the JRC's work, will be made available to the expert teams as needed.

The evaluation expert panel will be assembled following suggestions from the JRC Board of Governors and it will include specialists covering the main thematic areas of the JRC activities as well as management- and evaluation aspects. Sub-panels will be formed according to the main thematic budget lines and they will evaluate the implementation of the JRC work-programme in line with the Commission guidelines for evaluation. One third of the experts will be professional evaluators. The evaluation will be made on the basis of the provided documents, as well as on interviews with staff and management in the institutes.

These assessments will result in thematic reports, which will be combined in an overall JRC report to constitute the JRC 5-Year Assessment (1999-2003). The task of pulling together the thematic reports into an "umbrella" report document will be entrusted to a high-level personality, selected for his/her experience in R&D management and S&T policy making, and who will be one of the visiting experts described above.

The expert panels will be assisted in their work by a secretariat set up by the JRC. The secretariat will be responsible for the administrative support, for providing requested

materials and documentation, for establishing necessary contacts between the teams and the involved JRC institutes, and also with end-users of the JRC work. In addition, the JRC will provide a scientific secretary, whose task it will be to take notes of the interviews and who will synthesise them into minutes of the institute visits.

ANNEX: 2

Main reference documents for the 5-Year Assessment (1999-2003)

Annual Reports (AR)

AR 1999	Report EUR 19553 EN based on COM (2000) 366
AR 2000	Report EUR 19900 EN based on COM (2001) 239
AR 2001	Report EUR 20245 EN based on COM (2002) 306
AR 2002	Report EUR 20659 EN based on COM (2003) 189

Multi-Annual Work Programmes (MAWP)

MAWP 1999-2002	C (1999) 881/2
MAWP 2003-2006	C (2003) 819

Annual Work Programmes (WP)

WP 2000	internal JRC documents
WP 2001	
WP 2002	
WP 2003	

Previous 5-Year Assessments

Evaluation of the JRC 1992-1996	COM (1997) 164
5-Year Assessment Report (1995-1999)	Barabaschi report

Council Decisions

Council Decision 02 JRC Non-Nuclear	2002/836/EC	in OJ L 294/60
Council Decision 02 JRC Nuclear	2002/668/Euratom	in OJ L 232/34
Council Decision 99 JRC Non-Nuclear	1999/174/EC	in OJ L 64/127
Council Decision 99 JRC Nuclear	1999/176/Euratom	in OJ L 232/34

Others

European Research Area Action Plan	JRC Publications S.P.B. 03 80
JRC Enlargement Action	JRC Publications S.P.B. 03 62
JRC User Satisfaction Survey	report prepared by EOS Gallup for the JRC (April - May 2003)
Scientific Audit Report – Summary	internal JRC document (1999)
Implementation of the JRC's Mission Davignon Report	report by an independent high level expert panel to the European Commission (2000)
1 st JRC Benchmarking Report	internal JRC document (2002)
Matching Human Resources and JRC's Tasks	C (2001) 1518 final
Overview Past Evaluations	document prepared by the JRC for the 5-Year Assessment Panel

ANNEX 3

Projects 1998-2002, Attributed to the 2003-2006 MAWP Core Areas

2003-2006 Core Area	1998-2002 Activity N°	1998-2002 Activity Title
Food, Chemical Products and Health	1	Control of quality and safety of food and related items (development, validation and harmonisation of analytical methods)
FCH	2	Contamination of nutrition and consumer products due to material release
FCH	3	Reference materials for agricultural, food and consumer products
FCH	4	Reference measurements for agricultural, food and consumer products and data bases
FCH	5	Sampling for Information on Genetically Modified Organisms
FCH	6	Support to the implementation of the Community policy on biotechnology, including the detection of Genetically Modified Organisms (GMO) in environmental and in food samples
FCH	7	Environmental integrity and human health
FCH	8	Endocrine disruptors; development and validation of methods
FCH	9	The validation of alternative methods
FCH	10	Boron Neutron Capture Therapy for the treatment of cancer and other diseases - BNCT
FCH	11	Alpha-Immunotherapy
FCH	12	MInimally invasive MEdical Systems
FCH	13	RELIability of bioMEDical Devices
FCH	14	Functional systems for health and consumer protection
FCH	16	MEDical Radiographic Equipment CHaracterisation
FCH	17	Telematic systems for the EU pharmaceutical regulatory activity
FCH	18	Life science and impact on society
FCH	29	Chemical Substances, Risk Assessment
FCH	68	Animal Tagging
FCH	74	Chemical reference methods and measurements for normalisation and certification
Environment and Sustainability	28	HYdrogen DAmage Prevention through NETworking
ES	39	The European landscape: Geo-information for development and environmental monitoring
ES	40	Environment and society Part II. The European Integrated Pollution Prevention and Control Bureau
ES	41	Water Quality
ES	42	Impact of Waste Emissions on Soils
ES	43	Coastal monitoring and management
ES	44	UV-radiation, Noise, Indoor exposure, electromagnetic Fields
ES	45	Support to air quality monitoring using space techniques
ES	47	Reference materials for pollution control
ES	48	Energy and climate change
ES	49	Global Environmental Information Systems

ES	50	Atmospheric processes related to regional and global changes
ES	51	Energy and sustainability: Part 2 (Energy Systems)
ES	52	Photovoltaic and solar electricity
ES	53	Advanced Electricity Storage
ES	54	Hydrogen fuel: Sustainable and safe production, storage and safety
ES	55	Best Available Technologies for Environmental Friendly and Efficient Energy
ES	56	Efficient Power Generation (EPG) / Advanced fossil fired power plant
ES	57	Efficient Power Generation (EPG) / Gas turbines
ES	58	Clean and efficient waste incineration, waste-to-energy and biomass combustion
ES	62	Sustainability in transport and mobility
ES	63	Community Reference System on Emissions and Air Quality
ES	64	Technologies for Emission Abatement in Transport and Non-road Sectors
ES	65	Clean transport technology - Air transport
ES	84	GI and GIS: Harmonisation and Interoperability
ES	105	European Soil Bureau
ES	106	New technologies in support of more effective EU Aid, Development and Assistance Programmes
ES	112	Energy technologies Observatory
ES	77	Space Coordination Group
EURATOM	46	Radioactivity Environmental Monitoring
EURATOM	59	Reference measurement for neutron - materials interaction
EURATOM	60	Neutron reference measurements for environmental protection
EURATOM	75	Radionuclide metrology
EURATOM	86	European Network for Inspection Qualification
EURATOM	87	Ageing Materials Evaluation and Studies
EURATOM	88	Network for Evaluation of Structural Components
EURATOM	89	Safety of Nuclear Fuel
EURATOM	90	Basic Actinide Research
EURATOM	91	Partitioning and Transmutation
EURATOM	92	Exploitation of Neutron Data
EURATOM	93	Spent Fuel Characterisation in View of Long-Term Storage
EURATOM	94	Key Issues in Nuclear reactor Safety
EURATOM	95	Safeguards Research and Development at Ispra
EURATOM	96	Safeguards Research and Development at Karlsruhe
EURATOM	97	Metrology and Quality Assurance for Nuclear Safeguards
EURATOM	98	Support to Euratom Safeguards Directorate
EURATOM	99	Support to the International Atomic Energy Agency
EURATOM	100	Measurement of Radioactivity in the Environment
EURATOM	101	High temperature Reactor - Technological network
EURATOM	102	Decommissioning
EURATOM	108	Network of neutron techniques Standardisation
EURATOM	109	European Network for Medical Radio-Isotope and Beam Research
EURATOM	110	Safety of Eastern European Type Nuclear Facilities
Technology Foresight	24	Statistics support: European statistical laboratory
TF	37	Environment and society. Part 1
TF	69	The "Futures" project
TF	70	European S&T observatory, the high level economist group

TF	76	Knowledge and skills: Perspectives for Europe
TF	81	Enlargement: Building linkages on prospective activities
TF	83	Mediterranean and regional perspectives
TF	85	European Science & Technology Observatory
Reference Materials and Measurements	15	Biomedical CRMs for clinical diagnostics
RMM	61	Reference measurements for neutron data standards
RMM	72	BCR and industrial certified reference materials
RMM	73	Metrology in chemistry and traceability
RMM	82	International comparability of chemical measurements
Public security and Antifraud	19	Electronic business
PSA	20	Consumer protection Laboratory for the study, testing and monitoring of Electronic Payment and Electronic Commerce
PSA	21	Cybersecurity and dependability of information technology systems
PSA	22	Networks, multimedia and education
PSA	23	Medical and health telematics
PSA	25	25.1 IPSC Information Management and open source Intelligence for anti-fraud policy 25.2 IPSC Data analysis and risk analysis in support of anti-fraud policy.
PSA	26	Safety and emergency management systems for man-made and natural hazards
PSA	27	European Pressure Equipment Research Council
PSA	30	Evaluation of technologies for civilian demining
PSA	31	Information systems in civilian demining
PSA	32	European Co-ordination Centre for Aircraft Incident Reporting Systems
PSA	33	Structural Safety of Means of Transport under fast transients
PSA	34	Structural crash safety enhancement of vehicles and road equipment by precision impact tests
PSA	35	Research in support to the implementation and validation of the EUROCODES and the mitigation of seismic risk in Europe.
PSA	36	Natural hazards
PSA	38	Scientific knowledge assessment and information technology
PSA	66	The MARS Project (Monitoring Agriculture with Remote Sensing)
PSA	67	Advanced statistics for clearance of accounts
PSA	71	Building the information society
PSA	80	Technology assessment and validation, demonstration,
PSA	103	New technologies for monitoring fishing vessels
PSA	104	Galileo Support
PSA	107	Safety of Pressure Equipment and components containing hydrogen
PSA	111	Monitoring Illicit Discharges
PSA	78	Applications on the synergy of satellite telecommunications, earth observation and navigation
PSA	79	The Centre for Earth Observation

ANNEX 4

2003 Staff and Budget Allocation by Priority Area

CORE AREA	PRIORITY AREA	2003 STAFF ALLOCATION (%)	2003 SPECIFIC CREDITS ¹⁴ (%)
CORE AREA 1 – FOOD, CHEMICAL PRODUCTS AND HEALTH	1. Food Chain	5.4	5.8
	2. Biotechnology	2.4	4.2
	3. Safety of Chemicals	9.8	7.5
	4. Health	4.2	2.7
CORE AREA 2 - ENVIRONMENT AND SUSTAINABILITY	5. Protection of the European Environment	16,7	16.7
	6. Global Change	5.0	5.5
	7. Energy	5.7	5.8
CORE AREA 3 – EURATOM	8. Nuclear Safety and Security	21.8	22.6
CORE AREA 4 – HORIZONTAL PRIORITIES	9. Technology Foresight	3.8	4.0
	10. Reference Materials and Measurements	10.0	11.2
	11. Public Security and Anti-Fraud	15.2	14.0
		100	100

¹⁴ 'Specific Credits' refer to the budget allocated to an activity – excluding staff costs.

ANNEX 5

JRC Institutes Involved in Each Priority

INSTITUTE ¹⁵	CORE AREA 1 – FOOD, CHEMICAL PRODUCTS AND HEALTH				CORE AREA 2 – ENVIRONMENT AND SUSTAINABILITY			CORE AREA 3 - EURATOM	CORE AREA 4 – HORIZONTAL PRIORITIES		
	Priority 1 Food Chain	Priority 2 Biotech.	Priority 3 Safety of Chem.	Priority 4 Health	Priority 5 Envir	Priority 6 Global Change	Priority 7 Energy	Priority 8 Nuclear Safety and Security	Priority 9 Tech Foresight	Priority 10 Reference Materials	Priority 11 Public Security & Anti- Fraud
IRMM	✓	✓		✓	✓			✓		✓	
IHCP		✓	✓	✓						✓	✓
IPTS	✓	✓		✓	✓	✓	✓		✓		✓
IES					✓	✓	✓				✓
IE				✓			✓	✓			✓
IPSC	✓							✓	✓		✓
ITU				✓				✓			

¹⁵

- IRMM Institute for Reference Materials and Measurements, Geel, Belgium
 ITU Institute for Transuranium Elements, Karlsruhe, Germany
 IE Institute for Energy, Petten, the Netherlands
 IPSC Institute for the Protection and Security of the Citizen, Ispra, Italy
 IES Institute for Environment and Sustainability, Ispra, Italy
 IHCP Institute for Health and Consumer Protection, Ispra, Italy
 IPTS Institute for Prospective Technological Studies, Seville, Spain

ANNEX 6

Members of the Assessment Panel

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ANNEX 7

Members of the Seven Individual Expert Groups

Institute visited by Expert Group ¹⁶	Members of Expert Group	Priority Areas Concerned
IRMM	David FISK Andrew WALLARD Dervilla DONNELLY Lasse MATTILA	Food, Biotechnology, Health, Nuclear, Environment, Reference Materials
ITU	Frantisek PAZDERA Lasse MATTILA Pierre TURQ Evelyn WALLACE FOSHAUG	Nuclear, Health
IE	David FISK Lasse MATTILA Horst SOBOLL Evelyn WALLACE FOSHAUG Frantisek PAZDERA	Energy, Nuclear, Health, Public Security and Anti-Fraud
IPSC	David FISK Joan MAJÓ i CRUZATE Brigitte SERREAULT Frantisek PAZDERA	Public Security and Anti-Fraud, Food, Nuclear, Foresight
IES	David FISK Peter FRITZ Carlos BORREGO Leszek KUŹNICKI Horst SOBOLL Uno SVEDIN	Environment, Global Change, Energy Public Security and Anti-Fraud,
IHCP	David FISK Dervilla DONNELLY Peter FRITZ Antonius KETTRUP Bent SCHMIDT-NIELSEN	Biotechnology, Chemicals, Health, Public Security and Anti-Fraud, Reference Materials
IPTS	David FISK Philippe BOURDEAU Joan MAJÓ i CRUZATE Dervilla DONNELLY Uno SVEDIN	Foresight, Public Security and Anti-Fraud, Food, Biotechnology, Health, Environment, Global Change, Energy

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 ITU Institute for Transuranium Elements, Karlsruhe, Germany
 IE Institute for Energy, Petten, the Netherlands
 IPSC Institute for the Protection and Security of the Citizen, Ispra, Italy
 IES Institute for Environment and Sustainability, Ispra, Italy
 IHCP Institute for Health and Consumer Protection, Ispra, Italy
 IPTS Institute for Prospective Technological Studies, Seville, Spain