

Table of Content:

Section I: Introduction

Section II: The Work Programme Policy theme, Agendas and contributing Actions

Section III: Integration of JRC Actions

Annexes:

- 1. List of proposed Actions**
- 2. List of Acronyms**

JRC Multi Annual Work Programme

2007-2013

Section 1. Introduction

Background

The Multiannual work programme (MAWP) of the JRC for the year 2007-2013 is firmly set in the context of the Commission policy agenda. The programme serves the objectives of growth, sustainable development and security through a series of actions dedicated to the development and provision of scientific and technical support to the relevant policy items. As proposed in the Specific Programme (ref COM(2005)439 and COM(2005)444), this will secure the best match between the JRC Agenda and the priority policy needs.

Prosperity in a knowledge intensive society is a top political priority as it includes high sustainable growth, more and better jobs, knowledge, and competitiveness. The JRC proposal comprises a spectrum of actions which serves those objectives through attention to the regulatory context, the development of measurement standards and data harmonization and a support to key policy areas such as energy, transport, information, chemicals and biotechnologies. A direct support to policy formulation is provided in the areas of economic, market and fiscal policies.

The sustainable management of resources is a long standing area of work of the JRC and one in which it has well established competences. The policies on which the JRC will focus are well identified; they relate to Community competences in agriculture and environment which are large areas in the work agenda of the Commission. The “environment and health” theme is emerging a new focus of attention. Climate change remains a key feature of this portfolio.

Security and freedom is a growing concern of the Union. The proposal covers internal security where interactions between the Commission and Member States is expanding and where technical support is critical. It also includes a well established policy area where many new challenges lay ahead, including the safety of food and feed and response to disasters.

The inclusion of “Europe as a world partner” is a departure from previous JRC framework programmes in the sense that it now explicitly identifies a new geographical scope of work. Such development serves as support to a range of external policies (in particular international trade, Community action relevant to stability, non-proliferation and common foreign and security policy, development cooperation policy and humanitarian aid; European neighbourhood) but it also indicates a strategic positioning of the JRC on the global playing field. The global dimension is of critical relevance in future EU policies; it touches upon security issues and development cooperation.

In the EURATOM programme, the objective of the JRC is to develop and assemble knowledge, to provide crucial scientific/technical data and support for safety/security, reliability, sustainability, and control of nuclear energy, including the assessment of safety and security aspects related to innovative/future systems.

The work programme proposed here represents a natural evolution of the work performed in previous programmes; it capitalises on past investments in know-how and facilities. The proposal is characterized by

- flexibility in responding to the changing needs associated with the evolution of EU policies for the duration of the programme (7 years)
- a focus on issues which are important in terms of socio-economic concerns, which have a clear community dimension and strong R&D component
- attention to the provision of quality expertise and support to other commission services upon the emergence of new issues in crises situations
- reinforcement of competences and facilities in new fields of investigations which are relevant to future policies.

- increased reliance on networks and partnerships with other institutions and expert groups pursuing similar objectives and interests; the JRC will also increase its role as technical coordinator of expert networks created in policy DGs.

A customer's orientation

The policy driven orientation of the multiannual work programme is supported by a strong attention to the specific needs of the customers who are mainly those services involved in the design, formulation, implementation and monitoring of those policies. Those customers are mainly concentrated in the Commission services but the JRC will further develop its scientific and service approach relationship with the other key actors in the EU policy making process: the European Parliament, the Council and a broad range of community Agencies. Dedicated efforts will be made to link with relevant institutions in Member States. In a global context (Policy Theme 4) the JRC will increasingly link its activities with the needs of partner countries.

The length of the FP7 is of 7 years and this will require a built-in flexibility to adjust to new demands, new areas of Community concern (or, possibly, competences) and scientific developments. It may also require some reconfiguration of the balance of efforts towards the customers.

The structure of the programme

In line with the JRC specific programmes (EC and EAC) this multiannual work programme provides a general description of the line of work and accompanying Actions (124 in the current proposal – see Annex 1) which will be undertaken during the FP7 period. It also gives a first estimate of the resource envelope which will be allocated to each of the 21 policy Agendas in the EC part of the programme (see Annex 2). The EURATOM part contains 26 Actions organised under 3 agendas.

The structure of the JRC FP7 Multiannual Workprogramme 2007-2013 is summarised in the following table:

Policy Theme 1. Prosperity in a knowledge intensive society

Agenda 1.1 Competitiveness and innovation

- 1.1.1 Reference materials
- 1.1.2 Econometrics
- 1.1.3 Indicators and intelligence for a knowledge society
- 1.1.4 Clean technology assessment
- 1.1.5 Chemicals
- 1.1.6 Data harmonization

Agenda 1.2. European Research Area

Agenda 1.3. Energy and transport

- 1.3.1 Energy
- 1.3.2 Transport

Agenda 1.4. Information society

Agenda 1.5. Life Sciences and biotechnology

Policy Theme 2. Solidarity and the responsible management of resources

Agenda 2.1 Agriculture, rural development, and fisheries

- 2.1.1 Agriculture and Rural Development
- 2.1.2 Fisheries and maritime policy and marine environment

Agenda 2.2 Natural resources

Agenda 2.3 Environment & Health

Agenda 2.4 Climate change

Policy Theme 3 Security and Freedom

Agenda 3.1 Internal security

Agenda 3.2 Disasters and response

Agenda 3.3 Food and feed safety and quality

Policy Theme 4. Europe as a world partner

Agenda 4.1 Global security

Agenda 4.2 Development cooperation

Policy Theme 5. The EURATOM programme

Agenda 5.1 Nuclear waste management and environmental impact

- 5.1.1 Spent fuel characterisation, storage and disposal
- 5.1.2 Partitioning, Transmutation and conditioning
- 5.1.3 Basic actinide research
- 5.1.4 Nuclear data
- 5.1.5 Medical applications from nuclear research
- 5.1.6 Measurement of Radioactivity in the environment
- 5.1.7 Knowledge Management, Training and Education

Agenda 5.2 Nuclear safety

- 5.2.1 Safety of nuclear installations
- 5.2.2 Nuclear fuel safety in power reactors operating in the EU
- 5.2.3 Safe Operation of Advanced Nuclear Energy System

Agenda 5.3 Nuclear security

- 5.3.1 Nuclear Safeguards, Additional Protocol and Combating Illicit Trafficking
- 5.3.2 Open Source Information Collection on Non Proliferation

The MAWP is complemented before the beginning of each year by an Annual Work Programme which details the Actions to be undertaken by the JRC for that year. These actions are described in terms of objectives, deliverables and resources (staff and resource) in the annual programme and associated resource table. Those Actions are reviewed annually in order to review progress and determine the need for resources for the following year. These annual adjustments bring to the programme an element of flexibility; they are fully discussed with the EC High Level Users Group and the Board of Governors before implementation.

Integration of activities within the JRC

The integrated delivery of support to specific policies is a requirement of the 7th FP of the JRC. This will be a key feature of this MAWP. Indeed, the need for understanding the multiple facets of a policy issue requiring S&T support is often very acute. The grouping of JRC Actions around policy themes, additional coordination and the exploitation of synergies between the various JRC resources will foster this approach. Integration also favours economy of scale, efficiency of delivery and image building. Several agendas of the programme implicitly require integration of competencies, such as in environment and health, biotechnologies and sustainable agriculture. The various Actions, undertaken in this MAWP will be implemented in the context of the Priority Areas identified at the end of this document.

A commitment to research

The provision of research support to policies is becoming increasingly complex and requires investments in top expertise and facilities. Many Actions of the present MAWP include the development of the skills, experimental facilities and knowledge necessary to conduct their work. The MAWP proposed here will, therefore, foster the development of a strong knowledge base which can provide specialised answers to complex problems. An insertion in European and international research networks and participation to other EU, national and international research efforts are indispensable in this context. At the Union level, participation to research networks provides the necessary critical mass when dealing with large complex issues and answering urgent requirements which cannot be handled by single research organisations.

The role of exploratory research within the JRC will be maintained as it is necessary to build future competencies and knowledge. Exploratory research is essential for fulfilling the JRC's mission because it helps to strengthen the JRC scientific base, to anticipate future science and technology needs and to get prepared for possible policy requirements. It is designed to investigate an area on which little information exists, e.g. to evaluate the feasibility of undertaking future efforts in a completely new research area, or where essential expertise is lacking so far. The resources which are invested in exploratory research are considered as "seed money" which may yield practical results at a later stage and, if successful, will contribute to the activities of the JRC in the medium to long term.

Participation in FP7 indirect actions

The JRC will continue to participate in Framework Programme Indirect Actions, on the same basis as entities established in the Member States. Collaboration with national public and private research institutes, academia, industry, and international bodies, contributes to acquiring and transferring expertise and know-how. Participation in Indirect Actions is indeed an important tool for networking with the research community and for staying on top of the latest scientific developments.

JRC and the Member States

Member States have always considered that research is an appropriate tool to facilitate collaboration and possibly harmonisation at EU level. A significant part of the activities of JRC were designed and decided in the context of a more general R&D framework where the complementarity with national R&D activities was a key criterion. Therefore the JRC has been involved in the "European Research Area". The Advisory Committees of the JRC nuclear Institutes, for instance are mainly composed of representatives of national research organisations and industry. The JRC research programmes have always had a strong European dimension with a tradition of networking and strong international involvement.

Enlargement and integration of new Member States, and closer partnerships with European Neighbourhood countries

The current period marks a phase of unprecedented changes for the European Union in terms of its population, borders and membership. Following the accession of 10 countries to the European Union in May 2004 and that of Romania and Bulgaria planned for January 2007, the European Commission started accession negotiations with Croatia and Turkey and is strongly supporting the Western Balkan countries thorough Stabilisation and Association Agreements. Moreover, the European Union has launched in 2004 the European Neighbourhood Policy, with the objective of avoiding the emergence of new dividing lines between the enlarged EU and its neighbours and instead strengthening stability, security and well-being for all concerned citizens

Against this background, and based on the positive results of FP6, the JRC will maintain in FP7 a specific Enlargement and Integration Action (E&IA) aiming at supporting the integration of new Member States across its activities, and assisting the effort of the present and Potential Candidate Countries and, on a selective basis also of the Neighbourhood Partner Countries, in aligning to the Acquis Communautaire and European standards, whereas JRC has relevant S&T competence.

In order to support the enlargement process, the JRC continues to pay particular attention to the participation of Candidate Countries as it did previously with the New Member states in its international collaboration efforts, as well as in its training programme. It concerns mainly (but not only) the following fields:

- **Enlargement and Integration Projects** addressing priority needs of target countries (or regions) for implementing EU legislations. These projects would address for example the S&T needs of the Baltic Sea, Mediterranean or Black Sea ecosystems, the characteristics of Russian type nuclear reactors, the protection of the environment (air, water and soil) to enhance the quality of life, the anti-seismic requirements of typical civil constructions or the safety and quality aspects of local agricultural products. , take-up of the Information Society, stimulating private investment in research, implementing the Integrated Pollution Prevention & Control Directive, transfer of Foresight best practices, and assessing the farm-level impact of the Common Agricultural Policy..
- **Advanced and Training Workshops.** A number of workshops and training courses on various scientific and technical aspects of EU policies will be organised by the JRC institutes, with the participation of experts from ministries, authorities, research institutes and controlling bodies mainly from the target countries, but also from the EU Member States so as to promote wider cooperation and exchange of best practices. Collaboration with DG Enlargement's TAIEX programme will also be pursued.
- **Temporary Positions for Visiting Staff.** The JRC will continue to offer some visiting positions to researchers and experts from target countries associated to FP7 for short term

temporary stays at the JRC Institutes. Emphasis will be given to the scheme of Detached National Experts which has proven to be an effective vehicle for transferring knowledge and developing longer term institutional collaborations.

- **Dissemination Action.** In order to disseminate the results of the JRC research activities and to raise awareness about the opportunities to work with the JRC, the JRC will organise in the target countries information events which will take into account their specific needs for support in given S&T areas. The E&IA will benefit from the support of the JRC Network of National Contact Points in each target country, which has to be also further developed and strengthened.

Intellectual property and knowledge transfer

The dissemination and uptake of research results are essential to the success of the European Research Area and to the realisation of the knowledge economy. In line with its mandate to manage the Communities' intellectual property, the JRC will pay special attention to ensure that results from its work-programme are protected and transferred to industry, national authorities and the wider scientific community. The role of intellectual property in facilitating such knowledge transfer will be emphasised and efforts will be devoted to further promoting awareness of intellectual property rights within the JRC.

The broad activities envisaged will include:

- identification and protection of research results from the JRC work-programme
- promoting the transfer of promising JRC technologies through licensing and
 - collaborative R&D with industry participation fostering entrepreneurship among JRC researchers and promotion of spin-off creation based on JRC technologies

JRC Multi Annual Work Programme

2007-2013

Section 2. The WP Policy Themes, Agendas and contributing Actions

Policy Theme 1. Prosperity in a knowledge intensive society

Total Indicative Budget (2007-2013): 680.9 M€

Research Staff (Statutory/non statutory): 464

A key objective of the 7th FP is to maximize the leverage of investments in research to stimulate the competitiveness of the European economy. The JRC's FP7 portfolio will include a broad range of items which contribute to this overarching objective. Elements such as fostering research and innovation, developing a culture of excellence, establishing standards, improving market transparency, setting up of appropriate regulatory context, anticipating critical issues affecting society and designing sustainable management practices in a broad range of economic activities fall into that category of activities which feed the knowledge society.

The activities of the JRC undertaken in the five policy agendas described in Policy Theme 1 cover critical areas of the Union's life and contain potential developments which will affect the citizen for years to come. R&D support to the knowledge society must keep pace with those developments. The JRC research agenda will adapt to the changing context driven by the political evolution of the Union itself, by an ever increasing globalisation of the economy, by continuous and sometimes unpredictable impacts of new technologies and by a growing concern for health and security.

This section of the JRC Multi-Annual Work Programme represents a sizeable share of the overall effort. It benefits from an extensive experience accumulated during the previous work programmes (e.g. references and standards) and addresses new challenges posed by recent and forthcoming policy development (e.g. in chemicals, in nano-technologies). It is organized in five policy agendas:

- 1.1 Competitiveness and innovation
- 1.2 European Research Area
- 1.3 Energy and Transport
- 1.4 Information Society
- 1.5 Life sciences and biotechnology

Agenda 1.1. Competitiveness and innovation

1.1.1 Reference materials, reference measurements and standards

A direct impact of JRC work on competitiveness is found in its capacity to develop reference materials, reference measurements methods and other standards in various facets of economic life. Trade relies on global reference measurement systems consisting of reference laboratories, materials, and methods – many of them based on metrological principles. Therefore, quality assurance tools, in particular the development and production of reference materials, reference measurements and horizontal assessments will be pursued in a broad range of policy area which have a strong impact on European industry (as in chemicals and cosmetics), on European independence as in the energy sector, on the preoccupation of the citizen as in food safety and GMOs (relevant JRC reference work in the area of GMOs and food/feed and is described in the Agendas 1.5 and 3.3 respectively).

Three Actions are explicitly dedicated to reference, measurements and standardisation:

1. Europ RM (European Reference Materials - Technology developments and quality management): Certified reference materials are fundamental to the development of a common European measurement system and essential for achieving comparability and

traceability of measurement data. This requires the maintenance of up to date technologies for preparing reference materials and guaranteeing their quality. New engineering reference materials, in particular for nanotechnology, will be developed. Post certification monitoring of reference material stability and ensuring proper storage, availability and distribution on a worldwide scale is also included. Cooperation with international standardisation and metrology bodies is a key feature of this action as is the provision of reference materials in support to Community Reference Laboratories.

Users: DG ENTR, TAXUD, SANCO, ENV, RELEX

2. SEMI (Support to European Measurement Infrastructure and Community Reference Laboratory for heavy metals): This activity provides support to the evolution of a European Measurement Infrastructure through development of methods, setting up of European measurement standards, conduct of inter laboratory comparisons and support to the accreditation/certification training processes in the Member States. Emphasis is put on heavy metals in food and feed. This action will also provide scientific support to the operation of Community Reference Laboratories.

Users: DG ENTR, ENV, AIDCO, SANCO, TAXUD

3. SUP-STANDS Standards (Research in support of standardisation in construction and construction products) In the construction sector, standardisation is essential to promote efficiency, safety and competitiveness. In line with its previous involvement in this area of work the JRC will continue the development of EUROCODES. This includes pre-normative research, large-scale reference tests and activities fostering the adoption of the EUROCODES in new markets and their further harmonization. The Action will play a coordinating role in the context of the Technology Platform for construction. The Action is also strongly relevant to Agenda 3.2 for its contribution to earthquake risk assessment and mitigation.

Users: ENTR, RTD, ENTR

Reference materials, reference measurements and standards

Europ RM	European Reference Materials – Technology developments and quality management	IRMM
SEMI	Support to European Measurement Infrastructure (and Community Reference Laboratory for heavy metals)	IRMM
SUP-STANDS	Research in support of standardisation in construction and construction products	IPSC

1.1.2 Econometrics

This Agenda addresses the growing demand for the development of Commission in-house capacity to operate advanced econometric modelling and sensitivity analyses in a wide range of policy fields. Priority has been given to the financial, internal market and fiscal policies, as well as education policy. A focus on the development, evaluation and use of composite indicators is maintained as these indicators experience recurring acceptance problems at the EC service level and in Member States. Associated with this agenda is an activity responding to the emerging demand for a better understanding of the relationship between the needs of the knowledge society and the provision of education. Of particular relevance is the common

evaluation of the efficiency of investments in education in Member States. Close cooperation will be maintained with ESTAT. Three activities are foreseen in this section of the competitiveness agenda:

1. EEMC (Euro area Economy Modelling Centre): This action concentrates on the provision of methodological and technical support to the EU macroeconomic policy analysis and coordination tasks (macroeconomic modelling, short term analysis and training); support is provided at Commission and Member States levels. The work will pay particular attention to high and sustainable standards of research and delivery systems.

User: DG ECFIN, BEPA

2. FINECON (Financial econometrics for a single market and competitiveness policies): This action focuses on carrying out modelling as well as statistical and econometric analyses in support to the European single market and competition initiatives. The action will also provide support to ex- ante and ex-post assessments (including impact assessments) and to the development of specific indicators.

In particular, the work in the area of financial services will concentrate on: econometric modelling and analysis in Clearing and Settlement and banking directives (Capital Requirements Directive and Deposit Guarantee Schemes Directive); cooperation on evaluation of economic impact of the Financial Services Action Plan (FSAP) and in obtaining financial data for the Financial Integration Monitor (FIM); economic analysis in the area of insurance (Solvency II and insurance mechanisms for terrorism and natural catastrophes) and statutory audit. Furthermore, this action will also include work on data gathering techniques and econometric models for analysis and assessment in the area of public procurement; and econometric analysis of services and overall internal market policy.

Users: DG MARKT, COMP, ECFIN, ESTAT

3. QSI (Quality of Scientific Information in the EU Policy Processes): increasing the robustness of scientific advice to policy development is a common thread throughout the JRC work programme. This action will develop guidelines and tools for quality assessment of policy relevant scientific information. It will focus on the management of uncertainty in the formulation and communication of complex and sensitive issues.

Users: DG EAC, ENV, SANCO

Econometrics

EEMC	Euro area Economy Modelling Centre	IPSC
FINECON	Financial econometrics for a single market and competitiveness policies	IPSC
QSI	Quality of Scientific Information in the EU Policy Processes	IPSC

1.1.3 Indicators and intelligence for the knowledge society

This area covers a range of research and monitoring activities dedicated to the Lisbon Agenda in terms of indicators and scoreboards, demographics of skilled manpower, as well as process and conditions for stimulating industrial innovation. It will provide guidance on the

development of research policy items, on the Lisbon agenda, on stimulating the knowledge society objectives, and on improving employment in advanced and innovative sectors of the European economy.

Three actions are foreseen:

1. STAT-IND (Indicators and benchmarks for innovation and the knowledge-economy):

Indicators, scoreboards and composite indicators are constructed, tested and delivered to Commission services in the context of the Lisbon agenda, for instance, in the areas of public procurement and financial services: indicators in Clearing and Settlement and a cost of capital indicator (Lisbon process Structural Indicator exercise). The research agenda focuses on sensitivity analysis. Close cooperation is maintained with OECD, ESTAT and international activities in this area of economic analysis. Applications are also developed in other areas (e.g. environment, natural resources energy). This action includes activities provided in support to the development of the CRELL Centre for Lifelong learning which will be monitoring and evaluating the performance of education and training systems in Europe and their contribution to the achievement of the Lisbon goals. (including the development of indicators and benchmarks)

Users: DG EAC, ENTR, TRADE, ECFIN, ESTAT, RTD, REGIO, EMPL

2. HREK (Human Resources for a Europe of knowledge):

This action aims at providing a system for monitoring the skilled human resources available in Europe for supporting the ongoing transition to a more knowledge and technology intensive economy. It will develop appropriate quantitative and qualitative indicators for characterising trends in their supply and demand, careers and mobility (both geographic and occupational). The analyses of education, training and lifelong learning and employment dynamics needed to support the design of specific policy measures will be developed by applying econometric modelling, data panels (including linked employer-employee data sets), expert panels, benchmarking and intelligence methods. The work will involve collaboration with a European wide network of national partners to collect local data. Close cooperation with ESTAT in its field of activity and the OECD will ensure coordination with already existing databases or other international initiatives.

Users: DG RTD, EAC, ENTR, ESTAT, EMPL, Member States

3. IRI (Industrial Research and Innovation):

This Action will provide a platform for the long-term collection of information, its analysis and the reporting of developments in industrial research and innovation in Europe and of its relation to economic performance, providing techno-economic and policy intelligence on the subject. The action will support the implementation of the Commission's "3% (Barcelona) Action Plan" and "European Industrial Research and Innovation Monitoring System". Economic and financial analyses - at firm, sector, country, EU and international levels – will be carried out using econometric modelling, matrices, data panels, expert panels, benchmarking and intelligence methods. The analytical work is based on both original data and publicly available information. The work relies on the collaboration with business associations, academia and international organisations and ESTAT.

Users: DG RTD, ENTR, ECFIN, ESTAT, REGIO, Member States

Knowledge society

STATIND	Indicators and benchmarks for innovation and the knowledge-economy	IPSC
HREK	Human Resources for a Europe of Knowledge	IPTS
IRI	Industrial Research and Innovation	IPTS

1.1.4 Clean technology assessment

Many items in the JRC Work Programme for 2007-2013 will contribute to the development and use of clean technologies (see, for example, Policy Theme 3: Conservation and management of Natural Resources). Indeed, the environmental dimension is one of the pillars of sustainable development which receives attention throughout the programme. This area of work will specifically focus on implications of clean technologies in a production-consumption context. In pursuing this work actions will strive to use the breath of expertise available centre-wide.

Two actions are foreseen

1. EIPPCB (European Integrated Pollution Prevention and Control Bureau):

The purpose of this Bureau is to support the implementation of the Integrated Pollution Prevention and Control (IPPC) Directive 96/61/EC by elaborating techno-economic reference documents on best available techniques (BREFs) with the involvement of industry and Member States. BREFs have to be taken into account when competent authorities in the Member States determine conditions for IPPC permits. The task of the Bureau is to draft and then subsequently update the BREFS for each of the 32 sectors covered by the IPPC Directive. Draft BREFS are formally adopted by the Commission and published in the Official Journal. The work programme for the BREFs is established together with Member States and industry in the framework of an Information Exchange Forum foreseen by the Directive.

Users: DG ENV, ENTR, RTD, Member States

2. SUSPROC (Sustainable Production and Consumption):

The essence of sustainability policymaking is managing trade-offs between the three dimensions of sustainability: prosperity or competitiveness; a clean environment; social protection and equity. This action will focus on: the characterisation and assessment of technological options for sustainable production and consumption; the environmental improvement potential of products; resource/material flows; interactions between innovation, competitiveness, environmental impact and regulation. The action will develop and use impact assessment methodologies, including general equilibrium models, cost benefit analysis, and environmental accountability frameworks, combined with input-output analysis. Capabilities will also be developed for better understanding the employment impact. The action will support the formulation of policies concerning the EU Sustainable Development Strategy in areas such as natural resources, waste and recycling strategies, Integrated Product Policy and the Environmental Technologies Action Plan.

Users: DG ENV, RTD, ENTR, SG

Clean technology assessment

EIPPCB	European Integrated Pollution Prevention and Control Bureau	IPTS
SUSPROC	Sustainable Production and Consumption	IPTS

1.1.5 Chemicals

The new European chemicals policy sets the framework for the safety of chemicals and products which requires additional scientific and technical support. The focus will be on

- i. Continuing role of the European Chemicals Bureau in the assessment of chemicals until the European Chemicals Agency is in full operation.
- ii. Support to the implementation of the current and new European chemicals policy, including the development and maintenance of the guidance tools and management systems; provision of relevant information to EU external partners and other nations.
- iii. Development of approaches for integrated chemical risk assessment applied more particularly to ecotoxicology.

These activities will be carried out with a view to develop a system of reference for integrated risk assessment in support of the body of EU chemicals legislation (such as REACH, 7th Amendment to the Cosmetics Directive, General Product Safety Directive, Water Framework directive and IPPC).

Four actions are foreseen:

1. CompuTERM (Computational Toxicology and Environmental Risk Modelling): An integrated approach based on the use of experimental and estimation method is needed to contribute to the scientific basis of environmental and human health risk assessments for chemicals.

The objective of this action is to develop, assess and implement computer-based methods for assessing the environmental distribution and fate of chemicals and products, and their effects on human health and the environment. The focus will be on mathematical and statistical models, chemo-informatics quantitative-structure-activity relationships, molecular modelling, theoretical approaches to systems biology and molecular modelling applied to nano-particles.

Users: DG ENV, ENTR, SANCO, RTD

2. RefineRISK (Integrated Risk Assessment of Chemicals): The objective of this project is to develop a system of reference for integrated chemical risk assessment at the JRC. The project will develop science-based environmental and human health risk assessment methodologies, focusing on quantitative risk assessment via exposure modeling, intelligent testing strategies, and the integration of emerging techniques (e.g. grouping and read-across). This work will be performed in close collaboration with the CompuTERM action. The output of the activities will provide direct support to the risk assessment of industrial chemicals and biocidal active substances.

Users: DG ENV, ENTR, SANCO, ESTAT, RTD

3. SUPCHEM (Support to Chemicals Legislation): The objective of this action is to provide high quality scientific and technical support and expert advice on questions related to the implementation of the new chemicals legislation (REACH and GHS). The ECB will continue to play a key role in the development of guidance and assessment tools that will support various stakeholders to fulfill their obligations under the new chemicals legislation. The work of the action will be adjusted over time depending upon the evolution of the programme of the new European Chemicals Agency. The activities will closely follow the scientific themes of the Action RefineRISK.

Users: DG ENV, ENTR, SANCO, TAXUD, DEV, RTD

4. GLOB-CHEM (Global Chemical Data Management and Harmonisation): The objective of this Action is to further harmonise information management on chemicals with OECD, Industry and others at international level. Standard data formats, databases, tools and reference systems will be developed to serve customer DGs and other relevant bodies. Expertise will be developed through joint actions such as exploring new web technologies for uniting remote datasets and to address emerging policy needs, e.g. nano-particles. Training initiatives will assist and engage important stakeholders via RefineRISK. Synergy will be sought with the ESTAT baseline study on REACH and its indicators related to chemical risks.

Users: DG ENV, ENTR, TAXUD, DEV, ESTAT, RTD

Chemicals

CompuTERM	Computational Toxicology and Environmental Risk Modelling	IHCP
RefineRISK	Integrated Risk Assessment of Chemicals	IHCP
SUPCHEM	Support to Chemicals Legislation	IHCP
GlobCHEM	Global Chemical Data Management and Harmonisation	IHCP

1.1.6. Data Harmonisation

The competitiveness of European economy also benefits from increased access to harmonised information and interoperable services related to the reporting on items of community policy relevance. In the area of environment and natural resources a specific effort is carried out in the context of the INSPIRE Directive and the Shared Environmental Information system (SEIS). The JRC will contribute to the data and information management for GMES including the procurement of community satellite data sets for a broad range of uses. In the context of the Water Framework Directive, an Action is also dedicated to the maintenance of a reference community information system on water quality. The JRC will cooperate closely with ESTAT for actions relevant to its activity.

Three Actions are included in this area:

1. INSPIRE (Infrastructure for Spatial Information in Europe): This Action will assume the scientific and technical coordination to the implementation of the INSPIRE Directive. It will conduct a wide range of activities as foreseen in the INSPIRE action plan: preparation which include the preparation of implementing rules for metadata for geographic data and services, harmonised data specifications, and network services. This Action will also develop

the EU Community Geoportal, a one-stop facility to discover and access geographic information and INSPIRE compliant services at the European level. The Action will develop and test the contribution of in-situ data acquisition and monitoring infrastructures and integrate them into the INSPIRE framework. It will also liaise with the European and international research communities and their networks, and will be responsible for technical coordination with other relevant initiatives such as GMES, and GEOSS, as far as Spatial Data Infrastructure is concerned. A strong research component will underpin these activities leading to the definition and the development of the next generation of Spatial Data Infrastructures.

Users: DG ENV, AGRI, REGIO, ESTAT, INFSO, ENTR

2. COSIN-JRC (Community Spatial Information Infrastructure): Standardisation and harmonisation are fundamental to improve access and the integrated use of Community information resources and services through the development of a Community Spatial Data Infrastructure. The extensive experience of the JRC with the production and use of geo-referenced data in the field of environment and natural resources is here put to work to support the application of INSPIRE principles across the JRC spectrum of relevant activities (soils, water, forestry, agriculture and other aspects of environment and natural resources). The Action will support the development of the Environmental Data Centres (EDC) hosted by the JRC and the setting up of a common architecture for all data centres in the context of SEIS. The Action will develop and test new protocols, standards, methods and tools for data integration and analysis and will ensure interoperability of data and services, and new information gathering activities. The research undertaken in this context will reinforce the JRC role as a recognised reference centre for geospatial information systems and science.

Users: DG ENV, AGRI, REGIO, ESTAT, ENTR

3. IWQIS (Integrated Water Quality Information System): the Action consists in the further development of standard reporting tools on water quality in support to the Water Framework Directive and the Water Information System for Europe (WISE). Technical and data management activities are complemented by research in the field of eco-informatics.

Users: DG ENV, ENTR, RTD

4. CID (Community Image Data Portal): The action relates to the acquisition and access to Satellite Imagery in the context of the Commission service needs (including GMES services). Collaboration with external partners (ESA, Industry) is foreseen. In terms of access, particular attention will be given to the further development of an Image Portal favouring, in respect of property rights, the sharing of images between Commission services other stakeholders as well as providing some viewing services for the European citizen. In addition to development activities linked to the satellite data service, the action will provide support to the coordination of the JRC inputs to the GMES initiative including support to the identification of data needs and user requirements.

Users: DG ENTR, RTD, AGRI, ENV, RELEX, DEV, REGIO

Data harmonisation

INSPIRE	Infrastructure for Spatial Information in Europe	IES
COSIN-JRC	Community Spatial Information Infrastructure	IES
IWQIS	Integrated Water Quality Information System	IES
CID	Community Image Data	IPSC

Agenda 1.2 European Research Area

The JRC continues to play a role in the construction of the European Research Area (ERA). This initiative aims at making European research more coordinated, efficient, innovative and attractive to European best scientists.

The JRC will play its part throughout its work programme by including in its Actions elements of networking at European level, dedicated efforts towards the enlargement process, training thorough association with research activities, opening of access to infrastructures, participation to European Technology Platforms, Joint Technology Initiatives and Article 169 actions, where relevant. Dedicated innovation and technology transfer activities also contribute to the ERA goals.

In addition to ERA-driven generic activities spread throughout the JRC work programme, a series of actions will pay attention to the analysis of the dynamics of research in Europe. They will do so by focussing on items relevant to the development of the knowledge society such as national investments in research, innovation policies, efficient use of technology foresight etc (see also Agenda 1.1.2).

Three actions are foreseen:

1. ERA-Policies (Support to Evidence-based Research Policy-Making):

The objective of this action is to support evidence based-policy making in the research field in Europe and thereby contribute to the development of the European Research Area. This objective will be achieved in particular through the sustained provision of the “ERAWATCH strategic intelligence service”, a user-driven service developed by the JRC in close coordination with DG Research. The ERAWATCH service monitors national and regional research systems in the EU and beyond, and provides relevant information and intelligence to research policy makers at both EU and Member State levels. The provision of the ERAWATCH service by the JRC will be based on a collaboration with a European-wide network of national partner organisations that collect local information and data and contribute to their presentation and analysis. The ERAWATCH service will be available to all users on the Web. The ERA-Policies action will also develop related activities such as the analysis of the dynamics of university-based research activities in Europe and of their links with other missions of higher education institutions.

Users: DG RTD, REGIO, ECFIN, ESTAT, EAC, Member States

2. FOR-ERA (Foresight for the European Research Area):

This action aims to improve the functionality and use of Foresight as a relevant instrument for policymaking within the European Research Area. To meet this objective, the action will contribute to advance the Foresight knowledge-base through the development of tools and by fostering joint learning among Foresight practitioners and users. Furthermore, the action will undertake Foresight projects to develop anticipatory intelligence and the early identification of challenges and dynamics of change in the area of research and innovation policies that will support the EU decision making process. The action will support the use of Foresight for underpinning the European Research Area through open coordination of vision building, strategy development and priority setting.

Users: DG RTD, ENTR, REGIO, SANCO, EAC, Member States

3. IP-KT (Intellectual Property and Knowledge Transfer)

There are two main objectives of this Action. The first compasses the protection, promotion and exploitation of the intellectual property of the European Communities and the provision of support to all Commission services generating and using IPR, as mandated by Commission Decision SEC (1397) of 19.09.2001. Activities will include protection of patents, copyright and trademarks of the Communities and to advise user DGs on various IP issues.

The second objective is to promote knowledge transfer from the JRC to industry, national authorities and the wider scientific community through the most appropriate means. It will include the exploitation of commercially promising JRC technologies through licensing and collaborative R&D with industry partners. The action will also foster a culture of innovation within the JRC through measures such as developing awareness of the importance of intellectual property and support for entrepreneurship.

Users: All DGs

European Research Area

ERA-Policies	Support to Evidence-Based Research Policy-Making	IPTS
FOR-ERA	Foresight for the European Research Area	IPTS
IP-KT	Intellectual Property and Knowledge Transfer	ISR

Agenda 1.3 Energy and Transport

1.3.1. Energy

The EU Energy agenda represents a key part of the JRC multi annual work programme. The work will be undertaken in the context of the three dimensions of the energy policy of the Union: sustainability of energy production systems, security of supply and competitiveness. The three items intersect in many ways and a key feature of the JRC programme approach will be to integrate technical, analytical and to some extent experimental know how in order to deliver complete assessments as required.

With respect to sustainability, the focus will be on new and renewable energy sources and carriers, where competences have been developed during the previous work programmes. Emerging issues such as biofuels will be given particular attention as they often require rapid techno-economic assessments by the policy services. Networking with stakeholders which are growing in number and interest around this agenda will receive specific attention.

Competitiveness will be served by integration of knowledge on all energy sources and demand types in support to the formulation of more informed policies. In selected areas, technological developments – mainly in terms of measurement of system performance and certification - will be pursued. The range of energy activities found in the FP7 programme will all feed into a dedicated JRC energy cell which will maintain scientific reference systems and, technology assessments covering the full energy chain, as well as modelling and scenarios capabilities.

With respect to the security of energy supply, the JRC will progressively expand its capabilities to deal with economic and geopolitical aspects of the supply of energy to Europe. Key feature of this work are analyses of the causes, consequences and possible mitigation measures of major disruptions to energy based on all-hazards approach. This will include the development of monitoring and risk assessment techniques.

The agenda contains 8 Actions:

1. FENCAB (Clean and Efficient Energy from Biomass, Coal and Waste): Research on thermodynamics and process flows in thermal and biological energy conversion technologies will be conducted with the goal to reach high conversion efficiency and low emissions and with particular emphasis on evaluation of carbon capture technologies for the abatement of CO₂ emissions. This know-how will be used to evaluate real-life conversion systems using coal, biomass and waste, separately or mixed. Priority will be given to work on the best conversion and integration routes to achieve optimal yield of heat, electricity, alternative fuels (including hydrogen and second generation biofuels) or chemical feedstock with exploitation of by-products and process waste streams.

Users: DG TREN, AGRI, ENV, RTD, ENTR

2. FCPoint (Fuel Cell Power Chain Integration and Testing): This Action will generate pre-normative experimental know-how on performance and durability of fuel cell technologies for stationary, transport and portable applications. The knowledge will be applied to verification and validation of fuel cell technologies and their incorporation in the energy chain. The activity will be backed up by multi-scale (nano, meso, macro) fuel cell modelling, simulation & model validation.

Users: DG RTD, TREN, ENV

3. SYSAF (Systems for Alternative Fuels): SYSAF will generate pre-normative experimental know how on the safety and performance testing of up-scaled solid-state and hybrids hydrogen tanks and complex components. The action will also perform modelling to evaluate experimental results and to study release scenarios and will develop competences for techno-economic assessment of hydrogen storage technologies.

Users: DG RTD, TREN, ENV

4. ASSETS (Assessment of Energy Technologies and Systems): Through the development of tools, methods and models the Action will evaluate sustainable energy technologies and pathways focusing on efficiency improvements and CO₂ emission reductions. It will generate scenarios for future energy and conversion technology mixes and will study the availability and production potential of indigenous energy resources. It will also assess geopolitical risks

associated with the import and transit of energy, and operational hazards to energy infrastructure, aiming at improving the security and reliability of energy supply.

Users: DG TREN, RELEX, RTD, JLS, INFSO

5. REFREE (Scientific Technical Reference System for Renewable Energy and End-Use Efficiency): This Action will provide data and analyses on the implementation of renewable energies and their economic effects on energy markets, technology sectors and industrial growth. It will also consolidate methodologies for the assessment of the energy savings obtained by increased end-use efficiency in the electricity sector.

Users: DG TREN, ENV, RTD, REGIO, ESTAT, ENTR

6. SOLAREC (Photovoltaic Solar Electricity): The reference laboratory operating under this Action will continue its crucial role in resolving the technical and scientific issues raised by the large scale implementation of photovoltaic panels (5% of European electricity supply by 2025). The action will determine performance and longevity of photovoltaic technologies by calibration and the use of new accelerated ageing techniques. It will also perform research on ultra-efficient (>40%) solar cells. Better assessments of solar resources will feedback into cost-calculations on a regional scale and into modelling of dispatch issues in European grid networks.

Users: DG TREN, ENV, ENTR, RTD

7. BioF (Quality and Performance of Biofuels): This Action will develop geographical information systems to assess the potential of European biomass resources at regional scale in relation to the potential from elsewhere, in particular Developing Countries. It will also study the trade-offs between uses for heat, electricity and transport fuels. It will assess the environmental constraints, agro-economic impacts and new (2nd generation) conversion technologies.

Users: DG ENV, AGRI, ENTR, DEV, TREN

8. ETTEA (Energy and transport techno economic analysis):

This action will carry out impact assessments and socio-economic analyses related to policies involving energy and transportation technologies, as well as policies whereby the tax burden is shifted from label to energy carriers. The aim is to address, with the help of the appropriate analytical tools, the costs and benefits of alternative policy options related to a broad set of energy/transportation technology clusters, and to provide inputs for energy and transport policy making. This will include the analysis of the supply structure of final energy demand (electricity, heat, transportation fuels) in terms of resources and technology availability, as well as the study of the demand side of energy-intensive sectors, with particular attention to transport. The geographical scope of these analyses goes beyond EU borders, since three fundamental issues (competitiveness of EU industry, security of energy supply and compliance with environmental standards) need to be analysed in a global context. The activity builds on energy and transport technology references jointly developed with other actions in this Agenda (REFREE, ESTA, SUSTRANS).

Users: DG TREN, ENV, RTD, ENTR, SG, INFSO, ECFIN, EMPL

Energy

FENCAB	Clean & Efficient Energy from Biomass, Coal and Waste	IE
FCPoint	Fuel Cell Power Chain Integration and Testing	IE
SYSAF	Systems for Alternative Fuels	IE
ASSETS	Assessment of Energy Technologies and Systems	IE
REFREE	Scientific Technical Reference System for Renewable Energy and End-Use efficiency	IES
SOLAREC	Photovoltaic Solar Electricity (Resource, Performance and Value)	IES
BioF	Quality and Performance of Biofuels	IES
ETTEA	Energy and transport techno economic analysis	IPTS

1.3.2. Transport

Sustainable transport relates to environment quality, mobility, competitiveness, single market and innovation. The conclusions of the Gothenburg European Council of 2002 indicated that “*A sustainable transport policy should tackle rising volumes of traffic and levels of congestion, noise and pollution and encourage the use of environment-friendly modes of transport as well as the full internalisation of social and environmental costs...*”

Actions undertaken by the JRC in this policy area will be geared to support the sustainability of European transport systems. In the early stage of the setting of the portfolio attention will concentrate on emissions related to transport and their impact on the environment at the local and regional levels. Characterisation and apportioning of transport related emissions will provide direct input into emission abatement strategies. The technological potential for reducing emissions, evolution of fuels and engines, alternative vehicle concepts will be integrated in the assessment of future prospects. Hydrogen as fuel for road transportation will be given special attention (see also Agenda 1.3.1) and will be coordinated with any relevant JTI. Impact of clean transport objectives on innovation and growth will also be evaluated with respect to a set of transport policy options.

Transport affects the European landscape in many ways and this will be evaluated mostly with respect to the establishment of large interregional corridors. The impact on environment, health, access, mobility will be studied.

Finally, the JRC will follow safety issues related to air transport and will develop methods and supporting technologies for assessing vulnerability of transport systems to unintended and mal-intended acts (see also Security Agenda).

Six Actions are proposed:

1. SUSTRANS (Sustainable Transport): With the objective to reduce the impact of transport on air quality, this action will conduct technical and multi-criteria assessments of transport alternatives. These assessments will be based on life-cycle analysis of the technological alternatives. The action will also maintain experimental and measurement facilities (VELA labs) for validation of emissions by various vehicles and under various uses. The action will contribute to assessing the impact of Trans European Networks (Corridors) by

applying a broad range of expertise available in the JRC (air quality, transport technologies, land use, health impact).

Users: DG ENV, ENTR, TREN, RTD

2. TRANSTECH (Transport Technologies): The Action will focus on developments in emission abatement technologies. Starting with assessments of the conventional and advanced transport platforms and fuels the action will evaluate the potential for reduction of toxic and green house gases associated with technological changes (road, non road, rail and maritime transport). Advanced (portable) emission measurement systems will be studied/tested as a contribution to abatement strategies. The Action will be closely involved in the definition of new emission standards, and harmonisation of emission testing (Europe and world-wide).

Users: DG ENTR, ENV, TREN, RTD

3. ECCAIRS (European Centre for Collection and Assessment of Multimodal Transport Safety Data): The air transport accident reporting system developed during the past two framework programme will now be expanded to cover maritime and rail transport. Attention will be given to the development and implementation of models of analysis using the existing ECCAIRS database in view of helping policies fostering multi-modal transport systems. The goal is to develop a common approach leading to an EU wide assessment of transport safety covering the relevant injuries.

Users: DG TREN, ESTAT

4. VATDIS (Vulnerability Assessment in Transport Distribution Systems) The Action will address the issue of vulnerability of transport and distribution systems and infrastructure against man-made risks, natural hazards and intentional acts. It will base its approach on system analysis and on assessment, testing and standardization of security related technologies as they apply to different modes of transport and distribution systems. Operational solutions to reduce vulnerabilities and improve resilience will be designed.

Users: DG TREN, JLS, SANCO

5. AIRMODE (Air Quality, Transport and Modelling): The Action will carry out research on transport and air quality modelling for selected hot-spots at urban and regional scales. Research will aim at harmonising modelling tools from local to hemispheric scale and improving emission inventories in support of EU Air Quality and Climate Change strategies and legislation. Research will also be performed in modelling particles in confined spaces (tunnels, car exhaust) to assist emission abatement strategies. Activities will be conducted in close coordination with other JRC CAFÉ related activities.

Users: DG ENV, TREN, RTD, ENTR

6. APE (Air Pollution and Effects): This Action will provide technical support to the development and implementation of the air quality directives. It will focus on the harmonization of air quality and emission measurements. A regional focus will be adopted in for studying the impact of atmospheric pollution on ambient air quality. Impacts of atmospheric pollution on ecosystems, human health and climate will be assessed.

Users: DG ENV, TREN, RTD, AGRI, SANCO, RELEX, AIDCO, ESTAT

Transport

SusTrans	Sustainable Transport	IES
TransTech	Transport Technologies	IES
ECCAIRS	European Centre for Collection and Assessment of Multimodal Transport Safety Data	IPSC
VATDIS	Vulnerability Assessment in Transport Distribution Systems	IPSC
AIRMODE	Air quality, Transport and Modelling	IES
APE	Air Pollution and Effects	IES

Agenda 1.4 Information society

Building a European Information Society is a key ambition of the renewed Lisbon Objectives and is currently framed by the i2010 policy initiative. Within this policy framework, the role of the JRC is to support the overall formulation and implementation of appropriate Information Society strategies, policies, regulations and actions contributing to a competitive, innovative and inclusive European Information Society.

Agenda 1.4 will focus on supporting the three main pillars of the i2010 initiative: (i) research to support the completion of a Single European Information Space in a global competitive dimension; (ii) research to support the competitiveness of the European R&D system in Information Society Technologies as part of the European knowledge society; (iii) research to support policies that apply Information Society Technologies to increase inclusion, enhance better public services and raise the overall quality of life.

The JRC will complement technology push approaches to the development of the European Information Society with socio-economic impact and demand analysis.

Three actions are included:

1. IS&GROWTH (Information Society, Competitiveness and Growth):

This action will support the formulation of EU policies with regard to a competitive and innovative Information Society. It will focus on the integrated analysis of key factors in the deployment, access and use of Information Society Technologies. From that, best practices will be deduced in order to support the development of future strategies. The action will develop models that assess the impact of the Information Society on growth, competitiveness and cohesion. It will pay special attention to the take up of the Information Society in the New Member States and Accession Countries. It will explain broadband take-up based on the analysis of a range of broadband drivers. It will develop indicators to monitor eInclusion targets at EU level. It will also analyse from a global perspective the competitiveness of the European R&D system and Europe's industrial position in the field. The necessary information will be collected from all appropriate sources, in particular ESTAT.

Users: DG INFSO, ENTR, REGIO, BEPA, ECFIN, EMPL

2. e-Applications (Applications for the Information Society): This action will support the formulation of policies for the development of the Information Society in areas such as ICT for governance, health, business, learning and social inclusion, transport and mobility, security and environment. Research will focus on how the application of Information Society Technologies by private and public institutions can contribute to create public value in a knowledge based society, encompassing its socially inclusive, democratic, economic and governance dimensions. These include the provision of public services such as education and lifelong learning, health and social care, public administration and democratic processes. The action will also support the development of a coherent European e-learning strategy. The identification of best practices, combined with scenario exercises, will contribute to the design of future e-services.

Users: INFSO, EAC, ENTR, EMPL

3. TEFIS (Techno-economic Foresight for the Information society):

This action will focus on emerging trends (up to a 15 year time horizon) in Information Society Technologies by executing integrated techno-economic foresight analyses (scenarios, road mapping and demand analysis). It will contribute, as part of the ERA objectives, to establish a common European foresight platform on future scenarios and applications. It will specifically address the way digital technologies will affect identity and identity policies.

Users: DG INFSO, JLS, EMPL, EAC, EP

Information Society

IS&GROWTH	Information Society, Competitiveness and Growth	IPTS
e-APPLICATIONS	e-Applications for the Information Society	IPTS
TEFIS	Techno-economic Foresight for the Information Society	IPTS

Agenda 1.5 Life sciences and biotechnology

As key enabling scientific fields and technologies, life sciences and biotechnology are pertinent to many policy areas where they may significantly contribute to the achievement of European objectives such as those identified in the Lisbon agenda. Their potential is broadly recognised in healthcare, agriculture, environment and industrial processes.

Life sciences and biotechnology can help the implementation of legislation in various areas by providing a sound scientific basis and defining potential opportunities and risks. Major advances in research and development as well as their medical and commercial applications also make it necessary to harmonise and/or modify existing legislation or to develop a new regulatory context, e.g. in the areas of tissue engineering and genetic testing.

Biotechnological and life sciences activities at the JRC will focus both on the health-related aspects of biotechnology, such as bioanalysis (e.g. genetic testing, reference measurement systems for proteins), advanced alternative methods to animal experiments, bioinformatics in support of selected "omics" approaches, factors modifying individual responses to environmental stressors, and on agro-food applications, i.e. emerging biotechnological applications, GMO analysis and the coexistence of GM and non-GM crops.

In addition, the convergence of biotechnology with other disciplines such as information technologies, physics and chemistry, enables the development of new classes of products, e.g. via nanoproducts. They can possess new characteristics which many require the modification of existing or the development of new legislation. With respect to nanomaterials, scientific and technical support by the JRC is needed for the possible adaptation and resulting implementation of legislation and/or guidelines. There is a particularly strong demand to fill knowledge gaps related to the potential toxicity of nanomaterials.

To provide the necessary support to regulation and legislation, the JRC will strengthen its investments in facilities and expertise in certain key areas such as systems biology and bioinformatics.

Twelve activities are foreseen in the area of life sciences and biotechnology:

1. VALINFO (Validation and dissemination of scientific information & management support): This Action is in direct support of the main objectives of the European Centre for the Validation of Alternative Methods (ECVAM) as requested by the Commission Communication (SEC(91)1794), namely, the establishment and management of a database on alternative methods, and the promotion of dialogue between legislators and other involved parties with the view to international recognition of test methods. In addition, support to the ECVAM unit management is provided.

Users: DG SANCO, ENV, ENTR

2. CRL-IGL (Community Reference Laboratory for Genetically Modified Food and Feed and Support to the Implementation of the GMO Legislation): With this Action, the JRC will continue to fulfil the duties according to its mandate as Community Reference Laboratory for Genetically Modified Food and Feed (CRL GMO). This comprises the testing and validation of GMO detection methods including the evaluation of scientific and technical data as part of the authorisation procedure for GMOs for food and feed use. The work also includes the validation, definition and delivery of the appropriate control samples. The CRL operates in close collaboration with the European Network of GMO Laboratories (ENGL), and plays a key role in emergency situations concerning release of unauthorised GM foods and feed into the European market. The Action will also be instrumental in initiating and implementing data and information processing and exchange measures related to the regulatory requirements of the authorisation process for GMOs, and more specifically Directive 2001/18/EC on the deliberate release into the environment of GMOs, Regulation 1829/2003 on GM food and feed, Regulation 1830/2003 on traceability and labelling and Regulation 1946/2003 on the transboundary movement of GMOs. Core areas of activity include management of the exchange of information in support of Part B and Part C of Directive 2001/18/EC and development of new tools to facilitate access to and exchange of information. In this regard, the Action will continue to fulfil the JRC's role as the European Community focal point for the Biosafety Clearing House under the Cartagena Protocol on Biosafety (CPB), inter alia through timely transmission of relevant information to the global Biosafety Clearing House.

Users: DG SANCO, ENV, TAXUD

3. ITraS (Identification and Traceability of GMOs and systems biology): The objective of this action is to conduct research, development, training and competence-building activities for the harmonised implementation of GMO legislation. The Action involves research and development in areas related to the assessment of GMOs, reference analytes and their use as control samples. It also carries out stability studies and the molecular characterisation of selected GMOs and will further develop its biometrics competences. In particular, it will develop a systems biology approach, including bioinformatics and high-throughput assessment in order to develop tools for the assessment of health and environmental impact of GMOs, and in collaboration with EFSA. It will also continue theoretical and laboratory training in GMO analysis. The action will design and implement a horizontal activity, to apply molecular approaches for the development and optimisation of tools for the identification and traceability of plant and animal species. Application is foreseen in various fields relevant for agriculture, forestry and fisheries, environmental protection, wildlife trade, human and animal health and consumer protection.

Users: DG SANCO, ENV, TAXUD

4. InViTech (In Vitro Testing Technologies and Assay Automation): The objective of this horizontal Action is to support priority areas in chemicals, nanotechnology and environment and health through the provision of innovative in vitro assay technologies and test methods. A state-of-the-art robotic facility, specifically designed for in vitro cell and tissue based assays, will provide critical data to many internal JRC customers, mainly in the areas of exposure assessment, bio-security, nanotoxicity and the validation of non-animal alternative methods. The Action will also assess and demonstrate new assay technologies, such as micro- and nanotechnologies, to facilitate their uptake for regulatory testing.

Users: DG ENTR, ENV

5. Nanobiotech (Nanobiotechnology for Health): This Action will apply nanobiotechnology tools for the development of sensors to be used in the fields of security and health and environmental monitoring, e.g. in situ monitoring of cell metabolism in relation to in vitro toxicology. The action will also address questions related to nanotoxicity and develop methods for the investigation of cell interaction with nanosized objects as a function of their surface properties.

Users: DG SANCO, ENTR, ENV, RTD, INFSO

6. MANTRA (Molecular and Nano-Tracer Applications): This Action will utilise the JRC's MC40 Cyclotron and provide horizontal support to other Actions in the production of

radiotracers. The radiotracers will find application in two main areas: exposure and toxicology studies of chemicals and nanoparticles, and research in Nuclear Medicine. In the area of exposure and toxicology, radiotracers for the investigation of toxicity mechanisms of chemicals and nanoparticles will be produced, and a direct nanoparticle activation facility will be developed, while the advanced testing facilities at the Cyclotron will be used to study exposure via wear or degradation of biomaterials. In the area of Nuclear Medicine, collaborative work with several research groups including the Nuclear Chemistry Unit of ITU will focus on production of novel therapeutic isotopes and diagnostic radiotracers.

Users: DG SANCO, ENTR, ENV

7. VALCOS (Validation for Cosmetics): The 7th Amendment to the Cosmetics Directive (Council Directive 2003/15/EC) foresees the phasing out of animal experiments in the cosmetics industry within 10 years. The Action will develop, validate and promote non-animal test methods designed for the testing of chemical substances (especially cosmetic ingredients) and cosmetic products and support ECVAM's activities in the following key areas: topical toxicity, sensitisation and carcinogenicity/mutagenicity.

Users: DG SANCO, ENTR

8. VALCHEM (Validation for Chemicals and CORRELATE): ValChem addresses the requirement in Directive 86/609/EEC, REACH, 91/14/EEC and provides direct support to European Policy on chemicals and agrochemicals in the assessment of alternative methods. ValChem represents ECVAM's activity on policy support on chemicals and agrochemicals, and as reference laboratory for alternative test methods (CORRELATE), interconnected with ECVAM's key thematic areas. This comprises assessment of method reliability and test performance, ring trials as well as hosting a repository of suitable reference substances for alternative tests. CORRELATE serves to speed up the process of method evaluation and validation and to enhance quality. It evaluates method suitability for REACH

Users: DG SANCO, ENTR, ENV, EChA, EFSA

9. VALDRUG (Validation for Pharmaceuticals):

The validation of new methodologies for risk assessment of pharmaceuticals will form the focus of this Action, in particular to predict safety profiles (predictive toxicology) according to the requirements in Directive 86/609/EEC on the protection of animals used for experimental and other scientific purposes. This work will include biotechnological drugs and will support standardisation and validation of in vitro methods for risk prediction and benefit - risk assessment. It will cover ECVAM's activities in the key areas of systemic toxicity, immunotoxicity and reproductive toxicity.

Users: DG SANCO, ENTR

10. VALPRO (Validation for Consumer Products): In support of the requirements in Directive 86/609/EEC for the Commission and the Member States to actively support the development, validation and acceptance of methods which could reduce, refine or replace the use of laboratory animals, this Action covers ECVAM's activities on consumer products, food, nanoparticles and medical devices. It addresses the key areas of ecotoxicology, toxicokinetics and strategic developments.

Users: DG SANCO, ENTR, ENV, EMPL, AGRI

11. LIFETECH (New technologies in Medicine and Health – Socio-Economic Analysis for Policy Development): This action will support EU policy development in the areas of medicine and health by identifying new technologies and analysing the socio-economic impacts and possible needs for policy initiatives in connection with their application. In the first years it will focus on the socio-economic impact of advances in *biotechnology* in areas of prevention, diagnosis and treatment, e.g. genetic testing and pharmaco-genomics. The action will gradually move into wider aspects of new technologies and public health economy. Novel foods and areas in which the border between food and medicine is becoming blurred will be covered.

Users: DG SANCO, ENTR, RTD, ESTAT, INFSO

12. Biotech RM (Reference Materials for Biotechnology, Health and Life Sciences): This Action covers the design, production and certification of new reference materials as well as the contribution to international metrological and standardisation efforts for quality assurance in bioanalysis and life sciences.

New reference materials both for qualitative and quantitative analysis will be developed for genetically modified organisms, health-related reference measurement systems and micro- and nanobiotechnology. The development of certified calibrants and the realisation of matrix reference materials certified for DNA copy number ratios will be in the focus of the first years. In addition, new concepts for the quality assurance of the whole measurement procedures applied in life sciences will be developed for DNA- and protein based measurements.

Users: DG SANCO, ENV, AGRI, ENTR

Life sciences and biotechnology

VALINFO	Validation and dissemination of scientific information & management support	IHCP
CRL-IGL	Community Reference Laboratory for Genetically Modified Food and Feed and Support to the Implementation of the GMO Legislation	IHCP
ITraS	Identification and Traceability of GMOs and systems biology	IHCP
InViTech	In Vitro Testing Technologies and Assay Automation	IHCP
Nanobiotech	Nanobiotechnology for Health	IHCP
MANTRA	Molecular And Nano-TRacer Applications	IHCP
VALCOS	Validation for Cosmetics	IHCP
VALCHEM	Validation for Chemicals	IHCP
VALDRUG	Validation for Pharmaceuticals	IHCP
VALPRO	Validation for Consumer Products	IHCP
LIFETECH	New Technologies in Food and Medicine - Socio-Economic Analysis for Policy Development	IPTS
Biotech RM	Reference Materials for Biotechnology and Life Sciences	IRMM

Policy Theme 2: Solidarity and the responsible management of resources

Total Indicative Budget (2007-2013): 577.6 M€

Research Staff (Statutory/non statutory): 394

Sustainable management of our natural resources and the environment is an ever increasing challenge for the Union. It is a key component of the sustainable development objectives included in the European Union Treaty. Knowledge and technology are essential in this context as they provide potential solutions to the difficult sustainable equation which aims at an equilibrium between economic growth and social and environmental sustainability. This chapter of the JRC Agenda for 2007-2013 addresses several sectors of community competences which are central to sustainable development objectives. Actions under this policy theme will provide support to the 6th Environmental Action Programme and its thematic strategies; some activities will be developed in support to the development of GMES services and links will be made with the Global Earth Observation System of Systems. Actions under this policy theme should provide support to the 6th Environmental Action Programme and its thematic strategies; EU Forest Action Plan.

The fields of agriculture and rural development present specific challenges because they are at the core of production, socio-economic and environmental systems which need to be balanced to the satisfaction of a broad range of stakeholders in a difficult global context. The Agenda proposed by the JRC will focus on an integration of those various dimensions at Community level.

The Fisheries policy, the Marine Strategy and the emerging EU Maritime policy provide the background for the JRC agenda of work in the area of marine ecosystems and resources. The current situation in this sector presents critical sustainable development issues in terms of reconciling production objectives with depletion of resources, social aspects and environmental quality. The JRC provides technical and scientific support to this growing agenda which is likely to significantly evolve during the period covered by the programme.

The attention of the citizen for the quality of the environment is a European trade mark. The JRC proposes an R&D agenda which is in line with the objectives of the 6th Environmental Action programme and which will rely on its long lasting research investments in areas such as air and water quality, soils and spatial aspects of natural resource management. The links between environmental conditions and health calls for new avenues of investigations on exposure and health impacts which are now imbedded in this Policy Theme.

Climate change remains a central issue in the sustainability agenda. Measures undertaken at the Union level and internationally to reduce greenhouse gas emissions and to adapt to global warming need to be continuously supported by scientific research. The focus will be on validation of formal reporting commitments, assessing the cost of impacts of climate change, evaluating future changes in socio-economic and natural systems and their impact on greenhouse gas-emissions. The link with the Energy and Transport Agendas for assessing the development of clean technologies and their cost is obvious. The climate change Agenda is geared towards a full support to integrated assessment modelling of Climate Change and other policy areas (notably air pollution) in EU and non EU regions, allowing the quantification of synergies and trade-offs between the related policies.

In the context of this policy agenda, the extensive use of space borne remote sensing for monitoring the evolution of the environment is essential. The deployment of science and technology in this area provides an independent tool to address sustainability issues; pan European applications will contribute to the emerging space policy for Europe.

This Chapter of the programme is divided into 4 Agendas:

- 2.1 Agriculture, rural development and fisheries
- 2.2 Natural resources
- 2.3 Environment and Health
- 2.4 Climate change

Agenda 2.1 Agriculture, rural development and fisheries

2.1.1. Agriculture and rural development

Agriculture and rural development has been a central theme in several JRC framework programmes. Actions included in this 2007-2013 multi-annual work programme will further : Develop the capacity to provide technical support to the implementation and control of the Common Agricultural policy (CAP), and to contribute to the development of integrated services for monitoring new requirements resulting from the CAP. Extend the JRC expertise to new areas as required by the second pillar of the CAP and the rural development policy. This includes characterisation of rural areas, anticipating their diversity and building up a policy relevant typology of rural areas; understanding socio-economic functioning of rural areas and incorporating this knowledge in a socio-economic model for policy assessment; studying institutions and governance of rural areas and other developments that are critical for the successful implementation of policies. Secure a new role in providing strategic analyses on how to achieve socio-economic and environmental sustainability in European agriculture. For this new role, the JRC would need command of modelling and policy assessment tools, deep knowledge of current production schemes and their use of resources, taking into account results arising from R&D programmes already in place elsewhere.

Work on the three dimensions of the sustainable development equation will be undertaken: production and competitiveness, the agri-environment and its link with natural resources and the quality of life of producers and consumers (see also the Food Quality Policy Agenda 3.3).

- Production/competitiveness: in addition to the support to regulatory items (control, monitoring) the objective will be expanded to cover crop forecasts as well as medium/long-term commodity market prospects. Strategic techno-economic analyses of production systems at the farming system level will also be developed. Methodological aspects related to implementation of the new EU agricultural statistical system will be studied.
- Agri-environment/ landscape: the focus will be on the use of natural resources, the impact of agricultural policies and measures on the environment, the effects of farming practices on soils and water conditions, biodiversity and landscapes. Attention should also be given to the better use of soil services in agricultural practices and policy. Targeted, site specific, territorial strategies for the implementation of rural development will be developed with instruments which integrate the necessary data and models and display results as geospatial information. Maintaining the necessary community data bases is a key item in this area of work. Impact of climate change on European agriculture and adaptation of agriculture and farming practices to climate change will be analysed and interpreted in policy terms.
- Quality of life: the focus will be on the producer in terms of sustainability of farming systems and the demographics of the rural sector. Issues on the side of those living in rural areas are: income (agricultural, non-agricultural), opportunities for quality jobs, social inclusion (access to services), changes in social structures – demographic (as ageing population) and migration in and out, declining traditional way of life. From

the consumer side, the work will include traceability, assessments of food quality (see Agenda 3.3), certification schemes, integration of animal welfare and environmental standards. Specific attention will be given to the impact of world trade on the rural sector and to impacts of the CAP reform in the New Member States and Candidate Countries.

Given the range and complexity of sustainable development issues the JRC will also work on articulating and maintaining information on the various positions held by the stakeholders (producers, consumers, Commission, national authorities, professional organisations, NGOs etc.). This will require that staff maintains full knowledge of policy, scientific, political and other developments, impinging upon the rural sector.

There are 6 Actions in this agenda:

1. MARS-PAC (Management and Control Methods for the Common Agricultural Policy): The reform of the CAP will be further supported by extensive, standardised and sustainable control methods in a variety of agriculture-related areas. This Action will focus on the definition, development and testing of control methods for application at Member States' level. Common specifications, standard measurement and data management tools and validated methods will be studied to reinforce the consistency of land parcel identification and measurement across the Union and in new Candidate Countries. Concerning the cross compliance, FAS and Rural Development, the activity will focus on: the optimisation of the definition of GAECs through exchange of best practices; their control by field inspection and/or Remote sensing; the support given to the exchange of information or access to geographical database between the competent Control Bodies involved in the Cross-Compliance; the assessment of the maintenance of permanent grassland's ratio; the setting-up and organisation of the FAS.

Users: DG AGRI, ELARG, RELEX, ENV, ENTR

2. MARS-STAT (EU and World Crop Production Forecasts and Estimates, Climate Change impact on Agriculture Systems): The Action is centred on the JRC's crop yield forecasting system aiming at providing accurate and timely crop yield forecasts for the union territory. The system will be enlarged to estimates of world production in view of providing data on main crop quantities in the export market. Climate change impact on European agriculture will be studied in the context of the Climate Change Agenda and in view of providing support to new CAP formulation. Climate relevant items in European Agricultural Insurance System will be studied. A European Agrophenology Network will be set-up.

Users: DG AGRI, ESTAT, ENV, REGIO, ELARG, RELEX, ENTR, DEV

3. SUSTAG (Support to Sustainable Agricultural and Rural Development Policies): This action will focus on the socio-economic aspects at farm level of the Common Agricultural and Rural Development Policy. It will include an analysis of farmers' response to policy changes, emerging farming techniques (organic, integrated, etc), agricultural technologies and market opportunities, including an increased attention on food quality. The focus will be on income and distributional effects of the CAP reform. Rural development policies will be supported particularly through the characterisation and development of a typology of rural areas as a basis for a future modelling of the rural economies. Governance of rural areas will be studied taking into account the increasing societal demands on agriculture and rural areas, e.g.

conservation, countryside stewardship (including environmental aspects) and the provision of leisure services. Particular attention will be paid to the specific rural development problems of the New Member States and Candidate Countries (including the special problems of subsistence farming etc.).

User: DG AGRI, ECFIN

4. AGRITRADE (Agricultural Trade and Market Policies)

This action will perform strategic policy analysis on agricultural trade and market policies, based on advanced economic modelling tools and qualitative methods. It will provide projections for agricultural commodity markets in the context of CAP reform and international trade agreements (WTO, regional agreements), adjusting the research focus according to the policy agenda (e.g. milk market reform, country specific policies). It will also take into account developments in the food industry sector and in EU food quality policy.

Users: DG AGRI, ENTR, SANCO, TRADE, TAXUD, ECFIN

5. AGRITECH (New Technologies in Agriculture - their agronomic and socio-economic impact):

This action will support policies affected by the introduction into agriculture, forestry and aquaculture of new technologies, analysing their potential socio-economic impacts and the possible policy needs. In the first years the action will concentrate on biotechnology applications (GM crops and plants/animals, but also advanced non-GM techniques), in particular the measures aimed at ensuring co-existence between GM and non GM crops, and on supporting the development of legislative initiatives concerning the production of GM and non GM seeds in Europe. Support in this connection will be based on agronomic feasibility studies, economic impact analyses of the proposed measures and the elaboration of consensus documents.

Users: DG AGRI, ENV, SANCO, TRADE, Member States

6. AGRI ENV (Integration of Environment Concerns into Agriculture): the Action focuses on the impact of the CAP and Rural Development policy on the European environment. It will analyse key agri-environmental issues and their geographical distribution in Europe. The Action will further develop a Rural Development Geo-spatial Information System to assist policy evaluation and better spatial targeting of measures, and provide tools and methods for evaluating effectiveness and outcome of agri-environmental policy, in particular with regard to the rural development monitoring guidelines (environmental component). The Action will also develop research activities to better understand natural constraints to agriculture and support land capability assessment in order to reach a better balance between the use of natural resources and agricultural production. New issues will be tackled by integrating biophysical and economic models in a territorial context leading to geo-referenced assessments on impacts and effectiveness of agri-environmental measures.

Users: DG AGRI, ENV, ESTAT

Agriculture and Rural Development

MARS-PAC	Management and Control Methods for the Common Agricultural Policy	IPSC
MARS-STAT	EU and World Crop Production Forecasts and Estimates, Climate Change impact on Agriculture Systems	IPSC
SUSTAG	Support to Sustainable Agricultural and Rural Development Policies	IPTS
AGRITRADE	Support to Agricultural Trade and Market Policies	IPTS
AGRITECH	New Technologies in Agriculture - their agronomic and socio-economic impact	IPTS
AGRI ENV	Integration of Environment Concerns into Agriculture	IES

2.1.2. Fisheries, Maritime policy and Marine environment

The multi-annual work programme of the JRC will pursue a series of Actions aimed at providing R&D support to the European maritime economy. The context is provided by the existing fisheries policy, the Marine Strategy and the emerging Maritime Policy. The latter will propose concrete steps towards the integration of Lisbon based objectives and sustainable management of ecosystems. The Actions undertaken in the JRC agenda will focus on the development of better tools to manage data related to the marine resources and environment and marine activities such as the movement of vessels in EU waters. Actions in this area will also provide relevant support to GMES.

Currently the focus is on monitoring fishery activities, providing support to Marine Conventions and scientific committees, assessing quality of coastal waters and modelling ocean dynamics. Links also exist with the Security Agenda in terms of monitoring illegal activities taking place at sea. As in other policy agendas the JRC will dedicate specific efforts to the provision geospatial information tools for better taking into account the diversity of the European geographical situation. The Agenda will evolve with the development of related policies, in cooperation with ESTAT where it is relevant.

There are 3 Actions in this agenda:

1. FISHREG (Scientific and Technical Support to the Common Fisheries Policy): The quality and timeliness of scientific data with which the fisheries policy can be enforced remains a critical item in the policy support agenda. This action will contribute to the development of an information system to support surveillance and control of fisheries activities. Data and information related to the socio-economic aspects of fisheries activities will be progressively added (coherence with statistical terminology will be maintained). New technologies for combating fraud in markets will be tested and the developments will be consistent with existing data sources.

Users: DG FISH, ENTR, ESTAT

2. MASURE (Maritime Surveillance): This Action will specifically examine technical issues related to maritime safety and security and more specifically with respect to marine surveillance. Real time monitoring of maritime activities in fisheries, transport, and security will be further developed using a range of observation and data management technologies..

The objective is to provide tools for the spatial planning of the growing maritime economy. Risk evaluation will be performed and a more extensive knowledge of infringement cases will be delivered.

Users: DG FISH, TREN, RELEX, ENTR, DEV, ESTAT, ENV

3. PROCAS (Protection and Conservation of European Seas): The Action is dedicated to the building of a comprehensive knowledge base in support to the Marine Strategy, Maritime Policy. Analysis of remote sensing data, application of numerical hydrodynamic models, development of environmental indicators, definition of eco-regions and standard techniques for monitoring marine ecosystem functioning developed in co-operation with regional seas conventions will support this knowledge base. It will contribute to the knowledge base necessary for reporting on the quality of the marine environment through WISE. Analysis of status and trends of the EU marine environment will be continued. Long term data sets will be used to analyse trends as required by the Marine Strategy. Collaboration with international entities and Member States' institutions will enhance harmonised monitoring and reporting of the environmental status of European seas and coastal areas.

Users: DG: ENV, FISH; ENTR, REGIO, RTD, ENTR, ESTAT

Fisheries/Maritime policy and Marine Environment

FISHREG	Scientific and Technical Support to the Common Fisheries Policy	IPSC
MASURE	Maritime Surveillance	IPSC
PROCAS	Protection and Conservation of European Seas	IES

Agenda 2.2 Natural resources

The JRC agenda on natural resources is firmly set in the context of sustainable development. Items developed under this agenda will contribute to ensuring that consumption of renewable and non-renewable resources and the associated impacts do not exceed the carrying capacity of the environment. Achieving a de-coupling of economic growth from resource use through significantly improved resource management efficiency, dematerialisation of the economy and waste prevention is another objective to which JRC Actions will contribute. The work will be closely linked to the Sixth Environmental Action Programme.

The specific objectives of this Agenda research will focus on the setting up and validation of tools and methods to monitor and assess the quality of ecosystem components (e.g. air, water, soils, forests) to identify and evaluate the impact of resource use on the environment, to perform integrated analyses of environmental policy issues and produce research results related to the sustainability of resource use. The comparability of measurement data at the pan-European level, which is crucial for the harmonized implementation and monitoring of environmental policies, will be supported by new quality assurance tools for corresponding measurement systems. As in other areas, particular attention is given to the development and maintenance of community spatial databases, including the development of general indicators of ecosystem spatial patterns. Actions in this portfolio will conform to the INSPIRE principle in the provision of harmonised, quality controlled spatial data across Europe (see Agenda 1.1) and several of them will contribute to the evolution of GMES services. Several Actions in other JRC policy agendas (see energy, competitiveness, agriculture, disasters and response) also contain resource management related items. Their contribution will be integrated in the following Actions where applicable. Activities related to official statistics will be developed in the framework of the "Group of Four" agreement (ENV, EEA, JRC and ESTAT) leading to the setting-up of the European Environmental Data Centres.

These activities will be carried out through the following 7 Actions:

1. ATEAM (Aquatic and Terrestrial Ecosystems Assessment and Monitoring): This Action will address how to incorporate the protection of terrestrial and aquatic ecosystems in the context of EU Water Resources, Nature and Regional policies Action Plans. ATEAM will pursue the implementation of an integrated land-water ecosystem approach at catchment scale including transitional and coastal waters. Monitoring and integrated dynamic modelling will be combined to assess the fate and transport of pollutants across a range of scales, from European to regional and local, and derive indicators on trends, pressures and effectiveness of policies measures. Bio-physical and socio-economic aspects will be combined in the analysis of trade-offs between conservation of ecosystems and habitats and opportunities for economic development. A specific component of this Action will aim at non-accession countries bordering the Mediterranean sea providing support to the Horizon 2020 programme (Euro-Mediterranean partnership).

Users: DG ENV, REGIO, ENTR, RTD

2. EEWAI (European Ecological Water Quality and Intercalibration): This Action serves as the long-term reference centre for inter-calibration of Member State's ecological quality assessment systems for inland and coastal waters. It will contribute to the development of new molecular methodologies for water quality assessment.. The work on development and harmonisation of the water quality criteria for the Water Framework Directive will include research on bio-indicators and molecular biomarkers for the detection of impacts of pressures

(e.g. nutrient loading, hydro-morphological changes, invasive species, climate change) on the biodiversity, ecological water quality and the functioning of aquatic ecosystems.

Users: DG ENV,RTD

3. FOREST (Forest Data and information systems): The Action deals with the flow of policy relevant forest information, from initial field data collection all the way to final reporting. This will be achieved by setting up the European Forest Data Centre (EFDAC) as the single forest information focal point for all relevant EU policies and initiatives, and as the basis of the European Forest Monitoring System proposed in the EU Forest Action Plan (COM(2006)302 final). FOREST will consolidate the forest information systems existing or under development at the JRC (the European Forest Fire Information System, the Forest Focus Data Platform and the European Forest Information and Communication Platform) into a European Forest Data Centre (EFDAC), compliant with INSPIRE. Advanced modelling techniques and scenario analyses will be used to provide the information needed to understand the status and trends of European forests (species distribution, forest area, and biomass), the interactions between forests and biodiversity, those between forests and climate change and the protective function of forests.

Users: DG ENV, AGRI, REGIO, ESTAT, ENTR,RTD

4. SOIL (Soil Data and Information Systems): EU policy relevant soil information, from initial field data collection all the way to final reporting will be managed by this Action. This will be achieved by using the European Soil Data Centre (ESDAC) as the single soil information focal point. This will serve the new Thematic Strategy for Soil Protection and the Soil Framework Directive. Advanced modelling techniques and scenario analyses will be used to provide soil information to end users in relation to the major threats to soil identified in the Soil Framework Directive (sealing, erosion, and decline of organic matter, compaction, salinisation landslides and contamination). On contamination, the ESDAC will provide for an interface with the work so far carried out by the EEA and will exploit the results of the HERACLES component within the ENSURE Action). Given the strong international dimension of soil protection, the Action also aims to develop an operational Global Soil Information System and provide technical support to the UN Convention to Combat Desertification. This work will be undertaken in the context of the UMCCO WG on the elaboration of a 10 year strategic plan. This includes the development of an operational Global Soil Information system (GLOSI) for the regular assessment of global soil degradation processes.

Users: DG ENV, AGRI, REGIO, DEV, ESTAT, ENTR,RTD,AIDCO

5. ENSURE (Environmental Assessment of European Waste and the Sustainable Use of Resources): This Action will analyse trade-offs between environmental impacts and resource consumption in a decision-support framework making the link between the initial extraction of resources, their use, products, possible recycling and ultimate disposal. The approach used here will address both more traditional environmental impact assessments related to resource consumption, e.g. waste management and contaminated sites, while complementing these with assessment methods and sustainability indicators for life cycle thinking. This action will provide policy makers with guidance for the development of knowledge based waste policies. and the risk assessment methodologies for contaminated sites. The main policies supported will be the Thematic Strategy for the Sustainable Use of Natural Resources, the Thematic

Strategy on Waste Prevention and Recycling the Integrated Product Policy and the Thematic Strategy for Soil Protection. ENSURE will also contribute to the provision of data and information for existing and upcoming related Data Centres.

Users: DG ENV, ENTR, ESTAT, RTD

6. IMES (Isotopic Measurements for environmental support): EU legislation lays down requirements for the monitoring of chemical substances, but data collected during monitoring campaigns do not systematically allow the identification of the source of pollution. Isotopic measurements can help to address this limitation for e.g. tracking the circulation of water, assessing anthropogenic contributions to greenhouse gases, etc. The Action will carry out research on how isotopes enable source apportionment and authentication in environmental, agricultural, (organic) food and health issues. Research will focus on isotopic measurements of, among other, carbon dioxide, nitrates, nitric oxides, polycyclic aromatic hydrocarbons, and strontium.

Users: DG AGRI, ENV, SANCO

7. ENV RM (Environmental reference materials): Reference materials for quality assurance of environmental monitoring are required to support EU policies in the area of air, water, soil and waste. This Action will develop new materials for priority substances, emerging pollutants and a new range of analyte/matrix combinations. It will provide certified reference materials, but also quality control materials on special request of DG ENV. A contribution to International harmonisation efforts and support metrology and standardisation bodies is included in the objectives of this Action.

Users: DG ENV, ENTR

Natural resources

ATEAM	Aquatic and Terrestrial Ecosystems Assessment and Monitoring	IES
EEWAI	European Ecological Water Quality and Intercalibration	IES
FOREST	Forest data and information systems	IES
SOIL	Soil data and information systems	IES
ENSURE	Environmental Assessment of European Waste and the Sustainable Use of Resources	IES
IMES	Isotopic Measurements for environmental support	IRMM
ENV RM	Environmental reference materials	IRMM

Agenda 2.3 Environment & health

The impact of environmental factors on human health has recently received high visibility in the European policy debate, first by its inclusion as one of the main priorities of the 6th *Environmental Action Plan*, followed by the adoption by the Commission of the *European*

Environment and Health Strategy (2003) and of the *European Environment and Health Action Plan 2004-2010* (2004) by the Commission. The *Review and Implementation Plan on Environment & Health Information* identifies the key information actions to be pursued over the period until 2010 and provides the policy framework for efforts on environment & health information.

Research is an essential component of this European Action Plan. Both the JRC and DG RTD have been shaping the research agenda in this field. JRC has a traditionally strong involvement in many of the E&H priority areas and will continue to strengthen its activities to support the implementation of the Action Plan and European Environment and Health research in general during FP 7.

The JRC will work towards the development and validation of methods and methodologies for monitoring, exposure assessment and for evaluating environmentally-related health effects. In order to cover the whole chain: from pollutant to disease, the JRC activities in E&H will be organized within three interrelated areas covering integration of environment and health information, exposure assessment, and health effects.

Four Actions form this agenda:

1. ENVIHEALTH (Health impact assessment of environmental risk factors): The aim of this Action is to develop methodologies for the health impact assessment of environmental risk factors with emphasis on Environmental Burden of Disease (EBD). The aim is to analyse current models of EDB estimates to pave the way for an agreed European approach. The work will be done in close collaboration with WHO-Europe. The JRC will also define a weight-of-evidence terminology to grade uncertainty in environment & health interaction and work to optimise and map E&H information from available monitoring data. Emerging issues are the impact of climate changes and of new technologies on health.

Users: DG ENV, SANCO, ENTR

2. EXPO-Health (Human Exposure to Environmental Stressors and Health Effects): This Action will assess integrated human exposure to selected environmental stressors (including chemicals and physical agents) and its possible health effects. This will be achieved by developing and validating methods for monitoring and evaluating exposure and impact pathways. The Action will contribute to the development of a framework for properly considering risk modifiers in order to reduce uncertainty in human health risk assessment. Special attention will be given to the work on indoor air quality assessment and on health effects of combined human exposure to mixtures of toxicants present in consumer products. In this context, primary importance will be given to addressing real life environment/health interactions, such as chronic low dose exposures and combined effects and their effects on susceptible population groups. The work will be performed in collaboration with EU-wide and international research networks focusing on environment and health interactions. Moreover, the Action will support specifically the development and implementation of EU legislation on food contact materials and deliver scientific and technical support in the area of controls of and exposure to substances from food contact materials, covering both established and emerging materials. In this frame, the JRC will also fulfill the duties of Community Reference Laboratory for food contact materials.

Users: DG SANCO, ENV, ENTR, RTD, ESTAT, EEA, EFSA, ECDC

3. EXPO-Tools (Integrated Exposure assessment and modelling): Harmonisation of methodologies, models, reference data, information exchange and quality assurance tools are key items in exposure assessment for chemicals and physical agents (noise, EMF, UV). The Action will build on the further implementation of the EU Exposure Assessment Toolbox to support the GPSD and RAPEX notifications. It will contribute to the harmonisation of exposure assessment tools implemented through several policies (e.g. REACH, IPPC). The

project will organise the validation of EU reference exposure scenarios, data and methods. It will demonstrate the feasibility of introducing exposure uncertainty analysis in policy implementation to optimise evaluation and improve risk communication. Emphasis will be given on delivering risk assessments in different policy areas including environmental, occupational and consumer exposure to chemicals and physical agents and in particular to the preparation of harmonised ambient noise-mapping assessment methods and to contribute to a review of health effects due to ambient noise.

Users: DG SANCO, ENV, ENTR, ESTAT, EMPL, RTD, INFSO

4. MAST (Multipurpose advanced Spectroscopic Technologies): The main objective of this Action is to integrate advanced spectroscopic technologies (NMR, MS, IRMS...), multivariate data processing and reference databanks of biological matrices (biological fluids, food, natural extracts and cells) in order to generate synergies in applications related to a range of European Policies (e.g. food quality, human health, exposure assessment, fight against illicit drugs, environment, agriculture...). This action is based on existing JRC competence in advanced analytical and data processing technologies for spectroscopic fingerprinting of biological fluids (metabonomics) and agro-food matrices. Advanced technology and know how will be applied to other forensic issues (e.g drugs). The agenda will be consolidated and extended in collaboration and interaction with other JRC activities and external networks.

Users: DG SANCO, ENV, AGRI, TAXUD, ENTR, JLS

Environment and health

ENVIHEALTH	Health impact assessment of environmental risk factors	IES
EXPO-Health	Human Exposure to Environmental Stressors and Health Effects	IHCP
EXPO-Tools	Integrated Exposure assessment and modelling	IHCP
MAST	Multipurpose Advanced Spectroscopic Technologies	IHCP

Agenda 2.4 Climate change

The JRC will enhance its activities in support to the Climate Change policy of the Union: the implementation of the Kyoto Protocol and the development of an international post-2012 policy regime. This includes the development of knowledge and tools in support of the Commission's initiatives, such as the EU Action Plan on Climate Change and Development.. It requires the maintenance of in-house expertise which can provide answers to current issues, the promotion of and contribution to European networks providing supporting scientific analyses and the capability to engage into research lines addressing Community related climate change issues. The agenda foresees an expansion of the JRC's capacity to deliver an integrated assessment of climate change and other policy areas (notably air pollution) in Europe and other world regions that are of strategic importance in international negotiations. JRC will be ready to provide responses to inquiries not only by the Commission, but also by

Member States, International Organizations, and the general public regarding climate change. Linkages will be developed with GMES and GEOSS activities.

Five broad areas of activities are planned:

- provision of validated reference data to assess the potential and cost of various options for the reduction of emissions by sources and enhancement of removals by sinks of greenhouse gases (cost of mitigation)
- provision of reference data to assess the exposure and sensitivity of natural and man made systems to climate change hazards, and to assess the potential and cost of reducing exposure and sensitivity to such change (cost of adaptation)
- integration of mitigation and adaptation strategies via scenario building, to contribute to an extended cost - benefit analysis of climate change policies. This includes the analysis of co-benefits and dis-benefits in other policy areas, in particular air pollution.
- development and application of methodologies for monitoring climate change, its drivers and its effects (the Global Climate Observing Systems in the context of the UNFCCC) as well as assessing the effectiveness of policies and verification of reported data and claims (the EU greenhouse gas inventory system)
- assessing the social acceptance of climate change effects and climate change policies through stakeholder involvement and multi-criteria analyses. Throughout the JRC programme, a range of other Actions also contribute to the objectives cited above. For example, activities in the field of agriculture, water resources, extreme weather events and energy will include elements highly relevant to mitigation and adaptation. Such contribution will be integrated in the overall pool of knowledge delivered by the JRC.

Five Actions will be devoted to this agenda:

1. GAPCC (Global Air Pollution and Climate Change): This action addresses the linkages between climate change and air pollution and climate change, in particular the potential for synergies and trade-offs between related policies. The Action will focus its assessments on a number of world regions (and their interconnections through hemispheric transport) that are of importance in international air pollution and climate change negotiations where the Union plays a leading role (e.g. the UN Convention on Long-Range Transboundary Air Pollution and the UN Framework Convention on Climate Change). The integrated use of models, ground and space based monitoring techniques will be expanded in that perspective.

Users: DG ENV, RELEX, ENTR, DEV

2. GHG - AFOLU (Greenhouse Gases in Agriculture, Forestry and other Land Uses): A holistic approach of agriculture, forestry and land use has been introduced in the formal assessment and reporting of greenhouse gases emissions and sinks. This introduces challenging complications when preparing the EU greenhouse gas inventory. This Action will address the issue primarily at the European level through the development and integration of process models and observations. The Action will also assess the sectors sensitivity to climate change and its options for adaptation.

Users: DG ENV, AGRI, RELEX, ENTR

3. ICPA-EEI (Integrated Climate Policy Assessment: emissions and environmental impacts): This Action will develop integrated global emission inventories of greenhouse gases and of air pollutants. It will study a broad range of environmental effects of such emissions, today and in the future, applying atmospheric and climate models and blending them with global environmental data sets. The socio-economic scenarios required as input for this work will be provided by the companion Action ICPA-Impacts (see below).

Users: DG ENV, ENTR

4. ICPA-Impacts (Integrated climate policy assessment: scenarios and economic impacts): The goal of this action is to produce integrated assessments of climate change mitigation and adaptation options. It will focus on techno-economic analyses and greenhouse gas abatement scenarios at EU and global scale. The economic impact of alternative policies will be analysed, including that of implementation modalities and mitigation costs. To this end, estimates will be made of the damage due to climate change, and cost-benefit analyses of alternative adaptation options will be conducted. Methodologies to be used include not only detailed, disaggregated sectoral models (energy, transportation, land use models), but also multi-sectoral, multi-country macroeconomic models that capture cross-sectoral spillovers as well as the transboundary effects of the policies addressed (such as competitiveness and terms of trade).

Users: DG ENV, DG TREN, DG ENTR, DG ECFIN, DG DEV

5. SOLO (Systematic Observations of Land and Oceans): Satellite data sources will be used to generate land and ocean climate related variables, in the context of the Global Climate Observing System. Quality, reliability and accuracy of satellite products will be assessed through laboratory, in situ benchmarking activities; new algorithms will be developed to increase their relevance as physical parameters in climate studies and international networks supported to ensure global acceptability of products.

Users: DG ENTR, ENV, ENTR, DEV

Climate change

GAPCC	Global Air Pollution and Climate Change	IES
GHG-AFOLU	GreenHouse Gases in Agriculture, Forestry and Other Land Uses	IES
ICPA-EEI	Integrated Climate Policy Assessment: Emissions and Environmental Impacts	IES
ICPA-Impacts	Integrated climate policy assessment; scenarios and economic impacts	IPTS
SOLO	Systematic Observations of Land and Ocean	IES

Policy Theme 3. Security and Freedom

Total Indicative Budget (2007-2013): 404.3 M€

Research Staff (Statutory/non statutory): 276

JRC is expanding its activities to support a broad range of security issues and include protection of the citizen, the territory and the essential functions of society (including economy, food, transport and economy sectors) from a range of threats, primarily: natural hazards, unintentional acts (e.g. accidental), intentional acts (e.g. illegal activities including fraud and organised crime; terrorism) as well as geo-political factors and global challenges which affect Europe both directly and indirectly.. This orientation follows new developments associated with the European Security Agenda and European Security Research, *inter alia*: the European Security Strategy (ESS 2003), the new EU Action Plan against terrorism (2004), the 2004 Report of the Group of personalities '*Research for a Secure Europe*', the Commission's preparatory action for a genuine European Security Research Programme (ESRP), the Hague programme on strengthening freedom and security in the EU, Commission proposals for the future external relation instruments, and its proposal for a new theme on Security and Space within FP7 (Cooperation activities).

JRC's agenda in this area will be to provide technological and research, capability-driven, support to the development of the European area of Freedom, Security and Justice (protection from threats related to terrorism, crime, and fraud, border management; critical infrastructure protection; transport safety and security; security of the supply chain), Global Stability and Security (humanitarian aid, development cooperation, Common Foreign and Security Policy, community action for stability, and community action relevant to non-proliferation, and Neighbourhood policies) and an improved European capacity to respond to crises and disasters.

The relevant technologies include space observations, information technologies such as web intelligence, data mining, surveillance, detection, tracing and tracking. JRC will also further develop expertise and networks in risk analysis, vulnerability assessment, systems engineering and analysis, forensic profiling of synthetic drugs and statistics including data mining, geo-spatial analysis, communication and modelling technologies Several Actions in this portfolio will be organised so that they can significantly contribute to crisis and disaster responses at the community and world-wide level. The establishment of a reference centre for testing and certification in the context of security systems, tools and methods is also included in the Agenda. Close cooperation with ESTAT will be maintained wherever relevant.

Food safety is a key political preoccupation and one that touches upon a broad range of domains such as health, trade, agriculture, consumer protection, standards, control and traceability. The JRC continues a series of Actions in this area in view of reinforcing consumer confidence in the food sector and react to food crises when they arise.

Agenda 3.1. Internal Security

The focus of this part of the JRC agenda is to develop and apply information technologies and system analysis approaches to the fight against fraud, organised crime including money laundering, and illicit trafficking. Attention will be devoted to technological and methodological developments as well as analysis studies in support to the protection of critical infrastructure in key sectors at the European level (e.g. information systems, financial systems, industrial plants, public buildings, key sites and monuments, transport and distribution systems and infrastructures such as electricity and gas/oil), to the security of the supply chain, to integrated border management (including migration), to transport safety and

security, as well as to the establishment of counter-terrorism measures. The Agenda will address prevention, preparedness and risk management in several actions where relevant. Provision of support to the EU Crisis room structure (ARGUS) is also foreseen.

There are nine actions in this Agenda:

1. BorSec (Border Security): This Action will contribute to the establishment of standards in support to border security, the implementation of the European certification reference centre for biometrics as well as the interoperability for e-passport, Schengen II information system and Visa information system. It will also act as information source on biometrics, as well as for interoperability tests, vulnerability assessment of e-passport and support to the detection of explosives and other dangerous goods.

Users: DG JLS, INFSO, RELEX, TAXUD, TREN, ENTR, RTD

2. IMIA (Intelligence and Analysis for Security and Antifraud): This Action will provide context-sensitive, EU-added-value solutions using a range of analytical techniques (data gathering, data warehousing, data mining, crosschecks, risk analysis, and assessments) in order to target suspicious aid beneficiaries, assess risk for the non-profit sector, warn about suspicious Small Arms and Light Weapons and Dual Use transfers, detect false declarations of origin, or target high risk goods and detect non-compliant EU ports.

Users: DG OLAF, AIDCO, ECHO, JLS, RELEX, TRADE, TAXUD, TREN

3. EMM (Web Monitoring and Intelligence): This Action focuses on techniques and algorithms for mining and analysing information from open sources including the Internet, providing live media monitoring to the Commission services, and intelligence analysis for investigators and analysts from the Commission, other EU institutions, and Member States. The expertise in Web and Language technologies are combined to process and analyse unstructured, multi-lingual, textual information, otherwise inaccessible.

Users: DG COMM, JLS, RELEX, ECHO, OLAF, TREN, AGRI, TAXUD, REGIO, ELARG, ENV

4 TEWTS (Test and evaluation of Wireless Technologies in security) This action aims at identifying and developing the accomplishment of a number of technical tasks in order to position the JRC as a Test and Evaluation Centre for wireless communications in the context of security applications. The action has the general objective of further investigating and validating them against real scenarios in the field of security emergencies management as well as peacekeeping operations. Particular emphasis will be given to the aspects of systems and network interoperability, compliance with standards and information/communication security and assurance, in view of defining an appropriate and agreed procedure for certification.

Users: DG TREN, JLS, INFSO

5. ITeST (Integration and Testing of Supply Chain Security Technology): ITeST (Integration and Testing of Supply Chain Security Technology): The focus of this Action is to validate approaches for integrating security in supply chains and to test technological solutions with respect to interoperability, performance and conformance to standards. A host of measures is being developed to increase the security in supply chains. At the moment the focus is on shipping containers and proposed measures including container tracing and tracking systems, transponder based seals, scanning devices, condition monitoring systems. In the future, other aspects of supply chains (bulk transport, crates, packages) will be addressed. Focus will also be on testing of identification techniques (RFID, Ultrasonic, Electrostatic, ...) to qualify guidance systems and equipment for detection, of dangerous goods.
Users: DG TREN, JLS, TAXUD

Users: DG TREN, JLS, TAXUD

6. PVACS (Physical Vulnerability Assessment of Critical Infrastructures): The focus of this Action is to assess threats and vulnerabilities of structures (such as public buildings, transport stations, energy infrastructure, key sites and monuments..), being part of critical infrastructures of the Union. It will design risk management approaches to disastrous events and intentional attacks on such infrastructures through development of appropriate structural hardening techniques. The protection of structures will be addressed against severe loads such as blasts and impacts. Structural vulnerabilities will be identified and classified via proper material modelling, structural mechanism and simulation techniques. Progressive collapse avoidance and robustness will be examined in a pre-standardisation context; blast wave effects on humans in confined urban areas will be investigated.

Users: DG TREN, JLS, ENTR, ADMIN, RTD

7. RATPSE (Radar Technologies for Public Security and Early-Warning): This Action will focus on the development of radar technologies for operational use in support of alert systems. It will develop a tools, that can be used for early-warning for tsunami triggered by slope failure e.g. in the Mediterranean/ Black Sea basins. It will also investigate the potential for operational use of the LISA system for early-warning of snow avalanches in the Alpine Region. The instrumentation will be developed in view of securing rapid deployment in crises situations.

Users: DG ENV, INFSO

8. SCNI (Security of Critical Networked Infrastructures): The objective of the Action is the assessment of threats and vulnerabilities to networked infrastructures: information systems, communication networks, electricity and gas/oil infrastructures. The focus will be on models and methodologies for the analysis and evaluation of European-wide networks, their weaknesses, potential malicious actions for attacking them, and the effectiveness of counter measures, tools for observing the networks and detecting anomalies in support of early warning, tools for data sharing, infrastructure assurance and risk governance.

Users: DG JLS, INFSO, TREN, ENTR, RTD, RELEX

9. STAF (Statistics for Anti-Fraud): The objective of this Action is to detect important fraud control problems as patterns in large volumes of data. This will be tackled by further advancing Statistical Data Mining methods. Results on operational data will be interpreted

together with experts in the field. Methods developed will be peer reviewed by the statistical scientific community. Methods to be used routinely in antifraud applications will be made available to end users via graphical user interfaces on the web. This Action will include work on composite indicators and statistics in the area of money laundering.

Users: DG OLAF, TAXUD, ESTAT, TRADE, MARKT

Internal Security

BorSec	Border Security	IPSC
IMIA	Intelligence and Analysis for Security and Antifraud	IPSC
EMM	Web intelligence and analysis	IPSC
TEWTS	Test and evaluation of wireless technologies in security	IPSC
ITesT	Integration and testing of supply chain security technology	IPSC
PVACS	Physical Vulnerability Assessment of Critical Structures	IPSC
RATPSE	Radar Technologies for Public Security and Early-Warning	IPSC
SCNI	Security of Critical Networked Infrastructures	IPSC
STAF	Statistics for antifraud	IPSC

Agenda 3.2 Disasters and Response

Actions will be dedicated to the development of better capacity to prevent, forecast and deal with natural and technological disasters. The portfolio includes systems dedicated to early warning, alert, monitoring and damage assessment. Modelling is given specific attention with respect to the occurrence of natural events such as floods and drought, for example in support of the Flood Action Programme. The reporting on and drawing lessons from natural and technological disasters will be maintained as key feature of progress in this area. The Action items are geared towards the provision of direct support to the Community civil protection mechanisms and to interventions by the Solidarity Fund. They are also linked to the development of GMES services. Synergies with Agendas 2.2 (Natural Resources) and 2.4 (Climate Change) will be developed.

There are three actions in this agenda:

1.NAHA (Natural Hazards): The Action will focus on the development of early warning, monitoring and damage assessment systems for weather driven natural hazards, as well as for tools for assessing climate change effects, land use change effects, risk mapping and adaptation (prevention and reduction) to extreme events driven by climate change. While the focus is on the European Territory, applications to non-EU areas will be considered (eg. Africa)

Users: DG ENV, REGIO, TREN, ENTR, DEV

2. MAHB/NEDIES (Risk Analysis for industrial accidents and natural disasters): The objective of this Action is to provide scientific support to the Community policies for the control of industrial accident hazards – in particular the 'Seveso' Directives – chemical incidents and natural disasters (in the context of the Civil Protection). Beyond fulfilling several Commission requirements related to the directives, MAHB will support improved

risk control through accident analysis using innovative tools, land-use planning, prevention/mitigation measures and tracing dangerous substances. It will also address emerging risks and analysis of threats/vulnerabilities of chemical infrastructures. This helps improve the implementation of EU legislation in the Member States. NEDIES will focus on lessons learned from natural disasters, risk reduction measures and analysis of natural/technological (NATECH) risks.

Users: DG ENV, ENTR, ECHO

3. SAFECONSTRUCT-Risks (Research in support of standardisation in construction and construction products) In line with its previous activity, the JRC will continue the development and calibration of models for the vulnerability assessment of existing constructions under earthquake actions. It will develop new design methods and risk mitigation strategies, including innovative technologies for retrofitting of vulnerable constructions. The action will also advance the co-operation of the major European laboratories in earthquake engineering through IT based networking and will provide support to standardization for enhanced earthquake protection (See Agenda 1.1.1).

Users: DG RTD, ENTR, ENLR

Disasters and response

NAHA	Natural Hazards	IES
MAHB/NEDIES	Risk Analysis for industrial accidents and natural disasters (MAHB/NEDIES)	IPSC
SAFECONSTRUCT - Risks	Research in support of standardisation in construction and construction products	IPSC

Agenda 3.3 Food and Feed Safety and quality

This agenda focuses on the scientific and technical support to the development, implementation and monitoring of EU policies and legislation on food and feed safety and quality. Of particular importance is Regulation (EC) No 178/2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety. It identifies risk analysis as a fundamental component of food safety policy, establishes that the food chain as a whole must be taken into consideration and that products must be traceable at all stages of the food chain.

A major part of the work of the JRC in this area will be carried out in support to Regulation (EC) No 882/2004 on official controls performed to ensure the verification of compliance with food and feed law, animal health and animal welfare rules. This regulation integrates controls at all stages of production and emphasises the importance of reference materials and the quality of analytical results. The designation of Community Reference Laboratories should contribute to a high quality and comparability of the latter.

Actions of the JRC will be in line with the Fork to Farm concept which takes into account consumers' demands and their feedback right along the food chain. The JRC will provide reference materials as well as new analytical methods or validate existing ones in collaborative trials. It will also establish and keep monitoring databases and harmonised monitoring procedures for a broad range of food and feed types as requested by its customers.

In order to support customer DGs more efficiently in emergency situations such as food crises, the JRC will extend its expertise to new and emerging areas where necessary, e.g. to molecular biology and hyphenated measurement techniques for food and feed control. The JRC will apply advanced technologies such as proteomics and metabonomics to better understand the interaction of food and health. The JRC will also prepare for areas where new EU legislation can be anticipated for the coming years, e.g. in the fields of functional and organic food, nutrition and health claims on food, allergens and innovative packaging. In this respect, it has established a Community Reference Laboratory for food contact materials (see also Agenda 2.3 – Action Expo-Health). The JRC has also established Community Reference Laboratories for mycotoxins, PAHs and heavy metals (see 1.1.1. SEMI). The cooperation with the European Food Safety Authority will be further strengthened. Cooperation with ESTAT will be established in the field of sound documented methodology. The JRC will examine how to address questions related to the identification of "traditional food" produced in Third Countries.

Four Actions are foreseen in the area of food and feed safety and quality:

1. MonCoTraF (Monitoring, Control and Traceability in the Food Chain): The objective of this Action is to develop and apply real-time monitoring as well as control systems and tools in the context of the traceability of livestock and food, animal welfare and selected animal diseases. Work is performed in view of establishing an efficient prevention of hazards (food safety crisis, animal diseases outbreaks), the detection of frauds (relevant for CAP) and non compliance with EC legal requirements in general. Practical and workable solutions, coherent with the existing Community systems, will be developed to enable a fully reliable management of the zoo-technical production with respect to safety, more particularly with respect to animal health and welfare requirements as well as consumer protection.

Users: DG SANCO, AGRI, ESTAT

2. FeedSQ & CRL (Feed safety and Community Reference Laboratory for Feed Additives Authorisation): This Action will deliver scientific and technical support in the area of analytical control of feed, especially on feed additives and animal by-products, also in urgent and unexpected cases. Within this Action the JRC will fulfil the duties as Community Reference Laboratory for Feed Additives Authorisation and Control and support other CRLs (e.g. animal by-products) upon request. The work will mainly consist of method evaluation, development and validation, the organisation of proficiency and other inter-laboratory tests to assess the capability of European control laboratories to correctly analyse feed samples, and the monitoring of substances of interest in feed upon customers' request.

Users: DG SANCO, ESTAT

3. Food RM (Reference materials for food safety and microbiology): In support to EU Directives concerning contaminants, pathogens and micro-organisms in water and food, feed additives, food labelling and anti-fraud measures this Action will develop certified reference materials and quality control materials. This will cover both matrix materials and calibration standards, where needed, to assure the reliability and comparability of measurement data. Moreover, reference materials to check the identity of micro-organisms and pathogens as well as food tracing markers will be developed. In addition, requirements to support CRLs with reference materials will be taken up.

Users: DG SANCO, AGRI, TAXUD, ESTAT

4. Food SQ (Food Safety and Quality control): This Action aims at the harmonisation of analytical procedures to be used in European laboratories in order to obtain comparable results in food control. The validation and standardisation work will cover food safety and quality and handle problems of various kinds (e.g. natural and man-made toxins, ingredients, additives, food authentication including organic food authentication by various analytical methods) also in urgent and unexpected cases. In support to the implementation of European food legislation, the Action will act as the CRL on PAHs (Poly-cyclic Aromatic Hydrocarbons) and as the CRL on mycotoxins, monitor specific substances in food, establish and maintain European databases in this area.

Users: DG SANCO, AGRI, TAXUD, ENTR, DEV

Food and Feed Safety and quality

MonCoTraF	Monitoring , Control and Traceability in the Food Chain	IPSC
FeedSQ & CRL	Feed safety and Community reference Laboratory for Feed Additives Authorisation	IRMM
Food RM	Reference materials for food safety and microbiology	IRMM
FoodSQ	Food safety and quality control (and Community Reference Laboratories for mycotoxins and PAHs)	IRMM

Policy Theme 4. Europe as world partner

Total Indicative Budget (2007-2013): 87.5 M€

Research Staff (Statutory/non statutory): 60

The JRC portfolio of Actions under this policy theme aims at providing support to two policy areas in the external relations of the Union: global security and development cooperation. The first area of work concerns the development of systems and technologies which provide information, analyses, management tools and data sets in the context of crisis management and security. Techniques will focus on the collection, analysis and diffusion related to early warning of potential crises, assessment of humanitarian aid, relief operations and post-crisis management. This will be done through the Global Disaster Alert System and to participation to responses to specific crises situations which the EU wants to alleviate around the world. A close collaboration is foreseen with the Council Situational-Centre and EU Satellite Centre. A specific contribution to GMES objectives is also foreseen.

In the context of the Stability Instrument the JRC will develop technical support to transborder challenges such as non proliferation, fight against trafficking and terrorism. Intelligence based systems, web-mining and data warehousing are central tools in this Action. The Action also makes intensive use of remote sensing data with the long term view of supporting a range of specific needs, such as monitoring illegal logging, gem mining, dual use items etc, in various parts of the world.

The second area of work concerns development cooperation where the JRC will provide information and tools for planning, monitoring and assessing development programmes. The focus will be on the establishment of satellite based monitoring systems which will maintain an intelligent watch on the conditions of resources and environment under growing human pressure. This agenda is a contribution to the European Development Fund and the development policy which require that the management of natural resources and the environmental dimension be integrated in all aspects of development cooperation. Food

availability/demand and the development of crises situations related to climate and other natural causes will also receive dedicated attention.

Furthermore, common elements of the JRC actions foreseen in the Agendas 4.1 and 4.2 will contribute to the Africa Caribbean and Pacific -ACP- Observatory for Sustainable Development. The purpose of the Observatory is to provide relevant, reliable, ready-to-use and updated information to the EC services and to the beneficiary countries and regions in order to improve the decision-making processes. Whilst addressing all ACP countries, the African continent will be the focus in the initial phase. The ACP Observatory will support three main domains: sustainable management of natural resources, food security and crisis response/monitoring for security. A thematic and geographical coordination mechanism will be put in place between the different actions.

Agenda 4.1 Global Security

The focus of this part of the JRC agenda is to develop and apply information technologies, geo-spatial (including remote sensing) analysis techniques, and system analysis approaches to provide support to policies and actions in which the Community has competence and fully participates, particularly in: crisis management, conflict prevention, international disaster response, common foreign and security policy, in addressing the root causes of migration, and in tackling global challenges such as non-proliferation, terrorism, and illicit trafficking. Some activities will be developed in support to the development of GMES services, in particular in the fields of emergency response and security.

1. ISFEREA (Information Support for Effective and Rapid External Action): the Action concentrates on the development of techniques and analytical methods for extracting information from satellite imagery to support territorial analyses. It maintains systems of data and information integration where geospatial information, political context and socio-economic analyses are combined to develop intelligence analyses. It develops methods for monitoring conflicts resources such as timber, diamonds and drug crops, for post-crisis damage assessment, for situation assessments and awareness particularly in situations of crisis or emerging crisis or threatening to escalate into a conflict, and for understanding root causes of migration and their policy implications, focusing specifically on Africa.

Users: DG RELEX, ECHO, AIDCO, DEV, ENV, OLAF, ENTR

2. CriTech (Crisis Monitoring and Response Technologies): The Action is dedicated to the development of web-based solutions to the collection, integration, analysis, visualisation and dissemination of crises related information. Expertise in numerical modelling, information technologies and GIS will be expanded in view of providing novel solutions for crisis preparedness, for early warning, for monitoring the development of a crisis, and for evaluating the consequences of crises such as those related to communicable diseases, natural disasters etc. Systems will be developed to reinforce information sharing throughout the crisis cycle. With respect to crisis management the focus will be on developing multi-hazard impact assessment system in natural and technological disaster situations, develop a centre of excellence in crisis communication and provision of scenario analysis tools for public health decision makers.

Users: DG JLS, RELEX, ECHO, ENV, SANCO, TREN, ENTR

Global Security

ISFEREA	Information support for effective and rapid external action	IPSC
CriTech	Crisis Monitoring and Response Technologies	IPSC

Agenda 4.2 Development Cooperation

There are three Actions in this Agenda, aiming at developing products usable by partner countries, which will be involved in the definition of Specific requirements. Links will be maintained with other EC funded activities and international programmes.

1. MONDE (Monitoring Natural resources for Development cooperation): The Action will establish dedicated monitoring techniques for promoting the sustainable management of natural resources in ACP countries. Particular attention will be paid to land cover and land use dynamics, fresh water availability, desertification, forest resources, coastal zone management, and marine resources, threats to biodiversity and the urban ecological footprint. Tools combining satellite data, advanced geospatial analysis and socio-economic models will be shared with Commission services and ACP countries in charge of sustainable management of natural resources and environmental protection. Country and region specific environmental diagnostics will be produced as well as reports for Multilateral Environmental Agreements. This action is a major item in the development of the ACP observatory.

Users: DG DEV, AIDCO, RELEX, ENV, ECHO, ENTR

2 MARS-FOOD (Support to Food Security): Monitoring crop conditions in sensitive areas provides the base for assessing food conditions in areas of needs in terms of UN and EU Food-related Aid delivery. Crop models are developed based on agro-meteorological, statistical and satellite data. The Action will also provide scientific and technical backing to EU-funded programmes in food security. It will contribute to the improvement of crop and food supply assessment and emergency need assessments exercises of the UN, as well as to the enhancement of Food Security Information Systems in sensitive countries and regions. The scope of the Action is global, with a special focus on Africa. The Africa activities will constitute the ACP Observatory Food Security component.

Users: DG AIDCO, RELEX, ECHO, DEV, AGRI, ENTR

3. TREES-3 (Global Forest Resource Monitoring): The Action is proposed to take a fresh look at deforestation issues in a global perspective. The work will generate regional forest maps, track areas of rapid forest change and produce statistically valid estimates of cover change for the current decade. The drivers of deforestation will be identified at the regional levels, with a focus on Eurasian boreal forests and tropical forests. The TREES-3 products will be used as inputs in future impact scenarios. Biomass maps and carbon emission/storage estimates will be produced for selected forest ecosystems and shared with Commission services, EU Delegations, International Organisations and partner countries.

Users: DG ENV, DEV, RELEX, AIDCO, ENTR

Development Cooperation

MONDE	Monitoring Natural resources for Development cooperation	IES
MARS-FOOD	Support to Food security	IPSC
TREES-3	Global Forest Resource Monitoring	IES

Policy theme 5. The EURATOM programme (2007-2011)

Total Indicative Budget (2007-2013): 517M€

Research Staff (Statutory/non statutory): 469

The nuclear activities of the JRC, implemented under the Euratom Multi-annual Work Programme, so called “Direct Actions”, aim to satisfy the R&D obligations of the Euratom Treaty¹ and to support both Commission and Member States in the field of safeguards and non-proliferation, waste management, safety of nuclear installation and fuel cycle, radioactivity in the environment and radiation protection.

The objective of the programme is to develop and assemble knowledge on nuclear energy production, its safety and reliability, its sustainability and control, its threats and challenges and its future exploitation potential, including safety and security of innovative/future reactor systems.

Agenda 5.1 Nuclear waste management and environmental impact

The management of spent fuel and nuclear high level waste (NHLW) involves transport, conditioning, storage and geological disposal. The major objective is to prevent the release of radionuclides to the biosphere over a very long time scale. The design, assessment and functioning of the engineered, and natural barrier system over the relevant time scales are key components for the achievement of this objective and depend *inter alia* on the fuel behaviour. The development of inert matrices for NHLW conditioning will represent in the long term a key improvement in nuclear waste management.

The study of alternative waste management strategies that would considerably reduce the long-term hazard of waste disposal continues to gain high attention. For transmutation, both fast and thermal reactors are considered along with dedicated actinide burning facilities. Most proposed concepts for future reactor systems incorporate such selective radionuclide separation.

Basic knowledge is required to underpin the understanding of physical processes in nuclear fuel from production of energy to waste management. In addition, the proposed designs for dedicated minor actinide burners and advanced concepts for nuclear energy production result in new demands for nuclear data with significantly improved accuracy. The medical applications benefit from JRC’s nuclear facilities and expertise, which are used for research on new isotope production, development of clinical reference materials and support to new cancer therapies.

According to the Euratom Treaty, Articles 35 and 36, the Member States are obliged to monitor the level of radioactivity in the environment and communicate the results to the Commission. This allows checking compliance with regulations. Support for these obligations includes the continuous exchange, validation and reporting of information related to radioactivity in all environmental compartments as well as scientific and technical support for the implementation.

Finally, it is important for new generations of nuclear scientists and engineers, to maintain and deepen knowledge of nuclear research through experiments, results, interpretations and skills acquired in the past. This applies especially to domains where three decades of experience in analysis of reactor performance and safety was concentrated in complex

¹ Mainly Art 8 ; Art 35, chapter VII

analytical tools such as models and computer codes. Basic research activities link closely to training and education activities and access to facilities.

The agenda has seven sub-agendas reflecting the different areas of work:

- 5.1.1 Spent fuel characterisation, storage and disposal
- 5.1.2 Partitioning, Transmutation and conditioning
- 5.1.3 Basic actinide research
- 5.1.4 Nuclear data
- 5.1.5 Medical applications from nuclear research
- 5.1.6 Measurement of Radioactivity in the environment
- 5.1.7 Knowledge Management, Training and Education

5.1.1 Spent fuel characterisation, storage and disposal

This line of research aims to investigate in all of its aspects a high-level waste management strategy favoured by several member states namely intermediate storage with subsequent conditioning for final disposal. It also provides research for the other strategy that involves reprocessing and transmutation to lower the radio-toxicity of high-level waste before geological disposal as it investigates short-term storage scenarios and facilities for transport and storage.

This sub-agenda contains two Actions related to the behaviour of the high-level waste during storage and to the packages and facilities employed for storage and disposal.

1. HLWM (High Level Waste Management): The ultimate aim of this Action is to be able to predict the properties and the response of the waste system to specific environmental conditions, referred to final repository, to interim repository, and to short-term storage scenarios. To achieve this aim, it will acquire experimental data and results from atomistic calculations suitable to derive a comprehensive understanding of the long-term behaviour of high level waste forms from current and future nuclear fuel cycles.

User: DG TREN

2. SAFEWASTE (Waste packages and systems for transport, storage and disposal of high-level nuclear waste and spent fuel): The objective of this Action is to develop a sound scientific and technical basis for assessing the safety of packages and systems for nuclear waste and spent fuel, including transport, storage and deep geological disposal. It will also promote harmonised approaches to accelerate implementation of disposal systems in the Community, collaborating with relevant IAEA and OECD initiatives. The Action will develop methods for assessing the performance of waste packages and systems in selected key areas: structural integrity, inspection, radionuclide migration and risk analysis, and will consider a range of potential degradation processes and scenarios. Collaboration with stakeholders (implementors, safety authorities and R&D organisations) via networking and participation in international projects is foreseen. Special focus will be given to training and dissemination.

User: DG TREN

Spent fuel characterization, storage and disposal

HLWM	High Level Waste Management	ITU
SAFEWASTE	Waste packages and systems for transport, storage and disposal of high-level nuclear waste and spent fuel	IE

5.1.2 Partitioning, Transmutation and Conditioning

1. AFC (Alternative Fuel Cycles): This Action will provide reliable information to policy and decision makers for the management of radioactive waste, in particular spent fuel, in order to reduce the radio-toxicity both in activity and in time and thus permitting a safe, sustainable and broadly acceptable management strategy for spent fuel and long-lived waste. The JRC will reinforce its competences and facilities to address an important issue of major societal concern.

User: DG TREN

Partitioning, transmutation and conditioning

AFC	Alternative Fuel Cycles	ITU
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5.1.3 Basic actinide research

1. FAR (Fundamental and applied Actinide Research): The aim of this Action is to provide the basic and more applied knowledge to underpin the understanding of nuclear materials and fuel processes (from production of energy to waste storage), and to stand as the “academic window” and reference centre of the JRC activities in the field, including knowledge dissemination through active contribution to the European Research Area.

Users: DG TREN, ELARG, RTD

Basic actinide research

FAR	Fundamental and applied Actinide Research	ITU
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5.1.4 Nuclear data

Neutron induced reaction cross sections are the basic data required for the assessment of safety aspects of nuclear energy production and the nuclear fuel cycle, and for the design of advanced new concepts. Any design of such a nuclear system relies on a complete and accurate neutronics data base. Libraries of experimental as well as evaluated neutron data are maintained by nuclear data centres in China, Europe, Japan, Korea, Russia, USA, coordinated by the Working Party on International Evaluation Co-operation (WPEC) of the Nuclear Energy Agency (NEA) of the Organisation for Economic Co-operation and Development (OECD). Co-operation with non-OECD countries is ensured through the participation of the International Nuclear Data Centre (INDC) of the International Atomic Energy Agency (IAEA).

For many isotopes or neutron energy regions experimental data are lacking or are inconsistent, and the evaluations rely on model codes to complement the data bases. Especially in these cases data libraries often show substantial differences among each other. Detailed requirements for new measurements and evaluations are collected in a High Priority Request List which is edited by the NEA databank. The JRC Actions ND-standards and ND-minwaste carried out at the JRC facilities for nuclear data measurements support these international programmes, with special emphasis on the JEFF project (Joint Evaluated Fission and Fusion File). JRC offers access to its facilities to external users through a Euratom Transnational Access Programme.

This sub-agenda contains two Actions:

1. ND-minwaste (Nuclear Data for waste transmutation and safety of innovative concepts): Different scenarios for nuclear waste minimisation, based on accelerator-driven systems or fast reactors, are under discussion. In parallel, the Generation IV nuclear energy systems are under development, with much improved safety and reliability and much reduced amounts of high-level waste. The current nuclear database is not sufficient to fulfil the high demands on accuracy and completeness imposed by these investigations. This Action will provide experimental data for the assessment of reactor and spent fuel safety, nuclear waste management, Accelerator Driven System (ADS) development, and Generation IV concepts.. Special attention will be given to the fast neutron energy range. The priorities for new measurements are determined in close co-operation with the NEA databank of the OECD and the Nuclear Data Section of the IAEA.

User: DG TREN

2. ND-standards (Basic research in nuclear physics and nuclear data standards): The majority of measurements in neutron physics are performed relative to cross-section standards. It is therefore essential that these standards be continuously improved and their underlying physical mechanisms understood. In order to arrive at comprehensive libraries of evaluated data, cross-sections of all the reactions not accessible experimentally are calculated using models. The improvement of modelling of neutron-induced nuclear reactions based on experimental information is an essential part of the data evaluation process. The Action will concentrate on measurements of standard cross sections, studying the fission process, and modelling of neutron induced reactions, based on experimental data. The Action will also support new developments in measurement techniques and data acquisition systems.

User: DG TREN

Nuclear data

ND-minwaste	Nuclear Data for waste transmutation and safety of innovative concepts	IRMM
ND-standards	Basic research in nuclear physics and nuclear data standards	IRMM

5.1.5 Medical applications from nuclear research:

Two medical applications activities have emerged from the performed nuclear research. The aim is to develop these applications further on and make them available for implementation by hospitals and pharmaceutical industry.

1. AIT (Alpha-Immunotherapy): This Action will contribute to the development of novel strategies for the therapy of cancer and infectious diseases. The main objectives are to develop production processes for the reliable supply of suitable alpha emitters to hospitals and to obtain fundamental data on the mechanisms of radiation induced effects on human cells.

User: DG RTD

2. NCT (Development and Exploitation of Neutron Capture Therapy): This Action will provide the scientific and technical support for a disease targeted therapy for the treatment of certain types of cancer and other diseases. It will provide standardisation in treatment planning, dosimetry and testing of boron compounds. Competencies will be reinforced through clinical trials at the High Flux Reactor. New tumour types, e.g. from the liver, will be treated with the additional goal to have a European standard, including one for treatment planning and dosimetry. Societal issues, through the use of NCT for diseases of the ageing, such as arthritis, will be investigated. Ethical issues, such as the testing of boron compounds in cell cultures alone, will lead to recommendations avoiding animal experiments.

Users: DG SANCO, INFSO

Medical applications from nuclear research

AIT	Alpha-Immunotherapy	ITU
NCT	Development and Exploitation of Neutron Capture Therapy	IE

5.1.6 Measurement of Radioactivity in the environment.

Based on the JRC experience and expertise in radionuclide measurements and metrology, this line of research aims at further improving the analysis, control and understanding of radioactivity in the environment in accordance with the Euratom Treaty Art. 35 & 36 on continuous monitoring of radioactivity levels in air, water and soil and its verification.

This sub-agenda consists of three Actions:

1. MaRe (Measurement of Radioactivity in the environment and biological matrices): This action focuses on the development of analytical methods in trace analysis of radionuclides in the environment, the identification and characterisation of radioactive scrap material and sources. Work also includes studies on speciation and migration patterns of actinides in the biosphere.

Users: DG TREN, ELARG, ENV, SANCO

2. Radioactivity Environmental Monitoring (REM): The aim of this Action will be to perform research in support of the design and implementation of EU policies in the field of environmental radioactivity monitoring. It will also support Member States in the harmonization of national modelling tools including their use in radiological emergency situations.

Users: DG TREN, ENV

3. RADMET (Radionuclide Metrology for Primary Standardisation and Policy Support): This Action contributes to the combined effort to build an international reference system for radioactivity standards. The priorities for new measurements are determined in close co-operation with the 'Comité Internationale des Poids et Mesures' and the 'Bureau International des Poids et Mesures' (CIPM/BIPM). Reference materials for radionuclides in food and environmental matrices are developed and measurement comparisons are organised with the monitoring laboratories of the Member States to support the harmonisation of EU-wide monitoring. It will use the wide range of measurement equipment including an underground gamma-spectrometry laboratory to provide SI-traceable reference measurements and improved nuclear decay data of fissile materials and fission products. New generations of nuclear scientists and engineers will be trained through strengthened networking activities.

Users: DG TREN, ELARG, ENTR, ENV

Measurement of radioactivity in the environment

MaRe	Measurement of Radioactivity in the environment and biological matrices	ITU
REM	Radioactivity Environmental Monitoring	IES
RADMET	Radionuclide Metrology for Primary Standardisation and Policy Support	IRMM

5.1.7 Knowledge Management, Training and Education

1. KTE (Knowledge Management, Training and Education): This Action aims at maintaining, developing and disseminating knowledge in the nuclear field. It promotes and disseminates comprehensive sources of reliable nuclear information, provides high-level training for young students and researchers in the nuclear field and dedicated seminars. This Action will also support the coordination and provision for general training needs in nuclear science and technology through scientific networking, schools and workshops.

Users: DG TREN, Member States

Knowledge management, Training and Education

KTE	Knowledge Management, Training and Education	ITU
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Agenda 5.2 “Nuclear safety”

Nuclear safety includes both the safety of the reactors and the safety of the nuclear fuel itself. To maintain and improve the safety level of both Western and Russian type of nuclear power plants, advanced and refined safety assessment methodologies and corresponding analytical tools have to be extended and validated. Targeted experimental investigations will be carried out to enable the validation and verification of the safety assessment tools and to improve the understanding of the underlying physical phenomena and processes. The JRC is fully involved in the international efforts for an advanced nuclear reactor safety.

Fuel safety concentrates on prevention and mitigation of the consequences of hypothetical accidents. The two main aspects in this research are: mechanical integrity of the fuel assemblies during reactor lifetime, and fuel response to transient conditions and to severe reactor accident conditions up to core melt down.

The studies have also to reflect on the new reactor strategies presently considered worldwide, like the Generation IV Roadmap scenario, inspired by a comprehensive assessment including public concerns, such as improved safety, reduced wastes and improved resistance to proliferation.

The agenda has 3 sub-agendas:

5.2.1 Safety of nuclear installations

5.2.2 Nuclear fuel safety in power reactors operating in the EU

5.2.3 Safe Operation of Advanced Nuclear Energy System

5.2.1 Safety of nuclear installations

The Actions in this area focus on the long term safe operation of both Western and Russian power reactor types. The activities concentrate on providing the scientific and technical knowledge, especially in important safety issues needed for policy support and for safety enhancement in general. These activities aim at contributing to the high safety level of nuclear installations in the enlarged EU and Neighbouring Countries. Main areas addressed are safety of ageing components in nuclear power plants, safe operation of nuclear installations, and analysis and management of nuclear accidents. A new Action aims to establish and operate a centralized EU Clearinghouse for operational experience feedback in nuclear safety.

1. SAFELIFE (Safety of Ageing Components in Nuclear Power Plants): Experimental research will exploit unique JRC facilities to study potential damage (radiation embrittlement, fracture, fatigue and corrosion) with extreme loading scenarios of key NPP components. The results will be integrated into deterministic and risk-informed models, in the framework of European and international initiatives to promote best practice for plant life management. The Action will develop advanced component life assessment methods to address ageing damage processes and vulnerability to extreme loading scenarios, support safety authorities by promoting European consensus on best practices, also in the context of IAEA and OECD initiatives, and underpin the European competence base in nuclear safety via training and knowledge management.

Users: DG TREN, ELARG, RELEX, AIDCO

2. SONIS (Safe Operation of Nuclear Installations): The Action addresses techniques for maintenance and In-Service Inspection optimization including risk informed approaches, integrated with asset management and probabilistic safety assessment, analysis of the available experience in the fire qualification of equipment and database development, models for plant operating organizations with integration of the operational safety programs. Models will be developed for a cost effective integration of the operational safety of both existing and new nuclear installations, with special emphasis on the long term plant operation, for Maintenance, Surveillance and Inspection for systems and structures important to safety, for fire safety and for organisational and management issues.

Users: DG TREN, RELEX, ELARG, AIDCO

3. AMA (Analysis and Management of nuclear Accidents): The Action addresses analysis of the consequences of a severe accident by dissemination of the PHEBUS and associated separate effect test programs for computer code application improvement, analysis of the safety aspect connected with a potential explosion of hydrogen, probabilistic and risk methodologies for complementing the deterministic approaches and for a better definition and quantification of safety margins. The Action aims to contribute at a European level to the

harmonisation of commonly validated and accepted computer code applications for the safety analysis of nuclear reactor accidents and the planning of adequate accident management measures, through validation, verification, benchmark-exercises and dedicated work-shops.

Users: DG TREN, ELARG, RELEX, AIDCO

4. NUSAC (Nuclear Safety Clearinghouse): The objective of this Action is to establish and operate a centralized EU Clearinghouse for operational experience feedback which will produce systematic insights into the depth of the implemented NPP (Nuclear Power Plant) safety precautions and margins and will serve as an effective instrument to strengthen co-operation between licensees, regulatory bodies and technical experts involved in assessment of operational events.

Users: DG TREN, ENV, RELEX, ELARG, AIDCO, RTD

Safety of Nuclear installations

SAFELIFE	Safety of Ageing Components in Nuclear Power Plants	IE
SONIS	Safe Operation of Nuclear Installations	IE
AMA	Analysis and Management of nuclear Accidents	IE
NUSAC	Nuclear Safety Clearinghouse	IE

5.2.2 Nuclear fuel safety in power reactors operating in the EU

1. SCNF (Safety of Conventional Nuclear Fuels): This Action will establish the in-pile behaviour of conventional UO₂ water reactor fuel and MOX fuel at extended burn-up up to and beyond 100 MWd/kgHM. It also aims to understand the mechanisms controlling fission gas release, fuel swelling and fuel-cladding mechanical interaction, all of which may limit the burn-up that can be reached. The TRANSURANUS code will be extended to VVER and CANDU fuel and be updated so that it can be used by national safety authorities for the licensing of nuclear fuel.

Users: DG TREN, ELARG

Nuclear fuel safety in power reactors operating in the EU

SCNF	Safety of Conventional Nuclear Fuels	ITU
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5.2.3 Safe Operation of Advanced Nuclear Energy Systems

It is essential for the JRC to be part, directly and indirectly (by co-ordinating European contributions), in the world-wide initiative on new reactor strategies. This includes primarily safety and safeguard aspects of innovative nuclear fuel cycles, in particular characterisation, test and analysis of new fuels. Also the development of safety and quality goals, safety requirements and advanced evaluation methodology for reactors will be addressed. This is reflected in the two Actions of this sub-agenda:

1. SAF (Safety of Advanced Fuels): New JRC competences pertaining to advanced sustainable fuels and their fuel cycles will be established, thus maintaining and developing the JRC position as an independent advisor to the Commission and Member States on fuel safety related issues. In doing so, the JRC will also make an important contribution in the quest to fulfil energy needs of future generations. This Action will form part of the EURATOM contribution to Gen IV International Forum (GIF).

User: DG TREN

2. SAFETY-INNO (Safety of innovative reactors design): Safety, feasibility and performance of innovative nuclear systems will be evaluated through the execution and the scientific analysis of irradiation experiments on fuel and on structural materials for innovative reactors in the HFR Petten, analyses of the nuclear and thermal-hydraulic safety of various GIF systems, and of conceptual ADS designs, out-of-pile structural material tests, maintenance work and upgrading of the fuel and materials databases, coordination of the R&D within the HTR-TN network and the V/HTR-IP. Scientific and technical support will be provided for the development of selected innovative reactor projects that would make the nuclear power option safer, more versatile and sustainable, economically sound and publicly acceptable. This objective shall be reached through European, multinational or bi-lateral cooperation with at least one existing demonstration reactor project in Europe or elsewhere.

User: DG TREN

Safe Operation of Advanced Nuclear Energy Systems

SAF	Safety of Advanced Fuels	ITU
SAFETY-INNO	Safety of innovative reactors design	IE

Agenda 5.3 Nuclear security

Although the JRC has over 30 years experience in supporting the Euratom and Non-Proliferation Treaties, technical innovations and improvements are continued to be required to implement the evolving safeguards policy. The Additional Protocol aims to assure the absence of undeclared nuclear operations. Its implementation requires a number of techniques different from those involved in verifying nuclear material accountancy. It requires an overall description of a country's nuclear activities, provisions for more extensive site declarations and more varied inspection requirements.

The detection and the identification of illegally transported or stored nuclear material constitute a major line of defence against the illicit trafficking. Nuclear forensic science provides clues on the origin of the seized material. Establishing appropriate response plans for handling cases of detection remains an important issue.

The agenda is organised in two sub-agendas:

5.3.1 Nuclear Safeguards, Additional Protocol and Combating Illicit Trafficking

5.3.2 Open source Information collection on Nuclear Non Proliferation

5.3.1 Nuclear Safeguards, Additional Protocol and Combating Illicit Trafficking:

The JRC contributes to nuclear security in the areas of safeguards, non-proliferation and the fight against illicit activities involving nuclear and radiological material. The activities consist mainly of science-based technical support to Commission Services (DG TREN, RELEX, AIDCO) and to the International Atomic Energy Agency (IAEA) and involves also work through international collaboration and networks (incl. advanced nuclear energy systems). The activities include a wide range of technological R&D, on-site assistance, production and world-wide dissemination of certified reference materials and other quality assurance tools, training and knowledge management. In the last decade the focus has evolved from the verification of nuclear material accountancy in declared activities to the monitoring of the complete fuel cycle and to the objective of detecting undeclared activities (Additional Protocol). In addition more recent evolution has been motivated by the new security threats associated with illicit trafficking and potential misuse of nuclear and/or radiological material.

Eight Actions are foreseen:

1. NUMAMET (Nuclear Materials Measurement Techniques): Technical innovations and improvements drive this Action of JRC support to the Euratom and Non-Proliferation Treaty based on available experimental facilities, well characterized materials and nuclear fuel cycle competences. This Action focuses on measurement methods of nuclear and radioactive material, qualification of plant specific NDA reference materials, data integration of these nuclear measurements and the on-site assistance and provision of training for IAEA and Commission inspectors. The technologies developed provide input also to non-proliferation and combating illicit trafficking activities. This includes characterisation of other material by analysis of neutron induced reactions. The Action can also contribute to the monitoring of the international commitments for returning weapon grade materials in the civil fuel cycle (US and RF).

Users: DG TREN, RELEX, AIDCO

2. PhyMod (Physical Modelling and analysis of instruments and systems): The simulation technique has become a valid and valuable tool to replace measurements every time the experiment is impossible. In addition physical modelling is applicable for nuclear security assessments (e.g. detection equipment design and capabilities). JRC continues to develop methods (based on Monte Carlo techniques) to simulate the behaviour of NDA instruments used in nuclear safeguards. This Action also deals with source term calculation and verification of spent fuel compositions for safeguarding the back-end of fuel cycle. For the analysis and interpretation of the large amount of process data in complex installations, system modelling is essential. The JRC process monitoring tool aims to verify the consistency and coherency of plant operation with safeguards requirements. Enhanced solution monitoring will also be pursued.

Users: DG TREN, RELEX, AIDCO, IAEA

3. VERTEC (Verification Technologies and Methodologies (for nuclear safeguards and additional protocol)): Verification of nuclear materials, activities and processes, increasingly involves intelligent monitoring systems, remote measurements, mobile communications, secure data transmission and computer assisted manipulations, as well as better tools for information analysis to reduce both inspector workload and burden on the nuclear industry. In the new Euratom safeguards approach also the concept of auditing for assessment of the accountancy system quality is included which JRC will support by means development of

methodology and training. The “investigative inspector”, with its enhanced role under the additional protocol, will also be provided additional support and tools including information processing using Geographical Information System, extended to multiple types of data, sources and time-frames.

Users: DG TREN, RELEX, AIDCO

4. AMENUS (Assessment Methodologies for Nuclear Security): This Action will contribute to the development of methodologies, software tools and probabilistic methods for evaluation of safeguards effectiveness, proliferation resistance and, when requested, vulnerability assessment of existing and advanced nuclear energy systems and research reactors. This is connected to the participation in the Generation IV International Forum (GIF) expert group for “Proliferation Resistance and Physical Protection” (PR&PP), contribution to IAEA INPRO (International Project on innovative reactors and fuel cycles) and collaboration with other related international initiatives (e.g., GNEP Global Nuclear Energy Partnership). Specific studies can be made on request to assess the capabilities of different reactor systems for producing specific nuclear materials (either during normal operation or through dedicated cycles). A focus will also be on the design and development of tools to analyse import/exports of dual-use items and technology.

Users: DG TREN, RELEX, AIDCO

5. FACIL (Forensic Analysis and Combating Illicit Trafficking): The Action constitutes a major line of defence against the illicit trafficking of nuclear and other radioactive materials. It includes:

- Development of analytical methodologies to investigate nuclear forensic samples as well as for other Safeguards purposes.
- Study of new parameters for the determination of the origin of nuclear materials. These include the correlations between impurities in a nuclear sample and its origin, age determinations, the use of microscope techniques, etc.
- Training of National Experts of Members States (Characterisation of radioactive material, chemical analysis, trace analysis, macrostructure, microstructure,...)
- Maintenance of the ITU Nuclear Forensics Database
- Support to EC and member states in analysing seized materials
- Support to ITWG, IAEA, Europol, Interpol, and other(inter-)national organisations.

Users: DG TREN, RELEX, AIDCO

6. NTAS (Nuclear and Trace Analysis for Safeguards): This Action contributes to Commission services under the Euratom Treaty and to IAEA under the Non-Proliferation Treaty. Continuous technical innovations and improvements are required to implement the evolving safeguards policy of present and future fuel cycles. Analytical measurements (destructive, non-destructive) are provided to the safeguards authorities (IAEA and DG TREN) - especially for the detection of undeclared activities using the techniques of particle analysis – as well as to other (inter-)national organisations. Analytical support to other nuclear-oriented projects of JRC will be also ensured.

Users: DG TREN, RELEX, AIDCO

7. METRO (Metrological tools to support nuclear safeguards activities): This Action will support nuclear safeguards and fissile material control by providing metrological tools for measuring bulk materials and also environmental samples. JRC will provide reference materials to the highest standard of uranium and plutonium and carry out inter-laboratory comparison exercises (REIMEP, NUSIMEP). New samples will be developed for inter-laboratory comparison campaigns for environmental sampling.

Users: DG TREN, RELEX

8 NuTraSeal (Development and validation of nuclear traceability and sealing systems): This Action will develop and validate sealing and traceability systems for use by safeguards inspectors. Nuclear safeguards applications require highly specialised and secure systems for sealing and providing continuity of knowledge in safeguarded installations. New solutions and improved designs are continuously requested by the inspection agencies (e.g. new development for dry storage, long-term repositories). The Action provides in-house design, validation and production of seals, reading systems and data acquisition systems. Besides developing these systems, the Action also involves vulnerability assessment of systems that are developed by other countries (e.g. under support program to the IAEA).

Users: DG TREN, JLS, TAXUD

Nuclear Safeguards, Additional Protocol and Combating Illicit Trafficking

NUMAMET	Nuclear Materials Measurement Techniques	IPSC
PhyMod	Physical Modelling and analysis of instruments and systems	IPSC
VERTEC	Verification Technologies and Methodologies	IPSC
AMENUS	Assessment Methodologies for Nuclear Security	IPSC
FACIL	Forensic Analysis and Combating Illicit Trafficking	ITU
NTAS	Nuclear and Trace Analysis for Safeguards	ITU
METRO	Metrological tools to support nuclear safeguards activities	IRMM
NuTraSeal	Development and validation of nuclear traceability and sealing systems	IPSC

5.3.2 Open source information collection on Non-Proliferation:

With the aim of supporting Commission services and collaborating with the IAEA and Member States authorities, the JRC collects and analyses information from a variety of sources (internet, specialised literature, data bases) on nuclear non-proliferation issues. This information can be used to produce country reports where the evolution of nuclear activities and of import and/or export of nuclear direct and dual use equipment and technology in selected countries will be closely followed. To underpin this work, JRC will further develop multilingual web search, knowledge management and data mining technologies. The information from these open sources will be supplemented with satellite imagery.

1. Non Proliferation Open Source INTelligence (NP-OSint): This Action investigates and reports on issues related to the proliferation of weapons of mass destruction. Within the Action, reports and briefings are produced on an as requested basis on issues of nuclear, chemical and biological non-proliferation and delivery systems. The reports cover countries, smuggling networks and locations that perform training for suspect persons. They are compiled from information procured from open sources using tools developed by the JRC and from the analysis of satellite images.

Users: DG TREN, RELEX

Open source information collection on Non Proliferation

NP-OSint	Non Proliferation Open Source INTelligence	IPSC
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Section 3. Integration of JRC Actions

Rationale

To increase integration in the execution of the JRC work programme, seven Priority Areas have been identified. These are groupings of Actions which are related in terms of theme of study, scientific support fields, required experimental facilities and overall expertise. These groups of actions require similar competences and contribute to same overall policy area.

The Institute Directors are assuming the tasks of Priority Area Coordinators (PACs) as shown in the following Table. The PACs will take the lead in the development of their respective Priority Area with a focus on integration of the relevant Actions with respect to strategy, contents and development of competences. Where applicable, the PACs will also stimulate and monitor the delivery of products to the customers.

The PACs are delegated by the DG to coordinate strategic planning and integration of Action implementation in their priority area. They also carry out forward analyses and anticipation not limited to existing actions.

The advantage of proceeding along such line is to take maximum benefit of the multidisciplinary nature of the JRC and offer an integrated and coherent service to the policy DG services.

Priority areas in JRC Work Programme and coordination

1. Food chain	DIR IRMM
2. Biotechnology, chemicals, health	DIR IHCP
3. Environment ,climate change, natural disasters	DIR IES
4. Energy and Transport	DIR IE
5. Nuclear Energy, Safety and Security	DIR ITU
6. Lisbon agenda, information society, rural development	DIR IPTS
7. Internal/External security, antifraud and development aid	DIR IPSC

Annex 1. JRC FP7 MAWP List of proposed Actions

Policy Theme	Agenda	Sub-A	Acronym	Title	Institute
1. Prosperity in a Knowledge Intensive Society	1.1 Competitiveness and innovation	1.1.1	SUP-STANDS	Research in support of standardisation in construction and construction products	IPSC
		1.1.1	Europ RM	European Reference Materials – Technology developments and quality management	IRMM
		1.1.1	SEMI	Support to European Measurement Infrastructure (and Community Reference Laboratory for heavy metals)	IRMM
		1.1.2	EEMC	Euro area economy modelling centre	IPSC
		1.1.2	FINECON	Financial econometrics for a single market and competitiveness policies	IPSC
		1.1.2	QSI	Quality of Scientific Information in the EU Policy Processes	IPSC
		1.1.3	STATIND	Indicators and benchmarks for education innovation and the knowledge economy	IPSC
		1.1.3	HREK	Human Resources for a Europe of Knowledge	IPTS
		1.1.3	IRI	Industrial Research and Innovation	IPTS
		1.1.4	EIPPCB	European Integrated Pollution Prevention and Control Bureau	IPTS
		1.1.4	SUSPROC	Sustainable Production and Consumption	IPTS
		1.1.5	CompuTERM	Computational Toxicology and Environmental Risk Modelling	IHCP
		1.1.5	Refine RISK	Integrated Risk Assessment of Chemicals	IHCP
		1.1.5	SUPCHEM	Support to Chemicals Legislation	IHCP
		1.1.5	GlobCHEM	Global Chemical Data Management and Harmonisation	IHCP
		1.1.6	COSIN-JRC	Community Spatial Information Infrastructure	IES
		1.1.6	INSPIRE	Infrastructure for Spatial Information in Europe	IES
		1.1.6	IWQIS	Integrated Water Quality Information System	IES
		1.1.6	CID	Community Image Data	IPSC
	1.2 European Research Area		IP-KT	Intellectual Property and Knowledge Transfer	DISR
			ERA-Policies	Support to Evidence-Based Research Policy-Making	IPTS
			FOR-ERA	Foresight for the European Research Area	IPTS
	1.3 Energy and Transport	1.3.1	FENCAB	Energy Material Products from Coal and Biomass	IE
		1.3.1	ASSETS	Assessment of Energy Technologies and Systems	IE
		1.3.1	FCPoint	Fuel Cell Power Chain Integration and Testing	IE
		1.3.1	SYSAF	Systems for Alternative Fuels	IE
		1.3.1	BioF	Quality and Performance of Biofuels	IES
		1.3.1	SOLAREC	Photovoltaic Solar Electricity (Resource, Performance and Value)	IES
		1.3.1	REFREE	Scientific Technical Reference System for Renewable Energy and End-Use efficiency	IES
		1.3.1	ETTEA	Energy and Transport Techno-Economic Analysis	IPTS

		1.3.2	SusTrans	SUSTAINABLE TRANSPORT	IES
		1.3.2	TransTech	Transport Technologies and emissions	IES
		1.3.2	APE	Air pollution and effects	IES
		1.3.2	ECCAIRS	European Centre for Collection and Assessment of Multimodal Transport Safety Data	IPSC
		1.3.2	VATDIS	Vulnerability Assessment in Transport Distribution Systems	IPSC
		1.3.2	AIRMODE	Air Quality and Transport Modelling	IES
	1.4 Information Society		e-APPLICATIONS	Applications for the Information Society	IPTS
			IS&GROWTH	Information Society, Competitiveness and Growth	IPTS
			TEFIS	Techno-economic Foresight for the Information Society	IPTS
	1.5 Life Sciences and Biotechnology		VALINFO	Validation and dissemination of scientific information & management support	IHCP
			CRL-IGL	Community Reference Laboratory for Genetically Modified Food and Feed and Support to the Implementation of the GMO Legislation	IHCP
			ITraS	Identification and Traceability of GMOs and systems biology	IHCP
			InViTech	In vitro testing technologies and assay automation	IHCP
			Nanobiotech	NanoBiotechnology for Health	IHCP
			MANTRA	Molecular And Nano-TRacer Applications	IHCP
			VALCOS	Validation for Cosmetics	IHCP
			VALCHEM	Validation for Chemicals	IHCP
			VALDRUG	Validation for Pharmaceuticals	IHCP
			VALPRO	Validation for Consumer Products	IHCP
			LIFETECH	New Technologies in Food and Medicine - socio-economic analysis for policy development	IPTS
			Biotech RM	Reference materials for biotechnology and life sciences	IRMM
2. Solidarity and the responsible management of resources	2.1 Rural development, agriculture and fisheries	2.1.1	MARS-PAC	Management and Control Methods for the Common Agricultural Policy	IPSC
		2.1.1	MARS-STAT	EU and World Crop Production Forecasts and Estimates, Climate Change impact on Agriculture Systems	IPSC
		2.1.1	AGRITECH	New Technologies in Agriculture - their agronomic and socio-economic impact	IPTS
		2.1.1	AGRITRADE	Support to Agricultural Trade and Market Policies	IPTS

		2.1.1	SUSTAG	Support to Sustainable Agricultural and Rural Development Policies	IPTS
		2.1.1	AGRI-ENV	Integration of environmental concerns into agriculture	IES
		2.1.2	FISHREG	Scientific and Technical Support to the Common Fisheries Policy	IPSC
		2.1.2	MASURE	Maritime Surveillance	IPSC
		2.1.2	PROCAS	Protection and Conservation of European Seas	IES
	2.2 Natural Resources		ATEAM	Aquatic and Terrestrial Ecosystems Assessment and Monitoring	IES
			EEWAI	European Ecological Water Quality and Intercalibration	IES
			FOREST	Forest data and information systems	IES
			SOIL	Soil data and information systems	IES
			ENSURE	Environmental assessment of European wastes and the sustainable use of resources	IES
			IMES	Isotopic Measurements for environmental support	IRMM
			Env RM	Environmental reference materials	IRMM
	2.3 Environment and Health		ENVIHEALTH	Health impact assessment of environmental risk factors	IES
			EXPO-Health	Human Exposure to Environmental Stressors and Health Effects	IHCP
			EXPO-Tools	Integrated Exposure assessment and modelling	IHCP
			MAST	Multipurpose Advanced Spectroscopic Technologies	IHCP
	2.4 Climate Change		GAPCC	Global Air Pollution and Climate Change	IES
			GHG-AFOLU	GreenHouse Gases in Agriculture, Forestry and Other Land Uses	IES
			ICPA-EEI	Integrated Climate Policy Assessment: Emissions and Environmental Impacts	IES
			ICPA-SEI	Integrated Climate Policy Assessment - scenarios and economic impacts	IPTS
			SOLO	Systematic Observations of Land and Ocean	IES
3. Security and freedom	3.1 Internal security		BorSec	Border Security	IPSC
			IMIA	Intelligence and Analysis for Security and Antifraud	IPSC
			TEWTS	Test and evaluation of wireless technologies in security	IPSC
			ITesT	Integration and testing of supply chain security technology	IPSC
			PVACS	Physical Vulnerability Assessment of Critical Structures	IPSC

			EMM	Web Mining and Intelligence	IPSC
			RATPSE	Radar Technologies for Public Security and Early-Warning	IPSC
			SCNI	Security of Critical Networked Infrastructures	IPSC
			STAF	Statistics for antifraud	IPSC
	3.2 Disasters and Response		NAHA	Natural Hazards	IES
			MAHB/NEDIES	Risk Analysis for industrial accidents and natural disasters (MAHB/NEDIES)	IPSC
			SAFECONSTRUCT-Risks	Research in support of risk analysis in construction and construction products	IPSC
	3.3 Food and Feed Safety and Quality		MonCoTraF	Monitoring , Control and Traceability in the Food chain	IPSC
			FeedSQ & CRL	Feed safety and Community reference Laboratory for Feed Additives Authorisation	IRMM
			Food RM	Reference materials for food safety and microbiology	IRMM
			FoodSQ	Food safety and quality control (and Community Reference Laboratories for mycotoxins and PAHs)	IRMM
4. Europe as a world partner	4.1 Global security		CriTech	Crisis Monitoring and Response Technologies	IPSC
			ISFEREA	Information Support for Effective and Rapid External Action	IPSC
	4.2 Development Co-operation		MONDE	Monitoring Natural resources for Development cooperation	IES
			MARS-FOOD	Support to Food security	IPSC
			TREES-3	Global Forest Resource Monitoring	IES
5. EURATOM	5.1 Nuclear waste management and environmental impact	5.1.1	HLWM	High Level Waste Management	ITU
		5.1.1	SAFEWASTE	Waste packages and facilities for transport, storage and disposal of high-level nuclear waste and spent fuel	IE
		5.1.2	AFC	Alternative Fuel Cycles	ITU
		5.1.3	FAR	Fundamental and Applied Actinides Research	ITU
		5.1.4	ND-standards	Basic research in nuclear physics and nuclear data standards	IRMM
		5.1.4	ND-minwaste	Nuclear data for waste transmutation and safety of innovative concepts	IRMM
		5.1.5	AIT	Alpha-Immunotherapy	ITU

		5.1.5	NCT	Development and Exploitation of Neutron Capture Therapy	IE
		5.1.6	MaRe	Measurement of Radioactivity in the environment and biological matrices	ITU
		5.1.6	REM	Radioactivity Environmental Monitoring	IES
		5.1.6	RADMET	Radionuclide Metrology for Primary Standardisation and Policy Support	IRMM
		5.1.7	KTE	Knowledge management, Training and Education	ITU
	5.2 Nuclear safety	5.2.1	SAFELIFE	Safety of Ageing Components in Nuclear Power Plants	IE
		5.2.1	SONIS	Safe Operation of Nuclear Installations	IE
		5.2.1	AMA	Analysis and management of nuclear accidents	IE
		5.2.1	NUSAC	Nuclear Safety Clearinghouse	IE
		5.2.2	SCNF	Safety of Conventional Nuclear Fuels	ITU
		5.2.3	SAF	Safety of Advanced Fuels	ITU
		5.2.3	SAFETY-INNO	Safety of innovative reactors design	IE
	5.3 Nuclear security	5.3.1	NUMAMET	Nuclear Materials Measurement Techniques	IPSC
		5.3.1	VERTEC	Verification Technologies and Methodologies for Nuclear Safeguards and Additional Protocol	IPSC
		5.3.1	AMENUS	Assessment Methodologies for Nuclear Security	IPSC
		5.3.1	FACIL	Forensic analysis and combating illicit trafficking	ITU
		5.3.1	METRO	Providing metrological tools to support nuclear safeguards activities	IRMM
		5.3.1	NuTraSeal	Development and validation of nuclear traceability and sealing systems	IPSC
		5.3.1	PhyMod	Physical modelling and analysis of instruments and systems	IPSC
		5.3.1	NTAS	Nuclear and trace analysis for safeguards	ITU
		5.3.2	NP-OSint	Non Proliferation Open Source INTelligence	IPSC

Annex 2. List of Acronyms

CAP Common Agricultural Policy
ECB European Chemical Bureau
ECCAIRS European Co-ordination Centre for Aviation Incident Reporting Systems
EEA European Environmental Agency
ERA European Research Area
GMES Global Monitoring for Environment and Security
GMOs Genetically Modified Organisms
HFR High Flux Reactor
HLUG High Level User Group
IAEA International Atomic Energy Agency
INSPIRE Infrastructure for Spatial Information in Europe
IPPC Integrated Pollution Prevention and Control
MAHB Major Accidents Hazards Bureau
NDA Non Destructive Assay
NEA Nuclear Energy Agency
OECD Organisation for Economic Co-operation and Development
REACH Registration, Evaluation Authorisation, of the most dangerous Chemicals
UNFCCC United Nations Framework Convention on Climate Changes