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Proposal for a

COUNCIL DECISION

**concerning the specific programme, to be carried out by means of direct actions by the
Joint Research Centre, implementing the Framework Programme of the European
Atomic Energy Community for nuclear research and training activities (2012 to 2013)**

{COM(2011) 71 final}

{COM(2011) 72 final}

{COM(2011) 73 final}

{SEC(2011) 204 final}

EXPLANATORY MEMORANDUM

1. CONTEXT OF THE PROPOSAL

1.1. Grounds for and objectives of the proposal

The Euratom Treaty limits all research programmes to a maximum of 5 years. The current Euratom Framework Programme, Euratom FP7 (2007-2011), consisting of two Specific Programmes (one for 'indirect actions' and the other for 'direct actions' of the JRC) will expire at the end of 2011. The proposal accompanying this memorandum is for the adoption of a Council Decision to extend the Specific Programme for 'direct actions' for the two years 2012-2013. The principal aim is to ensure the continuation of EU-funded research in these fields for a further two years after 2007-2011. To this end, the proposal explains the objectives of the R&D activities.

1.2. General context

The JRC programme will focus on research on waste management, and the safety and security of present and advanced nuclear systems. The research programme will improve scientific knowledge in these fields and will provide support to policy options for the energy mix of the 21st century, and for the safe and efficient deployment of nuclear energy. Supporting basic and targeted scientific research will be needed to maintain a thorough understanding of a key phenomenon. There will also be a particular focus on support for the education and training of present and future scientists and engineers.

In the EU and worldwide, there is growing recognition of the need for the responsible use of nuclear energy, covering safety and security. This was recently highlighted at the highest political levels, in particular at the Paris conference on access to civil nuclear energy held in Paris on 8-9 March 2010, the Washington nuclear security summit on 12-13 April 2010, and the Non-Proliferation Treaty Review Meeting held in New York in May 2010.

A common European view of key problems and approaches is required to strengthen the European Research Area, so all activities must be delivered in close consultation with the principal technical forums such as the "Sustainable Nuclear Energy Technology Platform" (SNETP) and the "Implementing Geological Disposal Technology Platform" (IGDTP). Networking will also be promoted with international organisations and key third countries, e.g. Generation IV International Forum members. Where appropriate, coordination will be required with the indirect actions carried out by DG RTD and other initiatives in other DGs.

1.3. Nuclear research activities (direct actions)

This Specific Programme for direct actions covers the following three thematic priorities:

- (1) Nuclear waste management, environmental impact and basic knowledge;
- (2) Nuclear safety;
- (3) Nuclear safeguards and security.

1.4. Existing provisions in the area of proposal

In accordance with Article 7 of the Euratom Treaty the Euratom Framework Programme is Euratom's main instrument for supporting and complementing Member States' activities in nuclear R&D. The existing provisions, the Council decisions establishing the 7th Euratom Framework for 2007-2011⁽¹⁾, will expire at the end of 2011.

1.5. Consistency with other policies and objectives of the Union

R&D activities to be supported by the proposed Euratom Framework Programme are entirely consistent with the goals of the Strategic Energy Technology Plan (SET Plan).

2. RESULTS OF CONSULTATIONS WITH THE INTERESTED PARTIES AND IMPACT ASSESSMENTS

2.1. Consultations with interested parties

In accordance with the Euratom Treaty the Commission has consulted Euratom's Scientific and Technical Committee (STC). The proposal for the Euratom Framework Programme is also based on the outcome of the discussions with the Council on ITER.

2.2. Collection and use of expertise

The Commission has used various sources for preparing the Euratom Framework Programme proposal, including:

- a) Euratom FP7 Interim Evaluations carried out by independent panels of experts;
- b) input from the JRC Board of Governors;
- c) input on the extension of Euratom FP7 and the preparation of FP8 from Euratom's Scientific and Technical Committee (STC);
- d) reports such as vision documents and strategic research agendas prepared by the Technology Platforms in the nuclear field – Sustainable Nuclear Energy Technology Platform (SNETP), Implementing Geological Disposal Technology Platform (IGD-TP) and Multidisciplinary European Low Dose Initiative (MELODI).

2.3. Impact assessment

In accordance with Article 21 of the Implementing Rules for the Financial Regulation (Commission Regulation N°. 2342/2002), the Commission has prepared an ex ante evaluation. Since this proposal aims to continue the activities of the Euratom Framework Programme for 2012-13 under the same financial perspectives, the requirement for an Impact Assessment has been waived.

¹ Council Decision on the Euratom Framework Programme (2006/970/EURATOM), OJ L54, 22.2.2007, p. 21; Council Decision on the Specific Programme for indirect actions (2006/976/Euratom), OJ L54, 22.2.2007, p. 139; Council Regulation on the rules for participation (1908/2006), OJ L54, 22.2.2007, p. 4; Council Decision on the specific programme for direct actions carried out by the JRC (2006/977/Euratom), OJ L54, 22.2.2007, p. 149.

3. LEGAL ELEMENTS OF THE PROPOSAL

The legal basis for this Specific Programme is provided for by Articles 1, 2, 4 and 7 of the Euratom Treaty.

4. BUDGETARY IMPLICATION

The “legislative financial statement” attached to this proposal for a Decision sets out the budgetary implications and the human and administrative resources needed.

Proposal for a

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concerning the specific programme, to be carried out by means of direct actions by the Joint Research Centre, implementing the Framework Programme of the European Atomic Energy Community for nuclear research and training activities (2012 to 2013)

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Atomic Energy Community, and in particular Article 7 thereof,

Having regard to the proposal from the European Commission,

Having regard to the opinion of the European Parliament²,

Having regard to the opinion of the European Economic and Social Committee³,

Whereas:

- (1) In accordance with Council Decision No XXXX/20XX/Euratom of XXXXX concerning the Framework Programme of the European Atomic Energy Community for research and training activities (2012 -2013)⁴, hereinafter ‘the Framework Programme (2012-2013)’, the Framework Programme (2012 - 2013) is to be implemented through specific programmes that define detailed rules for their implementation, fix their duration and provide for the means deemed necessary.
- (2) The Framework Programme (2012 - 2013) comprises two types of activities: indirect actions in fusion energy research and research on nuclear fission and radiation protection, and direct actions for activities of the Joint Research Centre in the field of nuclear energy. The direct actions should be implemented by the present specific programme.
- (3) The Joint Research Centre, hereinafter ‘the JRC’, should implement the research and training activities to be carried out by means of the so-called 'direct actions' under a JRC specific programme implementing the Framework Programme (2012-2013).
- (4) In implementing its mission, the JRC should provide customer-driven scientific and technical support to the Union policymaking process, ensuring support for the implementation and monitoring of existing policies and responding to new policy demands. In order to achieve its mission, the JRC should carry out research of the

² Opinion delivered on xxx

³ OJ C xxx

⁴ OJ L xxx

highest European quality, including by maintaining its own level of scientific excellence.

- (5) In implementing this specific programme, emphasis should be given to promoting the mobility and training of researchers and promoting innovation, in the European Union. In particular, the JRC should provide appropriate training in nuclear safety and security.
- (6) This specific programme should be implemented in a flexible, efficient and transparent manner, taking into account the relevant needs of the JRC users and European Union policies, while protecting the European Union financial interests. The research activities carried out under the specific programme should be adapted where appropriate to these needs and to scientific and technological developments and aim to achieve scientific excellence.
- (7) For implementing this specific programme, cooperation under the Agreement on the European Economic Area or under an Association Agreement may be complemented by international cooperation, in particular on the basis of Article 2, point (h), Article 101 and Article 102 of the Treaty, with third countries and international organisations.
- (8) In the context of enlargement and integration activities, the JRC aims to promote the integration of the organisations and researchers of new Member States within its activities in particular for implementing of the science and technology components of the European Union *acquis*, as well as increased cooperation with organisations and researchers from accession and candidate countries. A progressive opening should also be envisaged towards the neighbouring countries, specifically on priority topics of the European Neighbourhood Policy.
- (9) The JRC should continue to generate additional resources through competitive activities. These include participation in the indirect actions of the Framework Programme (2012-2013), third-party work and, to a lesser extent, the exploitation of intellectual property.
- (10) Sound financial management of the Framework Programme (2012-2013) and its implementation should be ensured in an effective and user-friendly manner, while ensuring legal certainty and the accessibility of the results of the programme for all participants, in accordance with Council Regulation (EC, Euratom) No 1605/2002 of 25 June 2002 on the Financial Regulation applicable to the general budget of the European Communities⁵ and Commission Regulation (EC, Euratom) 2342/2002 of 23 December 2002 laying down detailed rules for the implementation of Council Regulation (EC, Euratom) No 1605/2002 on the Financial Regulation applicable to the general budget of the European Communities⁶.
- (11) Appropriate measures — proportionate to the European Union's financial interests — should be taken to monitor both the effectiveness of the financial support granted and the effectiveness of the utilisation of these funds in order to prevent irregularities and fraud. The necessary steps should be taken to recover funds lost, wrongly paid or incorrectly used in accordance with Regulation (EC, Euratom) No 1605/2002,

⁵ OJ L 248, 16.9.2002, p. 1.

⁶ OJ L 357, 31.12.2002, p. 1.

Regulation (EC, Euratom) No 2342/2002, Council Regulation (EC, Euratom) No 2988/95 of 18 December 1995 on the protection of the European Communities' financial interests⁷, Council Regulation (EC, Euratom) No 2185/96 of 11 November 1996 concerning on-the-spot checks and inspections carried out by the Commission in order to protect the European Communities' financial interests against fraud and other irregularities⁸ and Regulation (EC) No 1073/1999 of the European Parliament and of the Council of 25 May 1999 concerning investigations conducted by the European Anti-Fraud Office (OLAF)⁹.

- (12) The Commission should in due course arrange for an independent assessment to be conducted concerning the activities carried out in the fields covered by this specific programme.
- (13) Research activities carried out within this specific programme should respect fundamental ethical principles and observe the principles recognised in particular by the Charter of Fundamental Rights of the European Union.
- (14) The Commission has consulted the Scientific and Technical Committee.

HAS ADOPTED THIS DECISION:

Article 1

The specific programme, to be carried out by means of direct actions by the Joint Research Centre, implementing the Framework Programme of the European Atomic Energy Community for nuclear research and training activities (2012 to 2013), hereinafter the 'specific programme', is adopted for the period from 1 January 2012 to 31 December 2013.

Article 2

The specific programme shall establish the activities for the nuclear actions of the Joint Research Centre, supporting the whole range of research actions carried out in trans-national cooperation in the following thematic areas:

- (a) nuclear waste management, environmental impact and basic knowledge;
- (b) nuclear safety (of present and future generations of nuclear reactors, and of their fuel cycle);
- (c) nuclear security (including nuclear safeguards, non-proliferation, combating illicit trafficking and nuclear forensics).

The objectives and broad lines of the activities referred to in the first paragraph are set out in the Annex.

⁷ OJ L 312, 23.12.1995, p. 1.

⁸ OJ L 292, 15.11.1996, p. 2.

⁹ OJ L 136, 31.5.1999, p. 1.

Article 3

In accordance with Article 3 of Decision [*Reference of Euratom FP Council Decision to be added when adopted*], the amount deemed necessary for the execution of the specific programme is EUR 233 216 000.

Article 4

All research activities carried out under the specific programme shall be carried out in compliance with fundamental ethical principles.

Article 5

The specific programme shall be implemented by means of direct actions as established in Annex II to Decision [*Reference of Euratom FP Council Decision to be added when adopted*].

Article 6

1. The Commission shall draw up a multi-annual work programme for the implementation of the specific programme, setting out in greater detail the objectives and scientific and technological priorities set out in the Annex, and the timetable for implementation.
2. The multi-annual work programme shall take account of relevant research activities carried out by the Member States, associated states and European and international organisations. It shall be updated where appropriate.

Article 7

The Commission shall arrange for the independent assessment provided for in Article 6 of Decision ...to be conducted concerning the activities carried out in the fields covered by the specific programme.

Article 8

This Decision shall enter into force on the third day following that of its publication in the *Official Journal of the European Union*.

Done at Brussels,

For the Council
The President

ANNEX

Specific Programme of the Joint Research Centre

1. OBJECTIVE

The overall objective of the specific programme is to provide customer-driven scientific and technical support to the Union policy concerning nuclear energy, and to meet the obligations of the Treaty. To achieve this goal, knowledge, skills and competence need to be continuously updated, in order to provide the required state-of-the-art expertise in the domains of nuclear reactor safety and nuclear safeguards and security.

2. APPROACH

The nuclear activities of the JRC aim to meet the research and development (R&D) obligations of the Treaty and to support both the Commission and Member States in the fields of safeguards and non-proliferation, waste management, safety of nuclear installations and the fuel cycle, radioactivity in the environment, and radiation protection.

For the Framework Programme (2012-2013), research and support activity will continue to focus on:

- (a) nuclear waste management, environmental impact and basic knowledge;
- (b) nuclear safety (of present and future generations of nuclear reactors, and their fuel cycle);
- (c) nuclear security (including nuclear safeguards, non-proliferation, combating illicit trafficking, and nuclear forensics).

Moreover, the JRC will further strengthen its role as a European reference for the dissemination of information, training and education for young scientists.

3. ACTIVITIES

3.1. Nuclear waste management, environmental impact and basic knowledge

3.1.1. Spent fuel and high-level waste characterisation, storage and disposal

The management of spent fuel and nuclear high-level waste involves their processing, conditioning, transport, interim storage and geological disposal. The ultimate goal is to prevent the release of radio-nuclides into the biosphere during all these stages over their very long decay time scale. The design, assessment and functioning of engineered and natural containment barrier systems over the relevant time scales are key to achieving these objectives and depend among other things on fuel and/or waste behaviour in the geological environment. Such studies are covered by this specific programme.

3.1.2. Partitioning and transmutation

The main strategy considered for future nuclear energy systems includes closing the nuclear fuel cycle, with the aim of reducing the long-term radio-toxicity of the nuclear waste and enhancing the sustainable use of resources. The major challenges for this

concept remain the optimisation of partitioning techniques, to separate selected long-lived radio-nuclides from the spent fuel, and the fabrication and qualification of safe and reliable fuels for actinide transmutation. Experimental work on partitioning at the JRC includes research on both aqueous dissolution and pyro-metallurgical processes (in salt media).

3.1.3. *Basic actinide research*

To maintain competence and a leading position in the field of civil nuclear technology, it is essential to foster interdisciplinary basic research on nuclear materials as a resource from which new technological innovations can emerge. In turn, this requires knowledge of the response of the so-called '5f electronic layer elements' (i.e. the actinides) and compounds to (usually extreme) thermodynamic parameters. Because of the small experimental data base and the intrinsic complexity of modelling, our current knowledge of these mechanisms is limited. Basic research addressing these issues is crucial for understanding the behaviour of these elements and to remain at the forefront of contemporary condensed matter physics. Developments in advanced modelling and simulation will be leveraged to boost the impact of the experimental programmes.

The JRC's basic actinide research programme will remain at the forefront of actinide physics and chemistry, the main goal being to provide world-class experimental facilities to scientists from universities and research centres. These will allow them to investigate the properties of actinide materials, in order to complete their education and to contribute to advances in nuclear sciences.

3.1.4. *Nuclear data*

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 quality of experimental data is a key issue for better safety standards and reduced error margins, and hence cost effectiveness in the design and construction of new reactor systems. The data files used by industry and research laboratories have to be complete, accurate and validated by well-defined quality assurance procedures.

The JRC will produce internationally required data and will also continue the safe operation of the Van de Graaff and GELINA linear accelerators.

3.1.5. *Medical applications from nuclear research*

New cancer therapies called targeted alpha therapy (TAT), are taking advantage of the unique physical properties of alpha particle radiation (in particular its high energy and short path length in human tissue) to selectively target and destroy diseased cells while sparing surrounding healthy tissue. These techniques can be used for the treatment of cancer and infectious diseases.

The JRC will continue to support the development of TAT with a special focus on alternative processes for the production of alpha emitters and the radio-biological testing of radio-labelled bio-molecules, assessing their efficiency and feasibility and making these new applications available for implementation by hospitals and the pharmaceutical industry.

3.1.6. *Monitoring of radioactivity in the environment*

Title II, Chapter 3, of the Treaty provides for the establishment of basic safety standards for the health protection of workers and the general public against the dangers arising from ionising radiation. Articles 31 to 38 of the Treaty provides rules on the role of the Member States and the Commission with regard to the protection of human health, the control of levels of radioactivity in the environment, release into the environment, and nuclear waste management. Under Article 39 of the Treaty, the JRC provides assistance to the Commission in carrying out this task.

In view of the new limits for radio-nuclides in drinking water and food ingredients, the JRC will develop analytical techniques and produce corresponding reference materials. Inter-laboratory comparisons will be organised with the monitoring laboratories of the Member States to assess the comparability of the reported monitoring data under Articles 35 and 36 of the Treaty, and to support the harmonisation of the radioactivity monitoring systems with reference test materials.

3.1.7. *Knowledge management, training and education*

It is important to maintain and deepen the nuclear knowledge of the new generations of nuclear scientists and engineers, through dissemination of experiments, results, interpretations and skills acquired in research and applied programmes.

The JRC will contribute to making this knowledge readily available, properly organised and well documented and to supporting higher education activities in Europe for both operating and innovative Generation IV reactors. Furthermore, the JRC will develop the European Nuclear Human Resources Observatory to analyse the trends in Europe and provide scientific support for the Union policy making. The JRC will also continue to contribute to better communication on nuclear issues, in particular regarding public acceptability and more globally on strategies for overall energy awareness. The long experience and unique facilities for nuclear data measurements are also an excellent opportunity for the education and training of nuclear scientists and engineers, supplementing education at universities by giving hands-on access to nuclear installations.

3.2. **Nuclear safety**

3.2.1. *Nuclear reactor safety*

Nuclear safety and the reliability of operating installations is permanently subject to optimisation in order to meet the new challenges posed by market liberalisation, extended plant operation, and the so-called nuclear industry ‘renaissance’. In order to maintain and improve the safety level of both Western and Russian-type nuclear power plants, advanced and refined safety assessment methodologies and corresponding analytical tools have to be extended and validated. Targeted experimental investigations are carried out at the JRC to improve the understanding of the underlying physical phenomena and processes in order to enable validation and verification of deterministic and probabilistic safety assessments, based on advanced modelling of plant processes (reactivity and thermal-hydraulic), of components under operational loads/ageing, and of human and organisational factors. The JRC will also continue to play a central role in the establishment and operation of the European Clearinghouse for Operational Experience Feedback for the benefit of all Member States. It will provide topical reports on specific plant issues and facilitate the efficient sharing and implementation of operational experience feedback to improve the safety of nuclear power plants, for the benefit of all European regulators.

3.2.2. *Nuclear fuel safety in power reactors operating in the Union*

Generation II and III light-water reactors will operate throughout the 21st century. In order to optimise their safety and efficiency, an improved understanding of the in-pile behaviour of the fuel rod system (fuel and cladding) must be ensured, especially in relation to extended operation schemes, covering normal, incidental and accidental conditions. The two main aspects of this research are the mechanical integrity of the fuel rods during reactor lifetime and the fuel response to transient conditions (including severe reactor accident conditions up to core meltdown).

Ultimately, experiment and theory on well-defined physical and chemical mechanisms must be incorporated into multi-scale models and eventually fuel performance codes.

JRC research will also be devoted to improving the experimental benchmark for UO₂ and MOX fuel behaviour at high burn-up.

3.2.3. *Safe operation of advanced nuclear energy systems*

New reactor concepts for increased safety, efficiency and sustainability are considered worldwide to be a new research topic, in particular within the Generation IV International Forum (GIF). The JRC has been given a mandate by the Member States to act as the Implementing Agent for the participation of the Community in GIF. As such, the JRC will further coordinate the European contributions (through direct or indirect actions, or via the Member States) in the various GIF projects.

The studies performed in JRC laboratories primarily cover the safety aspects of innovative reactor design concepts and nuclear fuel cycles, in particular the characterisation, irradiation testing and post-irradiation examination of new fuel types, as well as innovative structural and cladding materials characterisation and qualification. Furthermore, studies are being carried out into the safety requirements of the new generation of reactors, and the objective evaluation of various innovative systems. The aim is to support the establishment of a common European approach to the safety evaluation of innovative reactors, which is a prerequisite for the timely construction of prototypes and demonstrators as planned in the SNETP Deployment Strategy.

3.3. **Nuclear security**

3.3.1. *Nuclear safeguards*

Due to the enhanced role played by nuclear energy in the production of electricity in Europe, and in the world, the handling of nuclear materials in the fuel cycle is continuously increasing. To prevent any diversion of these materials from their intended use, a strong and reliable system of nuclear safeguards and non-proliferation is crucial. Technical innovations and improvements continue to be required to implement the evolving safeguards policy. Today's challenge is to implement increased automation and better tools for information analysis to reduce both inspector workload and the burden on the nuclear industry. Next-generation reactor types and corresponding fuel cycles will also require new and innovative safeguards approaches.

3.3.2. *Additional Protocol*

The Additional Protocol aims to prevent undeclared nuclear operations. Its implementation requires a number of techniques different from (or more evolved than) those used in verifying nuclear material accountancy. Increased work is anticipated for checking the completeness of declarations, which will require more R&D on methods to detect clandestine programmes, in some cases by using the same techniques as in nuclear

forensics. Major efforts will be needed to improve methods of trace particle analysis for the verification of declared activities or for the detection of undeclared activities.

3.3.3. *Open-source information collection on nuclear non-proliferation*

With the aim of supporting Commission services and collaborating with IAEA and Member State authorities, the JRC will continue to systematically collect and analyse information from a variety of sources (internet, specialised literature, data bases) on nuclear non-proliferation issues. This information will be used to produce country reports to closely monitor the evolution of nuclear activities and the import and/or export of direct and dual-use nuclear equipment and technology in selected countries. In addition, the JRC will follow the technical evolution of export control regimes and will provide technical support to relevant Commission services.

3.3.4. *Combating illicit trafficking of nuclear materials, including nuclear forensic analysis*

The concerns arising from illicit trafficking of nuclear and other radioactive material, the proliferation risks associated with it and the threat of nuclear terrorism call for a set of measures to address prevention, detection and response. Nuclear security is getting increased attention at all levels, ranging from international initiatives (Global Initiative on Combating Nuclear Terrorism, Proliferation Security Initiative, UNSC 1540, and others) to multilateral cooperation and technical developments. Training of staff is of key importance for the implementation of nuclear security measures. The JRC shares with the Member States and with international organisations its experience and expertise in the nuclear area in general and in the nuclear security area in particular. To this end, different training programmes need to be developed or improved and the associated training modules have to be produced or updated. The JRC is going to establish a European Security Training Centre, which will initially focus on nuclear and radiological security.

4. ETHICAL ASPECTS

During the implementation of this specific programme and in the research activities arising from it, fundamental ethical principles are to be respected. These include the principles enshrined in the Charter of Fundamental Rights of the European Union.

In compliance with the principle of subsidiarity and given the diversity of approaches in Europe, participants in research projects must conform to the current legislation, regulations and ethical rules in the countries where the research will be carried out. In any case, national provisions apply and no research forbidden in any given Member State or other country will be supported by Euratom funding in that Member State or country.

Where appropriate, those carrying out research projects must seek the approval of the relevant national or local ethics committees prior to the start of the activities. An ethical review will also be undertaken systematically by the Commission for proposals dealing with ethically sensitive issues or where ethical aspects have not been adequately addressed. In specific cases, an ethical review may be held during the implementation of a project.

Following the Lisbon Treaty, the Community is required to pay full regard to the welfare requirements of animals in formulating and implementing EU policies, including research (Council Directive 86/609/EEC).

LEGISLATIVE FINANCIAL STATEMENT FOR PROPOSALS

1. FRAMEWORK OF THE PROPOSAL/INITIATIVE

- 1.1. Title of the proposal/initiative
- 1.2. Policy area(s) concerned in the ABM/ABB structure
- 1.3. Nature of the proposal/initiative
- 1.4. Objective(s)
- 1.5. Grounds for the proposal/initiative
- 1.6. Duration and financial impact
- 1.7. Management method(s) envisaged

2. MANAGEMENT MEASURES

- 2.1. Monitoring and reporting rules
- 2.2. Management and control system
- 2.3. Measures to prevent fraud and irregularities

3. ESTIMATED FINANCIAL IMPACT OF THE PROPOSAL/INITIATIVE

- 3.1. Heading(s) of the multiannual financial framework and expenditure budget line(s) affected
- 3.2. Estimated impact on expenditure
 - 3.2.1. *Summary of estimated impact on expenditure*
 - 3.2.2. *Estimated impact on operational appropriations*
 - 3.2.3. *Estimated impact on appropriations of an administrative nature*
 - 3.2.4. *Compatibility with the current multiannual financial framework*
 - 3.2.5. *Third-party participation in financing*
- 3.3. Estimated impact on revenue

LEGISLATIVE FINANCIAL STATEMENT FOR PROPOSALS

1. FRAMEWORK OF THE PROPOSAL/INITIATIVE

1.1. Title of the proposal/initiative

Proposal for a Council decision concerning the specific programme, to be carried out by means of direct actions by the Joint Research Centre, implementing the Framework Programme of the European Atomic Energy Community for nuclear research and training activities (2012 to 2013)

1.2. Policy area(s) concerned in the ABM/ABB structure¹⁰

10 03 - Directly financed Research operational appropriations - Euratom
10 03 01 - Nuclear action of the Joint Research Centre (JRC)
10 03 02 - Appropriations accruing from contributions from third parties
10 01 - Administrative expenditure of "Direct Research" policy area
10 01 05 - Support expenditure for operations of Direct research policy area
10 01 05 01 - Expenditure related to research staff
10 01 05 02 - External staff for research
10 01 05 03 - Other management expenditure for research

1.3. Nature of the proposal/initiative

- The proposal/initiative relates to a new action
- The proposal/initiative relates to a **new action following a pilot project/preparatory action**¹¹
- The proposal/initiative relates to **the extension of an existing action**
- The proposal/initiative relates to **an action redirected towards a new action**

1.4. Objective(s)

1.4.1. *The Commission's multiannual strategic objective(s) targeted by the proposal/initiative*

The Specific Programme is one of the building blocks of the European energy research policy and the EU 2020 strategy, especially the Innovation Union. The Specific Programme supports innovation in the nuclear energy field to tackle the challenges presented by energy and climate change. The current proposal addresses in detail the period 2012-13, but the activities remain fully consistent with the key milestones for technological development in the nuclear field over the next decade as laid out in the European Strategic Energy Technology Plan (SET-Plan).

¹⁰ ABM: Activity-Based Management – ABB: Activity-Based Budgeting.

¹¹ As referred to in Article 49(6)(a) or (b) of the Financial Regulation.

1.4.2. *Specific objective(s) and ABM/ABB activity (ies) concerned*

The overarching goal of directly financed research is to provide customer driven scientific and technical support to the EU policy related to nuclear energy. In particular, the nuclear activities of the JRC aim at satisfying the R&D obligations of the Euratom Treaty and supporting both European Commission and Member States in the fields of safeguards and non-proliferation, waste management, safety of nuclear installations and fuel cycle, radioactivity in the environment and radiation protection. To fulfil this goal, knowledge, skills and competence need to be continuously updated, in order to provide the required scientific state of the art expertise in the domains of nuclear reactor safety and nuclear security. The safe and reliable operation and maintenance of all nuclear installations and laboratories located in the JRC's nuclear sites and related management of the operational waste from their exploitation will remain a high priority objective.

The JRC's specific objectives are:

- Nuclear Waste Management and environmental impact

Nuclear waste management: strengthening of the knowledge base of relevant processes during dry storage of spent fuel and in the near-field of the final repository (from the waste/waste package to the geological barrier); in the field of partitioning and transmutation, contribution to demonstration of efficient processes and safe operation of fuel fabrication and partitioning facilities at laboratory scale, based on aqueous and dry techniques.

Basic research and applications: remaining at the forefront of actinide physics and chemistry and of nuclear reference data, with the main goal to provide world-class experimental results and to open its facilities to scientists from universities and research centres; in the field of nuclear data, production of internationally required data and safe operation of the Van de Graaff and GELINA accelerators; in the field of medical applications, support to the development of targeted alpha (particles) therapy with special focus on alternatives for the production of alpha emitters and the radio-biological testing of radio-labelled bio-molecules, assessing their efficiency and feasibility.

Monitoring of radioactivity in the environment: developing real-time systems to collect, validate, map and report on European scale information on environmental radioactivity; developing analytical techniques and producing the corresponding reference materials.

- Nuclear Safety

Nuclear reactor safety: maintaining competences in design and operational nuclear safety for Western and Russian designed power plants in order to provide valuable technical support to the other policy making Commission DG's in nuclear safety related legislation/projects/issues and to the EU regulatory bodies and technical support organisations in the interpretation and dissemination of events occurring in nuclear power plants.

Nuclear fuel cycle safety for the present generation of reactors: development of current and evolutionary fuel cycle trends and concepts for fuels operating in presently available so-called Gen II and III reactors; fuel rod safety assessment during in-pile operation through state of the art post irradiation examination techniques; modelling applications.

Safe operation of advanced nuclear systems: technical support to the implementation of the Sustainable Nuclear Energy Technology Platform (SNETP) deployment strategy; further and improved coordination of the Euratom participation in GIF, while remaining a major Euratom contributor to the GIF knowledge and data base build-up in the field of safety of advanced fuels, safety assessments and qualification of innovative materials.

- Nuclear Safeguards and Security

Nuclear safeguards: development of verification and detection, containment and surveillance technologies, advanced and innovative measurement methods for nuclear materials, production of required nuclear reference materials, organisation of inter-laboratory comparisons, and provision of training, in particular for IAEA and Commission inspectors; related to the "Additional Protocol", strengthening of the capability for detection of undeclared nuclear activities, enhancement of the spectrometric methods towards high resolution, high sensitivity and reliability.

Combating illicit trafficking of nuclear materials including forensic analysis: it concerns the establishment of an integrated nuclear security concept for prevention, detection, and response to scenarios of undeclared activities, and includes establishment and implementation of the European Security Training Centre at the JRC.

1.4.3. Expected result(s) and impact

The JRC programme will be focused on research on waste management, and the safety and the security of present and advanced nuclear systems. The research programme will improve the scientific knowledge in these fields and support to policy options, which are the most important challenges for the safe and efficient deployment of nuclear energy in the context of the energy mix of the 21st century. Supporting basic and oriented scientific research will be needed to keep the highest degree of understanding of key phenomenon, and particular focus will be also given to provide support for education and training of present and future scientists and engineers.

1.4.4 Indicators of results and impact

The JRC has put in place a system of evaluation support activities, ranging from the monitoring of achieving objectives and half-annual Directors' reviews of activities, through the Periodic Action Review (PAR), which assesses the set of JRC research projects (called "actions") in terms of achieved policy impact and scientific output once a year using an elaborated indicator-based methodology. At the level of policy support, the JRC determines the number of deliverables (productivity indicator), and the number of occurrences of a tangible impact at the level of policy makers using a list of pre-defined criteria (impact indicator). Scientific output is measured through the number of publications in peer reviewed journal articles (productivity indicator), and the number of joint publications with external research organizations (for measuring the degree of cooperation with top class institutes). In the course of 2011, the JRC will also develop a system to assess the impact of its scientific publications. Training and education results and impact will also be assessed.

1.5. Grounds for the proposal/initiative

1.5.1. Requirement(s) to be met in the short or long term

The nuclear activities of the JRC aim to meet the research and development (R&D) obligations of the Euratom Treaty and to support both the Commission and Member States in the fields of safeguards and non-proliferation, waste management, safety of nuclear installations and the fuel cycle, radioactivity in the environment, and radiation protection. The proposed Specific Programme will address different scientific and technological challenges in order to meet short and long term goals of the SET-Plan. For more details please refer to the ex ante evaluation.

1.5.2. *Added value of EU involvement*

The added value of Euratom actions and in particular JRC direct involvement in nuclear research is linked to cross border effects, economies of scale, contributing to the resolution of reduced national investments in research. Intervention at European level is justified in the nuclear field. Some nuclear research activities are of such a scale that few Member State could provide the necessary resources and expertise.

1.5.3. *Lessons learned from similar experiences in the past*

In 2010, a high-level panel of internationally recognized experts presented its report on the 'Interim Evaluation of the Seventh Euratom Framework Programme (2007-2011) – Direct Actions of the Joint Research Centre'. The experts wrote that "The overall assessment of the work is positive, based on the consideration that much of the JRC's scientific work is of a very high standard (internationally at the highest level)". Moreover, the "panel recommends that the JRC enhance its transparency, effectiveness and efficiency of the governance of its nuclear activities" and to "develop an 'ambitious Vision 2030' and associated strategy for its nuclear activities." The different aspects have been addressed in the JRC 2010-2020 strategy and in adapting a thematic management of the work programme.

1.5.4. *Coherence and possible synergy with other relevant instruments*

R&D activities to be supported by the proposed Specific Programme are within the scope of the Strategic Energy Technology Plan (SET-Plan), which has been endorsed by European Council.

1.6. **Duration and financial impact**

X Proposal/initiative of **limited duration**

- X Proposal/initiative in effect from [01/01]2012 to [31/12]2013
- X Financial impact from 2012 to 2016 (estimated end of payments on JRC actions)

1.7. **Management method(s) envisaged**

X **Centralised direct management** by the Commission

2. **MANAGEMENT MEASURES**

2.1. **Monitoring and reporting rules**

The Commission will continually and systematically monitor the implementation of the Euratom Framework Programme and its specific programmes and regularly report and disseminate the results of this monitoring. Following the completion of the Framework Programme and its specific programmes, the Commission will launch, not later than two years after its completion (2015) an external evaluation by independent experts of its rationale, implementation and achievements. The JRC provides scientific and technological support to (mainly Commission) users through a Work Programme with roughly one hundred actions of which about 25% are related to the Euratom programme. The JRC assesses the productivity and impact of its actions on an annual basis, using an

ex-post methodology applied in a peer review process. The results of this assessment feed directly into the planning for the work programme of the following year. The indicators and criteria used in this periodic action review relate directly to the actions' outputs and the JRC's corporate Key Performance Indicators. Moreover, on an annual basis and following the Commission decision¹² on the reorganisation of the JRC and in line with obligations stemming from the Specific Programmes (nuclear and non-nuclear parts), the JRC Board of Governors implements the annual monitoring of the implementation of the JRC Work Programme with its observations on the JRC annual report. An appropriate link with the Annual Monitoring of Indirect Actions is ensured.

2.2. Management and control system

2.2.1. Risk(s) identified

In line with the Commission requirements, a risk assessment exercise is performed annually for identifying the risks and indicating the corrective actions proposed. The identified risks, the corrective measures and the indicative timetable are taken up as part of the Commission's Management Plan.

2.2.2. Control method(s) envisaged

Several control methods are applied as it was the case throughout Euratom 7th Framework Programme (2007-2011), including ex-ante control measures and randomly selected biannual ex-post verifications in the framework of the internal control scheme. Moreover, the requirement for audit certificates and the performance of regular independent external audits help to ensure sound financial management, including regularity and legality of the transactions performed.

2.3. Measures to prevent fraud and irregularities

Appropriate measures will continue to be taken to prevent irregularities and fraud and the necessary steps shall be taken to recover funds lost, wrongly paid or incorrectly used in accordance with Council Regulation (EC, EURATOM) No 1605/2002 of 25 June 2002 on the Financial Regulation applicable to the general budget of the European Communities, Commission Regulation (EC, EURATOM) No 2342/2002 of 23 December 2002 laying down detailed rules for implementation of the Financial Regulation, Council Regulations (EC, Euratom) No 2988/95 of 18 December 1995 on the protection of the European Communities financial interests¹³, (EC, Euratom) No 2185/96 of 11 November 1996 concerning on-the-spot checks and inspections carried out by the Commission in order to protect the European Communities' financial interests against fraud and other irregularities¹⁴ and Regulation (EC) No 1073/1999 of the European Parliament and of the Council concerning investigations conducted by the European Anti-Fraud Office (OLAF)¹⁵.

¹² OJ L 107, 30.4.1996, p. 12 - 96/282/Euratom.

¹³ OJ L 312, 23.12.1995, p. 1.

¹⁴ OJ L 292, 15.11.1996, p. 2.

¹⁵ OJ L 136, 31.5.1999, p. 1.

3. ESTIMATED FINANCIAL IMPACT OF THE PROPOSAL/INITIATIVE

3.1. Heading(s) of the multiannual financial framework and expenditure budget line(s) affected

- Existing expenditure budget lines

In order of multiannual financial framework headings and budget lines.

Heading of multiannual financial framework	Budget line	Type of expenditure	Contribution			
	Number [Description.....]	DA/NDA (16)	from EFTA ¹⁷ countries	from candidate countries ¹⁸	from third countries	within the meaning of Article 18(1)(aa) of the Financial Regulation
1 a	10 03 Directly financed Research – Euratom 10 03 01 Nuclear action of the Joint Research Centre (JRC) 10 03 02 Appropriations accruing from contributions from third parties	DA	NO	YES/ NO*	YES	YES
	10 01 Administrative expenditure Direct Research 10 01 05 Support expenditure for operations of Direct research policy area 10 01 05 01 Expenditure related to research staff 10 01 05 02 External staff for research 10 01 05 03 Other management expenditure for research	NDA	NO	YES/ NO*	YES	NO

* discussions with Turkey related to Nuclear Research are ongoing.

- New budget lines requested

Not applicable

¹⁶ DA= Differentiated appropriations / DNA= Non-Differentiated Appropriations

¹⁷ EFTA: European Free Trade Association.

¹⁸ Candidate countries and, where applicable, potential candidate countries from the Western Balkans.

3.2. Estimated impact on expenditure

3.2.1. Summary of estimated impact on expenditure EUR million (to 3 decimal places)

Heading of multiannual financial framework:		1 a	Competitiveness for Growth and Employment			
DG: JRC			Year	Year	Year	TOTAL
• Operational appropriations			2012	2013	≥ 2014	
Number of budget line: 10.03	Commitments	(1)	9.895	10.252	0	20.147
	Payments	(2)	4.650	8.972	6.525	20.147
Number of budget line: 10.03.01	Commitments	(1)	9.895	10.252	0	20.147
	Payments	(2)	4.650	8.972	6.525	20.147
Appropriations of an administrative nature financed from the envelope of the specific programme						
Number of budget line: 10.01.05		(3)	104.648	108.421	0	213.069
Number of budget line: 10.01.05.01		(3)	57.444	59.515		116.959
Number of budget line: 10.01.05.02		(3)	10.577	10.958		21.536
Number of budget line: 10.01.05.03		(3)	36.627	37.948		74.574
TOTAL appropriations for DG JRC	Commitments	=1+1a+3	114.543	118.673	0	233.216
	Payments	=2+2a+3	109.298	117.393	6.525	233.216

• TOTAL operational appropriations	Commitments	(4)	9.895	10.252	0	20.147
	Payments	(5)	4.650	8.972	6.525	20.147
• TOTAL appropriations of an administrative nature financed from the envelope of the specific programme		(6)	104.648	108.421	0	213.069
TOTAL appropriations under HEADING 1 a of the multiannual financial framework	Commitments	=4+ 6	114.543	118.673	0	233.216
	Payments	=5+ 6	109.298	117.393	6.525	233.216

If more than one heading is affected by the proposal / initiative:

• TOTAL operational appropriations	Commitments	(4)				
	Payments	(5)				
• TOTAL appropriations of an administrative nature financed from the envelope of the specific programme		(6)				
TOTAL appropriations under HEADINGS 1 to 4 of the multiannual financial framework(Reference amount)	Commitments	=4+ 6				
	Payments	=5+ 6				

Heading of multiannual financial framework:		5	" Administrative expenditure "		
					EUR million (to 3 decimal places)
DG: JRC		Year 2012	Year 2013	TOTAL	
• Human resources					
• Other administrative expenditure					
TOTAL DG JRC	Appropriations				
TOTAL appropriations under HEADING 5 of the multiannual financial framework		(Total commitments = Total payments)			
					EUR million (to 3 decimal places)
		Year 2012	Year 2013	Year ≥ 2014	TOTAL
TOTAL appropriations under HEADINGS 1 to 5 of the multiannual financial framework		Commitments	114.543	118.673	233.216
		Payments	109.298	6.525	233.216

3.2.2. *Estimated impact on operational appropriations*

- The proposal/initiative does not require the use of operational appropriations
- The proposal/initiative requires the use of operational appropriations, as explained below:

Commitment appropriations in EUR million (to 3 decimal places)

Indicate objectives and outputs ↓			Year 2012			Year 2013	TOTAL	
	OUTPUTS							
	Type of output	Average cost of the output	Number of outputs	Cost	Number of outputs	Cost	Number of outputs	Total cost
SPECIFIC OBJECTIVE No 1 ¹⁹ ...								
- Output – EURATOM Direct research- JRC	Products and services for EU policy makers	64 (**)	157*	9.895	160*	10.252	317*	20.147
Sub-total for specific objective N°1			157*	9.895	160*	10.252	317*	20.147
TOTAL COST				9.895		10.252		20.147

(*) estimated number of outputs

(**) *The cost of each output is very variable. For instance, a routine deliverable (e.g. a periodical crop forecast bulletin) is not comparable to a final report of a large and possibly expensive study for which a considerable amount of credits may have led to a single study document. Both are relevant and useful but serve very different purposes. The average cost indicated is just a mathematical calculation dividing the budget by the estimated number of outputs.*

¹⁹ As described in Section 1.4.2. "Specific objective(s)..."

3.2.3. *Estimated impact on appropriations of an administrative nature*

3.2.3.1. Summary

- The proposal/initiative does not require the use of administrative appropriations
- The proposal/initiative requires the use of administrative appropriations, as explained below:

EUR million (to 3 decimal places)

	Year 2012	Year 2013	TOTAL
HEADING 5 of the multiannual financial framework			
Human resources			
Other administrative expenditure			
Subtotal HEADING 5 of the multiannual financial framework			
Outside HEADING 5 of the multiannual financial framework	Direct Research	Direct Research	Direct Research
Human resources	68.021	70.474	138.495
Other expenditure of an administrative nature	36.627	37.948	74.574
Subtotal outside HEADING 5 of the multiannual financial framework	104.648	108.421	213.069
TOTAL	104.648	108.421	213.069

3.2.3.2. Estimated requirements of human resources

- The proposal/initiative does not require the use of human resources
- The proposal/initiative requires the use of human resources, as explained below:

Estimate to be expressed in full amounts (or at most to one decimal place)

	Year 2012	Year 2013
• Establishment plan posts (officials and temporary agents)		
X 01 01 01 (Headquarters and Commission's Representation Offices)		
XX 01 01 02 (Delegations)		
XX 01 05 01 (Indirect research)		
10 01 05 01 (Direct research)	566	566
• External personnel (in Full Time Equivalent unit: FTE)²⁰		
XX 01 02 01 (CA, INT, SNE from the "global envelope")		
XX 01 02 02 (CA, INT, JED, LA and SNE in the delegations)		
XX 01 04 yy ²¹	- at Headquarters ²²	
	- in delegations (F4E)	
XX 01 05 02 (CA, INT, SNE - Indirect research)		
10 01 05 02 (CA, INT, SNE - Direct research)	166	166
Other budget lines (specify)		
TOTAL	732	732

XX is the policy area or budget title concerned.

The human resources required will be met by staff from the DG who are already assigned to management of the action and/or have been redeployed within the DG, together if necessary with any additional allocation which may be granted to the managing DG under the annual allocation procedure and in the light of budgetary constraints.

Description of tasks to be carried out:

Officials and temporary agents	Tasks derived from the nuclear research specific programme, in particular related to nuclear waste management, nuclear safety and nuclear safeguards and security.
External personnel	

²⁰ CA= Contract Agent; INT= agency staff ("*Intérimaire*"); JED= "*Jeune Expert en Délégation*" (Young Experts in Delegations); LA= Local Agent; SNE= Seconded National Expert;

²¹ Under the ceiling for external personnel from operational appropriations (former "BA" lines).

²² Essentially for Structural Funds, European Agricultural Fund for Rural Development (EAFRD) and European Fisheries Fund (EFF).

3.2.4. *Compatibility with the current multiannual financial framework*

- Proposal/initiative is compatible the current multiannual financial framework.
- Proposal/initiative will entail reprogramming of the relevant heading in the multiannual financial framework.

Not applicable

- Proposal/initiative requires application of the flexibility instrument or revision of the multiannual financial framework²³.

Not applicable

3.2.5. *Third-party participation in financing*

- The proposal/initiative does not provide for co-financing by third parties
- The proposal/initiative provides for the co-financing estimated below:

Appropriations in EUR million (to 3 decimal places)

	Year 2012	Year 2013
<i>Specify the co-financing body</i>	Third countries associated to the programme	
TOTAL appropriations co-financed	Third party contributions will be added at a later stage	

3.3. **Estimated impact on revenue**

- Proposal/initiative has no financial impact on revenue.
- Proposal/initiative has the following financial impact:
 - on own resources
 - on miscellaneous revenue

EUR million (to 3 decimal places)

Budget revenue line:	Appropriations available for the ongoing budget exercise	Impact of the proposal/initiative ²⁴	
		Year 2012	Year 2013
Item 6013		pm	pm
Item 6031*		pm	pm

* Discussions with Turkey related to Nuclear Research are ongoing.

For miscellaneous assigned revenue, specify the budget expenditure line(s) affected.

10 03 02 - Appropriations accruing from contributions from third parties

Specify the method for calculating the impact on revenue.

Certain associated states may contribute to a supplementary funding of the framework programme through association agreements.

²³ See points 19 and 24 of the Inter institutional Agreement.

²⁴ As regards traditional own resources (customs duties, sugar levies), the amounts indicated must be net amounts, i.e. gross amounts after deduction of 25% for collection costs.