

WORK PROGRAMME 2012

Euratom for Nuclear Research and Training Activities¹

(European Commission C(2012)7 of 10 January 2012)

¹ In accordance with the Treaty establishing the European Atomic Energy Community and in particular Articles 7 and 10 as contextualised in the following decisions: Council Decision of 19 December 2011 (Ref. Council 17503/11 – to be published in the OJ) concerning the Framework Programme of the European Atomic Energy Community for nuclear research and training activities (2012-2013) and the Council Decision of 19 December 2011 concerning the Specific Programme, to be carried out by means of indirect actions, implementing the Framework Programme of the European Atomic Energy Community for nuclear research and training activities (2012-2013) (Ref. Council 17504/11 – to be published in the OJ).

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GENERALITIES

Following the adoption of the Euratom Framework Programme for 2012-2013 (hereinafter 'the Framework Programme')² and the corresponding Specific Programme (hereinafter 'the Specific Programme')³ for 'Nuclear Research and Training Activities' and the Rules for the participation of undertakings, research centres and universities in indirect actions under the Framework Programme of the European Atomic Energy Community and for the dissemination of research results (hereinafter 'the Rules for Participation')⁴, the Commission adopts annual work programmes with the assistance of the Consultative Committees for Fission and Fusion. This work programme (WP) constitutes a financing decision for 2012. It defines the technical scope of actions and provides information on the implementation arrangements.

Research and development activities in this work programme comprise two research themes: Fusion Energy, and 'Nuclear Fission, Safety and Radiation Protection'.

OBJECTIVES

In the priority theme of Fusion Energy, the overall objective is to develop the knowledge base for, and realising ITER as a major step towards, the creation of prototype reactors for power stations that are safe, sustainable, environmentally responsible, and economically viable.

In the priority theme of Nuclear Fission, Safety and Radiation Protection, the overall objective is to establish a sound scientific and technical basis in order to accelerate practical developments for the safer management of long-lived radioactive waste, to enhance in particular the safety while contributing to resource efficiency and cost-effectiveness of nuclear energy and to ensure a robust and socially acceptable system of protection of man and the environment against the effects of ionising radiation.

Euratom research, both fission and fusion, pays attention to the gender equality issue and participation of women is actively encouraged.

² Council Decision of 19 December 2011(Ref. Council 17503/11 – to be published in the OJ)

³ Council Decision of 19 December 2011(Ref. Council 17504/11 – to be published in the OJ)

⁴ Council Regulation of 19 December 2011 (Ref. Council 17506/11 – to be published in the OJ)

I. CONTEXT

I.1 Approach

Nuclear power is the principal low carbon source of base load electricity in the EU, totalling some 135GWe of installed capacity and accounting for almost one-third of current electricity generation. This translates to a saving in CO₂ emissions of roughly 700 million tonnes per year, equivalent to that produced by all the cars in Europe. It therefore plays a key role in limiting the EU's emissions of greenhouse gases, and makes an important contribution to improving the Union's independence, security and diversity of energy supply.

Nuclear energy research is an important pillar of the European Strategic Energy Technology Plan (SET-Plan) – the technology pillar of the EU energy and climate policy – which has been launched by the Commission in 2007 and since then endorsed on several occasions by the European Council and the European Parliament.

Nuclear-related research activities cover a wide range of applications all over Europe from energy production through safety measures, radiation protection and medical uses, to the development of fusion as a new energy source.

The activities of the work programme 2012 are closely linked to the objectives of the Europe 2020 and Energy 2020 strategies. It contributes to the 'Innovation Union' flagship by supporting pre-commercial research and facilitating technology transfer process between academia and industry and to the 'Resource efficient Europe' flagship by greatly increasing the overall sustainability of nuclear energy. It follows up the conclusions of the European Council of 4 February 2011 which agreed that the EU and its Member States will promote investment in renewables, safe and sustainable low carbon technologies and focus on implementing the technology priorities established in the SET-plan. By putting emphasis on training in all its activities, boosting safety in the nuclear industry and creating a new sector of high-tech industry for fusion energy in particular, it will lead to growth and new jobs in a wide range of disciplines.

In 'fission, safety and radiation protection', activities aim at ensuring a continuation of the Community's outstanding safety record and the improvement of radiation protection. The key issues are operational reactor safety and management of long-lived waste, both of which are being addressed through continued work at the technical level, though allied political and societal inputs are also required. The objectives of the proposed activities are in line with the Strategic Research Agendas drawn up by the three technical forums (Sustainable Nuclear Energy Technology Platform – SNETP, Implementing Geological Disposal Technology Platform – IGDTP, and Multidisciplinary European Low-Dose Initiative – MELODI).

In fusion, the activities have two closely linked aims. First, the highest priority of the programme is to advance the construction of ITER under a strict policy of cost containment while maintaining risks at an acceptable level. The strategy for fusion R&D is to focus on the key activities required to accompany the construction of ITER and prepare its exploitation. The main goal is to protect the European investment in ITER and make sure that Europe, its research community and its industry, will reap the full benefit of the research at ITER and will be able to successfully further develop fusion as an energy source.

I.2 Scope of Work

This work programme, financed from the 2012 budget, contributes to the implementation of the Specific Programme.

I.3 International Cooperation

International cooperation – based on balanced reciprocal benefits – is aimed at contributing to the achieving of strategic objectives of the fusion and fission research and training programmes.

The main fusion-related international cooperation frameworks are the ITER Agreement among the seven parties, China, India, Japan, Russia, S.Korea and U.S together with Euratom (sections II.1.1 and II.1.2), as well as the Broader Approach Agreement between Euratom and Japan (section II.1.8).

The bilateral Cooperation Agreements in force between Euratom and all ITER parties plus some other Third States are aimed mainly at developing cooperation on activities in support of or complementary to ITER (section III.1) and to longer-term activities like DEMO. The bilateral work programmes of those Cooperation Agreements encompass extensive networks of collaborative activities between European entities and institutions of those Third States. Furthermore, Euratom also contributes to various multilateral cooperation frameworks, i.e. the OECD/IEA Fusion Power Coordinating Committee (FPCC) with eight Implementing Agreements, the IAEA International Fusion Research Council (IFRC), and the International Tokamak Physics Activity (ITPA) under the auspices of ITER-IO.

The importance of the global dimension of international cooperation in the fission area, in particular on nuclear safety-related research, has been underlined by the recent nuclear accident in Japan. Further cooperation with Third States is also carried out under specific Cooperation Agreements covering nuclear research or nuclear safety.

Cooperation between Euratom and OECD/NEA and IAEA is built on the established competences of these international organisations, in particular the accumulated historical knowledge tracking nuclear development over recent decades. In this regard, the IAEA could also play an important supporting role in fostering cooperation between Euratom and countries not yet having a fully developed nuclear infrastructure.

We draw attention to activities implemented by the EU external cooperation instruments in nuclear field, such as the Instrument for Stability in its component on CBRN risk mitigation, the Instrument for Nuclear Safety Cooperation and the Instrument for Preaccession in its component nuclear safety and radioprotection. These instruments do not finance research but may facilitate networking with R&D communities in nuclear safety, waste, radioprotection, emergency preparedness and training. This is particularly the case of the CBRN Centre of Excellence Initiative under the Instrument for Stability.

I.4 Cross-Cutting Issues

Whenever possible, synergies will be exploited between fission and fusion research within the Euratom programme, as well as between the Euratom and the Specific Programmes, implementing the Seventh Framework Programme (EU). Interactions between the different activities should be adequately accommodated. In particular, the European Energy Research Alliance (EERA) established under the SET-Plan could be a platform to promote energy-enabling technologies and/or stimulate cross-cutting research activities.

I.5 Submitting a Proposal

There are significant differences between the management and funding of the two themes. In the theme Fusion Energy the main funding schemes are the Contracts of Association between Euratom and national research organisations or bodies and multilateral agreements with those

organisations. Within these contracts and agreements an annual work programme is agreed and implemented.

The content of the programme is described in section II.1.

For the theme Nuclear Fission, Safety and Radiation Protection, the details of the activities and topics are presented in sections II.2, and III.2 provides information on the corresponding call(s) for proposals.

Proposals should be submitted under the terms of a call(s) for proposals set out in section III. In order to submit a proposal, a proposer should consult the following:

- this work programme;
- the relevant call for proposals as published on the relevant Commission websites following the announcement of the publication in the *Official Journal of the European Union*;
- the relevant Guide for Applicants.

These and a number of other useful texts, including the rules for participation, are available on the relevant Website <http://ec.europa.eu/research/participants/portal/page/home>. The latter should be consulted to ensure that the documents being used are the most recent. Some may be revised during the programme lifetime and even during the time a particular call is open.

Participants will have the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions.

I.6 Evaluation Criteria and Related Issues

The '[Rules for submission of proposals, and the related evaluation, selection and award procedures](#)'⁵ describe the basic procedures to be followed under the Seventh Framework Programmes. The set of criteria and thresholds applicable to this work programme are given in Annex 1 and is applicable to actions as a result of calls for proposals and grants to identify beneficiaries⁶, unless indicated otherwise. Any complementary criteria or thresholds, if applicable, are clearly stated in the relevant part of this work programme at the topic level, and in the call fiche. Furthermore, the work programme, and consequently its call(s) for proposals, may specify and restrict the participation of legal entities in order to take into account specific objectives of the Framework Programme.

When evaluating proposals received in response to a call, the Commission may opt to send the proposals to external experts or make proposals available to them by electronic means, so that experts can carry out their examination at home or their place of work.

For the fission call of this work programme, section III.2 provides indicative budgets for activities defined in the Specific Programme, or for areas or combinations of activities/areas, and explains how the ranked/reserve lists will be constituted.

I.7 Ethical aspects

All research carried out under this work programme must respect fundamental ethical

⁵ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:075:0001:0044:EN:PDF>

⁶ According to Article 12 and Article 13 (a) of Council Regulation of 19 December 2011 laying down the rules for the participation of undertakings, research centres and universities in indirect actions under the Framework Programme of the European Atomic Energy Community and for the dissemination of research results (2012-2012) (Ref. Council 17506/11 – to be published in the OJ).

principles, and the requirements set out in the text of the Specific Programme and Rules for Participation.

II. CONTENT OF PROGRAMME AND CALL(S) IN 2012

II.1 Fusion Energy

The content of the Fusion Energy programme has several facets covering the full range of instruments. These are:

- *European Joint Undertaking for ITER and the Development of Fusion Energy ('Fusion for Energy' – 'F4E')* to discharge the responsibilities of the European Union towards the ITER Agreement and the Broader Approach Agreement. Regarding the latter, the Commission promotes and steers the European participation, in particular by representing the Community in the governance bodies established by the Agreement and those of F4E, as well as in relations with the contributing Member States;
- *Contracts of Association* which are bilateral contracts between research organisations or bodies in all the Member States or Euratom Fully Associated Third States and the Community. Some Contracts of Association will include activities of research institutes in more than one Member State (transnational research Units);
- *European Fusion Development Agreement* between all the Associates (signatories of a Contract of Association) to fully exploit the JET Facilities and possibly other fusion devices and coordinate the research activities, including training, carried out under the Contract of Association;
- *Other multi-lateral agreements*, such as the Mobility Agreement, that promote the collaboration and mobility of researchers between the different research organisation and facilities;
- *Human resources, education and training* which are supported through training and career development fellowships via EFDA through the Contracts of Association;
- *Coordination and Support Actions* aimed at strengthening the interfaces of the fusion community with related scientific and industrial communities;
- *International agreements* including those covering the construction and exploitation of ITER and the implementation of Broader Approach Activities.

The Commission pursues the programmatic objectives of the European fusion programme through the Euratom participation in the various governance bodies of the above agreements and organisations.

II.1.1 Activity: The realisation of ITER

The Community has a special responsibility within the ITER Organization as the host of the project and will continue to play a strong role, particularly regarding the governance of the ITER International Organization, management and staffing, plus general technical and administrative support. The Community participation in ITER as a Party will be provided through the European Joint Undertaking for ITER and the Development of Fusion Energy ('Fusion for Energy' – 'F4E')⁷ and will include further contributions to the construction of equipment and installations needed at the ITER site, and support to the project during construction..

⁷ Council Decision No. 2007/198/Euratom of 27 March 2007 establishing the European Joint Undertaking for ITER and the Development of Fusion Energy and conferring advantages upon.

The R&D activities in support of ITER construction will be carried out in the Fusion Associations and European industries. They will include the development and testing of components and systems.

II.1.2 Activity: R&D in preparation of ITER operation

A focused physics and technology programme aims to consolidate ITER project choices and prepare for the rapid start-up of ITER operation. It will be carried out through coordinated experimental, theoretical and modelling activities using the JET facilities and other magnetic confinement devices. It will ensure that Europe has the necessary impact on the ITER project, and will prepare for a strong European role in its exploitation.

II.1.3 Activity: Limited technology activities in preparation of DEMO

Key technologies and materials required for the licensing, construction and operation of the DEMO power plant will be further developed in the Fusion Associations and industry in order to test them in ITER and to position European industry to be able to construct DEMO and develop future fusion power plants.

II.1.4 Activity: R&D activities for the longer term

Building on the activities specifically concerning ITER and DEMO, the implementation of the specific programme should result in developing the competences and enlarge the knowledge base in fields strategically relevant to future fusion power stations. These research activities will enhance the technical feasibility and economic viability of fusion power.

II.1.5 Activity: Human resources, education and training

The aim of this activity is ensuring adequate human resources and a high level of cooperation within the fusion thematic area, both for the immediate and medium term needs of ITER, and for the further development of fusion.

II.1.6 Activity: Infrastructures

The realisation of ITER in Europe, within the international framework provided by the ITER Organisation, will add to the new research infrastructures with a strong European dimension.

II.1.7 Activity: Industry and technology transfer processes

The realisation of ITER will bring many opportunities for industry to benefit from technology advancement. Through a pro-active technology transfer programme, industry will be encouraged to exploit all knowledge gained from ITER construction and operation as well as ensuring that a future European industry is provided with all the knowledge required to realise the first demonstration of electricity from fusion, DEMO. The Commission Services will continue to work with the Fusion Industry Innovation Forum in pursuit of this aim.

II.1.8 Activity: Broader Approach projects

The Agreement between the European Atomic Energy Community and the Government of Japan for the Joint Implementation of the Broader Approach Activities in the Field of Fusion Energy Research covers the joint implementation of three large research projects in Japan. These projects aim to support ITER and to promote the early realisation of fusion energy as a clean and

sustainable energy source. They are: the construction of the JT60-SA tokamak; the Engineering Validation and Design Activities for the International Fusion Materials Irradiation Facility (IFMIF/EVEDA); and the provision of a supercomputer for the International Fusion Energy Research Centre (IFERC). These projects cut across the aforementioned activities II.1.1 to II.1.7. The European contribution to these activities consists mainly of in-kind resources (equipment and staff) provided voluntarily by a number of Member States that are coordinated and transferred through F4E. A contribution is also provided directly by F4E.

II.2 Nuclear Fission, Safety and Radiation Protection

The overall objective is to establish a sound scientific and technical basis in order to accelerate practical developments for the safer management of long-lived radioactive waste, to enhance in particular the safety while contributing to the resource efficiency and cost-effectiveness of nuclear energy, and to ensure a robust and socially acceptable system of protection of man and the environment against the effects of ionising radiation.

There is increasing interaction between SNETP, IGDTP and MELODI and other stakeholder forums at the Union level, such as the European Nuclear Energy Forum (ENEF) and the European Nuclear Safety Regulators Group (ENSREG), and further synergies will be sought as appropriate through the activities proposed below, whilst recalling that the development of industrial products and services should be funded by the industry itself. Nuclear safety aspects will receive the greatest possible attention.

Depending on the strategic nature of the research, the *expected impact* may be defined at the level of the activity, area or specific topic. Usually a maximum of one project will be considered for funding per topic. Where more than one project per topic may be considered for funding, the *funding scheme(s)* for that topic is/are indicated in the plural. In some specific cases, a larger maximum number of projects to be retained for funding under one topic may also be mentioned.

II.2.1 Activity: Management of Ultimate Radioactive Waste

II.2.1.1: Geological disposal

- ***Expected impact:*** Contribution to the structuring of the EU platform and to the progress towards the implementing of geological disposal in line with the Vision Report and/or Strategic Research Agenda (SRA) / Deployment Plan of IGD-TP, the 2020 objectives of the SET-Plan, and the new EU Directive on the responsible and safe management of spent fuel and radioactive waste, together with significant advances in the treatment and/or understanding of key remaining issues. In particular, this should lead to demonstrable improvements in robustness of associated performance and safety analyses, and ultimately to increased confidence in the safety case as it relates to specific scientific/technical fields or physical components of a repository system, and/or foster the joint strategic planning necessary to bring about such advances.

Topic: Fission-2012-1.1.1: Technical feasibility and long-term performance of repository components – full-scale demonstration of plugs and seals. RD&D activities for demonstrating the feasibility of the full-scale construction, testing and achievement of the safety functions of plugs and seals to fulfil the required long-term performance of the components and safety of the repository. Work should include all the activities and steps to perform new and innovative in-situ demonstrations, including design and specifications of the demonstrators, development of working procedures and components, associated technologies, construction or emplacement, understanding of evolutionary processes in the 'as-built' components, numerical modelling and testing of the long-term performance of the end product(s). This excludes the production costs of manufacturing of the components and specific technologies for the in-situ construction or emplacement of the plugs and seals after design and development. With a view towards confidence building among decision makers and the public, wide dissemination of information should be foreseen, including critical and integrated analyses of the achievements and results for the chosen plugs and seals (approach, methods, and technologies per host rock). A common strategy for dissemination to and communication with key stakeholders (political, governmental, regulators, media, NGOs,

public) should be developed and implemented. Proposals should foresee the organisation of at least one international workshop or conference with publication of proceedings.

Funding scheme: Maximum one Collaborative Project.

Topic: Fission-2012-1.1.2: Support to the technical secretariat of the Implementing Geological Disposal Technology Platform. Further deepening, integration and coordination of the activities of the IGDTP (www.igdtp.eu) members. This should include activities that involve as many members as possible beyond the Executive Group in the structuring and implementation of the platform's activities, including research. Dedicated work packages should be proposed (i) to network, structure and develop RD&D programmes and competences in countries with less advanced geological disposal programmes, (ii) to contribute to fulfilling the requirements, including advice and expertise, laid down in the new EU Directive on the management of radioactive waste, and (iii) to develop, implement and coordinate education and training activities in geological disposal in Europe (maximising synergies with other initiatives). The organisation of a public event at least on an annual basis should be included in the proposal.

Funding scheme: Maximum one Coordination and Support Action (coordinating or supporting). Euratom will contribute only up to a maximum of 75% of the total cost on a shared cost basis.

II.2.2 Activity: Reactor Systems

II.2.2.1 Safety and competitiveness of existing and future nuclear installations

- **Expected impact:** Increased safety of existing reactors through advances in numerical simulation for continued safe operation and improvements in understanding and management of severe accidents in the European context, leading to the development of common strategies for plant safety at EU level.

Topic: Fission-2012-2.1.1: Simulation Platform for Nuclear Reactor Safety. Computational modelling and simulation are an intrinsic part of the Strategic Research Agenda of SNETP. A long-term roadmap has been established in Europe for the development of a simulation platform for nuclear reactor safety, which has consolidated and extended the multi-scale and multi-physics aspects by integrating new codes, developing models and testing coupling schemes between neutronics, thermal hydraulics and fuel codes. The present topic is to ensure the realisation of the final phase of the roadmap by extending and improving the accuracy of the models (core physics, two-phase thermal hydraulics), modelling of the fuel by including a fuel performance code, and computation with detailed meshing. Special emphasis should be put on experimental validation, sensitivity and uncertainty analysis to ensure the reliability of the tools. The second objective is to demonstrate the capabilities of this simulation platform to run practical cases of safety of Light Water Reactors (LWRs). Simulation of accidental scenarios similar to the recent accident in Japan is welcome. A users' group from EU and third countries should test the new tools in a number of benchmark exercises with a view to their qualification. Links could be established with the USDOE Consortium for Advanced Simulation of LWRs (CASL) in the USA. The NEA and/or IAEA databanks should be used for validation, where necessary, to avoid duplication.

Funding scheme: Maximum one Collaborative Project.

Topic: Fission-2012-2.1.2: Impact of the nuclear accident in Japan on Severe Accident

Management. R&D activities should address, in severe accident situations, both the behaviour of nuclear power plants and of spent fuel ponds, up to the point of possible releases of radioactive substances to the environment, with the general objective of improving the understanding of the accidents and the support to decision-making. In particular, the following aspects should be considered: phenomenology, mitigation of consequences (in particular loss of power, of monitoring instruments), and numerical simulation with computer codes. Cooperation with Japan is welcome.

Funding scheme: Maximum one Collaborative Project or Coordinated Action or their combination if appropriate.

Topic: Fission-2012-2.1.3: Consequences of combination of extreme external events on the safety of Nuclear Power Plants (NPPs). The nuclear accident in Japan resulted from the combination of two correlated extreme external events (earthquake and tsunami). The consequences (flooding in particular) went beyond what was considered in the initial NPP design. Such situations can be identified using PSA methodology that complements the deterministic approach for beyond design accidents. If the performance of a Level 1-Level 2 PSA concludes that such a low probability event can lead to extreme consequences, the industry (system suppliers and utilities) or the Safety Authorities may take appropriate decisions to reinforce the defence in depth of the plant. The present topic aims at providing best practice guidelines for PSA analyses and for the definition of appropriate criteria for decision making in the European context. Involvement of regulatory authorities in the foreseen action is strongly encouraged. Cooperation with Japan is welcome.

Funding scheme: Maximum one Coordination and Support Action (coordinating or supporting).

In this work programme, other actions in this area are within scope of topics Fission-2012-2.3.1&2.

II.2.2.2: Advanced nuclear systems for increased sustainability

In this work programme, actions in this area are within scope of topics Fission-2012-2.3.1&2.

II.2.2.3: Cross-cutting aspects for nuclear systems

- ***Expected impact:*** EU activities should contribute to the enhancement of safety, in line with the Strategic Research Agenda / Deployment Strategy of SNE-TP, while contributing to resource efficiency and cost-effectiveness of nuclear energy, including as part of the efforts coordinated under the SET-Plan.

Topic: Fission-2012-2.3.1: R&D activities in support of the implementation of the Strategic Research Agenda of SNE-TP⁸. Integrating R&D activities to help initiating, designing and

⁸ According to the Specific Programme, while respecting the overall objective of focusing exclusively on safety while contributing to resource efficiency and cost-effectiveness of nuclear energy, the Euratom Programme can support “research to underpin the safe operation of all reactor systems (including fuel cycle facilities) in use in Europe or, to the extent necessary in order to maintain broad nuclear safety expertise in Europe, those reactor types which may be used in the future. This includes plant life assessment and management, safety culture (minimising the risk of human and organisational error), advanced safety assessment methodologies, numerical simulation tools, instrumentation and control, and prevention and mitigation of severe accidents, with associated activities to optimise knowledge management and maintain competences. Activities include basic and key cross-cutting research activities (such as material science)

developing projects or programmes, in line with the Strategic Research Agenda (SRA) and according to the priorities in the Deployment Strategy (DS) of SNE-TP (www.snetp.eu) and SET-Plan goals. In any case, priority will be given to those areas most amenable to a genuine collaborative and integrating effort within Europe (e.g. for the preparation of key research infrastructure projects for long-term research). Synergies with other relevant initiatives are crucial, e.g. nuclear-related research programmes by EERA (the European Energy Research Alliance under the SET-Plan). Significant participation of public authorities and industrial stakeholders is encouraged. Participation of relevant partners from third countries would be valid if it adds to the scientific and/or technological excellence of projects and/or lead to an increased impact of the research to be undertaken.

Funding scheme: Coordinated Actions and/or Collaborative Projects and/or their combination if appropriate.

Topic: Fission-2012-2.3.2: Non-research activities in support of the implementation of the Strategic Research Agenda of SNE-TP and safety of nuclear systems. Coordination and support activities to complement the implementation of the Strategic Research Agenda (SRA) and Deployment Strategy (DS) of SNE-TP (www.snetp.eu) and of tasks and initiatives under the SET-Plan. Only those aspects not adequately covered in on-going activities should be proposed. In this context, cross-cutting refers either to the inter-disciplinary nature of the activity or to the interest from a broad range of stakeholders and national programmes; in any case, priority will be given to those areas most amenable to a genuine collaborative and integrating approach within Europe. Participation of relevant partners from third countries could lead to increased impacts.

Funding scheme: Coordination and Support Actions (coordinating or supporting).

II.2.2.4: Advanced systems for non-electrical uses of nuclear energy

In this work programme, actions in this area are within scope of topics Fission-2012-2.3.1&2.

II.2.3 Activity: Radiation Protection

II.2.3.1: Qualification of risks for low and protracted exposures⁹

Topic: Fission-2012-3.1.1: Contribution to low-dose risk research in Europe. In line with the HLEG vision report (www.hleg.de) and/or Strategic Research Agenda (SRA) of MELODI (www.melodi-online.eu), support will be provided for projects addressing identified key issues relating to risk from low and protracted exposure to ionising radiation and focusing on those areas/directions identified and prioritised by MELODI as the most promising in terms of addressing/resolving key issues in the vision / SRA. A multi-disciplinary and integrating approach will be required aiming to assess health effects through integration of radiobiological research and epidemiological studies of groups exposed to low doses in order to better substantiate conceptual/computational modelling assumptions. It is essential to include interfaces with the broader (i.e. non-radiation) biological and epidemiological communities that can bring new ideas or methodologies to radiation protection research.

and, while focusing exclusively on safety aspects, the study of future reactors and all aspects of the fuel cycle such as partitioning and transmutation.”

⁹ This is to be interpreted as exposures typically encountered in the workplace, the environment and in the use of radiation in medicine for diagnostic purposes. Use of radiation in medical therapeutic practices is excluded except where the effect on healthy/normal tissue can also lead to better understanding of low dose risks.

Proposals should avoid duplication of past and on-going research. The active participation of relevant partners from third countries might add to the value of the project.

Funding scheme: Coordinated Actions and/or Collaborative Projects and/or their combination if appropriate.

- **Expected impact:** Significant optimisation of the protection afforded to the workforce and public as a result of improvements to regulatory regimes following the resolution of one or more key identified issues in radiation protection research on low-dose risk.

II.2.3.2: Medical uses of radiation

In this work programme, actions in this area are within scope of topic Fission-2012-3.1.1.

II.2.3.3: Emergency and post-accident management

Topic: Fission-2012-3.3.1: Update of emergency management and rehabilitation strategies and expertise in Europe. There is a need to re-evaluate current European preparedness and expertise regarding emergency management of events at nuclear installations or during the transport of radioactive material, in particular in the light of the nuclear accident in Japan. The work should develop multi-disciplinary, innovative and integrative thinking about such management, related expertise and training, and should consider the environment, the source term, countermeasures and provisions to be envisaged at an early stage in the post-accident management, and should also involve public authorities and affected groups. Effort should also be devoted to re-evaluating the interaction of technical experts with authorities in charge, communication to the public and the training of key players. Cooperation with Japan is welcome.

Funding scheme: Maximum of one Coordination and Support Action (coordinating or supporting) or Collaborative Project or their combination if appropriate.

- **Expected impact:** Improved robustness and efficient application of emergency and post-accident management expertise, plans and related training in Europe.

II.2.3.4: National research activities in other areas

No topics in 2012 call.

II.2.4 Activity: Infrastructures

II.2.4.1 Area: Supporting infrastructures

No topics in 2012 call.

II.2.4.2 Area: Access to infrastructures

Topic: Fission-2012-4.2.1: Transnational access to large infrastructures. Community support will be provided to cover the improved Transnational Access to Large Infrastructures (TALI) for researchers from Member States and Associated States, other than the state where the infrastructure is established, in order to promote coordinated and pan-European access for researchers to infrastructures that provide essential and unique services to the European research community. Access to researchers from 3rd countries could also be envisaged, where

such access is part of the promotion of broader international cooperation with the countries concerned. The coordinated work and active participation of major infrastructure operators and representatives of potential users is required to achieve the objectives.

Funding Scheme: Combination of Coordination and Support Actions with collaborative research projects (aimed at improving the access and the quality of research services offered).

- **Expected impact:** Optimised use of existing nuclear research infrastructures in Europe in all activities of the programme and facilitated access to these infrastructures by researchers throughout Europe and from 3rd countries.

II.2.5 Activity: Human Resources and Training

II.2.5.1: Training of research workers

A significant part of the support for human resources and training will be implemented by encouraging the embedding of this support within the Networks of Excellence, Collaborative Projects and, where appropriate, other actions. It is considered that 5% of the total budget of these projects should be dedicated to training activities. Proposals for Networks of Excellence and Collaborative Projects will in particular foresee a dedicated budget for:

- The development and delivery of training courses in the subject matter of the project. These courses will be widely announced (preferably posted on the ENEN Website – <http://www.enen-assoc.org/>). This might take place in collaboration with the IAEA and/or the OECD/NEA.
- The exchange of research workers aiming at improving synergies between private and public research organisations at international level. A part of the research undertaken in the project will be executed by researchers preparing a doctoral thesis or employed on a post-doctoral position. More use should be made of the funding instruments provided by national and international programmes, such as trans-European mobility scheme for university studies /Tempus/ or programmes of the Education, Audiovisual and Culture Executive Agency /e.g. Erasmus Mundus/).

In addition to the above embedded training and mobility activities, proposals for dedicated *Euratom Fission Training Schemes* (EFTS) can be submitted under the following topic, in particular in areas where a shortage of skilled professionals is identified (see 'European Human Resources Observatory for the Nuclear Energy Sector' – <http://ehron.jrc.ec.europa.eu/>). The implementation of ECVET is particularly welcome ('European Credit system for Vocational Education and Training' – <http://www.ecvet-team.eu/>). The main motivation of the EU behind the ECVET initiative is to propose a response to the challenge of borderless mobility and lifelong learning that all industrial sectors are faced with (aeronautics and automobile are pioneering ECVET in the EU Member States). The cornerstone of ECVET is the formulation of 'competence building' schemes in terms of 'Learning Outcomes' related to Knowledge, Skills and Attitudes. An EFTS is aimed at structuring continuous professional development schemes across the EU, following the ECVET principles (notably, learning agreements and individual transcripts). The target public consists of professionals at post-graduate or higher level who are committed to participate in ambitious training actions spread over many years.

- **Expected impact:** Through effective coordination at Community level, continuous improvement of nuclear safety culture as a result of: training schemes and/or doctoral schools spread over many years and many countries, taking advantage of public-private partnerships recognised as international scientific references; maximising the transfer of

higher-level competences (that is: knowledge, skills and attitudes) for young as well as experienced research workers; increasing the attractiveness of nuclear careers in public and private research organisations across the EU and strengthening links with other Community policies and training networks outside the EU.

Topic: Fission-2012-5.1.1: Euratom Fission Training Schemes (EFTS) in 'Nuclear Fission, Safety and Radiation Protection'. Aligned with the above ECVET principles, an EFTS should address the challenges of borderless mobility and lifelong learning in specific domains. This is facilitated by following the ENEN approach, based on four principles, namely: (i) modularity of courses and common qualification criteria, (ii) common mutual recognition system, (iii) facilitation of mobility for trainers and trainees across the EU, and (iv) feedback from the 'employers' from public or private sectors. For this purpose, a *European Passport of Professional Competences* should be developed in each EFTS, wherever possible. Proposals for EFTS should be submitted by networks of organisations of pan-European character and relevance (host providers and sending providers), consisting of academia and 'employers'. An EFTS should consist of a variety of learning paths, including PhD student coaching, mentoring of new professionals, customer training, internships in industry, regular or virtual classroom training, face-to-face or distance learning, etc. An EFTS should also address a variety of profiles as appropriate (from young recruits to top managers in all nuclear sectors). The drafting and co-funding of co-authored textbooks at higher education level should take place under the control of an international review committee. 'Think tank' activities should be organised (preferably in collaboration with SNE-TP, IGD-TP or MELODI) with the aim to anticipate future training needs and to support policies for the continuous improvement of nuclear safety culture. It is viewed that the active participation of relevant partners from third countries or international organisations should add to the scientific and/or technological excellence of the project. Any applied or basic science theme within scope of Euratom FP 2012-13 can be proposed provided it is not already the subject of an EFTS from previous calls. Euratom funding is intended principally for the coordination and networking aspects, i.e. scientific secretariat, implementation of joint training programmes following ECVET principles, organisation of training events (for example, on the occasion of international conferences), mobility of trainers and trainees, access to research and training facilities, etc. Other funding sources should be used to pay the grants for individual fellowships (e.g. industrial or regulatory support, governmental actions at regional, national and international level, including other Community policy actions). The active participation and contribution of 'employers', i.e. representatives of system suppliers, energy providers, safety authorities and TSOs, users of ionising radiation in medicine and industry, waste management agencies, etc., is essential. The active participation of relevant partners from third countries might add to the value of the project. Likewise, synergies will be sought with complementary actions supported by the EU, in particular by the DG in charge of Development and Cooperation (DG DEVCO), in relation with third countries.

Funding scheme: Maximum of three Coordination and Support Actions (coordinating).

II.2.6 Activity: Cross-Cutting Actions

Topic: Fission-2012-6.0.1: Actions supporting programme implementation and other activities. The topic under the WP 2012 covers mainly the preparation of possible future Community actions (e.g. prospective studies, exploratory measures, pilot actions, etc.). Events such as workshops and conferences will not be supported if the proposed action does not demonstrably serve strategic and pan-European objectives.

Funding Scheme: Coordination and Support Actions (supporting).

- **Expected impact:** To help support strategic and pan-European objectives of the programme (European Research Area, future actions).

Topic: Fission-2012-6.0.2: Widening involvement in the 'Fission, Safety and Radiation Protection' Programme. Support will be provided for activities that can demonstrably lead to the greater involvement of those Member States who could benefit from increased participation in the programme. This is focused on those Member States, in particular with civil nuclear power programmes, or hosting institutes involved in nuclear activities, whose greater participation could be mutually beneficial. The topic is not to support actual R&D per se, rather to support, for example, (i) networking activities, either of public authorities and/or research institutes within the region and with similar organisations in other Member States; (ii) pilot studies to investigate how specific organisations or institutes can better exploit their competences and can integrate more effectively in Community activities, perhaps through a process of internal reorganisation; (iii) outreach activities enabling such organisations to become more closely involved in pan-European initiatives; or combinations of these and/or other duly justified actions. Proposals should not focus on cooperation in very specific R&D topics, but on launching projects that can produce results across the board or at least in areas such as research in radioactive waste management, in nuclear safety, or in radiation protection. Synergies may be needed with current projects or those specifically dealing with research infrastructure. A strong involvement of appropriate organisations from the Member States concerned is essential, and projects may also need to include partners from other Member States. All projects need to be aware of and, where appropriate, interact with the key technical forums in fission / radiation protection, i.e. SNETP, IGD-TP and MELODI.

Funding Scheme: Combination of Coordination and Support Actions with collaborative projects.

- **Expected impact:** Improved participation of less participating Member States in Euratom FP projects, thereby enabling a more broad and effective implementation of the European Research Area in the field of nuclear fission, and exploiting the full potential of institutes, universities and other organisations in these countries as regards their infrastructure, human resources and overall competences.

II.2.7 Activity: Cooperation with Third Countries

A structured dialogue has already been established with Russia and China, leading to specific topics in the 2009, 2010 & 2011 calls. Dialogue has also started with other key 3rd countries, e.g. USA (in the context of the EU-US Energy Council) and Ukraine. In both these cases, as with Russia and China, cooperation is being pursued under the umbrella of existing Euratom bilateral agreements. Furthermore, specific cooperation with Japan in the wake of the recent nuclear accident could be envisaged.

In any case, where relevant and of mutual interest and benefit, bodies from 3rd countries are encouraged to (i) join proposals / projects as full consortium partners (at zero cost to Euratom unless the appropriate case can be made for reimbursement of their costs according to the Rules for Participation), (ii) join the end-user groups established within the Euratom projects, or (iii) establish Memoranda of Understanding / Collaboration Agreement between projects in the 3rd country and similar projects in Euratom (Collaboration Agreements are signed by all partners in the Euratom and 3rd country projects). In all cases, such decisions rest with the Euratom consortia concerned. The implementation and cooperation will be monitored under the auspices of any existing agreements between Euratom and the 3rd country concerned.

Subjects in which cooperation is welcome

In the following topics, international cooperation is considered particularly appropriate and may be included as an element of the proposals:

- Fission-2012-2.1.1: Simulation Platform for Nuclear Reactor Safety
- Fission-2012-2.1.2: Impact of the nuclear accident in Japan on Severe Accident Management
- Fission-2012-2.1.3: Consequences of combination of extreme external events on the safety of NPPs
- Fission-2012-2.3.1: R&D activities in support of the implementation of the Strategic Research Agenda of SNE-TP¹⁰
- Fission-2012-2.3.2: Non-research activities in support of the implementation of the Strategic Research Agenda of SNE-TP⁹
- Fission-2012-3.1.1: Contribution to low-dose risk research in Europe
- Fission-2012-3.3.1: Update of emergency management and rehabilitation strategies and expertise in Europe
- Fission-2012-4.2.1: Transnational access to large infrastructures
- Fission-2012-5.1.1: Euratom Fission Training Schemes (EFTS) in 'Nuclear Fission, Safety and Radiation Protection'

However, international cooperation is also welcome in all other topics in this work programme on the basis of mutual interest and benefit, except if specifically excluded in the topic text. Coordination of activities included in this work programme with those of the Nuclear Safety Co-operation Instrument (NSCI) is encouraged in the proposals, where appropriate, on the same conditions as above.

¹⁰ Within the framework of the Generation IV International Forum (GIF), Euratom and the other GIF members are committed to providing scientific contributions to the various GIF Project Arrangements set up under the six selected GIF systems. Euratom FP projects are potential major Euratom contributors to GIF, and projects concerned should therefore identify deliverables that can form part of this contribution. Such deliverables should be agreed during the negotiation phase and made available to Euratom, through the terms of the Grant Agreement, in order that JRC, the Euratom Implementing Agent for GIF, can fulfil its obligations.

III. IMPLEMENTATION OF PROGRAMME AND CALL(S) IN 2012

III.1 Fusion

Activities under the thematic area 'Fusion energy research' will be implemented on the basis of procedures and rules for dissemination and use of results set out in the following instruments with the indicative budget shown in the table 'Euratom Budgetary Overview 2012'.

International agreements

International agreements relate to cooperation with third countries, or any legal entity which may be established by such an agreement, in particular the ITER Agreement.

Contributions to the international ITER project and to the Broader Approach projects (see also below) will be provided by 'Fusion for Energy' as domestic agency for the contribution of Euratom to ITER and as implementing agency for the contribution of Euratom to Broader Approach projects.

International cooperation will also continue under the umbrella of existing bilateral Cooperation Agreements aimed at supporting and complementing ITER activities in force between Euratom and Switzerland, Japan, U.S.DOE, Russia, Ukraine, Kazakhstan, South Korea, India, China and Brazil (the latter pending Brazilian ratification). Further to the collaborative activities of Fusion Associations and EFDA with entities from the aforesaid third States, other collaborations on specific programmes and projects will also be carried out on a bilateral basis, and the Euratom Cooperation Agreements will integrate all these activities.

In this respect, these Euratom Cooperation Agreements represent the framework encompassing all cooperative activities between Euratom and fusion entities from third States, and will continue to be an important instrument to facilitate the decision-making process at international level.

Multilateral cooperation will include participation in the IEA, IAEA and ITPA frameworks, as well as in other frameworks referred in section I.3. The funding of these activities will be through the Contracts of Association, EFDA and the Mobility Agreement.

The European Joint Undertaking for ITER and the Development of Fusion Energy 'Fusion for Energy' (F4E)

Established under the Euratom Treaty as the European Joint Undertaking for ITER and the Development of Fusion Energy, F4E has the tasks of providing the contribution of the Community to ITER, providing the Community contribution to Broader Approach activities with Japan, and preparing and coordinating a programme of activities in preparation for the construction of a demonstration fusion reactor and related facilities. The resources of the Joint Undertaking consist of a contribution from the Community budget (about 83%), the ITER host State (France, about 17%) and the F4E Members (EU Member States and Switzerland, less than 1%).

In 2012 F4E will aim to negotiate and sign Procurement Arrangements with ITER and to sign the procurement contracts foreseen in the F4E schedule. Components on the critical path, such as buildings, toroidal and poloidal field coils and vacuum vessel which will require the launch of additional large contracts in 2012. The main procurement contracts to be initiated

will be related to the magnets (assembly, manufacture, tests); vacuum vessel (additional stages according to progress); tritium system; cryoplant; power supplies; neutral beam systems for construction of the Neutral Beam Test Facility; buildings (mainly civil work on the tokamak complex and surrounding buildings).

F4E will carry out other activities related to ITER construction. It will continue design and R&D activities (including Remote Handling, Heating and Current Drive, Vacuum System, Tritium System, Diagnostics and Test Blanket Modules); continue preparation of safety and licensing documentation for ITER in Cadarache and related safety studies; investigate manufacturing methods and non-destructive tests of critical components for cost minimisation and risk mitigation; prepare new facilities to test prototypes and components; continue activities for the preparation of the ITER site.

With respect to the Broader Approach, F4E will implement Procurement Arrangements with the Voluntary Contributors and carry out limited direct contributions which will cover residual activities on the TF Conductor and preassembly tooling, transportation of some components, and cash contributions for the IFMIF/EVEDA and IFERC supercomputer projects.

Contracts of Association

The Contracts of Association renewed under Euratom Seventh Framework Programme (2007-2011) between the Community and Member States or Euratom Fully Associated Third States or legal entities within Member States or Euratom Fully Associated Third States have an indicative budget that comprises financing of baseline support, with additional support for priority projects, training and career development fellowships and support actions; the total amount for these activities is shown in the indicative budget table in section V of this work programme.

For career development fellowships (with a duration of 2 years), the maximum Community contribution will be up to EUR 54 300 per year and per researcher as a living allowance, up to EUR 6000 per year and per researcher for expenses related to the participation to research and training activities (meeting and conference attendance, participation in training actions, research costs, etc), with an additional flat rate of 3% of the direct costs for management activities and flat rate of 10% of direct costs as contributions to overheads, excluding costs for subcontracting. The use of the mobility agreement to support mobility of the participants for their training actions etc. will ensure the pan-European nature of the joint training actions. To ensure continuity of employment of the researchers and retention of the best candidates, the start date of the fellowships may be fixed as the date which is the deadline for the Associations to make their proposals.

European Fusion Development Agreement

The European Fusion Development Agreement (EFDA), concluded between the Community and organisations in, or acting for, Member States or Euratom Fully Associated Third States, was renewed under Euratom Seventh Framework Programme (2007-2011). The Community support covers research co-ordination activities, training and career development fellowships, support actions, JET S/T Orders implemented under the Contracts of Association, the JET Implementing Agreement (JIA), the JET Operation Contract and the EFDA Host Support Agreement, secondment and assignment of staff. The year 2012 will also mark the entering into force of the Power Plant Physics and Technology (3PT) Implementing Agreement under EFDA and the start of Community funding under this agreement.

The global indicative budget for EFDA, (including Host support, JET Operational Contract and JET activities) is shown in the table 'Euratom Budgetary Overview 2012'.

Mobility Agreement and other multilateral agreement

The indicative expenditure for the Mobility Agreement and any other multilateral agreement concluded between the Community and associated organisations is shown in the table 'Euratom Budgetary Overview 2012'.

III.2 Nuclear Fission, Safety and Radiation Protection

- **Call Identifier:** FP7-Fission-2012
- **Date of publication:** 17 January 2012¹¹
- **Deadline:** 27 March 2012, at 17.00.00, Brussels local time¹²
- **Indicative budget:** EUR 53.251.000 from 2012 budget

The table below provides indicative 2012 budgets for activities defined in the Specific Programme and/or in this work programme (excluding 'other actions' in section IV):

Group	Activities	Indicative budget repartition (EUR million)
1	Fission-1	9.00
2	Fission-2	20.00
3	Fission-3	15.00
4	Fission-4, 5 & 6	9.25
	Total	53.25

All budgetary figures in this work programme are indicative. Following the evaluation of the proposals, the final budget awarded to actions implemented through calls for proposals may vary:

- by up to 10% of the total value of the indicated budget for each call; and
- any repartition of the call budget may also vary by up to 10% of the total value of the indicated call budget.

- **Topics called:**

Usually a maximum of one project will be considered for funding per topic (indicated by a singular under *funding scheme*). Where more than one project per topic could be considered for funding, this is clearly indicated (by a plural) under *funding scheme*. In such cases, the number of possible funded projects may be limited (i.e. a maximum greater than one is specified for that topic).

Activity/Area	Topic	Funding Scheme
Management of Ultimate Radioactive Waste:	Fission-1	
<i>Geological disposal</i>	<i>Fission-1.1</i>	
	Fission-2012-1.1.1: Technical feasibility and long-term performance of repository components – full-scale demonstration of plugs and seals	Maximum one Collaborative Project

¹¹ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

¹² The Director-General responsible may delay this deadline by up to two months

	Fission-2012-1.1.2: Support to the technical secretariat of the Implementing Geological Disposal Technology Platform	Maximum one Coordination and Support Action (coordinating or supporting) <i>Euratom will contribute only up to a maximum of 75% of the total cost on a shared cost basis.</i>
Reactor Systems:	Fission-2	
<i>Safety and competitiveness of existing and future nuclear installations</i>	<i>Fission-2.1 (for other actions refer to Fission-2012-2.3.1&2)</i>	
	Fission-2012-2.1.1: Simulation Platform for Nuclear Reactor Safety	Maximum one Collaborative Project
	Fission-2012-2.1.2: Impact of the nuclear accident in Japan on Severe Accident Management	Maximum one collaborative project or Coordinated Action or their combination if appropriate
	Fission-2012-2.1.3: Consequences of combination of extreme external events on the safety of NPPs	Maximum one Coordination and Support Action (coordinating or supporting)
<i>Advanced nuclear systems for increased sustainability</i>	<i>Fission-2.2(refer to Fission-2012-2.3.1&2)</i>	
<i>Cross-cutting aspects for nuclear systems</i>	<i>Fission-2.3</i>	
	Fission-2012-2.3.1: R&D activities in support of the implementation of the Strategic Research Agenda of SNE-TP	Coordinated Actions and/or Collaborative Projects and/or their combination if appropriate
	Fission-2012-2.3.2: Non-research activities in support of the implementation of the Strategic Research Agenda of SNE-TP	Coordination and Support Actions (coordinating or supporting)
<i>Advanced systems for non-electrical uses of nuclear energy</i>	<i>Fission-2.4 (refer to Fission-2012-2.3.1&2)</i>	
Radiation Protection:	Fission-3	
<i>Quantification of risks for low and protracted exposures</i>	<i>Fission-3.1</i>	
	Fission-2012-3.1.1: Contribution to low-dose risk research in Europe	Coordinated Actions and/or Collaborative Projects and/or their combination if appropriate
<i>Medical uses of radiation</i>	<i>Fission-3.2 (refer to Fission-2012-3.1.1)</i>	
<i>Emergency and post-accident management</i>	<i>Fission-3.3</i>	
	Fission-2012-3.3.1: Update of emergency management and rehabilitation strategies and expertise in Europe	Maximum one Collaborative Project or one Coordination and Support Action (coordinating or supporting) or their combination if appropriate
<i>National research activities in other areas</i>	<i>Fission-3.4 (no topics in 2012)</i>	
Infrastructures:	Fission-4	
<i>Supporting infrastructures</i>	<i>Fission-4.1 (no topics in 2012)</i>	

<i>Access to infrastructures</i>	<i>Fission-4.2</i>	
	Fission-2012-4.2.1: Transnational access to large infrastructures	Combination of Coordination and Support Actions with collaborative research projects
Human Resources and Training:	Fission-5	
<i>Training of research workers</i>	<i>Fission-5.1</i>	
	Fission-2012-5.1.1: Euratom Fission Training Schemes (EFTS) in 'Nuclear Fission, Safety and Radiation Protection'	Maximum of three Coordination and Support Actions (coordinating)
Cross-cutting Actions:	Fission-6	
<i>Cross-cutting actions</i>	Fission-2012-6.0.1: Actions supporting programme implementation and other activities.	Coordination and Support Action (supporting)
	Fission-2012-6.0.2: Widening involvement in the 'Fission, Safety and Radiation Protection' Programme.	Combination of Coordination and Support Actions with collaborative projects

- **Eligibility criteria:**

- The general eligibility criteria are set out in Annex 1 and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.
- Minimum number of participants¹³ as set out in the Rules for Participation:

Funding scheme	Minimum conditions
Collaborative project (also applicable for a combination of a CP with another funding scheme) and Network of Excellence	At least 3 independent legal entities, each of which is established in a MS or AC, and no two of which are established in the same MS or AC.
Coordination and support action (coordinating type)	At least 3 independent legal entities, each of which is established in a MS or AC, and no two of which are established in the same MS or AC.
Coordination and support action (supporting type)	At least 1 independent legal entity

- Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to the minimum number of eligible participants.

Proposals that do not conform to the eligibility criteria will be rejected at the eligibility stage and will not be evaluated by the independent experts.

- **Evaluation Procedure:**

- The evaluation criteria (including any weights and thresholds) and sub-criteria together with the eligibility, selection and award criteria for the different funding schemes are set out in Annex 1 to this work programme.
- Proposal page limits: Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template

¹³ MS = Euratom (EU) Member State; AC = Associated country. Where the minimum conditions for an indirect action are satisfied by a number of legal entities, which together form one legal entity, the latter may be the sole participant, provided that it is established in a Member State or Associated country

available through the EPSS. The Commission will instruct the experts to disregard any pages exceeding these limits.

- The evaluation will follow a single stage procedure.
 - Proposals will not be evaluated anonymously.
 - Proposals may be evaluated remotely.
 - At the end of the evaluation process, proposals will be ranked within their indicative budget group (see table above) and funded until the indicative budget for this group is exhausted. The budget repartition in this table is indicative. Hence there will be competition between topics in the same indicative budget group, and some topics may end up not being supported if proposals fail to reach a high enough standard (even though proposals in other groups with lower overall scores may be funded) or if this work programme limits the maximum number of proposals that may be funded under one single topic. Proposals scoring above all evaluation thresholds, but for which sufficient funding is not available, will be put on a common reserve list for the whole call, from which proposals will be considered for funding if additional funds become available from any part of the call. In the ranked lists per group and the reserve list, all funding schemes have the same weight, the priority order being determined by total score. To separate tied proposals, the score for criterion 1 may be given priority, followed by that for criterion 3, except if otherwise decided and justified by the evaluation panels. Proposals on the reserve list are not carried over for funding from next year's budget. Depending on the strategic nature of the topic in question, the Commission may, in such cases, decide to reinsert the topic in next year's work programme.
- **Indicative evaluation and contractual timetable:** Evaluation: spring 2012; contract negotiation and signature: summer / autumn 2012.
 - **Consortia Agreements:** Required for all projects where there is more than one partner.
 - **Particular requirements for participation, evaluation and implementation:** None beyond the standard rules and guidelines. The forms of grant and maximum reimbursement rates which will be offered are specified in Annex 2.
 - **Use of flat rates for subsistence costs:**
In accordance with Annex 2 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available at the following website: http://cordis.europa.eu/fp7/find-doc_en.html under 'Guidance documents/Flat rates for daily allowances'.

IV. OTHER ACTIONS FOR 2012

Interdisciplinary study on the benefits and limitations of nuclear fission for a low carbon economy

In order to respond to the Council request made as a part of the political agreement of 28 June 2011 on the Euratom Framework Programme (2012-2013), the Commission will contract in 2012 an interdisciplinary study on the benefits and limitations of nuclear fission for a low carbon economy. As requested by the Council, this study should help with the preparations of a symposium, involving a broad spectrum of stakeholders, on the same subject to be organised in 2013. The indicative budget planned for this study is EUR 150 000. The launching of the procurement procedure for the direct service contract is expected to start in the 1st quarter of 2012 and the study is expected to be carried out in a period of 12 months.

Funding scheme: Coordination and Support Action (supporting action), public procurement

Grant to a named beneficiary action in favour of FORUM ENGELBERG

The 'Forum Engelberg' will organise its 20th Forum Engelberg conference in 2012 focussing on Tomorrows Energy Challenges. This conference will address topics of a particular interest for the socio-economic aspects of energy systems, like for example "holistic evaluations of energy systems, "dealing with nuclear energy and its risks – a peculiarity?", "social acceptance of nuclear energy against the background of other options" or "economic costs of withdrawal from nuclear". This conference will in particular contribute to the preparation of the symposium to be held in 2013 on the benefits and limitations of nuclear fission energy for a low-carbon economy which was requested by the Council as part of the political agreement of 28 June 2011 on the Euratom Framework Programme (2012-13). It will be evaluated in accordance with the standard evaluation criteria (including weight and thresholds) and sub-criteria, together with an eligibility, selection and award criteria for the funding scheme as set out in Annex 2 of this work programme.

Funding scheme: Coordination and support action (supporting action).

Indicative budget: EUR 150 000.

The named beneficiary for this grant is: L 'ASSOCIATION FORUM ENGELBERG (art. 60 CCS) with its seat in Genève (Adress: FORUM ENGELBERG, C.P. 139, CH-6045 Meggen, Switzerland)

Contribution to the Organisation for Economic Co-operation and Development (Nuclear Energy Agency) / Secretariat for the Generation-IV International Forum (GIF)

USA, UK, France, Brazil, Japan, Korea, South Africa, Argentina and Canada signed the Generation-IV International Forum (GIF) Charter in July 2001, with the purpose of developing concepts for one or more nuclear energy systems that can be operated in a manner that will provide a competitive and reliable supply of energy, while satisfactorily addressing nuclear safety, waste, proliferation and public perception concerns. Switzerland signed the GIF charter in February 2002. Euratom signed the Charter on 30 July 2003 by a decision of the Commission pursuant to Article 101(3) of the Euratom Treaty. The Russian Federation and the People's Republic of China signed in November 2006. A Framework Agreement (FA) for collaboration on R&D of Generation-IV systems, setting the framework conditions for subsequent system and project arrangements, has also been concluded and all Charter signatories (except Argentina, Brazil and UK) have acceded to it. The Charter was originally

for duration of 10 years, and in 2011 the FA signatories unanimously prolonged this duration indefinitely. The FA depository is the OECD/NEA. The EU Council approved the accession of the Euratom to the FA in its Decision no. 14121/05, Brussels, 8 November 2005, and Euratom formally acceded in May 2006. Accession brings with it certain obligations, including the co-funding of the NEA's GIF technical secretariat activities. The level of this funding from each signatory was established by the GIF Policy Group at its meeting in Beijing, China, 23-24 October 2008, and revised at its meeting in San Diego, USA, 4-5 March 2009 and Lucerne, Switzerland, 6-7 October 2011.

Euratom contribution: EUR 144 000 for operation of the Secretariat to the end 2012, in the form of a 'subscription', in accordance with Article 108(2)(d) of the Financial Regulation and Article 160a of its Implementing Rules.

Experts contracts

Group(s) of external experts will be established to provide analyses in policy relevant areas and to advise on or support the design and implementation of EU Research Policy.

Indicative budget: EUR 150 000.

Funding scheme: Coordination and Support Action (supporting action), expert appointment letters

Contracts will be placed to independent experts for the evaluation of proposals as well as for the mid-term and periodic review of the Framework Programme actions.

V. BUDGET

		Year 2012 Million EUR
Calls	Call FP7-FISSION-2012	53.25
Experts, Evaluators	Evaluation of proposals, Project review (Fi)	0.26
Other	European JU for ITER (F4E)	1 067. 90
	COA (‘baseline support, and additional support under EFDA outside JET’) (Fu)	36.25
	EFDA (‘JOC and JET orders’) (Fu)	20.13
	Mobility and other agreements (Fu)	5.00
	Subscription payment – GIF technical secretariat (Fi)	0.14
	Interdisciplinary study (Fi)	0.15
	Grant to a named beneficiary action in favour of Forum Engelberg	0.15
	External experts group(s)	0.15
Estimated Total Budget Allocation		1 183.38

All budgetary figures in this work programme are indicative.

The final budget proposed for the different actions in the Fusion theme may vary by up to 10% of the total value of the proposed budget for each action.

Following the evaluation of the proposals the final budget awarded to actions implemented through calls for proposals may vary:

- by up to 10% of the total value of the indicated budget for each call; and
- any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget

The final budgets for evaluation, monitoring and review may vary by up to 20% of the indicated budgets for these actions. The final budget awarded for actions in the fission theme, not implemented through calls for proposals, may vary by up to 10% of the indicated budgets for these actions.

VI. INDICATIVE PRIORITIES FOR FUTURE WPs AND CALLS

The 2012 work programme is the first of two annual programmes in the Euratom FP 2012-2013, which follows the five annual programmes of Euratom FP7 (2007-2011). The 2013 work programme is expected to follow a similar strategy, though in the fission call additional topics on safety may be included depending on the outcome of the on-going ‘stress tests’ following the recent nuclear accident in Japan.

In 2013 the fusion part of the work programme will continue to concentrate on the activities listed in section II.1.

LIST OF ANNEXES

- 1) Eligibility and Evaluation Criteria for Proposals
- 2) Table for Forms of Grants and Maximum Reimbursement Rates for Projects Funded through the Euratom Work Programme

Annex 1: Eligibility and Evaluation Criteria for Proposals

Eligibility criteria

A proposal will only be considered eligible if it meets all of the following conditions:

- It is received by the Commission before the deadline given in the call text.
- It involves at least the minimum number of participants given in the call text.
- It is complete (i.e. both the requested administrative forms and the proposal description are present)
- The content of the proposal relates to the topic(s) and funding scheme(s), including any special conditions, set out in those parts of the relevant work programme
- Other eligibility criteria may be given in the work programme at the level of individual topics (see also the table under section III.2), in which case they may override the criteria above.

Evaluation criteria

The criteria against which proposals will be evaluated are set out in Articles 14 and 15 of the Rules for Participation. For the Specific Programme these are:

- scientific and/or technological excellence;
- relevance to the objectives of the Specific Programme¹⁴;
- the potential impact through the development, dissemination and use of project results;
- the quality and efficiency of the implementation and management.

Within this framework, the work programmes will specify the evaluation and selection criteria and may add additional requirements, weightings and thresholds, or set out further details on the application of the criteria.

The purpose of this annex is to set out such specifications. Unless otherwise indicated in the relevant parts of this work programme, the criteria, weightings and thresholds given here will apply to all calls for proposals.

Proposals will be evaluated in line with the Commission ‘Rules on Submission of Proposals and the Related Evaluation, Selection and Award Procedures’.

A proposal which contravenes fundamental ethical principles, fails to comply with the relevant security procedures, or which does not fulfil any other of the conditions set out in the specific programme, the work programme or in the call for proposals shall not be selected. Such a proposal may be excluded from the evaluation, selection and award procedures at any time. Details of the procedure to be followed are given in the Commission rules mentioned above.

¹⁴ **Relevance:** A proposal may be **partially relevant** if it addresses only marginally the topic(s) of the call, or if only part of the proposal addresses them. Such conditions will be reflected in the evaluation of the first criterion (‘S/T excellence’). The degree to which a proposal is relevant to the objectives of a call will be reflected in the evaluation of the third criterion (‘impact’). Proposals that are clearly not relevant to a call (‘out of scope’) will be rejected on eligibility grounds before the evaluation.

The arrangements for a particular call will be set out in the relevant Guide for Applicants.

Evaluation criteria →		1. Scientific and/or technological excellence (relevant to the topics addressed by the call) (award)	2. Quality and efficiency of the implementation and the management (selection)	3. The potential impact through the development, dissemination and use of project results (award)
Funding scheme ↓				
All funding schemes		<ul style="list-style-type: none"> <i>Soundness of concept, and quality of objectives</i> 	<ul style="list-style-type: none"> Appropriateness of the management structure and procedures <u>Quality and relevant experience of the individual participants</u> 	<ul style="list-style-type: none"> <i>Contribution, at the European [and/or international level], to the expected impacts listed in the work programme under relevant topic/activity</i>
Collaborative Projects		<ul style="list-style-type: none"> <i>Progress beyond the state-of-the-art</i> Quality and effectiveness of the S/T methodology and associated work plan 	<ul style="list-style-type: none"> <u>Quality of the consortium as a whole (including complementarity, balance)</u> Appropriateness of the allocation and justification of the resources to be committed (staff, equipment) 	<ul style="list-style-type: none"> Appropriateness of measures for the dissemination and/or exploitation of project results, and management of intellectual property.
Networks of Excellence		<ul style="list-style-type: none"> <i>Contribution to long-term integration of high quality S/T research</i> Quality and effectiveness of the joint programme of activities and associated work plan 	<ul style="list-style-type: none"> <u>Quality of the consortium as a whole (including ability to tackle fragmentation of the research field, and commitment towards a deep and durable integration)</u> Adequacy of resources for successfully carrying out the joint programme of activities 	<ul style="list-style-type: none"> Appropriateness of measures for spreading excellence, exploiting results, and disseminating knowledge, through engagement with stakeholders and the public at large.
Co-ordination & Support Actions	CA	<ul style="list-style-type: none"> Contribution to the co-ordination of high quality research Quality and effectiveness of the co-ordination mechanisms, and associated work plan 	<ul style="list-style-type: none"> <u>Quality of the consortium as a whole (including complementarity, balance) [for SA: only if relevant]</u> Appropriateness of the allocation and justification of the resources to be committed (staff, equipment) 	<ul style="list-style-type: none"> Appropriateness of measures for spreading excellence, exploiting results, and dissemination knowledge, through engagement with stakeholders, and the public at large.
	SA	<ul style="list-style-type: none"> Quality and effectiveness of the support action mechanisms, and associated work plan 		

Notes:

- Evaluation scores will be awarded for each of the three criteria, and not for the sub-criteria. Each criterion will be scored out of 5. No weightings will apply. The threshold for individual criteria will be 3. The overall threshold, applying to the sum of the three individual scores, will be 10.
- The second column corresponds to the **selection criteria** in the meaning of the Financial Regulation¹⁵ (Article 115) and its Implementing Rules¹⁶ (Articles 176 and 177). They also will be the basis for assessing the ‘operational capacity’ of participants. The other two criteria correspond to the **award criteria**.
- For the evaluation of first-stage proposals under a two-stage submission procedure, only the sub-criteria in italics apply.

¹⁵ OJ L248 16.9.2002, p1

¹⁶ OJ L357 31.12.2002, p1

If the topic requires a funding scheme which is a **combination of a Collaborative Project and a Coordination Action** (covering integration, networking, transnational access and joint research, along the lines of the FP6 I3 – Integrated Infrastructures Initiatives), the evaluation criteria are:

<i>Evaluation criteria applicable to</i> Combination of collaborative research projects and coordination and support actions		
1. S/T QUALITY ‘Scientific and/or technological excellence (relevant to the topics addressed by the call)’	2. IMPLEMENTATION ‘Quality and efficiency of the implementation and the management’	3. IMPACT ‘Potential impact through the development, dissemination and use of project results’
<ul style="list-style-type: none"> • Clarity of the objectives and quality of the concept. • Contribution of the overall project to the provision of integrated services and to the co-ordination of high quality research. • Quality and effectiveness of the Joint Research Activities and associated work plan: The extent to which the activities will contribute to quantitative and qualitative improvements of the services provided by the infrastructures. • Quality and effectiveness of the co-ordination mechanisms and associated work plan: The extent to which the Networking Activities will foster a culture of co-operation between the participants, and enhance the services to the users. • <i>(whenever appropriate)</i> Quality and effectiveness of the Trans-national Access and research services, and associated work plan: The extent to which the activities will offer high quality services, access to state-of-the-art research infrastructures, and will enable users to conduct high quality research. 	<ul style="list-style-type: none"> • Appropriateness of the management structure, the management procedures, and the implementation plan to achieve the objectives of the project. Quality and relevant experience of the individual participants and quality of the consortium as a whole (including complementarity, balance, critical mass). • Appropriate allocation and justification of the resources to be committed (, staff, equipment), by task and participant. 	<ul style="list-style-type: none"> • Contribution at the European level of the Joint Research Activities towards an optimum development of European capacities, knowledge and technologies. • Contribution at the European level of the collaborative arrangements put into place and the perspectives for their long-term sustainability, towards a structuring impact on the pool of research capacities in Europe. • <i>(whenever appropriate)</i> Contribution at the European level of the access and service activities towards an improved access to - and use of - the pool of research infrastructures and new opportunities of access and use for researchers from across the EU. • Appropriateness of measures envisaged for the management of intellectual property and for the dissemination and/or exploitation of project results.

The second column corresponds to the selection criteria in the meaning of Article 115 of the Financial Regulation (see previous table).

Annex 2: Table for Forms of Grant and Maximum Reimbursement Rates for Projects Funded through the Euratom Work Programme

Forms of Grant

The Euratom FP 2012-13 'Rules for Participation' stipulate three potential forms of grant for the Community financial contribution: reimbursement of eligible costs, flat rate financing including scale of unit costs, and lump sum financing. In this work programme, for all funding schemes in the call for proposals, the reimbursement of eligible costs (including the different options for flat rates on indirect costs as established in Article 31 of the Rules for Participation) will be the only form of grant used¹⁷.

In accordance with Article 2 of the Commission Decision of 23 March 2009 under reference C (2009) 1942, the present work programme provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. The applicable flat rates are available at the following website http://cordis.europa.eu/fp7/find-doc_en.html under 'Guidance documents/Flat rates for daily allowances'. Please note this option is only available when stated explicitly in the call fiche.

Maximum Reimbursement Rates

The upper limits foreseen in the Rules for Participation (Article 32) for the Community financial contribution are summarised in the following table.

	Non-profit public bodies, secondary and higher education establishments, research organisations and SMEs	All other organisations
Research and technological development activities	75%	50%
Demonstration activities	50%	50%
Coordination and support actions and actions for the training and career development of researchers	100%	100%
Management, audit certificates and other activities ¹⁸	100%	100%

¹⁷ This annex does not apply to the funding schemes listed under section III.1 (fusion energy), except where the activities are implemented through calls for proposals.

¹⁸ Including, inter alia training activities in actions that do not fall under the funding schemes for training and career development of researchers, coordination, networking and dissemination (as set out in Article 32(4) of the Rules for Participation).