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NOTE

From: Presidency
To: Delegations

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Subject: Proposal for a Council Regulation on the Research and Training Programme of the European Atomic Energy Community (2014-2018) complementing the Horizon 2020 - The Framework programme for Research and Innovation
– Presidency text

Delegations will find attached a Presidency text on the Proposal for a Council Regulation on the Research and Training Programme of the European Atomic Energy Community (2014-2018) complementing the Horizon 2020 - The Framework programme for Research and Innovation.

Explanation:

~~Strikeout~~ = deletion in relation to doc. 5669/13

Bold underlined = new text

Proposal for a

COUNCIL REGULATION

on the Research and Training Programme of the European Atomic Energy Community (2014-2018) complementing the Horizon 2020 – The Framework Programme for Research and Innovation

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Atomic Energy Community, (hereinafter the ‘Euratom Treaty’), and in particular the first paragraph of Article 7 thereof,

Having regard to the proposal from the European Commission,

Having regard to the opinion of the European Parliament¹,

Having regard to the opinion of the European Economic and Social Committee²,

Whereas:

- (1) One of the aims of the European Atomic Energy Community (hereinafter the ‘Community’) is to contribute to the raising of the standard of living in the Member States by, inter alia, promoting and facilitating nuclear research in the Member States and complementing it by carrying out a Community research and training programme.

¹ OJ C , , p. .

² OJ C , , p. .

- (2) Nuclear research can contribute to social and economic prosperity and environmental sustainability by improving nuclear safety, security and radiation protection. Equally important is the contribution of nuclear research to **ensure safety in an efficient and coordinated manner in those Member States where utilisation of nuclear energy is part of the strategy for decarbonisation of energy systems.** ~~the long-term decarbonisation of the energy system in a safe, efficient and secure way.~~
- (3) By supporting nuclear research the Research and Training Programme of the Community (hereinafter the ‘Euratom Programme’) will contribute to achieving objectives of the ‘Horizon 2020’ Framework Programme for Research and Innovation established by Regulation (EU XX/XXXX of [...])¹ (hereinafter ‘Horizon 2020 Framework Programme’) and facilitate implementation of the Europe 2020 strategy, and the creation and operation of the European Research Area.
- (4) Notwithstanding the potential impact of nuclear energy on energy supply and economic development, severe nuclear accidents may endanger human health. Therefore, nuclear safety and, where appropriate, security aspects dealt with by the JRC should be given the greatest possible attention in the Euratom Research and Training Programme.
- (4a) The European Strategic Energy Technology Plan (SET Plan), set out in the Council conclusions of 28 February 2008, is accelerating the development of a portfolio of low carbon technologies. The European Council agreed, at the meeting on 4 February 2011, that the Union and its Member States would promote investment in renewables, safe and sustainable low carbon technologies and focus on implementing the technology priorities established in the SET Plan.

¹ OJ L [...]

- (5) As all Member States have nuclear installations or make use of radioactive materials particularly for medical purposes, the Council has recognised in its conclusions of 2 December 2008¹ the continuing need for skills in the nuclear field, in particular through appropriate education and training linked with research and coordinated at Community level.

(5a) Acknowledging the role of nuclear fission for the time being as a 'bridging technology' in certain Member States in the broader context of finding a sustainable energy-mix for the future.

- (6) By signing the Agreement on the Establishment of the ITER International Fusion Energy Organisation for the Joint Implementation of the ITER Project², the Community has undertaken to participate in ITER construction and its future exploitation. The Community contribution is managed through the 'European Joint Undertaking for ITER and the Development of Fusion Energy' (hereinafter 'Fusion for Energy'), established by Council Decision of 27 March 2007³. The activities of Fusion for Energy, including ITER, are to be regulated by a separate legislative act.
- (7) For fusion to become a credible option for commercial energy production, it is, firstly, necessary to successfully and timely complete the construction of ITER and start its operation. Secondly it is necessary to establish an ambitious, yet realistic roadmap towards the production of electricity by 2050. Reaching those goals requires the European fusion programme to be redirected. A stronger focus should be placed on the activities **notably** in support to ITER, **which may include** and the developments towards the demonstration reactor. Such rationalisation and refocussing should be achieved without jeopardising the European leadership of the fusion scientific community.

¹ Council Conclusions of 2 December 2008 on the need for skills in the nuclear field (15406/08).

² OJ L358, 16.12.2006, p.62

³ OJ L 90, 30.03.2007

- (8) The Joint Research Centre (JRC) should continue to provide independent customer-driven scientific and technological support for the formulation, development, implementation and monitoring of Community policies, in particular in the field of nuclear safety and security research and training.

To optimize human resources and ensure no duplication of research in EU, any new activity carried out by JRC shall be analyzed to check the consistency with those already existing in the Member States. The security aspects of the framework programme should be limited to the direct actions of the JRC.

- (9) The Joint Research Centre should continue to generate additional resources through competitive activities, including participation to the indirect actions of the Euratom Programme, third party work and, to a lesser extent, the exploitation of intellectual property.
- (10) While it is for each Member State to choose whether or not to make use of nuclear power, the role of the Union is to develop, in the interest of all its Member States, a framework to support joint cutting-edge research, knowledge creation and knowledge preservation on nuclear fission technologies, with special emphasis on safety, security, radiation protection and non-proliferation. That requires independent scientific evidence, to which the JRC can make a key contribution. That has been recognised in the Commission Communication 'Europe 2020 Flagship Initiative Innovation Union'¹, in which the Commission stated its intention to strengthen scientific evidence for policy making through the JRC. The JRC proposes to respond to that challenge by focusing its nuclear safety and security research on the Union's policy priorities.
- (11) With the aim of deepening the relationship between science and society and reinforcing public confidence in science, the Euratom Programme should favour an informed engagement of citizens and civil society on research and innovation matters by promoting science education, by making scientific knowledge more accessible, by developing responsible research and innovation agendas that meet citizens' and civil society's concerns and expectations and by facilitating their participation in the Euratom programme activities.

¹ COM(2010) 546 final, 6.10.2010.

- (12) The implementation of the Euratom Programme should respond to the evolving opportunities and needs from science and technology, industry, policies and society. As such, the agendas should be set in close liaison with stakeholders from all sectors concerned, and sufficient flexibility should be allowed for new developments. External advice should be sought on a continuous basis during the Euratom Programme, also making use of relevant structures such as European Technology Platforms.

(12a) Acknowledging the outcomes of the debates that took place at the Symposium on 'Benefits and Limitations on Nuclear Fission Research for a Low Carbon Economy' prepared by an interdisciplinary study involving, inter alia, experts from the fields of energy, economics and social sciences, organised in Brussels on 26-27 February 2013 which recognised the need to continue nuclear research at the European level.

- (13) The Euratom Programme should contribute to the attractiveness of the research profession in the Union. Adequate attention should be paid to the European Charter for Researchers and Code of Conduct for the Recruitment of Researchers¹, together with other relevant reference frameworks defined in the context of the European Research Area, while respecting their voluntary nature.
- (14) The activities developed under the Euratom Programme should aim at promoting equality between men and women in research and innovation, by addressing in particular the underlying causes of gender imbalance, by exploiting the full potential of both female and male researchers, and by integrating the gender dimension into the content of projects in order to improve the quality of research and stimulate innovation. Activities should also aim at the implementation of the principles relating to the equality between women and men as laid down in Articles 2 and 3 of the Treaty on European Union and Article 8 of the Treaty on the Functioning of the European Union (TFEU).

¹ C(2005) 576 final, 11.3.2005

- (15) Research and innovation activities supported by the Euratom Programme should respect fundamental ethical principles. The opinions of the European Group on Ethics in Science and New Technologies should be taken into account **in the broader debate on energy mix**. Research activities should also take into account Article 13 of the TFEU and reduce the use of animals in research and testing, with a view to ultimately replacing animal use. All activities should be carried out ensuring a high level of human health protection.
- (16) A greater impact should also be achieved by combining the Euratom Programme and private sector funds within public-private partnerships in key areas where research and innovation could contribute to Union's wider competitiveness goals. Particular attention should be given to the involvement of small and medium-sized enterprises.
- (17) The Euratom Programme should promote cooperation, in particular in the field of safety, with third countries based on common interest and mutual benefit **notably to promote the highest safety standards**.
- (18) In order to maintain a level playing field for all undertakings active in the internal market, funding provided by the Euratom Programme should be designed in accordance with state aid rules so as to ensure the effectiveness of public spending and prevent market distortions such as crowding-out of private funding, creating ineffective market structures or preserving inefficient firms.
- (19) The need for a new approach to control and risk management in Union research funding was recognised by the European Council of 4 February 2011, asking for a new balance between trust and control and between risk-taking and risk avoidance. The European Parliament, in its Resolution of 11 November 2010 on simplifying the implementation of the Research Framework Programmes¹, called for a pragmatic shift towards administrative and financial simplification and stated that the management of Union research funding should be more trust-based and risk-tolerant towards participants.

¹ INI/2010/2079

- (20) The financial interests of the Union should be protected through proportionate measures throughout the expenditure cycle, including the prevention, detection and investigation of irregularities, the recovery of funds lost, wrongly paid or incorrectly used and, where appropriate, penalties. A revised control strategy, shifting focus from minimisation of error rates towards risk-based control and fraud detection, should reduce the control burden for participants.
- (21) It is important to ensure sound financial management of the Euratom Programme and its implementation in the most effective and user-friendly manner possible, while also ensuring legal certainty and accessibility of the programme to all participants. It is necessary to ensure compliance with Council Regulation (EU) No XXXX/2012 [New Financial Regulation]¹ and with the requirements of simplification and better regulation.
- (22) To ensure the most efficient implementation possible, and easy access for all participants through simplified procedures, and to achieve a coherent, comprehensive and transparent framework for participants, the participation in the Euratom Programme and the dissemination of research results should be subject to the rules applicable to the ‘Horizon 2020’ Framework Programme, as set out in Regulation (EU) No XX/XXXX [Rules for participation] with certain adaptations [or exceptions].
- (23) It is important to continue to facilitate the exploitation of intellectual property developed by participants while protecting the legitimate interests of other participants and the Community in accordance with Chapter 2 of the Euratom Treaty.

¹ OJ [...]

- (24) The Participant guarantee funds, managed by the Commission and established pursuant to Council Regulation (Euratom) No 1908/2006 of 19 December 2006 laying down the rules for the participation of undertakings, research centres and universities in action under the Seventh Framework Programme of the European Atomic Energy Community and for the dissemination of research results (2007 to 2011)¹ and Regulation (Euratom) No XX/XX of [...] laying down the rules for 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 (2012-2013)² have proved to be an important safeguard mechanism which mitigates the risks associated to the amounts due and not reimbursed by defaulting participants. The Participant guarantee fund established pursuant to Regulation (EU) No XX/2012 [Rules for participation and dissemination] should also cover actions under Regulation (Euratom) No 1908/2006, Regulation (Euratom) No XX/XX [Euratom Rules for participation (2012-2013)] and this Regulation.
- (25) Article 7 of the Euratom Treaty entrusts the Commission with the responsibility of carrying out the Euratom Programme. For the purposes of implementing the Euratom Programme, except its direct actions, the Commission should be assisted by a consultative committee of Member States to ensure appropriate coordination with national policies in the areas covered by this research and training programme.
- (26) Achievement of the Euratom Programme's objectives in relevant areas requires support for cross-cutting activities, both within the Euratom Programme and jointly with the activities of the 'Horizon 2020' Framework Programme.
- (27) Effective performance management, including evaluation and monitoring, requires development of specific performance indicators which can be measured over time; are both realistic and reflect the logic of the intervention; and relevant to the appropriate hierarchy of objectives and activities. Appropriate coordination mechanisms should be put in place between the implementation and monitoring of the Euratom Programme, and the monitoring of progress, achievements and functioning of the European Research Area.

¹ OJ L 400, 30.12.2006, p. 1.

² OJ L [...]

- (28) The Board of Governors of the Joint Research Centre, set up by Commission Decision 96/282/Euratom of 10 April 1996 on the reorganisation of the Joint Research Centre¹, has been consulted on the scientific and technological content of on the direct actions of the JRC.
- (29) For reasons of legal certainty, Council Decision 2006/970/Euratom of 18 December 2006 concerning the Seventh Framework Programme of the European Atomic Energy Community (Euratom) for nuclear research and training activities (2007 to 2011)², Regulation (Euratom) No 1908/2006, Council Decision 2006/976/Euratom of 19 December 2006 concerning the Specific Programme implementing the Seventh Framework Programme of the European Atomic Energy Community (Euratom) for nuclear research and training activities (2007 to 2011)³, Council Decision 2006/977/Euratom of 19 December 2006 concerning the Specific Programme to be carried out by means of direct actions by the Joint Research Centre implementing the Seventh Framework Programme of the European Atomic Energy Community (Euratom) for nuclear research and training activities (2007 to 2011)⁴, Council Decision XXXX/XXXX of [...] concerning the Framework Programme of the European Atomic Energy Community for nuclear research and training activities (2012-2013)⁵, Regulation (Euratom) No XXX/XXXX [Euratom Rules for participation (2012-2013)], Council Decision XXXX/XXXX/Euratom of [...] 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)⁶ and Council Decision XXXX/XXXX/Euratom of [...] 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)⁷ should be repealed.
- (30) The Commission has consulted the Euratom Scientific and Technical Committee,

HAS ADOPTED THIS REGULATION:

¹ OJ L 107, 30.4.1996, p. 12.
² OJ L 400, 30.12.2006, p. 60.
³ OJ L 400, 30.12.2006, p. 404.
⁴ OJ L 400, 30.12.2006, p. 434.
⁵ OJ L [...].
⁶ OJ L [...].
⁷ OJ L [...].

TITLE I

ESTABLISHMENT

Article 1

Establishment

This Regulation establishes the Research and Training Programme for the period from 1 January 2014 to 31 December 2018, hereinafter the ‘Euratom Programme’, and lays down the rules for participation in that programme, including the participation in programmes of funding bodies managing the funds granted in accordance with this Regulation and in activities conducted jointly under this Regulation and under the ‘Horizon 2020’ Framework Programme established in Regulation (EU) XX/XXX (hereinafter ‘Horizon 2020’).

Article 2

Definitions

For the purposes of this Regulation the following definitions apply:

- (a) ‘*research and innovation activities*’ means the whole spectrum of activities of research, technological development, demonstration and innovation, including the promotion of cooperation with third countries and international organisations, dissemination and optimisation of results and stimulation of the training and mobility of researchers in the European Atomic Energy Community (hereinafter ‘the Community’);
- (b) ‘*direct actions*’ means research and innovation activities undertaken by the Commission through its Joint Research Centre;
- (c) ‘*indirect actions*’ means research and innovation activities to which the Union or the Community (hereinafter the ‘Union’) provides financial support and which are undertaken by participants;

- (d) ‘*public-private partnership*’ means a partnership where private sector partners, the Community and, where appropriate, other partners, such as public sector bodies, commit to jointly support the development and implementation of a research and innovation programme or activities;
- (e) ‘*public-public partnership*’ means a partnership where public sector bodies or bodies with a public service mission at regional, national or international level commit with the Community to jointly support the development and implementation of a research and innovation programme or activities.

Article 3

Objectives

1. The general objective of the Euratom Programme is to pursue nuclear research and training activities with an emphasis on nuclear safety, security and radiation protection, notably to contribute to the long-term decarbonisation of the energy system in a safe, efficient and secure way. The general objective shall be implemented through the activities specified in Annex I in the form of direct and indirect actions which pursue the specific objectives set out in paragraphs 2 and 3 of this Article.
2. The Euratom Programme indirect actions shall have the following specific objectives:
 - (a) support ~~safe operation~~ **safety** of nuclear systems;
 - (b) contribute to the development of sustainable **safe longer term** solutions for the management of ultimate nuclear waste including **final geological disposal as well as** partitioning and transmutation;
 - (c) support the development and sustainability of nuclear expertise and excellence in the European Union;
 - (d) support radiation protection and **development of medical applications of radiation, including, inter alia,** the secure and safe supply **and use** of radioisotopes, ~~including development of medical applications;~~

- (e) move toward demonstration of feasibility of fusion as a power source by exploiting existing and future fusion facilities;
 - (f) lay the foundations for future fusion power plants by developing materials, technologies and conceptual design;
 - (g) promote innovation and industrial competitiveness;
 - (h) ensure availability and use of research infrastructures of pan-European relevance;
3. The Euratom Programme direct actions shall have the following specific objectives:
- (a) improve nuclear safety including: ~~fuel and~~ **nuclear** reactor **and fuel** safety, waste management, including **final geological disposal as well as** partitioning and transmutation; decommissioning, and emergency preparedness;
 - (b) improve nuclear security including: nuclear safeguards, non-proliferation, combating illicit trafficking and nuclear forensics;
 - (c) raising excellence in the nuclear science base for standardisation;
 - (d) foster knowledge management, education and training;
 - (e) support the policy of the Union on nuclear safety and security.

Any new attribution of activity to the JRC will be analysed to check its consistency with activities already existing in the Member States.

4. The Euratom Programme shall be implemented in such a way as to ensure that the priorities and activities supported are relevant to changing needs and take account of the evolving nature of science, technology, innovation, policy making, markets and society, with the aim of optimizing human and financial resources and to avoid duplication on nuclear research and development in the EU.
5. Within the specific objectives referred to in paragraphs 2 and 3, account may be taken of new and unforeseen needs that arise during the period of implementation of the Euratom Programme. This may, if duly justified, include responses to emerging opportunities, crises and threats, to needs relating to the development of new Union policies, and to the piloting of actions foreseen for support under future programmes.

Article 4

Budget

1. The financial envelope for the implementation of the Euratom Programme shall be [EUR 1 788.889 million]. That amount shall be distributed as follows:
 - (a) indirect actions for the fusion research and development programme, [EUR 709.713 million];
 - (b) indirect actions for nuclear fission, safety and radiation protection, [EUR 354.857 million];
 - (c) direct actions, [EUR 724.319 million].

[For the implementation of indirect actions of the Euratom Programme, no more than 13.5 % shall be for the Commission's administrative expenditure.]

2. The financial envelope of the Euratom Programme may cover expenses pertaining to preparatory, monitoring, control, audit and evaluation activities which are required for the management of the Programme and the achievement of its objectives, in particular studies and meetings of experts, as far as they are related to the general objectives of this Regulation, expenses linked to information technology networks focusing on information processing and exchange, together with all other technical and administrative assistance expenses incurred by the Commission for the management of the Euratom Programme.
3. Where necessary and duly justified, appropriations may be entered in the budget beyond 2018 to cover technical and administrative assistance expenses, in order to enable the management of actions not yet completed by 31 December 2018.
4. Where the direct actions contribute to initiatives established by entities entrusted with implementation of tasks by the Commission in accordance with Article 6(2) and Article 15, such contribution shall not be considered as part of the financial contribution allocated to these initiatives.

Article 5

Association of third countries

1. The Euratom Programme shall be open to the association of:
 - (a) acceding countries, candidate countries and potential candidates, in accordance with the general principles and general terms and conditions for the participation of those countries in Union programmes established in the respective framework agreements and decisions of association councils or similar agreements;
 - (b) selected third countries that fulfil all of the following criteria:
 - (i) have a good capacity in science, technology and innovation;

- (ii) have a good track record of participation in Union research and innovation programmes;
- (iii) have close economic and geographical links to the Union;
- (iv) are European Free Trade Association (EFTA) members or countries or territories listed in the Annex to Regulation (EU) No XX/2012 of the European Parliament and the Council establishing a European Neighbourhood Instrument¹.
- (v) have fair and equitable treatment of Intellectual Property Rights.

(c) countries or territories associated to the Seventh Euratom Framework Programme.

2. Specific terms and conditions regarding the participation of associated countries in the Euratom Programme, including the financial contribution, based on the gross domestic product of the associated country shall be determined by international agreements between the Union and the associated countries.

¹ OJ L [...]

TITLE II IMPLEMENTATION

CHAPTER I IMPLEMENTATION, MANAGEMENT AND FORMS OF SUPPORT

Article 6

Management and forms of Community support

1. The Euratom Programme shall be implemented through indirect actions using one or several of the forms of funding provided for by Regulation (EU) No XXX/2012 [New Financial Regulation], in particular grants, prizes, procurement and financial instruments. The Community support shall also consist of direct actions in the form of research and innovation activities undertaken by the Joint Research Centre (JRC).

2. Without prejudice to Article 10 of the Euratom Treaty, the Commission may entrust part of the implementation of the Euratom Programme to the funding bodies referred to in Article [55(1)(b)] of Regulation (EU) No XXX/2012 [New Financial Regulation].

The Commission may also entrust the implementation of indirect action under the Euratom Programme to bodies created under or referred to in the 'Horizon 2020' Framework Programme.

3. **The Commission shall adopt, by means of implementing acts, in accordance with the examination procedure referred to in Article 12(2), the approval decision of indirect actions funding.**

Article 7

Rules for participation and dissemination of research results

1. The participation of any legal entity in indirect actions undertaken under the Euratom Programme shall be governed by the rules laid down in Regulation (EU) No XX/2012 [Rules for participation and dissemination], subject to paragraphs 2 and 3 of this Article.

2. For the purposes of the Euratom Programme, ‘the security rules’ referred to in the first subparagraph of Article 40(2) of Regulation (XX) [Rules for participation and dissemination] shall include the defence interests of the Member States within the meaning of Article 24 of the Euratom Treaty.

By way of derogation from the first subparagraph of Article 41(3) of that Regulation, the Commission or the funding body may, with regard to results which are generated by participants having received Community financial contribution, object to transfers of ownership or to grants of both an exclusive and a non-exclusive licence, to third parties established in a third country not associated to the Euratom Programme where it considers that the grant or transfer is not in accordance with the interest of developing the competitiveness of the Union economy or is inconsistent with ethical principles or security considerations. ‘Security considerations’ shall include the defence interests of the Member States within the meaning of Article 24 of Euratom Treaty.

By way of derogation from the first subparagraph of Article 46(1) of that Regulation the Community and its joint undertakings shall, for the purpose of developing, implementing and monitoring Community policies and programmes or obligations assumed through international cooperation with third countries and international organisations, enjoy access rights to the results of a participant having received a Community financial contribution. Such access rights shall include the right to authorise third parties to use the results in public procurement and the right to sub-license and shall be limited to non-commercial and non-competitive use and shall be granted on a royalty-free basis.

3. The ‘Participant guarantee fund’ established pursuant to Regulation (EU) No XX/2012 [Rules for participation and dissemination] shall replace and succeed the Participant guarantee funds established pursuant to Regulation (Euratom) No 1908/2006 and Regulation (Euratom) No XX/XX [Euratom Rules for participation 2012-2013].

Any sums from the Participant guarantee funds established pursuant to Regulations (Euratom) No 1908/2006 and (Euratom) No XX/XX [Euratom Rules for participation (2012-2013)] shall be transferred to the Participant guarantee fund as of 31 December 2013. The participants in actions under Decision XX/XX [Euratom Programme 2012-2013] signing grant agreements after 31 December 2013 shall make their contribution to the Participant guarantee fund.

Article 8

Cross-cutting activities

1. In order to achieve the objectives of the Euratom Programme and to address challenges common to the Euratom Programme and Horizon 2020, activities cutting across the indirect actions set out in Annex I and/or those implementing the Specific Programme of the Horizon 2020 Framework Programme, as established by Council Decision XX/XXXX/EU¹, may benefit from the Union financial contribution.
2. The financial contribution referred to in paragraph 1 of this Article may be combined from the financial contributions for indirect actions set out in Article 4 of this Regulation and in Article 6 of Regulation (EU) No XX/XXXX [establishing Horizon 2020], and implemented through a single funding scheme.

Article 9

Gender equality

The Euratom Programme shall ensure the effective promotion of gender equality and the gender dimension in research and innovation content.

¹ OJ L [...]

Article 10

Ethical principles

1. All the research and innovation activities carried out under the Euratom Programme shall comply with ethical principles and relevant national, Union and international legislation, including the Charter of Fundamental Rights of the European Union and the European Convention on Human Rights and its Supplementary Protocols.

Particular attention shall be paid to the principle of proportionality, the right to privacy, the right to the protection of personal data, the right to the physical and mental integrity of a person, the right to non-discrimination and the need to ensure high levels of human health protection.

2. Research and innovation activities carried out under the Euratom Programme shall have an exclusive focus on civil applications.

Article 11

Work programmes

1. The Commission shall adopt, **by means of implementing acts, in accordance with the examination procedure referred to in Article 12(2)**, work programmes for the implementation of the indirect actions. The work programmes shall allow for bottom up approaches that address the objectives in innovative ways.

The work programmes shall set out the essential elements for implementing the actions in accordance with Regulation XX/2012 [the Financial Regulation], including their detailed objectives, the associated funding and the timetable, as well as a multi-annual approach and strategic orientations for the following years of implementation.

2. For direct actions, the Commission shall, in accordance with Decision 96/282/Euratom, draw up a multi-annual work programme, setting out in greater detail the objectives and scientific and technological priorities presented in Annex I, and the timetable for implementation.

That multi-annual work programme shall also take account of relevant research activities carried out by the Member States, associated countries and European and international organisations. It shall be updated as and where appropriate.

3. The work programmes shall take account of the state of science, technology and innovation at national, Union and international level and of relevant policy, market and societal developments. They shall be updated as and where appropriate.
4. The work programmes shall contain a section which identifies the cross-cutting activities as referred to in Article 8.

Article 12

Governance of the programme

~~1. For the purpose of implementing the indirect actions of the Euratom Programme, the Commission shall be assisted by the following consultative committees:~~

~~(a) for fission-related aspects, the consultative committee referred to in points 5 and 6 of the Annex to Council Decision 84/338/Euratom, ECSC, EEC¹;~~

~~(b) for the fusion-related aspects, by the consultative committee for the fusion programme established in accordance with Council Decision of 16 December 1980².~~

~~By way of derogation from Article 3(3) of Decision 84/338/Euratom, ECSC, EEC and from point 9 of Council Decision of 16 December 1980 respectively, the consultative committees shall be chaired by the Commission.~~

1. The Commission shall be assisted by a Committee. That committee shall be a committee within the meaning of Regulation (EU) No 182/2011³.

¹ OJ L 177, 4.7.1984, p. 25.

² Not published in the Official Journal.

³ OJ L 55, 28.2.2011, p. 13.

1a. The Committee may meet in two different configurations, dealing with fission related aspects and fusion related aspects of the Programme.

2. Where reference is made to this paragraph, the examination procedure in accordance with Article 5 of Regulation (EU) No 182/2011 shall apply.

Where the Committee delivers no opinion, the Commission shall not adopt the draft implementing act and the third subparagraph of Article 5(4) of Regulation (EU) No 182/2011 shall apply.

3. Where the opinion of the Committee is to be obtained by written procedure, that procedure shall be terminated without result when, within the time-limit for delivery of the opinion, the chair of the Committee so decides or a simple majority of Committee members so request.

Article 12a

2.—The Commission shall regularly inform **Member States** of overall progress in implementing the Euratom Programme, and shall provide it with timely information on all indirect actions proposed or funded under the Euratom Programme.

Article 13

External advice and societal engagement

1. For the implementation of the Euratom Programme, account shall be taken of advice and inputs provided by, where appropriate: the Euratom Scientific and Technical Committee pursuant to Article 134 of the Euratom Treaty; advisory groups of independent, high level experts set up by the Commission; dialogue structures created under international science and technology agreements; forward-looking activities; targeted public consultations (including, where appropriate, national and regional authorities or stakeholders); and transparent and interactive processes that ensure responsible research and innovation is supported

2. Full account shall also be taken of the research and innovation agendas-established by, inter alia, European Technology Platforms, Joint Programming Initiatives and European Innovation Partnerships.

CHAPTER II SPECIFIC FIELDS OF ACTION

Article 14

Small and medium-sized enterprises

Particular attention shall be paid to ensuring the adequate participation of, and innovation impact on, small and medium-sized enterprises (SMEs) as well as private sector in general in the Euratom Programme. Quantitative and qualitative assessments of SME participation shall be undertaken as part of the evaluation and monitoring arrangements.

Article 15

Public-private and public-public partnerships

To attain the objectives set out in Article 3, specific activities of the Euratom Programme may be implemented through:

- (a) Joint Undertakings established on the basis of Chapter 5 of the Euratom Treaty;
- (b) Public-public partnerships based on the funding scheme 'Programme co-fund actions';
- (c) Contractual public-private partnerships, as referred in Article 19 of Regulation (EU) No xxx/201x.

Article 16

International cooperation with third countries and international organisations

1. Entities established in third countries and international organisations shall be eligible to participate in indirect actions of the Euratom Programme under the conditions set out in Regulation (EU) XX/XXX [Rules for Participation]. Exceptions to the general principle are set out in Article 7. International cooperation with third countries and international organisations shall be promoted by the Euratom Programme with a view to:
 - (a) strengthening the Union's excellence and attractiveness in research and innovation as well as its economic and industrial competitiveness;
 - (b) tackling effectively common societal challenges;
 - (c) supporting the Union's external and development policy objectives, complementing external and development programmes. Synergies with other Union policies will be sought.
2. Targeted actions with the objective of promoting cooperation with specific third countries or groups of third countries shall be implemented on the basis of a strategic approach as well as common interest, priorities and mutual benefit, taking into account their scientific and technological capabilities and market opportunities, and the expected impact.

Reciprocal access to third country programmes should be encouraged. In order to maximise impact, coordination and synergies with initiatives of Member States and associated countries shall be promoted. The nature of the cooperation may vary according to the specific partner countries.

Cooperation priorities shall take into account developments in Union policy opportunities for cooperation with third countries, and fair and equitable treatment of intellectual property rights.

Article 17

Information, communication, exploitation and dissemination

1. When implementing the Euratom Programme, dissemination and communication activities shall be considered an integral part of the actions supported by the Euratom Programme.
2. Communication activities may include:
 - (a) initiatives aimed at widening awareness and facilitating access to funding under the Euratom Programme, in particular for those regions or types of participant that have a relatively low participation;
 - (b) targeted assistance to projects and consortia to provide them with access to the necessary skills to optimise the communication, exploitation and dissemination of results;
 - (c) initiatives to foster dialogue and debate on scientific, technological and innovation-related issues with the public, and to take advantage of social media and other innovative technologies and methodologies;
 - (d) communication of the Union's political priorities provided that they are related to the aims of this Regulation. In particular, it shall provide timely and thorough information to Member States.
3. Subject to the applicable provisions of the Euratom Treaty and relevant Union legislation, dissemination activities may include:
 - (a) actions which bring together results from a range of projects, including those that may be funded from other sources, to provide user-friendly databases and reports that summarise key findings;

- (b) dissemination of results to policy makers, including standardisation bodies, to promote the use of policy-relevant results by the appropriate bodies at international, Union, national and regional level.

CHAPTER III

CONTROL

Article 18

Control and audit

1. The control system set up for the implementation of this Regulation shall be designed so as to provide reasonable assurance of achieving adequate management of the risks relating to the effectiveness and efficiency of the operations as well as the legality and regularity of the underlying transactions, taking into account the multi-annual character of programmes as well as the nature of the payments concerned.
2. The control system shall ensure an appropriate balance between trust and control, taking into account administrative and other costs of controls at all levels, especially for participants, so that the Euratom Programme objectives can be achieved and the most excellent researchers and most innovative enterprises can be attracted to it.
3. As part of the control system, the audit strategy for expenditure in the indirect actions under the Euratom Programme shall be based on the financial audit of a representative sample of expenditure across the whole programme. Such representative sample shall be complemented by a selection based on an assessment of the risks related to expenditure.

Audits of expenditure in the indirect actions under the Euratom Programme shall be carried out in a coherent manner in accordance with the principles of economy, efficiency and effectiveness in order to minimize the audit burden of the participants.

Article 19

Protection of the financial interests of the Union

1. The Commission shall take appropriate measures ensuring that, when actions financed under this Regulation are implemented, the financial interests of the Union are protected by the application of preventive measures against fraud, corruption and any other illegal activities, by effective checks and, where irregularities are detected, by the recovery of the amounts wrongly paid and, where appropriate, by effective, proportionate and deterrent penalties.
2. The Commission or its representatives and the Court of Auditors shall have the power of audit, on the basis of documents and on-the-spot checks and inspections, over all grant beneficiaries, contractors, subcontractors and other third parties who have received Union funds under this Regulation.

Without prejudice to paragraph 3, audits by the Commission may be carried out up to four years after the final payment.

3. The European Anti-Fraud Office (OLAF) may carry out on-the-spot checks and inspections on economic operators concerned directly or indirectly by such funding in accordance with the procedures laid down in Council Regulation (Euratom, EC) No 2185/96 ¹ with a view to establishing whether there has been fraud, corruption or any other illegal activity affecting the financial interests of the Union in connection with a grant agreement or grant decision or a contract concerning Union funding.
4. Without prejudice to the paragraphs 1, 2 and 3, cooperation agreements with third countries and international organisations, grant agreements, grant decisions and contracts resulting from the implementation of this Regulation shall expressly empower the Commission, the Court of Auditors and the OLAF to conduct audits, on-the-spot checks and inspections.

¹ OJ L 292, 15.11.1996, p. 2.

CHAPTER IV

MONITORING AND EVALUATION

Article 20

Monitoring

1. The Commission shall annually monitor the implementation, including progress and achievements, of the Euratom Programme.
2. The Commission shall report and make publicly available the results of that monitoring.

Article 21

Evaluation

1. Evaluations shall be carried out in a sufficiently timely manner to feed into the decision-making process.

By 31 May 2017, and taking into account the ex-post evaluation of the Euratom 7th Framework Programme established by Decision 2006/970/Euratom and of the Euratom Programme (2012-2013) established by Decision 20XX/XX/Euratom to be completed by the end of 2015, the Commission shall carry out, with the assistance of independent experts, selected on the basis of a transparent process, an interim evaluation of the Euratom Programme on the achievements, at the level of results and progress towards impacts, of the objectives and continued relevance of all the measures, the efficiency and use of resources, the scope for further simplification, and European added value. The evaluation shall additionally take into account the contribution of the measures to the Union priorities of smart, sustainable and inclusive growth, results on the long-term impact of the predecessor measures and the degree of synergy and interaction with other Union funding programmes, including the Structural Funds.

By 31 December 2022, the Commission shall carry out, with the assistance of independent experts, selected on the basis of a transparent process, an ex-post evaluation of the Euratom Programme. This shall cover the rationale, implementation and achievements, as well as the longer-term impacts and sustainability of the measures, to feed into a decision on a possible renewal, modification or suspension of a subsequent measure.

2. Without prejudice to paragraph 1 direct and indirect actions of the Euratom Programme shall be subject to separate evaluations.
3. The evaluations referred to in paragraphs 1 and 2 shall assess the progress towards the objectives established in Article 3, taking into account, the relevant performance indicators defined in Annex II.
4. Where appropriate and available, Member States shall provide the Commission with data and information necessary for the monitoring and evaluation of the measures concerned.
5. The Commission shall communicate the conclusions of the evaluations referred to in paragraphs 1 and 2, accompanied by its observations, to the European Parliament, the Council, the European Economic and Social Committee.

TITLE III

FINAL AND TRANSITIONAL PROVISIONS

Article 22

Repeal and transitional provisions

1. Decision 2006/970/Euratom, Regulation (Euratom) No 1908/2006, Decision 2006/976/Euratom, Decision 2006/977/Euratom, Decision XXXX/XXXX [Euratom Framework Programme (2012-2013)], Regulation (Euratom) No XXX/XXXX [Euratom Rules for participation (2012-2013)], Decision XXXX/XXXX/Euratom [Specific programme (2012-2013)] and Decision XXXX/XXXX/Euratom [Specific programme – direct actions (2012-2013)] are repealed with effect from 1 January 2014
2. Activities benefiting from the Community financial contribution under programmes established by the Decisions referred to in paragraph 1 and the related financial obligations shall continue to be governed by the rules applicable to those programmes until their completion.
3. The financial allocation referred to in Article 4 may also cover the technical and administrative assistance expenses necessary to ensure the transition between that programme and the measures adopted under Decision XX/XX/Euratom [Euratom Framework Programme (2012-2013)], Decision XXXX/XXXX/Euratom [Specific programme (2012-2013)] and Decision XXXX/XXXX/Euratom [Specific programme – direct actions (2012-2013)].

Article 23

Entry into force

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

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels,

For the Council

The President

ANNEX I — ACTIVITIES**Rationale for the Euratom Programme —paving the way to 2020**

By achieving the objectives set out in Article 3, the Euratom Programme shall reinforce outcomes under the three priorities of the 'Horizon 2020' Framework Programme: *excellent science, industrial leadership, and societal challenges*. The Euratom Programme shall in particular support the transition to a reliable, sustainable and competitive energy system in the future, in the face of increasing resource scarcity, growing energy needs and climate change.

Nuclear power constitutes an element in the debate on combating climate change and reducing Europe's dependence on imported energy. In the broader context of finding a sustainable energy-mix for the future, the Euratom Programme will also contribute through its research activities to the debate on the benefits and the limitations of nuclear fission energy for a low-carbon economy. Through ensuring even higher safety levels, more advanced nuclear technologies could also offer the prospect of significant improvements in efficiency and use of resources and producing less waste than current designs. Nuclear safety aspects will receive the greatest possible attention.

The Euratom Programme shall strengthen the research and innovation framework in the nuclear field and coordinate Member States' research efforts, thereby avoiding duplication, retaining critical mass in key areas and ensuring that public funding is used in an optimal way.

The strategy to develop fusion as a credible option for commercial carbon-free energy production shall follow a roadmap with milestones towards the goal of electricity production by 2050. To implement that strategy, a restructuring of fusion-related work in the Union, including governance, funding and management, shall be carried out to ensure a shift of emphasis from pure research to designing, building and operating future facilities such as ITER, DEMO and beyond. That shall require a close cooperation between the entire Union fusion community, the Commission and the national funding agencies.

In order to maintain the Union expertise necessary for achieving those goals, the programme shall further enhance its role in training through the establishment of training facilities of pan-European interest that shall deliver dedicated programmes. That shall continue to promote the European Research Area and the further integration of new Member States and associated countries.

Activities necessary to achieve the programme objectives

Indirect actions

In order to ensure that the indirect actions of the Euratom Programme mutually reinforce research efforts of the Member States and the private sector, the priorities of the work programmes shall be established on the basis of **appropriate** inputs from national public authorities and nuclear research stakeholders grouped in bodies or frameworks such as technology platforms and technical forums for nuclear systems and safety (SNETP), management of ultimate waste (IGDTP) and radiation protection/low-dose risk (MELODI), the European Fusion Development Agreement, or any relevant organisation or forum of nuclear stakeholders.

(a) support ~~safe operation~~ safety of nuclear systems; (*Societal challenges*)

In line with the general objective, support to joint research activities concerning the safe operation of reactor systems (including fuel cycle facilities) in use in the Union or, to the extent necessary in order to maintain broad nuclear safety expertise in the Union, those reactor types which may be used in the future, focusing exclusively on safety aspects, including all aspects of the fuel cycle such as partitioning and transmutation.

(b) Contribute to the development of sustainable safe longer term solutions for the management of ultimate nuclear waste including final geological disposal as well as partitioning and transmutation (*Excellent science; Societal challenges*)

Joint and/or coordinated research activities on remaining key aspects of geological disposal of spent fuel and long-lived radioactive waste with, as appropriate, demonstration of technologies and safety. Those activities shall promote the development of a common Union view on the main issues related to waste management from discharge of fuel to disposal.

Research activities related to management of other radioactive waste streams for which industrially mature processes currently do not exist.

(c) Support the development and sustainability of nuclear expertise and excellence in the European Union (*Excellent science*)

Promotion of joint training and mobility activities between research centres and industry, and between different Member and Associated States, as well as support for maintaining multi-disciplinary nuclear competences in order to guarantee the availability of suitably qualified researchers, engineers and employees in the nuclear sector in the Union in the long term.

(d) Support radiation protection and development of medical applications of radiation, including, inter alia, the secure and safe supply and use of radioisotopes, including development of medical applications (*Excellent science; Societal challenges*)

Joint and/or coordinated research activities, in particular on the risks from low doses from industrial, medical or environmental exposure, and on emergency management in relation to accidents involving radiation, **and on radioecology**, to provide a pan-European scientific and technological basis for a robust, equitable and socially acceptable system of protection.

Research activities on medical applications of ionising radiation and addressing the operational safety aspects of radiation protection and their utilisation.

(e) Move toward demonstration of feasibility of fusion as a power source by exploiting existing and future fusion facilities (*Industrial leadership; Societal challenges*)

Support common research activities undertaken by members of the European Fusion Development Agreement to ensure the swift start of high performance operation of ITER including the use of relevant facilities (including JET, the Joint European Torus), of integrated modelling using high performance computers, and training activities to prepare the next generation of researchers and engineers.

(f) Lay the foundations for future fusion power plants by developing materials, technologies and conceptual design (*Industrial leadership; Societal challenges*)

Support to joint activities undertaken by members of the European Fusion Development Agreement to develop and qualify materials for a demonstration power plant requiring, inter alia, preparatory work for an appropriate material test facility and negotiations for the Union's participation in a suitable international framework for that facility. **Such development and qualifications shall make use of all possible levels of the experimental, computational and theoretical capacities available.**

Support to joint research activities undertaken by members of the European Fusion Development Agreement that shall address reactor operation issues and shall develop and demonstrate all relevant technologies for a fusion demonstration power plant. Those activities include the preparation of a complete demonstration power plant conceptual design(s) and exploration of the potential of stellarators as a power plant technology.

(g) Promote innovation and industry competitiveness (*Industrial leadership*)

Implementing or supporting knowledge management and technology transfer from the research co-funded by this programme to industry exploiting all innovative aspects of the research.

Promoting innovation through, inter alia, open access to scientific publications, a database for knowledge management and dissemination and promoting technology topics in educational programmes.

In the long term, the Euratom Programme shall support the preparation and development of a competitive nuclear fusion industrial sector **facilitating the involvement of the private sector as well as SMEs where appropriate**, in particular through the implementation of a technology road map to a fusion power plant with active industrial involvement in the design and development projects.

(h) Ensure availability and use of research infrastructures of pan-European relevance
(Excellent science)

Activities supporting the construction, refurbishment, use and continued availability of key research infrastructures under the Euratom Programme, as well as appropriate access to those infrastructures and cooperation between them.

(i) European Fusion Development Agreement

A grant (Programme co-fund action) shall be awarded to the legal entity that shall be established or designated by members of the European Fusion Development Agreement in order to implement and coordinate their activities. That grant may include resources in kind from the Community, such as scientific and technical exploitation of the JET facility in accordance with Article 10 of the Euratom Treaty, or the secondment of Commission staff.

JRC direct actions

The priorities for direct actions shall be established through consultation of the policy Directorates-General of the European Commission and of the JRC Board of Governors.

The nuclear activities of the JRC shall aim to support the implementation of Council Directives 2009/71/Euratom¹ and 2011/70/Euratom², as well as Council Conclusions giving priority to the highest standards for nuclear safety in the Union and internationally.

¹ OJ L 172, 2.7.2009, p.18.

² OJ L 199, 19.7.2011, p.1.

The JRC shall notably ~~mobilise the necessary capacity and expertise in order to~~ contribute to the **nuclear safety** research in the area of the improvement of the safety of nuclear installations **needed for safe, secure** and the peaceful use of nuclear energy and other non fission applications. **The JRC shall** ~~to~~ provide a scientific basis ~~to~~ **for the** relevant Union ~~legislation~~ **policies** and, where necessary, ~~to~~ react within the limits of its mission and competence to nuclear **events**, incidents and accidents. To that effect, the JRC shall carry out research and assessments, provide references and standards and deliver dedicated training and education. Synergies with the Sustainable Nuclear Energy Technology Platform (SNETP) and other cross-cutting initiatives will be sought as appropriate, with the aim of optimizing human and financial resources and to avoid duplication on nuclear research and development in the EU.

- (a) **Improve nuclear safety including: ~~fuel and~~ nuclear reactor and fuel safety, waste management including final geological disposal as well as partitioning and transmutation; decommissioning, and emergency preparedness**

The JRC shall contribute to the development of tools and methods to achieve high safety standards for nuclear installations and fuel cycles relevant to Europe. Those tools and methods shall include:

- (1) severe accident analyses modelling and methodologies for assessment of nuclear installations operational safety margins; support to the establishment of a common European approach to the evaluation of advanced fuel cycles and designs; and investigation and dissemination of the lessons learnt from operational experience. The JRC shall further reinforce its 'European Clearinghouse on NPP Operational Experience Feedback' to focus its activities on post-Fukushima nuclear safety challenges, appealing to the Members States' competences in this area.
- (2) minimisation of the scientific uncertainties in the prediction of long-term behaviour of nuclear waste and of the dispersion of radionuclides in the environment; and key aspects of research on decommissioning of nuclear installations.

- (3) exchange with relevant stakeholders for strengthening Union capacity to respond to nuclear accidents and incidents by research on alert systems and models for radiological dispersion in the air, and by mobilising resources and expertise for analysing and modelling nuclear accidents.

(b) Improve nuclear security including: nuclear safeguards, non-proliferation, combating illicit trafficking, and nuclear forensics

The area of non proliferation shall receive the greatest possible attention. The JRC will:

- (1) develop enhanced methodologies and detection/verification methods and technologies to support the Community safeguards and strengthen international safeguards.
- (2) develop and apply enhanced methods and technology to prevent, detect and respond to nuclear and radioactive incidents, including qualification of detection technology and development of nuclear forensics methods and techniques for fight against illicit trafficking in synergies with the global CBRN (Chemical, Biological, Radiological, Nuclear) framework.
- (3) support the implementation of the Treaty on the Non-Proliferation of Nuclear Weapons and Union-related strategies through analysis studies and follow-up of the technical evolution of export control regimes to support relevant Commission and Union services.

(c) Raising Excellence in the nuclear science base for standardisation

The JRC shall further develop the scientific basis for nuclear safety and security. Emphasis shall be given to research on fundamental properties and behaviour of actinides, structural and nuclear materials. In support to Union standardisation, the JRC shall provide state-of-the-art nuclear standards, reference data and measurements, including the development and implementation of relevant databases and assessment tools. The JRC shall support the further development of medical applications, namely new cancer therapies based on alpha irradiation.

(d) Foster knowledge management, education and training

The JRC shall stay abreast of new developments in research and instrumentation, safety and environmental regulations. To that effect, a rolling investment plan for the scientific infrastructures shall be implemented.

In order to maintain the Union at the forefront of nuclear safety and security, the JRC shall develop knowledge management tools, monitor Union trends in human resources through its Nuclear Human Resources Observatory and deliver dedicated training and education programmes, covering also decommissioning aspects.

(e) Support the policy of the Union on nuclear safety and security

JRC shall foster its expertise and excellence in order to provide independent scientific and technical evidence which might be necessary to support Union policy on nuclear safety and security.

As the Euratom Implementing Agent for the Generation IV International Forum (GIF), the JRC shall continue to coordinate the Community contribution to GIF. The JRC shall pursue and further develop international research cooperation with key partner countries and international organizations (IAEA, OECD/NEA) in order to promote Union's nuclear safety and security policies.

Cross-cutting activities within the Euratom Programme

In order to achieve its general objectives, the Euratom Programme shall support complementary activities (direct and indirect, coordination and stimulating joint programming) that ensure synergy of research efforts in solving common challenges (such as materials, coolant technology, reference nuclear data, modelling and simulation, remote handling, waste management, radiation protection).

Cross-cutting activities and interfaces with the 'Horizon 2020' Framework Programme for Research and Innovation

In order to achieve the objectives of the Euratom Programme, appropriate links and interfaces, such as joint calls, shall be ensured with the Specific Programme of the 'Horizon 2020' Framework Programme.

The Euratom Programme may contribute to the Debt facility and Equity facility developed under the 'Horizon 2020' Framework Programme that shall be widened to cover the objectives referred to in Article 3.

International cooperation with third countries and international organisations

International cooperation in nuclear research and innovation, based on shared goals and mutual trust, shall continue, with the aim of providing clear and significant benefits for the Union **and its environment**. As a contribution to the achievement of the specific objectives set out in Article 3, the Community shall seek to reinforce the Union's scientific and technical expertise through international cooperation agreements and to promote the access of the Union nuclear industry to new emerging markets.

International cooperation activities shall be promoted through multilateral frameworks (such as IAEA, OECD, ITER, GIF), and by the existing or new bilateral cooperation with countries having strong R&D and industrial bases and research installations under operation, design or construction.

ANNEX II — PERFORMANCE INDICATORS

This Annex presents for each specific objectives of the Euratom Programme a limited number of performance indicators for assessing results and impacts.

1. Indicators for indirect actions

- (a) support ~~safe operation~~ **safety** of nuclear;
 - Percentage of funded projects (joint research and/or coordinated actions) likely to lead to a demonstrable improvement in nuclear safety practice in Europe.

- (b) Contribute to the development of ~~sustainable~~ **safe longer term** solutions for the management of ultimate nuclear waste including **final geological disposal as well as** partitioning and transmutation.
 - Number of geological repositories for spent nuclear fuel and/or high-level waste that are planned in Europe and for which the Community supported the preparation of a safety case and the possible pre-construction phase.

- (c) Support the development and sustainability of nuclear expertise and excellence in the European Union
 - Training through research - number of PhD students and Post-Doc researchers supported through the Euratom fission projects
 - Number of fellows and trainees in the Euratom fusion programme

- (d) Support radiation protection and **development of medical applications of radiation, including, inter alia,** the secure and safe supply **and use** of radioisotopes, ~~including development of medical applications~~

- Percentage of funded projects likely to have a demonstrable impact on regulatory practice regarding radiation protection.
- (e) Move toward demonstration of feasibility of fusion as a power source by exploiting existing and future fusion facilities
- Number of publications in high impact journals.
- (f) Lay the foundations for future fusion power plants by developing materials, technologies and conceptual design
- Percentage of the Fusion Roadmap's milestones established for a period 2014-2018 reached by the Euratom Programme
- (g) Promote innovation and industrial competitiveness
- Number of spin-offs from the fusion research under Euratom Programme
 - Patents applications generated by European fusion laboratories
- (h) Ensure availability and use of research infrastructures of pan-European relevance
- Number of research infrastructures supported at Community level and of researchers using research infrastructures through mobility and access support.

2. Indicators for direct actions

- (a) Impact indicator for JRC policy support
- Number of occurrences of tangible specific impacts on Union policies resulting from technical and scientific policy support provided by the JRC.

- (b) JRC scientific productivity indicator
- Number of peer reviewed publications

The indicators referred to in points (a) and (b) may be represented according to the following Community objectives of direct actions:

- Improve nuclear safety including: ~~fuel and~~ **nuclear** reactor **and fuel** safety, waste management, including **final geological disposal as well as** partitioning and transmutation; decommissioning; and emergency preparedness;
- Improve nuclear security including: nuclear safeguards, non-proliferation, combating illicit trafficking and nuclear forensics;
- Raising excellence in the nuclear science base for standardisation;
- Foster knowledge management, education and training;
- Support the policy of the Union on nuclear safety and security.
