

# Euratom Working Programme 2016-2017 & Objectives of EURATOM B5 action on UC-EU collaboration

14 June 2017

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# Contents

- EURATOM WP2016-2017 last call results
- Ukrainian-EU B5 action
- Role of experts

Horizon 2020 is the financial instrument implementing the Innovation Union, a Europe 2020 flagship initiative aimed at securing Europe's global competitiveness



**Euratom is a complementary research programme for nuclear research and training**



- 1957: Euratom Treaty
  - Concept of Community Research programmes
  - Joint Research Centre established
- **1984: 1st Framework Programme (1984-1987)**
- 1987: ‘Single European Act’
  - Science becomes a Community responsibility
  - **2nd Framework Programme (1987-1991)**
- **1990: 3rd Framework Programme (1990-1994)**
- 1992: Treaty on European Union
  - Role of RTD in the enlarged EU
- **1994: 4th Framework Programme (1994-1998)**
- **1998: 5th Framework Programme (1998-2002)**
- 2000: European Research Area (ERA) launched
- **2002: 6th Framework Programme (2002-2006)**
- **2006: 7th Framework Programme (2007-13) & Euratom Programme (2007-11)**
  - 2011: Euratom Framework Programme 'FP7+2' (2012-2013)
  
- **2013: Horizon 2020 (2014-2020) & Euratom Programme (2014-2018)**
- **Coming in 2018: Euratom Programme (2019-2020)**

## Research and Training Programme of Euratom (2014-2018) complementing the Horizon 2020 Framework Programme for Research and Innovation

- General objective:
  - To pursue nuclear research and training activities with an emphasis on continuous improvement of nuclear safety, security and radiation protection, notably to potentially contribute to the long-term decarbonisation of the energy system in a safe, efficient and secure way
- That general objective shall be implemented through:
  - Activities in the form of indirect and direct actions
  - Cross-cutting activities within the Euratom Programme (i.e. fusion/fission)
  - Cross-cutting activities & interfaces with H2020 Framework Programme
  - International cooperation with third States and international organisations

Euratom Programme (2014-18) → Council Regulation of 16 December 2013

*Indirect actions*  
**DG-RTD**

**Fusion R&D  
Programme**

**€ 728 million**  
(45 %)

*Indirect actions*  
**DG-RTD**

**Nuclear Fission,  
Safety and  
Radiation Protection**

**€ 315 million**  
(20 %)

*Direct actions*  
**JRC**

**Nuclear Safety  
and Security**

**€ 560 million**  
(35 %)

**Total budget: € 1603 million**

**(outside H2020) → Council Decision of 13 December 2013**  
**ITER (2014-2020) through JU-F4E: € 2915 million in current values**

- *DG RTD: Directorate-General Research and Innovation, This Commission department is responsible for EU policy on research, science and innovation*
- *JRC: The Joint Research Centre is the Commission's science and knowledge service*

## EURATOM FISSION 2016-2017

- EURATOM FISSION 2016-2017 CALL was opened on 11 May 2016. The activities funded by this Work Programme have been developed in accordance with the Council Regulation on the Euratom Research and Training Programme (2014-2018). They are organised in six main sections:
  - 1. Support safe operation of nuclear systems
  - 2. Contribute to the development of solutions for the management of radioactive waste
  - 3. Foster radiation protection
  - 4. Management of research reactor availability in Europe
  - 5. Support the development of nuclear competences at EU level
  - 6. Fission/fusion cross-cutting actions
- Where appropriate, social science and humanities, socio-economic issues and trans-national access to research infrastructures are addressed within each of the six sections.
- **Submission deadline: 5 October 2016**
- **72 project proposals were submitted to this call**
- **The budget of the work programme 2016-2017 is 126,7 million of euros (59,3 million of euros for 2016 and 67,4 million of euros for 2017).**



## EURATOM FISSION 2016-2017

Event	Date
Call publication .....	14/10/2015
Call deadline .....	05/10/2016
Submissions start date	11/05/2016
Evaluation .....	Oct.16 – Jan.2017
Information to applicants	01/02/2017
Grant preparations .....	Feb. – May 2017
Projects launch .....	June – July 2017



<b>RECEIVED PROPOSALS</b>		<b>Proposals distribution per topic</b>	
<b>Topics</b>	<b>Description</b>	<b>N° of proposals received per topic</b>	<b>N° of proposals grouped</b>
<b>NFRP-1</b>	<b>Nuclear Safety</b>	<b>32</b>	<b>49</b>
<b>NFRP-2</b>		<b>3</b>	
<b>NFRP-3</b>		<b>2</b>	
<b>NFRP-4</b>		<b>7</b>	
<b>NFRP-5</b>		<b>5</b>	
<b>NFRP-6</b>	<b>Radioactive Waste Management</b>	<b>4</b>	<b>13</b>
<b>NFRP-7</b>		<b>8</b>	
<b>NFRP-8</b>		<b>1</b>	
<b>NFRP-9</b>	<b>Radiation protection</b>	<b>1</b>	<b>1</b>
<b>NFRP-10</b>	<b>Management of research reactor</b>	<b>1</b>	<b>2</b>
<b>NFRP-11</b>		<b>1</b>	
<b>NFRP-12</b>	<b>Support for careers in the nuclear field</b>	<b>5</b>	<b>5</b>
<b>NFRP-13</b>	<b>Fission/fusion cross-cutting actions</b>	<b>1</b>	<b>2</b>
<b>NFRP-14</b>		<b>1</b>	
		<b>72</b>	

# A - SUPPORT SAFE OPERATION OF NUCLEAR SYSTEMS (49/**14**)

**NFRP 1:** Continually improving safety and reliability of Generation II and III reactors (32/**9**)

**NFRP 2:** Research on safety of fast neutron Generation-IV reactors (3/**1**)

**NFRP 3:** Investigating the safety of closed nuclear fuel cycle options and fuel developments (2/**1**)

**NFRP 4:** Research on the safety of small modular reactors (7/**1**)

**NFRP 5:** Materials research for Generation-IV reactors (5/**2**)

59,753,671.90 Euros

## **NFRP 1: Continually improving safety and reliability of Generation II and III reactors (32/9)**



Project Acronym	Project Title	Beneficiaries	Coordi
<b>ADVISE</b>	ADVanced Inspection of Complex StructurEs	FR, CZ, DE, FR, HU, LT, UK	EDF
<b>ATLAS+</b>	Advanced Structural Integrity Assessment Tools for Safe Long Term Operation	FI, DE, ES, FI, FR, HU, NL, SE, SI, UK	VTT
<b>CORTEX</b>	Core monitoring techniques and experimental validation and demonstration	SE, CH, CZ, DE, EL, ES, FR, HU, JP, SE, US	CHALMER S
<b>IL TROVATORE</b>	Innovative cladding materials for advanced accident-tolerant energy systems	BE, BE, DE, FR, IT, JP, SE, UK, US	SCK CEN
<b>MEACTOS</b>	Mitigating Environmentally Assisted Cracking Through Optimisation of Surface Condition	ES, BE, CH, CZ, ES, FI, FR, RO, SI, SK, UK	CIEMAT

## **NFRP 1: Continually improving safety and reliability of Generation II and III reactors (32/9)**



Project Acronym	Project Title	Beneficiaries	Coordin
<b>McSAFE</b>	High-Performance Monte Carlo Methods for SAFETy Demonstration- From Proof of Concept to realistic Safety Analysis and Industry-like Applications	DE, BE, CZ, DE, FI, FR, NL, SE, UK	KIT
<b>NARSIS</b>	New Approach to Reactor Safety Improvements	FR, AT, DE, FI, FR, HR, IT, NL, PL, SI, UK	CEA
<b>NOMAD</b>	Nondestructive Evaluation (NDE) System for the Inspection of Operation-Induced Material Degradation in Nuclear Power Plants	DE, BE, CH, DE, ES, FI, HU, UK	Fraunhofer EMFT
<b>TeaM Cables</b>	European Tools and Methodologies for an efficient ageing management of nuclear power plant Cables	FR, CZ, DE, FI, FR, IT, PL	EDF

## **NFRP 2: Research on safety of fast neutron Generation-IV reactors (3/1)**

Project Acronym	Project Title	Beneficiaries	Coordinator
<b>ESFR-SMART</b>	European Sodium Fast Reactor Safety Measures Assessment and Research Tools	CH, BE, DE, ES, FR, IT, LV, SE, UK	PSI

## **NFRP 3: Investigating the safety of closed nuclear fuel cycle options and fuel developments (2/1)**

Project Acronym	Project Title	Beneficiaries	Coordinator
<b>GENIORS</b>	GEN IV Integrated Oxide fuels recycling strategies	FR, BE, CZ, DE, ES, FR, IT, NL, PL, SE, UK,	CEA

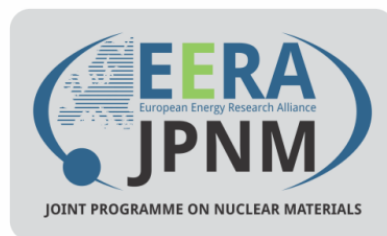
## NFRP 4: Research on the safety of small modular reactors (7/1)



Project Acronym	Project Title	Beneficiaries	Coordinator
<b>GEMINI+</b>	Research and Development in support of the GEMINI Initiative	<b>PL</b> , BE, CZ, DE, ES, FI, FR, JP, KR, LT, NL, PL, UK, US	

## NFRP 5: Materials research for Generation-IV reactors (5/2)

Project Acronym	Project Title	Beneficiaries	Coordinator
<b>GEMMA</b>	GEneration iv Materials MAaturity	IT, BE, CZ, DE, ES, FR, IT, KR, PL, RO, SE, UK	ENEA
<b>INSPYRE</b>	Investigations Supporting MOX Fuel Licensing in ESNII Prototype Reactors	FR, BE, CH, FI, FR, IT, NL, SE, UK	CEA





# B – CONTRIBUTE TO THE DEVELOPMENT OF SOLUTIONS FOR THE MANAGEMENT OF RADIOACTIVE WASTE (13/5)

**NFRP 6:** Addressing key priority R&I issues for the first-of-the-kind geological repositories (4/2)

**NFRP 7:** Research and innovation on the overall management of radioactive waste other than geological disposal (8/3)

**NFRP 8:** Pan-European knowledge sharing and development of competence in radioactive waste management (1/0)



19,455,488 Euros

**NFRP 6: Addressing key priority R&I issues  
for the first-of-the-kind geological repositories  
(4/2)**

Project Acronym	Project Title	Beneficiaries	Coordinator
<b>BEACON</b>	Bentonite mechanical evolution	SE, BE, CH, CZ, DE, ES, FI, FR, LT, SE, UK	SKB
<b>DISCO</b>	Modern spent fuel dissolution and chemistry in failed container conditions	SE, BE, CH, DE, ES, FI, FR, SE, UK	SKB

## **NFRP 7: Research and innovation on the overall management of radioactive waste other than geological disposal (8/3)**

Project Acronym	Project Title	Beneficiaries	Coordinator
<b>CHANCE</b>	Characterization of conditioned nuclear waste for its safe disposal in Europe	FR, BE, DE, FI, FR, IT, PL, RO, UK	ANDRA
<b>INSIDER</b>	Improved Nuclear Site characterization for waste minimization in DD operations under constrained Environment	FR, BE, CH, CZ, DE, ES, FR, HU, UA, UK	CEA
<b>THERAMIN</b>	Thermal treatment for radioactive waste minimisation and hazard reduction	FI, BE, DE, FR, LT, SK, UK	VTT

# C – FOSTER RADIATION PROTECTION

**NFRP 9: Impacts of low dose radiation exposure**  
**Radiation protection (1/1)**

Project Acronym	Project Title	Beneficiaries	Coordinator
<b>MediRad</b>	Implications of Medical Low Dose Radiation Exposure	AT, BE, CH, DE, EL, ES, FR, IE, IT, NL, PL, PT, SE, UK	



9,995,146 Euros

# D – MANAGEMENT OF RESEARCH REACTOR AVAILABILITY IN EUROPE

**NFRP 10:** Support for the optimised use of European research reactors (1/0)

**NFRP 11:** Support for the EU security of supply of nuclear fuel for research reactors (1/1)

Project Acronym	Project Title	Beneficiaries	Coordinator
<b>FOREVER</b>	Fuel fOR REsEarch Reactors	FR, BE, CZ, DE, FR, PL	CEA

6,598,148 Euros

# E – SUPPORT THE DEVELOPMENT OF NUCLEAR COMPETENCES AT EU LEVEL

## **NFRP 12: Support for careers in the nuclear field (5/2)**

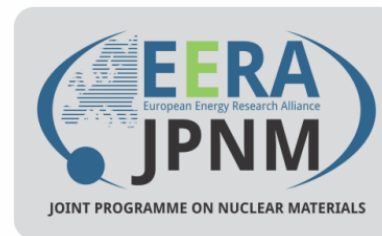
Project Acronym	Project Title	Beneficiaries	Coordinator
<b>ENEN+</b>	Attract, Retain and Develop New Nuclear Talents Beyond Academic Curricula	FR, BE, CZ, ES, FI, FR, HU, IT, RO, SI, UK	ENEN
<b>MEET-CINCH</b>	A Modular European Education and Training Concept In Nuclear and Radio Chemistry	DE, CY, CZ, FI, FR, IT, NO, SE, SI, UK	LUH

5,096,239 Euros

# F – FISSION/FUSION CROSS-CUTTING ACTIONS

**NFRP 13:** Fission/fusion cross-cutting research in the area of multi-scale materials modelling (1/1)

Project Acronym	Project Title	Beneficiaries	Coordinator
M4F	MULTISCALE MODELLING FOR FUSION AND FISSION MATERIALS	ES, BE, CH, CZ, DE, ES, FI, FR, HR, IT, PL, SE, TR, UK	CIEMAT



4,000,000 Euros

# F – FISSION/FUSION CROSS-CUTTING ACTIONS

**NFRP 14:** Cross-cutting support to improved knowledge on tritium management in fission and fusion facilities (1/1)

Project Acronym	Project Title	Beneficiaries	Coordinating Organisation
TRANSAT	TRANSversal Actions for Tritium	FR, BE, DE, FR, IT, RO, SI, UK	CEA

3,999,259 Euros

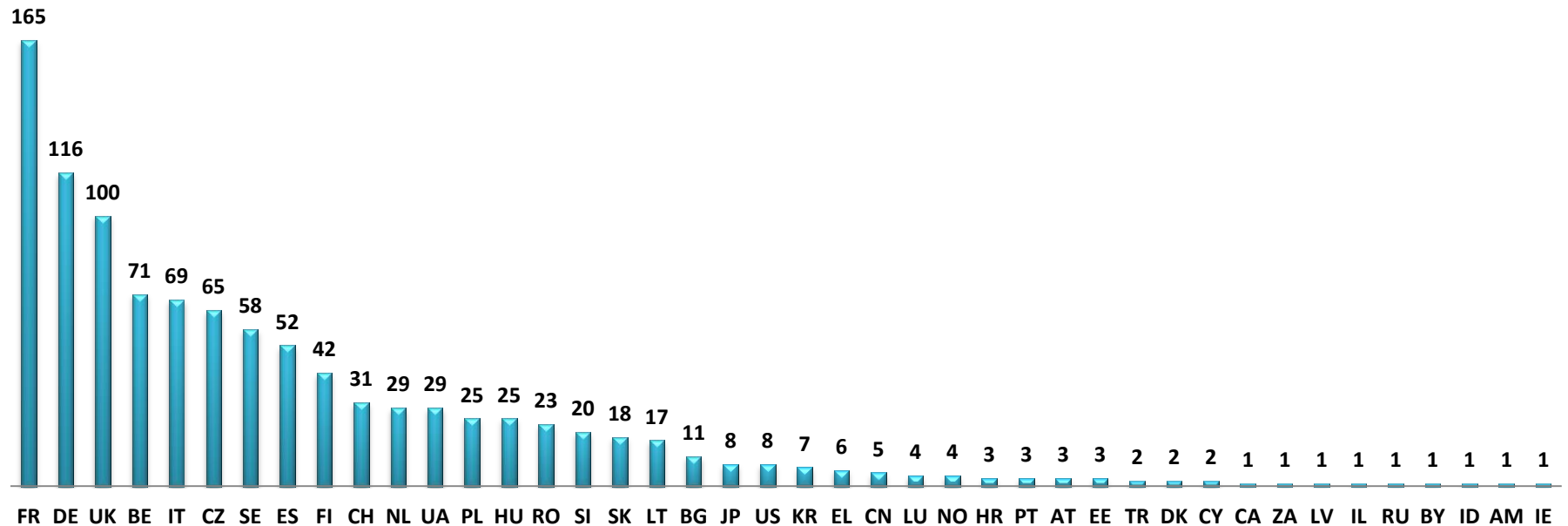


# N° of grants per cluster

Cluster	Definition	N° of Grants per cluster	Max Grant amount (€)
1	Support safe operation of nuclear systems	14	59,753,671
2	Contribute to the development of solutions for the management of radioactive waste	5	19,455,488
3	Foster radiation protection	1	9,995,146
4	Management of research reactor availability in Europe	1	6,598,148
5	Support the development of nuclear competences at EU level	2	5,096,239
6	Fission/fusion cross-cutting actions	2	7,999,259
<b>Total</b>		<b>25</b>	<b>108,897,954</b>

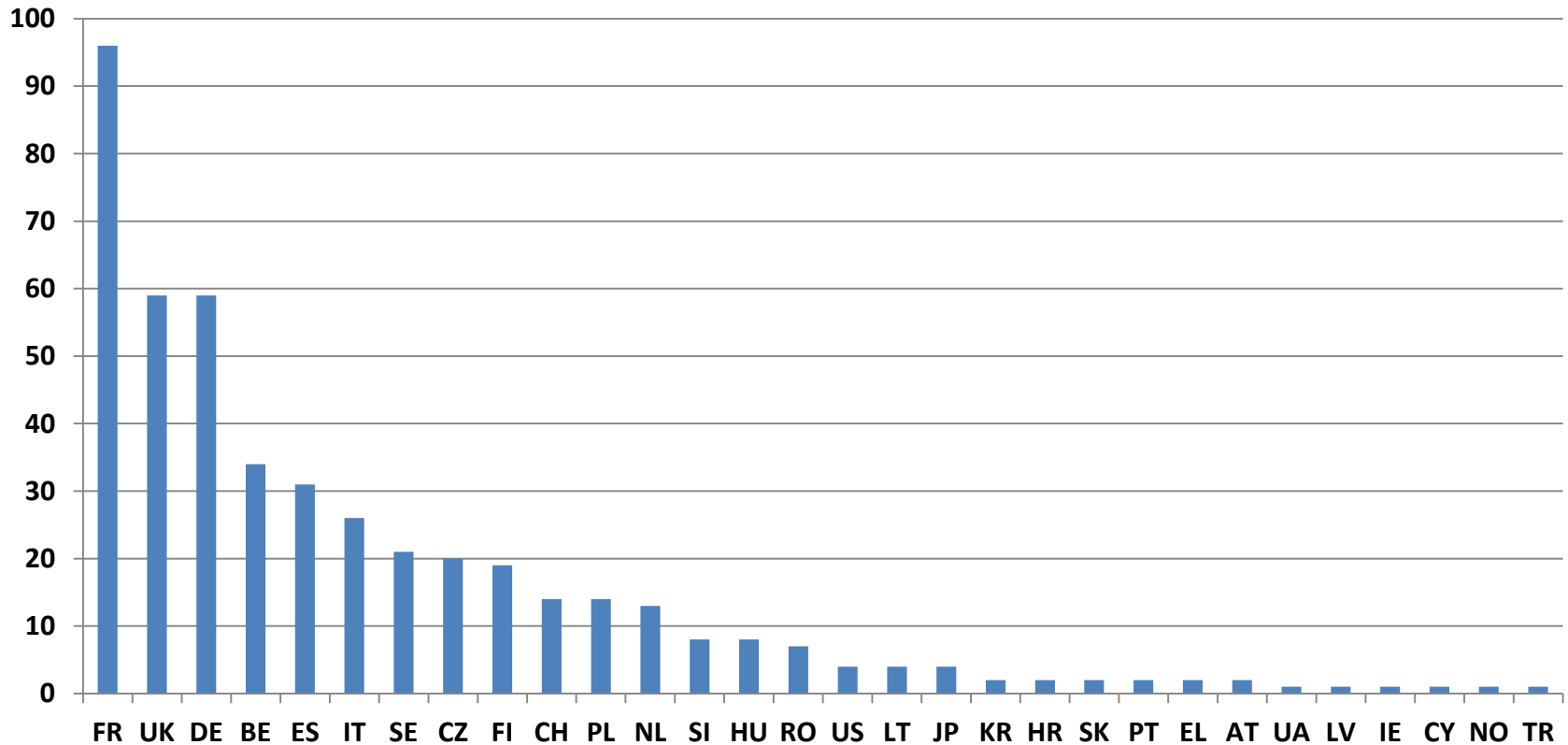
# Call 2016-2017

## Country distribution per applicants



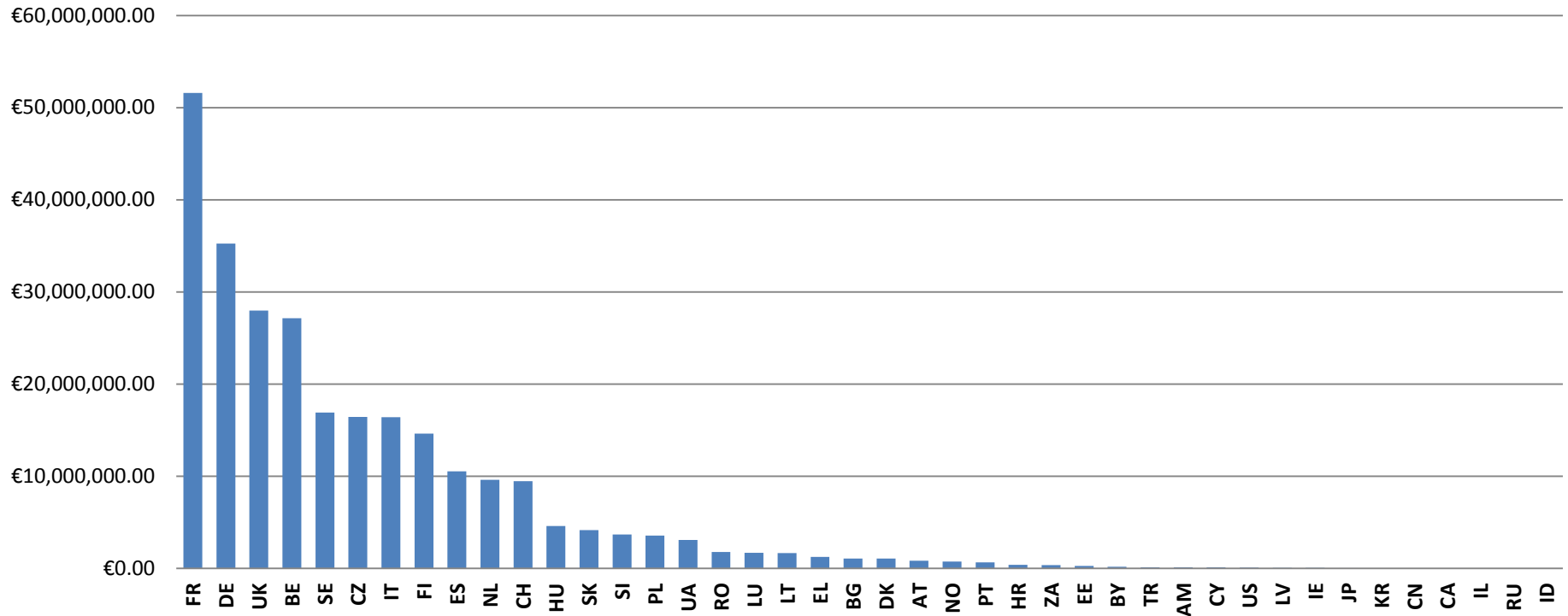
## Call – Euratom fission 2016-2017

### Number of participations per countries



## Call 2016-2017

### Country distribution per budget requested



## Call – Euratom fission 2016-2017

### Non-Euratom participation in 14 projects (out of 25 → 56%)

Third parties	Entities	Participations (in projects)	Co-financed participations	EC contribution (€)	Total cost (€)
Japan	4	4 (in 3)	1	10.000,00	322.167,50
Korea	2	2 (in 2)	0	0	369.425,00
Norway	1	1 (in 1)	0	0	430.455,75
Turkey	1	1 (in 1)	0	0	187.500,00
U.S.	4	4 (in 3)	1	98.008,75	367.957,50
<b>Totals</b>	<b>12</b>	<b>12 (in 10)</b>	<b>2</b>	<b>108.008,75</b>	<b>1.677.505,75</b>

Associated countries					
Switzerland	5	14 (in 10)	14	3.869.594,07	5.155.308,75
Ukraine	1	1 (in 1)	1	30.462,50	30.462,50
<b>Totals</b>	<b>6</b>	<b>15 (in 11)</b>	<b>15</b>	<b>3.900.056,57</b>	<b>5.185.771,25</b>

## Ukraine participation

- 29 applications from Ukrainian entities in 15 proposals
  - After evaluation: only 1 participant (Energorisk, Ltd.) will be funded
  - 11 are in 6 proposals below available budget
  - 12 are in 5 proposals below threshold
  - 5 are in 3 proposals in reserve list

- B.1: Support for fission research & innovation (R&I) investment projects of pan-European relevance through the InnovFin instrument
- B.2: SOFT Innovation Prize
- B.3: External expertise
- B.4: Expert group for interim evaluation of the Euratom Research and Training Programme 2014-2018
- B.5: External expertise for international cooperation in nuclear research with targeted countries**
- B.6: Public procurement - Studies for the interim evaluation of fission and fusion indirect actions under the Euratom Research and Training Programme 2014-2018
- B.7 Contribution to the Organisation for Economic Co-operation and Development (Nuclear Energy Agency) / Secretariat for the Generation-IV International Forum

## B5. External expertise for international cooperation in nuclear research with targeted countries

- **Objective:**

- The objective is to pursue focussed cooperative actions with specific third States in support to the implementation of the Euratom Research and Training Programme 2014-2018, covering the exchange of scientific and technical nuclear expertise through participation of technical experts in programmatic discussions under the legal framework of bilateral Euratom cooperation agreements in fission and fusion research.

- **Scope:**

- The targeted countries are Ukraine, owing to its possible future association to the Euratom Programme, and China as a major player in the nuclear sector.





## B5. External expertise for international cooperation in nuclear research with targeted countries

- With regard to Ukraine
  - **Fission** - This action will principally target **radiological data**, **decommissioning** and diversification of **nuclear fuel** and **operational experience** of **VVERs**. This will inter alia facilitate the alignment of Ukraine with European best practices regarding safety, whilst giving EU feedback from Ukraine's experience in operating VVERs.
  - **Fusion** - This action will aim to consolidate the Ukrainian initiative to align the Ukrainian fusion programme to the European Fusion Roadmap and to identify effective contributions to the **EUROfusion** scope of work.



## B5. External expertise for international cooperation in nuclear research with targeted countries

- Expected impact:
  - These actions will help to strengthen the bilateral cooperation on challenges of common interest between Euratom and two key third countries both in the fission and fusion research areas. In particular, they will
    - (i) promote **Ukraine's integration into the fission research programme** and its alignment with the European Fusion Roadmap under the framework of the association to the Euratom programme,
    - (ii) **spread European nuclear safety culture** and best practices, and
    - (iii) **promote win-win collaborations with China**, which is arguably the most ambitious country as regards development of new and advanced nuclear technologies.



## B5. External expertise for international cooperation in nuclear research with targeted countries

- EU experts in the following key areas:
  - Nuclear Safety
  - **Nuclear Materials Science**
  - Radioactive Waste Management
  - Radiation Protection
  - Decommissioning

## B5. External expertise for international cooperation in nuclear research with targeted countries

### EU experts roles:

- In frame of programmatic discussions in their specific field:
  - To provide analyses of research activities, capacities and infrastructures of Ukraine in the specific R&D field
  - To support enhancement of nuclear S&T cooperation and Ukraine's integration into the EU fission programmes
  - To provide recommendation for EU-UA future strategies & programmes
  - To propose research fields/topics for enhanced EU-UA cooperation
- The cooperative actions will be implemented by the expert under the forms of:
  - Visits and exploratory meetings on specific nuclear research capacities and facilities
  - Meetings and exchanges with main nuclear stakeholders of Ukraine
  - Common identification of measures to be taken on fission research cooperation
  - Preparation of specific reports with agreed actions, recommendations



## B5. External expertise for international cooperation in nuclear research with targeted countries

- EU experts outcomes:
  - Mission reports and proposed actions
  - Discussions with EC in Brussels
  - Recommendations to the EC in order to fulfil the goals mentioned before.



## B5. External expertise for international cooperation in nuclear research with targeted countries - Implementation

Ukraine National Contact Points NCP: **Prof. Yegor Dubynskyi**. Adviser to the Vice President National Academy of sciences of Ukraine. National NCP coordinator of Horizon 2020

- EU-Expert on **materials**: **Dr. Marta Serrano García**:
- Ukrainian counterpart: **Prof. Victor Voyevodin** and **Dr. Alexander Volobyyev** from KIPT

Mrs. Helena ZATLKAJOVA (EC DG RTD, Policy Officer)



## B5. External expertise for international cooperation in nuclear research with targeted countries

- 3 missions to Ukraine
  - The first mission to prepare the document on research infrastructures and capacities in fission materials in Ukraine.
    - KIPT 1-3 March 2017
  - The second one together with the **Enlargement JRC Workshop in June**. This meeting to prepare the document on the mid-term Ukrainian strategies, priorities and limitations in the nuclear fission materials area
  - The third one can be held the 2nd of 3rd week of November to finalise the documents
- Common identification of measures to be taken on fission research cooperation
- Preparation of specific reports with agreed actions, recommendations