



### EU/EURATOM Research and Training and Future Perspectives









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### **60 Years of the Rome Treaties (EC Lisbon + Euratom)**



#### http://europa.eu/european-union/eu60\_en



# Brexit and Euratom?













## **EU/Euratom Fission challenges**



Nuclear Energy Development, including Research Activities (art.4-11) Health and Safety (art.30-39) Safeguards (Guarantees for Peaceful Uses) (art.77-85) External Relations (art.101-106)

- Safe and harmonised management of radioactive waste
- Enhanced safety of design and operation of existing and future reactors
- Lift uncertainty about health risks after low radiation dose due to industrial and medical applications
- Ensure transfer of knowledge to future generation in the field
- Integration of European research programming and implementation
- Challenges need to be addressed worldwide



### **EURATOM Fusion research**



EU gave a new financial boost to fusion research

**EUROfusion Joint Programme signed in September 2014** (starting on 1<sup>st</sup> January 2014), replaces all Euratom/Associations agreements, **2014-2018**, a contract of around EUR 450 million implementing Fusion roadmap *https://www.euro-fusion.org/* 





#### JET operation secured until 2018

The new contract for JET facilities has been signed on 6 June 2014 between the European Commission and the Culham Centre for Fusion Energy. It is a major EUR 283 million contract, under Article 10 of the Euratom Treaty.

http://ec.europa.eu/programmes/horizon2020/en/news/eu-gavenew-financial-boost-fusion-research



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### **Euratom F4E, ITER and Fusion roadmap**



European Joint Undertaking for ITER and the Development of Fusion Energy Euratom contribution to the **Joint Undertaking 'Fusion for Energy'** F4E for the 2014-2020 period set at EUR 2.9 billion. ITER is international an collaborative project (EU, US, China, Japan, India Russia, South Korea)

http://ec.europa.eu/budget/mff/pro
grammes/index\_en.cfm#iter



### **EU/EURATOM Fission RTD Work Programmes**

~ 20%	Geological disposal	
~ <b>40%</b>	<ul> <li>Reactor systems</li> <li>Safety of existing nuclear installation (Gen II-III)</li> <li>Advanced nuclear systems for increased safety (Gen-IV)</li> <li>Partitioning, Transmutation and closed fuel cycle</li> <li>Cross-cutting aspects (e.g. fuels, materials, simulation, nuclear data)</li> <li>Other applications (e.g. cogeneration, support to Research Reactors)</li> </ul>	
~ 20%	Radiation protection	Grand Total: Euratom Fission RTD ~ 50 Mi€ / Year
~ 20%	Research infrastructures Training and mobility Cross-cutting	Euratom Fission JRC ~ 50 Mi€ / Year Total ~ 10 % EU Public&Private Fission R&D
European		European 6

×,

Commission

### H2020 EURATOM Fission Calls 2014-2017



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### **Euratom initiatives FP7, ETPs, ERA, INCO, H2020**

- Under Euratom, EC should promote and facilitate EU Nuclear safety R&D in MS, collab. IAEA, NEA, GIF
- **ETPs** are industry led to promote R&D and demonstration of EU fission technologies
- **EU fora** supporting nuclear policy, promoting stakeholders dialogue and safety improvements
- **ENEF** from 2007 and WG Transparency, risks and opportunities
- **ENSREG** from 2007, stress tests peer reviews
- SNETP composed of NUGENIA, ESNII and NC2I pillars
- SET-Plan Key action n.10 on nuclear fission and fusion
- **IGDTP** on geological disposal
- **MELODI** with NERIS-TP, EURADOS and Alliance
- **ENEN** European Nuclear Education Network
- **INCO** structured dialogue on R&D policy and priorities





### EU Energy Union COM/2015/80 final



**European Energy Union**, a framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy 25 February 2015 [COM/2015/80 final]

The Energy Union strategy has five mutually-reinforcing and closely interrelated dimensions designed to bring greater energy security, sustainability and competitiveness:

- Energy security, solidarity and trust;
- A fully integrated European energy market;
- Energy efficiency contributing to moderation of demand;
- Decarbonising the economy, and
- Research, Innovation and Competitiveness

*European Energy Union website http://ec.europa.eu/priorities/energy-union-and-climate/state-energy-union\_en EUR-Lex http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2015:80:FIN* 

Communication State of the Energy Union On a yearly basis



### **EU Nuclear Power Generation (PINC 2016)**



Other important aspects with respect to HR requirements for nuclear experts at a European scale are the experts employed by the regulatory bodies, their technical support organizations, and in nuclear research, education, and training.



#### **PINC - EU Nuclear Illustrative Programme**

https://ec.europa.eu/energy/en/news/commission-presents-nuclear-illustrative-programme

### H2020 Euratom and

14.7 Bi€

Erasmus+

Programmes managed by the EACEA:

### ...E&T Potential At EU level

#### Education, Audiovisual and Culture Executive Agency (EACEA)

Intra-ACP academic Lifelong learning **Erasmus Mundus** Tempus Bilateral cooperation mobility scheme Countries involved in a cooperation Eligible countries for the intra- Eligible countries for Lifelong Eligible countries for Erasmus EU members states ACP academic mobility scheme learning Mundus Tempus Partner Countries Eligible "third" countries for the Jean Monnet programme 6 Bi€ Ph.D. and Post Doc erc 25000 PhDs **Opportunities in Europe** e Curie Action And more European Research Council **KIC InnoEnergy** Established by the European Commission FIND a position through "Job Vacancies" APPLY directly to the research group! Marie Skłodowska-Curie 13 Bi€ 2.7 Bi€ actions research fellowships European Commission

### **European Master in Nuclear Energy (EMINE)**



In the framework of the European Institute of Innovation and Technology – KIC InnoEnergy. Duration: 120 ECTS, over two years. 30 Scholarships per year Language: English, Face to face education

MSc EMINE – European Master in Nuclear Energy







### **Euratom FISA-EuradWaste 2019**



### **SET-Plan TWG10 Nuclear - Key results**



#### **EU Decision Making Process (draft timeline)** EUr MS Evidence base monitoring connission Proposal Received Adoption 85% First reading) Adoption by the Commission Wainsupporting documents Etante Impact Assessment Inter-service consultations Rapporteur and Shadows Mandate to starts talks connitteevote **European** Amendments **Parliament** European Commission **Negotiations** Council's draft position with Parliament and Commission FP9 2019 2020 2021 2018 2017 European WP2018 2017 2018 BREXIT in March & June 2019 A Parliament elections WP2019-20 2019 2018 2021 2020 WP2021-22

Ordinary legislative procedure http://www.europarl.europa.eu/aboutparliament/en/20150201PVL00004/Legislative-powers



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# FP9 HORIZON EUROPE









In billion euro, current prices



Source: European Commission https://ec.europa.eu/commission/publications/factsheets-long-term-budget-proposals\_en



### Horizon Europe Budget: €100 billion\*



\* This envelope includes EUR 3.5 billion allocated under the InvestEU Fund.

€ billion In current prices

Open Science

- Global Challenges & Ind. Competitiveness
   Open Innovation
- Strengthening ERA

Euratom



### **Thank You!**



Commission