

Joint Research Centre

the European Commission's in-house science service

*Serving society
Stimulating innovation
Supporting legislation*

Training & Education at JRC: Challenges and Opportunities

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www.ec.europa.eu/jrc

Outlook

1. SHORT INTRODUCTION TO JRC

2. NUCLEAR TRAINING AND EDUCATION (major challenges)

3. JRC CURRENT NUCLEAR SKILL EFFORTS

a. EHRO-N

b. Supporting nuclear skills development of EU University Students

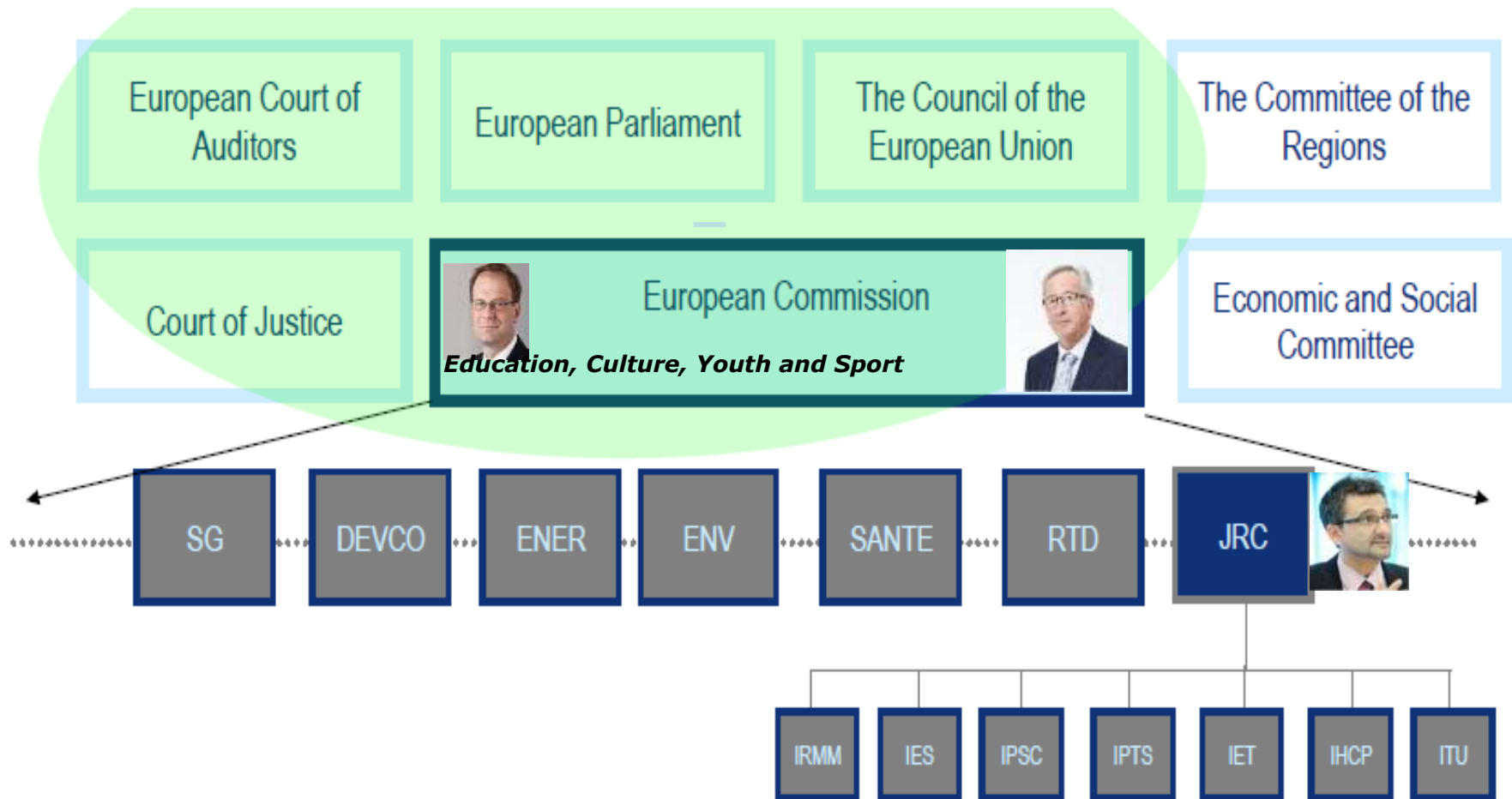
c. Supporting the professional development, nuclear vocational training and knowledge dissemination

4. A PROPOSED NEW STRUCTURE FOR THE JRC E&T

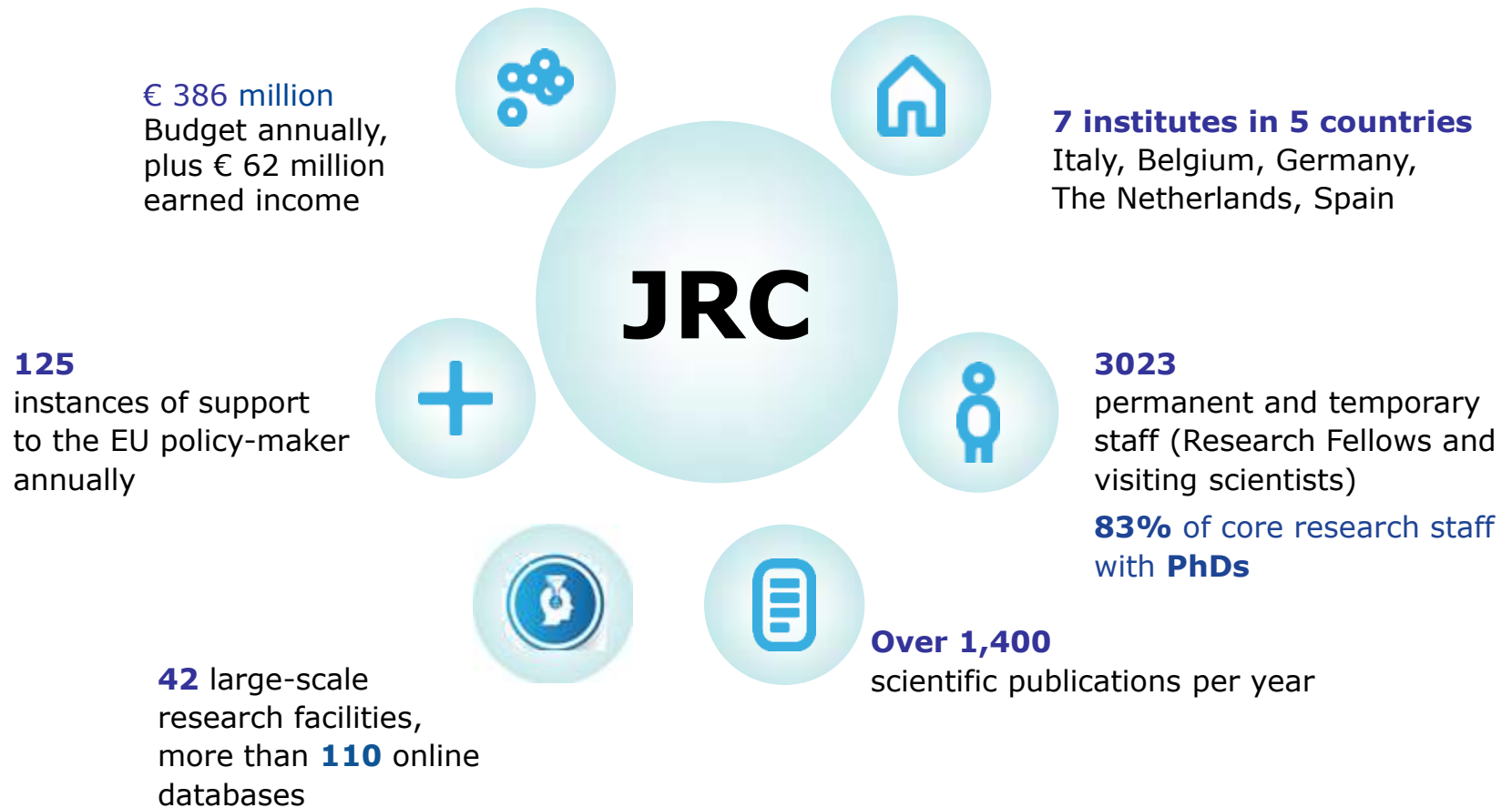
a. Collaborative Doctoral Partnerships (CDP)

5. SUMMARY AND CONCLUSIONS

The JRC inside the European Commission



JRC in figures



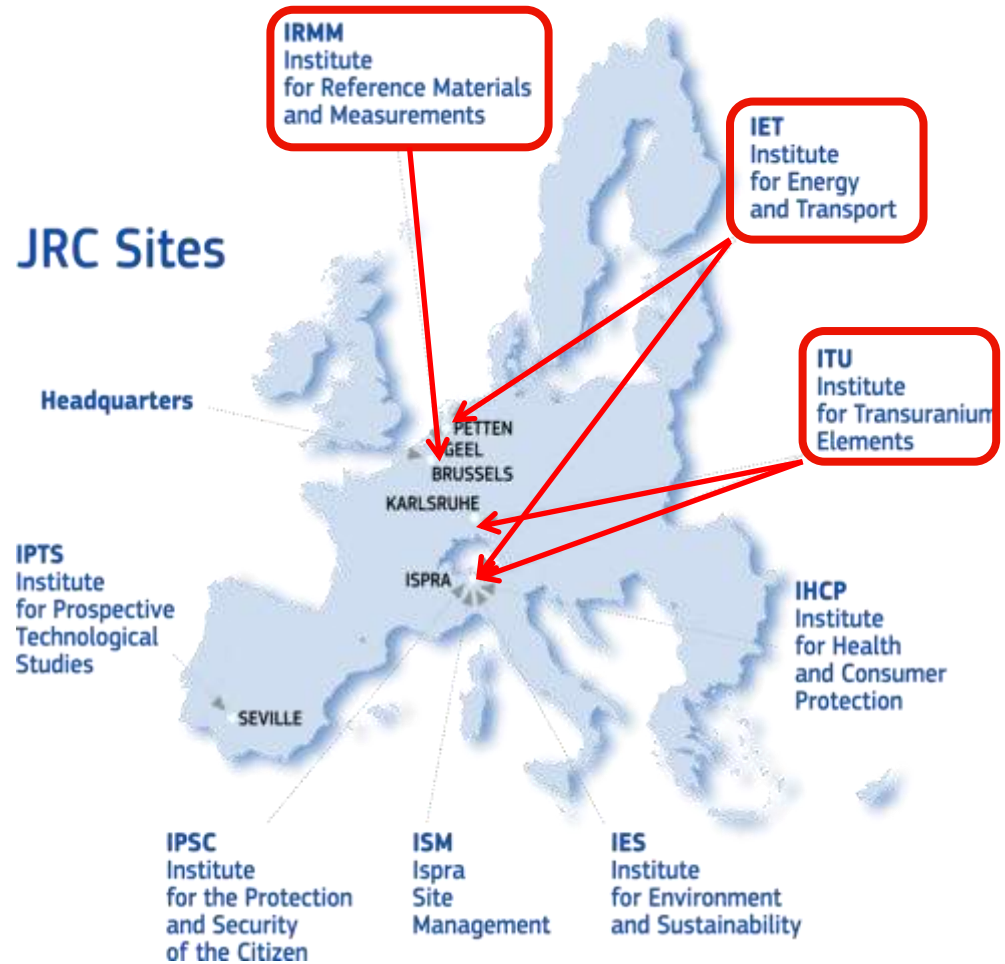
A BRIDGE BETWEEN SCIENCE AND POLICY



JRC is the only Directorate-General of the European Commission executing direct research and providing science advice to EU policy

 JRC nuclear sites

Agriculture and food security
Economic and monetary union
Energy and transport
Environment and climate change
Health and consumer protection
Information Society
Innovation and growth
Nuclear safety and security
Safety and security
Standards



JRC Nuclear FACILITIES



AMALIA Lab for research on structural materials

Environmental assisted degradation in nuclear components.

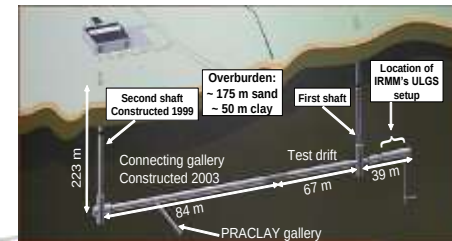
High Flux Reactor

**Irradiation experiments for materials and fuels
(Gen II-III-IV)**



GELINA

- Two accelerator-based neutron data facilities
- Laboratories for the preparation of nuclear reference materials
- Radionuclide measurement laboratories
- Underground low-level radioactivity laboratory



JRC Nuclear FACILITIES



Transmission Electron
Microscopy



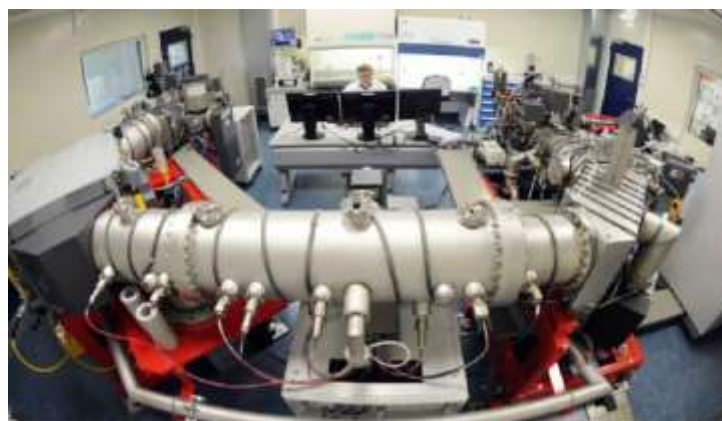
Hot Cells (24)



Minor Actinide
Laboratory



Surface Science



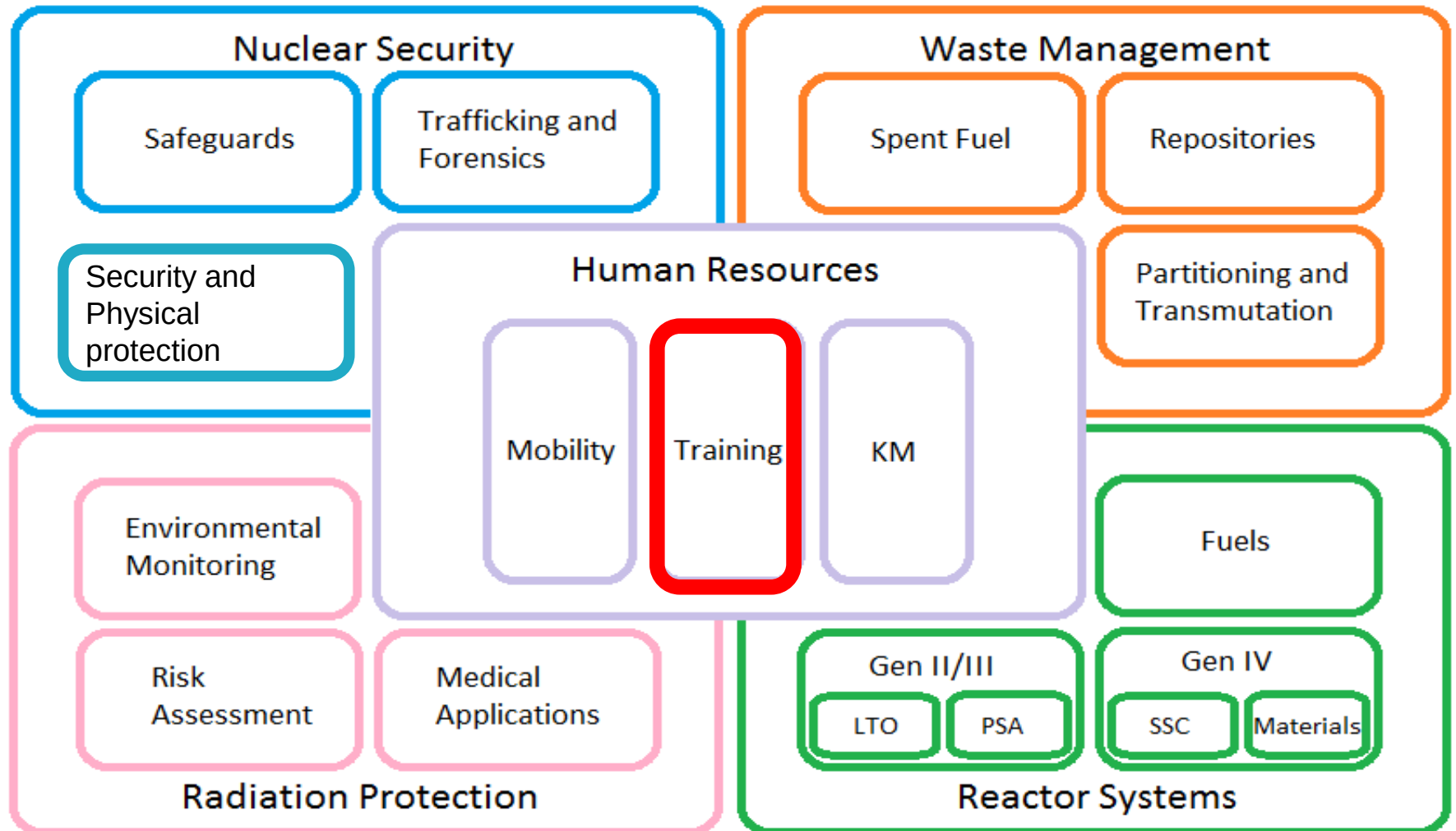
Large Geometry Secondary Ion
Mass Spectrometry (SIMS)

Euratom Treaty (1957)

states that:

*"the Commission shall be responsible for **promoting and facilitating nuclear research** in the Member States and for complementing it by **carrying out a Community research and training programme**".*

Nuclear Training & Education



EMERGENCY PREPAREDNESS
& RESPONSE

ADVANCED SCIENCE and
NUCLEAR DATA

NON ENERGY
APPLICATIONS

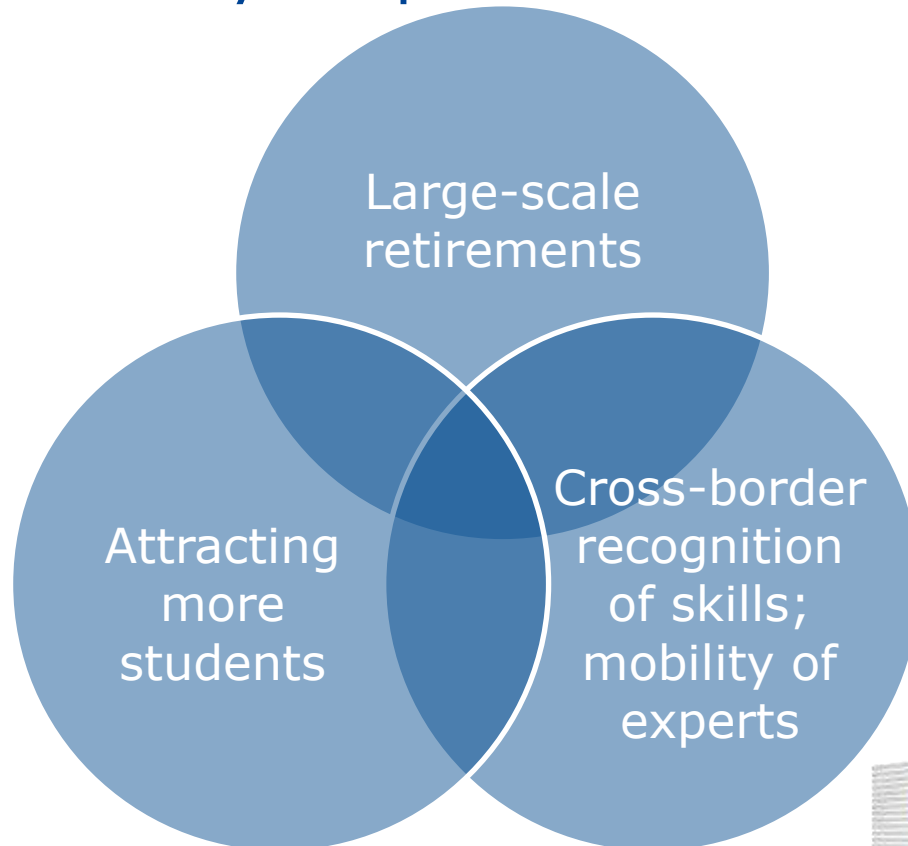
DECOMMISSIONING

Nuclear Training & Education

Key to the sustainability and **SAFETY** of the nuclear option in the energy mix

Challenge:

Long-term availability of qualified human resources

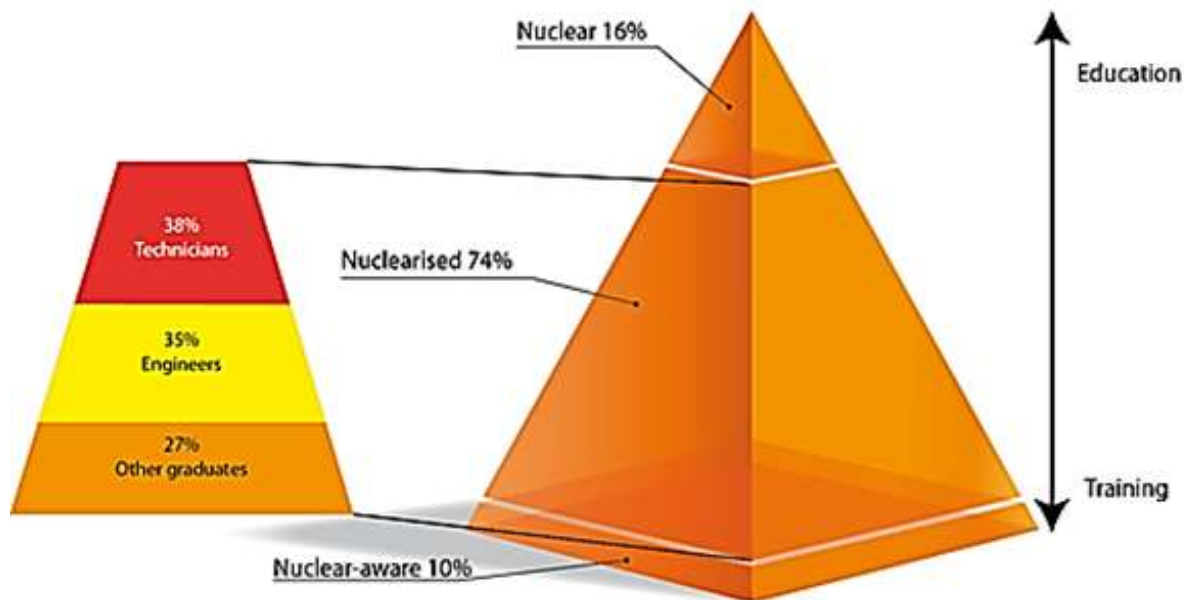


JRC's current nuclear skill efforts



European Human Resources Observatory for the Nuclear
Energy Sector

MISSION: Determine the situation of nuclear-educated Human Resources in Europe, assess the trends and suggest policy options for improvement.



ECVET: Facilitate cross-border and intersectorial mobility of the workforce.

JRC's current nuclear skill efforts

Supporting nuclear skills development of EU University Students
(Collaboration with EU universities):

- Access to unique and fully-licensed nuclear research infrastructure
- Participation to the definition and implementation of training courses and summer schools for EU students on extra curricula nuclear topics. ESARDA , Actinide Summer School and International Summer School for Nuclear Decommissioning and Waste Management (in collaboration with IAEA), Training courses INSC (DEVCO)
- JRC experts contribute to academic courses of several EU Universities
- Participation to the European Nuclear Education Network (ENEN), financial support for the ENEN PhD award.

JRC's current nuclear skill efforts

Supporting the professional development, **nuclear vocational training and knowledge dissemination** of nuclear safety and security in collaboration with research institutes, industries and academia.

- European Nuclear Security Training Centre (**EUSECTRA**)
- Hosting visiting scientists
- Development of a Massive Open Online Course (**MOOC**) with EU academia and research institutes (within the GENTLE project).
- Shaping vocational and hands-on training modular courses on nuclear decommissioning with EU industry, research institutes and Universities (European Learning Initiative on Decommissioning and Environmental Remediation (**ELINDER**))
- Interactive and hands-on learning (Nucleonica portal and the Karlsruhe Nuclide Chart.)

A PROPOSED New STRUCTURE FOR THE JRC EDUCATION AND TRAINING

STRAND 1: SCIENCE TO POLICY COURSES

- ☐ On-site courses (usually 1 to 5 days)
- ☐ Online courses

STRAND 2: ON-THE-JOB TRAINING

- ☐ Trainees: 3-12 months (up to 100/year - both paid and unpaid)
- ☐ Research fellows:
 - ☐ Collaborative Doctoral Partnerships (CDP): 24 to 36 months (up to 100 doctoral students within 3-5 years)
 - ☐ Junior and mid-career research fellows: flexible duration (0-5 and 5-10 years of experience after PhD)
 - ☐ Senior research fellows: flexible duration (more than 10 years of experience after PhD)

Collaborative Doctoral Partnerships (CDP)

Pilot project (20 PhDs/1-2 Meur) <https://ec.europa.eu/jrc/>
Establish partnerships with higher education institutions from Member States and countries associated to Horizon 2020 on topics proposed by JRC and to collaborate (via co-supervision) on specific PhD theses

June – September 2016	Launch of Europe-wide call for expression of interest
October 2016	Pre-selection of partners and Conclusion of Framework Agreements
November 2016	Call of proposals for specific topics for CDP
January 2017	Conclusion of Collaboration Agreements
February 2017	Start of CDP

Summary and Conclusions

Nuclear Training & Education is Key to the sustainability and SAFETY of the nuclear option in the energy mix

Institutional capacity-building, E&T needs to focus on the legislative and regulatory framework, nuclear safety, safeguards, security and physical protection, radiation safety, emergency preparedness and response, decommissioning and radioactive waste planning.

Based on its expertise and unique infrastructure JRC already provides a wide spectrum of trainings for nuclear safety, security and safeguards

There is a need for a **closer and better integration of E&T** initiatives which **JRC** intends to address in its renewed E&T partnership strategy