



# **ROUNDTABLE** **SUPPORTING EUROPEAN EXPERTISE** **IN NUCLEAR DECOMMISSIONING**

**23 January 2018**

**Brussels, Berlaymont building**

## **Synthesis Report**

2022

Organised jointly by the  
European Commission, FORATOM and the European Nuclear Society

EUR 29209 EN

This publication is a Conference and Workshop report by the Joint Research Centre (JRC), the European Commission's science and knowledge service. It aims to provide evidence-based scientific support to the European policymaking process. The scientific output expressed does not imply a policy position of the European Commission. Neither the European Commission nor any person acting on behalf of the Commission is responsible for the use that might be made of this publication. For information on the methodology and quality underlying the data used in this publication for which the source is neither Eurostat nor other Commission services, users should contact the referenced source. The designations employed and the presentation of material on the maps do not imply the expression of any opinion whatsoever on the part of the European Union concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

EU Science Hub  
<https://ec.europa.eu/jrc>

JRC111475

EUR 29209 EN

PDF	ISBN 978-92-79-85251-0	ISSN 1831-9424	doi:10.2760/034905
Print	ISBN 978-92-79-85252-7	ISSN 1018-5593	doi: 10.2760/376676

Luxembourg: Publications Office of the European Union, 2022

© European Union 2022



The reuse policy of the European Commission is implemented by the Commission Decision 2011/833/EU of 12 December 2011 on the reuse of Commission documents (OJ L 330, 14.12.2011, p. 39). Except otherwise noted, the reuse of this document is authorised under the Creative Commons Attribution 4.0 International (CC BY 4.0) licence (<https://creativecommons.org/licenses/by/4.0/>). This means that reuse is allowed provided appropriate credit is given and any changes are indicated. For any use or reproduction of photos or other material that is not owned by the EU, permission must be sought directly from the copyright holders.

All content © European Union 2022

How to cite this report: *Roundtable Supporting European Expertise in Nuclear Decommissioning*, EUR 29209 EN, Publications Office of the European Union, Luxembourg, 2022, ISBN 978-92-79-85251-0, doi:10.2760/034905, JRC111475.

#### **Presentations and interventions at the roundtable:**

Christophe Xerri (IAEA), Jorge Borque Liñán (ENRESA, E), Erika Bohl-Kullberg (Vatenfall AB, S), Richard R. Reid (EPRI, US), Christine Georges (CEA, F), Matthias Bothe (VKTA, D), Peter Nuenning (FRAMATOME, D), Tomas Liukaitis (Ignalina NPP, Lt), Frank Hardeman (SCK•CEN, B), Tomáš Klein (JAVYS, Sk), Alain Vallée (NUCADVISOR, F), Francesco Troiani (SOGIN, I), Joseph Boucau (Westinghouse, B), Sylvain Granger (EDF, F)

#### **FORATOM:**

Yves Desbazeille, Berta Picamal, Emilia Janisz, Witold Strzelecki, Graziella De Riddere

#### **ENS:**

Christian Legrain, Fernando Naredo, Kirsten Epskamp

#### **European Commission:**

Vladimir Šucha, Gerassimos Thomas, Massimo Garribba, Vincenzo Rondinella, Said Abousahl, Sophie Beernaerts, Gianfranco Brunetti, Athanasios Petridis, Nicole Rausch, Ivana Oceano, Manuel Martin Ramos

#### **Synthesis of the information and text writing:**

Daniela Santopolo and Pierre Kockerols

#### **Contribution to the text writing:**

Alain Vallée, Francesco Troiani

© Cover page: FORATOM IT management

## Foreword

The European Commission (EC) organised on 23<sup>rd</sup> January 2018 a roundtable discussion on nuclear decommissioning, in follow-up of similar successful meetings held in 2012 and 2014. The focus was given on “*Supporting European Expertise in Nuclear Decommissioning*”. The roundtable was chaired by Vladimír Šucha, Director General of the EC Joint Research Centre (JRC) and Gerassimos Thomas, EC Deputy Director General for Energy. It was organised jointly with FORATOM, the Brussels-based trade association for the nuclear energy industry in Europe and the European Nuclear Society (ENS), the association of nuclear professionals in Europe.

The aim of the roundtable was to assess the potential of joint EU actions to address two main areas in decommissioning: (1) technological challenges, including standardisation and (2) human competences, including education and training. In this perspective of stimulating joint European initiatives, the roundtable brought together industry, research organisations as well as European and international actors, including the International Atomic Energy Agency, to share their experiences in these fields.

The present report provides a synthesis of the highlights from the discussions at the roundtable.



## *Content*

### Background

- Role of the European Commission

- Role of FORATOM

- Role of the European Nuclear Society

### Aim and scope of the Roundtable

### Outcome of the Roundtable – Synthesis

- Status of nuclear decommissioning in the European Union

- On decommissioning technologies and the R&D requirements

- On standards

- On human resources

- On building of competences

### Conclusions

Annex: Agenda 23<sup>rd</sup> January 2018

Presentations at the Roundtable:

<https://ec.europa.eu/jrc/en/event/conference/roundtable-discussion-nuclear-decommissioning>

# **SUPPORTING EUROPEAN EXPERTISE IN NUCLEAR DECOMMISSIONING**

**Brussels, 23<sup>rd</sup> January 2018**

## *Background*

Nuclear decommissioning encompasses all technical and management actions associated with ceasing operation of a nuclear installation and its subsequent dismantling to remove it from regulatory control, aiming at delivering an environmentally friendly end-product, in line with the 'circular economy', as promoted by the EU.

Decommissioning is an industrial activity that is expected to grow worldwide, creating technological challenges along with new career opportunities. The Nuclear Illustrative Programme<sup>1</sup> of European Commission has indeed brought forward the growing importance of the activities related to the back-end of the nuclear fuel cycle.

The European industry masters a significant know-how that competes at the top level in the nuclear decommissioning market. However, in view of an expansion of the activities, further support to the development of the underpinning technical expertise is needed to answer the current and future challenges. A joint effort is also desirable to ensure the availability of the necessary workforce in the future.

## *Role of the European Commission*

Under the Euratom Treaty the Community has the important task to establish uniform safety standards for the protection of the health of workers and of the general public and to ensure that these standards are applied. In 2003 the European Union Institutions underlined the importance of the safe decommissioning of nuclear installations, including long-term management of radioactive waste and spent fuel. In the following years the Commission acted accordingly, issuing several acts, including a 2006 Recommendation on the management of financial resources for the decommissioning of nuclear installations, spent fuel and radioactive waste, and, later, crucial Directives<sup>2,3</sup> which apply to decommissioning insofar as they comprehensively refined the EU regulatory framework in the nuclear energy sector, with enhanced focus on safety and waste management.

---

<sup>1</sup> Communication from the Commission - Nuclear Illustrative Programme presented under Article 40 of the Euratom Treaty - Final (after opinion of EESC) <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52017DC0237>

<sup>2</sup> Council Directive 2009/71/Euratom of 25 June 2009 establishing a Community framework for the nuclear safety of nuclear installations <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0071> as amended by Council Directive 2014/87/Euratom of 8 July 2014 amending Directive 2009/71/Euratom establishing a Community framework for the nuclear safety of nuclear installations <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32014L0087>

<sup>3</sup> Council Directive 2011/70/Euratom of 19 July 2011 establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32011L0070>

This legal framework sets requirements for the Member States to ensure that arrangements are in place for education and training, as well as for research and development activities as relevant.

Euratom-funded research actions have contributed significantly towards European high-level expertise in the field. From 1979 to 2008 about € 60 million have been spent from the Euratom budget to diverse European consortia for the development of decontamination and dismantling techniques, technologies for waste minimisation, remote handling systems and decommissioning management tools.

The European Commission is also involved in decommissioning activities, since the JRC started in 1999 a programme to deal with its nuclear liabilities, including the dismantling of its disused nuclear facilities. Moreover the EC supervises the assistance programme to support the decommissioning of old reactors in Bulgaria, Lithuania and Slovakia, as their respective Governments committed to close these reactors prior to their accession to the European Union. The EC is coordinating as well the EU support for radioactive waste management and decommissioning of nuclear facilities in third countries, under the 'Instrument for Nuclear Safety Cooperation'.

Finally the EC has a role in the assessment and dissemination of decommissioning experience and best practices, and in the support to the necessary technological developments and training, through its research and training framework programmes.

#### *Role of FORATOM*

FORATOM is the Brussels-based trade association for the nuclear energy industry in Europe. FORATOM acts as the voice of the European nuclear industry in energy policy discussions with EU Institutions and other key stakeholders. The membership of FORATOM is made up of 15 national nuclear associations representing more than 800 firms, involved also in decommissioning activities. FORATOM Radioactive Waste Management and Decommissioning Working Group (WG) consists of specialists in decommissioning providing the required industry expertise to debate on technicalities and financing towards the European Institutions. Likewise, the Education and Training WG represents an important field of activity of FORATOM members. E&T experts from the nuclear industry and research exchange their experience in providing the best training solutions in decommissioning.

#### *Role of the European Nuclear Society*

The European Nuclear Society (ENS), which is the largest society of nuclear science, research and industry in Europe, brings together 10 000 nuclear professionals involved in the entire life cycle, from new build to decommissioning. Decommissioning is therefore a recurrent and important subject for expert discussions at ENS' conferences. What's more, ENS, together with its very active ENS Young Generation Network, plays an important role in the debate on how to retain the interest of youngsters in nuclear decommissioning. Decommissioning means: innovation, high responsibility and good career opportunities for very long period and ENS actively supports this message.

## *Aim and scope of the Roundtable*

With a view to stimulating new initiatives, the roundtable brought industry and involved actors together to share experiences with the decommissioning of nuclear facilities. The aim of the roundtable was to assess the relevance and the potential of joint EU actions to support the European expertise in the field of nuclear decommissioning, by addressing:

*technological challenges, including standardisation,*

*human resources and competences, including education and training.*

The agenda of the roundtable is provided in the annex.

## *Outcome of the Roundtable – Synthesis*

The main outcomes of the presentations<sup>4</sup>, interventions and discussions at the roundtable are summarised below, schematically and per topic that was addressed. This synthesis leads to overall conclusions presented in the last section.

### *Status of nuclear decommissioning in the European Union*

The average age of the nuclear power reactors is about 30 years in the EU; there is a considerable number of nuclear facilities which are already permanently out of operation; more will be shut down within the next two decades. This makes Europe one of the largest decommissioning markets in the world. To manage this situation and grab the underlying opportunities, the European industry has to build and deploy a stronger expertise for achieving safe, fast and cost-effective dismantling operations.

The decommissioning of the nuclear power plants, which represents a large part of the market, will be mostly sequential among European countries, as a result of their construction dates and the specific policies on life duration. Consequently, it can be expected that the decommissioning market will probably see a limited growth during the next two decades and that the core of the activities will move from country to country, when reactors will reach their end of life.

It may be observed that there is a tendency to postpone decisions that would allow progress with decommissioning projects. One of the main challenges today is to avoid that the work is transferred to the next generation and to create the conditions ensuring that the industry goes ahead in a transparent process.

This tendency to procrastinate is partially explained by the delays in waste disposal routes, which should be available for the whole spectrum of waste. This is an important limiting factor in several Member States as reported<sup>5</sup> by the European Commission in the frame of the implementation of the European waste directive<sup>3</sup>.

The directive is expected to help as it imposes on EU Member States an obligation to progress in elaborating clear policies and taking the necessary decisions.

### *On decommissioning technologies and the R&D requirements*

The previous generations of nuclear installations were constructed without taking the eventual decommissioning properly into account. Consequently, today there is either a need or an opportunity for inventing and developing solutions for decommissioning.

The European decommissioning industry has already acquired a significant technological expertise through the dismantling of some first generation nuclear facilities, which were quite

---

<sup>4</sup> For the presentations see: <https://ec.europa.eu/jrc/en/event/conference/roundtable-discussion-nuclear-decommissioning>

<sup>5</sup> Report from the Commission to the Council and the European Parliament on progress of implementation of Council Directive 2011/70/Euratom and an inventory of radioactive waste and spent fuel present in the Community's territory and the future prospects <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52017DC0236>



diverse and thus requested more complex operations than those expected for the current, rather standardized light water reactors fleet.

The maturity of the technologies and the need for R&D is indeed strongly dependent on the type of reactor or type of installation. The dismantling of light water reactors requires mainly experienced, state of the art technologies, most of them largely disseminated among the industrial companies (except few ones, like cleaning or cutting, in the hands of a limited number of companies). This is not the case for more peculiar installations, e.g. for the decommissioning of graphite reactors where the technologies for the dismantling, treatment and disposal of the graphite remain for many aspects unresolved.

Independently of the type of facility, the following technologies require attention for further technological research and development:

- Preliminary characterisation of the installations
- Segmentation techniques
- Decontamination of solids and liquids
- Robotics and use of drones
- Management of the waste streams from decommissioning
- Management of historical waste
- Clearance, recycling or disposal of very low level waste, waste optimization
- Release of buildings and site
- Site remediation, soil treatment
- IT tools for simulation, data management.

The R&D work should primarily focus on ripening pragmatic methodologies shortening the decommissioning schedules. Time reduction is crucial as the overhead costs for the safe conservation of the facilities are a major contributor to the total decommissioning costs.

R&D should also further help in minimising the amount of radioactive waste. This is of particular importance where the evacuation of waste is a limiting factor for decommissioning progress, as mentioned above. Waste volumes can be reduced by further improving the characterisation and clearance processes, as well as the treatment of the dismantled materials.

Further improving safety is obviously a continuous point of attention, but it should be noticed that for dismantling operations, industrial safety is usually at higher stake than nuclear safety.

The European Commission is well placed to support initiatives aiming at sharing R&D programmes in support of the industry, avoiding duplication of the work, and at exchanging experiences of the different actors, while respecting their intellectual property.

The International Atomic Energy Agency has also several programmes for supporting the dissemination of experiences and knowledge on particular topics (e.g. the 'GRAPA' project on the management of graphite) and is in this sense also interacting with European partners and the European Commission.

### *On standards*

To make the development and the use of the European decommissioning expertise more efficient, attention should be paid to the elaboration of standards. This should help creating one single market, and not a fragmented series of national markets, each one presenting its own specificities. The learning process from current and future decommissioning operations should allow the improvement in productivity and reduce costs and delays.

As such, standardisation of methodologies and technologies is necessary to move decommissioning to an industrial process, whereas it is still in many cases today a first-of-the kind activity. Standardisation can have several benefits e.g. in helping the decommissioning planning, facilitating the licensing process or reducing bottlenecks in the supplier market.

As a first step there is a need to identify the areas in which standards are useful and can support the industry. Some areas are directly linked to the nuclear or radiological component of decommissioning, but also the industrial component of the dismantling operations should be considered.

The standards should provide support, and thus not be conceived as a series of restrictive instructions. They could be seen as a 'toolbox', assisting efficiently the processes. In some areas where national standards already exist (e.g. materials clearance), they may serve as example or basis for the development of European standards.

The European Commission has programmes in place aiming at supporting the elaboration of standards. The European nuclear decommissioning industry could apply for such support in areas which are identified as relevant.

Attention should be also paid to ensure that the development of common methodologies or the implementation of codes and standards is not jeopardised by the current differences in the Member States' regulatory frameworks. Here, too, harmonisation should be pursued.

### *On human resources*

When a facility stops its operation, the first concern in human resources management is linked to the change in the *social context*. The activities change and the workforce has to be significantly reduced; the estimated staff for decommissioning is only a fraction of the staff for operation.

The whole organisation has also to adapt from continuous process-based work to project management. New competences are necessary, which can be obtained by reconvertng internal operational staff and by outsourcing to specialised contractor companies. Due to the lack of a wide range of specific technical services in the market, but also due to the need to keep operational staff, several operators choose to start the activities by re-employing their own staff.

A long-term staff planning is needed, which considers the different phases of the operations and the corresponding required staff and competences, which is variable in time, and the level of outsourcing. The planning must include how competences will be developed and maintained

(typically a planning over 4 years is necessary for some expert jobs) as well as the staff retention strategy.

How to attract young talent for new jobs or replacement jobs or to fill competence gaps is a key issue, which is particularly sensitive in some European countries where nuclear activities will cease to exist. Jobs in decommissioning are a priori not perceived as challenging or inspiring. On the contrary, many professionals in decommissioning experience their jobs as technically innovative, requiring initiative and offering good possibilities for career development.

The attractiveness of a job in nuclear decommissioning could be raised by promoting the learning opportunities in decommissioning and better clarifying the positive aspects of the job. The overall perception could be also improved by widening the overall public understanding on decommissioning and on its finality.

The European Human Resources Observatory in Nuclear (EHRO-N) is considered as a very important tool to collect and analyse data related to the supply and demand of nuclear experts in the EU, based on information from the European nuclear industry.

#### *On building of competences*

The feedback of on-going decommissioning projects shows that a large part of the activities do not require competences which are specific to decommissioning, but more general competences applicable also to other industrial activities. Specific decommissioning competences are needed in planning, engineering, licensing, procurement management. Specific on-site skills are needed in radiological fields, decontamination, dismantling sequences, remote techniques and waste processing. The variety of the decommissioning tasks requires also a good inter-disciplinary knowledge.

Professional learning programmes in decommissioning have been created over the last years in Europe. Through its project on 'European Learning Initiatives in Nuclear Decommissioning and Environmental Remediation' ('ELINDER'), the European Commission pools different existing learning programmes in view of enhancing their visibility and clarifying the learning outcomes.

For countries and enterprises embarked in decommissioning European-level actions are essential for the development of relevant competences. Several roundtable's participants have also expressed their interest on the Euratom Work Programme 2018 (topic "NFRP-2018-5: Development of a roadmap for decommissioning research aiming at safety improvement, environmental impact minimisation and cost reduction"). Currently the Euratom FP9 is in preparation and a broad consultation among the stakeholders has been carried out. Many opinions linked to the further development of expertise in nuclear decommissioning have been raised to be considered for future programmes.

Through the ERASMUS+ programme, strategic partnerships foster the long term cooperation between industry and vocational training organisations, and help building networks for exchanging experiences. Specifically for research, the Marie Skłodowska Curie Actions (MSCA) are notably funding individual fellowships for experienced researchers, training networks for early-stage researchers and staff exchanges between research institutions and the industry.

Their objective is to develop researchers' skills and employability in both academic and non-academic worlds, and generate knowledge and innovation in all fields of research. Some examples of support already exist in nuclear-related areas; applications for European projects linked to nuclear decommissioning may be in line with what is pursued by ERASMUS+ or MSCA.

The 'European dimension' of the decommissioning learning initiatives could make the jobs more attractive for young professionals and enhance the circulation of experiences and competences, thus helping to succeed tackling the decommissioning challenges.

## *Conclusions*

Nuclear Decommissioning is a key activity of the nuclear industry, both as the last step for countries which have decided to abandon nuclear energy, and as a demonstration of sustainability for those countries that will pursue the nuclear energy option. In this sense there is a strong positive message linked to decommissioning; its realisation demonstrates that it is feasible to close the industrial cycle and return sites to their original environmental conditions.

When looking at several on-going decommissioning projects in the EU, it appears that those related to rather 'conventional' nuclear installations (like pressurised water reactors) are progressing. Today it looks indeed likely that the related sites will be dismantled and cleaned up safely. The European industry should build on these experiences to further enhance the timeliness, efficiency and cost-effectiveness of the operations, with a view to achieve a competitive advantage in the growing international opportunities in the decommissioning market. This could be supported by developing and adopting agreed European standards in some defined areas, which would consolidate the commonly acquired experience.

There are nevertheless still a number of technological challenges for the decommissioning industry, which are often linked to the specificities of some installations (an example being the graphite reactors). Here research and innovation work is still needed. The technological solutions that will be found will become a driver for new developments, making the European industry more competitive. Advantage should be taken to streamline this work at European level, to avoid duplication and have the R&D targeted to the actual needs of the industry.

In order to help the EU to progress in decommissioning it is also essential that solutions are in place for the whole spectrum of waste streams, to allow a 'waste-led approach' during the dismantling. The on-going implementation of the European nuclear waste directive<sup>2</sup> should provide a stimulus especially in countries where little progress has been realised up to now. The acquired experiences could help harmonising the approaches for the waste categorisation, the waste acceptance and the related safety standards, which would obviously be beneficial for the European industry.

Finally, key for the support of the industry is the ability to rely on the right human resources. Although a large part of the required competences are very similar to other industrial activities, some specific know-how is needed for decommissioning. Jobs in decommissioning are frequently considered attractive by the workers involved, but they are not always perceived as such from the outside. Also here Europe has a role to play to raise the attractiveness for the younger generation and build together the necessary competences.



## SUPPORTING EUROPEAN EXPERTISE IN NUCLEAR DECOMMISSIONING

**AGENDA 23<sup>rd</sup> January 2018**

**Schuman room, Berlaymont building, Brussels**

**09:30 - 10:00 WELCOME:**

**Vladimir ŠUCHA**, Director General, Joint Research Centre, European Commission

**Gerassimos THOMAS**, Deputy Director General, DG Energy, European Commission

**10:00 - 10:40 OPENING SESSION: International framework to develop expertise**

- **Yves DESBAZEILLE**, Director General of FORATOM
- **Christian LEGRAIN**, Vice-President of the European Nuclear Society
- **Christophe XERRI**, Director of the Nuclear Fuel Cycle and Waste Technology Division, International Atomic Energy Agency

**10:40 - 12:20 SESSION 1: Addressing technological challenges, need for standardisation**

Session Chair: **Fernando NAREDO**, Secretary General of the European Nuclear Society

**Speakers:**

- **Jorge BORQUE LIÑÁN**, Jose Cabrera NPP decommissioning, ENRESA, Spain  
*Experiences and lessons learned: Jose Cabrera NPP Decommissioning Project*
- **Erika BOHL-KULLBERG**, Vattenfall AB, Sweden  
*Industrial technological challenges in decommissioning*
- **Richard D. REID**, Technical Executive, Decommissioning Technology Program, Electric Power Research Institute, USA  
*Views from the U.S. on R&D needs in nuclear decommissioning*
- **Christine GEORGES**, Head of Prospective and International development, CEA, France  
*Views on international research and innovation in nuclear decommissioning*
- **Matthias BOTHE**, VKTA - Strahlenschutz, Analytik & Entsorgung Rossendorf e.V., Dresden, Germany  
*Development of decommissioning standards in Germany, integration at EU level*

## **13:20 - 14:40 SESSION 2: Capitalising on EU competences in nuclear decommissioning**

Session Chair: **Said ABOUSAHL**, Head of the Euratom Coordination Unit, EC JRC

### **Speakers:**

- **Peter NUENNING**, Vice President Human Resources, Communication & Information Systems, Framatome GmbH, Germany  
*Preserving and developing of nuclear competencies with focus on Decommissioning*
- **Tomas LIUKAITIS**, Director Corporate Affairs and Administration, Ignalina NPP, Lithuania  
*Human Resources points of attention for the nuclear decommissioning industry: Ignalina NPP experience*
- **Frank HARDEMAN**, Deputy Director General SCK•CEN, Belgium  
*SCK•CEN participation in the ELINDER project*
- **Sophie BEERNAERTS**, Head of the Marie Skłodowska-Curie Actions Unit, DG for Education, Youth, Sport and Culture, European Commission  
*EC support to the development of professional competences*

## **14:40 - 16:30 PANEL DISCUSSION: Supporting decommissioning expertise: stakeholders' views**

Panel Moderator: **Massimo GARRIBBA**, Director for Nuclear Energy, Safety and ITER, DG Energy, European Commission

### **Panellists:**

- **Tomáš KLEIN**, Director of V1 Decommissioning and PMU Division, JAVYS, Slovakia
- **Alain VALLÉE**, CEO NUCADVISOR (NUVIA Group) , France
- **Francesco TROIANI**, Director Technological Development & Innovation, SOGIN, Italy
- **Joseph BOUCAU**, Director, Global D&D/WM Business Development , Westinghouse
- **Rita LECBYCHOVA**, Head of the Fission Energy Unit, DG Research and Innovation, European Commission
- **Vincenzo RONDINELLA**, Head of Department for Waste Management and Decommissioning, Joint Research Centre, European Commission

## **16:30-16:50 CONCLUSIONS**

- **Sylvain GRANGER**, Senior VP Head of Decommissioning and Waste Management, EDF, France
- **Massimo GARRIBBA**, Director for Nuclear Energy, Safety and ITER, DG Energy, European Commission

## **GETTING IN TOUCH WITH THE EU**

### **In person**

All over the European Union there are hundreds of Europe Direct information centres. You can find the address of the centre nearest you at: [https://europa.eu/european-union/contact\\_en](https://europa.eu/european-union/contact_en)

### **On the phone or by email**

Europe Direct is a service that answers your questions about the European Union. You can contact this service:

- by freephone: 00 800 6 7 8 9 10 11 (certain operators may charge for these calls),
- at the following standard number: +32 22999696, or
- by electronic mail via: [https://europa.eu/european-union/contact\\_en](https://europa.eu/european-union/contact_en)

## **FINDING INFORMATION ABOUT THE EU**

### **Online**

Information about the European Union in all the official languages of the EU is available on the Europa website at: [https://europa.eu/european-union/index\\_en](https://europa.eu/european-union/index_en)

### **EU publications**

You can download or order free and priced EU publications from EU Bookshop at: <https://publications.europa.eu/en/publications>. Multiple copies of free publications may be obtained by contacting Europe Direct or your local information centre (see [https://europa.eu/european-union/contact\\_en](https://europa.eu/european-union/contact_en)).

## The European Commission's science and knowledge service

Joint Research Centre

### JRC Mission

As the science and knowledge service of the European Commission, the Joint Research Centre's mission is to support EU policies with independent evidence throughout the whole policy cycle.



**EU Science Hub**

[ec.europa.eu/jrc](https://ec.europa.eu/jrc)



@EU\_ScienceHub



EU Science Hub – Joint Research Centre



EU Science, Research and Innovation



EU Science Hub



Publications Office  
of the European Union

doi:10.2760/034905

ISBN 978-92-79-85251-0