



# Radioactive Waste Management in the European Union

## State of play and strategic prospects

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*FISA 2022 / EURADWASTE '22, Lyon, 1 June 2022*

## Summary

- Secondary Euratom legislation and radioactive waste management policies
  - Implementation
  - Reporting cycle
- Safety aspects
- Financial aspects
- In-depth and prospective studies
  - National inventories
  - Radioactive waste classification schemes
  - Cost assessment
  - Risk profile of funds
  - Key Performance Indicators

# Radioactive waste directives

**Council Directive 2011/70/Euratom** establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste

**Council Directive 2006/117/Euratom** on the supervision and control of shipments of radioactive waste and spent fuel



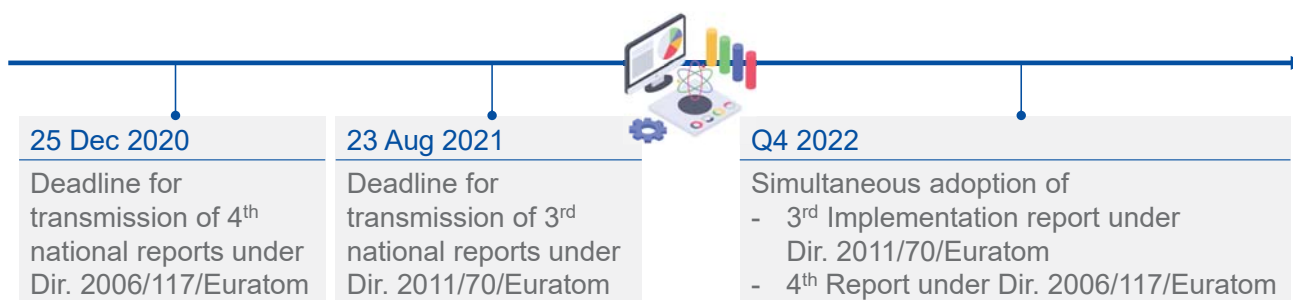
## Responsible & Safe Management of SPENT FUEL and RADIOACTIVE WASTE

A unique regional binding legislation aiming at ensuring safety in the backend of nuclear life-cycle without undue burden to future generations and with the necessary public information and participation

HOW DID WE GET THERE?



# Progress Reports



## Past reports

COM(2019) 632 <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=COM:2019:0632:FIN>

SWD(2019) 435 <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52019SC0435>

SWD(2019) 436 <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52019SC0436>

COM(2019) 633 <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52019DC0633>



# Advisory groups



# Safety aspects

## activities of ENSREG Working Group 2

- Working topics



National Programmes  
**Key Performance Indicators**



Defining starting point and  
end state of  
**decommissioning**



Review of regulation and  
management of  
radioactive waste arising  
from **non-energy uses**

<https://www.ensreg.eu/safe-management-spent-fuel-and-radioactive-waste/categorisation-radioactive-waste>

# Financial aspects of the nuclear backend

## the NuBaFA expert group working plan for 2022-2023

- Commission Decision C(2021) 2109
- DRAFT** Work Programme 2022-2023



Cost estimates &  
their uncertainties



Radioactive waste from  
non-power uses



Risk profile of funds

- 2<sup>nd</sup> Meeting – 8 June 2022, Luxembourg

<https://ec.europa.eu/transparency/expert-groups-register/screen/expert-groups/consult?lang=en&groupID=3777>

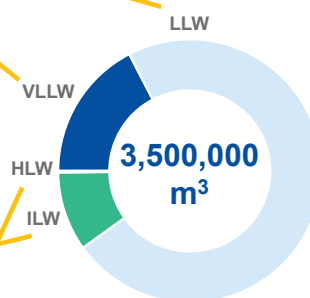
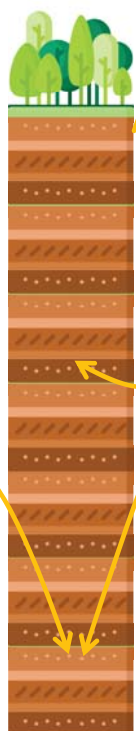
# In-depth and prospective studies

## INVENTORY



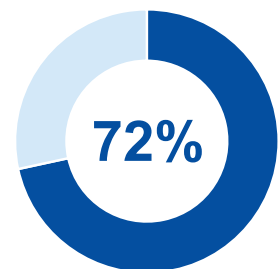
### Stored spent fuel

Very-Low-Level and Low-Level can be disposed of in surface facilities.



### Total amount

Largest amount of waste is Very-Low-Level and Low-Level (>90%); High-Level waste is 0.2% in volume.



### Waste disposed of

Very-Low-Level and Low-Level can be disposed of in surface facilities. Increased by 1.7% in the period 2013-2016.

# National inventories

## “Benchmarking analysis of member states approaches to definition of national inventories radioactive waste and spent fuel”

- Requirement: Council Directive 2011/70/Euratom, **Article 12.1.(c)**
- Focus areas:
  - **Approaches and methods**
  - **Classification systems and inventory data**
  - **Development of current inventories**
  - **Future estimates**
- **14** findings
- **2** recommendations

Source:

European Commission, Directorate-General for Energy, Benchmarking analysis of member states approaches to definition of national inventories radioactive waste and spent fuel, Publications Office, 2020, <https://data.europa.eu/doi/10.2833/460048>  
ISBN 978-92-76-27383-7



# Radioactive waste classification schemes

## “Study on radioactive waste classification schemes in the European Union”

- **TASK 1** Gap Analysis Commission Recommendation SEC(1999) 1302
- **TASK 2** Coherence in the use of IAEA General Safety Guide on Classification of Radioactive Waste
- **TASK 3a** Characterisation and classification systems - WAC
- **TASK 3b** Analysis of correlation and dependence of WAC and national strategies
- **TASK 4** Survey: Awareness of the public about radioactive waste classification schemes
- **TASK 5** Survey: Barriers to cross-border cooperation
- **TASK 6** Synthesis in view of a recommended European radioactive waste classification scheme

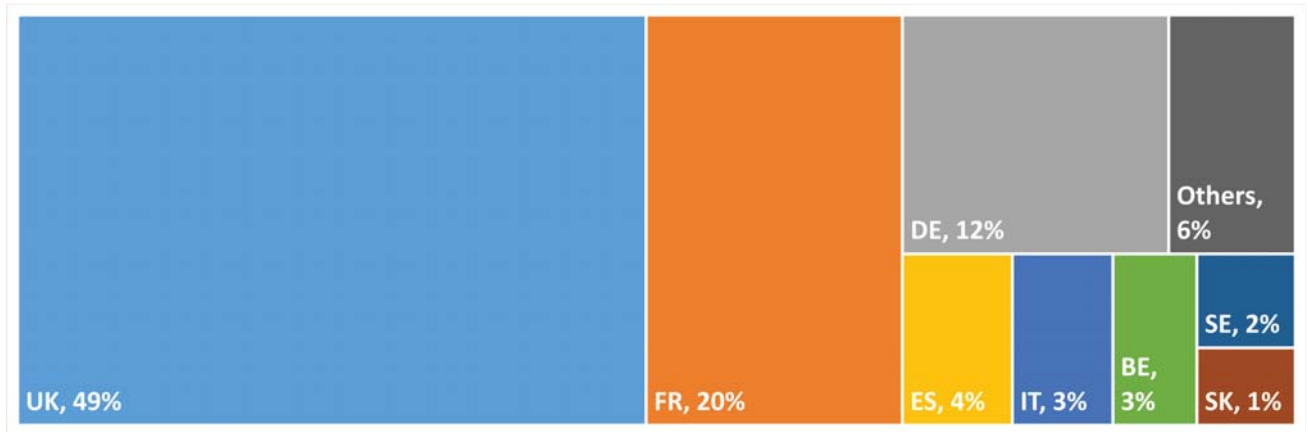
Source:

European Commission, Directorate-General for Energy  
Study to be completed



# COSTS

- European Commission estimate ranges from EUR 422 to EUR 566 billion.



Reference date December 2016; data for 28 Member States of the European Union



## Cost assessment

### “Methodologies of cost assessment for radioactive waste and spent fuel management”

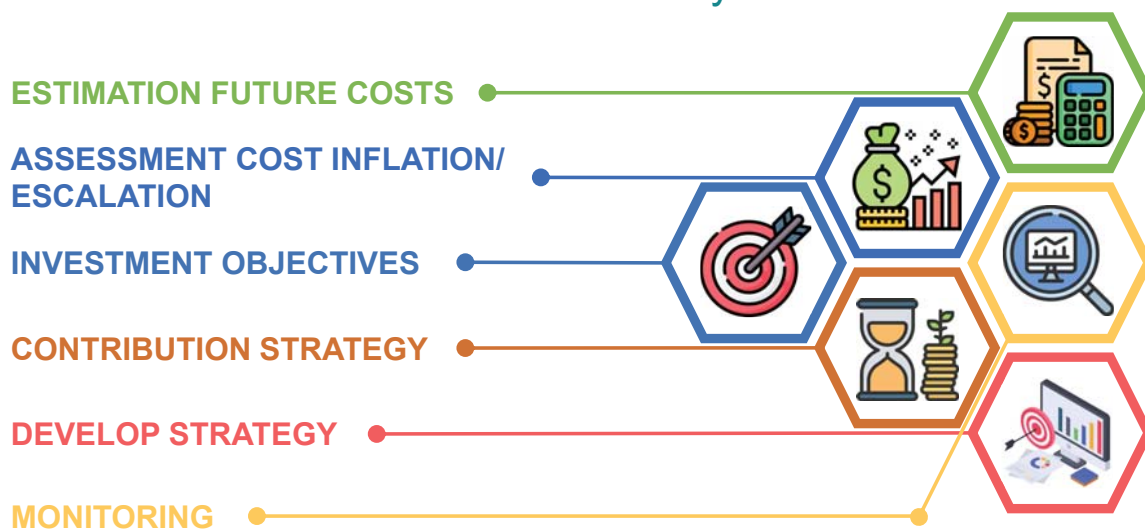
- Requirement: Council Directive 2011/70/Euratom, **Article 12.1.(h)**
- Focus areas:
  - **Governance** of cost assessment processes – good practices in cost calculation, review and frequency
  - **Methodologies** for cost calculation – good practices for proper cost calculation
  - **Key parameters** in cost calculation
  - **High-level taxonomy** – how to build a reference list of activities and cost items relating to radioactive waste and spent fuel management
  - **Cost Assessment Indicators** – what meaningful cost assessments indicators could be developed for radioactive waste and spent fuel management

Source:  
European Commission, Directorate-General for Energy, Methodologies of cost assessment for radioactive waste and spent fuel management : an overview of the practices adopted in the EU, Publications Office, 2020, <https://data.europa.eu/doi/10.2833/476584>  
ISBN 978-92-76-27086-7



# Risk profile of funds

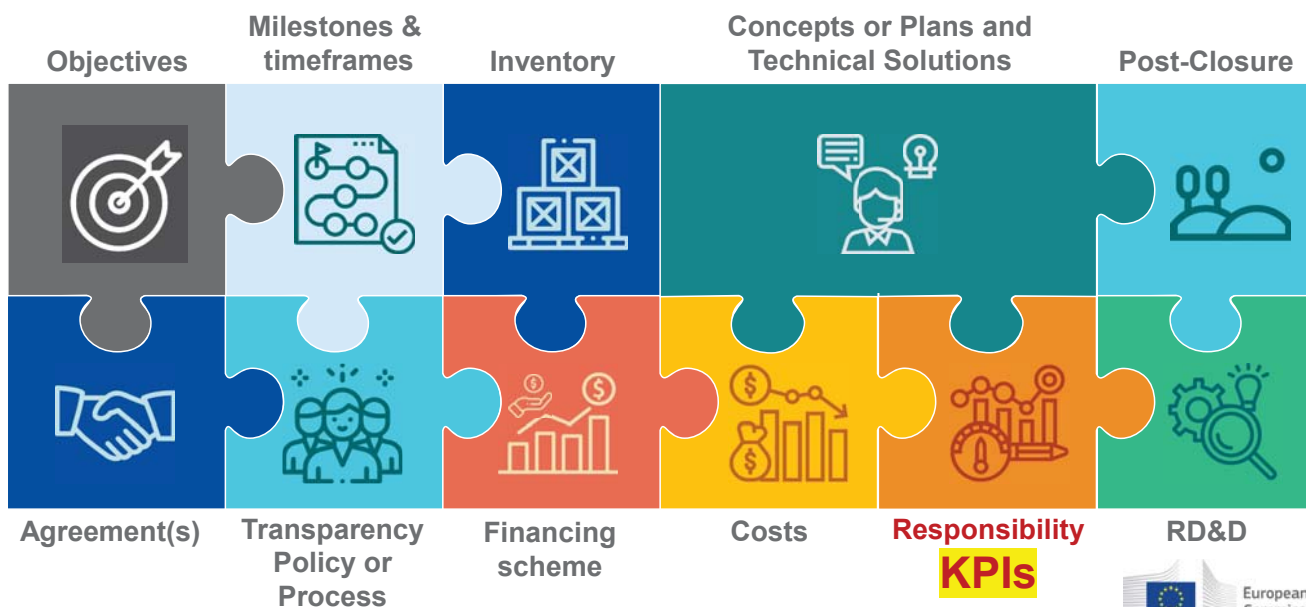
“Study on the risk profile of the funds allocated to finance the back-end activities of the nuclear fuel cycle in the EU”



Source: European Commission, Directorate-General for Energy, Briedyte, A., Lau, J., Bauer, G., et al., Study on the risk profile of the funds allocated to finance the back-end activities of the nuclear fuel cycle in the EU, Publications Office, 2019, <https://data.europa.eu/doi/10.2833/882170> ISBN 978-92-76-08713-7



# NATIONAL PROGRAMMES





# Key Performance Indicators

“Study on Key Performance Indicators for monitoring implementation of national programmes on safe and long-term management of spent fuel and radioactive waste”

- **Directive 2011/70/Euratom, Article 12.1(g)**

*The national programmes shall set out how the Member States intend to implement their national policies referred to in Article 4 for the responsible and safe management of spent fuel and radioactive waste to secure the aims of this Directive, and shall include [...]*

*(g) the responsibility for the implementation of the national programme and **the key performance indicators to monitor progress towards implementation**; [...]*



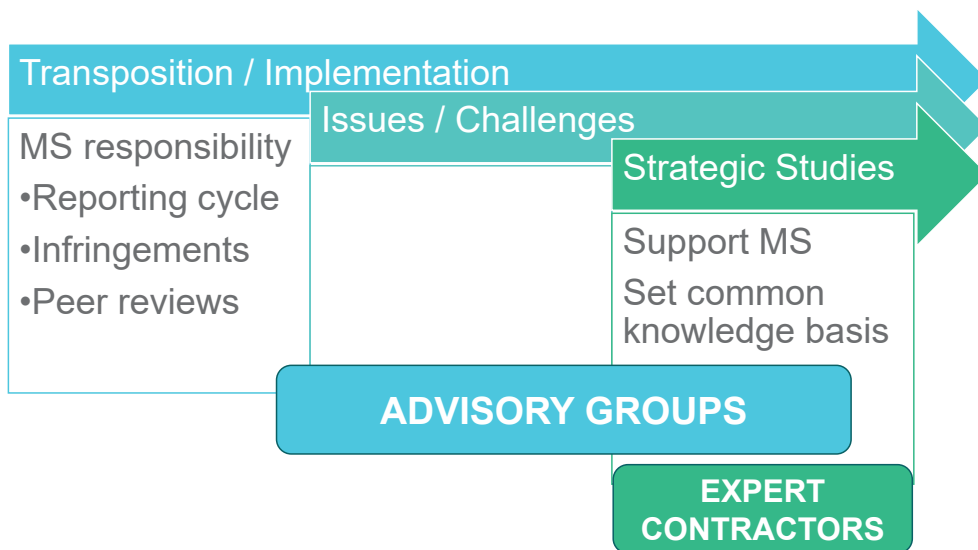
- **A working definition**  
**Tools for quantitatively measuring an organisation’s progress towards reaching their set goals and objectives, and to evaluate the need to initiate further steering actions**

Source:  
 European Commission, Directorate-General for Energy  
 Study under publication



# Conclusion

the overall system in one slide



**SAFE AND RESPONSIBLE  
 MANAGEMENT  
 OF SPENT FUEL  
 AND  
 RADIOACTIVE  
 WASTE**



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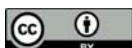
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# Thank you



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