



European  
Commission

**EU**  
**2016**



# European Commission perspective on Joint Programming

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## Why and What

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## WHY

Context

Euratom R&T programmes until FP7

Landscape starting Horizon 2020 (2014-18)

## WHAT

JP Principles and Euratom mandate and role

Scope and content of a JP

Objectives for Knowledge Management

Summary and conclusions



## Role:

- Develop research, disseminate knowledge, Article 2(a)
- Promote co-ordination of Member States' research, Article 4, 5
- Initiate joint financing of research programmes by MSs, Article 6(d)

## Fields of research (*for radioactive waste*), Annex I:

- Processing of radioactive material, Chap. IV
  - Concentration and storage of useless radioactive waste, §5
- Economic aspects of energy production, Chap. VIII
  - Technical and economic study of fuel cycles, § 2



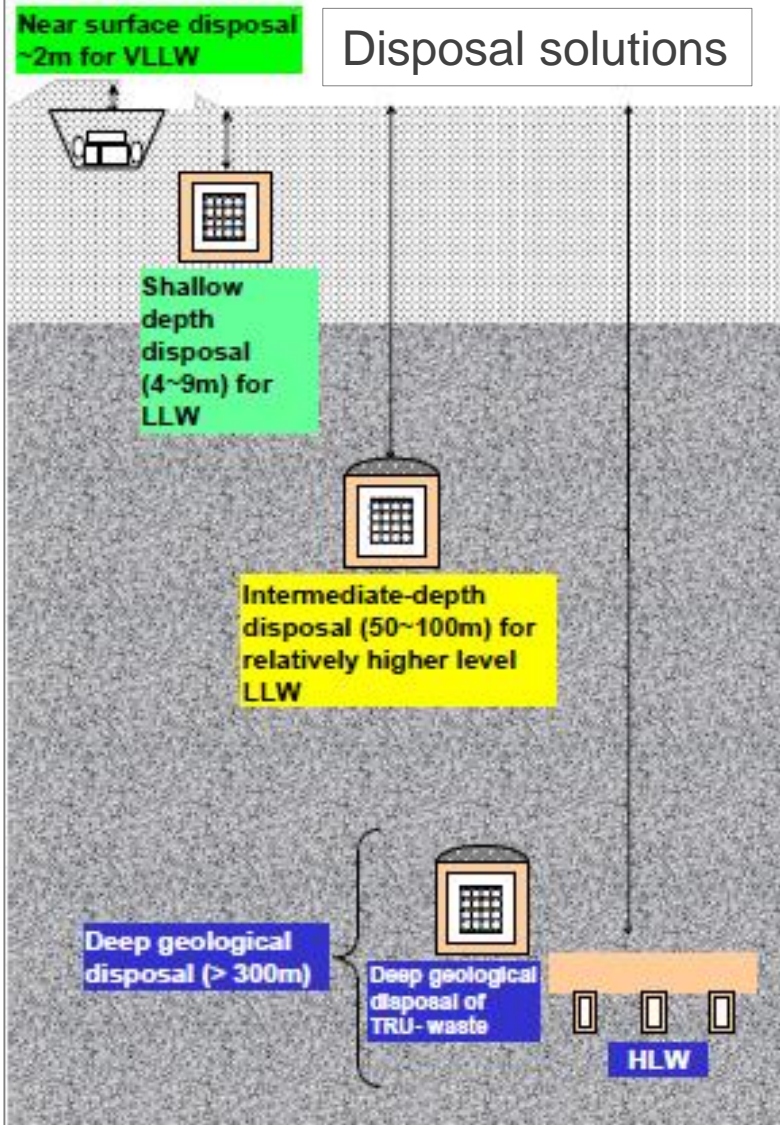
Member States shall implement national programmes including:

- Technical solutions for **spent fuel & radioactive waste management** from generation to disposal, Article 12.1(d)
- RD&D needed to implement solutions for the management of SF & RW, Article 12.1(f)
- E&T and R&D needed to obtain, maintain and further develop expertise and skills..., Article 8  
*in recitals, IGD-TP mentioned as key source of expertise*

# Scope of Euratom R&T programme: RWM



Predisposal (whole spectrum of RWM activities and waste categories)



*Knowledge Management for the dissemination of technical knowledge between programmes, communities and generations*

# Euratom R&T programmes until FP7



1975

## RWM

all waste categories and solutions

- Fundamental knowl.ge
  - Treatment, Conditioning
  - Site characterisation
  - Disposal
- near surface & GD

## Objective

- .Process understanding
- .Waste managt methods
- .Modelling tools

1998/2002

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## GD

HLW + SF and geological disposal only

- Focussed science
  
- Disposal: GD
- Govern. public accep.
- Education & Training

## Objective

- .Imp.ve knowl.ge & tools
- .Remaining key aspects
- .Demonstrate techn.gies
- .Impl.tion-oriented res.
- .Integ.tion around WMOs

2014

# Landscape for Euratom prog. (2014-18) (1/4)



- WMOs of advanced-programmes : effective coop.tion in IGD-TP on implementation-oriented RD&D & remaining aspects for GD
- But only 2 participations of eastern WMOs in IGD-TP Executive Group



**IGD-TP  
Executive Group members**



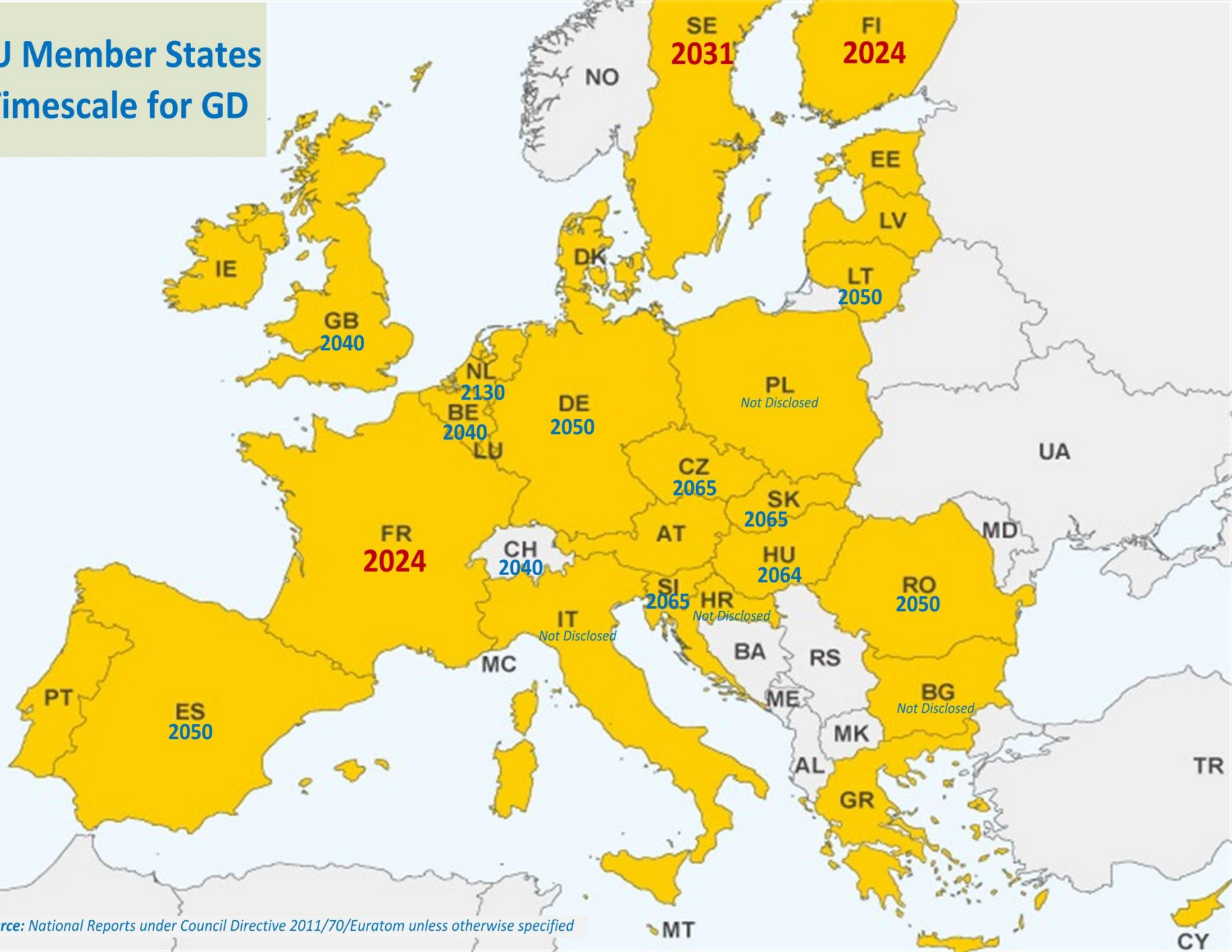


# Landscape for Euratom prog. (2014-18) (2/4)



- WMOs of advanced-programmes : effective coop.tion in IGD-TP on implementation-oriented RD&D & remaining aspects for GD
- But only 2 participations of eastern WMOs in IGD-TP Executive Group
- and gaps between programmes in preparation & timescale for GD implementation,
- in the needs of the programmes:
  - IGD-TP SRA adequately covers the needs from the more advanced countries but not the lesser advanced countries (SecIGD2 project, deliverable D1.7, 2015)*
- and some programmes have other priorities than HLW & SF

# EU Member States Timescale for GD



Source: National Reports under Council Directive 2011/70/Euratom unless otherwise specified

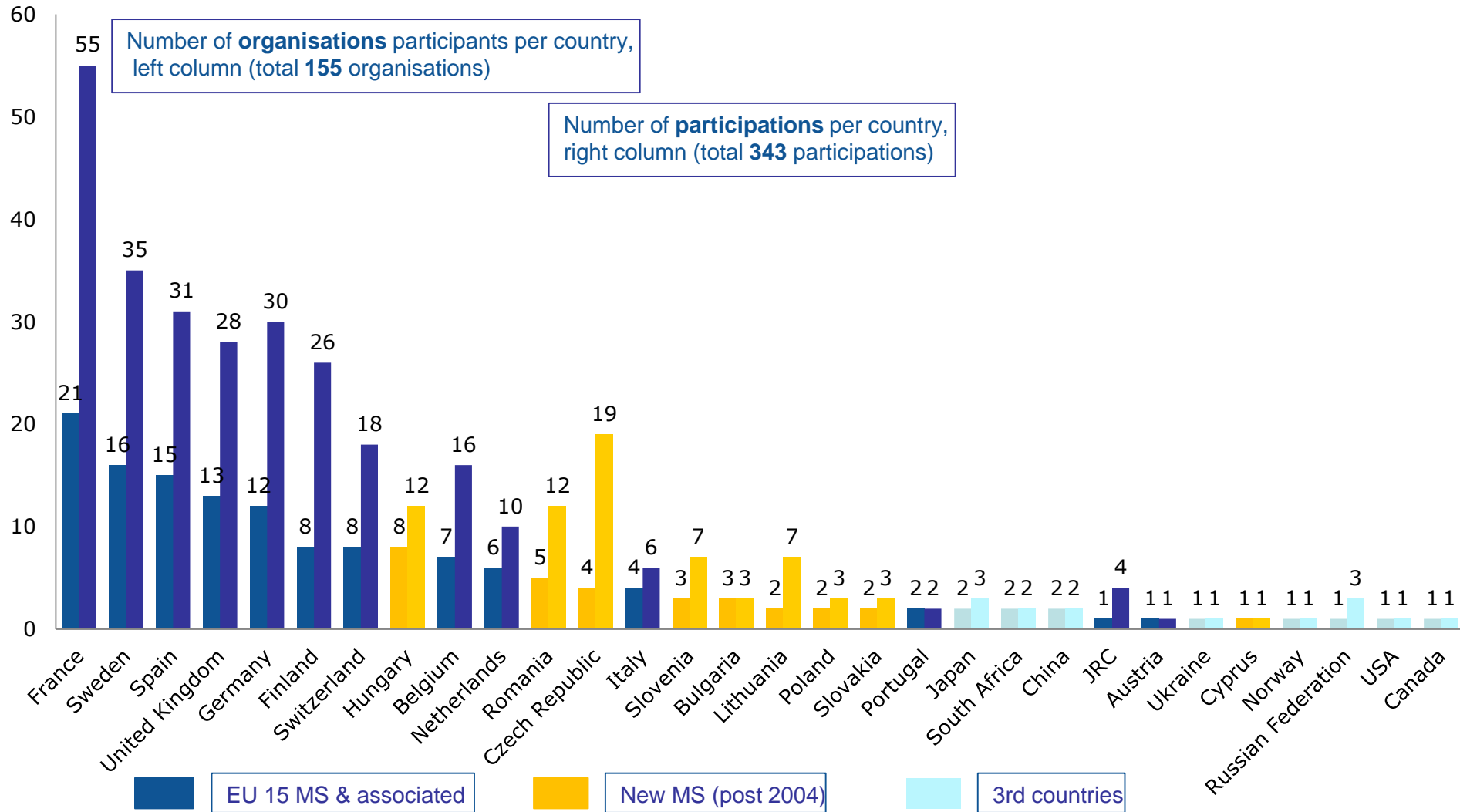
# Landscape for Euratom prog. (2014-18) (3/4)



- WMOs of advanced-programmes : effective coop.tion in IGD-TP on implementation-oriented RD&D & remaining aspects for GD
- But only 2 participations of eastern WMOs in IGD-TP Executive Group
- and gaps between programmes in preparation & timescale for GD implementation,
- in the needs of the programmes:
  - IGD-TP SRA adequately covers the needs from the more advanced countries but not the lesser advanced countries (SecIGD2 project, deliverable D1.7, 2015)*
- and some programmes have other priorities than HLW & SF
- and gaps in level of participation in FP7

# Level of participation

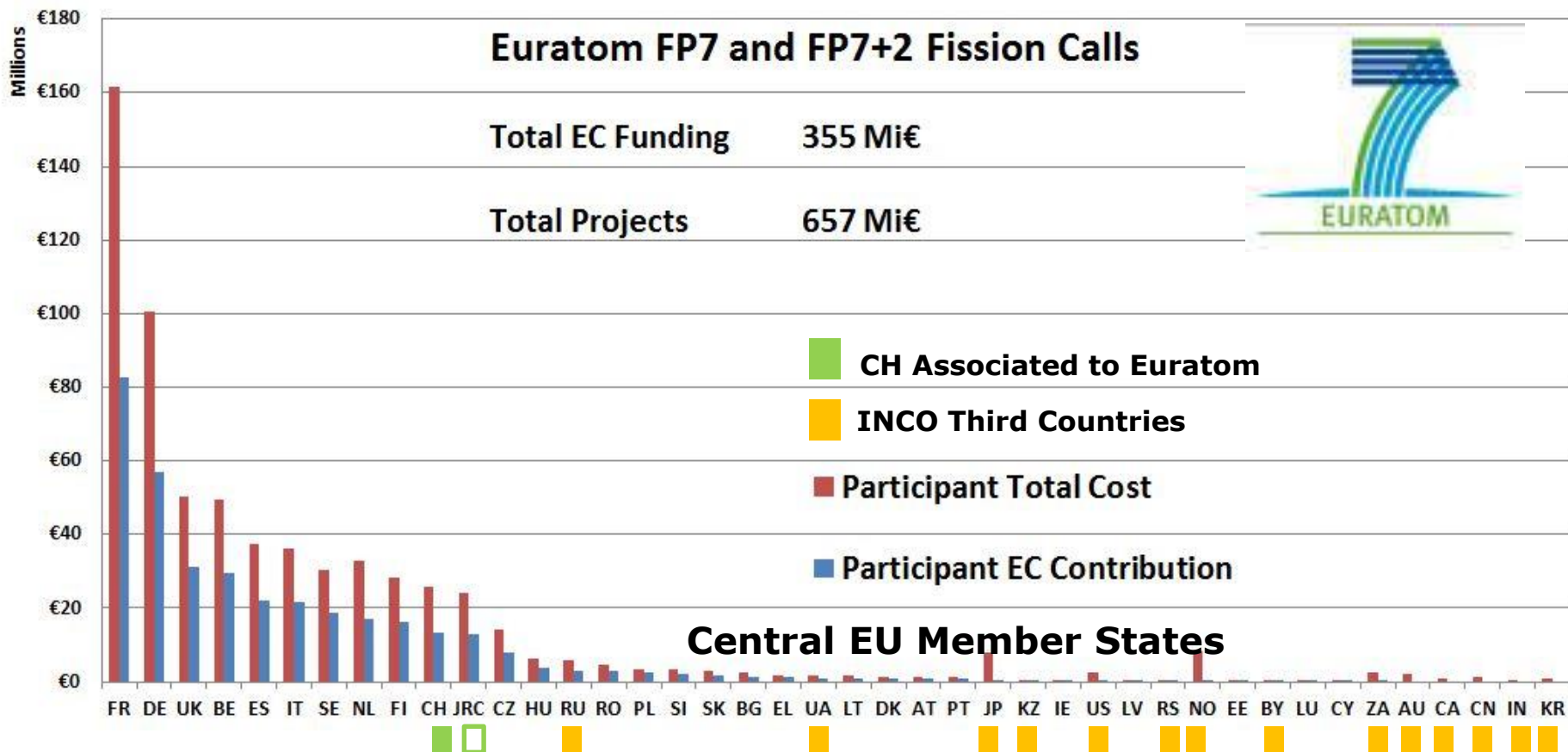
FP7



## Euratom FP7 and FP7+2 Fission Calls

Total EC Funding 355 Mi€

Total Projects 657 Mi€



**A total of 136 FP7 grants**



- Expertise & coordination for regulatory support needed
- Directive 2011 suggests to perform long-term science-oriented research
- Commission's key role for management and dissemination of knowledge (Knowledge Management) serving all programmes:
  - i.e. Document knowledge on science, technologies, methods, programme organisation, strategies etc..
  - For use in existing and future programmes
  - To train new staff and transfer to new generations,
  - To transfer between programmes





JP Principles and Euratom mandate and role  
Scope and content of a JP  
Objectives for Knowledge Management

# JP Principles and Euratom mandate and role (1/2)



Key principles for Joint Programming is "integration" and "inclusiveness" of the research communities and of the needs of all programmes

The mandate of Euratom is to cover research for the whole radioactive waste management, from generation to disposal

A key role of Euratom is also to disseminate knowledge

# JP Principles and Euratom mandate and role (2/2)



A JP should carry its own vision and purpose at European Level beyond national programmes' interests

Issue of allowing activities wider than implementation-oriented RD&D & remaining aspects for GD and preparing to manage research for after start of 1st repositories (topics, prog. implementation and governance)

Commission mandate however, to support excellent science and on common issues and views, not to redo or duplicate research within or between programmes, not either to assist individual programmes

# Scope and content of a JP in Euratom R&T



1975	1998/2002	2014		2018/20
<p style="text-align: center;"><b>RWM</b></p> <p style="text-align: center;">all waste categories and solutions</p> <ul style="list-style-type: none"> <li>- Fundamental knowl.ge</li> <li>- Treatment, Conditioning</li> <li>- Site Characterisation</li> <li>- Disposal</li> </ul> <p style="text-align: center;">near surface &amp; GD</p> <p style="text-align: center;">Objective</p> <ul style="list-style-type: none"> <li>.Process understanding</li> <li>.Waste managt methods</li> <li>.Modelling tools</li> </ul>	<p style="text-align: center;"><b>GD</b></p> <p style="text-align: center;">HLW + SF and geological disposal only</p> <ul style="list-style-type: none"> <li>- Focussed science</li> <li>- Disposal: GD</li> <li>- Govern. public accep.</li> <li>- Education &amp; Training</li> </ul> <p style="text-align: center;">Objective</p> <ul style="list-style-type: none"> <li>.Imp.ve knowl.ge &amp; tools</li> <li>.Remaining key aspects</li> <li>.Demonstrate techn.gies</li> <li>.Impl.tion-oriented res.</li> <li>.Integ.tion around WMOs</li> </ul>			<p style="text-align: center;"><b>RWM</b></p> <p style="text-align: center;">all waste categories + Pre and Disposal</p> <ul style="list-style-type: none"> <li>- Impl.tion-oriented &amp; optimisation</li> <li>- Regulatory-oriented</li> <li>- Long-term science &amp; innovation</li> <li>- Civil society contribution to progr.</li> <li>- Integrated Knowledge Management, Training &amp; Dissemination</li> </ul>

# Objectives for Knowledge Management in Joint Programming



To produce handbooks on science supporting the Safety Case

To prepare guidance documents for research programmes

To carry-out strategic studies in support of programme implementation

To prepare a portfolio and deliver training courses based on the products of the JP research, the KM activities and complementary needs

To coordinate and implement the dissemination activities of the JP, its technical projects and KM actions

An implementing committee is probably needed to establish list of domains, topics and prioritise activities for short and long-term use, for less- and advanced- programmes and along the JP timeframe and beyond

# Objectives for Knowledge Management in Joint Programming



Starting points are

*The Guidance for less-advanced Programmes in RD&D Planning Towards Geological Disposal of Radioactive Waste, (SecIGD2 project, deliverable D2.3, 2015)*

3. Programme activities and RD&D tasks (up to construction).....	24
3.1 Inventory.....	26
3.2 Cost.....	26
3.3 Waste treatment and storage.....	27
3.4 Implementation strategy.....	28
3.5 Generic safety case development.....	28
3.6 Competence development.....	29
3.7 Stakeholder engagement strategy.....	30
3.8 Site characterisation.....	31
3.9 Post-closure safety assessment tools / models / methodology.....	31
3.10 Environmental impacts and socio-economic effects.....	32
3.11 Operational safety and practicability.....	33
3.12 Data management and preservation of records.....	33



## 2. Processes

- **1. Radiation**
- **2. Thermal**
- **3. Mechanical**
- **4. Chemical**
  - 1. Homogeneous and heterogeneous chemical thermodynamics
  - ...
  - 5. redox processes
  - 6. Colloids and particles
  - 7. Gases
- **5. Geochemical and Biogeochemical Processes**
- **6. Mass transfer**
- **7. Process coupling**

## 3. Waste

- **1. Origins, types and classification (nuclear cycles..)**
- **2. Nuclide inventories and evolution**
- **3. Waste products and confinement matrices**
  - 1. Glass
  - 2. Spent Fuel
  - 3. Novel matrices
  - 4. Cement waste forms
  - 5. Bitumen

## 4. Barrier materials

- **1. Container**
- **2. Bentonite clay materials**
- **3. Cement**
- **4. Multimaterials interaction (near-field processes)**

## 5. Geology

- **2. Descriptive geology of the rock types**
- **3. Mineralogy**
- **4. Properties and functions (thermal, mechanical, hydraulic, chemical, transport)**

Wiki structure as example for text/handbook development

The international FEP list of OECD/NEA can also be used

# Summary and conclusions



- ✓ The rationale for a continued Euratom R&T programme beyond Horizon 2020 focussed mainly on implementation-oriented RD&D & remaining aspects for GD may not be sufficient once the 1<sup>st</sup> repositories will start
- ✓ Other needs of panEuropean interest are emerging as highlighted inter-alia by the Waste Directive 2011:
  - Gaps between programmes in preparation & timescale for implementation of technical solutions for SF & RWM from generation to disposal
  - Need for expertise & coordination for regulatory support
  - Need for long-term science-oriented research & innovation and Knowledge management over many decades
  - Increased inclusion of Civil Society concerns in research programmes
- ✓ A Joint Programme of R&T activities on RWM is the probably the best tool available to pool resources on research and knowledge management and to meet the needs of all without redoing, duplicating and to justify continued Euratom support.



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***THANK YOU FOR YOUR ATTENTION***