Evaluation of RWM strategies for the disposal of waste bearing naturally occurring long-lived radionuclides

Zoe McGrath & Kelvin Browning

EURAD-2: Astra Sub-Task 5.3. An evaluation of international learning on the life-cycle management of challenging waste types such as: Radium, Thorium, Uranium (Ra/Th/U) and Depleted Uranium (DU).

Background

Ra/Th/U/DU have been identified as challenging waste types. Limited information is available on how to manage the full lifecycle of these across different Large Inventory Member States (LIMS) and Small Inventory Member States (SIMS). A questionnaire was produced and distributed to collect information from 18 different countries (21 submissions) to understand their methodologies and approaches to radioactive waste management (RWM). Allowing for information sharing between the participating countries.

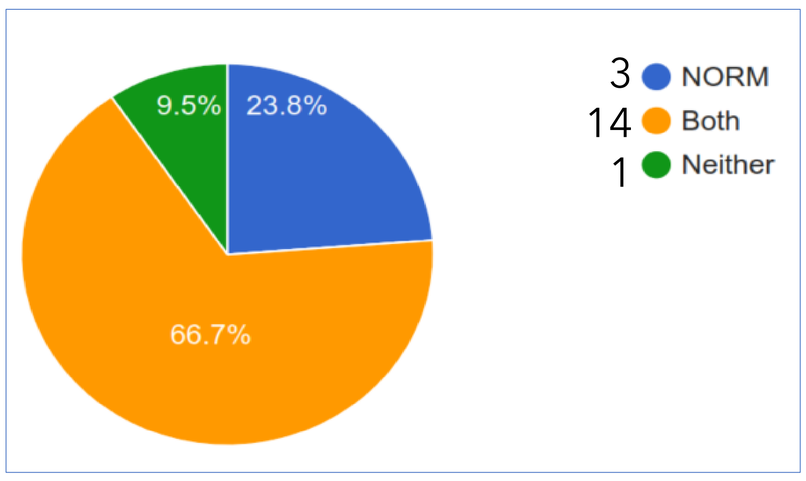
Questionnaire

29 questions, including the following categories:

- Inventory and Management and Treatment
- Reuse and Recylcing options
- Disposal Solutions
- Safety Case and Long-term Safety

Results were collected and analysed. Linking similarities and differences, as well as highlighting knowledge gaps. Results have been consolidated in a full report together with an evaluation of the recieved information.

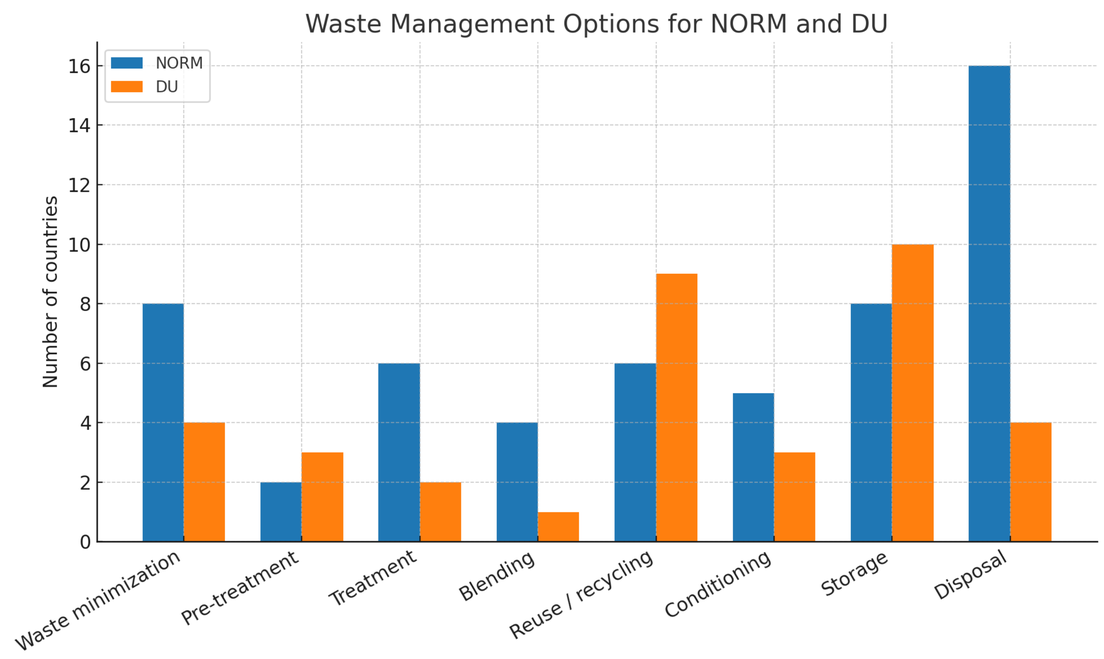
Inventory Management



‘**NORM waste**’ described as radioactive waste containing natural radionuclides, which exceed specific exemption limit criteria.

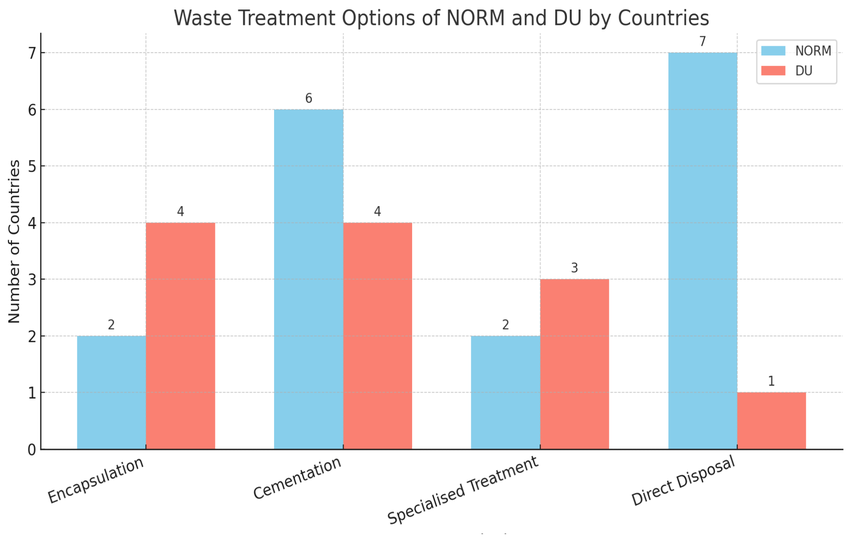
‘DU waste’ is often not described as a ‘waste’ type, but as a material that can be reused, or a resource. Generally, it is described as a safeguard material.

Management Options



Waste Treatment Options

Results showed information gaps on the details regarding the waste treatment options implemented and the methodologies used.



Reuse & Recycling

No Reuse/ Recycling	Austria, Bulgaria, Denmark, Estonia, Norway, Poland, Portugal, South Korea
Limited Information or Specific Example	Czech Republic, Greece, Slovenia, Switzerland, Ukraine
Active / Developed Options	France, Germany, Netherlands, The United Kingdom

Specific link found: Czech Republic (issue) and Ukraine (solution) for decontamination of metal pipes for scrap metal disposal

Final Disposal

Disposal Program Current or Selected			
Country	Yes	No	In Development
Austria		NORM	
Bulgaria		NORM, DU	
Czech Republic	NORM	DU	
Denmark		NORM	NORM
Estonia			NORM
France	NORM	DU	
Germany			NORM, DU
Greece		NORM, DU	
Netherlands	NORM		DU
Norway	NORM	DU	
Poland		NORM, DU	
Portugal		NORM, DU	
Slovenia	NORM		DU
South Korea	NORM, DU		
Switzerland	NORM, DU		
Ukraine		DU	NORM
United Kingdom	NORM		DU

Those in ‘pink’ have no selected methodology, nor in development

Conclusions

Waste Management Options: Waste minimisation not a challenge; conditioning (e.g., cementation) is common or planned, more information-sharing on processes and technologies is needed.

Reuse & Recycling: Countries face varied challenges; international collaboration and further R&D could enable viable reuse/recycling strategies and reduce disposal volumes.

Treatment Options: Most countries only store waste; limited treatment methods exist. More research and knowledge exchange are needed to close information gaps on treatment practices.

Disposal Programs: Eight countries have NORM disposal routes (Near Surface/Engineered Landfils) DU disposal is rare. Sharing on decision-making processes and selection criteria is recommended.

Disposal Challenges: Main issues are logistics, costs/assessments, and volume/timelines; stronger collaboration is needed to address these.

Safety Case: Many countries have NORM safety cases; DU cases are still developing. More information should be collected on safety case development and approaches

For more information

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