

Management of radioactive waste from decommissioning



During decommissioning, radioactive materials and objects contaminated with radioactivity – from protective clothing to parts of a reactor – are characterized and sorted to ensure waste prevention and waste minimization, reuse and recycling.

Radioactive materials and objects are subject to regulatory control. However, most of the material resulting from decommissioning is cleared from regulatory control, owing to its very low level of radioactivity.

Radioactive materials not suitable for recycling are sorted and packaged for temporary storage before disposal in purpose-built facilities – the final step in the management of radioactive waste.

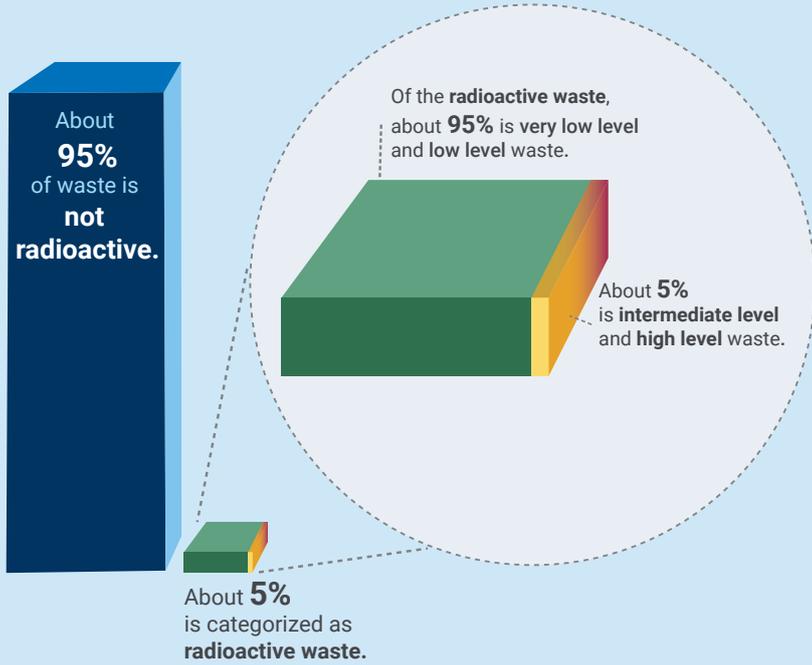
The waste hierarchy



A priority is to minimize the generation of radioactive waste.

The waste hierarchy, a key element in the implementation of sustainable decommissioning and waste management, sets the priority for managing waste. By taking decommissioning into account during the design phase of a nuclear facility, the creation of waste is prevented and minimized.

Amounts of waste from decommissioning



The range of waste resulting from decommissioning varies widely in terms of quantity and radioactivity. About 5% of the material resulting from decommissioning a nuclear power plant is radioactive at levels that mean it must be managed as radioactive waste (see classification below).



Classes and types of radioactive waste

The classification of radioactive waste may vary from country to country.

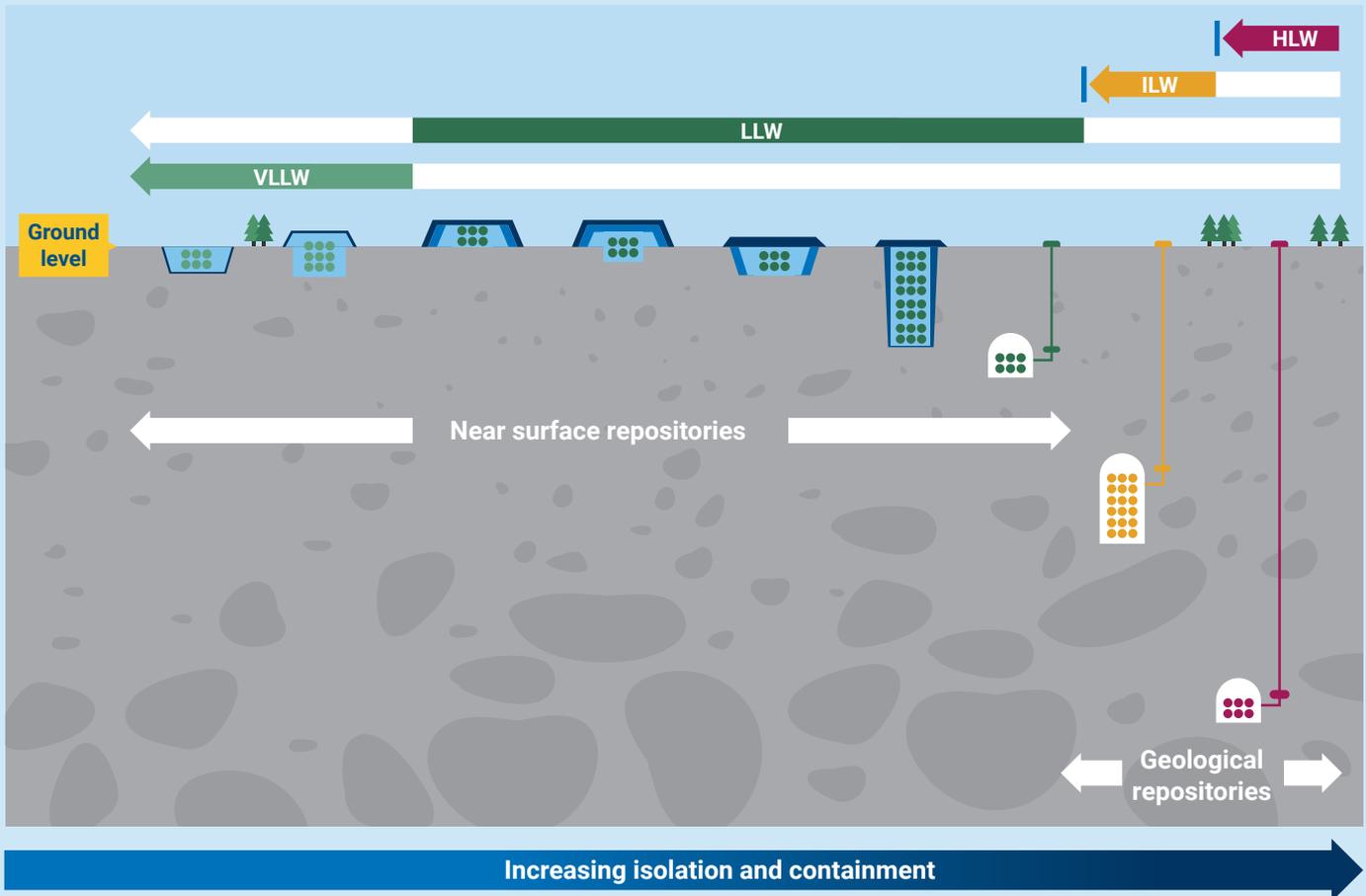
VLLW	LLW	ILW	HLW
<p>Very low level waste Concrete, soil, rubble...</p>	<p>Low level waste Personal protective equipment, wipes, auxiliary systems for decontaminating and dismantling structures...</p>	<p>Intermediate level waste Reactor primary circuit components, highly contaminated metals...</p>	<p>High level waste Spent fuel, spent fuel cladding hulls, vitrified waste from reprocessing...</p>
<p>Suitable for disposal in near surface landfills.</p>	<p>Suitable for disposal in near surface facilities; requires isolation and containment for up to several hundred years.</p>	<p>Suitable for disposal at greater depths in geological repositories; requires isolation and containment for several thousand years.</p>	<p>Suitable for disposal in deep geological formations several hundred metres below the surface; requires isolation and containment for several thousand years.</p>

Disposal facilities for radioactive waste provide isolation and containment based on multiple barriers and safety functions.

Reuse and recycling of materials cleared from regulatory control



Disposal options based on the class of radioactive waste



How is radioactive waste safely managed?



With multiple layers of protection, the public and the environment are safe from hazards and risks arising from the use of ionizing radiation — including from radioactive waste.



Access is strictly controlled to the sites where radioactive waste is managed.



Radioactive waste is managed by qualified and experienced personnel.



In accordance with strict procedures, the safety of radioactive waste management is the prime responsibility of the operator and is overseen by independent regulators.



Regulatory authorization of waste management facilities and activities is based on a safety case and detailed safety assessments.

There have been several decades of research, development and demonstration of the **safe disposal of radioactive waste**.



How does the safe management of radioactive waste contribute to the UN Sustainable Development Goals (SDGs)?



- ▲ Safe management of radioactive waste, environmental releases, decommissioning and remediation protects life on land and life below water.
- ▲ Safe management of radioactive waste, environmental releases, decommissioning and remediation contributes to recycling and reuse of materials, objects and sites.
- ▲ Nuclear technologies are sustainable when safe throughout their lifetime including safe management of radioactive waste, environmental releases and decommissioning.
- ▲ Sustainable use of nuclear technologies contributes directly to nine SDGs.