

■ The safe management of radioactive waste



The safe and efficient management of radioactive waste has always been, and will always be, a defining objective for the nuclear industry. The search for ever safer and more efficient ways of managing it, fuelled by the overriding aim of protecting human health and the environment, is a never-ending one. The nuclear community will continue to harness all its expertise, experience and energy to ensure that its excellent safety record for managing waste is maintained and that waste is managed safely and efficiently for generations to come.

Every human activity generates waste. Whether industrial, scientific or medical, nuclear activities are no exception to the rule. Some of the waste produced is inevitably radioactive.



The yearly production of industrial waste in the EU is 1 billion m³; toxic industrial waste is approx. 10 million m³; total radioactive waste is 50,000 m³; and highly active radioactive waste is 500 m³ (source: OECD-NEA, 2003).

Around 50,000 m³ of radioactive waste are produced per year in the EU. This is equal to 90 cm³ per person per year, compared with 100 kg per person per year of toxic waste (pesticide residues, heavy metals, asbestos and contaminated hospital wastes...).

The expected volume of radioactive waste that will be produced in the future is decreasing as a result of improved waste practices and new reactor design.

Once it has been properly conditioned radioactive waste is stored in specially designed storage or disposal facilities. As the conditioned waste is inert, there is insignificant risk to human health or the environment.

Low and intermediate level waste accounts for 99% of the total amount of radioactive waste. This waste includes protective shoe covers and clothing, cleaning materials like rags and mops, reactor water



Entrance to the ONKALO research facility in Finland

treatment residues, filters, resins, valves, plastic film and fabrics, etc. A large part of this category of waste results from the decommissioning of nuclear power reactors.



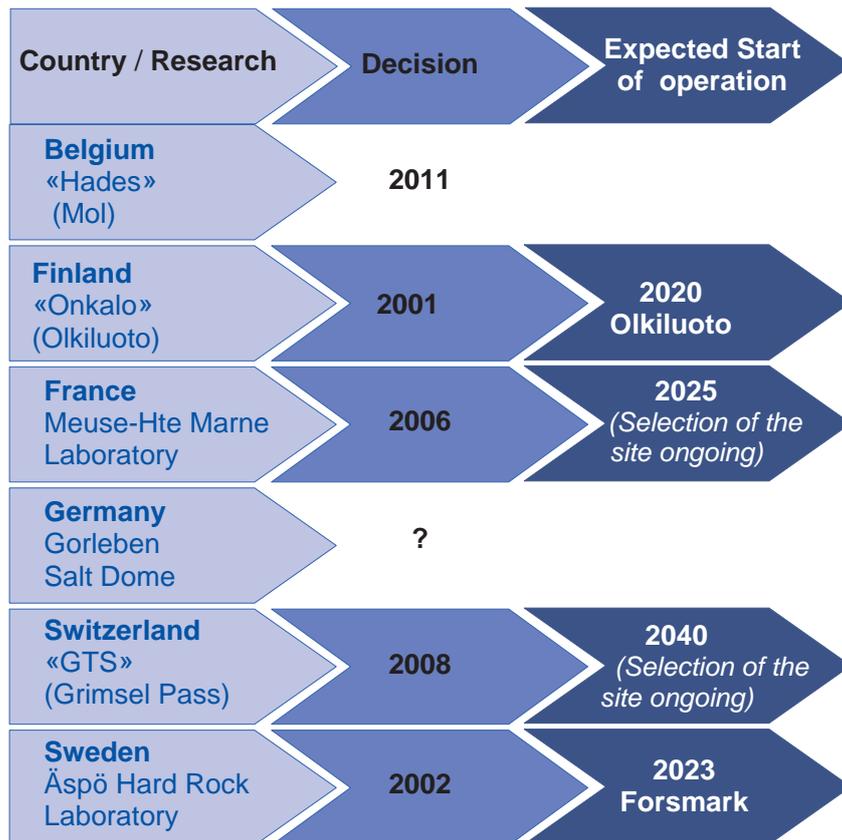
High-level waste (HLW) results either from unusable radioactive materials contained in spent fuel from nuclear power plants and research reactors, or from spent fuel reprocessing. It has to be contained until its level of radioactivity drops to that found in the natural environment. This category of waste accounts for only 1% of total amount of radioactive waste, but represents 96% of the radioactivity.

For HLW, there is broad consensus that deep geological disposal is the best applicable technical solution. Finland, Sweden, Switzerland and France have taken the political decision to assess the deep geological disposal option and are close to authorizing the construction and starting up of sites.

Other countries are actively considering this option.

Final HLW disposal activities in Europe

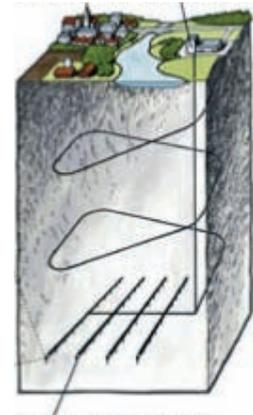
The following chart illustrates where the safe and efficient management of HLW is already taking place in Europe:



What does a repository look like?

A repository system consists of a series of disposal cells excavated in the rock formation. These disposal cells are grouped into large sets and the waste packages are placed inside. The sets are connected by galleries, which are accessible via a network of corridors. These corridors are connected to the surface by shafts.

Surface portion of deep repository



Underground portion of deep repository

Solutions exist

Radioactive waste remains a primary concern for citizens. Recent public opinions polls have shown that support for nuclear energy would be even greater than it already is if the public was reassured that the waste is being handled safely. But common misconceptions persist about the feasibility of managing radioactive waste safely. It is important to emphasise that options for managing radioactive safely already exist, and to stress that research into perfecting management techniques is ongoing.

The nuclear community has a responsibility to encourage an open and transparent debate on waste management. Knowledge empowers citizens and encourages decision-makers to show the political will needed to drive forward a common EU-wide legislative framework that will govern the future of radioactive waste management.



Tests and experiments at the ASPÖ underground laboratory (Sweden)