

2025 UK Radioactive Waste and Materials Inventory: summary report



Foreword



Every nuclear programme carries a responsibility that extends far beyond the lifetime of the facilities that generate nuclear energy: to understand, manage and ultimately dispose of radioactive waste safely, securely and transparently.

It is Nuclear Waste Services' job to deliver the safe disposal of radioactive waste and help to ensure the UK has a credible, permanent "end point" for its most hazardous materials.

The UK Radioactive Waste and Materials Inventory (UKRWI) is published every three years, is the UK's official national record of radioactive waste and materials, and supports the country's international reporting obligations. It provides a detailed snapshot of more than 1,200 individual waste streams, capturing not only what exists today, but also what we expect to arise in the future. It records radioactive materials

that are not currently classed as waste but which could one day become so if no further use is found. Taken together, this makes the UKRWI one of the most comprehensive datasets of its kind in the world.

The Inventory underpins the UK's long-term strategy for safely running its nuclear facilities and cleaning up some of the country's most complex historic sites. It provides the evidence base that allows Nuclear Waste Services, government, regulators and industry to make informed decisions: from how waste is packaged and treated today at the Low Level Waste Repository (LLWR), to the design of the future Geological Disposal Facility (GDF), which must safely contain the UK's most hazardous radioactive wastes for generations to come.

For Nuclear Waste Services, stewardship of the Inventory is central to our mission. It supports safe, secure and cost-effective decommissioning across the UK's nuclear estate, where accurate, up-to-date waste information is essential to applying the Waste Hierarchy and planning appropriate storage, treatment and disposal routes.

This brochure summarises some of the key statistics and lesser known facts behind the Inventory data. These figures represent decades of operational history, innovation and ongoing clean up and they also point to the scale of the challenge ahead. By making this information widely available, we aim to support informed discussion about how the UK manages radioactive waste now and in the future.



I encourage you to explore the full set of Inventory reports to understand how the dataset supports long-term safety, environmental protection and responsible decision-making on behalf of current and future generations.

John Corderoy
Chief Technical Officer,
Nuclear Waste Services



Nuclear Waste
Services

Welcome to
LLW Repository

T 019467 70200
www.nuclearwasteservices.uk

Part of the NDA group



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What is the UK Radioactive Waste Inventory?

The UK Radioactive Waste and Materials Inventory lists the radioactive waste and materials that exist in the UK at a specific point in time. It also forecasts how that's likely to develop, and includes information on radioactive materials that might be classed as waste in the future.

The Inventory has been going for over 40 years. It keeps track of radioactive waste in the UK and we update it every three years. The 2025 edition shows what the situation was in the UK on 1 April 2025 (called the 'stock date').

Interested in the full Inventory?

This is a summary of the main details of the Inventory. To find out more, take a look at the (much more technical) 2025 UK Radioactive Waste Inventory.

Who is it for?

The Inventory is available to anyone interested in radioactive waste and materials. It's designed to provide this data in an open and transparent way.

Who uses the Inventory?

– Government departments & agencies

– Supply chain organisations

– Waste planners

– Researchers & academics

– Members of the public

Sources of nuclear waste



Industry



Power plants



Medical uses



Research



Defence



Reprocessing

Figure 1: Users of the Inventory

Where does radioactive waste in the UK come from?

The nuclear power industry

Most radioactive waste in the UK comes from activities linked to the nuclear power industry.

That includes waste from:

- manufacturing nuclear fuel
- running nuclear power stations
- decommissioning nuclear power stations
- reprocessing used nuclear fuel
- research and development (for example, developing reactor technology, testing fuels and materials, improving safety systems, and managing and treating waste)

Other sources

Outside the nuclear power industry, the other sources of radioactive waste are:

- **defence activities** like the UK's nuclear-powered submarine programme
- **medical uses of radioactivity like treatments for cancer**
- **industrial uses of radioactivity like industrial imaging that produce waste that has to be managed safely**



The white reactor dome at Sizewell B nuclear power station in Suffolk, UK

How we organise radioactive waste in the Inventory

We organise radioactive waste into 'waste streams'. Each stream is waste – or a group of waste items – produced by a specific site, usually linked to a particular facility or process within that site.

For example, we split radioactive waste from a single facility into waste streams based on characteristics such as composition, radioactivity, and management route.



500-litre drums for Intermediate Level Waste

Why do we use waste streams?

Each waste stream includes details about the waste's composition, volume, mass and radioactivity. Recording waste in this way lets us capture consistent information for every site and process.

It also means we can build up a detailed national picture using clearly defined data from across the country.

How many waste streams are there?

The 2025 Inventory contains **1,280 waste streams** at sites across the UK.

Managing that many separate sources of radioactive waste is complex, which is why we record detailed information about each stream.

Where is the waste now?

1,280
waste streams¹

-  Spent fuel reprocessing
-  Nuclear power reactors
-  Nuclear energy R&D
-  Defence
-  Fuel fabrication & uranium enrichment
-  Medical & industrial
-  Waste disposal facility
-  New build

1. A waste stream includes waste or a collection of waste items at a particular site, usually in a particular facility and/or from a particular process or operation.



Figure 2: Waste streams and site locations across the UK

Categorising waste

We group the total reported volume of waste into four categories:

- High Level Waste (HLW)
- Intermediate Level Waste (ILW)
- Low Level Waste (LLW)
- Very Low Level Waste (VLLW)

These categories reflect differences in how radioactive the waste is and how we handle, store and dispose of it safely.

- **High level waste** is small in volume but gives off very high levels of radiation. We store it safely in a way that shields the radiation and manages the heat it produces.
- **Intermediate level waste** gives off less radiation than high level waste. But it still needs to be stored in specially designed containers.

- **Low level waste** and **very low level waste** make up most of the total volume. They give off comparatively low levels of radiation. We can manage much of this waste using less complex storage and disposal arrangements.

The space the waste occupies matters, but the level of radiation it gives off plays a central role in deciding how we manage it safely.

The total reported volume is **4,470,000 m³ (cubic metres)***. See Figure 3, below, for a description of the four waste categories.

* Values shown are rounded up or down as appropriate throughout.

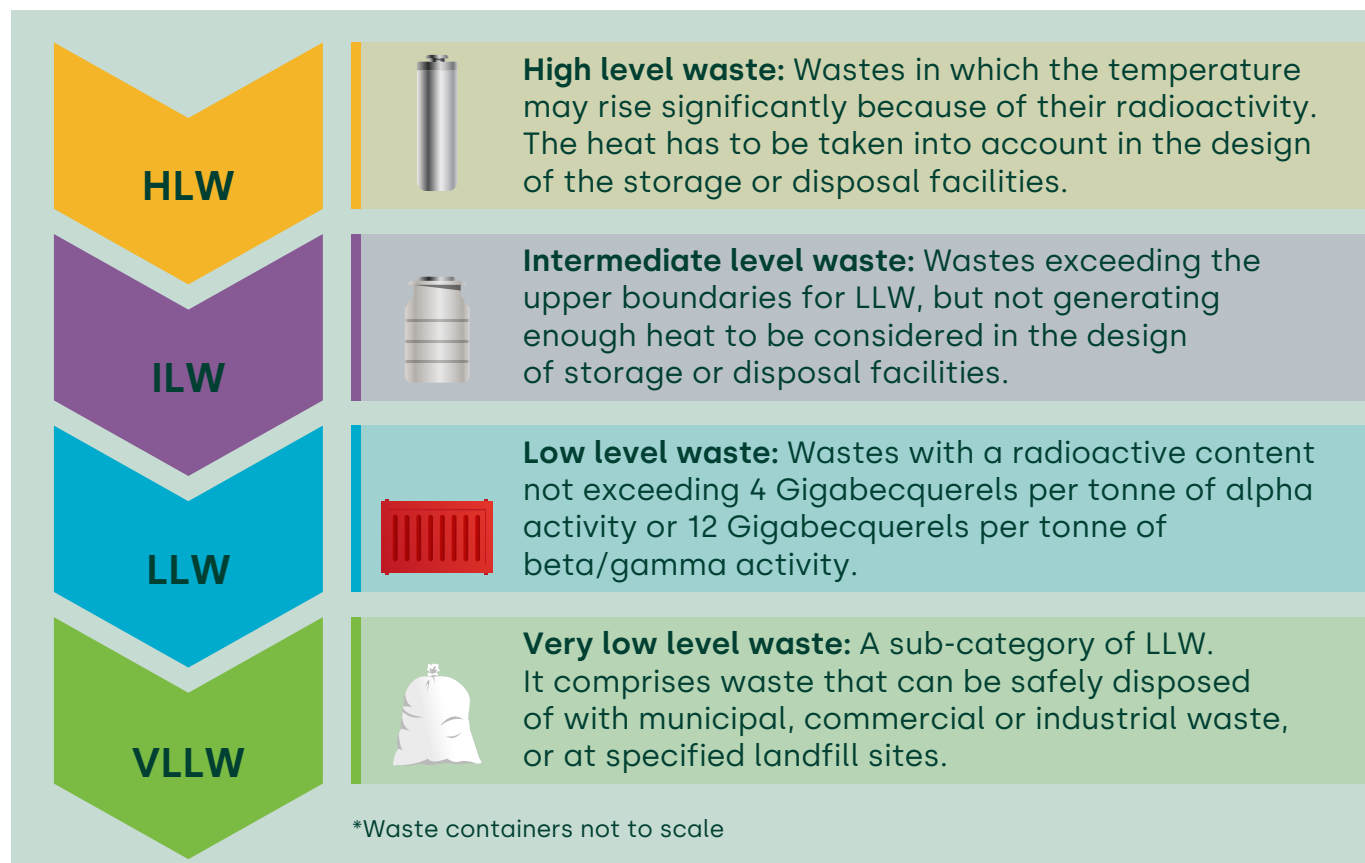


Figure 3: Categories of radioactive waste, defined



How much waste is there in the UK?

The 2025 Inventory lists how much radioactive waste existed in the UK on 1 April 2025. It also shows how much waste existing facilities and agreed programmes expect to generate after that date.

Nuclear Waste Services aims to deliver the most sustainable waste management solutions. We work with waste producers to support them in the preparation, planning, treatment, packaging, and disposal of radioactive waste.

Waste that existed on 1 April 2025

Sites across the UK held 174,000 m³ of radioactive waste on 1 April 2025.

Waste expected in future

Existing nuclear facilities and decommissioning programmes expect to generate a further 4,300,000 m³ over their remaining lifetimes.

The total

Together, the existing and expected volumes give a total reported volume of 4,470,000 m³.

This shows the overall scale of radioactive waste that the UK will have to manage as facilities continue operating and move through to decommissioning.

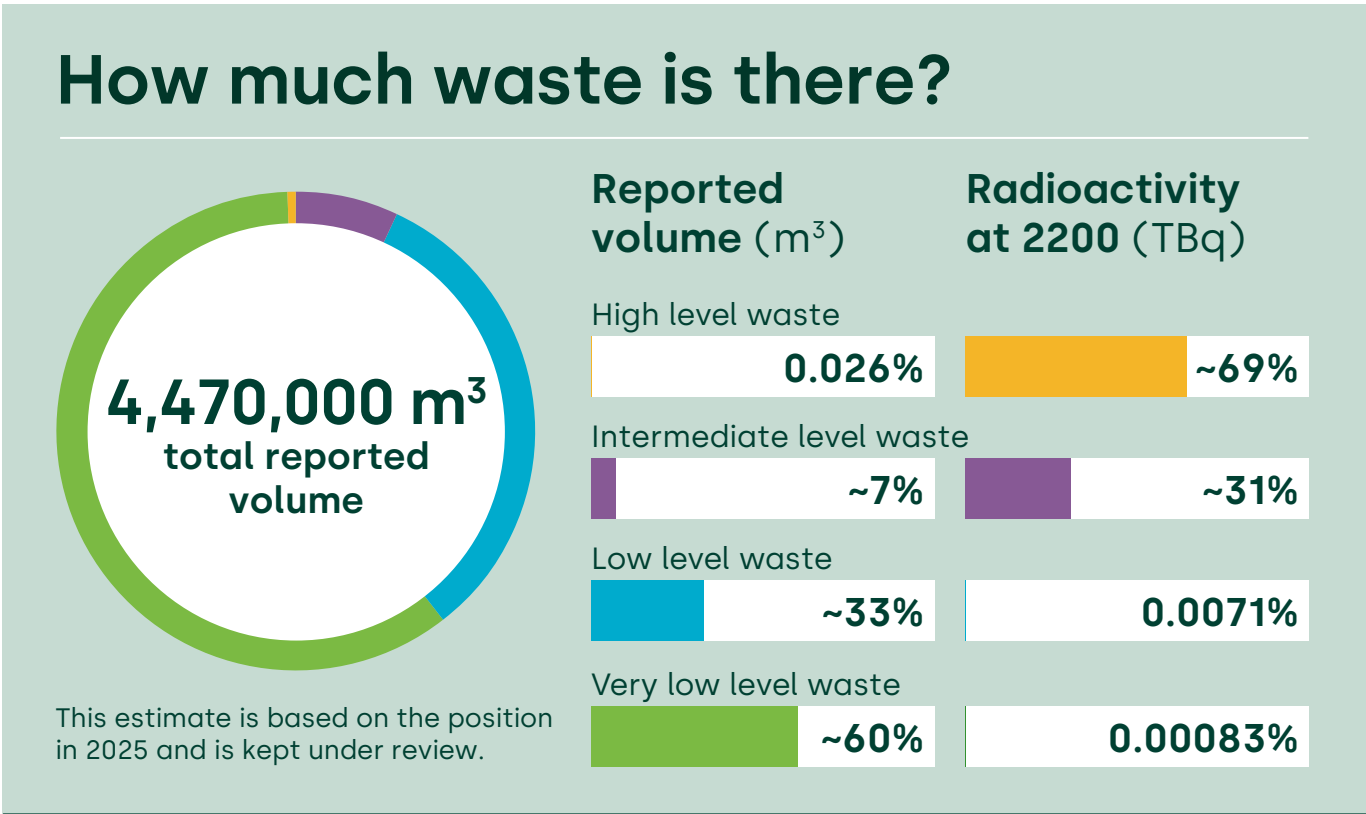


Figure 4: Reported volume and radioactivity of UK radioactive waste

How heavy is the waste?

The 2025 Inventory records approximately 4,880,000 t (tonnes) of radioactive waste. The total reported volume of the waste is 4,470,000 m³.

This total includes waste that existed on 1 April 2025 and waste that existing facilities and programmes expect to generate in future.

What's the difference?

The volume figure shows us how much space waste takes up. The mass shows how heavy it is. The two are linked, but they aren't the same.

Looking at weight as well as volume helps us understand the scale of the task. Volume affects storage capacity. Mass affects how we handle and transport waste, and design facilities to manage it safely.

What makes up that weight?

Much of it comes from construction and engineering materials used in nuclear facilities. These include concrete, metals and structural components.

These materials aren't unusual in themselves. They become radioactive waste when nuclear operations expose them to radiation or contaminate them during use.



500-litre radioactive waste drums

Radioactivity of UK waste

Volume and mass describe the scale of the waste. Radioactivity helps us decide on the level of shielding, containment and long-term management required.

How do we measure radioactivity?

It's measured in becquerels (Bq). One becquerel represents one radioactive decay per second. A terabecquerel (TBq) is one trillion decays per second.

Measuring long-term radioactivity

Radioactivity decreases over time, and different waste types decay at different rates. We calculate activity for the year 2200 so we can compare the long-term radioactivity of each waste type on the same date. This helps us plan how to safely handle, store, transport and dispose of the UK's radioactive waste.

In 2200, the total radioactivity across all waste types is estimated to be over **1,500,000 TBq**.

How radioactive is the waste?

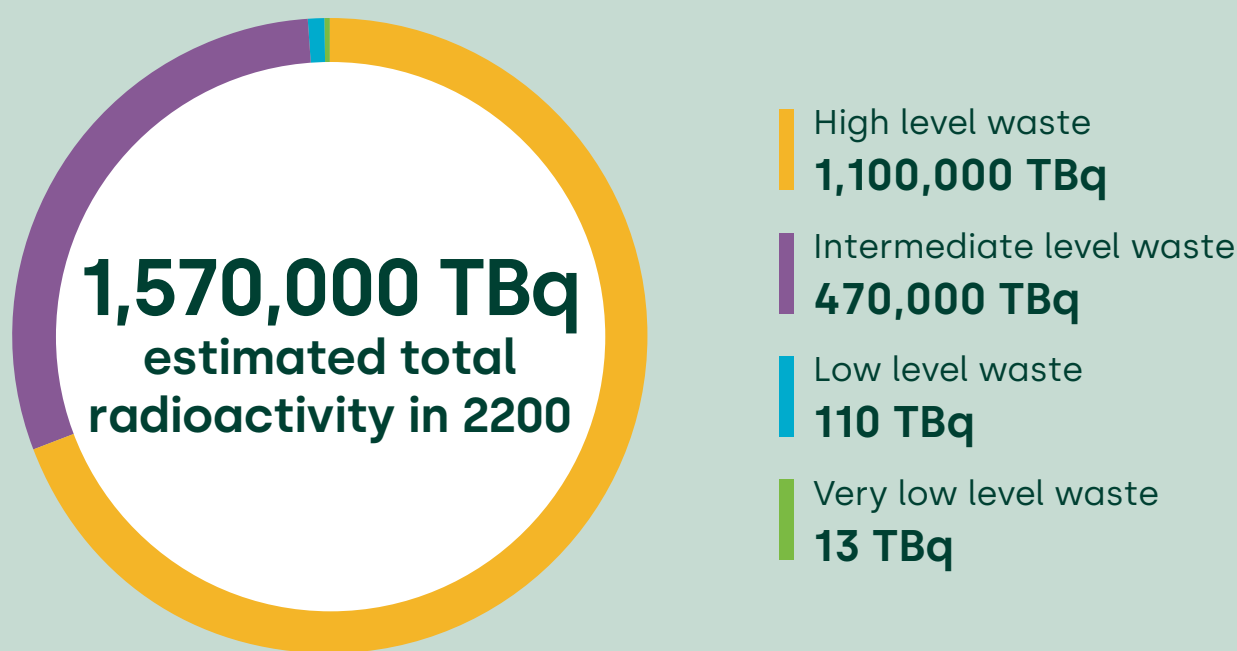


Figure 5: Total radioactivity across waste types

Volume and radioactivity: two different measures

The Inventory reports both volume and radioactivity because they describe different aspects of the UK's radioactive waste.

Volume shows how much space the waste takes up. Radioactivity shows how much radiation it gives off. Both influence how we manage the waste.

What the figures show

High level waste represents only a very small volume of the total, but it accounts for most of the total radioactivity.

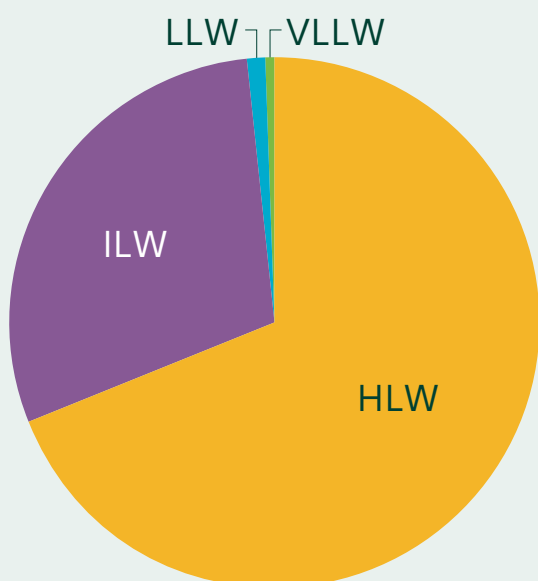
Low level and very low level waste make up most of the total volume, but are only a very small proportion of total radioactivity.

Why the difference matters

Volume affects how much space we need to store and dispose of the waste. Radioactivity affects how carefully we need to contain and manage it over the long term.

Radioactivity and volume compared

Radioactivity at 2200 (TBq)



Reported volume (m³)

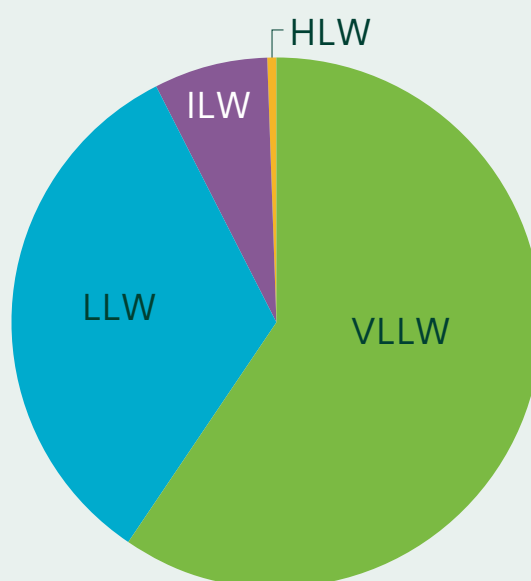


Figure 6: Different types of radioactive wastes by radioactivity (left) and volume (right)

What form does the waste take?

Radioactive waste doesn't all look the same. It comes from different activities and exists in many different forms.

The waste differs in:

- what it's made of
- how it behaves chemically
- how radioactive it is

Some waste is made up of dismantled reactor components and structural materials. Other waste includes contaminated soils, sludges or residues from industrial processes.

Why this matters

These differences affect how we package, store and treat each waste stream. We need to understand what the waste is made of and how it behaves before we can decide how to manage it safely.

How materials become radioactive waste

Most of the materials that make up radioactive waste are familiar. They become radioactive because nuclear operations expose them to radiation or contaminate them during use.

What is the waste made of?

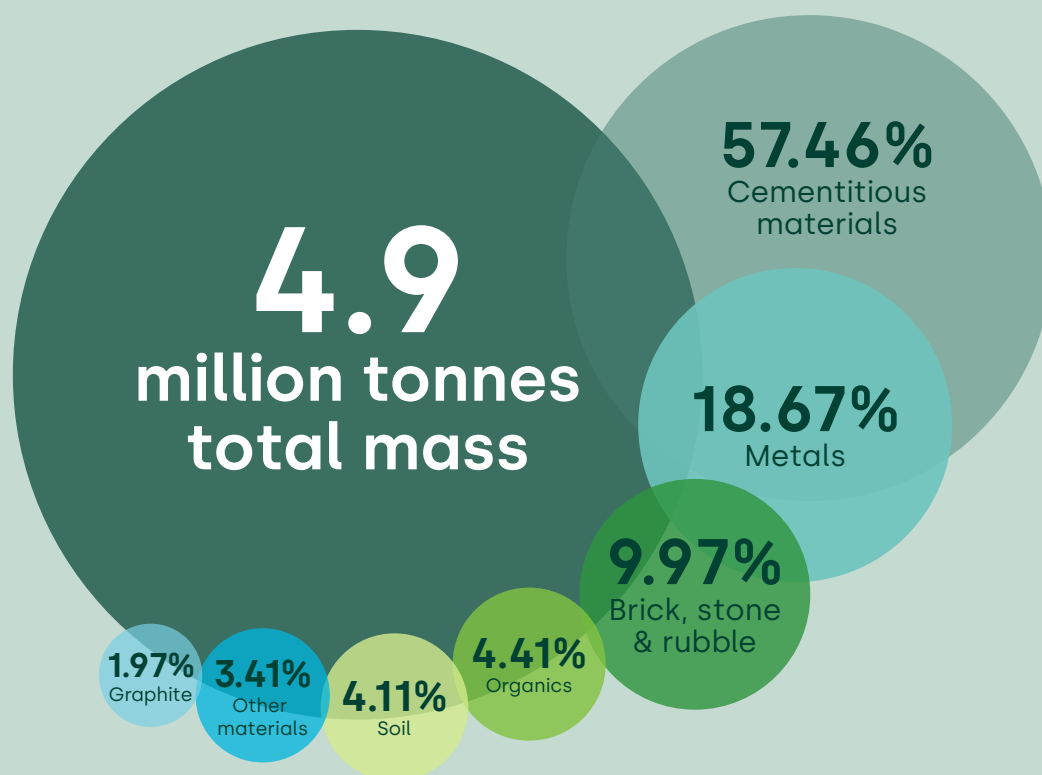


Figure 7: Material composition of UK radioactive waste



How we manage radioactive waste

The Inventory's data underpins how we manage radioactive waste in the UK. It gives us the information we need to decide how to handle different types of waste safely and effectively.

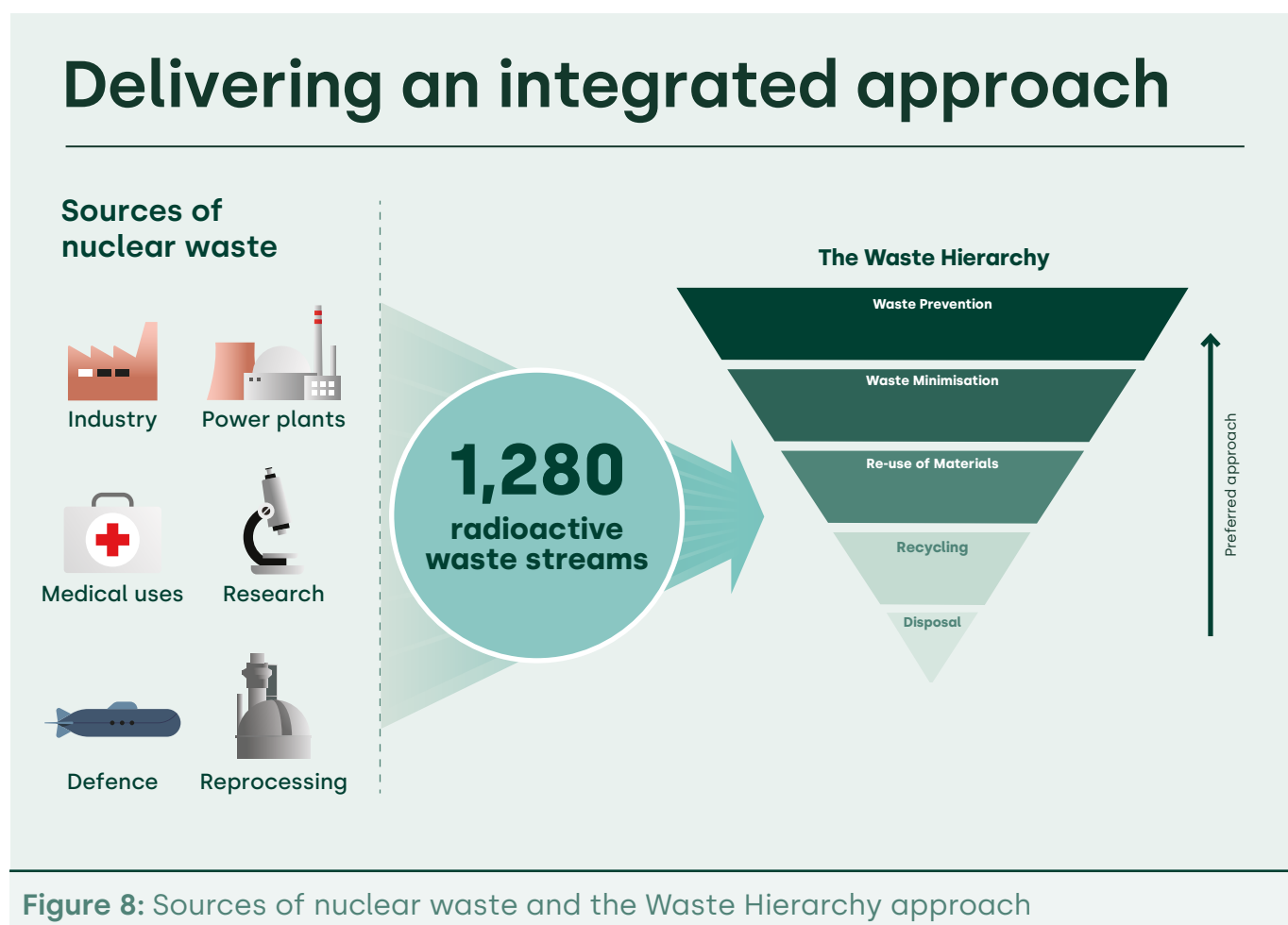
We then use this to develop an integrated approach. That means we look at all the available options then choose the most appropriate route for each type of waste.

How that approach works in practice

Where possible, and in order of preference, we:

- treat waste to reduce its volume
- re-use materials
- recycle materials
- dispose of waste at licensed facilities

Different wastes follow different management routes depending on their properties and levels of radiation.



The size of the task ahead

The 2025 Inventory shows the scale of the UK's radioactive waste challenge.

More than 4,000,000 m³ of radioactive waste still needs to be recovered and treated to complete the UK's decommissioning programme. Sites managed by the Nuclear Decommissioning Authority account for over 90% of the UK's expected waste volumes, showing that the challenge is concentrated in a small number of

complex locations rather than spread evenly across the country.

Waste management practice has also changed significantly. In 2009, the UK disposed of 95% of LLW at the LLWR in Cumbria and diverted 5% to other management routes like re-use and recycling. By 2024, we were disposing of 1% at the LLWR and diverting 99%. That shift reflects better treatment options and our focus on reducing and re-using waste wherever possible.

Disposal vs diversion

4 million m³

More than 4 million cubic metres of waste is still to be recovered and treated to complete the UK's decommissioning programme

95%

Almost 95% of the UK radioactive waste predicted volumes are generated by the NDA estate



2009



2024



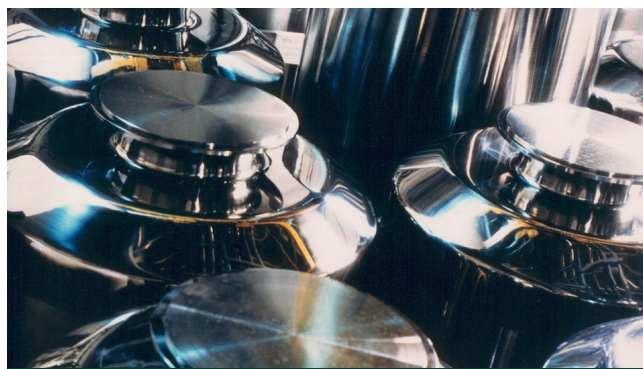
In 2009, 95% of low level waste was disposed of and 5% was diverted. This has been reversed, with 1% being disposed of and 99% being diverted in the 2024-2025 financial year¹.

1. Diversion and disposal percentages vary due to varying waste composition

Figure 9: Disposal and diversion percentages

Planning for long-term disposal

The Inventory doesn't just record volumes. It also informs long-term planning for how the UK will manage and dispose of its radioactive waste. The LLWR's long-term projects are all contributing to the final goal of capping the site. A GDF is recognised as the safe, secure, and long-term solution for the most hazardous radioactive waste in the UK.



High level waste containers



An illustrative example of a GDF

What the 2025 Inventory shows

The 2025 UK Radioactive Waste and Materials Inventory shows that:

- we know how much radioactive waste we have
- we understand how radioactive it is
- we know what it's made of
- we can forecast how much waste we'll need to manage in the future
- we can plan how to manage it effectively

By updating the Inventory every three years, we make sure that decisions about how to manage radioactive waste are based on current, consistent information.





Unit 2

Hinkley Point C - Building Britain's Energy Security

Where to find more information

You can find out more about NWS online or by contacting us directly.

About our organisation:
nuclearwasteservices.uk/about-us

You can subscribe for e-mail updates:
public.govdelivery.com/accounts/UKNDA/signup/42429

NWS Helpdesk



0300 369 0000



info@nuclearwasteservices.uk



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