

Urenco Nuclear Stewardship: Urenco's challenges in metallic waste



Providing **end of life-cycle** solutions to the nuclear industry

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About Urenco Nuclear Stewardship: part of the Urenco group



Enrichment
Services and fuel
cycle products



**Responsible
Nuclear
Stewardship**

U-Battery
Innovation in micro
modular reactor
technology



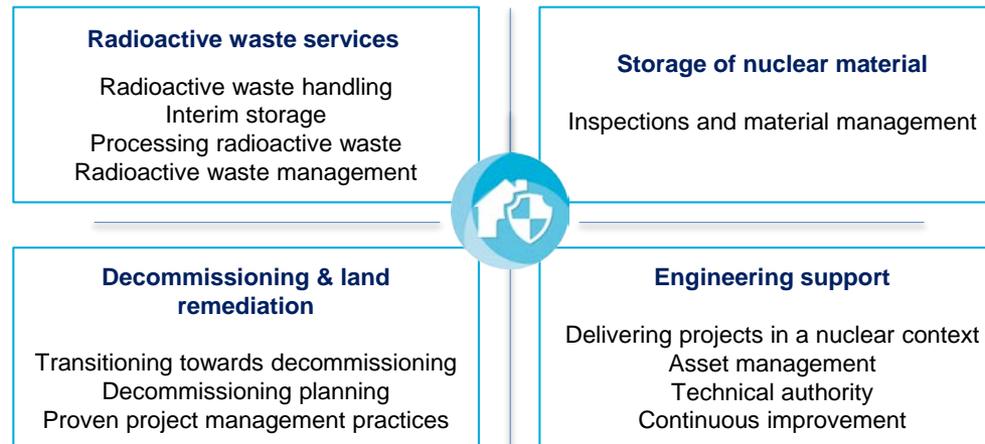
Stable Isotopes
Supporting key
medical and industrial
applications

Urenco Nuclear Stewardship has a leading role in providing responsible stewardship of nuclear materials through waste management, long term storage and decommissioning services.

We have delivered decommissioning and waste management scope for the Nuclear Decommissioning Authority across 21 projects at a cost of nearly £300m, 17% under budget.

We are the centralised waste management and decommissioning function for the Urenco group.

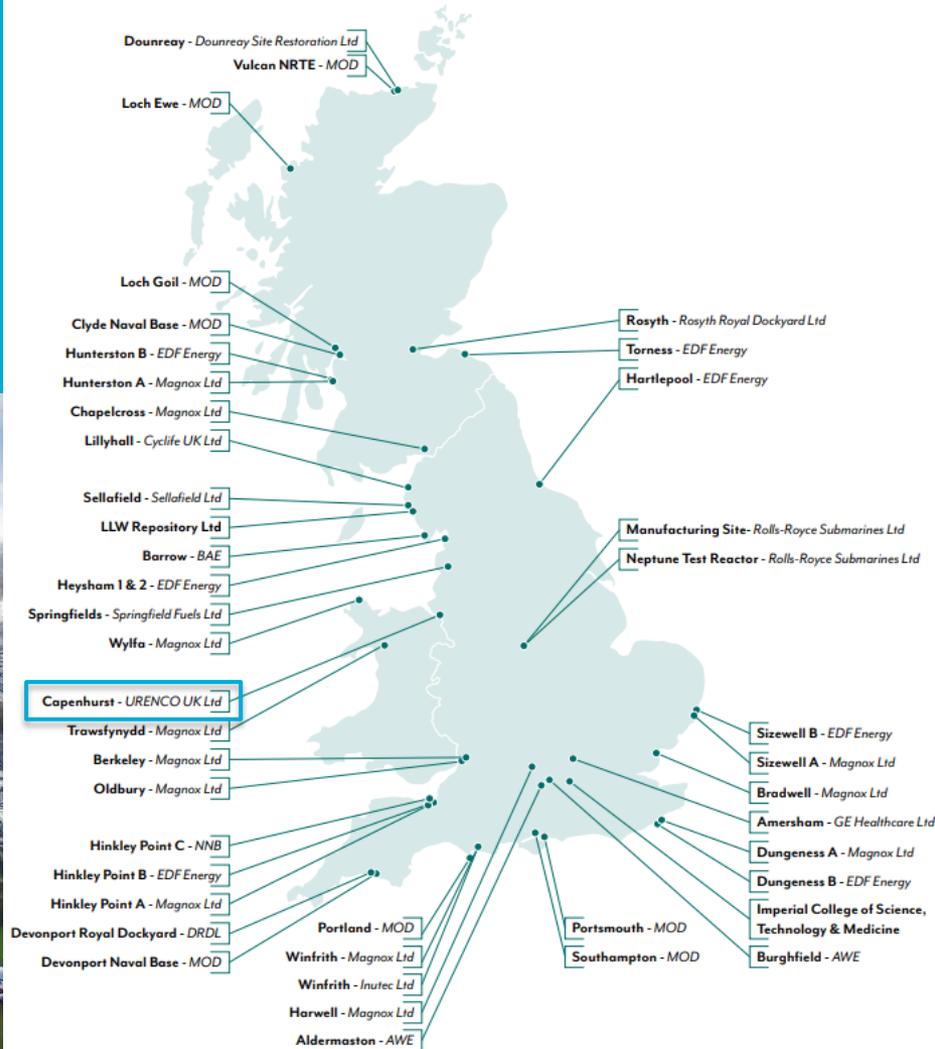
Our workforce have specialist management skills and expertise within the nuclear sector in:



Providing bespoke end of life-cycle solutions to the nuclear industry

Our base of operations: The Capenhurst site

- Nuclear Site Licence.
- Central UK location – Chester, Cheshire.
- Home to Urenco UK, Urenco ChemPlants and Urenco Nuclear Stewardship.
- Space and plans for growth.
- Excellent transport links.
- Sizeable storage / holdings depending on customer demand.



Office for Nuclear Regulation (ONR), December 2019. <http://www.onr.org.uk/documents/map-of-regulated-sites.pdf>

Urenco enrichment decommissioning

- Decommissioning Urenco enrichment assets will generate contaminated metal, including both aluminium and steel
- Challenges of handling alpha wastes and fissile material
- Current work has identified requirement for metal treatment capability to manage wastes, including surface cleaning and melting



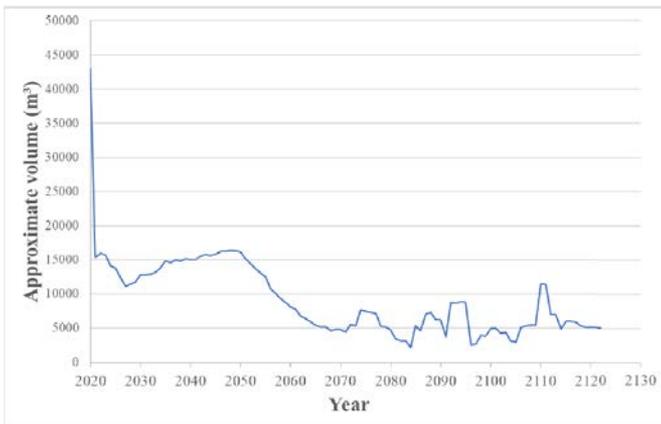
The challenges to Urenco

Absence of availability in the market

- Desk-based assessments into the supply chain have highlighted a risk to decommissioning
- Current supply chain capacity shows significant shortfall in managing the levels of metallic waste arising – without new facilities, risks of delayed decommissioning across the UK
- Demand for the UK metals treatment supply chain is forecast to increase, e.g. Magnox decommissioning
- Limited experience in aluminium melt

Security classification of components

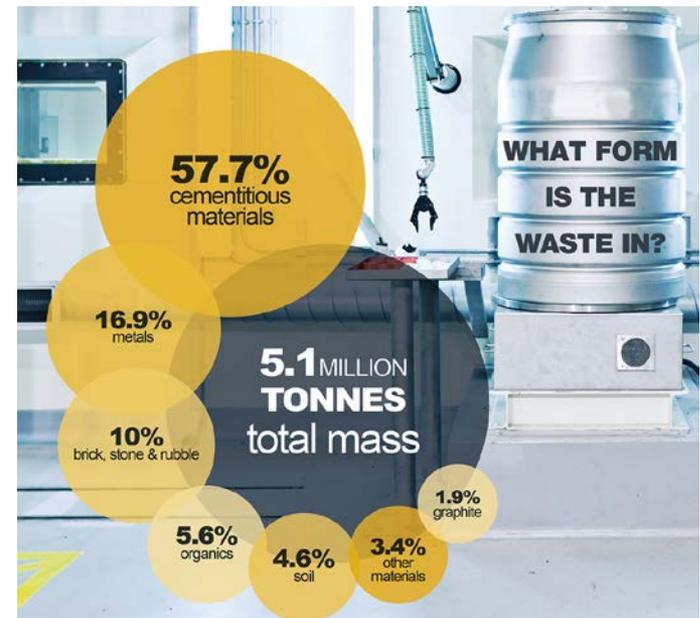
- Decommissioning includes security classified parts
- Complicates upstream deplanting to de-classify parts for transport



Estimated annualised metallic waste arising (in m3) over the next 100 years in 12 countries. The 2020 figure includes the inventories of existing waste. Galson Sciences Limited, 2020.

Long-term forecast: 2019 UKRWI data:

- 2019-2024: ~8,800 te/a metal waste for treatment.
- Entire inventory (~100yr): ~4,500 te/a average metal waste for treatment.
- Mostly ferrous LLW: ~90% across iron, stainless, and other steels



Self delivery a favourable option

- De-risks reliance on external supply chain
- Simplifies upstream deplanting
- Utilises previous experience – previous experience of metals treatment at Capenhurst from decommissioning of former gas diffusion plant and early centrifuge enrichment plants. Used as a basis for developing concept flow-sheet and cost estimates for current business case.
- Opportunity to offer excess capacity as external service – Timing of Urenco decommissioning is not yet fixed and is strongly dependent on external enrichment market conditions.

Ongoing trials

- Work to date includes investigations into laser decontamination and mechanical brushing as pre-treatments
- Ongoing work includes feasibility studies and cost assessments for melting of specific centrifuge components

Understanding market requirements

- Investigating requirements outside of Urenco – gathering information from potential users of a UK Metals Treatment Facility
- Implementing a Metals Treatment Facility with a melter for the benefit of the UK (and wider) nuclear industry, aligns with the Nuclear Decommissioning Authority – expand the technical scope of metallic treatment based on industry need
- Understanding the industries treatment goals – requires a better understanding of waste inventories and waste outcomes, e.g. volume reduction or shifting classification, looking at this with a waste-informed approach



Part of the strong
Urenco
Group

Experienced operators
on a nuclear licensed site

Long-standing contracts
with our customers

Ambitions
for **growth & diversification**

Global reach
from a convenient
UK location

Positioning on a
large nuclear site,
with space for
expansion

3100 m²
Waste Management
Facility

Willing to work in
partnership
with technology providers

Our people have
international experience
on nuclear sites

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