

Sustainable reuse and recycling of dredged canal sediments in Scotland

Towards zero waste and a circular economy?

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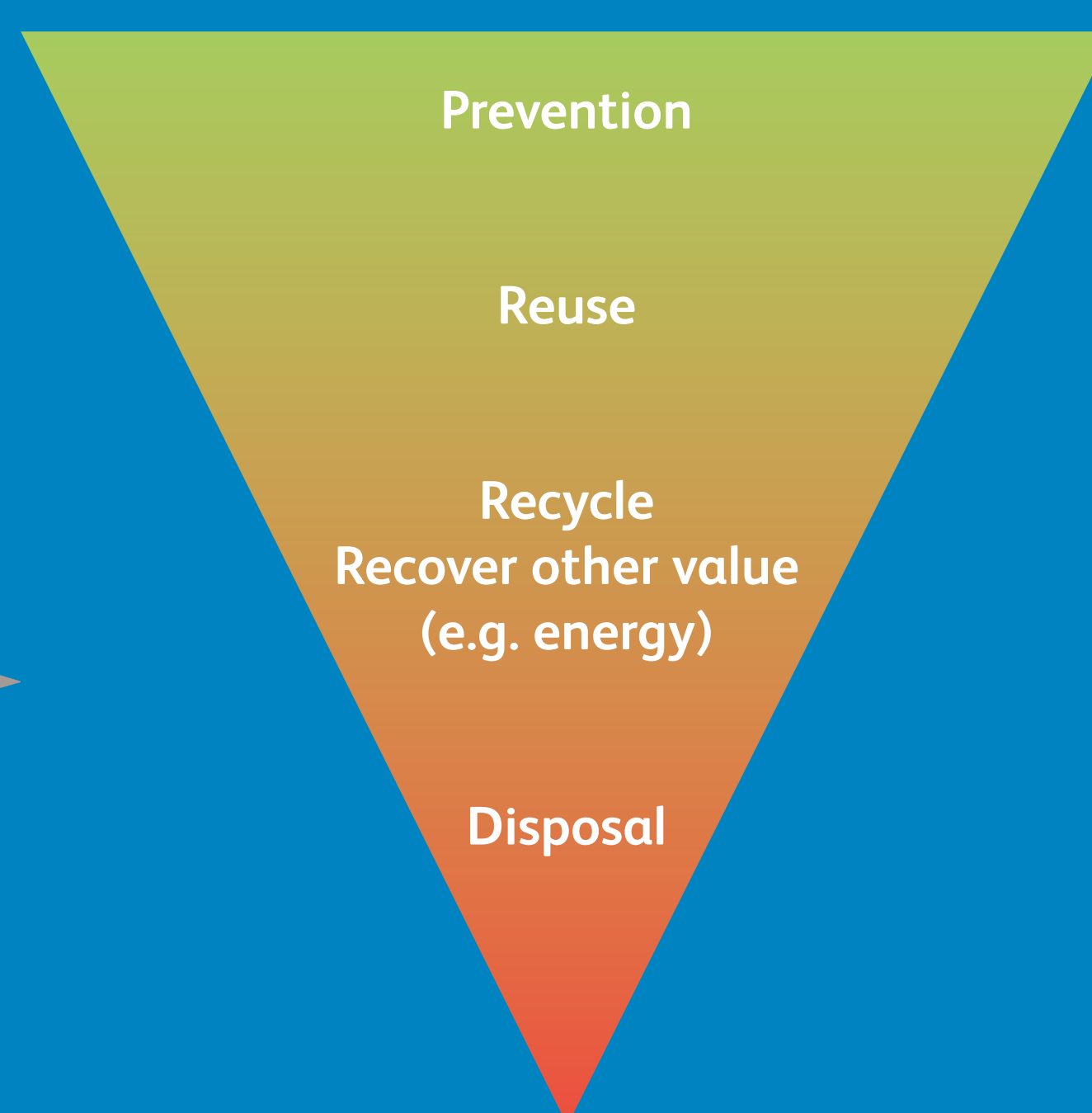
Dredging Scotland's Canals

- Constructed circa 1780, then fell into disuse in 1960s - reopening of Lowlands canals in 2001 – reconnected by Falkirk Wheel
- Dredged sediment traditionally sent to landfill. Currently exempt from Landfill Tax
- Urban & isolated dredging locations
- Sporadic nature of operations – may only be in an area once every 50 years
- Industrial heritage – contamination legacy
- Canals are Scheduled Ancient Monuments – protected so require Historic Scotland consent for works
- Increase in freight – need deeper canals
- Negative public opinion of dredged sediment



Zero Waste and the Circular Economy

- Circular economy is an alternative to the traditional linear economy of 'make, use and dispose'
- Nothing is a 'waste'. The circular economy sees everything as a resource – "waste is food"
- Scottish Canals are changing the view of dredged sediment from a waste to a resource
- Scotland launched an ambitious 'Zero Waste Plan' in 2010, with targets of 70% waste to be recycled, and a maximum 5% sent to landfill by 2025
- To meet the visions of the Circular Economy and Scotland's Zero Waste Plan, the Waste Hierarchy is being used by Scottish Canals to identify reduce, reuse and recycle options for dredged sediment



Contamination and Concrete – Recycling

- Heavy metals, tars, mercury – industrial legacy in sediment from 1800s as canals were used to dump waste. Use as recycled aggregate – use canal sediment to repair the canal itself
- Concrete strength trials – use dried, screened dredged sediment as a sand replacement
- Fixed in concrete blocks (20N strength)
- Use in concrete art with Edinburgh College of Art –public sculptures and art inspired by the canal



Topsoil – Recycling

- Joint venture with local charity - mix with green waste compost to create a topsoil
- Use material to create 39ha community forest in deprived area of Glasgow
- Glasgow - poor health, high deprivation, and high proximity to derelict land
- Trial of dredged sediment and compost mix to regenerate vacant and derelict land along the canals (community gardens, wildflower meadows) over winter 2014

Dewatering Solutions – Reduce and Reuse

- Water content makes transport expensive - paying for 30-40% water
- Scottish Canals have a SEPA waste exemption to spread sediment along canal banks
- Limited urban land bank but extensive along Caledonian and Crinan Canals
- **Winter 2014: Trial of geotubes** for rapid dewatering – wet sediment is pumped into geotubes. The pressure of the tube, plus the addition of flocculant, dewateres the wet sediment rapidly, with water returning to the canal, allowing immediate reuse of the sediment
- **Winter 2014: Trial of Nicospan** – create new canal wall using dredged sediment and simultaneously repair eroded embankments.



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