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Can we allay concerns over nuclear waste & fuel recycling

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What Influences Fuel Cycle Options?

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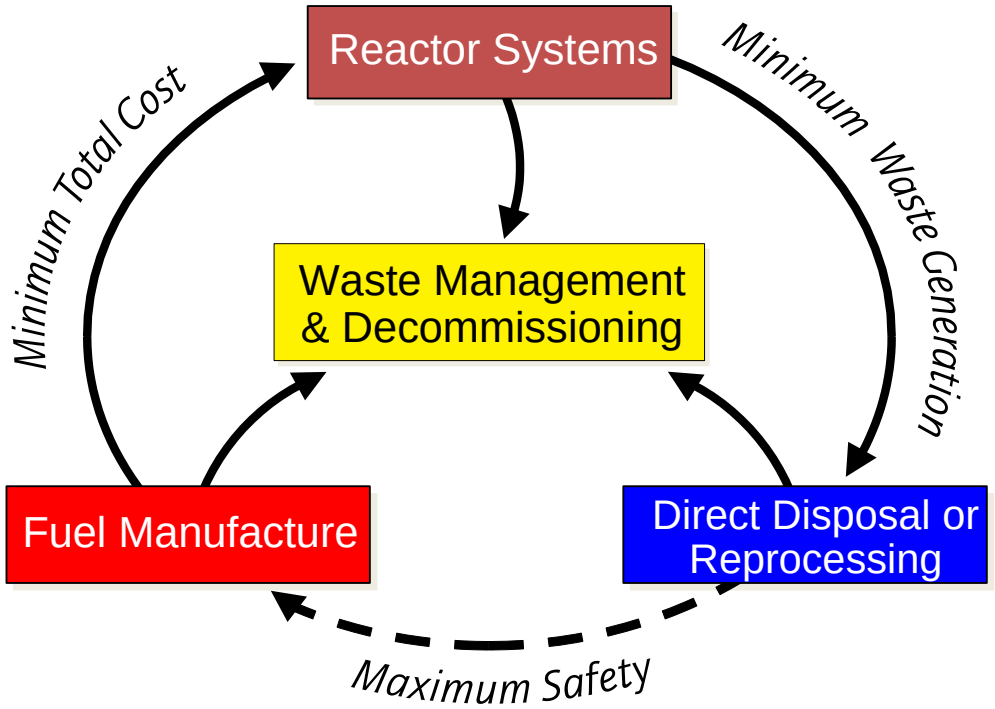
- Balance of number of parameters including:
  - Economics
  - Proliferation
  - Technology readiness
  - Fuel supply
  - Use of nuclear energy
  - Spent fuel storage
  - Disposal
  - Sustainability



- Worldwide growth of nuclear will impact on UK
- Higher levels of nuclear energy closed cycle more favourable

Public Consultation

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- Most suitable technical option agreed – deep geological disposal
- However UK Government wanted greater public involvement and therefore went back to considering all options
- Committee on Radioactive Waste Management compromised predominantly non-nuclear specialists to consider options
- Very transparent process established and conclusion eventually reached…..deep geological disposal

Geo disposal – Policy challenge not a technical challenge

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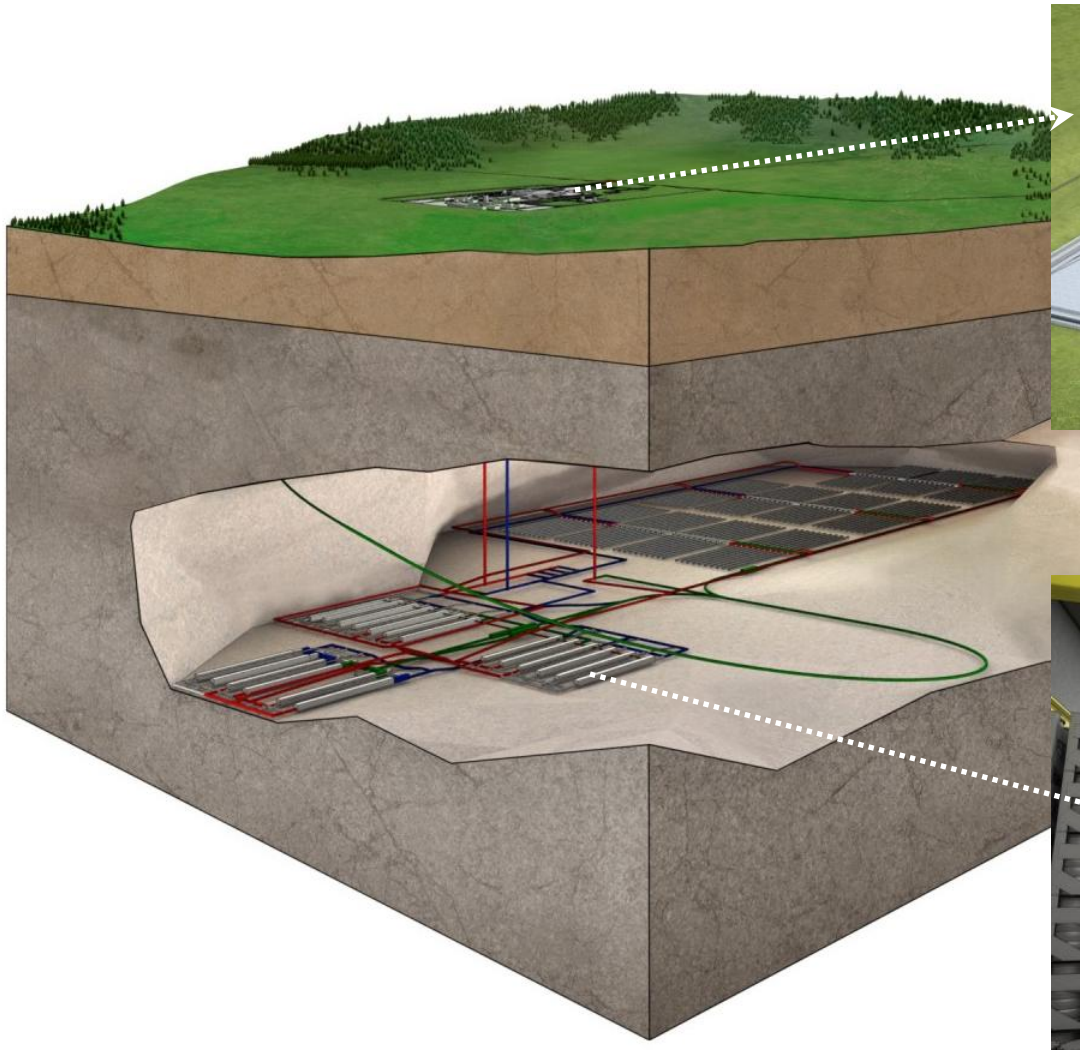

Geological disposal siting process

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- 2008 Site selection process
- Based on community voluntarism and partnership
  - Invited to participate without commitment
  - Retain a right to withdraw
  - Eligible for engagement package
  - Eligible for a benefits package
  - Subsequently required to take a decision to participate in the process

BERR Department for Business Enterprise & Regulatory Reform
Department of the Environment
defra Department for Environment Food and Rural Affairs

Approach to "Volunteerism"

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- 3 levels of approval needed
  - Local community (borough) ✓
  - County level X
  - National level (policy) ✓

Significant Campaign of Opposition

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Nuclear Waste Consideration

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- Putting waste into context:
  - Waste is localised, contained, small in volume and isolated from environment
  - Intergenerational issues CO2 vs nuclear waste
- National
  - Obtaining cross policy support
  - Take geology out of the equation
- Community:
  - Siting benefits to local community need to be made clear
  - Explanation over waste
  - Maintain volunteerism, participation and engagement

Explaining the Containment of Waste

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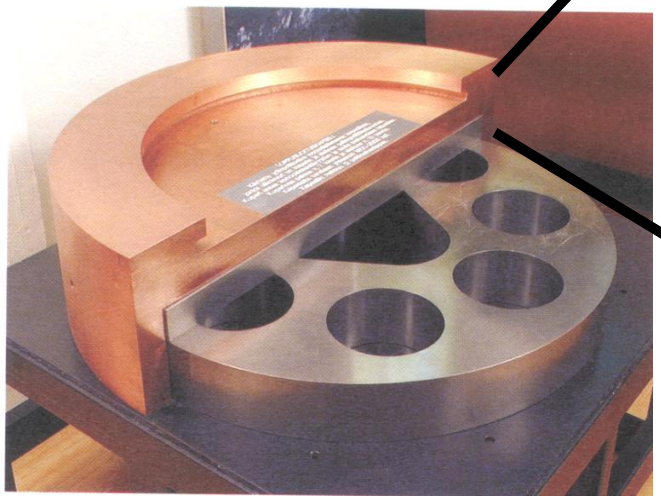
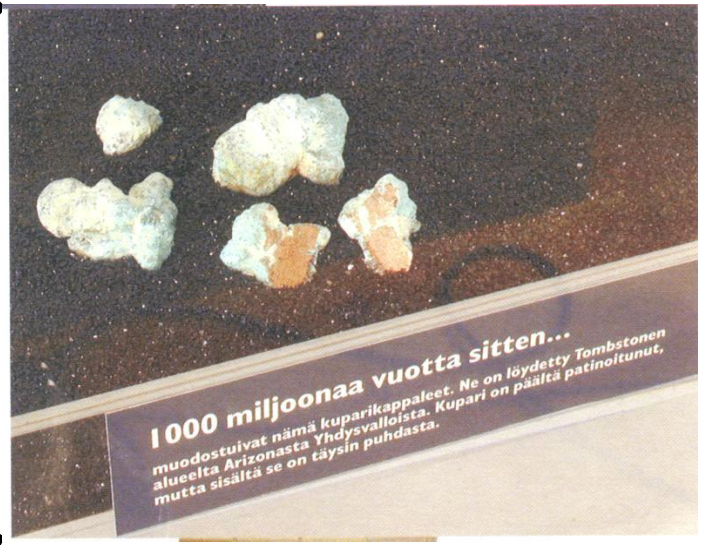
E.g. Finnish disposal canisters made of copper

Finnish canister lid





These lumps of copper were formed 1000 million years ago

Simple, Clear Messages to Address Public Values on Nuclear Waste

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COVRA, the Dutch high level waste repository, has been transformed into a public art work that is regularly repainted to become lighter and lighter orange to represent the decay of the waste inside.
After 100 year it will be white.

Making our Uranium Last Longer

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- Mining leaner reserves
- Squeezing out more U-235 from "tails" via further enrichment
- Advanced thermal reactor designs to increase efficiency
- Reprocessing – increases uranium utilisation and enables MOX usage
- Fast breeder reactors – utilise U-238
- Thorium – more abundant than uranium

Sustainable use of resources ?

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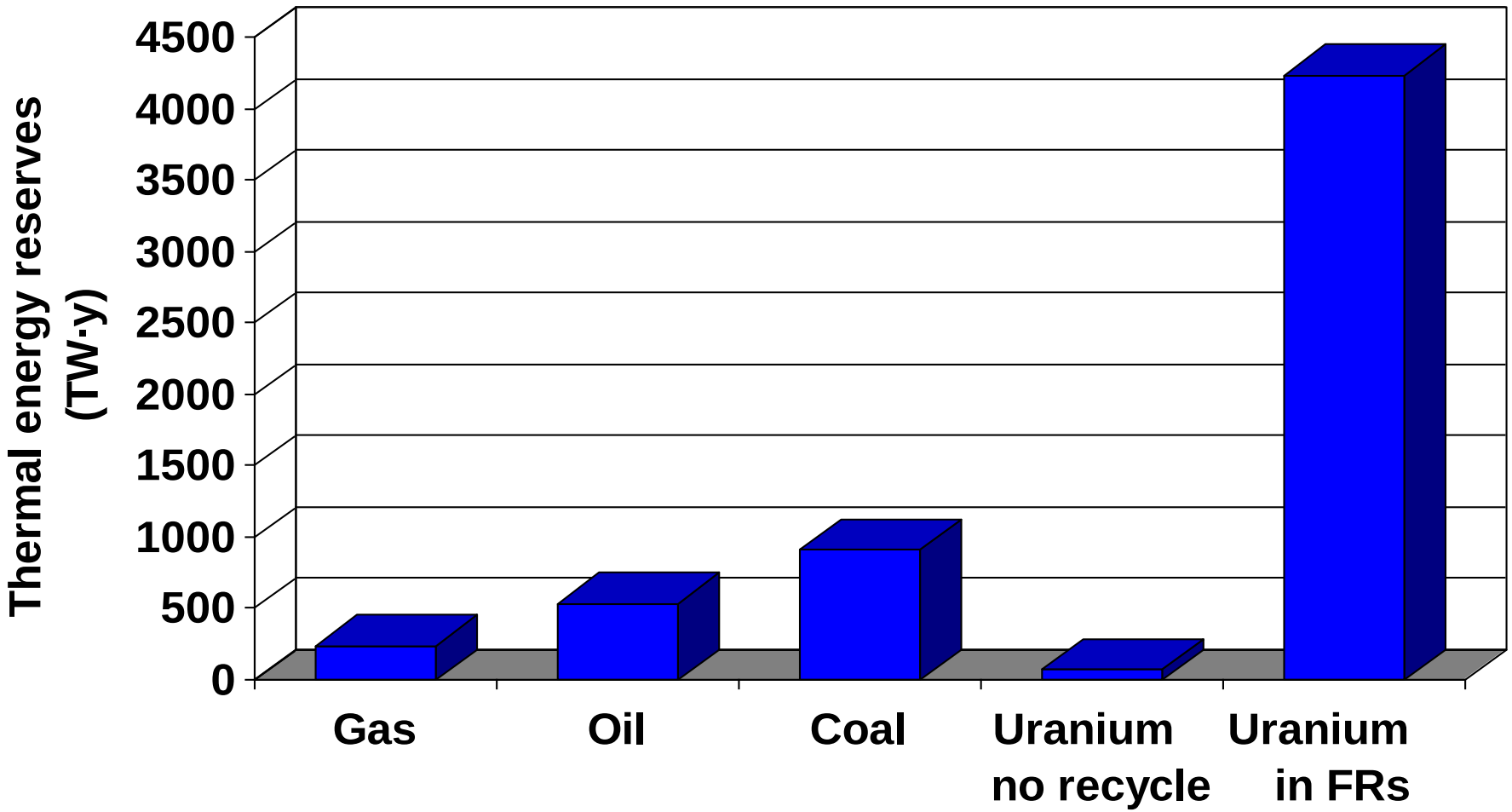

Source: US DOE Energy Information Administration "International Energy Outlook 2004", DOE/EIA-0484(2004)

Note: Gas and Oil include speculative reserves; Coal and Uranium do not

Repository considerations

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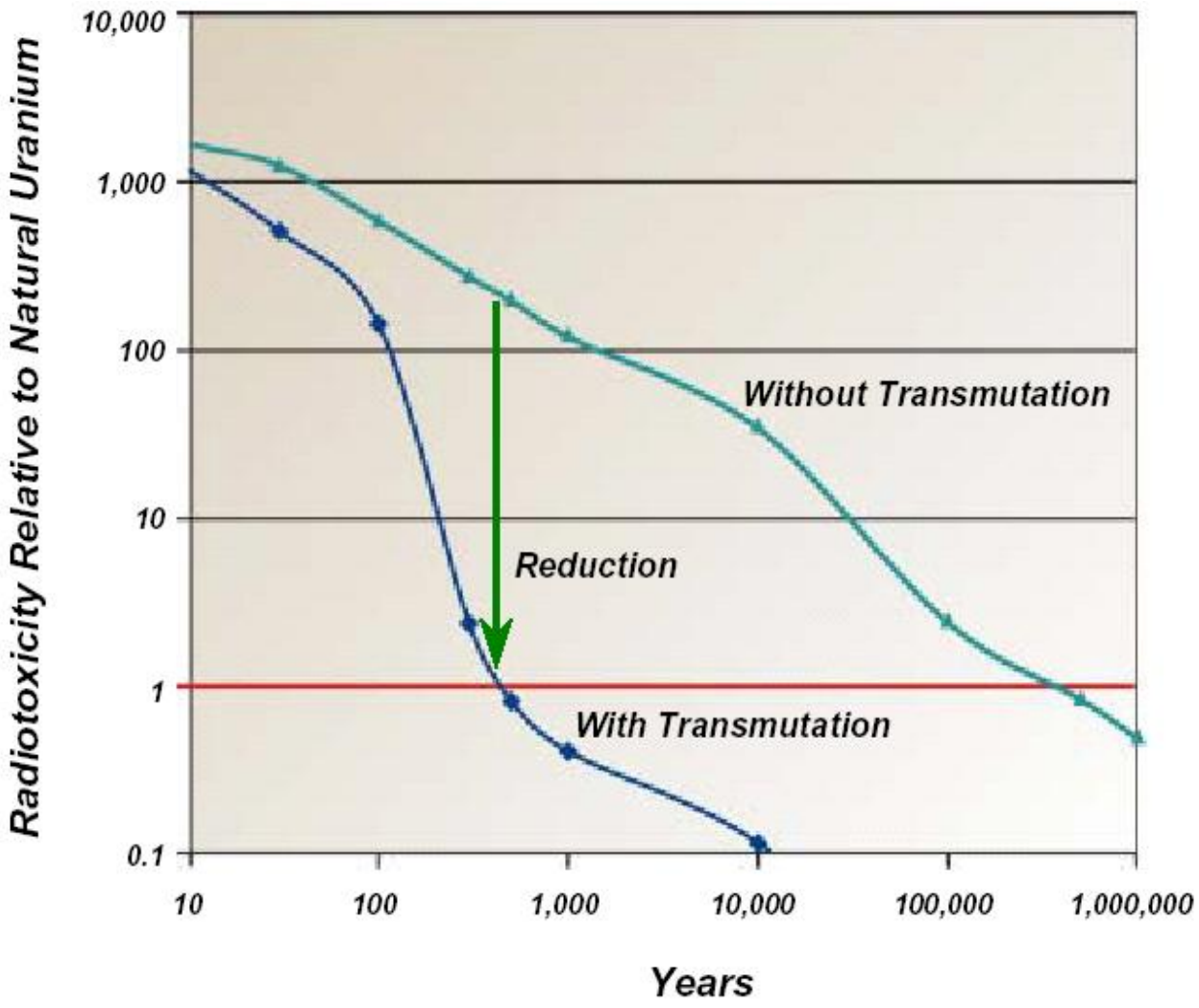

Future Recycling

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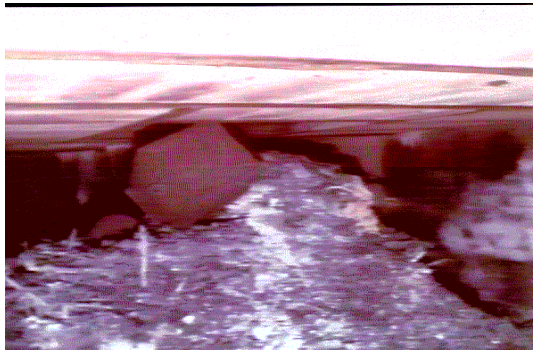
- Future recycling needs to look and feel different.
- Decouple links to legacy plants and military programmes



Conclusions

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- Need an holistic approach to the nuclear fuel cycle
- Saying no to nuclear waste is not an option
- Solutions need to be open, transparent with public consultation
- Volunteerism is essential
- Eventually benefits of fuel recycle need to be addressed

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