

The Nuclear Option: Decommissioning (and waste)

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In favour of nuclear power.....

- Low life-cycle carbon emissions
- An established technology, replicable in large units
- Uses little land
- Uranium plentiful and needed in small quantities
- Offers a quasi-domestic, apparently secure energy source

But against nuclear power.....

- Safety concerns, magnified since Fukushima
 - Security/terrorism vulnerability
 - Proliferation questions: dual use technologies
 - High construction costs
 - Public mistrust, varying by country/time period
 - Decommissioning and waste unresolved
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- Concentration here is on this last issue

Decommissioning and waste

- Distinguish between three cases: UK history, UK future, and international experience. All three are different
- Decommissioning – if defined only as de-constructing nuclear reactors - may be expensive, but can be done
- Inter-generational ethical questions arise if this is delayed by many decades, as in the UK
- But if, after de-constructing, there were no further problems, the issue would not be a major obstacle for nuclear
- The really difficult issue is how to manage the resulting waste, and the spent fuel that is the other main legacy

History of managing UK nuclear legacy is dire

- This has been complicated by the imperative to ‘re-process’ spent fuel – thus acquiring separated plutonium (though in future, reprocessing will stop, thus simplifying things a bit)
- Management of nuclear legacy in the UK has been one of long-term neglect, especially at Sellafield, which will alone cost a further £67 bn. to clean up
- Stewardship of Nuclear Decommissioning Authority at last provides a single-objective organisation – previously BNFL had primary mission of making money, especially via reprocessing

But what to do with the wastes?

- The virtually universal answer is: bury it deep underground
- But no country, despite 50-year history, has yet managed this for civilian wastes
- A major problem is the widespread view that burial means 'out of sight, out of mind'
- Very long delays in building repositories, with their risk of future radioactive leakage, raises the issue of inter-generational justice

Legacy wastes

- In UK and elsewhere, there are large stocks of waste already in existence
- The policy question is to find a least-worst solution: no need to look outside the nuclear sector
- CoRWM said: bury it deep provided that community genuinely volunteers: Government agreed
- Logic: risk to near-term generations of storing waste at surface larger than very long-term risk of return of radioactivity from a repository to biosphere

New-build wastes

- These raise different political, social and ethical issues
- Can now choose *not* to create more wastes at all, as low-carbon alternatives to nuclear exist
- UK Government has chosen to ignore this distinction between legacy and new-build
- But of course if a repository exists for legacy wastes, it is politically easier to gain support for new-build – same repository can host both waste types

Current UK state of play

- Government now starting to consult on volunteering process for local communities to host repository
- Only Local Authorities close to Sellafield are inclined to play – but also geological disputes
- Even if all goes well, and this is far from assured, earliest date for a working repository is 2040
- Question: does all this meet the 1976 ‘Flowers criterion’: that nuclear construction should not go ahead without the existence beyond reasonable doubt of a method indefinitely to safely contain radioactive wastes?

International context

- Finland and Sweden in the lead – but the leader, Finland, will not have working repository till 2020
- US has recently abandoned Yucca mountain after many \$bn. spent
- Multi-national (or deep sea) solutions often proposed e.g. China or Australia deserts, Kazakhstan, but politics and international law are heavily against
- Difficulty of resolving the waste issue is probably the most durable, troublesome of all nuclear problems