

Geological disposal of radioactive waste in Finland, France and the UK

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Pre-Fukushima “nuclear renaissance”

FRA

- 58 reactors, 75% of electricity
- Flamanville under construction & Penly approved (EPRs)
- Export ambitions

FIN

- 4 reactors, ~30% of electricity
- Olkiluoto 3 (EPR) under construction since 2005
- 2 new reactor projects approved by Parliament in 2010

UK

- 16 reactors, all but one to retire by 2023, 18-19% of electricity
- Govt policy since 2006: nuclear “back with a vengeance”
- 2009 programme of 12 reactors on 10 sites, down to 8 sites in 2010

Post-Fukushima: slow-down of the renaissance?

FRA

- Penly postponed/cancelled
- Hollande's commitment to reducing nuclear from 75% to 50% by 2025

FIN

- No changes in policy: the two Decisions-in-Principle still hold
- Fennovoima project: E.ON pulls out, enter Rosatom...
- Olkiluoto 3: will it be completed? Olkiluoto 4 – when?

UK

- 2013 Nuclear Industrial Strategy: 16 GW of new nuclear capacity by 2030 - at least 12 reactors on 5 sites
- timetable slipping: Hinkley C initial completion date 2018, now 2023

FIN

- construction of URL/GDF (Onkalo) underway since 2004
- planned entry into operation 2020

FRA

- URL under construction in Bure (east of the country) since 2000
- Bure to host the GDF (Cigéo)
- Cigéo operational 2025

UK

- search for a site still underway, but “*It’s Cumbria now and for the foreseeable future*” (Blowers 2014)
- operational in 2040 at the earliest
- temporary storage increasing in importance?

History

**France: From irreversibility to
opening up...
and to reversibility as closure**

1. Period of “closure” and failed site investigations: 1980s

2. Stalemate; moratorium and “opening up” 1990-2006

- 1991 “Bataille Law” – 15-year research on three options: geol disposal; interim storage; partitioning & transmutation
- 1998: Choice of Bure (between Meuse & Haute-Marne) for an URL
- 2005-2006: “public debate” (consultation) on the RWM orientations

3. Towards a GDF (Cigéo) in Bure: 2006-

- 2006: “Planning Law” & Law on transparency and safety:
 - **reversible** geological disposal as the reference
 - Andra to develop an industrial project (licence application in 2015)
 - creation of ASN (independent safety authority)
- 2010: government approves Andra’s proposal to build a GDF

- May-December 2013: mandatory **public debate** on Cigéo, organised by CNDP
 - obstructed by the opponents; public hearings replaced by “contradictory debates” on the internet
- Jan-Feb 2014: **consensus conference** to “rescue” CNDP and the debate
 - recommends an “industrial pilot phase” & slowing down
 - minimal interpretation of the “pilot” by Andra
 - construction licence application (incl. reversibility): 2015-2017
- 2020-2025 (2027): **Construction** of Cigéo
- **Uncertainties**: technical, financial, and public opposition

**Finland:
Long-term planning and
consistent implementation,
“in good spirit of
cooperation”**

1. Technical approach (1980s – 1994)

- 1983 Parliament Decision-in-Principle (DiP): strategy and timetable for policy

2. Participatory turn (1994 – 2000)

- 1994 laws on EIA and banning of waste exports
- 1996: creation of Posiva (by the nuclear industry)
- 1997-99: “EIA of the century”
- 2000: Approval of URL/GDF by Eurajoki municipal council

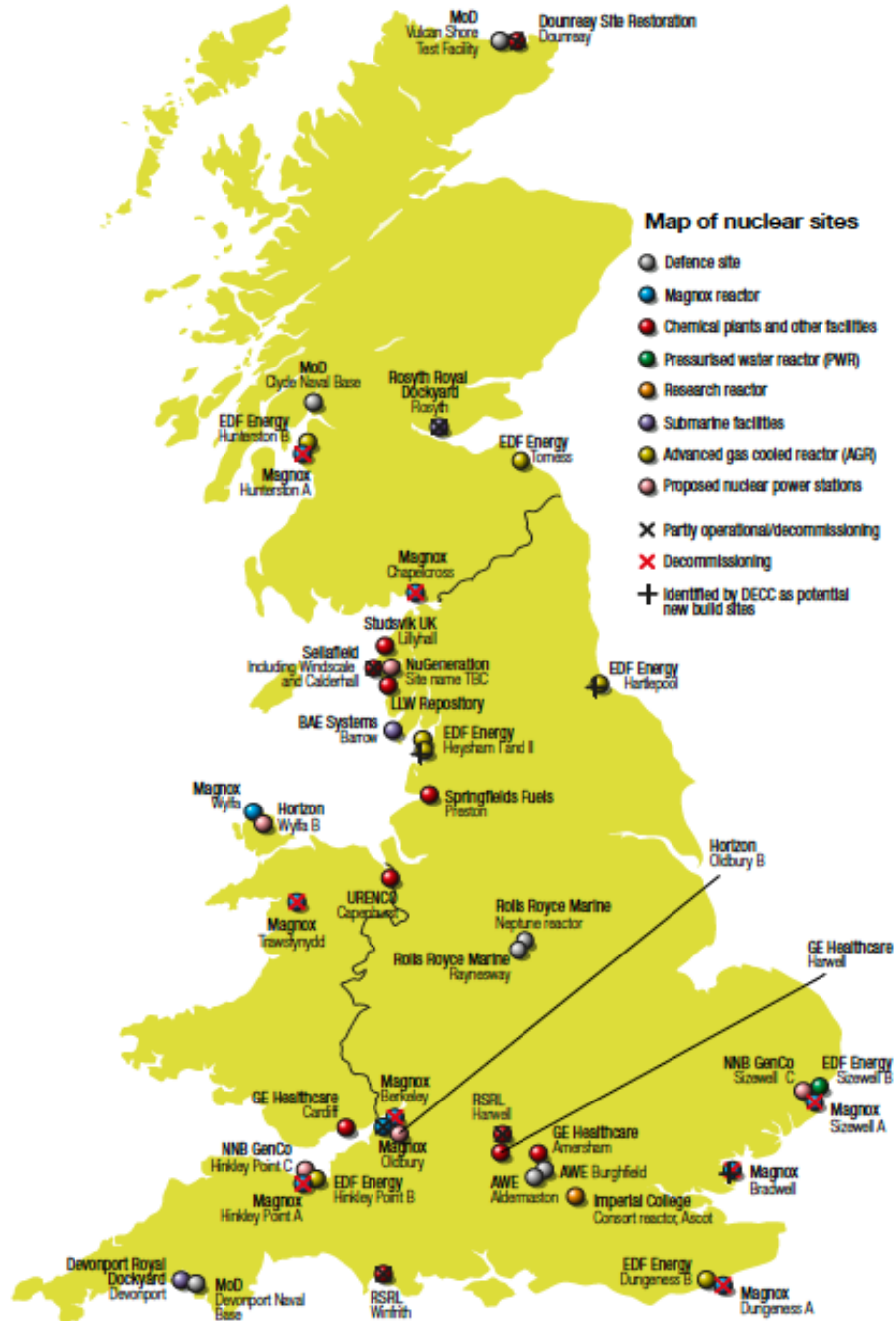
3. “The solution has been found, let us move on”

- 2001: Parliament DiP on “Onkalo”
- 2002: DiP on Olkiluoto 3
- 2004: construction of “Onkalo” begins
- 2020: operational

(Minor) potential uncertainties: new-build, copper, financing

- Fennovoima waste; will Posiva, TVO & Fortum accept them or will Fennovoima have to build its own GDF?
- Olkiluoto 4: would probably postpone the closing down of the facility
- Extension of the disposal facility, to accommodate O4 waste (a mere formality...)
- “Contamination” from Sweden?
 - Copper containers
 - Financing

UK: still searching for a site



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1. “*Closure*”, and *DAD (decide-announce-defend) policy (1980s – 1997)*

- 1997 Nirex Rock Characterisation Facility (RCF) project rejected

2. “*Opening up*” and *public engagement efforts (1999-2006)*

- CoRWM 2003-2006 to “build ***confidence***”; legacy waste
- voluntarism; suitable and willing host community
- R&D into geological disposal, ***together with*** a robust programme of interim storage
- Govt: new-build possible; “a solution has been found”

3. UK return of disguised authoritarianism? (2007 –)

- 2008 Planning Act & Managing Radioactive Waste Safely (MRWS)
- New CoRWM, with a more technical mandate
- Copeland & Allerdale (districts) & Cumbria (county) volunteer
- West Cumbria Managing Radioactive Waste Partnership
- Jan 2013: Allerdale & Copeland District Councils approve, Cumbria County Council rejects, continued engagement
- Government attempts to relaunch the process: Call for Evidence; Consultation (Dec 2013); **White Paper (July 2014)**
- Lack of clarity in WP; *dirigiste* approach to voluntarism; merely to justify the choice of Cumbria?

COMPARISONS

FIN

- direct disposal of SNF; granite
- project of moderate size; modest employment effects & other benefits

FRA

- reprocessing, vitrified waste; clay
- “megaproject”
- direct jobs: 1300-2300 during construction; 600-1000 during operation
- indirect and induced jobs: 2000-4000 (earlier promises 6000-7000...)

UK

- reprocessing; geology still uncertain
- “major infrastructure project”
- direct jobs: more than 1000 during construction; 570 during operation

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FIN

- nuclearised and prosperous community
- medium-sized municipality (6000 inhabitants)
- no state economic support, but industry-municipality agreements

FRA

- poor and declining periphery, without nuclear tradition
- patchwork of very small municipalities (Bure: 98 inhabitants); *Départements*
- significant, legally mandated economic support from the state; voluntary support from the industry

UK

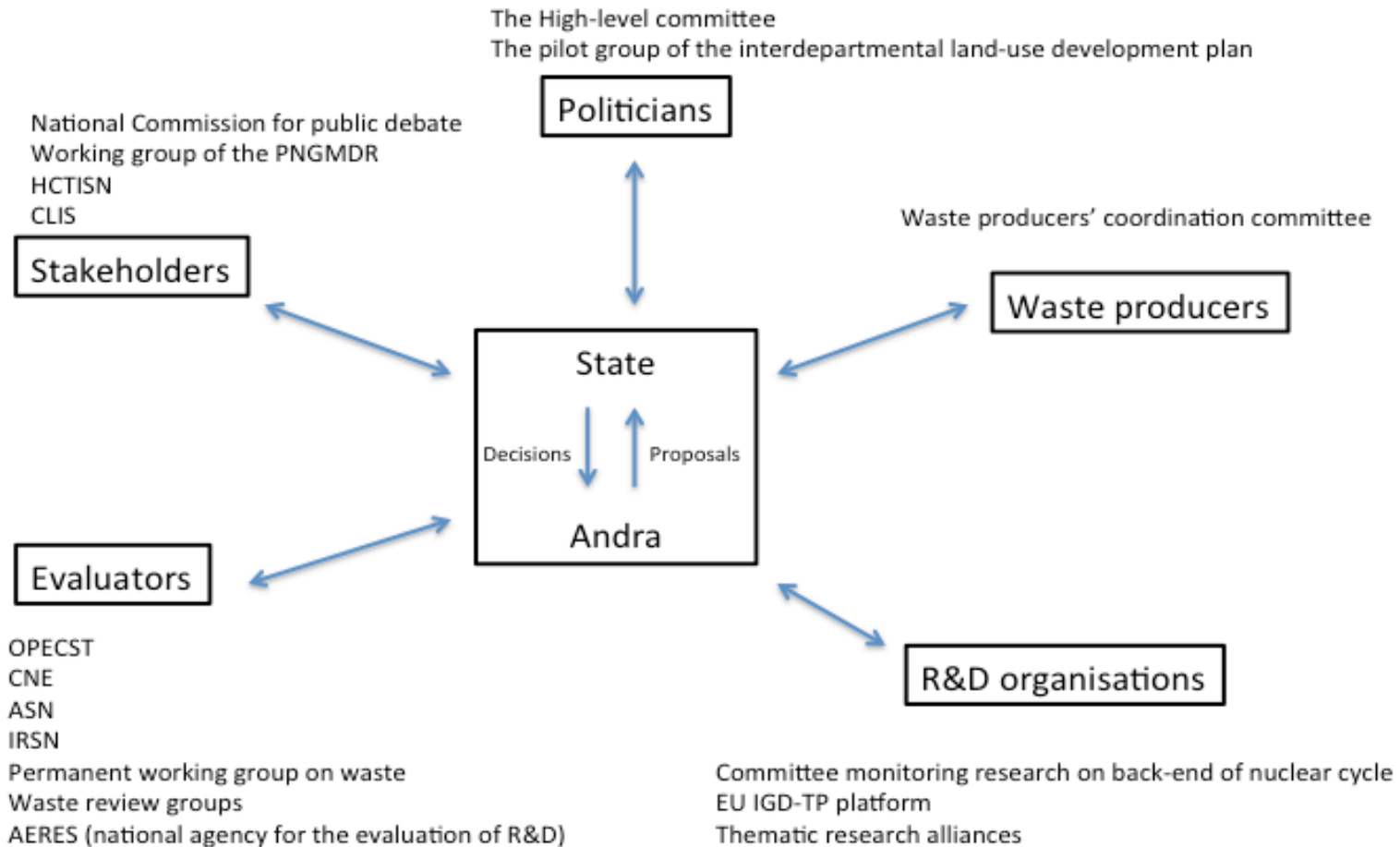
- “semi-poor”, “semi-nuclearised” region; polarisation
- 88 involved parish councils, district councils, county councils... (population: Allerdale 90 000, Copeland 70 000, Cumbria 500 000)
- significant (£1-2.5 million/community) economic support promised (investment & facilitation of engagement), but the details still open

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Governance arrangements

- developer: Andra – government agency of industrial/commercial character
- no municipal veto
- government decides; complex multi-level governance; diversity of municipalities
- Andra as the guarantor of continuity; “divide and rule” strategy (?)
- (shifting?) balance of power between industry, Andra, and safety authorities (ASN & IRSN)



- Private industry (Posiva = TVO + Fortum)
- Municipal veto *until the DiP* (cf. Sweden)
- Parliament DiP to establish the project is in the interest of the society
- Construction and operation licence by government
- Key relationship: Posiva & local municipality
- Other key players
 - Ministry of Trade and Industry
 - STUK (the safety authority)
 - VTT (state technical research institute)

UK: uncertainty & evolving governance structures

Voluntarism, but relationship between geology and socio-politics?

Municipal veto (Right of Withdrawal) under discussion:

- which level? “who” is the “community”? district vs. county councils
- WP suggestion: RoW up to the point of “an informed test of public support” for hosting a GDF
- how to conduct the “test of community support”?

Steering Group:

1. Local authority
2. Government
3. Developer (Radioactive Waste Management Ltd., subsidiary of NDA)

UK RWM governance

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Public opinion, engagement, and trust

- Local information and monitoring committee (CLIS)
- National Commission of Public Debate (debates 2005-06; 2013)
- Consensus conference 2014
- Strong minority opposition
- Tradition of centralism; call for strong leadership by the state
- Polarisation: state is the only legitimate, but tradition of radical grassroots activism

- the EIA of the century 1997-1999
- widespread support in the host municipality (and beyond)
- participation a non-issue today
- strong municipal autonomy
- consensus nation & “engineer country”
- no tradition of radical NGOs; no demand for participation
- strong trust in the authorities (incl. STUK), official experts, and nuclear industry

- Tradition of centralism, but also of “contradictory” debate
- The participatory turn of the early 2000s spurred demand
- Active debate today; CoRWM and the post-2008 process raised awareness and stimulated activity
- But persistent mistrust in government (policy, not the process?)

Return to authoritarianism and the “deficit model”?

- Informing the local communities – then “learning phase”

“Community representation working group” to be convened soon

To provide clarity on:

- What/who counts as “community”
- How and when to measure community support
- How to ensure that all levels of local government have a voice
- Developing options for disbursement of community investment

Members:

- DECC (chair), developer, local government, academia, relevant government departments

- Inseparability of nuclear energy policy (and more general policy context/trends) and RWM policy
- Closure/openness of decisions & stage of progress: FIN/FRA vs. UK
- Participation as a legitimation tool?
- Reversibility, lock-in, scale, and megaprojects
 - Pragmatic UK and FIN; French philosophers?
- Socio-economics & compensations: capacities of local authorities to negotiate? Size and character of the municipality
- Veto: who can say “no”w?
- State vs. “private” industry: who is trusted?