Conference or Workshop Item:
Connelly, Stephen, Cotton, Matthew David, Molyneux-Hodgson, Susan et al. (2013) New perspectives on understanding nuclear societies. In: The Conference on STS Perspectives on Energy, 04-05 Nov 2013, Universidade de Lisboa.

Understanding ‘nuclear societies’

Stephen Connelly • Matthew Cotton
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Photo: Federal Government of the United States

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Overview

- Introduction to the 'Nuclear Societies' PhD programme (an experiment!)
- Summary of key ideas informing the work
- The individual projects
- Ways of working: multi-disciplinarity and networks
- Questions…

The 'Nuclear Societies' programme

- Funding from UK ESRC for 3 x PhD scholarships
- to create a cohort of social science students to engage with a cohort of nuclear engineering students

<u>The Vision</u>

- ❖ to create a community of researchers – regardless of disciplinary background – capable of engaging with future research agenda relating to nuclear energy in society
- ❖ to shape the 'nuclear societies' agenda and impact on engineering approaches to energy

Key ideas 1: the policy context

- Energy security and climate change mitigation increasing as a matter of concern…

…with 'nuclear' a partial solution: the 'nuclear renaissance'

- Competing technologies; complex of advocacies; policy and funding tensions; varied historical contexts

→ wide range of technical, social, political challenges

and…

'nuclear power has been protected by an institutional web of social and technological practices…[which] engender a restricted scope for public discussion and democratic involvement within nuclear decision making' (Irwin et al., 2000: 83)

→ need and challenges for critical social science?

Why STS?

- social and political issues at every scale involve sciences and technologies (nuclear… chemistry, engineering, hydrology, materials science, medicine, meteorology, mining, physics, radiation, transport…)
- nuclear a 'blended issue' – both a technical and a 'morality policy' issue (Braun and Jörgens, 2013)
- technology/science shape debates, policies, responses, outcomes … and vice versa

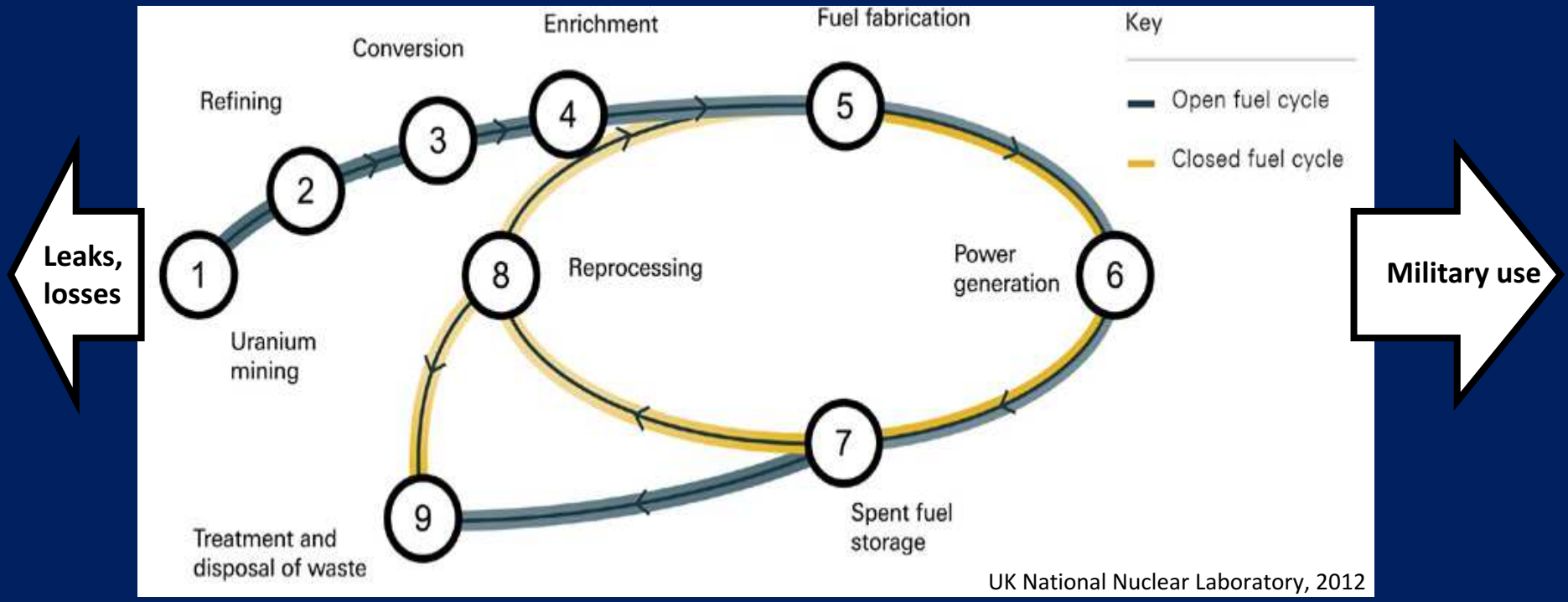
Photo: World Nuclear Association

Overarching questions

- What are the social, political and ethical implications of current developments in nuclear energy?
- How are socio-technical systems and practices at different scales interlinked in these developments?
- How are the socio-political implications enmeshed in technological processes and change – and vice-versa?
  - e.g. the thorium pathway in India, the fusion dream…?

… and more?

A material framing – the nuclear fuel cycle



- 'nuclear' is complex and extended in space and time
- cycle provides a framework – forces attention to less-studied aspects
- suggests a potentially large research programme

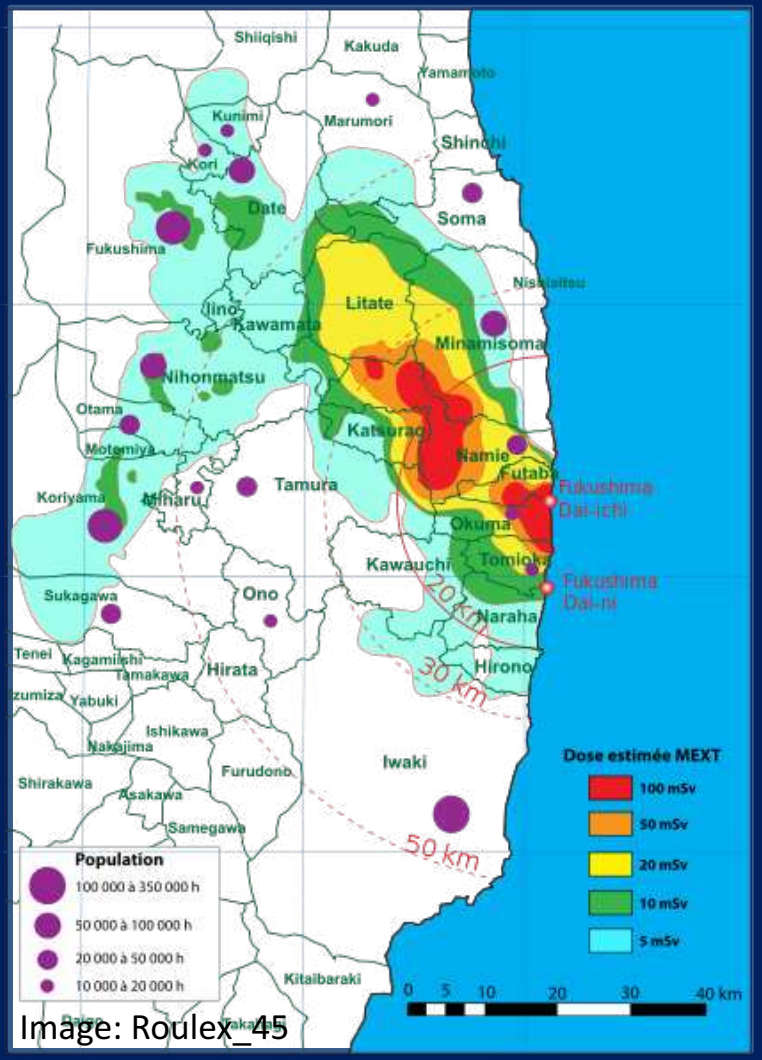
Key ideas 2: the academic context

- Existing STS research on 'civil nuclear' is limited
  - most existing (recent) STS centres on weapons and disasters
- Social science on 'civil nuclear' dominated by policy studies, cultural geography and social psychology - focus on risk:
  - legitimacy (involvement in decision-making on siting processes)
  - public understanding of (and engagement with) technological risk
- Philosophy: principally focuses on ethics (especially future generations and long-lived nature of waste)

Key ideas 3: initial conceptual tools

Scales: multiple, overlapping, interlinked

- constructed, contested, and 'do work'
- temporal (low-carbon transition vs. (de)construction vs. long term waste storage)
- spatial (from atomic to global – and risk/policy concerned with scalar containment)
- governance - local…national…supranational



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Key ideas 3: initial conceptual tools

- 'Nuclearism' (Irwin et al.) and 'nuclearity' (Hecht)
- Actor-networks
- Boundary work (e.g. Gieryn) (scales again!)

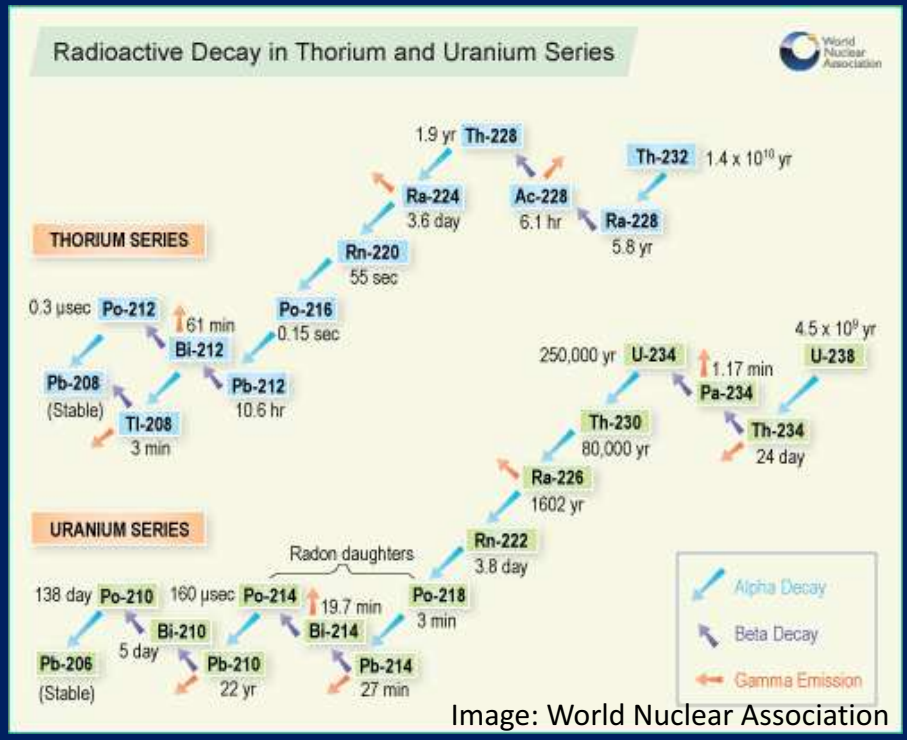

Image: World Nuclear Association

The PhD projects

- Marika Hietala – Decommissioning cultures
  - Susan Hodgson (Sociological Studies) and Neil Hyatt (Department of Materials Science and Engineering)
- Florian Abraham - Nuclear futures and the politics of scale
  - Matt Watson (Geography) and John Provis (Materials Science and Engineering)
- Caroline McCalman – New nuclear and environmentalism
  - Stephen Connelly (Town and Regional Planning) and Russell Hand (Materials Science and Engineering

  and Matthew Cotton (Town & Regional Planning)

Decommissioning Cultures: The policy and practice of waste management

Marika Hietala

- Approach: compare real-time decommissioning process, policy and practice in the UK & Finland. Actor-network approaches adopted to analyse nuclear waste disposal and storage innovations as socio-technical issues.
- Context:
  - UK: committed to deep geological disposal of nuclear wastes & to local voluntarism in the siting process – renewed process in 2014 following a failure in west Cumbria
  - Finland : waste repository site already selected
- Research questions:
  - do national cultural and political contexts influence attitudes and concerns regarding the technological aspects of nuclear waste disposal?
  - how are nuclear waste and deep geological disposal framed in the two countries, and what has shaped these framings over time?
  - can the policy desire to reach a broad public acceptance exist successfully with technological demands and desires

Nuclear futures and the politics of scale
Florian Abraham

Context:

- The UK government is currently developing nuclear power plant projects
- There is still little evidence of how commitment to nuclear power contributes to path dependencies in energy system innovation and development

Research questions:

- Can we rely once again on a resource based technology? (Uranium depletion)
- What are the social costs and benefits of nuclear energy? (For communities surrounding uranium mines, nuclear plants and disposal sites).
- How is the notion of "scale" embedded in the governance?
- What are the consequences of nuclear energy development for sociotechnical energy systems? What are the implications for alternative technologies?

New nuclear, new environmentalisms
Caroline McCalman

Context:

- the longstanding precariousness of nuclear power in the public psyche (destruction vs. production)
- traditional environmentalist opposition, successful in influencing public opinion – changing under impact of climate change agenda
- rise of the new 'common sense nuclearism'

→ questions about expertise, risk, and change/stability in these

Research questions:

- do environmentalists' opinions affect the public?
  - to what extent are people aware of splits in environmental opinion?
- are there 'generational' effects? How malleable are they?
- (how) has the public's new 'reluctant acceptance' (Bickerstaff et al. 2008) changed, post-Fukushima?

Mixed qualitative methods, with a focus on discourse analysis

Ways of working

- Social science base - the projects will produce *social science knowledge*

but

- Multi-disciplinary
  - problems conceived across sociological and technical concerns
  - students taking STS and engineering training modules
  - students form a social science cohort that will engage with a nuclear engineering cohort over the 4 years of the projects.
- PhD Network structure - a kind of 'research group' structure: peer group meetings; individual supervisor meetings; network meetings.
- Other networks: access to supervisors' networks; industry links; other colleagues' networks (e.g. SEAS research groups)…and more from here in Lisboa?

Currently foreseen questions:

- What might collaboration actually mean as a day-to-day practice? (By students, by supervisors…)
- How can (inter)disciplinarity be maintained? (The creative experiment does not 'fit' with university structures)
- What ethical issues may arise…?
  - …from STS engagements with nuclear engineering?
  - …from critical engagement with 'nuclearism'?
  - …from (competing/clashing) normative/moral/political positions?
- Through STS do we lose sight of (ecological) environmental issues and concerns?

What are the unknown unknowns?

Photo: Herman/VOA News