Energy resilience as the social control of technology?

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Questions and concerns

- (a). How to conceptualise energy resilience?
- (b). What insights can institutional theory shed on (a)? and
- (c). What is the role of language in institutionalisation?
- (d). What do the above tell us about improving governance/social control of energy technology?
UKERC energy resilience indicators

Possible resilience indicators for primary energy supply
- Import dependence
- Largest single source of supply
- Diversity/concentration of energy supply
- Energy portfolios

Possible resilience indicators for energy infrastructure
- Statistical probability of supply interruption in network industries
- Expected number of hours in which energy is unserved
- Value/level of unserved energy
- Energy storage capacity and/or stocks by fuel and market
- Largest single source of supply in a market energy
- Redundancy in network architecture

Possible resilience indicators for energy users
- Energy demand level
- Energy intensity
- Energy costs
- Back-up arrangements for energy sensitive users, e.g. hospitals
Energy resilience as: the ‘social control’ of technology?

Pressing problems of our time:

- How to get better technology in a better society?
- Can we control our [energy] technology...through the normal machinery of politics (i.e. incrementalism)?
- Yes: avoid inflexible technologies - they can’t be taken incrementally
3 Propositions

- Inflexible technology is unduly costly
- Inflexible technology is associated with centralised choice
- More flexible, decentralised alternatives exist
(a). Indicators of inflexibility

- Capital intensity
- Reliance on specialised infrastructure
- Lead time
- Unit size
(b). Centralised choice

- Absence of affected or knowledgeable actors impairs range of options considered and lessens robustness of decisions
- C.f. passive & active approaches to governance of energy system
Centralised systems: UK electricity supply data

Market structure:
- Proportion of electricity supplied by non-major producers c. 9.5%
- Renewables’ share of elec. generation >11% (2012); but 4.1% of total energy consumption
- 40-60% sticky/passive customers; dominance of ‘Big 6’ in retailing;
Regional shares (%) of 2 largest energy suppliers, UK 2010 (OFGEM, 2011)
(c). More flexible alternatives

- In UK, previously existed and currently available but marginal
- C.f. Lovins and Lovins (1982):
  - An inherently resilient system: many relatively small, fine-grained elements, dispersed in space, each having a low cost of failure
Realisation of such resilience is slow

Why?

Artefactual characteristics (content) and centralised choice processes are implicated in discourses and institutions. Critical analysis of Ds and Is may inform failed attempts at opening up.
Prevailing ‘rules of the game’

Mechanisms

Carriers

Processes

New rules that may be institutionalised

Partial Institutionalisation

Social practice

Discursive practice

Text

Institutionalisation

Partial Institutionalisation of new rules

Non-institutionalisation of new rules

Reinstitutionalisation of prevailing rules

Deinstitutionalisation of prevailing rules

Text

Non

institutionalisation

of new rules
Conclusion

- Consider energy resilience as social control (governance) of technology in society; not merely operational.
- (In)flexible energy systems are as much to do with social arrangements as technical infrastructure.
- Realisation of more flexible alternatives may be connected with messy change in institutional rules, implicated in social and discursive practice & text.
References

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