Energy Democracy: A Digital Future?

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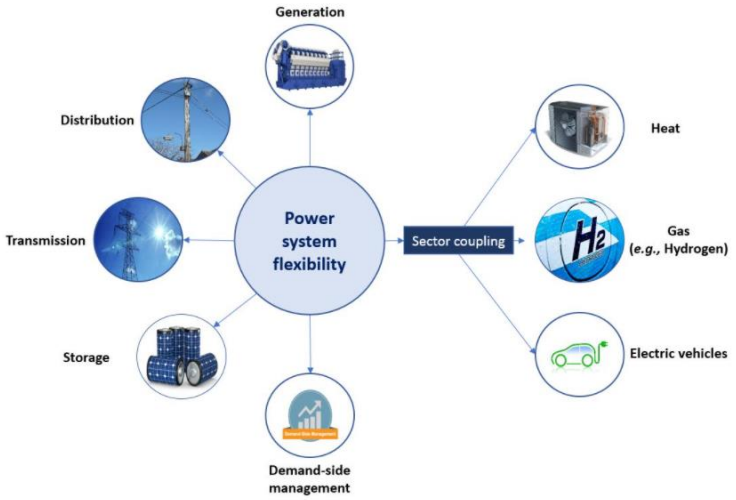
Energy democracy and analytical framework

Main dimensions	Components	Indicators
Popular sovereignty	Citizens as recipients of energy policy Citizens as stakeholders (producers and consumers) Citizens as accountholders	Welfare and energy access as key benchmarks Consumer prices and quality of service Prosumer legislation and grid access Prosumer support schemes Public accountability of energy decision-makers
Participatory governance	Inclusiveness Transparency Access to information Energy education and awareness raising	Incorporation of public consultations at all levels Citizen interest/opinion on par with expert agenda Due process and clear procedures Regulated lobbying Reporting on legislation and deliberation Independent research possible and available Existence of dedicated educational programmes
Civic ownership	Civic ownership of power generation Civic ownership of transmission/distribution infrastructure	Renewable energy deployment, dispersed energy capacity Share of energy from private, cooperative and communal sources Ownership structure and power in the political economy of energy Share of grid infrastructure co-owned by municipalities/communal

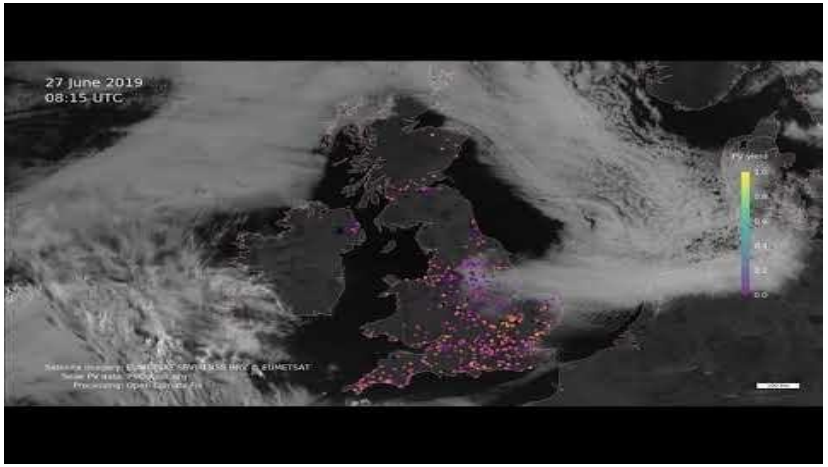
Source: Szulecki, 2018

Energy system digitalisation

"the act of incorporating digital systems and information and communications technology (ICT), along with the new business models and interaction opportunities these support, into the energy system." (Rhodes, 2020, p.5)



Source: Irena, 2018



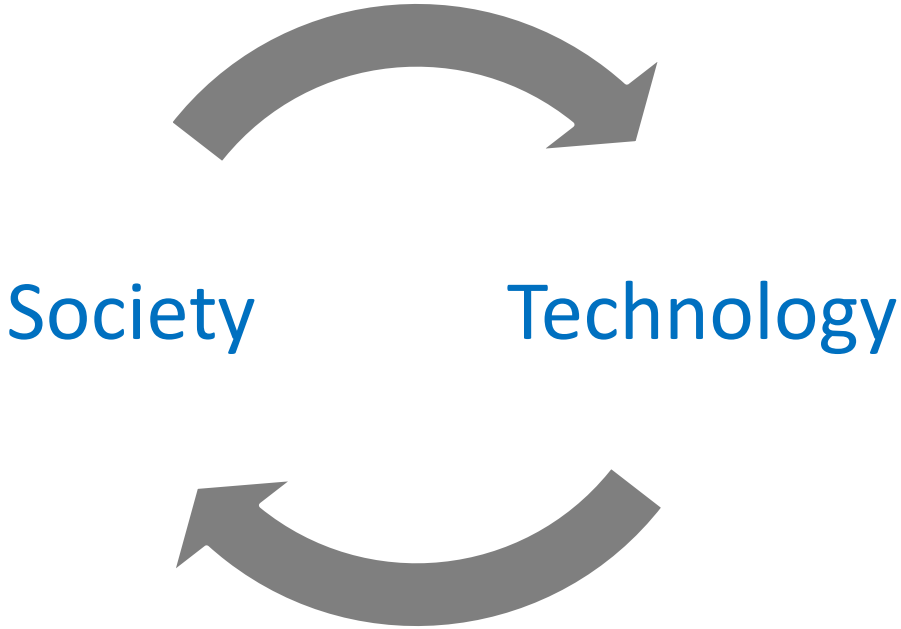
Source: Open Climate Fix, 2019

Digitalisation as a sociotechnical transition

- ‘Co-evolution’ (Foxon, 2014) or ‘mutual shaping of technology and society’ (Geels, 2002).
- Contests narratives of ‘antipolitics’ (Sadowski and Levanda, 2020).

But…

- Digital transitions are not energy specific and don’t fit neatly with existing theory. A disruptive ‘landscape pressure’ (Geels, 2011), but also there are unique ‘niches’ (Schot and Geels, 2008) within energy.



Data and software considerations

Skills and knowledge gaps, distributional issues, supply chain complexity, transparency challenges, proprietary challenges, scalar slipperiness,.

Popular sovereignty	Participatory governance	Civic ownership
• Potential interference by industry self-interest in governance (e.g. codes). • Cross-economy digital governance gaps • Automation produces new decision-making 'actors' (e.g. algorithms, human-machine collectives) • Accountability challenges (e.g. decision-making chains, liability, 'black box' systems).	• Potential interference by industry self-interest in governance (e.g. codes). • Scrutiny opportunities – openness vs security, privacy and commercial interest • May require new access rights regime? E.g. 'public interest'. (Frerk, 2019) • Standards development (Cohen, 2020). • Introduction of 'non-human actors' in decision making • Human-machine collectives. • Hidden but powerful processes – e.g. 'click work'.	• No universal concept of data ownership - contested in law (Stepanov, 2020) • Intellectual property challenges (e.g. dataset combination and reuse). (UKDS, no date). • Risk of 'micro-privatisation' (Sweeney, 2017). • As a service business models? Ownership vs use. • Complicates material asset ownership (van Veelen et al, 2021, Kitchin and Dodge, 2014) • Filters to value access (data and software).

Avenues for digital-democratic response?

Some may take familiar shapes…

- Community ownership of new asset types with mixed material and information-based components – e.g. VPPs (Thombs, 2019), aggregators (Carbon Coop and Regen, 2018).
- Public engagement around data/digital policy development.

Some could look quite different…

- Alternative governance approaches – e.g. commons-based (Hess and Ostrom, 2007)
- Shaping new institutions – e.g. data institutions (Hardinges and Keller, 2021), algorithmic bias audits (Raji et al, 2020), or 'public interest' data access mechanisms (e.g. Frerk, 2019).
- Open data licences, open source code and tooling.
- Public or non-profit ownership and development of data infrastructure(s).
- New collectives – e.g. virtual communities, 'hacktivists' etc.

Main dimensions	Components	Indicators
Popular sovereignty	Citizens as recipients of energy **data and digital** policy Citizens as **energy** stakeholders (producers and consumers and **'flexers'**) **Citizens as digital stakeholders (producers and consumers of data and software).** Citizens as accountholders	Welfare and energy access as key benchmarks **Digital skills and privacy as key benchmarks** Consumer prices and quality of service Prosumer **and 'flexer'** legislation and grid access Prosumer **and 'flexer'** support schemes Public accountability of energy decision-makers, **including computational components.**
Participatory governance	**Inclusiveness** **Transparency** **Polycentric approaches across supply chains** Access to information **and data at all levels of the energy system, while ensuring appropriate privacy and security** **Interpretability of decision-making models and appropriate redress mechanisms** Energy **and digital** education and awareness raising	Incorporation of public consultations at all levels Citizen interest/opinion on par with expert agenda Due process and clear procedures Regulated lobbying Reporting on legislation and deliberation Independent research possible and available Existence of dedicated educational programmes, **including digital-focussed, for end-users and public sector.** **Existence of data access mechanisms** **Inclusive, reflexive tech design and testing practices** **Fair algorithmic outcomes, with opportunity for public contestation and scrutiny**
Civic ownership	Civic ownership of power generation Civic ownership of transmission/distribution infrastructure **Civic ownership and/or co-production and/or management of: energy, flexibility, data and software assets and infrastructures across different geographies** **Open licensing and open source**	Renewable energy deployment, dispersed energy capacity Share of energy from private, cooperative and communal sources – **accounting for different geographic and virtual configurations** Ownership structure and power in the political economy of energy Share of **grid and data infrastructures** co-owned **and/or co-controlled** by municipalities/**other communal actors**

Conclusions

- Digitalisation **disrupts core concepts** within democratic theory used in existing energy democracy literature.
- Adaptation of the analytical framework could help **policymakers and practitioners** make valuable adjustments in a new sociotechnical context.
- However some of the bigger **paradigm changes are left uncaptured**.

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Any questions?