

7: Potential and Constraints in Energy System Innovation

Inviting flexibility in electricity system design: Experiences from a pilot project in Bangladesh

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Abstract

This paper is based on participant observation in a project where a solar electricity mini-grid was piloted in rural Bangladesh. I discuss the contradiction between a commonsense understanding of infrastructures as fixed and stable and the experience of the environment as a dynamic force pushing back into interventions and suggest how we might invite flexibility in electricity system design. The design of the village electricity grid and its operational model was challenged in the encounter with seasonal changes, practices of building flexible houses, and political dynamics. The inability of projects like ours to appropriately address such environmental and social challenges is often attributed to project workers' lacking information about local conditions. I challenge such assumptions and argue that the inability to appropriately address such challenges is also related to how project workers use representations, such as sketches and maps, to assist them in the process of planning and implementing plans. While such representations assist in sorting out complex realities by highlighting some attributes, they also necessarily hide other attributes. I use examples from our pilot project to discuss this and argue that other kinds of representations might have facilitated the design of a flexible electricity system better suited to the characteristics of the natural and social environment. Lastly, I argue that attending more closely to the choice of representations in processes of design and implementation can open a wider scope of possibility and may facilitate the development of flexible village electricity grids that are better adapted to fluctuating climatic, political and social conditions.

Scales of power: From private sector development to community mobilisation for decentralised solar systems

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Abstract

This paper starts from two assumptions. Firstly, providing adequate and clean energy for all requires a joint effort between state and private sector, as well as development institutions in order to provide universal access and increased investment in renewable energy. Second, universal access entails implementation of de-centralised energy for

rural electrification, which is contingent on a high degree of community mobilisation to ensure long term equal access, and ownership and responsibility for the energy infrastructure. These two assumptions involve a process of different stakeholder interests and power relations. As such it is important to examine how public and private partnerships for energy development align with socio-cultural and political dimensions of sustainable energy access. In light of these assumptions this paper critically reflects over the failures of an Indo-Norwegian ‘village electrification project’ in the Northern Indian state of Uttar Pradesh. By examining the intricate layers of the private-public partnership, technological expertise and community mobilisation of this case, this paper aims to discuss how interventions for de-centralised energy can be planned and designed to ensure a sustainable energy distribution, as well as community mobilisation that strive towards inclusion and empowerment of the intended beneficiaries.

Public perceptions of energy transition pathways

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Abstract

The public plays an important role in the question of whether the transition beyond oil can be successful. Individuals contribute to energy transitions in various roles, for example as consumers, house owners, employees, and voters. Thus, it is important to know how the public thinks about different routes to a low-carbon society.

A study will be presented that investigated the public perception of various pathways to energy transition. In a computer-administered lab survey among students (N=106), a collection of 25 components of potential energy transition pathways (i.e., steps that can be taken towards energy transition; e.g., renewable energy systems, behavioral changes, policy measures) was presented to respondents who answered several questions for each of the pathway components.

In open-ended free associations, the by far most frequent type of utterance was affective evaluations, which were mainly positive. Other frequent types of responses were prerequisites of the pathway components (e.g., international cooperation) and conflicting trade-offs. Respondents evaluated their own free associations predominantly positively.

Respondents were also asked to indicate which of a set of 15 motives and values they considered as closely related to each pathway component. A two-dimensional structure emerged in a correspondence analysis of these assignments: one dimension ranged from human prosperity to animal welfare, the other from curtailment to ample energy supply.

Taken together, results show that people have a mainly positive view on pathways to energy transition but are skeptical concerning their feasibility and efficacy. Implications for communication and policy making are discussed.

Preferences for Energy Supply Systems: A Cross-National Comparison of Four European Countries

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Abstract

The transition to a low-carbon future can only be achieved with widespread public support. The public will have to make drastic changes to their behaviour, and also to accept new energy technologies and facilities to decarbonise the energy they use. Considering that climate change is a global issue, demanding international action is needed involving EU countries and beyond.

While attitudes to climate change and energy supply systems are well documented within individual European countries, there is only limited coordinated cross-national research in the area. This presentation investigates public concerns and preferences regarding renewable and traditional energy supply systems in a cross-national comparison. It draws upon the JPI-Climate funded *European Perception of Climate Change* (EPCC) project, which ran from 2015-2017. The project produced a rich cross-national dataset, with four nationally representative surveys (total n=4,048) for Norway, UK, Germany, and France (Steentjes et al., 2017). This was accompanied by a socio-political profile report to inform the design of the survey and facilitate its interpretation (Arnold et al., 2017). Results are presented showing different patterns of energy preferences for low- and high-carbon energy sources. In particular, nuclear energy was perceived more positively in the UK than in the other countries, while Norway showed a unique pattern of energy security concern focusing on import dependency. Further analyses show that energy preferences are driven by specific concerns. While preference for coal and oil harmonise with concerns about economic development and affordability, preferences for renewables are driven by concerns about the environment and climate change. The implications of these results are discussed.