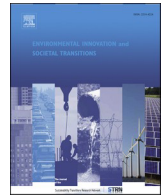




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Power to, over and with: Exploring power dynamics in social innovations in energy transitions across Europe

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ABSTRACT

This paper explores how power relations are manifested, altered and/or reproduced in processes of social innovations in energy transitions (SIE). We explore this research question by developing an interdisciplinary and transdisciplinary power heuristic building on different dimensions of power: power to, power over and power with. This conceptual framework helps us analyse the power dynamics in multiple types of SIEs that aim to contribute to sustainable energy transitions across three different national contexts: Germany, Poland, and the United Kingdom (UK). Our findings show how social innovation involves different dimensions of power to/over/with, and how power relations are both altered and reproduced. The cases under study also lead us to argue that understanding how power dynamics develop requires the analysis of the interplay between different power dimensions across the multiplicity of actors within different SIE-fields and their initiatives.

1. Introduction

While there is a growing agreement that current energy systems need to be decarbonised, debates are still ongoing on what exactly such a low-carbon and sustainable energy future should look like. Besides the many ecological and economic harms and challenges, transitions to sustainable energy systems also need to tackle numerous social issues linked to existing power relations (Brisbois, 2019; Sovacool and Brisbois, 2019). In line with the latter, we argue that energy systems suffer from inherently problematic power relations of inequality, exclusion, exploitation and extractivism. This implies that while technological innovation may be a necessary ingredient to tackle energy challenges, it is not sufficient for successfully tackling the ecological, economic, and social challenges in energy. These

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challenges are intertwined and systemic, and addressing them calls for *transformative social innovation* (Wittmayer et al., 2022a).

Transformative social innovation is defined as changing social relations involving new ways of doing, thinking and organising (Avelino et al., 2019; Wittmayer et al., 2020), which challenge, alter and/or replace dominant institutional arrangements (Haxeltine et al., 2017; Pel et al., 2020). Although there is an increasing recognition that transformations require socio-technical changes, the social dimensions of energy transitions are often neglected (Hirsh and Jones, 2014; Miller et al., 2014). Even in the field of sustainability transitions (Markard et al., 2012; Köhler et al., 2019; Loorbach et al., 2017), where there is an explicit socio-technical perspective and where many social dimensions of transition processes are addressed, social phenomena are often considered as dimensions of technological innovation. The added value of a social innovation perspective is to acknowledge the social as an object of innovation in and of itself (Avelino et al., 2019; Hölsgens and Schultze, 2020).

The issue of power relations is inextricably linked to the question about the transformative potential of social innovations in energy (SIE), and of innovation more generally. Understanding this potential thus requires studying how power relations are manifested, altered and/or reproduced in ongoing SIE-processes (Pel et al. 2020; Wittmayer et al., 2021). Both the fields of social innovation and sustainability transitions have been elaborately critiqued for ignoring or downplaying the role of power in processes of innovation and transition (e.g. Brandsen et al., 2016; Hendriks, 2009; Meadowcroft, 2009; Moulaert et al., 2007; Moulaert et al., 2017; Scoones et al., 2015; Smith and Stirling, 2010; Swyngedouw, 2005; Teasdale et al., 2020). Some of these critiques are accompanied by attempts to conceptualise power in relation to innovation and transitions, often in the energy context (e.g. Ahlborg, 2017; Avelino and Wittmayer, 2016; Avelino, 2017; Brisbois, 2019; Geels, 2014; Grin, 2010; Hess, 2013; Hoffman, 2013; Hoffman and Loeber, 2016; Sovacool and Brisbois, 2019; Teasdale et al., 2020). Notwithstanding this increasing attention to notions of power, research that links SIE and energy transitions in explicit power terms seems to be lacking. This is problematic because much research about innovation and transformative change in the energy sector tends to revolve around issues of power, i.e. individuals, organisations, and systems' (in)capacity to mobilise various types of resources to achieve a certain goal. A more systematic use of power concepts could provide insights into the socio-political dynamics of systemic change, where many actors in the energy system are changing their roles and activities whilst new actors come in.

This paper presents a systematic effort to integrate the concept of power into the analysis of SIE. Given that research on SIE is inherently interdisciplinary, and often transdisciplinary (Wittmayer et al., 2017), this requires an understanding of power that can be applied in an inter- and transdisciplinary context and that enables meaningful exchanges about power between researchers as well as practitioners working in the field of SIE. As such, this paper aims to answer the following research question: *how can we conceptualise and analyse power in the context of inter- and transdisciplinary research on SIE?* Answering this research question, we develop an inter- and transdisciplinary power heuristic that helps to increase our understanding of the socio-political dynamics of SIE. In doing so, we answer the above mentioned call for conceptualising and operationalising power perspectives into research in social innovation and sustainability transitions.

This paper is organised as follows. In Section 2, we introduce our methodology in three elements: a conceptual heuristic, empirical case studies and inter- and transdisciplinary workshops. We specify how the three empirical cases used in this paper have been clustered, selected and analysed. In Section 3, we present the conceptual heuristic of power for analysing SIEs. Out of the multiplicity of possible approaches, we focus on mapping three generic dimensions of power: power to, power over and power with. In Section 4, we analyse how power to/over/with has manifested across our three different cases: (1) cooperative organisation models for renewable energy in Germany, (2) pilot energy clusters in Poland and (3) actions against fracking in the United Kingdom (UK). In the discussion (Section 5) we discuss insights on power to/over/with that we gained across the different SIE-cases. We conclude (Section 6) by offering a reflection on the main insights on how power to/over/with manifest in SIE, and suggestions for future research.

2. Methodology

This research took place in the context of the EU-funded three-year research project "SONNET" (Social iNNovation in Energy Transitions), which focused on the emergence and development of SIE and involved researchers from various disciplines, as well as various societal stakeholders, in particular policy makers and energy entrepreneurs across Europe. In this context, we developed and applied a conceptual heuristic of power through an iterative inter- and transdisciplinary research process, which included empirical case-studies on SIE across various European countries. In this section, we shortly introduce the three main elements of the methodology underlying this paper: (1) developing a conceptual heuristic of power, (2) three empirical cases and (3) inter- and transdisciplinary workshops. Whereas this section elaborates on how the conceptual heuristic was developed, as a precondition to understand its origins, the content of the heuristic is further discussed in Section 3.

2.1. Developing a conceptual heuristic of power

In an inter- and transdisciplinary context like the SONNET-project, in which power is just one out of many topics, it is necessary to select power dimensions and perspectives that seem fitting for that research context. Here the challenge is to simplify - to a certain extent - the power concepts, but without losing the multi-dimensional complexity of power. Based on a literature review, and building on our earlier work on power (Avelino, 2021), we selected the distinction between power to, over and with as a focus. We then further operationalised these dimensions by (1) sharpening and 'translating' these power dimensions into short definitions and characterizations, including a collaboration with a graphic artist to visualise the concepts and (2) formulating empirical questions to be asked about SIE for each of these power dimensions. In Section 3, we present the conceptual heuristic of power, including the visualisation with short definitions (Fig. 1) and the formulation of empirical questions (Table 2).