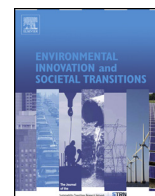




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Towards a conceptualization of power in energy transitions

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ABSTRACT

The field of sustainability transitions has recently benefitted from efforts by multiple scholars at better conceptualizing power and politics, and integrating insights from other fields. This article argues for an understanding of power as relational, productive, contingent and situated. I conceptualize power to the aim of understanding and explaining how and where power relations become de/stabilized in energy transitions in poor rural communities. An understanding of power as a relational capacity to act is integrated with a sociotechnical and relational understanding of constitutive power, which enables us to explore the co-production of social relations, technology and nature. The resulting conceptualization is applied to a case of mini-hydropower electrification in Tanzania. I find that electrification simultaneously reinforces social inequality and enhances social mobility. I identify material, symbolic and discursive domains that work as sources of de/stabilization of social hierarchies, producing effects on the system configuration and relations of class and gender.

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1. Introduction

This paper engages with the question of how to conceptualize power and politics in the field of sustainability transitions (ST). Some years back, ST scholars argued that political dimensions were not adequately reflected in the literature on sustainability transitions (Smith et al., 2010; Meadowcroft, 2011; van den Bergh et al., 2011). This stimulated discussion and efforts to address this perceived weakness. In a recent special issue addressing *The politics of sustainability transitions*, Avelino et al. (2016) suggest that ST scholars can learn from, and integrate, more elaborated conceptualizations of politics and power from other fields. There is still need to address the politics inherent in sustainability transitions and work towards more explicit, elaborated and better integrated conceptualizations of power and politics in transition studies (Scoones et al., 2015; Avelino et al., 2016).

With this paper, I wish to contribute to these joint efforts by arguing, in line with Nightingale (2006, 2011), for an understanding of power as being relational, contingent and situated.¹ In order to navigate in the rich philosophical debates on power, I build on Amy Allen's (Allen, 2014) three conceptions of power: (1) power as capacity to act (action-theoretical conception); (2) power as structural pressures (systemic conception); and (3) power as force fields (constitutive conception) that shape and co-produce subjectivities and interactions between humans, technology and nature. I argue that relational understandings of power are found among treatments of power in all three conceptions, and that conceptualizing power as

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¹ My understanding of relational power is inspired by the work of Andrea J. Nightingale. Her writings on power and subjectivity have shaped parts of my argument in important ways, and we develop a conceptualization in a forthcoming joint paper.

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relational, emergent and productive provides us with a theoretically consistent basis for working with the tensions between human agency and constitutive pressures, as well as dominance and empowerment.

While a thorough review of the treatment of power and politics in the ST field is outside the scope of this paper, I will use the special issue mentioned above as a point of reference. These contributions engage with various aspects of power and politics in ST, relating to: actor's roles and exercises of power (Avelino and Wittmayer, 2016); the concept of socio-political regime and a “just transition” in South Africa (Swilling et al., 2016); creative practices of niche and regime actors in the Netherlands (Hoffman and Loeber, 2016); public engagement in energy transitions in the UK (Chilvers and Longhurst, 2016); ‘political technologies’ and territorialisation of Spain's electricity sector (Castán Broto, 2016); problematic assumptions underlying transitions management (Kenis et al., 2016); the ambiguity of ‘capture’ of innovations by incumbent actors (Pel, 2016), and; the politics of visions of the future in key policy documents (Gaede and Meadowcroft, 2016).

Each of these contributions presents a different perspective on power in ST. This is no surprise since power is a broad (and contested) concept that, in order to be fruitful analytically, requires different conceptualizations depending on the empirical phenomena and analytical and political interests of the investigator (Lukes, 2005; Allen, 2014). Therefore, it can be argued that a fruitful conceptualization is one that helps us achieve our analytical and political aims. In this context, my interest is to understand and explain *how and where power relations become de/stabilized* in processes where renewable energy systems are introduced together with new organizational and institutional arrangements in local communities. The empirical case I work with is a small-scale electrification project, implemented by an international development organization, which aims at providing reliable electricity services to rural communities in Tanzania in order to enhance social and economic development of the area. My theorization of power is developed for, and through, the empirical study of this and other cases of locally-grounded energy transitions where new infrastructure, services and institutions/organizations are key features.

Avelino et al. (2016) suggest that sustainability transitions are not only processes of sociotechnical change, but also processes of sociopolitical change towards more sustainable societies. They exemplify with energy transitions in the UK, writing that it is “not only about a socio-technical transition from fossil-based fuels to renewable energy, but it is also a socio-political transition from centralized for profit energy companies, to decentralized, not-for-profit community-based and/or Third Sector-based energy cooperatives” (Avelino and Wittmayer, 2016: 638). In the Tanzanian context, it is not obvious that energy transitions involving decentralized and community-based electricity provision are necessarily “sustainable” (in either social, economic or ecological terms). Thus, I prefer to hold the question of sociopolitical change open and examine *if, how and where* relations of power – in this case most importantly class and gender relations – are reproduced and contested, and with what consequences for social inequality. The case I present here can be considered a successful example of sociotechnical change, but the sociopolitical outcomes are ambiguous – the introduction of electricity services results in growing social inequality in parallel with enhanced social mobility and expanded room for action for people involved. It seems relevant to explain the power dynamics that lead to these ambiguous outcomes as this may help us better understand the potential for sociopolitical change towards reduced poverty and a less unequal society.

To the aim of explaining de/stabilization of power relations, intertwined with the formation of a specific sociotechnical configuration of decentralized electricity supply, I engage with philosophical writings on power as well as with discussions on power among transition scholars, and present a conceptualization that integrates a relational action-theoretical understanding of power with a relational and sociotechnical framing of constitutive power – which pays attention to interactions between humans, technology and nature. I draw on key writings in feminist political ecology (FPE) and science and technology studies (STS) in order to conceptualize the active role of technology and nature in shaping electrification processes. Also, since the ST field is home to many scholars well-oriented in system thinking and sociotechnical approaches, I will use sociotechnical system concepts and visualizations in order to communicate how and where in these complex processes that power relations are (re)produced and contested. The question of how and where de/stabilization happens is then addressed empirically and theoretically in a case study of rural electrification in Tanzania.

The article is structured as follows: In the following, a short background (Section 2) is provided to situate the theoretical discussion in the context of electricity provision in rural Tanzania. In section 3, I review what I perceive as key writings on power and situate the discussions on power in the ST field in relation to these. I also present my own conceptualization of power, tailored for the study of (shifting) power relations in local-level energy transitions. Section 4 presents the methods used and the case study follows in Section 5. The ensuing conclusion (Section 6) highlights the possible value of a relational understanding of power for transitions studies.

2. Background

The linkages between energy supply and use, poverty and gender provide a good starting point for discussing power relations and local-level energy transitions in Tanzania, given that poverty alleviation is a key goal for the Tanzanian government's efforts to provide electricity services to the entire public. This section explains the linkages between electrification, gender, poverty and social inequality, and provides an overview of the current situation for public electricity provision in Tanzania.

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