



## Micro-hydro politics: Producing and contesting community energy in the North of England



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### ABSTRACT

Analyses of the politics of energy production have traditionally focused on issues of resource extraction and large scale generation. Yet questions of politics are just as critical when it comes to considering the development of 'small' energy – variously referred to as micro-or distributed generation and frequently associated with the growing role of communities in the production of renewable energy. In this paper, we focus on a resource – a local river – to examine the ways in which a community-based project sought to produce it as a viable and legitimate source of energy production. Such an initiative, we find, is fraught with challenges. In particular, we identify three facets of the production of micro-hydro power that have been critical to its deployment and contestation. First, the means through which the hydro resource is calculated and valued. Second, the ways in which recasting the river in energy resource terms serves to challenge established notions of the river. Third, the identification of hydro power as a 'low carbon' energy resource has at once served to create new discourses about the role and responsibilities for using the river as an energy resource, whilst also calling into question its viability in the long term under conditions of climate change.

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### Introduction

One of the key contributions emerging from the renewal of social scientific interest in questions of energy has been a challenge to the assumption that energy resources are simply there to be discovered, transformed and used. Instead, drawing on the long history of studies of political ecology, researchers have interrogated the ways in which energy resources are socially and materially produced in geographically uneven ways and with significant political, economic and environmental consequences (Bridge and Wood, 2010; Bridge and Le Billon, 2012; van der Horst and Evans, 2010). Such perspectives critically illustrate how the politics and economics of energy are not confined to the ways in which such resources are shared or their externalities are distributed and contested but are integral to the means through which different resources are produced as viable forms of energy. For the most part, this research has tended to focus on the production of 'big' energy – of the mining of uranium, oil exploration, transshipment of gas, coal mining, and the development of

large scale hydropower (Bartle, 2002; Bridge, 2004a,b, 2010; Egge and Milewski, 2002; Fletcher, 2011; Gabriel et al., 2013; Koch, 2002). In this paper, we argue that attending to the politics of energy production is just as critical when it comes to considering the development of 'small' energy – variously referred to as micro-or distributed generation and frequently associated with the growing role of communities in the production of renewable energy.

Indeed, the deployment of micro-generation technologies requires that various, sometimes unlikely, materials, entities and sites are recast as containing the potential for energy production, from roofs for solar power to hillsides for wind turbines, woodlands and waste streams for biofuels, and gardens for ground-source heat pumps. In this paper, we focus on one such resource – a local river – to examine the ways in which a community-based project sought to produce it as a viable and legitimate source of energy production. Such an initiative, we find, is fraught with challenges. While a great deal of research has now been gathered that focuses on the organizational, institutional and political issues that confront the development of community-based energy projects, we suggest that including an analysis of the socio-material ways in which energy resources are produced and contested through such interventions provides additional insights into how and why such projects (fail to) realize their potential. In particular, we identify three key sources of contestation. First, the means

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through which the hydro resource is calculated and valued, which in turn shapes the nature of investment and return that are sought to make such an intervention viable. Second, the ways in which recasting the river in energy resource terms serves to challenge established notions of the river as a resource for fishing, leisure and ecology, and in so doing existing social orders and political economies. Third, the identification of hydro power as a ‘low carbon’ energy resource has at once served to create new discourses about the role and responsibilities for using the river as an energy resource, whilst also calling into question its viability in the long term under conditions of a changing climate. Using the river responsibly is no longer a clear cut matter of stewardship, or even of restoration to a previous healthy ecological condition (Eden et al., 2000), but instead requires an engagement with both social and environmental futures.

In the remainder of the paper, we first examine the key insights from existing research into the development of community energy projects, and suggest that this body of work could usefully be extended by engaging with the literature on the political and geographical nature of energy production. Second, using the case study of Hexham River Hydro, a community-based micro-hydro project in the North of England, we analyze the projects development by exploring the ways in which the processes of calculation, contestation and the continual repositioning of climate change shape both the development and ultimate demise of the scheme. Finally, we conclude by considering the key implications for community-based energy projects using micro-generation technologies.

### Producing community energy?

In many developed economies during the 1950s and 60s a centralized system for energy generation was created with limited space for localized energy generation (Graham and Marvin, 2001; van Vliet et al., 2005). Unlike some countries, where governments supported decentralized, cooperative energy development models, such ideas and approaches were an anathema to UK energy policy for most of the twentieth century (Walker, 1997). However, the introduction of new concerns about climate change and targets for the development of renewable energy, during the early 2000s a range of government supported programmes were established which led to “a surge in local project development” (Walker, 2007, 1). Policy support, innovative financial models, and the development of feed-in-tariffs have meant that community-energy projects are now a prominent and growing feature of the UK energy landscape (Adams, 2008; Walker, 2008).

Despite increasing interest and improved technologies, financing opportunities and community governance arrangements aimed at encouraging community energy projects, the literature on the emergence of community energy projects in the UK details a number of “formidable barriers” that hinder prospective schemes (Bomberg and McEwen, 2012). In particular, three related sets of issues are often identified: organizational issues, relating to the capacities and ownership of community energy projects; institutional factors, the technical, financial and legal aspects of government policy and of partnerships with non-state actors that enable and constrain community energy projects; and the politics of local energy generation schemes, contestation that is regarded as particularly acute in relation to local wind energy projects. However, to date relatively little focus has been given to the ways in which particular energy resources come to be fashioned as the subject of community intervention, and the ways in which the social, material and ecological dimensions of such resources in turn shapes the ways in which community-based energy projects come to be understood and contested. Drawing on the literature that has examined the political economy and political ecology of the

production of energy resources can, we suggest, enable us to engage with the specificities of particular projects and places, and enhance our understanding of the nature and implications of community-based energy projects more broadly.

### *Identifying the barriers to community energy generation*

A diverse range of interventions to develop renewable energy resources, or to use energy more efficiently, are termed “community” energy projects (Walker and Devine-Wright, 2008). The term is applied to a wide range of development models, from technical projects located in a local place that comes to stand for community to projects wholly owned and managed by a group who consider themselves as a community and everything between and within these categories. As Walker (2008, 4402) argues, “establishing a community energy project involves many complexities, whichever model of development is adopted”. In the face of this complexity, much of the literature has sought to understand how and why community energy projects come to be established. Issues of capacity, including a lack of expertise, knowledge or equipment (Walker, 2008), and the existence of knowledgeable local individuals with expertise (such as retired engineers, accountants, lawyers and community workers) is seen as critical in shaping the initial organization of renewable energy projects (Smith and Seyfang, 2011). Projects often need expert advice and support and learning from experience (Adams, 2008; Walker et al., 2007). The ability to sustain the level of organization achieved at the start of projects is another challenge because knowledge and skill may dissipate over time (Walker, 2008).

Research also identifies some significant technical barriers, for example: the lack of incentives for network operators to connect to small networks; the costs of trading and the difficulty of accessing green certificates; the lack of market incentives for heat production; and the challenge of setting up a local heat networks which require collective management, billing and metering that are unfamiliar in the UK context (Walker, 2008; Watson et al., 2006). These technical challenges can be complex and impact directly on the projects financial capacity. For example, barriers to market entry and network connection can mean that community projects struggle to realize the income generating potential of their project (Hain et al., 2005). In the UK, financial resources for community energy have shifted from grants and pilot projects to incentives such as Feed-in Tariffs (FITs) and the Renewable Heat Incentive (RHI) (Smith and Seyfang, 2011). Grants involved a competitive bidding process, a pre-determined level of funding (a ‘lump sum’) for a specific time period that was enough to start the process (e.g. conduct a feasibility study) but not enough to cover long term or unexpected costs. In contrast, incentives such as FITs (launched in 2010) and the non-domestic RHI scheme (launched in 2011) provide a way of generating income from energy production once the scheme is built. The shift in funding is to encourage communities to develop their own energy projects however, this presents challenges for the UK community energy sector because “co-operatives and community schemes and independent commercial developers find it harder to access finance than schemes backed by large utilities. That makes development costs higher, returns lower and puts communities and other small developers at a significant disadvantage” (Hansard, 2013). The challenge of raising funds to cover capital costs at the high risk pre-planning stage has been identified as a major constraint by a number of commentators (see Middlemass and Parrish, 2010; Walker, 2008; Jaffe and Stavins, 1995).

There are further barriers identified in terms of fostering the organizational capacity to support the development of energy projects, especially in their early stages. Further institutional challenges are shaped by the “structural resources” available to

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