



What are community energy companies trying to accomplish? An empirical investigation of investment motives in the German case



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HIGHLIGHTS

- Community energy companies form a specific part of the impact investment sector.
- Differences in the valuation of investments exist mainly regarding the return motive.
- There are significant differences between North vs South and cooperatives vs LPs.
- The return motive plays a higher role for community energy founded 2009–2011.
- These differences have to be taken into account when assessing policy changes.

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ABSTRACT

Community energy has become an increasingly important issue in academia and in energy policy circles worldwide. Citizens jointly investing in and operating renewable energy installations have played an essential role in countries such as Germany or Denmark. Building on and extending previous studies, we collect survey data on investment motives for a stratified random sample of German community energy companies. Structural variables are selected using a socio-ecological-technical systems framework. This study aims to identify differences within the community energy sector to better understand investment behaviour and the effects of policy changes. Despite the small sample coverage at the individual member level, the preliminary results of this study suggest that, first, community energy forms a specific type of social investment and that, second, there are significant differences between community energy companies, especially regarding the assessment of the return motive. This motive plays a more prominent role in limited partnerships than in cooperatives and for community wind than for companies focusing on solar or biomass. While these and other factors are highly interrelated, our data indicate that the social setting and geographical and climatic conditions are the critical ones here. These findings may guide further research.

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1. Introduction

Citizens jointly investing in and operating renewable energy installations play an essential role in some European countries, most notably Germany and Denmark (Bauwens et al., 2016; Yildiz et al., 2015). Community ownership has attracted some attention in several disciplines in academia and beyond, and as a result, it has been examined with the help of a wide range of methods and from many different theoretical perspectives (see e.g. Jeong et al., 2012; Seyfang et al., 2013) and under a plethora of different terms (Walker and Devine-Wright, 2008; Walker et al., 2010) like

community renewable energy (Ruggiero et al., 2014), local community initiatives (Schoor and Scholtens, 2015) or local citizen-led initiatives (Yalçın-Riollet et al., 2014). The positive influence of community ownership on the acceptance of projects has been an important issue in many studies (e.g. Barry and Chapman, 2009; Fast 2013; Graham and Rudolph 2014; Maruyama et al., 2007; Musall and Kuik 2011; Warren and McFadyen 2010). Despite several attempts in the literature to describe citizen organisations, this topic has not been thoroughly investigated. There are only a few studies that present quantitative empirical data on the motives of citizens who financially contribute to renewable energy installations (Bauwens, 2016; Gamel et al., 2016; Radtke, 2014; Volz, 2012, 2011). Bauwens (2016) and Gamel et al. (2016) focus on wind energy and Volz (2012, 2011) on energy cooperatives only, a sector which has developed much since Volz has conducted his survey. Radtke (2014) provides some descriptive statistics, but

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does not test for differences between groups, which is at the centre of this article.

Using a descriptive, explorative approach, this article contributes to the still fairly small body of studies on community energy investments (Dóci and Vasileiadou, 2015). The case of Germany is used here because of the relative importance of its community energy sector and its characteristic heterogeneity. According to the market research company trend: research, community-owned wind farms with different legal statuses represent an estimated 20% share of installed capacity in the onshore wind subsector (trend: research and Leuphana, 2013). Overall, the German transition process called “Energiewende” (energy transition) has been characterised by a diversity of actors building renewable power plants. This distinctive feature of the German renewable energy sector has developed through the introduction of fixed feed-in tariffs. The protection of this diversity of actors has become a political goal (see Section 2 para. 5 sentence 3 of the Renewable Energy Sources Act of 2014). Discussions about this goal had started with the reductions of feed-in tariffs for photovoltaics (PV) in 2012 and the introduction of a mandatory market-premium system in 2014. It has been intensified since because of the proposed change from feed-in tariffs to a tender-based system (Hauser et al., 2014; Leuphana and Nestle, 2014). There is a considerable concern that an increasing professionalisation and the related decrease in involvement of the community will lead to a lower social acceptance of these kinds of projects. Therefore, people have sought to protect community initiatives against policy changes, e.g. through exemption clauses. However, the argumentation is usually based on the assumption that the different community energy investors behave in the same or in a similar way. Identifying patterns, i.e., differences between groups of community energy companies, can be a first step to better understand investment behaviour in this subsector and reactions to policy changes.

Also drawing on the insights of environmental psychology and the literature on investment motives, this article addresses the question of how community energy in Germany can be systematised with regard to the investment motives of members. For the selection of differentiators at firm level and the description of respective results, we use a socio-ecological-technical system (SETS) framework (Cayford and Scholten, 2014; McGinnis and Ostrom, 2014). The Socio-Ecological Systems framework (Ostrom, 2005; Poteete et al., 2010) – and, as an offset, also SETS – is an established framework for describing and analysing institutional diversity related to human-ecological and technical systems. The use of an established framework may help to compare results from different countries and disciplinary perspectives at a later stage.

The remainder of this article is structured as follows: after a short description of the methodology, the results of our survey and data analysis are presented. A discussion of the findings follows. The paper ends with some concluding remarks concerning the implications of these findings for energy policy and further research.

2. Methods

2.1. Hypotheses

Since the study aims to categorise community energy companies by investment motives of their members, we divided the sample into groups according to four structural variables. The outcome is used as an expression of what these organisations are supposed to accomplish. Two individual member characteristics were added to this set of variables mainly on methodological grounds (see below). We tested whether differences in the scores

for investment motives between groups with different values for the respective attribute are statistically significant. By doing so, we aimed to identify patterns in the German community energy sector. In a three-steps process, hypotheses were developed.

The first step was to identify potential motives. Drawing on the literature on community energy (Bomberg and McEwen, 2012; Boon and Dieperink, 2014; Radtke, 2014; Rogers et al., 2008, 2012; Schweizer-Ries et al., 2010; Volz, 2012; Walker, 2008; see also Dóci and Vasileiadou, 2015), we identified seven motives:

- return motive (i.e., the expectation to receive return on investment),
- energy supply motive (i.e., the goal to secure supply of electricity or heat from local or own sources),
- generation of regional added value (i.e., the aim to keep benefits in the region),
- nature conservation (i.e., the ambition to protect the environment, including climate change considerations),
- advancing the energy transition in Germany (i.e., the goal to support this political project),
- participating in the production of electricity or heat (i.e., actively taking part in the generation of electricity or heat), and
- being a member of the community (i.e., the identification with the neighbourhood through joint investment).

Considering some of these motives, we take findings from the fields of environmental psychology and political science into account, which both emphasise that motives are not only tied to material benefits and also include hedonistic and normative goals including the desire to influence policy outcomes (Lindenberg and Steg, 2007; Verba et al., 1995).

The second step was to identify the distinct structural aspects of the community energy companies included in the sample. SETS research posits that there are six first-tier contextual components that need to be considered when analysing institutional diversity: the technological system; technical units; governance system; actors; social, economic and political settings; and the related ecosystems. Applying this framework, we operationalised the contextual factors by using four measurable indicators for which data were available: The legal status frames property rights, operational and collective-choice rules within the organisation and therefore is a vital element of the governance system. The technological system differs between the cases with regard to the technology used in the projects. Social, economic and political settings change with location (here: the region where community energy companies are located) and year of formation. Location is also an indicator of the geographical conditions and hence the related ecosystem. The four structural characteristics are not independent of one another, but highly interrelated. Therefore, we tested them separately. In addition, two individual member level characteristics, investment sum and type of the member, are used mainly on methodological grounds (see discussion in Section 3.1): The former variable is highly correlated with the structural variables mentioned above. Therefore, it is included to analyse these interrelations. The type of stakeholder (with/without managerial function) is included to adjust for potential biases due to the disproportionately high number of officeholders in the sample.

In a third step, we related the seven investment motives to the values of the contextual variables and formulated the following alternative hypotheses to be tested:

- Hypothesis 1: Scores attached to investment motive differ between investment classes. More specifically, the higher the amount invested in the community energy company, the higher the weight placed on the return motive.

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