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Involvement in bottom-up energy transitions

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INTRODUCTION

Two of the main challenges facing humankind in the current century are energy insecurity and climate change (IPCC, 2018). It is widely recognized that a shift needs to be made towards low-carbon energy alternatives such as solar or wind energy and to reduce the use of non-renewable energy sources (Mulugetta, Jackson, & Van der Horst, 2010). However, international negotiations about climate change and mitigation can be slow and ineffective. There is increasingly societal disenchantment with top down approaches fighting for climate change due to the political bungling associated with the drawing up or renewal of (inter)national climate treaties (e.g., Kyoto, Copenhagen, Madrid). In addition, “both states and markets are constrained by the infrastructural and economic path dependency of large fossil energy systems” (Oteman, Wiering, & Helderma, 2014, p. 2). In response, increasing attention is being paid by citizens, scientists, and policy makers to the roles that different actors at different levels of society, such as individuals, households, communities and business organizations, can play in addressing environmental challenges. Especially, there is increased interest in the potential of local communities to be involved in, initiate, and run their own energy saving and production programs as a means to promoting a sustainable energy transition (IPCC, 2018; Middlemiss & Parrish, 2010).

From a cultural theory perspective (Thompson, Ellis, & Wildavsky, 1990), the increased emphasis on communities not necessarily seems to fit within modern individualistic society. Yet, it can be seen as part of a wider shift in policymaking in many Western countries from top-down structures towards a polycentric regime in which organizations and institutions at various levels of society are involved (E. Ostrom, 2012; V. Ostrom, Tiebout, & Warren, 1961). Governments increasingly put emphasis on the responsibility of actors beyond the state to govern various domains of life (Clarke, 2005, 2013; Ilcan & Basok, 2004; Seyfang & Haxeltine, 2012). This is reflected by for example the “Big Society” in the United Kingdom where the central government increasingly aims to transfer power to local levels of government and communities (Strachan, Cowell, Ellis, Sherry-Brennan, & Toke, 2015) or the “Participation Society” in the Netherlands (Putters, 2014). The role of citizens is hereby changing from merely receiving services provided by the state to one in which they are playing an active role in shaping such services (Wittmayer, Avelino, Van Steenberg, & Looibach, 2017). In response, community initiatives are increasingly set up providing health services, contributing to local safety and welfare, engaging in water management, and producing and fostering the use of sustainable energy to help addressing environmental challenges (Bauwens, Gotchev, & Holstenkamp, 2015; De Moor, 2015; Duijn, Van Buuren, Edelenbos, Van Popering-Verkerk, & Van Meerkerk, 2019; Dunlap & Brulle, 2015; Magnani & Osti, 2016; Van Der Schoor & Scholtens, 2015).

In recent years many community energy initiatives (CEIs hereafter) have emerged throughout Western Europe (Bauwens et al., 2015; Magnani & Osti, 2016; Van Der Schoor & Scholtens, 2015). Currently, there are over 1500 up and running renewable energy initiatives in Europe, with more than one million members in total (REScoop.eu, 2019). While CEIs potentially foster involvement in the sustainable energy transition and contribute to pro-environmental behavioral change (Heiskanen, Johnson, Robinson, Vadovics, & Saastamoinen, 2010; Middlemiss, 2011), it remains unclear why people become involved in these initiatives.

Both theoretical and empirical insights highlight the idea of the local community and the social interactions that reside within it as key in promoting involvement as these initiatives operate within the context of a local community (Rees & Bamberg, 2014) and pro-environmental behaviors more generally are embedded in social relations (Axsen & Kurani, 2012; T. Jackson, 2005). However, little is known yet about the role local social embeddedness, such as the interpersonal relations within the community, community member's social networks and various forms of trust, play for involvement in CEIs. Furthermore, we know little about the mechanisms through which such factors may affect involvement in CEIs. Shedding more light on these questions is one of the main aims of this thesis. By doing so, we focus on the community members living in the communities in which an initiative had recently been initiated, taking both potential members and non-members into account.

In addition, while the number of initiatives increased substantially over the past years, the evidence base for the role of community energy in the energy transition has been fragmented (Seyfang et al., 2013). In response to this, there is an international trend to encourage the shared ownership of renewable energy projects between communities and private companies. For example, in Denmark, the Danish Renewable Energy Act (2009) obligates wind energy developers to share 20% of the value of their projects with local communities living within 4.5 km of the site (Bauwens et al., 2015). Private companies are often better able to deliver large-scale energy projects (e.g. onshore wind farms) by spreading financial risk and easing the organizational burden for communities (Haggett, Creamer, Harnmeijer, Parsons, & Bomberg, 2013). Yet, shared ownership presumes that company and community actors have common goals, can form effective partnerships and negotiate fair outcomes. However, despite this trend, there is a surprising dearth of research on such arrangements (Slee, 2015) and especially the role of trust and justice in shaping practice.

Therefore, to complement the analysis on the role of local social embeddedness and its potential for involvement, in this thesis we additionally investigate the potential of shared ownership arrangements. Importantly, while many studies have focused on the views and experiences of one type of actor (Burningham, Barnett, & Walker, 2015; Seyfang et al., 2013), we take the views of both communities, developers, and intermediaries into account gaining a more comprehensive picture.

Thus, the aim of this thesis is twofold: (I) understanding the role of local social embeddedness for involvement of community members in CEIs and (II) examining how and when shared ownership arrangements between communities and commercial developers take shape in practice. By doing so, next to scientific contributions, we additionally hope to provide insights useful for (initiators of) CEIs, project developers, policy makers, and other stakeholders involved.

The structure of this chapter is as follows. Section 1.1 gives the background and scope of this thesis. The concept of community energy is introduced, after which subsequently a collective action perspective on CEIs is set out, theoretical approaches to studying community energy are discussed and which questions remain for involvement in CEIs. Section 1.2 then introduces our theoretical focus for studying involvement in CEIs, after which in section 1.3 the concept of shared ownership is addressed. In Section 1.4 the overarching research questions are given, followed by section 1.5, providing an overview of the empirical chapters. In section 1.6 the data collected for this thesis is discussed and lastly section 1.7 shows a schematic overview of the chapters.

1.1 Background and scope

1.1.1 Community Energy

Community energy is a contested term as there is a persistent ambiguity of what it means (Walker, 2011; Walker & Devine-Wright, 2008). CEIs can also differ substantially, for example in terms of their governance structure and technology use (Boon & Dieperink, 2014). One important distinction can be made between ‘communities of place’, defined by geographical location, and ‘communities of interest’, defined by some common bond or entity (Gilchreist, 2000). In this thesis the focus is predominantly on CEIs defined as bottom-up initiatives led by citizens who engage in the generation or facilitation of sustainable energy and/or sustainable practices on a local basis (Bauwens, 2016; Seyfang et al., 2013; Walker & Devine-Wright, 2008). The term community refers here to communities of place, since the initiatives being studied are emerging in local communities and often limited to a certain geographically defined area such as a village or a neighborhood. Importantly, when referring to community members, the focus is on residents of the community of place in which an initiative is embedded.

Two key dimensions of community energy are the process dimension (whom the project is run by) and the outcome dimension (whom the project is run for) (Walker & Devine-Wright, 2008). Usually, CEIs are set up and organized by volunteers, one or more community members, the so-called initiators. As such, CEIs differ from top-down approaches such as environmental policies implemented by a government (Igalla, Edelenbos, & van Meerkerk, 2019). When it comes to the outcome dimensions, the aims of CEIs often go beyond mere environmental goals (Hinshelwood, 2003; J. C. Rogers, Simmons, Convery, & Weatherall, 2008; Walker, Hunter, Devine-Wright, Evans, & Fay, 2007; Walker, 2011), additionally aiming at contributing to the local community. This reflects the collective action nature of CEIs.

1.1.2 Community energy as collective action

The problem of climate change creates a social dilemma. This is a situation in which an individual makes an independent choice in an interdependent situation, leading to behavior that is beneficial for one individual but by which everyone is worse off (Kollock, 1998). Environmental benefits are shared by all individuals, the possibility of positively influencing the climate is virtually zero for any given individual, and many recommended behaviors impose relatively high costs on individuals (Lubell, Vedlitz, Zahran, & Alston, 2006; Olson, 1965). This makes it tempting to free-ride on the efforts of others (G. Hardin, 1968; Olson, 1965). However, many studies have shown that next to more traditional solutions like state regulation or privatization, people can overcome social dilemmas and self-organize to solve collective good problems (E. Ostrom, 2000; Poteete, Janssen, & Ostrom, 2010). Especially since collective action problems faced by large groups, such as climate mitigation, are often decomposable into social dilemmas at a smaller scale and smaller groups are usually more conducive to collective action (E. Ostrom, 2012).

Yet, even in smaller groups, collective actions may not always reach optimal levels of contributions leading to an undersupply of pro-environmental action (or oversupply of environmental harms) (G. Hardin, 1968). Successful collective action requires the cooperation of at least a substantial fraction of community members. CEIs are no different in this respect.

They do differ in the sense that while pure collective goods are both non-rivalrous (jointness of supply) and non-excludable, CEIs can be seen as impure collective goods providing both private, individual benefits, and collective benefits for the community and society at large (e.g., Bauwens, 2017).

Private benefits include a return on investment or green electricity at a lower price, saved energy costs via for example low-carbon energy applications, or increased real-estate value. These benefits are exclusively enjoyed by the members of the CEI. Collective benefits are multi-layered, including contributing to a better environment on a local, societal, and world scale by fostering individual behavioral change (Heiskanen et al., 2010; Middlemiss, 2011). CEIs additionally often aim to contribute to the economic development of the local area (Hoffman & High-Pippert, 2010; J. C. Rogers, Simmons, Convery, & Weatherall, 2012), for example through the hiring of local contractors or merchants and feeding eventual profits back into other community projects and facilities like community centers. This is often the case in areas facing outmigration of young people and cuts in public funding. Furthermore, CEIs potentially contribute to local social cohesion (Bomberg & McEwen, 2012; Boon & Dieperink, 2014; Dóci & Vasileiadou, 2015; Hoffman & High-Pippert, 2010; J. C. Rogers et al., 2008; Seyfang et al., 2013; Van Der Schoor & Scholtens, 2015), and enhance local and national resource independence (Seyfang, Hielscher, Hargreaves, Martiskainen, & Smith, 2014; Seyfang & Haxeltine, 2012; Sokona, Mulugetta, & Gujba, 2012). These benefits exist for members of CEIs as well as non-members. This non-excludability of benefits makes the problem of collective action, especially in the start-up phase of project development, one of the main potential barriers for CEIs. Finding the right institutional and social conditions to facilitate this is thus crucial.

1.1.3 Current approaches to studying community energy

CEIs operate in a larger institutional context of energy laws, planning procedures, available subsidies, and market developments. Such factors set the institutional pre-conditions of initiatives regarding what is legally possible and what is profitable (Oteman et al., 2014; Oteman, Kooij, & Wiering, 2017). Predominantly, scholars studying community energy focus on this institutional context, using a transition perspective (Dóci & Vasileiadou, 2015; Hielscher, Seyfang, & Smith, 2013; Ruggiero, Martiskainen, & Onkila, 2018; Seyfang et al., 2014; Seyfang & Haxeltine, 2012; Seyfang & Smith, 2007). A transition perspective entails “an interdisciplinary research field focused on structural change in societal systems” (Wittmayer et al., 2017, p. 46) with a focus on socio-technical innovations (e.g. Geels, 2002; Rotmans & Loorbach, 2009). One of the dominant frameworks is the MLP perspective, understanding transitions “as outcomes of alignments between developments at multiple levels [of society]” (Geels & Schot, 2007, p. 399). These levels of society refer to respectively; technological niche innovations, socio-technical regimes, and the macro-level landscape (Geels, 2004). This work has greatly contributed to our understanding of community energy within the broader context of energy transitions.

However, the focus of the transition perspective has been pre-dominantly on project initiators (Wittmayer et al., 2017). Various studies have argued for, or provided evidence of, the importance of such committed volunteers contributing to the success of CEIs (Bomberg & McEwen, 2012; Chmutina & Goodier, 2014; Hoppe, Graf, Warbroek, Lammers, & Lepping, 2015;

Martiskainen, 2017; Oteman et al., 2014; Seyfang & Smith, 2007; Van Der Schoor & Scholtens, 2015; Walker, 2008). Yet, the existence of a group of highly motivated and resourceful initiators is no guarantee of the success of a CEI (Haggett et al., 2013). Success additionally requires attracting a sufficient number of community members to become involved. Less attention has been paid to the question why community members become involved. This thesis contributes to addressing this question by investigating which micro-level factors explain involvement in CEIs, while acknowledging that these micro factors reside within, are influenced by and in turn influence the macro context of national policies and institutions (Dunlap & Brulle, 2015; Walker, Devine-Wright, & Barnett, 2014).

1.1.4 Participation in Community Energy Initiatives

Involvement in a CEI can be seen as a more general type of pro-environmental behavior (Kalkbrenner & Roosen, 2016; Stern, 2000). As such, the determinants of a person's willingness to participate in CEIs are often studied by focusing on individual characteristics such as personal pro-environmental motivations and the endorsement of strong environmental values (Dóci & Vasileiadou, 2015; Perlaviciute & Steg, 2014; Sloot, Jans, & Steg, 2018; Stern, 2000). Such individual characteristics may be reflected in more general motivations to protect the environment and act in an environmentally friendly way (e.g., biospheric values or environmental self-identity; van der Werff & Steg, 2016). People may additionally engage in CEIs for reasons of self-interest (Dietz, 2015 b) such as gaining financial benefits. Indeed, some studies found economic return on investment to be a (self-reported) driver for involvement in CEIs (Bauwens, 2019; Dóci & Vasileiadou, 2015). However, Sloot et al., (2019) found that environmental motives were more consistently related to initiative involvement compared to financial motives.

Yet, merely focusing on personal motivations does not do justice to the collective nature of CEIs (Bauwens, 2017; Bell, Gray, & Haggett, 2005; Brewer & Stern, 2005; Hoffman & High-Pippert, 2010; Kalkbrenner & Roosen, 2016) and fails to unravel the working of social mechanisms related to involvement in CEIs. CEIs entail local collaboration towards achieving a common goal (Rees & Bamberg, 2014) and the adoption and diffusion of pro-environmental behaviors depends on both individual characteristics and interpersonal relations (see Axsen & Kurani, 2012 for an overview on interpersonal influence; Hopper & Nielsen, 1991; Weenig & Midden, 1991).

The importance of local social capital for the realization of renewable energy projects more generally has been highlighted by several scholars (Bock, Polach, Kunze, Maaß, & Grundmann, 2015; Sperling, 2017; Walker, Devine-Wright, Hunter, High, & Evans, 2010). Social capital is defined by Putnam (1993, p. 167) as 'features of social organization, such as trust, norms, and networks, that can improve the efficiency of society by facilitating coordinated actions'. While the term is contested, it usually entails some notion of both structural and cultural elements (e.g., Coffé & Geys, 2005; Hooghe & Stolle, 2003; Sabatini, 2009). The structural component refers to social networks and interpersonal relations (Pichler & Wallace, 2007). The cultural component usually refers to interpersonal trust and norms of reciprocity. It are exactly these features which arguably make CEIs conducive to collective action and promising with regard to involvement. However, despite this general emphasis on the "social dimension" of CEIs, there is a lack of analytical scrutiny to support claims about whether this actually fosters involvement in CEIs on a micro-level and to explain the social mechanisms

underlying them.

This thesis hereby contributes to the growing body of work within the domain of CEIs examining social factors in relation to involvement (Bauwens, 2016, 2019; Bomberg & McEwen, 2012; Boon & Dieperink, 2014; Haggett et al., 2013; Hoffman & High-Pippert, 2010; Kalkbrenner & Roosen, 2016; Koirala, Araghi, Kroesen, Ghorbani, Hakvoort, & Herder, 2018). These studies generally focus on the CEI initiators, assessing in retrospect what motivated them to take the lead and what contributed to the success of the initiative (e.g., Boon & Dieperink, 2014; Haggett et al., 2013; Seyfang & Haxeltine, 2012). Next to the danger of introducing a hindsight bias, merely including the initiators of CEIs is problematic since we do not know whether results actually apply to inhabitants of the community at large. Furthermore, the lion's share of empirical research examining people's motivations to become involved in CEI's relies on qualitative data with small samples of participants (e.g. Bomberg & McEwen, 2012; Dóci & Vasileiadou, 2015). Or, when analyzed quantitatively, the focus has been on intentions to participate in hypothetical projects among the general population rather than on motivations of (potential) participation in an actual CEI in the own community in which participation is a real option (Kalkbrenner & Roosen, 2016; Koirala et al., 2018; Rees & Bamberg, 2014) or merely on members (Bauwens, 2019; Hoffman & High-Pippert, 2010). Finally, previous studies conceptualized social factors often quite broadly or specified it mainly as community identification.

Moving this field forward, this thesis this thesis takes a community-relational approach, disentangling the constituent concepts of the social dimension of CEIs, and, crucially, actually scrutinizing the interpersonal relations of community members, as discussed below. Importantly, data was collected among community members living in communities in which an actual CEI had recently been instigated, making it a real-life option to participate. Furthermore, data was collected in the start-up phase of the initiative, circumventing possible hindsight bias from respondents (see section 1.6 for more details about the data).

1.2 A community-relational perspective on involvement

A community-relational perspective on studying involvement in CEIs recognizes the social embeddedness of environmentally behavior (e.g., T. Jackson, 2005). It acknowledges that decisions are not made in a social void and emphasizes that CEIs operate in local communities and the social interactions that reside within it, which may affect whether community members become involved in a CEI. Thus, we incorporate an "actor in context" approach, indicating that societal outcomes can be explained from assumptions about individual behavior in their social context (Flache & Dijkstra, 2015; Hedström & Bearman, 2009). Such an approach stresses that social factors are explicable "in terms of individuals, their properties, action, and relations to on another" (Hedström & Bearman, 2009, p. 6). As such, this approach includes, but is not limited to, (bounded) rationality approaches to collective action. We adopt the view that people generally do not behave as purely rational actors but as conditional cooperators (while acknowledging strategic behavior like opportunism is never completely absent) (Fischbacher, Gächter, & Fehr, 2001). This means they cooperate, when certain specific conditions are met. It is to these conditions to which we now turn.

First, perceptions of what motivates relevant others can influence individuals' thoughts,

feelings, or actions (Cialdini, Reno, & Kallgren, 1990; Dunlap & Brulle, 2015; Peattie, 2010; J.C. Turner, 1991) which may influence whether someone becomes involved in a CEI. Since people are part of their local community, the perception of their community to be motivated to engage in sustainable energy behavior (Dietz & Whitley, 2018) seems of particular importance for involvement. Furthermore, the importance of such perceptions for involvement, likely depend on the embeddedness of community members within their local community (cf. Fritsche, Barth, Jugert, Masson, & Reese, 2018). Such local embeddedness may be reflected by the level of identification with the community (how much they feel attached to their community) and the actual engagement in interpersonal contact with other community members (Deaux & Martin. Daniela, 2003; Stets & Burke, 2000). We propose that both identification with the community and interpersonal contact between community members (uniquely) increase the likelihood that people become involved in a community energy initiative and additionally are likely to promote the extent to which one acts in line with what one thinks the community finds important. We test these hypotheses in Chapter 2.

Second, involvement may depend on *which* interpersonal relations are taken into account. Social movement research consistently shows that direct social relations of potential participants with those already mobilized are of crucial importance for movement success (e.g., McAdam & Diani, 2003). However, relatively little attention has been paid to the interactions between initiators of CEIs and the local community in which they are embedded. To study such interactions, we use a social network approach. By doing so, we go beyond research addressing the existence of a direct tie from an initiator to a participant, and additionally examine *which* ties matter, if any. For example, while weak ties may generally matter for the diffusion of information and technological innovations (E. M. Rogers, 2003), or the coordination of collective action (Macy, 1990), strong ties provide trust, and social support and can be used to impose social pressure (McAdam, 1986; McAdam & Paulsen, 1993; Passy, 2003). Furthermore, people can be indirectly linked to an initiator via a shared membership of an organization within the community, referred to as an “extended tie”. In addition, we propose the number of ties matters, since individuals are more likely to adopt a new behavior when they have higher network exposure to it (Valente, 2010). The relative empirical neglect in earlier research of the structural position of, and relational ties to, initiators is mainly due to the fact that collecting complete social network data (i.e., accounting for every link among all individuals in a social system) is infeasible in many real-life communities.

In this thesis we propose an alternative approach to investigating the role of direct and extended ties between community members and initiators that allows for scrutinizing strong and weak direct ties, as well as extended ties. Our effort to map extended ties leverages the fact that people usually do not randomly meet each other. Through their memberships in formal and informal associations in the community (sometimes referred to as foci), individuals are embedded in many associational networks (Feld, 1981; McAdam & Paulsen, 1993) which can be used to map the wider community social structure. In turn, these networks can be used to investigate whether the connectedness of community members with initiators contributes to their decision to get involved in a CEI, to be tested in chapter 3.

Third, for collective action problems to be addressed, especially the trust that resides within social relations is hypothesized to be of importance. Indeed, trust has been shown to be important for the success of CEIs (Haggett et al., 2013; Seyfang & Smith, 2007; Sovacool,

2014; Walker et al., 2010; Wüstenhagen, Wolsink, & Burer, 2007). Yet, despite the emphasis on trust in the literature, micro-level quantitative evidence that trust induces people to contribute to CEIs is scarce. Especially, different forms of trust can be related differently to initiative involvement. CEIs interact with actors at different societal levels such as (national or regional) governments, local municipalities, energy companies, NGO's, and community associations. This multilayered social environment renders both interpersonal trust (between people) and institutional trust potentially important for CEIs (Walker et al., 2010). It is not self-evident that trust in these distinct actors at different levels would have similar implications for participation in CEIs. While trust in neighbors might increase CEI participation, many CEIs are set up in response to the perceived under-provision of societal needs by governments such as sustainable energy solutions. Thus, it may actually be a lack of institutional trust that mobilizes people for collective action in a CEI (Greenberg, Dyen, & Elliott, 2013). Furthermore, we examine the social mechanisms underlying the trust – participation link. Theoretically, trust is hypothesized to impact cooperation mainly because it raises *expectations* that other people will also contribute to the collective action (Ostrom, 1998; Sønderskov, 2008). Consequently, participation may not merely hinge on general trust, but on the specific expectations that others will cooperate as well (Axelrod & Hamilton, 1981; Bettencourt, Brewer, Croak, & Miller, 1992; Kollock, 1994; Lubell, 2004; Oliver, 1984; E. Ostrom & Walker, 2003). We test these propositions in Chapter 4.

1.3 Shared Ownership Arrangements

Even if CEIs overcome the barriers associated with collective action, they often remain relatively small in scale partly exactly due to their localness, reliance upon unpaid volunteers, the complexity of funding (Seyfang et al., 2013), and installation, legal and operational arrangements that need to be put in place (Walker & Devine-Wright, 2008). By contrast, private companies are usually better equipped to deliver (large-scale) energy projects, because they can spread financial risk. Yet, private projects can generate significant negative local environmental impacts. This often leads to local opposition dubbed 'NIMBYism' (Not In My Back Yard, Dear, 1992). In light of these problems there is an international trend to encourage the shared ownership of renewable energy projects between community actors and private companies. This raises questions concerning the organization of such shared ownership arrangements and possibilities for mutual reinforcement.

Shared ownership presumes that company and community actors have common goals, can form effective partnerships, and negotiate fair outcomes. However, community energy is often founded upon certain values that are distinct from commercial projects: work conducted voluntarily, driven by environmental and social concerns, maximizing local participation, and based on collective benefit sharing (Hargreaves, Hielscher, Seyfang, & Smith, 2013; Hielscher et al., 2013; Walker & Devine-Wright, 2008). This points to potential difficulties for both parties to build sustainable cooperative relations and high transaction costs of doing so (cf. Williamson, 1979). Such costs include collecting information and the negotiation and monitoring of contracts between parties (Vatn, 2005). Theoretically, the trust that may (or may not) exist between different actors or is built over time, the expectations that each party has of the other (Walker et al., 2014), the values that they hold (Hargreaves et al., 2013) and the

perceived justice (Bickerstaff, Walker, & Bulkeley, 2013) of such arrangements are expected to be of importance for shared ownership to be successful in practice. For example, trust may reduce the transaction costs and hereby increase cooperation between involved parties (Dyer & Chu, 2003). Since it is an understudied topic, we put emphasis on the meaning and discourse of stakeholders involved, examined in chapter 5.

1.4 Research Questions

In short, this thesis tackles the following two overarching research question(s):

- I. To what extent is involvement in community energy initiatives by community members related to community-relational factors such as their involvement in the community, social networks, and various forms of trust?
- II. How are shared ownership arrangements perceived by communities, commercial developers, and intermediary actors and how does this potentially affect how such arrangements are formed?

1.5 Outline of the chapters

This thesis addresses these research questions in four empirical chapters. Below we give an overview and discuss the specifics of each chapter (see section 1.7, Table 1.2 for a graphical overview of the different chapters). The empirical research of chapters 2-4 is based on (subsamples of) a field study in 10 local communities in the Netherlands conducted for this dissertation, in which a CEI had recently been instigated using a mixed methods approach, will be outlined in section 1.6. Due to this fact, some degree of overlap and repetition between the chapters with regard to the details of the data cannot be avoided. For chapter 5 we draw on qualitative data from in-depth interviews with 19 UK stakeholders from industry, community, and advisory backgrounds which will be extensively discussed in the methods section of chapter 5 and will thus not be further discussed in this introductory chapter.

In **chapter 2** we examine the potential of community factors in motivating involvement in CEIs. More specifically, we take into account people's perception of the extent to which their community is motivated to engage in sustainable energy behavior and two indicators of involvement in the community; their identification with the community and their interpersonal relations with other community members. Next to assessing the unique relation of identification with the community and interpersonal contact with involvement in a CEI, we further investigate whether people's community involvement strengthens the relationship between the extent to which people perceive their community to be motivated to engage in pro-environmental behavior and initiative involvement.

Chapter 3 examines the role of social networks in influencing individuals' decisions concerning participation in a CEI, by incorporating different types of social contact community members have with CEI initiators. Importantly, we investigate the strength and number of ties between community members and initiators. Furthermore, it is tested whether extended ties via other affiliations within the community are related to involvement, especially when

combined with direct ties to the initiators.

In **chapter 4** the role of trust is examined, taking both community members and initiators into account using a mixed methods approach. We assess whether interpersonal trust between community members and institutional trust (in both state and local level institutions) is associated with involvement in CEIs. In addition, we examine the social mechanisms underlying the trust – participation link by testing whether trust impacts cooperation because it raises *expectations* that other people will also contribute to the CEI.

In **chapter 5**, the shared ownership of renewable energy projects is studied, involving a legal arrangement between local communities and commercial developers. Here, we shift our focus from the individual perspective of community members to a wider outlook including the views of community actors, industry, and intermediaries, examining the role of trust and justice in shaping practice.

1.6 Research design and data

1.6.1 Field setting and rationale

The aim of the data collection for chapters 2-4 was to gain insight in involvement in CEIs. We extend previous research by looking at community members facing the real choice to become involved in a new CEI, taking both potential members and non-members into account. Furthermore, these initiatives were in early stages of project development at the time of data collection instead of already being formally registered. Hereby we circumvented a bias towards more established and thus already successful initiatives and the communities in which they are initiated.

The field study took place in 10 local communities in the northern part of the Netherlands. Communities varied in their location (villages or city neighborhoods), their size, housing stock, and had on average 1130 inhabitants (ranging from 240 to 2200). The Netherlands has a tradition of collective wind energy initiatives since the privatization of the energy supply in the late 1980s (Oteman et al., 2014). Yet, community energy based on local ownership and involvement are not as embedded in the institutional system compared to countries like Germany and Denmark (Oteman et al., 2014). The rapid increase in volume from 2008 onwards, with currently over 582 local renewable energy projects up and running (Schwencke, 2019), makes the Netherlands a particularly interesting place to conduct our study on involvement in such bottom-up collective actions.

All of the initiatives studied were initiated by a small group of community members varying from 5 to 11 in size, aiming to make their local community energy neutral within the next ten years. They were supported by the Dutch foundation *Stichting Samen Energieneutraal* (translated: Together Towards Energy Neutrality, see Appendix 1 for method and vision) which provided advice and functioned as an umbrella network organization. The initiatives followed different strategies to achieve this goal or aimed to do so, for example raising awareness regarding energy saving and renewable energy alternatives such as the installation of smart meters and thermal insulation, offering schemes for the collective purchase of solar cells, generating renewable energy via collective PV solar installations.

Notably, since people could not formally sign up as initiative members yet, we examined

two indicators of CEI involvement, namely people's willingness to participate in the initiative (in terms of volunteering for and financially investing in the initiative¹) and their actual attendance of an initiative meeting. Of course, willingness to participate reflects an early stage in one's decision process to participate in a CEI in the future and people may not follow up on their expressed willingness (cf. Kollmuss & Agyeman, 2002). Therefore, initiative meeting attendance complements our measurement of initiative involvement by capturing the actual (self-reported) behavior of attending an initiative meeting. By using these different indicators we take a more comprehensive view compared to focusing merely on one single outcome indicator.

1.6.2 Quantitative sample

Data were collected via self-administered questionnaires between 2015 and 2018, after a first meeting had been organized by the initiators to inform community members about the CEI. Ethical approval was provided by the Ethics Committee of the Heymans Institute (ECP) of the University of Groningen. All respondents were asked for active consent. We pilot tested the core questions asked in the questionnaire and the data collection procedure in one community prior to the data collection.

Distribution of the survey

First, an information letter about the upcoming study was sent to community members, additionally containing a short initial survey including a request for participation in the main questionnaire accompanied by a prepaid response envelope. We asked one adult resident per household² to fill out the survey and indicate whether they were willing to participate in the study, and send it back to us. People could indicate whether they would like to receive an email with a link to an online questionnaire or request a paper version of the questionnaire that would be sent to them via regular mail; in this case, they needed to fill out their address details. Online data for the main questionnaire were collected using the survey software Qualtrics. In addition, main questionnaires were delivered door-to-door to a random sample of initially approached households who had not responded to our first request for participation. The contact details of the participants were always kept separate from the actual survey data, so that anonymity of the data was ensured. All main questionnaires were distributed between 3 to 5 months after the initial request and short survey. This difference in timing was mainly due to school holidays. Reminders were sent two weeks after distributing the main questionnaires. Before filling out the main questionnaire, participants were asked to sign an informed consent form (all original questionnaires in Dutch are available upon request). In the first three communities, a short follow-up questionnaire was sent shortly after participants had filled out the main questionnaire, containing additional concepts deemed relevant for this

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1. Within Dutch cooperatives a distinction can be made between becoming a member of the initiative in the sense of merely paying an annual membership fee and having legal influence over the decision-making process of the CEI by voting, or actually getting energy supplied from the CEI. In this thesis no such difference is made since we measured willingness to participate before the initiative had been formalized, making such distinction less relevant. Additionally, in reality they mostly have been found to overlap.
 2. For simplicity, we treat a household within a community as one single decision maker, acknowledging that community members living within a household do not necessarily hold the same views and act similarly.

thesis. We asked for the same person to complete this follow-up questionnaire. Households were only re-approached if they had indicated on the main questionnaire to be willing to be involved in any follow-up questionnaires.

Response

In total, 11302 households were approached for the short initial survey of which 1881 indicated to be willing to participate in the main questionnaire (1266 online and 713 on paper). The number of households selected for the door-to-door sample depended on the size of the community. Given the available resources, in smaller communities (<500 households) we conducted 50 follow-up visits and 100 in larger communities (>500 households), resulting in 800 door-to-door follow-up visits. Thus, the total number of households approached for the main questionnaire, including door-to-door, was 2581 of which 967 completed the main questionnaire (response rate for the main questionnaire of 37% of those indicating their willingness to complete the main questionnaire, ranging from 26% to 49% across communities). In the first three communities all but 19 respondents indicated to be willing to complete the follow-up questionnaire. We additionally re-invited 311 respondents who did not respond to the initial questionnaire, of which 69 completed a questionnaire (response rate of 22%). We removed respondents who did not give active informed consent and respondents who had missing values on more than 90% of the variables resulting in a final dataset containing a sample of 742 respondents (final response rate of 29%, ranging from 26% to 45% across communities). Of these respondents 56% filled out a questionnaire online, 29% on paper via mail and 15% on paper door-to-door.

Sample

As can be seen from table 1.1, in the total sample of community members 59% of the respondents were male and 41% female, with a mean age of 58.3 ($SD = 14.1$). Most respondents had either completed secondary vocational education or training (33%) or higher education (57%). The median household income level was 2000-2999 euros net per month (ranging from less than a 1000 euros net per month to 4000 or more). Almost all respondents indicated to be home-owners (87%). Most respondents lived together with their partner (44%), with some living with partner and children (27%) or alone (26%). Finally, most respondents were either employed (50%) or retired (34%) at the time of data collection.

Initiators differed on many characteristics from community members, in line with theory stating that CEIs are frequently led by small groups of highly committed and resourceful individuals (Aiken, 2012; Barr & Devine-Wright, 2012; DuPuis & Goodman, 2005) who tend to be older, highly educated males (Van Der Schoor & Scholtens, 2015; Van Veelen, 2018; Warbroek, Hoppe, Bressers, & Coenen, 2019), although there do not seem to be any substantial age differences in our sample (see Table 1.1).

We additionally examined the socio-demographic characteristics for the different modes of data collection (online respondents, the paper-pencil respondents, and the total sample; see Appendix 2) and, to assess the representativeness of our data, we analyzed the demographic characteristics of the sample in comparison with the Dutch population on a number of background characteristics. In 2018 the mean age among the Dutch population was 42 (CBS, 2018a) with a modal income of 2458 euro (standardized) (CBS, 2018b). Almost

70% was employed and around 23% was retired (CBS, 2018d). Comparing education levels is somewhat difficult since different scales were used. In the Dutch population around 40% had obtained higher education (CBS, 2018c). The male female ratio was 99 to 100 and almost 60% of the Dutch households were homeowners (Kullberg & Ras, 2018). In comparison, our sample contained older, more highly educated people, and more homeowners. This is quite similar compared to some other studies on CEIs (e.g., Sloot et al., 2018). Crucially, the main aim of this thesis was to explain participation in communities in which a CEI was initiated and not to generate a representative sample of the Dutch population *per se*. Moreover, for collecting the network data used in Chapter 3, it was important to gain as large a sample as possible *per community*.

Table 1.1: Socio-demographic characteristics initiators vs. community members

Variable	Initiators		Community members		Total sample	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Age	60.17	11.19	58.29	14.05	58.48	13.77
Number of years living in the community	22.54	14.41	23.38	16.17	23.49	16.18
	Percent		Percent		Percent	
Living arrangement						
<i>Alone</i>	13.2		25.7		24.2	
<i>Alone with children</i>	10.0		2.7		3.2	
<i>Together with partner</i>	50.0		43.6		43.9	
<i>Together with partner and children</i>	16.8		26.6		26.5	
<i>Other</i>	10.0		1.4		2.2	
Education						
<i>Primary education</i>	2.3		1.7		1.8	
<i>Lower vocational education</i>	2.3		9.4		8.7	
<i>Secondary vocational education</i>	17.1		32.3		31.9	
<i>Tertiary education</i>						
<i>Scientific education</i>	39.0		41.6		41.2	
	39.0		15.0		16.4	
Gender						
<i>male</i>	81.0		58.8		60.8	
<i>female</i>	19.0		41.2		39.2	
Income						
<i>< 1000</i>	5.0		4.9		4.7	
<i>1000-1999</i>	10.0		22.6		21.8	
<i>2000-2999</i>	25.0		28.3		28.3	
<i>3000-3999</i>	22.5		22.4		22.6	
<i>>4000</i>	37.5		15.7		16.6	
<i>Does not want to disclose</i>			6.1		6.0	
Work situation						
<i>Being employed</i>	43.6		50.2		50.6	
<i>Temporarily unemployed</i>	2.6		3.4		3.1	
<i>Unemployed</i>						
<i>Retired</i>	5.1		4.6		4.6	
<i>Student</i>	41.0		33.5		33.4	
<i>Other</i>	0.0		1.2		1.1	
	7.7		7.1		7.2	
Home ownership						
<i>Tenant</i>	2.7		12.6		11.7	
<i>Homeowner</i>	96.3		87.4		88.3	
Area						
<i>Rural</i>	72.3		72.3		72.9	
<i>Urban</i>	27.7		27.7		27.1	

1.6.3 Qualitative sample

Although the main empirical focus of chapter 2-4 was quantitative, the questionnaire research was complemented with qualitative research to gain a better understanding regarding the initiators setting up CEIs. For the qualitative part, semi-structured interviews were used as this is a suitable method to probe participants' perspective on a topic in some depth. Interviews were conducted in March and April 2015 with 8 CEI initiators. All interviews were conducted in Dutch. Interviews were conducted face-to-face by the same interviewer, and lasted approximately one hour each. The actual interviews were preceded by a pilot interview. In addition, over a year of observations of monthly team gatherings were used, next to the meetings minutes, to put findings in perspective. The interviews and observations were recorded with permission of the respondents.

1.7 Content structure

A systematic overview of the empirical chapters of this thesis, summarizing the specific focus of each chapter, the research question, sample, and analytical strategy used, is included in table 1.2.

Table 1.2 Overview of the empirical chapters.

Chapter	Research question	Sample	Analytical strategy
Chapter 2	To what extent and how are perceived community energy motivation, identification with the community and interpersonal contact related to CEI-involvement?	439 community members in 7 communities	<i>Quantitative:</i> Partial proportional odds model
Chapter 3	To what extent and how are ties between community members and initiators related to involvement in CEIs?	467 community members in 8 communities	<i>Quantitative:</i> Partial proportional odds model
Chapter 4	Is trust in different actors and expectations regarding the involvement of other community members related to involvement in CEIs? To what extent do these factors play a role for initiators to take the lead?	398 community members and 45 initiators in 7 communities	<i>Mixed-methods:</i> Proportional odds model Thematic analyses
Chapter 5	How do communities, developers, and intermediary actors view shared ownership? To what extent do concepts of trust and justice play a role in how shared ownership arrangements are viewed by different actors involved?	19 stakeholders from community, industry, and advisory backgrounds	<i>Qualitative:</i> Thematic analyses

