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SPECIAL FEATURE: ORIGINAL ARTICLE

Individuals within the Larger System to Support the Energy Transition

(Too) high hopes? How Austrian energy community actors construct their roles in the energy transition

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Abstract

Energy communities (ECs), as forms of social innovation, have the potential to contribute to sustainability transitions in the energy system. Hence, policymakers place great hopes in ECs as drivers of the energy transition and impose 'transformative goals' on EC actors. However, earlier work revealed differentiated motives (e.g., personal gain, hedonism, economic reasons) on the part of these actors, with system transformation not always being the most important goal. Hence, this empirical study aims to provide a more nuanced picture of how individual actors, namely, founders, intermediaries, and influential early members of ECs, set about understanding and constructing their roles in the energy transition. Using the concept of actor roles in transitions and taking a discourse–theoretical approach, we study the case of Austria, where recent legislative changes enabled the formation of renewable ECs. Drawing on extensive desk research, 15 in-depth interviews, and participant observations in four community meetings, we identify four ideal–typical role constructions of EC actors: *grassroots*, *entrepreneurial*, *local hero*, and *techno-centric*. In fact, these roles vary significantly in their transformative potential, with the grassroots role emphasizing empowerment for a profound social and ecological transition, the techno-centric focusing on technological advancement, while the entrepreneurial role prioritizes economic aspects, and the local hero role centers on a limited, small-scale approach. Our findings challenge the widespread assumption of EC actors taking a 'transformative' role and reveal novel insights into the different roles' main concerns that need to be considered in the implementation of energy policies.

Keywords Energy communities · Energy transition · Actor roles · Social innovation · Sustainability transition discourses · Ideal types

Introduction

Earlier work has shown that energy communities (ECs), as groups of individuals, businesses, and organizations collaborating to produce, consume, and share renewable energy (RE) locally, have the potential to make noticeable change to the overall energy system itself (Dóci et al. 2015). These communities are considered forms of social innovation, which have been identified as fostering sustainability transitions in the energy system and driving overall sustainable development (Caramizaru and Uihlein 2020; Dall-Orsoletta et al. 2022; Dóci et al. 2015; Gui and MacGill 2018; Hewitt et al. 2019; Hoppe and de Vries 2018; Otamendi-Irizar et al. 2022; Wittmayer et al. 2020). In line with these findings, the European Union has assigned ECs a prominent role in its Clean-Energy-For-all-Europeans-Package, a broad political strategy and corresponding set of regulations for the energy

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transition in the European Union (European Commission 2019).

The primary actors of ECs, including founders, intermediary organizations supporting the founding process, and influential early members, may well, however, have to disappoint the high hopes placed on ECs. While some of them indeed subscribe to this idea of social innovation and work to dismantle the regime (Dall-Orsoletta et al. 2022), others' interests in ECs may well be limited to ownership and financial return (Reiner et al. 2014), other forms of gain (e.g., autarchy), or hedonic reasons, such as the pleasure of partaking in community activities (Dóci and Vasileiadou 2015). Hicks and Ison (2018) identified 22 different motives in five categories (i.e., social, environmental, technological, political, economic) that actors may be pursuing with their engagement in ECs. Moreover, Dóci et al. (2015) portrayed ECs as mostly 'internally oriented niches' that primarily aim at meeting internal goals for its members (i.e., normative, gain-oriented, or hedonic goals) without necessarily having the intention of inducing larger systemic transitions. Despite these findings on differentiated motives of EC actors, most transition research assigns 'transformative goals' to them, thus potentially rendering expectations of the 'transformative potential' of ECs overly optimistic.

This empirical study aims to provide a more nuanced picture of how individual actors in and around ECs construct their roles in the energy transition. We build on Wittmayer et al.'s (2017) work on actor roles in transitions and proceed from the assumption that actors co-construct their roles through discourse. Taking a discourse–theoretical approach, we contribute to a novel and critical standpoint on ECs, aiming to identify actor role constructions (Chouliaraki and Fairclough 1999). As for the empirical context, we investigate the case of Austria, where renewable ECs are currently in a process of diffusion. Besides extensive desk research, we draw from 15 in-depth interviews and participant observations in four community meetings from the fall of 2022. In those data, we look for EC actors' views of their roles, including their activities and the resources they use. Applying a variant of Stapley et al.'s (2022) ideal-type analysis, we identify four roles: grassroots, entrepreneurial, local hero, and techno-centric. We use Hicks' and Ison's (2018) five categories of motives (i.e., social, environmental, technological, political, economic) to detail the ideal–typical self-descriptions of these actor roles and discuss implications regarding their transformative potential in the energy transition.

Our research sheds light on different types of EC actor role constructions, responding to recent calls to provide a more nuanced understanding of the individuals at work in the energy transition (Biely et al. 2022). Our findings challenge the widespread assumption that EC actors generally take a 'transformative' role as such. Furthermore, our study on roles in the current formation process of ECs contributes to a better understanding of agency (Huttunen et al. 2021), actors (Horstink et al. 2021), and social innovations in the context of energy transitions (Wittmayer et al. 2020).

The potential of energy communities in transitions

A clean energy community (Gui and MacGill 2018) or RE community (Hicks and Ison 2018)—for the sake of brevity, referred to as an energy community (EC)—is a group of individuals, businesses, or organizations that work together to generate, consume, and share RE (i.e., solar, wind) within a local area (Hewitt et al. 2019). These communities can take many forms, such as cooperatives, community benefit societies or other types of social enterprises, and involve a wide range of stakeholders (Hicks and Ison 2018). In any case, EC members act as 'prosumers' who co-produce and distribute energy and are thus authorized to engage in activities traditionally reserved for energy suppliers' hands.

Due to the active contribution of consumers and changing social relations, for instance, between energy suppliers and households, ECs are frequently treated as a form of social innovation (Wittmayer et al. 2020). Social innovation refers to the application of "new ideas that work in meeting social goals" (Mulgan et al. 2007, p.80). In contrast with other, say, technological innovations, social innovations aim to induce social change by introducing alternative social interactions or practices (Hoppe and de Vries 2018; MacCallum et al. 2009; Repo and Matschoss 2019). In addition, social innovations, such as communities and cooperatives, often emerge in response to crises (Hewitt et al. 2019; Martinelli et al. 2010; Moulaert et al. 2017) and have been described as "an effective way of responding to social challenges by mobilizing people's creativity to develop solutions and make better use of scarce resources" (Hubert 2010, p.6). Hence, social innovations are seen as promising factors for social change in general (Howaldt and Schwarz 2016; Mulgan et al. 2007) and energy transitions, in particular (Hewitt et al. 2019; Wittmayer et al. 2020).

ECs, as social innovations, may fuel energy transitions in various ways. First, albeit on a small scale, due to their use of RE resources, ECs immediately help to reduce greenhouse gas emissions and contribute to decentralized energy production and diversification, which can, in turn, increase energy resilience when the current energy system is destabilized (Gui and MacGill 2018). They enable new forms of organizations, business models, and institutions in the energy industry (Dóci et al. 2015). By developing utopias, creating shared visions, and "imagin[ing] new ways of being, new relationships and new ways of doing" (Haxeltine et al. 2016, p. 15), they have the potential to fuel (political) agency

(cf. Novy 2019). Furthermore, first (or early) movers (Jacobsson and Johnson 2000) in the field of ECs may be seen as incubators for the energy transition by addressing diverse energy matters and enacting innovative ideas (Hewitt et al. 2019; Seyfang and Smith 2007). Lessons from one community may inspire the replication and dissemination of similar initiatives in other areas, helping to accelerate the transition toward sustainable energy systems (Seyfang and Haxeltine 2012). Finally, from a social movement perspective, ECs can empower actors to take control of their energy systems and make decisions about energy production and consumption, which can serve to increase public support for sustainable energy transitions (Seyfang et al. 2010; Smith 2012). Some have even portrayed ECs as collective action initiatives for accelerating the energy transition or contributing to energy democracy (Gregg et al. 2020; Hess 2018). In summary, ECs are met with the expectation of helping reduce carbon footprints, fostering agency and participatory processes in the energy transition, benefiting the local economy, and creating a win–win financial situation for all actors involved.

Commensurate with this reception, ECs often face normative expectations, for instance, of implementing democratic mechanisms for fostering collective decision-making, for empowering members to understand energy policies, or for adapting their energy consumption (Brummer 2018; Vihalemm and Keller 2016; Wuebben et al. 2020). Moreover, as social innovations, they are often assumed to be following a public interest beyond individual advantages or to be supporting local economic development (Bauwens and Defourny 2017; Magnani and Osti 2016). Furthermore, the European Union's 'Clean-Energy-For-all-Europeans-Package' rests on these assumptions—with the new favorable conditions for ECs come high hopes for them to "actively take part in the clean energy transition", thereby "unlocking technological and social innovation" (European Commission 2019, p. 12).

In contrast with these high expectations that EC actors do things differently and work to dismantle the regime, findings showed that their motives might exhibit significant variance. Dóci and Vasileiadou (2015) found gain (e.g., decreasing energy costs) and normative goals (e.g., the need to address climate change) to be the core motives behind engagement in ECs, with hedonic motivations (e.g., the joy of being part of a community) likewise present in the background. A study across 25 cases by Hicks and Ison (2018) revealed that EC actors might be driven by various political (e.g., mobilization), environmental (e.g., reduced pollution), social (e.g., community building), technological (e.g., energy self-sufficiency), or economic (e.g., community income) motives. From their work on enabling and disabling policy environments for community-led initiatives, Celata and Coletti (2019) concluded that it is often the case that initiatives such as ECs also strive to challenge the existing regime and strengthen their political influence; yet, they are nevertheless mainly driven by pragmatic goals, also including material benefits for the participants, such as ownership or financial return (Reiner et al. 2014; Schreuer 2018). In line with these findings, Dóci et al. (2015) suggested that ECs are forms of niche innovations that are 'internally oriented', mainly driven by the desire to meet the specific needs of their users that cannot be satisfied by incumbent regime products and services. While this "lack of intention does not necessarily prevent these niches from contributing to sustainability transitions" (Dóci et al. 2015, p. 94), achieving the transition is nevertheless frequently not their primary goal.

What is more, current political strategies speak of EC actors as social innovators, active consumers, or active citizens for contributing to the energy transition (European Commission 2019), thereby treating them as a relatively homogeneous group of actors and assigning to them a certain (transformative) role in the energy transition. However, given the various shapes that ECs can take (Gui and MacGill 2018), and against the backdrop of findings on varying motives outlined above, we argue that this assumption of heterogeneity across EC actors is overly simplistic. Instead, different types of EC actors may exist who are pursuing very different motives and constructing their roles differently (Wittmayer et al. 2017).

Defined as "a set of recognizable activities and attitudes used by an actor to address recurring situations" (Wittmayer et al. 2017, p. 49), roles are enacted by individuals and socially co-constructed through discourse. Discourse exhibits ways of thinking expressed through language (e.g., oral or written texts) and non-verbal practices (e.g., constructing a photovoltaic plant; Chouliaraki and Fairclough 1999). It represents actors' varying interpretations of social and physical phenomena. Discourse–theoretical perspectives have gained popularity in sustainability transition research, contributing to an understanding of the diverse interpretations of social and physical phenomena, and to a narrative of how (un)sustainable futures are shaped (Hajer 1995; Simoens et al. 2022). Broad discourses on sustainability can be radically transformative (frequently highlighting societal change), such as 'green radicalism' (Dryzek 1997), or 'environmentalist discourse' (Späth and Rohracher 2012), sometimes linked to 'localism' (Audet 2016). More moderate discourses of modernization (frequently highlighting technological change) are related to 'problem-solving' (Dryzek 1997), 'technocentrism' (Audet 2016), 'materialist discourse' (Späth and Rohracher 2012), or 'ecological modernization' (Hajer 1995). Actors borrow from these larger discourses and may adapt them (Späth and Rohracher 2012; Wittmayer et al. 2019). Against the background of existing discourse–theoretical perspectives in transition research, we contribute to a novel standpoint toward ECs.

Building on the findings that heterogeneous motives beyond 'societal transformation' may be driving EC actors, we assume there is also variance in how they construct their roles as such. Hence, taking a discourse–theoretical approach, we formulate the following research question for our empirical study: how do EC actors construct their roles in the energy transition?

Methods

Our research design is a single case study on Austrian ECs (Yin 2014). We collected extensive qualitative data through desk research, in-depth interviews with EC actors, field visits of ECs, and participant observation of EC workshops. Employing a discourse–theoretical perspective, we contribute to an understanding of actors' own interpretations of their role in the energy transition and go beyond isolated observations (e.g., asking specifically for ECs' potential to enhance social capital) to identify underlying patterns of interpretation across actors. We thereby challenge the widespread assumption of 'transformative' goals and offer the basis for a nuanced and critical perspective on ECs for further research in other cultural, socio-political, economic, and technological contexts. With the ideal-type analysis, we carve out the specific roles and tie into the EC actors' perspective, "explain[ing] some aspect of reality, without considering these types to be an 'objective' version of the world" (Stapley et al. 2022, p.2).

The case of Austria

Austria's electricity sector is primarily centralized through the public grid, such as other European countries. It is now obliged to adhere to the goals of the Clean-Energy-for-all-Europeans-Package to "provide an enabling framework to promote and facilitate the development of renewable energy communities" (RED II Art. 22 para. 4) to put them "on an equal footing with other market participants" (RED II Art. 22 para. 7).

With 72% of RE (hydropower, wind, and photovoltaic) in electricity consumption in 2021 (BMK 2022), Austria has a high share of RE, mainly due to large hydropower capacity along the river Danube. Like many other countries, Austria faces rising electricity consumption (BMK 2022), calling for greater expansion of RE for a successful energy transition. Previous forms of community energy operated on the smallest scale, because they were not authorized to share electricity beyond property lines or faced administrative barriers to operating as an official energy supplier (Schreuer 2018).

In 2021, Austria transposed the European directives on ECs into national law. As a result, private individuals, small and medium-sized enterprises, municipalities, and local authorities are now allowed to form renewable ECs to share RE on local and regional scales through the public grid. They benefit from reduced grid fees, subsidies, and other support programs, thus operating in an unprecedented context for energy-sharing. The interest in ECs has been high: approximately 290 ECs were founded between July 2021 and February 2023 (BMK 2023).

ECs face high expectations as drivers of the energy transition. The national energy strategy aims for 100% electricity consumption through RE by 2030 and climate neutrality by 2040 (BML 2019). ECs are expected to contribute to these goals, for example, through decentralized governance arrangements, empowering citizens, creating overall awareness about the energy transition, supporting the local economy, and counteracting energy poverty (Coordination Office 2023).

Data collection

To ensure internal validity of the case study, we strived for triangulation through two means (Yin 2014). First, we considered the situation of Austrian EC actors with different foci, collecting data at the 'system' level, the individual actor level, and the interaction level (Table 1). Second, we combined desk research, interviews, and observations to obtain insight into the question of how EC actors construct their roles.

To understand the overall situation of Austrian ECs generally, we applied desk research, extensively reading information on the empirical implementation of ECs, for example, by the responsible ministries. These documents referred us to additional materials, including reports on funding programs, and information on specific ECs, revealing opportunities for field access along the way for conducting interviews and observations.

To understand actor roles, we conducted semi-structured interviews with 15 EC actors (referred to as I.01 to I.15), among them, ten committed founders engaging in all organizational aspects, one non-founding member who had joined the EC soon after its foundation and influenced key decisions, and four intermediary actors who had offered their expertise during foundation, but had since withdrawn from daily affairs post-founding. While all interview partners were highly engaged and influenced key decisions in establishing the EC, our selection aimed for heterogeneity (e.g., in interview partners' backgrounds) to contrast actor roles.

We worked with interview guides to address key issues, specifically asking for activities (by themselves and related to others), resources (material and immaterial) and motives, but offered significant leeway for interview partners to emphasize themes they identified as relevant. We reduced social desirability bias by explaining how the data would be used, ensuring anonymity and confidentiality. We asked

Table 1 Overview of data collection

Focus	Aim	Data collection	Type of data
Context of Austrian ECs	Understand the general landscape, recent changes in the frameworks for ECs, and the expectations toward ECs	Desk research on state and federal coordination offices, ministries, regulation offices for the energy market, intermediary organizations, official websites of ECs, press database	35 documents (legislation, general statistics, strategy papers, announcements and reports of public funding programs, newsletters of intermediary organizations, public communication, e.g., press releases)
Role constructions by individual EC actors	Understand how individual EC actors describe their own role, including their activities and resources	15 interviews Four field visits with ECs	1190 min of audio recordings 300 pages of transcripts 12 pages of field notes
Differences in role constructions in conversations with others	Understand differences in role constructions as observable in conversations with other EC actors	Two community meetings with 12 to 18 participants; organized by ECs Two community workshops with approximately 80–100 participants and subgroups with 20–25 participants; organized by intermediary organizations	100 min of audio recordings 28 pages of transcripts 40 pages of field notes

participants to talk about their background and their role in relation to the inception of the EC. Frequently, participants related to relevant themes in their response to the initial questions; we intervened rarely and only asked open-ended questions when interview partners diverged from the topic at hand. Furthermore, we probed for more information, requested stories or examples, or prefaced questions with brief information (e.g., acknowledging the possible diversity of sustainability strategies) for reducing biases (Bergen and Labonté 2020). On average, interviews lasted 80 min. They were audio-recorded and transcribed, revealing 300 pages of interview transcripts. In four cases, interviews were connected to more extended field visits (3–4 h each), which we documented in field notes (12 pages).

Finally, to understand subtle differentiations of role constructions in natural contexts and conversations among EC actors, we observed four community events (referred to as O.1 to O.4). Two of these events were organized by ECs themselves, following their first experience on a small scale (with 2–4 members) and aimed at including more members. They were public events addressing small businesses or private stakeholders, informing potential members about the EC and "lowering the threshold to become part of the community" (O.1). The events encompassed casual small-talk, formal presentations by EC founders and, in one case, a technological intermediary. The events ended with a formal Q&A and an informal gathering. The other two community workshops were organized by intermediaries to identify common challenges and potential solutions for ECs. The workshops started with formal presentations by intermediaries, outlining the workshop's objectives. Participants then self-sorted into predefined workshop groups. In these groups, moderators encouraged EC representatives to share experiences, and intermediaries summarized their insights into ECs. The moderators documented key points on a flipchart and later presented them to the other participants. These events concluded with an informal gathering.

The duration of the events was between 3 and 7 h. In the events, the participating author identified herself as a researcher and was primarily a silent observant. Formal parts of the event were documented with field notes and information materials, and informal conversations were audio recorded with permission from the speakers.

Data analysis

We took a discourse–theoretical perspective (Chouliaraki and Fairclough 1999) and applied a variant of Stapley et al.'s (2022) ideal-type analysis to facilitate comparisons between how EC actors construct their roles. This method aligns with Wittmayer et al.'s (2017, p. 49) conception of actor roles as "ideal-types [… that] are socially constructed"

and Chouliaraki's and Fairclough's (1999, p. 13) conception of discursive practices as a vehicle to "establish distinctive identities".

The ideal-type analysis was mainly based on audio transcripts and field notes, supplemented by documents from desk research. In adherence with Stapley et al.'s (2022) initial steps and upon thorough familiarization with the data, we coded audio transcripts and field notes. Drawing on Wittmayer et al.'s (2017) definition of actor roles, we looked for actors' self-descriptions, including their activities and resources. For example, I.10 identified himself as a "catalyst" for RE, citing instances where he promoted RE projects among policymakers or businesses and referred to his expert network as a resource. Further, for each interview and observation, we produced a memo.

The initial set of codes and memos were the basis for identifying the actor roles. We discussed the memos extensively to facilitate intuitive processing as highly useful for pattern recognition in data (Kump 2022). Employing card sorting—a recognized knowledge elicitation technique (Rugg and McGeorge 2005)—we systematically compared memos to unveil similarities and differences (Stapley et al. 2022). This process revealed a high degree of heterogeneity regarding actors' goals, activities, and resources. However, we identified clear patterns for specific aspects of ECs. For example, while all actors had commented on other EC members, some knew their names by heart, whereas others referred to them as anonymous 'customers'. Hence, we proceeded with Hicks' and Ison's (2018) categories of social, environmental, technological, political, and economic motives, restructuring our initial set of codes for the purpose of scrutinizing role constructions within these categories.

This fine-grained analysis revealed four ideal–typical actor role constructions. We recoded our data with the final code system (five categories, four actor roles). Inspired by previous literature on discourse analysis in the context of sustainability transitions, we refer to them as grassroots, entrepreneurial, local hero, and techno-centric actor roles (Table 2).

Findings

In the following subsections, we describe the four ideal–typical ways in which EC actors construct their roles, namely, grassroots, entrepreneurial, local hero, and techno-centric, along the social, political, environmental, technological, and economic dimensions (Table 2). Given the nature of ideal types, actors will normally not assume just one role; nevertheless, our interview partners showed tendencies in terms of which roles were dominant ones, with three mainly assuming the grassroots role, three the entrepreneurial, five the local hero, and four the techno-centric role.

Grassroots role

The core of the grassroots role is the aim of empowering 'ordinary' citizens to contribute to the energy transition and be a part of a social movement. Actors are primarily concerned with ecological considerations, viewing them as inherently intertwined with social and political aspects. To this end, they perceive high agency in shaping a profound sustainability transition through ECs. From this perspective, ECs are "a revolution in the energy system, because […] every individual […] now has completely new possibilities […]. They can take the scepter of energy supply and consumption into their own hands together with others" (I.04). Their aim of empowering others extends beyond individual ECs onto external stakeholders and other ECs, "because really this has nothing to do with competition. We want to achieve a goal together as effectively as possible" (I.11). This role is less concerned with economic and technological aspects, and sometimes even involves devaluing other ECs with financial goals.

As its core feature in the *social* dimension, grassroots actors highlight the importance of building relationships united by common goals or values for motivating active participation in the community. This includes the expectation of collective decision-making and participating in other community activities (e.g., energy efficiency workshops). While the shared goals identified vary, they often revolve around fostering a profound sustainability transition (e.g., achieving 100% RE targets, conserving biodiversity), and are seen as a unifying and mobilizing factor for community members. Moreover, grassroots actors perceive anonymity among members as undesirable; however, existing informal relationships matter less than shared goals, thereby aligning with the political underpinnings of mobilization.

Regarding the *political* dimension, grassroots actors are strongly motivated by a desire to overcome political inertia in the energy transition, criticizing previous political inaction: "[…] we have to take matters into our own hands somehow […] we can't wait for the politicians, we must simply take the initiative ourselves" (I.06). This oppositional stance toward policymakers is notable as the framework of ECs is explicitly designed to drive the transition forward. Moreover, grassroots actors perceive a high capability of mobilizing and empowering others, assuming that many are willing to contribute to a common goal. The moderator at a community event urged participants to unite and become a political force by collaborating on a cohesive plan, stating that ECs "are not as important in the political process as we might think. But if we manage to make a paper to show that we really think about ways to reform the law, then […] we could be successful" (O.3). As such a political force, the grassroots role aims for a "democratization of the energy transition" (I.04).

Table 2 Ideal–typical role constructions by EC actors

Actor roles	Social	Political	Environmental	Technological	Economic
Grassroots *Leader empowering citizens to contribute to a profound social and ecological transition*	EC as: community united by shared values EC as: means for cooperation instead of competition Members as: active participants in community and collective decision-making Own role as: leader empowering others	EC as: democratization of the energy transition EC as: contributors to citizen empowerment EC as: means of compensating political inaction	EC as: means of mitigating climate change EC as: catalyst for social change as part of climate change mitigation EC as: means of reducing consumption	EC as: implementer of decentralized technologies for decentralized transition EC as: means of creating awareness for technologies	EC as: means for self-determination of prices EC as: means for independence from suppliers Own role as: not financially motivated
Entrepreneurial *Entrepreneur implementing business project for long-term economic value*	EC as: service-orientated business for "customers" Members as: followers of efficient decision-making by board Members as: promoters of EC Own role as: philanthropist tackling energy poverty	EC as: means of forming allies with political actors Own role as: powerful in shaping EC conditions	EC as: access to RE for climate change mitigation Members as: supporters of climate change mitigation via willingness to pay	EC as: business cooperating with technological service providers EC as: business model that defines scale of installed capacity EC as: means of accessing siting areas for RE	EC as: means for price stability and long-term economic value EC as: means for independence of markets and "goodwill of people" Own role as: entrepreneur managing a business project
Local hero *Knowledgeable local aiming for benefits of an informal, small community*	EC as: community united by proximity and informal ties Members as: followers of decision-making by quasi-experts Own role as: committed leader helping the local community	EC as: powerless in achieving broad change EC as: dependent on simple conditions (e.g., limited bureaucracy)	EC as: measure to prevent local environmental disasters Self as: promoter of sustainable lifestyles Self as: protector of local landscape	EC as: means for implementing technologies for local independence Own role as: skillful hobbyist "playing around" with gimmicks	EC as: means of protecting community from high energy prices EC as: means for independence from suppliers
Techno-centric *Expert aiming for RE advancement and optimized use*	EC as: network of experts Members as: passive followers of decision-making by experts Own role as: indispensable expert for others	EC as: means of anticipating future policy changes Own role as: catalyst for RE among political and business actors	EC as: means for large-scale contribution to climate change mitigation EC as: data-driven approach toward climate change mitigation	EC as: means of advancing compatibility of technologies for broad audiences Own role as: frontrunner of RE technologies	EC as: means of profiting from financially efficient and large-scale decentralized energy EC as: means of contributing to decentralized market structure

The table is best read as "[role] views [content]", e.g., the grassroots role views the EC as a community united by shared values

Of the actor roles identified, the grassroots role is the one that puts the highest priority on the *environmental* dimension and stresses the relevance of climate change mitigation. They do not deem technological changes to be sufficient and, although RE expansion is considered crucial, sometimes even criticize large-scale expansion (e.g., referring to it as "plastering areas with photovoltaic", I.11). Reflecting on their own consumption patterns as well as on growing collective energy consumption over the past decades, grassroots actors are convinced that societal change and a "fundamental mind shift" (I.11) on reductions in production and consumption are necessary.

From the grassroots actor perspective, the most relevant *technological* aspect is the possibility to decentralize RE systems. Decentralized technologies are a means of creating a beneficial context for RE implementation among a broad group of citizens. While they utilize established technologies and raise awareness and visibility for RE systems, they do not have a special interest in advancing technologies per se. However, they see those technologies as necessary for achieving ecological sustainability.

Regarding the *economic* dimension, the grassroots role stands out by firmly distancing itself from financial interests, reinforcing its ecological concerns and political drive for meaningful change. These actors also distance themselves from other EC actors who are supposedly financially motivated as well as from energy suppliers. While the former hinder a fundamental transition via ECs, the latter operate in a growth-oriented energy market, where customers are at the mercy of nontransparent and competitive market mechanisms. In contrast, grassroots actors highlight that ECs enable self-determination of prices, thus gaining independence from energy suppliers and competitive markets.

Entrepreneurial role

The self-constructed purpose of the *entrepreneurial role* is to establish ECs as a long-term business model with the value proposition of "giving easy access to renewable energy [to all]" (I.10). To that end, their main concerns are economic aspects, including their ability to manage efficient projects and the need for customers' willingness to pay, as well as the need to provide convenient services, create stable energy prices, local value, and to contribute to climate change mitigation.

The core *social* feature of the entrepreneurial actor role is to provide others with easy access to ECs and RE through the service provision. They thus treat members as relatively passive service recipients and the EC as a pragmatic project that should be managed efficiently. Hence, they often assume that many actors lack the resources for dealing with an EC anyhow, will trust in the board's decisions (e.g., energy prices, investing in collective RE plant), and thus benefit from professional implementation, creating a win–win situation: "Everyone is happy with what we decide and say and likes to follow us" (I.09). The entrepreneurial role is interested neither in personal relationships nor social mobilization; instead, members are often called "customers" (I.09), while active EC members are instrumental "caretakers" (I.03) who promote ECs in their communities. Still, actors in this role may also highlight social goals of their businesses, such as counteracting energy poverty, and portraying themselves as benevolent entrepreneurs.

Regarding the *political* dimension, the entrepreneurial role expresses high agency in shaping the context of ECs. These actors highlight the advantages of malleable conditions (e.g., contractual agreements with grid operators), such that they can "set markers" (I.12) and co-create structures for the future of ECs. Unlike the grassroots role, the entrepreneurial role does not focus on collective participation within the EC or the creation of a movement, nor does it criticize political inaction. Instead, in their capacity to modify the conditions for ECs, political actors (e.g., policymakers, local authorities) are seen as allies of the ECs. Entrepreneurial actors see this as mutually beneficial. That is, emerging ECs first reveal practical experiences on which policymakers then depend to advance the institutional frameworks accordingly.

Entrepreneurial actors, meanwhile, see their contribution to *environmental* issues and climate change mitigation mainly by facilitating access to RE. Their service provision reduces barriers to clean energy production and consumption. Furthermore, the entrepreneurial role stands out due to its economic view on environmental issues, emphasizing the need for members' willingness to pay for climate change mitigation. Barriers emerge because of "[t]he target group that says: I'd rather pay more to do something good, […] is just not so big" (I.09). Although entrepreneurial actors state that "[counteracting] climate change *should* be the main reason" (I.03) for participating in ECs, they do not advocate for profound changes, instead highlighting a pragmatic and reward-oriented approach.

The entrepreneurial role does not associate strongly with *technological* aspects. Instead, actors emphasize the necessity of working with professional technological service providers because of the complexity of the technological implementation of ECs. Nonetheless, these actors consider the size of technologies and potential access to siting areas as relevant features for expanding RE production and scaling up their business models.

Regarding the *economic* dimension, the entrepreneurial role emphasizes independence in achieving price stability and creating economic value, building on a long-term business model. Furthermore, being able to self-determine prices creates independence from the volatility of markets and the "goodwill of people" (I.10). If, however, the EC does not have its own RE plants and relies on feed-ins from members,

"customers" (I.09) interested in advantageous market prices may exit the EC. Investments in collective RE plants are thus necessary for creating long-term economic value but also for maintaining a high standard of living. Moreover, financial motivations on the part of members (e.g., return on investment for crowdfunding) are seen as legitimate by entrepreneurial actors as long as they do not jeopardize the EC's business model.

Local hero role

Actors who assume the *local hero* role are mainly concerned with providing for their community, seizing informal resources and their personal technological competence (e.g., experience with photovoltaic). Contrary to technology experts (such as the techno-centric role), these are often autodidacts with a 'do-it-yourself' attitude, using informal organizational structures to manage their communities, all the while relying on informal communication channels: "You'll definitely hear somewhere in the community when something is not right" (I.13). Local hero actors are dedicated to shielding their local community from high market prices and other bad influences from the outside.

In the *social* dimension, the local hero strongly identifies with leading a close-knit community (e.g., a neighborhood, village). They highlight the informal social ties and their familiarity with the local community, enabling them to take the lead and make decisions by themselves or together with trusted friends or family members while ascribing less legitimacy to other members: "I'm the driver of the energy community, and the others don't deal with it at all. It's really difficult to let anyone have a say because they don't know what's behind it" (O.3). This role proceeds on the assumption of knowing what is best for members and provides informal assistance, for example, in educating members on energy-saving measures and in supporting those who struggle to "make ends meet" (I.07), also selling electricity at low prices or sharing it free of charge. Moreover, again highlighting the importance of informal resources, actors strive to establish informal ties with external stakeholders: "You have to know someone, and then you'll achieve something" (I.13).

As for the *political* dimension, the local hero role strives to build structures within the immediate community but wishes for ECs' conditions (e.g., regulations, structures) to "remain simple" (I.07) and manageable. Increasing complexity or excessive bureaucracy would challenge this role, which strongly relies on informal resources. While actors identify with contributions to defined climate targets, they view policymakers as responsible for the energy transition and do not anticipate radical changes or wide-reaching political influence with their own actions, perceiving themselves to have little leverage to drive significant contextual shifts: "We're much too small to make a noise" (I.01).

In line with the focus on their local communities, local hero actors associate strongly with local *environmental* consequences (e.g., local flooding due to climate change). They deem ECs as crucial to averting local environmental disasters and support environmental goals by promoting sustainable lifestyles among community members. Moreover, they recognize the significance of expanding RE. On one hand, local hero actors are hesitant to accept ground-mounted RE plants and exhibit an emotional attachment to certain locations, voicing fears that large-scale RE technologies may destroy the local landscape, but on the other hand, they tend to accept RE plants on unused land "when no more rooftops are available" (I.07).

Regarding *technologies*, the local hero role also relies on informal resources, such as personal experience with technologies, and emphasizes the local community. As such, this role can best be described as a skillful hobbyist striving for independence in managing the EC (e.g., from technological intermediaries) and community benefits through local independence of supply. Actors consider technologies to be gimmicks with which they enjoy "playing around" (I.02) and take pride in their self-optimized technological performance. Moreover, this role views the implementation of new technologies as important (e.g., energy storage technologies), because it bolsters local independence. Accordingly, local hero actors fear dependence on outsiders who may not have the community's best interest in mind. They thus, for example, oppose non-locals investing in local RE projects, thereby also limiting the implementation of technologies.

Independence is also a crucial aspect in the *economic* dimension. Here, the local hero role seeks to protect the community against high energy prices, helping it benefit from reduced taxes and fees for the energy infrastructure. For example, when a family member hesitated to join the EC, an interview partner said, "So you'd rather pay the fool's tax to the [grid] operator instead of saving us some money?" (I.02). Moreover, actors do not shy away from expressing interest in 'low prices' instead of 'price stability' (contrary to entrepreneurial actors who aim for long-term business models), as long as their immediate community benefits.

Techno-centric role

The *techno-centric* role highlights professionalism and expertise in its approach to ECs. Actors are primarily concerned with technological aspects and aim at advancing RE implementation. They view themselves as indispensable technological experts suitable for achieving large-scale and professional decentralization of RE, therein also changing market structures along the way. For their part, they dismiss the contribution of small ECs as ineffective for the energy transition.

Regarding the *social* dimension, the techno-centric role attributes little relevance to member participation. Instead, actors strongly identify with professional expertise in RE. In their view, decisions are best made within a personal network of RE experts. Moreover, they question the relevance of information-sharing, considering it highly time-consuming, as illustrated by I.08: "In such meetings, people have so many questions, and I sometimes think: You just want to participate, so why do you need to know that?". While recognizing the need for attracting members and formal participation like voting at general assemblies, they prefer simple and automatized processes over high levels of member involvement.

In the *political* dimension, the techno-centric role can best be described as a "catalyst for renewable energy project development" (I.10), promoting RE expansion among political and business actors. Actors are often critical of postponements of the legislative framework and political inertia to implement further changes for community energy (e.g., larger-scale citizen ECs). However, techno-centric actors also recognize their political opportunities as such. Due to their technological expertise, they can anticipate the relevant changes and act as pioneers for others.

Regarding the *environmental* dimension, the techno-centric role highlights the necessity of large-scale contributions to climate change mitigation. Actors underpin the need to expand RE wherever possible, applying a data-driven approach based on transparent information on electricity production and consumption. A quote by I.14 illustrates this: "[This device] has 350,000-kWh of electricity consumption, but only 40 kW peak production. Therefore, that production goes, poof, away. To really achieve climate neutrality, we need production capacities". Environmental goals are approached with a technological focus, building on expertise and concrete figures to argue for large-scale technologies.

In the *technological* dimension, the techno-centric role takes pride in its expertise in implementing professional RE projects. Actors distance themselves from the technological "triviality of smaller energy communities" (I.05) and consider themselves as frontrunners of RE technologies who can provide optimal support to ECs. Moreover, they question the experience and qualification of energy utilities: "The central players are simply overwhelmed by the complexity of hundreds of energy communities […]. Energy communities optimize on a small scale" (I.10). In their view, sophisticated technological capabilities are needed not only for managing ECs, but for achieving data transparency, energy efficiency, optimization, and grid relief. Hence, techno-centric actors perceive their work as crucial to making ECs compatible with broader audiences and contributing to further technological advances.

In *economic* terms, the techno-centric role emphasizes its contribution to an optimized, and therefore, financially efficient decentralized energy supply. Unlike the entrepreneurial role, actors highlight immediate financial benefits regardless of long-term business models. Relating to collective RE plants for the EC, one participant said, "When something breaks even in four years, I have a return of twenty-five percent. I don't need to give a second thought to that" (O.2). Techno-centric actors perceive large-scale thinking—including determining the possible size of technologies and number of users—as crucial for achieving cost-effectiveness quickly. Combining this large-scale thinking with decentralized energy and financial attractiveness, techno-centric actors envision a new decentralized structure for the electricity market, both in terms of technology and organization.

Discussion

The starting point of this research was the observation that both policy (e.g., European Commission 2019) and research (e.g., Gui and MacGill 2018; Otamendi-Irizar et al. 2022) place high hopes on EC actors as drivers of the energy transition, while, at the same time, empirical findings revealed mixed motives behind why these actors actually establish and contribute to ECs (Dóci and Vasileiadou 2015; Dóci et al. 2015). Hence, we aimed to take a closer look at how EC actors construct their roles and discuss implications for the energy transition. We applied a discourse–theoretical approach, which has a long tradition in research on the environment and sustainability (e.g., Dryzek 1997; Hajer 1995) for explaining EC actors' understanding of their roles. Utilizing Hicks' and Ison's (2018) categories of EC actors' motives as an analytical tool, we identified four ideal–typical role constructions. Our findings reveal substantial differences in these roles regarding social, political, environmental, technological, and economic aspects. These roles occur in 'hybrid' forms, and actors may tap into multiple discourses to make ECs accessible to broader audiences (cf. Chouliaraki and Fairclough 1999; Späth and Rohracher 2012). Nevertheless, actors exhibit differences regarding the activities that can be expected in the context of transitions when identifying with a certain role (Wittmayer et al. 2017).

Of the four roles, the *grassroots* role most strongly meets the 'transformative' expectations toward ECs. It draws from the long-established narrative of creating profound change from the bottom up—by mobilizing communities for social, political, and environmental goals, and by imagining radically different energy supply and consumption. Despite often operating on a small scale, the grassroots role envisions broad empowerment and plays a vital role in critiquing policymakers and ECs' regulations. Hence, they fit the view of ECs as social innovations put forward in the transition literature (Dall-Orsoletta et al. 2022; Gregg et al. 2020; Hewitt et al. 2019; Wittmayer et al. 2020) and support the vision of

ECs' transformative potential, albeit in a more critical way than proposed by policymakers.

The *techno-centric* role partly aligns with the expectation of moving the energy transition forward. Drawing from ecological modernization discourse (Hajer 1995), techno-centric actors envision radical change for a decentralized energy system as a process of technological (Hekkert and Negro 2009) rather than social innovation. Despite this, their focus on efficiency and scale can be a strong driver for mainstreaming RE.

The two other roles, *entrepreneurial* and *local hero*, are more internally oriented (Dóci et al. 2015) and show less interest in undoing the existing energy regime. The *entrepreneurial* role is driven by establishing a long-term business model, viewing the changing regulations as an opportunity to provide services for "customers". This role proposes a 'business case' approach to sustainability, where customers benefit from easy access to RE (Carrol and Shabana 2010). However, even if entrepreneurial actors indeed change institutions and build new structures, aiming for growth and helping ECs diffuse, they starkly contrast with the image of active citizens driving the energy transition.

Finally, the least transformative of these roles are *local heroes*. They explicitly focus on internal goals and hedonistic motives of being part of a community (Dóci et al. 2015). Although "localist transition discourses" (Audet 2016, p. 378) are sometimes characterized by strong transformative visions, we would argue that this role has substantial limitations in its transformative potential. Actors aim to shield the community from the outside (e.g., from investors), positing scaling or more 'professional' approaches as a risk to their core as a 'social community' (for similar arguments see Kump and Fikar 2021). With strong reliance on a single individual, their focus on the 'local nature' of their communities, and their work with well-established technologies, they are limited in their transformative capacities.

Based on our findings, we conclude that, apart from the grassroots role, many EC actors may not specifically intend to transform the incumbent energy regime as such. Despite this lack of intention, actors with 'less transformative roles' can still contribute to mainstreaming RE and trigger regime change (Dóci et al. 2015); however, these changes may rather be seen as side effects. Our work has several policy implications. Strategies such as the Clean-Energy-for-all-Europeans-Package rest on normative expectations which some actor roles may meet more than others.

While all EC actor roles do, to some extent, aim to contribute to the energy transition (see Table 2), policymakers need to recognize variations in their transformative potential. The *grassroots role* may be more critical than intended by policymakers, but it underscores the need for policymakers to embrace critics, as they provide lessons from transformative experiments beyond well-established strategies. Moreover, the outspoken character of grassroots actors provides a foundation for mobilization, and may contribute to exchange with more inward-oriented roles, such as local heroes. To channel these resources, policymakers may build on community events to facilitate exchange with the grassroots role. Furthermore, the grassroots role may benefit from support for the technological infrastructure for ensuring that their strong political agency can actually manifest in the implementation of RE.

Regarding the *techno-centric role*, their confidence in advancing RE is important for implementing RE projects. However, they are likely to meet skepticism from other roles, such as the local hero and the grassroots, and may engender opposition toward RE projects. To counteract this, policymakers may highlight risks associated with foregoing local actors and instead foster collaborations with less knowledgeable EC actors who may benefit from the techno-centric role's technological expertise. Moreover, policymakers may leverage this expertise by facilitating exchange with energy utilities. This could be achieved by establishing a public coordination office, a strategy that has demonstrated success in facilitating collaborations within the country context of this study.

In addition, policymakers may integrate findings on the less transformative roles, namely, the entrepreneurial and the local hero, into their strategies. Although it is necessary to acknowledge a deficit of transformative elements, the *entrepreneurial role* may be suitable for attracting mainstream actors (cf. Geels 2021) by treating members in their established roles as primarily passive consumers. Moreover, policymakers can recognize the relevance of building stable organizational structures. For instance, they could provide informational material, or support founding services for ECs, which are less driven by the entrepreneurial role. Considering the *local hero role*, policymakers may leverage their capacity to work with local communities based on a foundation of trust. Since the country context of Austria is characterized by a large number of associations contributing to community building (Vandor et al. 2017), such associations could function as entry points for establishing interactions between local hero actors and participants from the outside to foster transformative potential while respecting the need to have a solid foundation of mutual trust. Finally, policymakers may attend to potential adverse side-effects of ECs such as an increasing 'responsibilization' on the part of individuals. Considering limited resources (time, know-how, financial), many actors may not be able to assume a transformative role and rely on adequate (technological, financial, etc.) support.

As a potential limitation, our work was based on a single case study design set in the specific context of Austria. In his seminal paper on the case study method, Flyvbjerg (2006) argued that one could generalize from single case studies on

whether they serve the purpose of 'falsification'. Our study aimed to challenge—and thus potentially 'falsify'—the assumption that EC actors typically have 'transformative' goals. We identified four different actor types with varying degrees of such goals, implying that, in fact, a more nuanced view of EC actors is needed for properly understanding their role in the energy transition. Furthermore, regarding the transferability of our immediate case, many other European regions will face similar regulatory conditions due to the Clean-Energy-For-all-Europeans-Package, and actors may thus exhibit similar roles there, too. However, we do not claim these are the *only* four actor roles, and recognize that varying cultural, socio-political, economic, and technological contexts in other regions will also impact EC actors' role constructions, leading to more or different types. Hence, future research may transfer these findings to the context of ECs for further exploration.

Moreover, while actor roles encompass sets of typical "recognizable activities" (Wittmayer et al. 2017, p. 49), these activities may deviate from their reports. Especially in interviews, participants "[provide] a subjective window into their experiences and perspectives, with details selected […] in the moment of their interview, depending on what they remembered or were willing or able to share" (Stapley et al. 2022, p. 5) and do not necessarily correspond to actual actions. Future work may thus empirically investigate how these discursively constructed roles are reflected in actual practices by EC actors. Finally, given the possibility to tap into multiple discourses, a better understanding of such an adoption of different discourses to attract broader audiences may be a compelling avenue for future work in helping to seize the mobilizing potential of ECs.

Conclusion

Conducting a nuanced ideal-type analysis from a discourse perspective, this study contributes to a novel standpoint on ECs, elucidating how EC actors interpret their own role as part of the energy transition. It identifies four distinct self-constructed roles among key actors in ECs, two of which exhibit more pronounced transformative potential—the grassroots role emphasizing empowerment for a profound social and ecological transition and the techno-centric role focusing on RE advancements. The others, the entrepreneurial role and the local hero role, demonstrate lower immediate transformative capacity. These novel insights imply that researchers must study EC actors in a nuanced way. Moreover, given the policy goal of motivating citizens to get involved in the energy transition, policymakers must consider these diverse actor roles to effectively channel their resources and promote progress in the transition process.

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Conflict of interest The authors have no conflicts of interest to declare that are relevant to the content of this article.

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