SMR JOURNAL OF SERVICE MANAGEMENT RESEARCH

Volume 4

2–3/2020

SPECIAL ISSUE "Tuning the Sounds of Service: Essays in Honour of Michael Kleinaltenkamp"

C.H.BECK · Vahlen · Munich

www.journal-smr.de

Q650202002

From Centralized Energy Generation and Distribution to Clean Energy Communities: Exploring New Modes of Governance for the Energy Sector

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Community management is swiftly developing into a central research field in management literature. A growing body of conceptual and empirical studies is concerned with different aspects of communities, their initiation, management, and termination. One sector that offers a particularly exciting research topic in this respect is the energy sector. We elaborate on the radical transition of the energy industry from large, centralized power-generation facilities to a much more decentralized, community-based production of energy. We scrutinize the theoretical perspectives on managing communities and distinguish between different modes of governance for the production of energy. We also consider recent European Union initiatives that will have a noteworthy effect on the transition process. Our typology shows that the necessary management tasks vary across different types of coordination. Eventually, the establishment of clean energy communities might challenge the very identities of established utility providers.

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Acknowledgements: The authors would like to thank two anonymous referees and the editors for their extremely helpful and constructive comments and the Dieter Schwarz Foundation, Neckarsulm and Heilbronn, for the generous financial support within the framework of the PhD program "Dynamic Capabilities and Relationships" of the European Universtiy Viadrina, Frankfurt (Oder) and the German Graduate School of Management and Law, Heilbronn.

1. Introduction

In an essay in the *Harvard Business Review*, Henry Mintzberg called for a "rebuilding of companies as communities" (2009, p. 140). In light of the global financial crisis that was just about to unfold, he argued that companies – and specifically their management – were out of touch with many organizational stakeholders and needed a renewed sense of community to address the concerns of all their constituents. Although the financial crisis lies behind us now, Mintzberg's call has not lost any of its currency, given that other external challenges, such as the issues around climate change, are only mounting.

Over the last 20 years, community management has become a central research issue in a number of different industries, ranging from automotive (Algesheimer et al. 2005) to medicine (Young 2013) to luxury goods (Hollebeek et al. 2017). A growing stock of literature, both conceptual and empirical, addresses different aspects of community-building and managing (Kraut and Resnick 2011), including the returns of doing so (Manchanda et al. 2015). However, as we show later, it is the discipline of (service) marketing management that has strong ties to this concept and much to contribute to the conversation around community management.

Many industries today are undergoing a process of radical change. Digitalization and new forms of cooperation with customers both play a central role, allowing for new types of value creation and capture (Kleinaltenkamp et al. 2013; Martinelli and Tunisini 2019; Vargo 2008). While it seems intuitive to connect the two literatures on community management and customer integration, due to the more active roles of customers in community settings, extant community research has not systematically examined customer integration and community governance. This represents a clear gap in the literature.

The energy sector is a case in point when it comes to radical change. Through the break-up of the traditionally combined activities of energy generation, distribution, and sales, the industry has witnessed an increasing amount of competition. There is a strong conceptual turn from the focus on marketing energy assets to energy services (Helms 2016). Digitalization has a pronounced impact at all levels, enabling decentralized energy produc-

tion, new digital processes, and innovative customer touchpoints (Rusitschka and Curry 2016; Sioshansi 2016), all of which have implications for the management of energy communities as well. In addition a changing institutional environment is putting pressure on established business models and will further the development of energy communities (Lowitzsch et al. 2019).

Thus, our research question is the following: What is the difference between managing (traditional) customer transactions in the energy sector and the increasingly important energy communities? To answer this question, we review multiple theoretical perspectives and use a typology of three specific approaches toward the customer to systematically differentiate communities and their management from other types of customer orientation. It turns out that communities differ fundamentally in their perceptions of the roles of supplier and customer and in the way they manage their cooperation. At the core, we show that different types of communities are based on different antecedents, serve different customer needs, and require very different management approaches.

First, we elaborate on the phenomenon of communities and describe different perspectives on them. Second, we briefly present the energy sector as an industry in which the management of communities will play a crucial role in the future. Third, we develop our typology of different customer approaches and discuss the different management dimensions of each type, referring to our energy business example. Finally, we discuss the implications of our work for theory and practice.

2. Communities: phenomenon and perspectives

Despite numerous attempts at definition, there is still no clear consensus on the concept of "community" but rather numerous definitions, each of which is oriented toward a specific research purpose. Furthermore, communities exist for a variety of purposes, ranging from marketing-specific objectives, such as brand management, to innovation management outcomes, such as generating new product ideas.

The exchange of ideas and resources among community members can be seen as a starting point for defining the concept of community. Resnick and Kraut (2012, p. 14) defined an online community as "a virtual space where people come together with each other to converse, exchange information or other resources, learn, play, or just be with each other". Through the advancement of information technologies – often referred to as "web 2.0" – over the last two decades, these communities often develop as online communities. In a general sense, these communities bring together geographically dispersed individuals in an online space. The reason for people joining this space is that their members share certain interests, ideas, or convictions (Resnick & Kraut 2012). They may also be brought together by joint conditions, as in the case of medical communities. Online communities take a wide range of forms today, and they are supported by different types of technologies. Even though online communities are a virtual phenomenon, they can also be the starting point for real community-building in that they facilitate cooperation in different forms. Platforms such as the mutual childcare community www.siteinander.com or the nursing service platform www.careship.de are examples where communities – online and offline – go hand-in-hand.

Firms long ago discovered the value of communities. Customer communities can provide innovative solutions for companies to integrate the feedback and knowledge of customers (Algesheimer et al. 2005; Wirtz et al. 2013; Manchanda et al. 2015; Hollebeek 2017). In terms of service management, customer communities are often one of the first places to which customers turn when they have issues or questions. Prominent examples from Germany include service communities run by Deutsche Bahn (www.community.bahn.de) and Telekom (www.telekomhilft.telekom.de). Wagner et al. (2016) showed further categories and examples. Through the user-generated content at the hearts of many online communities, the topic has a natural interface with the concept of customer integration and engagement (Kleinaltenkamp et al. 2013; Fonferek et al. 2019) because, through interactions with communities, customers are effectively integrated into the operations of organizations. Communities thus become vehicles for customer integration and insight (Wagner et al. 2017). Because of its relevance for a company's market orientation, community management is most often tied to marketing departments and budgets (Clauss et al. 2019; Happe and Storer 2019). However, communities may be used as vehicles and interfaces for a variety of organizational stakeholders beyond customers, such as suppliers, investors, innovators, etc. (Wagner et al. 2016).

Going one step further, some researchers consider communities new organizational forms that operate under different conditions than traditional organizations (Faraj et al. 2016). Some criteria by which to separate traditional and new forms of organizing are task division, task allocation, reward distribution, and information flows (Lettl and Speckbacher 2014; Puranam et al. 2014). Thus, online communities not only serve as platforms for information exchange but also as bases for completely new forms of cooperation and divisions of labor. They also have the potential to help build new business models, that is, rationales for how organizations create, deliver, and capture value (Osterwalder and Pigneur 2010, p. 14). Faraj et al. (2016, p. 669) continued to note that "there is a need to research (communities) as complex settings where serious

work gets done and effective collaboration at a hitherto unseen scale can emerge".

As this definition highlights, community today is often a product of both digital technology *and* people. Thus, having the right technology in place does not suffice. The purpose of communities is also extended in many industries. Customer integration now often includes customers as partners and co-producers. Furthermore, other stakeholders apart from customers can become important community members. We therefore follow Gui and MacGill (2018, p. 95) and define communities in a very general way as "social and organizational structures formed to achieve [the] specific goals of its members". These goals can focus on a variety of aspects. In the case of energy communities, the focus today is on the production, consumption, and distribution of cleaner energy. Ultimately, communities can be seen as new organizational forms that embrace new forms of cooperation among stakeholders to achieve goals.

3. The case of power-generating industry

Energy systems are undergoing rapid transitions and are in search of new business models.

In the past, utility providers typically engaged in centralized, large-scale production and distribution of power to guarantee universal energy access (Gui and MacGill 2018, p. 94). Currently, however, the "Fridays for Future" movement and the resulting government activities to promote renewable energy together with the rapid development of renewable technologies have altered the energy industry worldwide (Gui and MacGill 2018, p. 94). The cost of renewables has come down. There are claims that, in five years, a tipping point will be reached where new-build solar or wind capacity will be cost-competitive with the fuel cost of existing conventional plants. Renewable generation is projected to account for more than 50 % of total power generation post-2035 (Tryggestad et al. 2019).

Power systems will see strong growth in balancing needs. New flexibility solutions, such as batteries or gas turbines, are likely to appear on the power grid. Markets are expected to expand with increasing numbers of players and new disruptive technologies (Tryggestad et al. 2019). Electrification across key end users is foretold to double electricity demand by 2050. This is particularly driven by a shift toward electricity as an energy source in road transportation and increased demand in buildings (Tryggestad et al. 2019). Global energy-related emissions will peak in 2024 and fall by ~20 % from 2016 to 2050, according to McKinsey's Global Energy Perspective 2019 (Tryggestad et al. 2019).

All of these developments create a need to adapt to this rapid transition in utilities. Energy companies will have to embrace digital technologies. They must demonstrate that they can successfully move into activities outside their core businesses. They also need to redefine their roles in the value chain while continuing to manage their core business efficiently (Aubert et al. 2018). Following Deloitte's "digital industry atlas", the extent of digital disruption in the energy sector will take time but will have a particularly strong impact. The energy industry should therefore consider digital disruption as their biggest upcoming challenge, since it will radically alter cooperation between former customers and utility providers. Transformation has already started, but there is still time for a mindset shift that allows for the necessary innovation (Harting et al. 2015).

Customer relationships are especially expected to change under the new regime. Energy is not a low-involvement product any longer. Consumers turn into prosumers, consuming but also producing energy. In this new landscape, energy communities become new modes of cooperation, offering interesting new business models for utilities. Thus, utilities need to adapt and innovate rather than rely on well-worn strategies. Many utilities are stuck with a familiar strategy: increasing the rate base, exiting riskier business areas, and keeping costs in check. To be in the vanguard, however, companies have to show that they can adapt to change by embracing non-commodity business and disruptive forces from new technologies (Aubert et al. 2018).

The emergence of energy communities addresses community energy needs as well as their social, environmental, and economic goals (Gui and MacGill 2018, p. 95). Decentralized generation and energy storage technologies allow individuals to disconnect from the grid, generate power for themselves, and sell the surplus back to their local utility. The relevance of community models is also reflected in the European Union (EU) Renewable Energy Directive (RED), which sees "renewable energy communities" (RECs) as a new governance model to enable energy-sharing among community members. The updated version of the EU directive (RED II) is part of the Clean Energy Package. It entered into force in December 2018 and is specified by the Internal Electricity Market Directive (IEMD) and Internal Electricity Market Regulation (Lowitzsch et al. 2019). The RED II has to be translated into national law by the EU Member States by June 2021. It puts a strong emphasis on RECs and thus creates an institutional environment that will be important for both new players in the market and the incumbent energy companies – although the large incumbents are currently not envisaged as RECs.

Against this background, utilities' relationships with their customers will change irreversibly. Customers will expect

greater choice and control about how their energy is generated and better access to usage information from their digital devices (Aubert et al. 2018). Successful utilities will adopt different business models with varying degrees of participation. One promising option is the role of a distributed-system platform provider which offers platform services to enable customer access to wholesale products (Aubert et al. 2018).

A number of answers to the challenges that energy providers face have already been found. Introducing a collaborative approach to empower prosumers is one future success scenario. This consumer-centric market could be built on peer-to-peer (P2P) and community-based structures. Indeed, P2P trading is one promising new business model for utilities. The idea arose from sharing-economy principles. An individual entity can sell generated electricity to another entity via a connected, often virtual, relationship. This business model is challenging the old, centralized electricity supply system (Coutinho 2018). Gui and MacGill (2018, p. 96) discuss other structures of energy communities, including virtual power plants, community microgrids, and integrated community energy systems.

Although some energy companies have already recognized the relevance of community business models, many factors limit their success. Community models are often tested as small pilot projects, for instance, but their scalability remains limited. Many community concepts also lack viable business models. Finally, the members of communities are often still seen as competitors instead of integrated members of a value chain or value community.

The main root of these limitations, however, is that classic management approaches are often simply transferred to dealing with communities. We show that this is not a promising model and that energy communities require a completely different management approach altogether. In other words, there is a need for a paradigm shift.

4. Developing a typology of customer approaches

4.1. State of research

Gui and MacGill's (2018, p. 95) definition of communities as "social and organizational structures formed to achieve [the] specific goals of its members" may appear a bit open-ended. However, it leaves room for a broad range of theoretical perspectives. It is also useful when the roles of communities in business models are not yet clear. It allows creativity and entrepreneurship:

"Social and technological entrepreneurs and utilities operating within an environment increasingly defined by energy consumers, industry groups, and policy actors will need to be adaptable and innovative in choosing strategic directions and associated investment decisions, establishing appropriate alliances, and acquiring resources to meet their goals in this low-carbon energy transition." (Gui and MacGill 2018, p. 94).

Research interest in power-generating industries with a focus on digitalization and renewable energy results from radical changes in the energy sector. The industry is therefore a perfect showcase for illustrating that community management will play a decisive role in the future. Schoor and Scholtens (2019) conducted a comprehensive literature review of the scientific approaches to energy communities. What they call "community energy literature" focuses on the most dynamic, interesting part of the business, namely, on renewable and sustainable energy and its production and distribution – with a special emphasis on smaller communities and networks, such as neighborhoods and municipalities. Thus, they fully consider the trend toward decentralization mentioned above. Energy production is gradually changing – at least partly – from centralized production to local production of renewable energy. Communities of citizens as customers and producers become key actors in this transition to a sustainable energy regime, questioning old business models (Gui and MacGill 2018).

Schoor and Scholtens's analysis covers a time period of 10 years and includes 263 contributions that appeared in scientific journals. Most of these studies were case studies in the United Kingdom (UK), the United States of America (US), Germany, and the Netherlands. The studies used a wide variety of theoretical approaches, such as economics, sociology, and social geography, and dealt with various aspects of energy communities. Schoor and Scholtens clustered the theoretical approaches into four domains: sociotechnical studies, social-economic studies, governance and planning studies, and socio-psychological motivations.

According to Schoor and Scholtens, sociotechnical studies are predominantly transition studies. Since decentralized communities of energy producers and consumers also aim to establish sustainable energy systems, transition studies are interested in issues such as moves from centralized to decentralized systems (Schoor and Scholtens 2019, p. 26). "Transition studies" include evolutionary studies, grassroots innovation, and some studies on innovation systems. Interestingly, most contributions still see energy communities as a niche phenomenon.

Local and regional policies and governance are another important part of the community energy literature (Schoor and Scholtens 2019, pp. 31–33). Many studies have raised the question of how to manage the new relationships and opportunities arising from transitions to renewable energy systems, especially if these also entail transitions to decentralized systems. Important issues in this literature are the new roles of local governments, rela-

tions with private actors and the existing energy sector, relations between different levels of government, and the participation of citizens in municipal administration (Schoor and Scholtens 2019, p. 31).

Another cluster of studies includes economic studies and business analysis. This research has focused on issues such as the relation between energy networks and utilities, economic performance and benefits, organizational design, and the role of social engineers. Sociological studies, on the other hand, have focused on the roles of different local actors, the development of local initiatives, and types of organizations and social networks (Schoor and Scholtens 2019, p. 30 f.).

In conclusion, it becomes apparent that the research on communities in the energy sector is just getting started but definitely gaining momentum. So far, however, there is no clear consensus about appropriate theories, and the terminology and key constructs are not yet well-defined. On the other hand, a number of interesting insights have already been made that range from the individual level (e. g. the motivations of members to join communities) to the organizational and market levels (e. g. the organization of local communities and the economic performance of communities) to the environments of energy communities (business partners and local or national governments). The research results have a great number of practical and theoretic implications, but they leave open the question of which management approach is to be applied under which conditions and for which type of community. This prevents a systematic approach to the development of different community management approaches and of conceivable business models. We claim that the changes that we witness in the energy sector – especially the emergence of local energy-producing communities – will require very different types of management and governance approaches. For this reason we had developed our research question above: What is the difference between managing (traditional) customer transactions in the energy sector and the increasingly important energy communities? We also question the views of many of the transition studies that perceive energy communities as merely niche phenomena. Looking at the legal developments and EU initiatives described by Lowitzsch et al. (2019), such communities could play much more important roles in the future.

4.2. Types and characteristics of customer relations

On the basis of the above literature review and brief introduction of the energy sector, a very general observation can be made. While traditional cooperation between energy producers and their customers can best be characterized as a classic market transaction, newer, community-oriented business models can be characterized by more relational elements. If consumers also become producers, the boundaries and identities of energy companies are generally questioned and cooperation takes on new forms. Thus, a distinction can be made between customers managed in a market-coordination style and customers managed with a more "relational approach" (Macneil 1978; Dwyer et al. 1987; Heide 1994).

Whenever anonymous, market-like types of transactions are abandoned in an exchange, a new kind of relationship is established among the parties to a transaction. We also argue that relational exchanges among community members may even dissolve the former boundaries of traditional energy providers. In other words, the departure from traditional market exchange may not only result in closer ties between parties but also in a variety of governance forms that might question the structure of the core company altogether.

To make our point, we distinguish between three types of buyer-seller cooperation at a very general level: customers managed in a market-like fashion and (non-market) communities that can be characterized by much closer relational ties among community members. Non-market communities, however, are not a homogeneous phenomenon, as Heide (1994) pointed out. Therefore, we distinguish further between customer communities that are managed by core suppliers and communities that are initiated by actors other than established energy companies. These actors can be customers, municipalities, small private firms, and other stakeholders. Our triple typology should help to give a first orientation but is still of limited value without discussing the assumptions and management tasks associated with each type (Heide 1994).

To derive meaningful management implications, we refer to Williamson's transaction cost theory (1975; 1985) and to the "search, experience, and credence" classification of goods and services based on the work of Nelson (1970) and Darby and Karni (1973). Both approaches focus on the selection of governance systems depending on the characteristics of transactions. Thus, they are well-suited to answering our research question.

In Williamson's work (1975; 1985), transactions are characterized by their characteristics, as shown in the so-called market-failure framework. The more "problematic" the transactions are in terms of complexity and dependency (through specificity), the more the efficient form of governance moves away from pure market coordination. Nelson (1970) and Darby and Karni (1973) used a similar logic. They described the abilities of customers to assess the quality of products and draw conclusions for management. Whereas "search" goods are those whose characteristics and qualities can be relatively easily evaluated prior to purchase or consumption, "experience" goods are those that can be properly evaluated only after the product has been bought, consumed, or experienced. "Credence"

goods, on the other hand, are difficult to evaluate. Even after entering a contract, it might be impossible to say if it was worth it, such as medical treatments in hospitals.

The work of Nelson, Darby and Karni, and Williamson has some important implications for the management of communities, as opposed to the management of discrete transactions in mass markets. We discuss some central assumptions about three ideal types of cooperation derived from the literature and address their management implications. The ideal types of cooperation represent market coordination – centralized mass markets (CMMs) – and non-market coordination – centralized energy communities (CECs) and decentralized energy communities (DECs). These three types of cooperation show, on the one hand, that in addition to the classic mass market relationships in the energy sector, relational elements are increasingly entering into exchanges. On the other hand, the distinction between CECs and DECs shows that established utilities may play important roles in building alternative, community-oriented relationships but that they may also lose their dominant roles in some communities. This could be partly due to the new EU energy directives. There, mainly smaller and local companies are envisaged as members of the energy communities.

CMMs represent the current utility approach in our study. Large investor-owned corporations (private or public) use big power-generation facilities to provide energy for an anonymous mass market. The efficient, broad-based supply of energy is the main objective of this approach – along with cost recovery and profit.

We refer to CECs as communities in which the incumbent utility – perhaps with a small number of other actors – keeps power and control over a community (Carolan 2014). A large variety of new business models are conceivable in this case. Members of the community can collectively own production facilities or participate in the production and/or consumption of power. This is also the playing field on which established companies react to new developments and test new business models. Since established companies play central roles here, developed models can be integrated relatively easily into existing energy macro grids and regimes.

We define DECs as communities of customers, businesses, municipalities, and other potential stakeholders that produce and consume energy locally. The production facilities may or may not be connected to the main energy grid (Gui and MacGill 2018, p. 102). The members of a DEC typically have strong local connections. Large utility corporations do not usually belong to the community. It is important to note that large incumbent energy providers are explicitly excluded from both types of DECs that are established under the new EU governance model for energy communities, that is, the RECs (defined in the RED II) and citizen energy communities (defined in the IEMD) (Lowitzsch et al. 2019).

As shown in *Tab. 1*, the management tasks and processes show systematic differences among discrete customer transactions in CMMs, CECs, and DECs. In the following, we take a closer look at each of them. To better structure our work, we rely on studies that divide cooperation between customers and suppliers into different phases (Dwyer et al. 1987; Heide 1994) and distinguish among community building, community management, and community disintegration. Many topics can be discussed throughout these stages. However, there seems to be a general understanding that management tasks include planning, organizing, leading, and controlling to achieve goals effectively and efficiently (Jones 1995). As shown, the activities and processes in these stages differ systematically across discrete transactions on CMMs, and the more relational approaches within CECs, and DECs.

Community building

Generally speaking, the process of building a community includes the attraction, evaluation, and selection of cooperation partners. However, depending on the respective business model or community type, this involves very different activities. The "discrete approach" in the case of CMMs represents an extreme case. Customers might be connected through some kind of grid, as in the energy case, but they hardly interact or exchange anything. In this form, market governance does not require much of an initiation or building process (Heide 1994). Even the identities of the parties to a transaction do not really matter.

In contrast, CECs and DECs are based on somewhat selective building processes, though the building processes once again differ in their respective attributes. CECs are often topic- or issue-driven. A central issue – such as renewable energy or climate change – is identified, and the core supplier reacts by offering a product that takes that specific interest into account. Building an issue-related CEC requires an initiation process that considers customer interests and a related offer by a supplier. Since the quality of "clean energy" can hardly be called a "search quality" but rather an "experience" or even "credence quality", the trustworthiness of suppliers will be a key issue for the supplier selection of customers. At the same time, a supplier will only be successful if its firm can send signals of reliability. Community members, on the other hand, must show their interest and willingness to consume or even produce renewable energy.

DECs, again, require the joint community formation of customers, suppliers, and other potential stakeholders. Since the technical requirements, the complexity of the projects, and the financial risks are all quite high, all par-

Community type **Management tasks**	**Centralized mass markets (CMMs):** Discrete transactions & management of "search" quality	**Centralized energy communities (CECs):** Relational approach & management of "experience" or "credence" qualities	**Decentralized energy communities (DECs):** For example, RECs & citizen energy communities (according to the EU RED)/relational approach & management of "experience" or "credence" qualities
Community building	No particular building process; market-like establishment of transactions	Community initiated by incumbents or local actors. Most common subject: the integration of renewable energy into the existing main grid. Established energy utilities play a key role	Formation of community by customers and other stakeholders. Utilities do not play a role according to EU RED
Community management planning/ Time Horizon	Short-term but often repeated transactions	Medium to open-ended	Open-ended
Flexibility and change/ adjustment	No need for flexibility or adjustment	Some changes in interaction; innovation relatively easily integrated into existing regime	Mutual adjustments to changing environment; constant negotiation of details
Organizing/role of organization or corporate identity	Core supplier / initiator, leader, & technical platform provider	Trusted supplier; business partnership between community members and supplier	Roles to be defined; business partnership and cohesion among community members; role and identity of established utilities unclear
Commitment & switching costs	Low	High commitment and increased switching costs	High commitment and switching costs
Risk management	Low in spite of liberalization of markets; search qualities for customers	Low risks for utilities; increased but manageable risks for community members; experience qualities	High risks due to specific investments of the involved parties; volatile environment; new technologies; experience and credence qualities
Control and incentives	Monitoring of pre-defined results	Mutual assessment of monetary and non-monetary targets	Ex-ante incentives, socialization, mutual assessment of monetary and non-monetary targets
Leading	"Business as usual"; strong leadership not required; efficiency-driven management	Leadership required to create a fit between corporate structure and strategies and community requirements	Strong entrepreneurship and leadership; different parties can take the leading role. Find legitimacy for new identity
Corporate-government relations	Important, stable	Important, stable/developing, issue-oriented	Very important, volatile; buffering or bridging as strategies for utilities
Community disintegration	Termination of contract is easy, low exit barriers	Termination of contract is possible, although switching costs exist	Open-ended community, disintegration as divestment process

Tab. 1: Types and characteristics of customer relations

ties involved have correspondingly high needs for uncertainty reduction. Initiation processes therefore require the extensive screening of partners. Experiences, skills, and the constructive handling of conflicts will play major roles. Essentially, the community-building processes for DECs try to verify interests and incentives and to reduce goal divergence before the project begins. A main challenge – at least for DECs that are built in accordance with the EU Directive – is that large, established energy companies in these communities are not even intended as cooperation partners. Know-how and financial resources may therefore have to be provided by other actors, possibly making kick-off efforts costly.

Community management

The ongoing management of transactions requires that a number of functions are performed. Once again, they differ across the different types of coordination.

Planning includes the alignment of rights and duties between different parties to a transaction but also refers to the time horizons of economic activities. In discrete transactions (CMM), the time horizons are usually short-term. Every transaction can be treated separately and ends automatically. In energy markets, however, we observe some inertia on the customer side. Repeated transactions embedded in self-renewing contracts are the rule rather than the exception. There is no need for flexibility in planning, and adjustments are carried out by leaving the supplier in case of dissatisfaction. CECs and DECs, on the other hand, will be characterized by long-term time horizons, mutual adjustments to changing environments, and constant negotiation of details. This will be the case particularly during periods of energy transition, when new business models still have to be developed and members of the community perceive much uncertainty. In the case of CECs, connections to main grids and existing infrastructure (Gui and MacGill 2018, p. 100) and the strong involvement of incumbent firms facilitate the planning. Even for CECs, however, volatile environments with respect to technology, generation of business models, and government intervention seem reasonable assumptions. In the case of DECs, planning will be even more complex. Therefore, planning and contracts will never be complete but rather open and subject to change. Adjustments during projects will constantly accompany communities and will require mutual planning. Thus, we agree with Dwyer et al. (1987) that relationships need to be created in ongoing processes.

Organizing, as the second principal function of management, requires the structuring of organizations to achieve the goals of company communities in effective, efficient ways. Once again, great differences emerge among the three types of approaches toward the market with respect to the deployment of resources and the structuring of processes. In the case of CMMs, suppliers target anonymous markets and focus on efficiency. Since energy could be considered a low-involvement product in the past, many customers did not really care. They did not take advantage of the chance to select a specific supplier but stayed with their current one. For some price-sensitive customers, price differences were reasons to switch from one supplier to another. With the reality of climate change and a political agenda that focuses on renewable energy, energy moved from low involvement to high involvement for some important customer segments. Because of the credence or experience qualities of the product of "clean energy", the reliability of sources becomes a key issue. Therefore, issue-driven customer communities require more relational approaches toward the community. The segment of highly involved customers in CECs, with their strong interest in issues such as renewable energy, demands more interactive communication altogether. There is a desire to obtain reliable information and to exchange ideas between suppliers and community members. The trustworthiness of energy sources becomes a critical issue with respect to the credence qualities of clean energy. Reliability also becomes a key issue when customers become producers or prosumers within the existing energy infrastructure. Once again, utilities need to change their structures and processes, including communication, to meet their partners' needs.

DECs are yet another story. In this case, the collaboration between customers and corporations undergoes drastic changes. Former consumers take on the roles of producers, and the whole organization of the value chain is put into question. The roles in this type of community need to be newly defined. For consumers, it is a big step to move in the direction of producing energy *and* organizing the energy ecosystem. For utility companies, their former business model per se is questioned. The boundaries of firms are redefined and organizational identities change. The roles of core utility providers were left more or less unchanged in the discrete market approach or the more relational CECs. In the case of DECs, however, the roles of former energy providers appear to be relatively unclear (Lowitzsch et al. 2019). Since organizational identity is considered very stable by many researchers (Whetten 2006), the former identities of utility firms might hinder their flexibility in involving themselves in new, upcoming business models.

The community members of DECs, on the other hand, need to develop strong ties among each other and other stakeholders. The way community members work together eventually influences their success but also results in high switching costs. Thus, switching costs are another feature that differs across the three types of cooperation. Whereas they are not a major issue in the discrete model, for instance, customer communities experience significant switching costs such as specific investments that result in commitments (Söllner 1999). In DECs, parties might be "locked in" due to high, specific investments (Williamson 1985). The importance of managing commitments and safeguards rises once we move from discrete transactions to DECs. The risks involved for all parties appear much higher than those of the traditional approach. Once again, they must be negotiated, and the roles of the involved parties with respect to risk-bearing need to be newly defined.

Controlling is the third principal function of management. Creating new business models and building communities requires some kind of monitoring system to evaluate if obligations have been met by all parties (Rubin 1990) and if projects worked successfully. Measuring performance can help ensure that companies stay successful. It can target pre-defined outputs (ex-post) or can be exercised ex-ante by designing incentive systems that supplement ex-post control. Some kind of performance measurement will take

place in all the different forms of cooperation. However, whereas profit per unit or time period will be measured in discrete customer transactions in CMMs, monitoring will focus on customers and customer segments in CECs. In DECs, the focus might move to ex-ante measures. Trust and reliability may serve as relational norms that are necessary preconditions for any kind of cooperation. Socialization processes will partly replace output control (Ouchi 1979). On the other hand, transparent business models need to be developed that allow each party to estimate costs and benefits and to check whether goals were met. In this context, it can be assumed that the targets in energy communities also include non-monetary quantities to a greater extent than in CMMs.

Leadership is the fourth function. According to Jones (1995), the leadership task includes creating a vision and direction for the organization. This includes the encouragement of employees and other stakeholders to contribute to this goal. Thus, leadership is about shaping behavior and creating new business opportunities. Therefore, for Kouzes and Posner (1995), leaders should be role models, inspire a shared vision, challenge the status quo, and enable and encourage stakeholders to act and contribute.

Under the old, static energy regime, strong leadership was hardly demanded. Rather, it was a matter of trimming the organization for efficiency to improve profit. In connection with disruptions in the energy sector, however, leadership is in strong demand. Two different task strands must be distinguished here, especially if the implementation of energy communities is to be regarded as a promising model. The first is to identify and implement the activities required for new community-oriented business models. The second is to credibly communicate the need for change to the members of the organization.

The first task requires good knowledge of the functioning of the new energy communities. Much is still in motion, and the environment is characterized by great uncertainty for all parties involved (Lowitzsch et al. 2019). A mindset of entrepreneurship will be required, and leadership may also touch on the issue of defining the new role of the company in the community. Whereas a consistent market and customer orientation (Narver and Slater 1990) is required in CECs, incumbent utilities might need to find completely new roles at a local level in DECs.

This also shows the importance of governments (local and federal) in the process of energy transition. Even though utility companies used to act in a highly regulated market, the volatile character of the current situation places special demands. Since the EU regulation is developing and will have to be translated into national law, corporations need to decide whether they want to adapt to new regulations or if they want to shape the institutional environment. Meznar and Nigh (1995) suggested that the corporate-government activities of firms can be classified either as activities that "buffer" a firm from political institutions or "bridge" with the environment. Their key interest was under which conditions firms should engage in buffering or bridging activities. In an empirical test, they concluded that buffering is practiced in situations of high environmental uncertainty and strong organizational power, whereas bridging is widely used in cases of high uncertainty and when management has a government-oriented mindset. Utility providers have always been government-oriented (Siedentop and Söllner 2010). We therefore should expect that big players in the market will also act as government-oriented institutional entrepreneurs (Garud et al. 2007) to play a role in the world of DECs.

The second leadership task is as big a challenge as the first one, especially if utilities want to get involved in DECs: managing the change from past CMM business models to CECs, especially to DEC models. Many established firms do not succeed in their efforts to innovate due to inertia or prevailing mental models and cognitive frames (Tripsas and Gavetti 2000). Organizational identity has been identified as such a cognitive frame (Nag and Gioia 2012). The answer to the question "Who are we as an organization?" (Whetten 2006, p. 219) shapes the activities of organizations and might prevent firms from breaking new ground. Stanske (2019) claimed that identity-challenging innovations – such the development of CECs or DECs – require special attention. If employees and other stakeholders perceive changes as illegitimate, turn-arounds might fail (Stanske 2019).

Community disintegration

Interestingly, all three types of cooperation appear somewhat open-ended at first sight. However, discrete transactions can easily be terminated in accordance with existing contracts. The relationship between supplier and customer is nothing more than a sequence of isolated transactions. It is mainly the low involvement of customers that makes switching among different suppliers unlikely.

In the cases of CECs and DECs, the disintegration of communities is a management task of its own, and not much knowledge has been generated on this issue so far. Cooperation can contain some specified regulations on the termination of the community. Members will also usually want to know about the processes and conditions to leave the community. Terminating membership in a community is often more like a disinvestment than a simple abandonment of the community. Difficulties and unexpected risks involved in the process are hard to predict. Therefore, specifying the exit option ex-ante appears to be another important management task in energy communities.

5. Discussion and conclusion

Our study shows how governance and management approaches differ among different types of supplier-customer relationships in energy markets: the traditional model and two types of energy communities, CECs and DECs. The previous literature on communities relied on a number of different theories and highlighted very different aspects. However, an integrated framework that systematically shows the differences in managing communities compared to traditional, more discrete types of transactions was missing. The energy sector, as an industry in transition, appeared particularly interesting for our research interest. New business models are being tried out, but established firms find it difficult to adjust to the new, volatile situation.

Thus, our main contribution is to show how governance modes must change when the conditions of cooperation between the stakeholders of an industry change. Thus we identify ideal types of cooperation between traditional energy suppliers and their customers, develop the appropriate governance modes in the energy sector and discuss differences in the management of these types along with the management tasks of initiating, managing, and disintegrating customer relations. By doing so, we answered our research question: What is the difference between managing (traditional) customer transactions in the energy sector and increasingly important energy communities? Thus, we hope to offer a better orientation for practice and to contribute to a better theoretical understanding of different modes of governance.

We need to emphasize limitations of our work, however. The three types of customer relations and communities represent ideal types. We are aware of the fact that they are theoretically derived and that reality is much more complex, often mixing governance types. Our understanding of these hybrid forms of governance is still limited and needs to be addressed.

Moreover, it cannot be assumed that the three forms of governance are completely independent of each other. There may well be interactions between management approaches that are pursued in parallel. However, knowledge about this is still very limited.

Furthermore, the energy sector represents an industry embedded in a volatile environment. Building communities under these circumstances is a demanding task that involves technical, legal, and social questions apart from management issues. Much more interdisciplinary research is needed to better understand the connections between these topics (Lowitzsch et al. 2019).

We also need to point out that switching from one type of governance – e. g. from managing discrete transactions on a mass market to another type, such as community management – is not an easy task. Innovative business models may challenge corporate identities and legitimacy (Stanske 2019). Leadership, therefore, is not only required to amend business models to fit changing environments but also to inspire employees and stakeholders to support the transition. We have not included this line of argumentation in our study, but we are aware that there is a need for further research.

Finally, we would like to point out the connection between our study and the energy turnaround that is currently taking place. We would like to emphasize that a better understanding of the functioning of energy communities is also urgently needed because the success of the energy transition ultimately might well depend on whether DECs can successfully establish themselves. A continuation of the "old model" will likely make the transition to renewable energies a failure.

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Keywords

Community Management, Energy Sector, Governance, Sustainability