

Energy justice for members only?

A study of German energy cooperatives' contributions to energy justice

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Abstract:

Energy cooperatives are seen as a way to achieve energy democracy in both academic and activist circles, with often an implicit expectation that they also contribute to energy justice. These assumptions are increasingly being questioned, often on the grounds of the limited diversity of energy cooperative membership. I conducted semi-structured interviews with four German energy cooperatives in order to investigate the extent and conditions under which energy cooperatives can contribute to energy justice. Applying the principles of energy justice outlined by Sovacool et al. (2017) as a framework, my findings indicate that while energy cooperatives make a variety of contributions to energy justice that benefit people beyond their immediate membership, it is especially in the field of distributional and procedural justice that mainly their members benefit. Furthermore, the ability to contribute to energy justice can at times be constrained by a lack of capacities and well as inadequate policy measures.

Keywords: energy democracy, energy democratization, energy poverty, community energy, prosumer, electricity

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“The energy transition represents a one-time window of opportunity to democratize the energy sector. Once utilities have built giant renewable power plants, the markets will be closed to community projects.”

Morris and Jungjohann (2016), p. 413

1. In search of the energy system of the future

The transition from fossil fuels to renewable energy is no longer a question of “if”, but rather of “when” and, crucially, “how”. As Germany tries to cut its dependence on Russian fossil fuels, the energy system of the future is still unclear. Will there be gigantic solar parks in far-away deserts, used to produce green hydrogen that will be brought to Germany through old gas pipelines (Hamouchene,

2021)? Or will wind farms and solar parks be located closer to home, on German fields and coastlines? Who will get to decide where they are built, who will benefit from the revenue they generate, and who will bear the burdens associated with them?

These are the kind of questions that energy justice research seeks to examine. Energy justice describes “a global energy system that fairly distributes both the benefits and burdens of energy services, and one that contributes to more representative inclusive energy decision making” (Sovacool et al., 2017, p. 677). In Germany, energy cooperatives have proven themselves to be important actors in the *Energiewende* (energy transformation) (Klemisch, 2014). With community energy found to strengthen the local economy and increase the acceptance of renewable energy (Brummer, 2018; Ott & Wieg, 2014), it appears intuitive that especially energy cooperatives, which are built on the principle of democracy, would contribute to energy justice (van Bommel & Höffken, 2021). Indeed, beyond social movements endorsing energy cooperatives as a way of making the energy system more democratic (gerechte 1komma5, 2020; RWE & Co enteignen, 2021), the European Commission has also encouraged member states to create enabling conditions for community energy initiatives like energy cooperatives (van Bommel & Höffken, 2021). This makes energy cooperatives especially interesting and relevant as research objects. However, energy cooperatives, and energy communities more broadly, have also been criticized as undemocratic, lacking diversity and being primarily an investment opportunity for the well-off (Becker, 2022; Haas & Sander, 2018; Radtke, 2016, 2018). At the same time, they are also subject to regulatory hurdles that limit their activities (Energie Zukunft, 2015).

While there is increasing academic interest in the relationship between community energy initiatives and energy justice, existing research mainly focuses on energy justice within the members of an initiative (van Bommel & Höffken, 2021). This thesis therefore has a twofold aim; in posing the question “*to what extent and under what conditions can German energy cooperatives contribute to energy justice?*” I intend to address the research gap on interactions of energy cooperatives with energy justice in the broader energy system, as well as gain knowledge that can be used in societal decision-making (Miller, 2013). In order to answer my research question, I conducted semi-structured interviews with board members of four German energy cooperatives that I identified as “good practice” examples on the basis of their projects. Combining the interviews with background research and further information from energy cooperatives’ websites, I analyze

- *which aspects of energy justice can energy cooperatives contribute to, and*
- *what conditions hinder or support energy cooperatives’ contributions to energy justice.*

The thesis is structured as follows: I start by introducing energy justice as a theoretical framework, and examine its relationship to energy democracy (section 2). In section 3, I introduce the role energy cooperatives play in the German energy system, and examine the criticism levelled against them in regards to their contributions to democracy and justice. After detailing my methodology in section 4, I discuss the results of my analysis of the contributions of energy cooperatives to energy justice in section 5. The paper concludes with a summary of my findings and implications for social movements (section 6).

2. Theoretical framework

This section introduces the concept of energy justice, and how it is applied within this thesis as a decision-making framework. Due to its prominent role in the German discourse on energy justice and energy cooperatives, I also introduce the term “energy democracy”, and compare it to the concept of energy justice. Then I detail the principles of energy justice developed by Sovacool et al. (2017), on the basis of which the analysis is later conducted.

2.1. Energy justice as a decision-making framework

Much like sustainability science is an “attempt to bridge the natural and social sciences for seeking creative solutions” (Jerneck et al., 2011, p. 69), the field of energy justice is characterized by its interdisciplinary approach. In applying principles of social justice to energy research (Jenkins et al., 2016) it seeks to politicize a field of research that is often thought of as purely technical (Sovacool et al., 2017). Sovacool and Dworkin (2015) define energy justice as a “global energy system that fairly disseminates both the benefits and costs of energy services, and one that has representative and impartial decision making” (p. 436). They outline how the concept can serve as a conceptual tool for philosophers and ethicists, an analytical tool for researchers and as a decision-making tool for energy planners and consumers. Whereas the conceptual framework focuses on *costs*, *benefits* and *procedures*, and the analytical framework is based on the notions of *procedural*, *distributive*, *recognition* and *cosmopolitan justice*, the decision-making framework integrates these notions into a more detailed, practice-based set of principles.

Sovacool and Dworkin (2015) originally proposed eight principles of energy justice, encompassing *accessibility*, *affordability*, *due process*, *good governance*, *sustainability*, *intragenerational equity*, *intergenerational equity* and *responsibility*. These were expanded to ten principles in Sovacool et al. (2017) through the addition of *resistance* and *intersectionality* (see also section 2.3.). While the

authors foresaw the decision-making principles for energy planners and consumers to use, I believe they are also useful for evaluating energy cooperatives as existing institutional arrangements, in order to contribute to the development of “viable alternatives” (Isgren et al., 2019, p. 1498).

2.2. The “language war” with energy democracy

The German literature that critically examines energy cooperatives appears to favor the term energy democracy over that of energy justice (Becker, 2022; Haas & Sander, 2018). In the last decade, the term first gained traction in activist circles, and was then adopted as a conceptual framework in the academic literature. Conceptualized to varying degrees as process, outcome or goal (Szulecki & Overland, 2020), it has even made its entry into government discourse at various levels of governance (European Committee of the Regions, 2018; van Veelen, 2018). However, the concept has been accused of engaging in a “language war” with energy justice (Droubi et al., 2022, p. 2) as well as being called “academically unnecessary” (p. 13), being criticized for assuming that democracy automatically leads to justice, and for failing to engage with the more established field of energy justice research (Droubi et al., 2022).

The terms energy democracy and energy justice are often used interchangeably (Becker et al., 2015, p. 57), especially within social movements. In the academic literature, some conceptualizations of energy justice and energy democracy are virtually identical in building on a “triumvirate of tenets” (McCauley et al., 2013, writing on energy justice) of *distributional justice*, *procedural justice* and *recognition justice*, with the last aspect at times being replaced by *systemic justice* (Becker et al., 2015, energy justice) or *power* (Feldpausch-Parker et al., 2019, energy democracy).

In Germany, the term of energy democracy (*Energiedemokratie*) has recently been taken up by *Der Klimaplan von Unten* (climate plan from below), a “Green Deal” written in a bottom-up process initiated by a group of German climate activists, which holds energy democracy as one of its six pillars (gerechte 1komma5, 2020). They define the concept as “a collectively organized and decentralized energy supply on the basis of renewable energy” (gerechte 1komma5, 2020, p. 57). In the first edition published in 2020, they suggest that “the involvement of citizens in decision making can for example happen through energy cooperatives or participative discussions within municipalities” (gerechte 1komma5, 2020, p. 57). The *RWE & Co enteignen* (expropriate RWE & Co) campaign launched in autumn 2021 meanwhile demands the expropriation of energy companies like RWE, and the subsequent socialization of energy production. They, too, suggest that this could be achieved via municipalization with the involvement of local or regional society, or through energy cooperatives, though these visions have not been concretized further (RWE & Co enteignen, 2021).

Due to the overlapping definitions of energy democracy and energy justice, as well as a desire to engage with the work done by German social movements on the topic, I find it appropriate and indeed necessary to consider the literature on energy democracy in the further course of this thesis.

2.3. Principles of energy justice

The ten principles of energy justice intertwine a multitude of overlapping notions of justice, such as procedural justice, distributive justice, cosmopolitan justice, justice as an outcome, justice as due process and justice as fairness (Sovacool & Dworkin, 2015).

While all principles are important, availability and affordability are considered the most simple and accepted ones (Sovacool & Dworkin, 2015). Availability means that “people deserve sufficient energy resources of high quality (suitable to meet their end uses)” (Sovacool et al., 2017, p. 687), and concerns the ability of a system to provide sufficient energy resources when needed. This includes the availability of fuel sources (both fossil and renewable), as well as the infrastructure required to produce, transport, conserve, store and distribute energy (Sovacool & Dworkin, 2015). Affordability means that “all people, including the poor should pay no more than 10% of their income for energy services” (Sovacool et al., 2017, p. 687).

The notion of procedural justice is contained in the principle of due process and the principle of transparency and accountability (previously good governance). Apart from calling for effective judicial and administrative recourse, the due process principle also requires adequate options for stakeholder participation in energy policymaking and the inclusion of communities in decision-making about projects that will affect them (Sovacool & Dworkin, 2015). Transparency and accountability meanwhile refer to all people having access to high quality information about energy and the environment, as well as fair, transparent, and accountable forms of energy decision making (Sovacool et al., 2017).

Intergenerational equity means that “future generations have a right to enjoy a good life undisturbed by the damage our energy systems inflict on the world today” (Sovacool et al., 2017, p. 687). It thereby overlaps to some extent with the notion of sustainability, which Sovacool et al. (2017) define to mean that “energy resources should be depleted with consideration for savings, community development, and precaution” (p. 687). This in turn is closely related to the notion that “all actors have a responsibility to protect the natural environment and minimize energy-related environmental threats” (Sovacool et al., 2017, p. 687).

Sovacool and Dworkin (2015) root the principle of intragenerational equity in the distributive dimension of justice, which in contrast to procedural justice puts the focus on outcomes (Mundaca et al., 2018). Distributive justice examines how costs and benefits are allocated. In Sovacool et al. (2017), the principle is defined as all people having a right to “fairly access energy services” (p. 687), “fairly” underlining that distributive justice is concerned with how costs and benefits can be allocated in a fair manner, with a key question being if goods should be distributed on the basis of need, merit or property rights, or something else entirely (Sovacool & Dworkin, 2015). Although not listed as a principle in its own right, Sovacool and Dworkin (2015) see cosmopolitan justice as an application of distributive and procedural justice at a global scale, and it makes sense to consider it within the dimension of intragenerational justice as well.

The principles of resistance and intersectionality are added to the framework on the basis of a consideration of non-Western and non-anthropogenic theories of justice (Sovacool et al., 2017). The principle of resistance calls for energy injustices to be actively and deliberately opposed (Sovacool et al., 2017). Intersectionality meanwhile calls for the expansion of the idea of recognitional justice to “encapsulate new and evolving identities in modern societies, as well as acknowledging how the realization of energy justice is linked to other forms of justice, e.g. socio-economic, political and environmental” (Sovacool et al., 2017, p. 687).

3. The role of energy cooperatives in Germany

This section gives an overview over the history of the German *Energiewende* and the role community energy and especially energy cooperatives played in it. It details the principles cooperatives are organized around, as well as the critiques directed against cooperatives in general and energy cooperatives in particular. It closes with a consideration of whether energy justice may better be delivered via public utilities.

3.1. Historical context

In 2013, a year after a common definition of “energy democracy” was first adopted by activists at the Lausitz Climate Camp (Angel, 2016), the term was already being used as rallying cry in the campaigns to re-municipalize the electricity grids in Berlin and Hamburg (Becker et al., 2015), and academic attention followed suit. At around the same time, the *Energiewende* was picking up speed in the wake of the 2011 Fukushima disaster (Morris & Jungjohann, 2016). This expansion was in large parts driven by *Bürgerenergie* (citizen energy), which is the term used to describe community energy in

Germany (Radtke, 2016). Energy communities are noted for increasing the acceptance of renewable energy infrastructure, especially of wind power in rural areas, as well as strengthening local economy and community (Brummer, 2018; Ott & Wieg, 2014).

In 2012, 47% of installed renewable capacity in Germany was in the hands of citizens. 52% of that was in the hand of individual owners, such as farmers, or people with solar panels on their roofs, with a further 21% in the hand of energy communities (*Bürgerenergiegesellschaften*), and 27% falling under other forms of citizen participation (trend:research/Leuphana, 2013). While more recent numbers on the ownership of renewable capacity are not available, the German Cooperative Association DGRV reports that in 2020, the 835 energy cooperatives in Germany generated 8.8 TWh of renewable electricity (DGRV, 2021). This amounts to 1.8% of the 502.6 TWh of total electricity generated in Germany that year (Statistisches Bundesamt, 2021), avoiding 3 million tons of CO₂-equivalent (DGRV, 2021).

Cooperatives have a long history in Germany, to the point that they marked the first German contribution to the UNESCO immaterial world heritage list in 2016 (UNESCO, n.d.). Electrification cooperatives have been around in Germany since the late 19th century, initially as a way of providing for rural electrification (Holstenkamp, 2015). In the early 2010s, aided by the introduction of feed-in tariffs in 2001 and a reform of the cooperative law in 2006 (Engerer, 2014), Germany experienced an almost exponential growth in energy cooperatives, with record numbers of energy cooperatives being founded in the years 2011, 2012 and 2013 (Franziska Kahla et al., 2017). Since then however, growth has slowed down significantly, mainly attributed to a reform of the Renewable Energy Law (*Erneuerbare Energien Gesetz*, EEG) in 2014 that forces energy cooperatives to take part in renewables auctions where they have to compete with private investors (Energie Zukunft, 2015).

3.2. The principles of energy cooperatives

As Yildiz et al. (2015) note, “cooperatives are not the only relevant business model for financial citizen participation within the energy sector in Germany, but they constitute the organizational form that has become the most relevant regarding active participation in local energy policy” (p.61). Cooperatives have the purpose of advancing their members’ goals, which since the 2006 reform of the cooperative law (*Genossenschaftsgesetz*, GenG) include not only the economic goals of their members, but also social and cultural matters (§1 I GenG). This allows them to go beyond profit maximization (Yildiz et al., 2015). Furthermore, a member’s share of votes is not determined by the number of shares they hold - every cooperative member has one vote (§43 III GenG), ensuring democratic decision-making within the cooperative despite unequal financial contributions.

Beyond the democratic principle of “one member, one vote” and the principle of advancing member’s economic interests, cooperatives are also shaped by the “identity principle” (*Identitätsprinzip*), whereby the consumers of a cooperative are identical with the producers (Klemisch & Boddenberg, 2016). In the case of housing cooperatives, the tenants are their own landlords, and in worker cooperatives, the employees are their own employers. For energy cooperatives, it would mean that the electricity producers are also the electricity consumers. In practice, this principle is hard to achieve, due to the unique characteristics of electricity that make it difficult to store, as well as the legal framework that initially incentivized feeding the generated electricity into the general grid as opposed to using it locally (Klemisch & Boddenberg, 2016). This has started to change in recent years. In 2021, 80% of energy cooperatives were active in solar electricity production, 30% in wind electricity production, and 36% were involved in electricity supply (DGRV, 2021). While most energy cooperatives are therefore production cooperatives, a growing number are also (part of) consumption cooperatives, most notably Bürgerwerke, a cooperative of energy cooperatives with currently 104 members providing consumers with electricity from energy cooperatives’ production (Bürgerwerke, n.d.).

3.3. On the transformative potential of cooperatives

Ever since their popularization in the 19th century, the potential of cooperatives as an alternative to capitalism has been debated controversially.

In “Social Reform or Revolution”, Rosa Luxemburg explains how, operating within a predominantly capitalist economy, production cooperatives are forced to compete with non-cooperative enterprises in order to survive, requiring the workers forming a cooperative to essentially exploit themselves. This resonates with the fact that most people active in energy cooperatives do so on a voluntary, unpaid basis (Brummer, 2018). Consumption cooperatives are however able to help production cooperatives “[remove] themselves artificially from the laws of free competition” by providing a “constant circle of consumers” (Luxemburg, 1970, p. 36). As such, cooperatives are limited to “the manufacture of articles serving immediate needs” (Luxemburg, 1970, p. 36), which includes renewable energy production and supply, however does not cover other sectors such as mining. Luxemburg therefore declares cooperatives as unsuitable for “a general social transformation”, concluding that they can only mount an attack “on the twigs of the capitalist tree” (Luxemburg, 1970, p. 36). Still, this at least speaks for consumption cooperatives allowing energy production cooperatives to free themselves of the market.

In practice, however, without a full identity of producers and consumers, trade-offs between the benefits of the consumers and those of the producers arise. For example, seeing that the Bürgerwerke provide renewable energy through Power Purchase Agreements (PPA) with electricity producers, as opposed to purchases from the electricity market, they should be able to be immune to the electricity price increases on the market due to high gas prices. However, they need to balance the interests of their production cooperatives, who could get a higher price if they sold their electricity elsewhere, with the interests of their consumers in low electricity tariffs (Bürgerwerke, 2022). Their contracts are therefore oriented along the market prices of electricity. Furthermore, when purchasing energy from energy cooperatives, the Bürgerwerke need to match the price the energy cooperatives could achieve through feed-in tariffs. In the past, these prices were above market price, meaning that the Bürgerwerke only purchased part of its electricity from energy cooperatives, and instead supplied the majority of its electricity through an agreement with the Töging hydropower plant. Here, the Bürgerwerke need to match market prices as well. As market prices have risen above feed-in tariffs in light of the ongoing energy crisis, this enables the Bürgerwerke to purchase more energy from energy cooperatives (Bürgerwerke, 2022).

Karl Marx had a more ambivalent opinion on cooperatives, having faith in their potential, but being critical of their tendency to become isolated from the labour movement (Ji, 2020). In his 1875 *Critique of the Gotha Programme*, Marx notes that “as far as the present co-operative societies are concerned, they are of value *only* insofar as they are the independent creations of the workers and not protégés either of the governments or of the bourgeois.” (Marx & Sitton, 2010, p. 159).

Initially, the most common business model for energy cooperatives was to collect funds for solar photovoltaic installations or wind turbines, feed the generated electricity into the grid and reap the handsome feed-in tariff introduced by the government with the EEG of 2000, which was paid out to members of the cooperative as dividends. Indeed, most energy cooperatives are being run by volunteers who do not depend on the cooperative for their livelihoods. Viewed critically, energy cooperatives can therefore be seen as a form of sustainable investment where citizens profit of state subsidies, with the environmental benefits at times merely a “welcome side effect” that can be used for marketing purposes (Radtke, 2016, p. 10). This type of thinking seems to be especially prevalent in energy cooperatives that were founded by another organization in a top-down manner (Drewing & Glanz, 2020).

Haas and Sander (2018) criticize that in energy cooperatives, members primarily take the position of a private owner of the means of energy production rather than that of a democratic citizen. Furthermore, they point to the inherent tension between democracy and capitalism: while

democracy is built on the principle of all citizens enjoying equal political rights, capitalism leads to the accumulation of wealth in the hands of a few, resulting in economic inequality. This economic inequality shapes participation in energy cooperatives and limits their democratic nature. The nature of energy cooperatives, while democratic on the inside due to the “one member, one vote” principle, requires participants to make an initial financial contribution, which could hinder the participation of people with lower incomes (Becker, 2022). Indeed, it is especially men with academic degrees and high income who participate in community energy schemes (Rommel et al., 2018).

In light of the initial dependence on feed-in tariffs and the mostly upper- and middle class background of their members, German energy cooperatives in their current form can thus hardly be seen as a vehicle for a total transformation of the energy system. However, as Klemisch (2014) writes, “although cooperatives are not per se directed against the capitalist economy, they represent a non-capitalist element due to their identity and democracy principle” (p. 22). It is within this function of a non-capitalist element that I expect them to contribute to energy justice. Furthermore, energy cooperatives, while being dependent on the state for their functioning, can also potentially contribute to democratizing it, as I discuss below.

3.4. Energy cooperatives, remunicipalization and the state

Due to the perceived democratic deficits of energy cooperatives, there has been a turn to the study of (re)municipalization of energy infrastructure as an alternative path to democratization (Becker, 2022; Haas & Sander, 2018). In the late 1990s and early 2000s, many German municipalities sold their grids and utilities to private bidders, on concession contracts of usually 20 years (Becker, 2022). As these contracts are running out, many municipalities have bought back their grids and utilities, returning them to state ownership (Becker, 2022).

However, it appears inaccurate to contrast energy cooperatives and remunicipalization as two opposing pathways towards energy democracy, since they may also be linked. Instead, Becker (2022) demonstrates how movements for the remunicipalization of electricity grids in Berlin and Hamburg have seen the emergence of two different models of community participation – partial ownership through energy cooperatives (*Netzbeteiligung*) as well as ownership by “participatory utilities”. Remunicipalization efforts therefore represent a window of opportunity for the introduction of demands for democratization of public utilities.

Looking at movements to remunicipalize the energy grid in Berlin, and to prevent the partial privatization of the local utility in Augsburg, Haas and Sander (2018) find that while formal public

ownership of energy production through public utilities does not necessarily guarantee democratic participation, a democratization can be achieved through citizen initiatives.

Becker (2022) finds that grid ownership through energy cooperatives has its shortcomings in democratic participation being limited to cooperative members, aggravated by the social imbalances commonly observed in cooperative membership. If membership is not limited to residents of a municipality, direct beneficiaries of the cooperative's operations may also not be users of the grid's services. Grid ownership through cooperatives can therefore be understood as "collectivized private ownership" (Becker, 2022, p. 167). On the other hand, participation in a democratic utility may be hindered by the high level of expertise required to debate energy issues, imposing in effect similar restrictions on participation as the membership requirement of energy cooperatives. As Szulecki and Overland (2020) note, "increased participation can also reinforce existing inequalities, as people who have the time and resources (financial, socio-cultural) to participate tend to be those who are already privileged"(p. 8). Additionally, Becker points to the experience that the implementation of social tariffs after remunicipalization is difficult when municipalities have to refinance investments.

Aside from social movement-driven democratization of electricity networks in large cities like Berlin and Hamburg, there are a variety of examples from smaller cities around Germany that illustrate the different relationships energy cooperatives can have with municipalities and how this can open up citizen participation in the electricity network or the city utility. For example, the energy cooperative Rheinessen eG holds 23,9% of the municipal network operator Rheinessen-Energie GmbH (Energiewende Jetzt, n.d.–a), and the energy cooperative BürgerEnergie Wolfhagen eG holds a 25% stake in their local utility (Energiewende Jetzt, n.d.–c). The city of Jena sold two percent of its energy business to the cooperative Bürgerenergie Jena eG, and the energy cooperative of Steinfurt holds 15% of the local utility since 2016 (Energiewende Jetzt, n.d.–b). Other times, the municipality may block energy cooperatives' activities on account of the criticism outlined above, i.e. energy cooperatives being undemocratic ("Kirchheim Macht Sich Unabhängig," 2012).

Therefore, it appears that energy cooperatives cannot be thought of as entirely separate of, or even opposed to the state. Instead, they appear more or less intertwined with the state, if not always on an organizational level, then at least in regards to the policies that govern their work, as touched upon in section 3.2. This opens up questions about the extent to which they can contribute a non-capitalist element into the capitalist state (see section 3.3), if they themselves are associated with the state. Following Wright (2019), capitalist states are never entirely capitalist, but rather consist of "loosely coupled, heterogenous systems of apparatuses, within which the mechanisms that help reproduce capitalism are dominant"(p. 115). Democratizing the local state can therefore mean

enlarging the space for non-capitalist projects like energy cooperatives (Wright, 2019), and vice versa.

4. Methodological considerations

As I have demonstrated above, while there are indications that energy cooperatives are able to contribute to a more just and democratic energy system, they are also under a variety of inherent constraints. Therefore, I conducted four semi-structured interviews with energy cooperative board members in order to investigate to what extent and under what conditions energy cooperatives can contribute to energy justice. The following section explains the way critical realism influenced the research design, as well as detailing the way the interviews were prepared, conducted and analyzed.

4.1. Epistemological approach

The use of interview methodology requires a consideration of what kind of knowledge can be generated from this process. Within this thesis, I primarily used interviews to collect information that cannot be accessed in any other way, rather than putting a focus on the subjective experiences of the respondents. At the same time, the information gained from the respondents is necessarily shaped by their own opinions and perceptions. The thesis is therefore written from a critical realist perspective, which distinguishes between the real domain, the actual domain and the empirical domain, referred to as ontological depth (Edwards et al., 2014). Mechanism and structures that generate events lie in the real domain. The events they generate, both observed and unobserved, are found in the actual domain. Only events that are observed and experienced may emerge into the empirical domain (Brönnimann, 2022). In this way, causal mechanisms can be understood through phenomena at the empirical level, without reducing the real world (ontology) to our knowledge of reality (epistemology) (Fletcher, 2017).

This impacted my study design in several ways. Critical realist research is “theory-driven”, meaning that both interviews and analysis are guided by the researcher’s theory rather than the respondent’s thoughts (Edwards et al., 2014; Fletcher, 2017). Section 4.2.2. of this thesis details how the theoretical framework of energy justice guided the interview process. As critical realist interview methodology also benefits from drawing on resources external to the interview, in order to triangulate information gained from the interviews (Edwards et al., 2014), I supplemented the information gained from the interviews with information from other sources in the analysis, to allow for a more comprehensive discussion.

4.2. Semi-structured interviews

While valuable information on the various projects undertaken by energy cooperatives can be found on their websites, the voluntary nature of energy cooperative membership means that websites may be updated infrequently and lack important information. Interviews were therefore chosen to access information about the work of energy cooperatives.

The method of semi-structured interviews is especially useful for asking “probing, open-ended questions” (Adams, 2015, p. 494). Unlike surveys or questionnaires, the interviewer is able to follow up on the answers given, allowing them to explore aspects previously not considered. This made the method especially appropriate for the type of broad research questions posed in this thesis.

4.2.1. Selection of interview partners

Since this thesis is interested in the contributions energy cooperatives *can* make to energy justice, I selected good practice examples of energy cooperatives through a screening of energy cooperative websites, as well as websites collecting information on energy cooperatives such as *energiegenossenschaften-gruenden.de*. Cooperatives were selected on the basis of provision of tenant energy projects, participation in electricity grids as well as commitments to social justice on the website, which I expected to be factors that can contribute to energy justice. Following Szulecki (2018), I narrowed the analysis to the electricity sector, due to its centrality in the ongoing energy transition, as well as the predominance of electricity production and supply in the activities of German energy cooperatives (DGRV, 2021).

I contacted a total of five energy cooperatives, out of which four responded and were available for an interview. As can be seen in table 1, medium-sized and larger cooperatives from towns (Kirchheim unter Teck, Mörfelden-Walldorf), a small city (Reutlingen) as well as the capital (Berlin) are represented, located all across Germany. The people interviewed were all board members of their respective cooperatives. The interviews were conducted in German, taking place in March and April 2022 via zoom or telephone.

Table 1. Energy cooperatives interviewed

name	members	location	Activities in the electricity-sector
BürgerEnergie Berlin (BEB)	1000+	Berlin	Tenant energy Energy supply through Bürgerwerke Bulk purchases of solar panels for prosumers Energy saving consultations Anticipated: partial ownership of the Berlin municipal electricity grid

Erneuerbare Energien Neckar-Alb eG (EENaEG)	886	Reutlingen	Tenant energy Energy supply through Bürgerwerke
Teckwerke eG	1000+	Kirchheim unter Teck	Tenant energy Energy supply through Bürgerwerke Bulk purchases of solar panels for prosumers
Bürgerenergie Rhein-Main eG (BERMeG)	269	Mörfelden-Walldorf	Tenant energy Energy supply through Bürgerwerke 5% ownership of the municipal gas- and electricity grid

Basic information about the energy cooperatives interviewed for this thesis, based on their websites and interviews.

4.2.2. Construction of interview guidelines

The questions asked during the interviews initially were formulated on the basis of the ten principles of energy justice proposed by Sovacool et al. (2017). During the first two interviews however, attempting to systematically cover all principles within the interviews proved to be very time consuming.

Therefore, I adapted the questions to be more open-ended, giving the respondents more space to elaborate on their own conceptions of energy justice and energy democracy. The subsequent interviews started with a probing of the respondents' understanding of energy democracy and energy justice. While Chilvers and Pallett (2018) advocate for a relational approach that centers practitioners' conceptions of energy democracy, employing a purely inductive methodology would have been unsuitable for answering my research question. Rather, I took the respondents' conceptions as a starting point for the interview, upon which to direct subsequent questions.

On the basis of this, I asked the respondents how energy cooperatives can contribute to energy justice, allowing them to focus on the aspects most relevant to their own work. As this was the most central part of the interview, I asked follow-up questions to gather more information on the different aspects of energy justice. The interview closed with a visioning question, in order to gauge future perspectives for energy cooperatives.

4.3. Analysis of interviews

I transcribed the interviews on the basis of audio recordings and subsequently naturalized them, meaning that I removed redundancies and grammatical errors (Bucholtz, 2000). I then coded them using Nvivo. For the purpose of answering SRQ1 (*which aspects of energy justice can energy cooperatives contribute to?*), I used the principles of energy justice of Sovacool et al. (2017) to code the material deductively. During this iterative process, I decided to group related principles together

and to drop the principle of intersectionality from the analysis, as it goes beyond the scope of this thesis (see table 2). In order to answer SRQ2 (*what conditions hinder or support energy cooperatives' contributions to energy justice?*), I coded the material inductively to identify conditions that hinder or enable energy cooperatives' contributions to energy justice. The results of this process are presented and discussed in section 5. All quotes used in the analysis were translated from German into English.

Table 2. Principles of energy justice, adapted from Sovacool et al. (2017)

Code	Original Principle	description
Availability		people deserve sufficient energy resources of high quality (suitable to meet their end uses)
Intragenerational Equity		All people have a right to fairly access energy services
Affordability		all people, including the poor should pay no more than 10% of their income for energy services
Procedural justice	Due Process	Countries should respect due process and human rights in their production and use of energy
	Transparency and Accountability	All people should have access to high-quality information about energy and the environment and fair, transparent and accountable forms of energy decision making
Sustainability	Sustainability	Energy resources should be depleted with consideration for savings, community development and precaution
	Intergenerational Equity	Future generations have a right to enjoy a good life undisturbed by the damage our energy systems inflict on the world today
	Responsibility	All actors have a responsibility to protect the natural environment and minimize energy-related environmental threats
Resistance		Energy injustices must be actively, deliberately opposed

4.4. Limitations

This research design is subject to several limitations. In terms of subject matter it puts its focus on the work energy cooperatives do in the field of electricity, and without further exploring how energy cooperatives contribute to energy justice through the provision of heat and services like carsharing. Furthermore, the scope is limited to the situation in Germany, and it is difficult to apply any findings to other countries due to the very specific historical and policy context in Germany (Drewing & Glanz, 2020). Lastly, a clear limit of this thesis is the small amount of interviews conducted due to time constraints. While the results are not intended to be representative, but rather an overview over good practices within energy cooperatives, conducting further interviews would have enriched my results, and would have allowed me to deepen my enquiries on the basis of previous interviews.

5. Results and discussion

This section presents and discusses the insights gained in the interviews, structured by sub-research question. Section 5.1. examines the contributions energy cooperatives in Germany make to energy justice, and section 5.2. describes the conditions that influence their ability to do so.

5.1. Contributions to energy justice

5.1.1. Availability

With 100% of the population in Germany having access to electricity (IEA et al., 2021), energy is readily available in Germany. In fact, Azzuni and Breyer (2020), in calculating a Global Energy Security Index based on 15 dimensions, find that Germany is one of the most energy secure countries in the world. This is mainly on account of high resilience (“adaptive capacity to cope with changes and shocks in the energy system in order to ensure the continuity of a functioning society and system”(Azzuni & Breyer, 2020, p. 19)) as well as the “advanced” nature of German energy policy, though they note that Germany suffers from a lack of available physical resources.

The Russian invasion of the Ukraine in February 2022 however highlighted German dependency on fuel imports from Russia (Bauer et al., 2022). By increasing the renewable energy capacity in Germany, energy cooperatives are able to reduce this dependency and contribute to energy security. Speaking only two weeks after the invasion, BEB also reported an increased interest in the installation of insular solar modules that can provide energy in the event of a blackout (Interview BürgerEnergie Berlin). A month later, Teckwerke also reported a „very high interest in (...) increasing autarky of energy supply“ (Interview Teckwerke). At the same time, neither EENAeG nor BERMeG had observed changes in demands for their services as of March and April.

Energy cooperatives are therefore able to contribute to availability of electricity in Germany by expanding renewable energy capacity, which in turn also strengthens →sustainability, as well as →affordability.

5.1.2. Affordability

In 2020, German households spent an average of 6.1% of their income on energy (Statistisches Bundesamt, 2022). For households with an income of under 1300€ per month (13.3% of German households in 2018, (Bundeszentrale für politische Bildung, 2020)), energy expenses made up 9.5% of income though. In light of the recent rise in gas and electricity prices (Hauser, 2022), the portion of income spent on energy can be expected to rise above 10%, especially for low income groups.

None of the energy cooperatives reported to addressing energy poverty within their work. According to the BEB in Berlin, aside from a lack of capacity to address energy justice issues like power cuts, they feel these issues are already represented by other actors in Berlin, which is why they themselves focus on other topics (Interview BürgerEnergie Berlin). The respondent representing Teckwerke suggested that making energy affordable is actually the responsibility of the state, which could implement a progressive pricing policy that guarantees a base amount of electricity at very affordable prices, with additional electricity use billed at higher rates.

Nonetheless, energy cooperatives are able to make a contribution towards the affordability of electricity as outlined below, both to members as well as non-members of the cooperatives. It is however unclear to what extent these contribution are able to directly benefit people affected by energy poverty, without explicit targeting of these groups by the cooperatives.

Bürgerwerke: affordable electricity through a consumption cooperative

Founded in 2013, the Bürgerwerke are a cooperative composed of energy cooperatives, which allows production cooperatives to market and sell their electricity. Membership in an energy cooperative is not required to become a customer. All of the energy cooperatives interviewed are members of the Bürgerwerke, and thus advertise their tariffs on their websites.

One respondent from an energy cooperative that was amongst the founders of Bürgerwerke explained that they are able to provide competitive prices due to the lower profit expectations compared to private investors (Interview Teckwerke). While they had to increase prices for new customers at the end of December 2021 due to the overall increase in electricity prices, they lowered them again as soon as they could in February 2022 (Bürgerwerke, 2022; Interview Teckwerke). However, as illustrated in section 3.3., it is at times difficult for Bürgerwerke to balance the interests of their producers with their consumers. The representative of Teckwerke further explained why the provision of affordable energy is so complicated:

„That means, we are definitely able to compete, but we also don't want to attract people that are only looking for the cheapest provider. Because when you add a new electricity customer to your infrastructure, it takes about two and a half to three and a half years until the investments, the effort you have made, are recovered with this customer as profit. But only a customer who stays with you for five, six, seven years brings you an economic advantage. That means we don't want customers who are just looking for the cheapest electricity provider, we expressly don't want them. That means we don't make any overly cheap offers.“ (Teckwerke, 2022b)

Tenant electricity

Germany has the lowest rate of home ownership in the EU, with 49.6% of the population renting their accommodation (Eurostat, 2021). Tenant electricity schemes, which all of the cooperatives interviewed were involved with, allow them to become producers of their “own” electricity nonetheless, which one respondent described as follows:

“That's cheaper electricity, that's 10% below the utility tariff, and you have, dear tenant, the possibility to get renewable electricity cheaper from your own roof, and what else you need when it's night or there are clouds, you still have to get that from your energy supplier.” (Interview EENAeG)

Similarly, BürgerEnergie Berlin report that roughly 1/3 of yearly electricity use can be covered this way at a very low tariff, although with Berlin's wide range of electricity providers, it may be possible to find a cheaper one, which however then would have a different electricity source makeup and wouldn't have a connection to the own accommodation. Often, tenant energy projects are implemented in cooperation with housing cooperatives (Interview EENAeG).

Overall, they are seen as a good way of promoting energy justice (Interview BürgerEnergie Berlin). However, the implementation of tenant electricity schemes has proven very difficult so far. One cooperative reported that they have been involved in tenant electricity projects since 2012 – before the term even existed, which back then was “very simple and very successful” (Interview Teckwerke). In 2017, the German government began supporting such models through a *Mieterstromzuschlag* (tenant electricity bonus). The subsidy has been very ineffective so far, with the representative of the Teckwerke, calling the current policy an “administrative monster” (Interview Teckwerke). Indeed, all respondents point towards the administrative complexity of tenant electricity, where a separate electricity tariff needs to be created. Since tenants have no obligation to buy the electricity from the rooftop solar, a different accounting process is needed for tenants that buy it and those that don't, something a respondent referred to as “total insanity” (Interview BürgerEnergie Berlin). Both EENAeG and BERMeG reported having to pay an external contractor to take care of the complicated payment modalities. Financially, it is almost a zero-sum game, which is why so few actors are active in the field (Interview BürgerEnergie Berlin).

Affordable solar panels for prosumers

During the interviews, it became obvious that some energy cooperatives also support private citizens in the purchase of solar panels, allowing them to become prosumers, meaning that they are simultaneously producers and consumers of energy (Szulecki, 2018). Being able to cover part of their electricity consumption on their own lowers electricity expenses, once the initial costs of purchase

have been amortised. Teckwerke remarked that “through bulk purchasing, we get very good conditions, which is of course passed on to the people.” While Teckwerke offer some additional benefits for their members and customers, the bulk purchasing actions are open to anyone, provided they are able to pay the fee of 75€ for initial advice and 100€ for the planning services (Teckwerke, 2022). Tenants meanwhile can profit from affordably priced balcony solar modules (Teckwerke, n.d.). While BERMeG do not offer any balcony modules themselves, they use their website to advertise the city’s service of providing partial grants for the purchase of balcony modules (Interview BERMeG). Members of the cooperative get an additional rebate of 10% (BERMeG, n. d.).

BEB also runs a solar installation programme, where citizens can install their own solar panels with the help of experts and other members of the cooperative, which can lower installation costs, in addition to creating a feeling of community (Interview BürgerEnergie Berlin).

Overall increase in renewable energy

Lastly, by increasing the share of renewable energy in the German electricity mix, energy cooperatives also contribute to lowering electricity prices for consumers overall. On the electricity market, the price is determined by the most expensive powerplant in the merit order – usually gas plants (Houben, 2022). A higher share of cheaper renewables means that the more expensive plants will be pushed out of the merit order (Houben, 2022).

5.1.3. Intragenerational equity

Energy cooperatives are able to offer a variety of contributions to energy justice that are not limited to their membership, such as providing affordable energy (→affordability) as well as increasing renewable energy production (→sustainability) and lowering dependence on fossil fuels (→availability), which benefits society as a whole. In order to gain dividends from an energy cooperative, as well as take part in the decision making process (→procedural justice), cooperative membership is however necessary. Energy cooperatives allow ordinary citizens to benefit from the feed-in tariff for renewables, which ensures that profits stay in the region, as opposed to going to large national and international investors (Interview Teckwerke). While this increases distributive justice overall, energy cooperative membership itself tends to be skewed in favor of older men with a high level of education and income (Rommel et al., 2018).

Financial barriers to membership

An often-cited obstacle for marginalized groups to access energy cooperatives is that of share prices (Hanke et al., 2021; Radtke, 2018). For the energy cooperatives I interviewed as a part of this thesis, membership requires the purchase of at least one share of 100€, with several cooperatives encouraging the purchase of even more shares due to the high administrative costs of welcoming new members. Indeed, BürgerEnergie Berlin explained that even the recommended 500€ of shares are very cheap from an administrative standpoint, since every membership is associated with a lot of administrative effort (BürgerEnergie Berlin, n.d.). In a recent survey of all German energy cooperatives, 69% report a minimum share purchase of up to 500€, with 10% requiring minimum purchases of shares above 1000€ (DGRV, 2021). Members' mean contribution was 5164€, with only 27% contributing less than 1000€. This indicates clearly that a majority of energy cooperative members invest significant sums.

Asked about whether a minimum contribution of 100€ or above is perhaps too much for some people to pay, one respondent expressed disbelief about 100€ being unaffordable in Germany, and pointed to the cooperative's high number of members. Another, while initially stating that energy cooperatives also enabled people with "low income" to actively take part in the German energy transformation, conceded that "people with very low income are not our members". Returning to the topic shortly after, they expressed their belief that, if people with low income changed their priorities, they too would be able to afford the 400€ membership in an energy cooperative. These statements speak to a certain lack of recognition of people with very low incomes.

Social and cultural barriers to membership

As Drawing and Glanz (2020) detail, active membership in energy cooperatives is also often shaped by informal networks and a perceived necessity of technical affinity that women or otherwise marginalized groups may have limited access to. BürgerEnergie Berlin explained that they have noticed that they are able to attract a more diverse crowd when they address issues in a more political and cultural manner, compared to the older, male crowd they tend to attract with technical topics (Interview BürgerEnergie Berlin). On top of trying to be mindful of the kind of images they use as well as the speakers they invite for events, they are also involved in a research project on how to make the Energiewende more diverse and just (Interview BürgerEnergie Berlin).

EENAeG further reported difficulties with recruiting younger members, especially with a view to eventually replacing the often already retirement-age board members, despite efforts to reach out

and collaborate with universities (Interview EENAEg). One reason they suggested for this is that young people are likely to move away after their studies.

It is worth noting however that the obstacles to participation outlined above appear to be of a systemic nature, and are therefore also likely to be appear in the context of participatory utilities (Becker, 2022). Addressing them may require deeper changes at a societal level. However, the revised European Renewable Energy Directive (RED II) suggests that

“Member States should take appropriate advantage of [opportunities for renewable energy communities to advance energy efficiency at household level and helps fight energy poverty through reduced consumption and lower supply tariffs] by, inter alia, assessing the possibility to enable participation by households that might otherwise not be able to participate, including vulnerable consumers and tenants.” (Directive (EU) 2018/2001, 2018)

While it can therefore be argued that it is not the responsibility of energy cooperatives themselves to tackle issues of intragenerational equity, the German government definitely does hold a responsibility to improve participation of marginalized groups.

Cosmopolitanism

Intragenerational equity can also be understood to entail an element of cosmopolitanism, that requires a consideration of the way communities in other parts of the world are impacted by energy policies. Although this topic did not come up in the interviews, there are some energy cooperatives, that lend financial support to initiatives outside of Germany. For example, the energy cooperative EWS Schönau, which produces as well as distributes electricity, adds a “sun cent” (*Sonnencent*) to their electricity and gas tariffs, which is used to fund climate-related projects in Germany and abroad (EWS Schönau, n.d.). Part of the projects that are funded this way are located in marginalized regions (EWS Schönau, n.d.).

The energy cooperative fair pla.net uses a similar approach. While their shares can be purchased at a comparably high price of 250€, the money is used to fund projects in the global north as well as the global south, for example India, Philippines, Kenya and Nigeria (Fair Pla.net, n.d.). As such, the financial means of the well-situated are leveraged for the purpose of delivering energy justice.

5.1.4. Procedural justice

While financial participation – a way of increasing the acceptance of renewable energy projects in the population - does not necessarily have to happen through energy cooperatives, energy cooperatives enable further participation in decision-making as well (BERMeG, 2022; Teckwerke, 2022b).

The representative of BEB remarked that the Berlin grid operator, although 100% owned by the state of Berlin, is organized on the basis of private-sector principles, and thus lacks organs allowing for citizen participation (Interview BürgerEnergie Berlin). In December 2021, after a decade of campaigning, the newly elected government of Berlin included citizen participation through the BEB cooperative in their coalition agreement (BürgerEnergie Berlin, n.d.).

According to the respondent from the BEB:

“It is very important that actors such as grid operators learn to deal not only with a few very professionally positioned actors, but also with a large number of actors who deal with this topic on a one-off basis, perhaps only once, because they only have their own roof that we are implementing, but they don't actually spend the rest of their lives dealing with such energy management issues. And there is a [knowledge] gradient, but it has to be balanced out as best as possible so that it doesn't lead to people saying "it's all too complicated, I don't understand it, I can't talk to these people because somehow we all speak different languages to each other".”

In terms of participation in decision-making however, energy cooperatives suffer of similar shortcomings as in regards to distributional justice, with membership being a prerequisite to make decisions such as what the profits of the cooperative will be spent on. BEB however argued that once the energy cooperative succeeds in becoming a partial owner of the grid, this will open avenues of participation for non-members as well. The cooperative sees itself as the vehicle for enabling citizen participation in the municipal grid, though they acknowledge that cooperative members have decision-making powers that go beyond those of non-members, in that they can decide what the financial returns of grid operation are spent on.

“I believe that a structure is needed in which people can organise themselves in order to be able to bundle their points of view and bring them into politics or, in our case, it is somehow also concretely about bringing them into grid operation, simply because one voice alone is not enough and that, in the end, somehow as many voices as possible need to be bundled in order to be able to achieve a change in the end.”

This function of bundling citizen interests was also mentioned by BERMeG. When the mayor of Mörfelden-Walldorf first initiated citizen participation in the grid, the other shareholders were initially sceptical, since they assumed this would mean a lot of individual citizens would become involved (Interview BERMeG). The mayor was then able to explain that citizens would be represented by one entity – the local energy cooperative (Interview BERMeG). The shareholders thus agreed – some only after a longer period of hesitation, for the energy cooperative to purchase 5% of shares (Interview BERMeG). In practice, organizing citizen participation through energy cooperatives may therefore be a good way of implementing citizen participation in city utilities, provided barriers to cooperative membership are reduced.

Energy cooperatives are able to contribute to increased transparency in the energy sector, allowing more people to interact with the energy system. Many energy cooperatives actively provide information on climate and energy related issues. For example, in 2019 BEB organized a “long night of the climate”, with various events such as lectures and workshops on climate related issues (Interview BürgerEnergie Berlin). The event unfortunately could not take place in the subsequent years due to the pandemic (Interview BürgerEnergie Berlin). In terms of financial accountability, the cooperatives are audited on an annual or biennial basis, depending on their total assets, “more strictly than any stock company” (Interview Teckwerke).

5.1.5. Sustainability

Since the energy cooperatives interviewed only produce and sell electricity from renewable sources, a baseline of sustainability is given. As such, the topic did not come up a lot in the interviews. Renewable energies however also come with their own sustainability challenges, such as recycling of wind turbines and solar panels. While solar panels technically speaking have a very long lifespan, the fact that solar panels do not receive a feed-in tariff after 20 years results in many installations being taken down before they have reached their end of life (Interview EENAeG). However, the direct marketing of electricity through consumer cooperatives like the Bürgerwerke enables energy cooperatives to keep installations running profitably (Bürgerwerke, 2022).

Teckwerke also mentioned that they have children as members whose grandparents bought shares for them (Interview Teckwerke), a factor that can promote the participation of younger people in energy cooperatives (Drewing & Glanz, 2020), and thereby contribute to both intragenerational and intergenerational equity.

Energy saving is a further aspect that energy cooperatives promote, although it did not come up in the interviews. BEB for example offers free energy saving consultations for its members (BürgerEnergie Berlin, 2018). The “power rebels of Schönau”, pioneers of the renewable energy cooperative movement, were a group of citizens that became concerned about their small town’s reliance on nuclear energy after the Tchernobyl-disaster in 1986. Eventually founding the cooperative utility EWS Schönau, they were initially motivated by the desire to reduce energy consumption (Morris & Jungjohann, 2016). Similarly, the energy cooperative of Wolfhagen offers funds for their members to invest in energy-efficient appliances (Energiewende Jetzt, n.d.–c).

5.1.6. Resistance

The principle of resistance calls for energy injustices to be actively and deliberately opposed (Sovacool et al., 2017). While different forms of resistance can be envisioned, the most relevant form of resistance against injustices practiced by energy cooperatives appears to be political work. Notably, the extent to which the energy cooperatives interviewed are engaged in political work vary widely. Indeed, the representative of Teckwerke remarked to stay out of politics as far as possible (Interview Teckwerke). One respondent explained, that while their energy cooperative stays out of politics, they are active in a state-level network of energy cooperatives that tries to influence politics (Interview BERMeG). The representative of BEB remarked to especially addressing the deficient legislation in the area of tenant energy on a political level (Interview BürgerEnergie Berlin). Their cooperative also supports the Fridays for Future climate strikes (BürgerEnergie Berlin, 2022). The representative of EENAeG noted that, while they themselves as well as another member of the cooperative are heavily involved in the political process both on a local level, as well as through lobbying at the national level, this is not a specific feature of energy cooperatives (Interview EENAeG). Albeit they see themselves as a small actor with limited influence, they believe this allows them to contribute practical perspectives where lawmakers failed to think policy measures all the way through.

Table 3 summarizes the contributions of the interviewed energy cooperatives to the principles of energy justice as outlined in this part of the discussion.

Table 3. Contributions of energy cooperatives to the principles of energy justice

Principles of energy justice	Contributions of energy cooperatives
Availability	Moderate contributions <ul style="list-style-type: none"> Increasing renewable energy capacity Prosumption
Intragenerational equity	Limited contributions <ul style="list-style-type: none"> Distribution of dividends to members
Affordability	Notable contributions <ul style="list-style-type: none"> Tenant energy Prosumption Electricity supply through Bürgerwerke Increasing renewable energy capacity
Procedural justice	Notable contributions <ul style="list-style-type: none"> Decision-making for members Ownership of electricity grids Increased transparency and information Electricity supply through Bürgerwerke
Sustainability	Notable contributions <ul style="list-style-type: none"> Increasing renewable energy capacity Promotion of energy saving

Resistance	Moderate contributions <ul style="list-style-type: none"> • Political lobby work
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5.2. Conditions for energy justice

In the analysis of the interviews, professionalization, a cooperative’s relationship with its municipality, and the role of legislation were identified as important conditions that influence the extent to which energy cooperatives can contribute to energy justice. They will be discussed in this section.

5.2.1. Professionalization

As pointed out in section 5.1.3., energy cooperatives give the lack of capacities on the grounds of being volunteer-run as a reason that they are not able to adequately address issues of intragenerational equity. Enhancing working capacities could therefore contribute to improved intragenerational equity in the energy system by diversifying energy cooperative membership. Three of the energy cooperatives interviewed expressed an explicit desire as well as a need to professionalize their work. Teckwerke recounted that the purely volunteer-run cooperatives they observe eventually lose importance, and BERMeG emphasized that they “have the goal of professionalizing ourselves, and we need to have that in order to keep this cooperative alive in the long term.” Teckwerke already has board members working in part time positions, and is hoping to employ people on a full-time basis soon (Interview Teckwerke). BürgerEnergie Berlin noted that they hope to be able to professionalize with the additional income from grid participation. BERMeG however noted that while grids were previously referred to as “money printing machines”, the Federal Network Agency since adjusted the capital returns to the market interest rate, resulting in a lower capital returns than initially calculated.

5.2.2. Relationship with the municipality

In the interviews, the respondents expressed a broad range of relationships to the state. BERMeG connected their good relationship with their local municipality to their success. Not only did the mayor of their town initiate the participation of the energy cooperative in the grip operation, but the cooperative also has 80% of their photovoltaic and heat installations on or in municipal buildings (BERMeG, n.d.). The representative of BEB emphasized that they “don't think [they] are concerned with breaking up the political primacy in grid operation”, and that they don’t intend to get in the way of the democratically legitimated structures of the state government. That is why their application in

the concession procedure was not targeted at taking over the grid in its entirety, but to instead run it together with the state of Berlin (Interview BürgerEnergie Berlin). Teckwerke on the other hand, in their bid to take over part of the grid back in 2012, did target a blocking minority of 25% (“Kirchheim Macht Sich Unabhängig,” 2012).

However, Teckwerke report that their bid to hold a stake in the electricity grid failed, because they did not have the support of the local mayor (Interview Teckwerke). Indeed, in 2012, the mayor argued that while they were in favor of citizen participation in the energy supply, if the grid belonged to the city, it would automatically belong to everyone, rather than only belonging to a select few citizens (“Kirchheim Macht Sich Unabhängig,” 2012) It however does not appear that the city has yet implemented participatory mechanisms or intends to do so in the future. According to the respondent, the municipality is now considering to begin selling electricity through the municipal utility, which would put them in direct competition with the Teckwerke (Teckwerke, 2022b). The respondent commented that “the municipality should concentrate on its core tasks and not enter into unfair competition with private individuals.” (Interview Teckwerke). This raises questions about the role energy cooperatives should play. According to the respondent, they do not have the ambition to provide energy to the entire region (Interview Teckwerke), which would leave room for other actors, raising the possibility of energy cooperatives co-existing with participatory utilities. Other cooperatives interviewed stated that they want to contribute as much as possible to the renewable energy supply in their region, however do not think that achieving 100% coverage on their own is realistic (Interview BERMeG; Interview EENAEg). One respondent remarked that they intend to work together with the “big utilities” to achieve this goal (Interview EENAEg).

5.2.3. Legislation and role of the state

As has already been mentioned in 5.1., there are several policies that limit the potential for energy cooperatives to contribute to energy justice, most notably in the field of tenant electricity. Respondents also criticized other measures that affect prosumers, such as the fact that there is effectively a 10kWh limit on rooftop solar installations, because anything above results in a lower feed-in tariff, as well as additional charges and tax obligations (Interview Teckwerke).

The so-called Easter package that was presented by the German government in April 2022, was deemed as an improvement, with policies that hindered energy cooperatives in their work however persisting, such as the low feed-in tariffs if part of the electricity generated is used directly, and part is fed into the grid. This becomes a problem if the solar panels are on a building that does not use a lot of the generated electricity, and could lead to smaller installations even when there is space for

larger ones (Interview EENAEg). The respondent of the Teckwerke cooperative however confided that they do not need subsidies anymore, as they market almost all their electricity under Power Purchasing Agreements (PPA), where they are able to make 10ct/kWh, as opposed to the 6ct feed-in tariff.

In an interview held before the introduction of the measures, one respondent pointed out that, while they were expecting clear improvements in the conditions they would be operating under, their cooperative was in a state of limbo, since they did not know what kind of conditions they would be doing their projects under, and what kind of government support they would be able to receive (Interview BürgerEnergie Berlin)

There is especially a demand for simplification of policies (Interview BürgerEnergie Berlin; Interview Teckwerke), with one respondent remarking that „every time a politician touches something, it becomes a bit more complicated” (Interview Teckwerke). By simplifying the implementation of tenant electricity projects, the state could create the conditions for energy cooperatives to be able to contribute more to energy justice, though it could also result in more competition for energy cooperatives, including from profit-oriented actors.

Crucially for energy justice, the EU directive RED II has provisions that should enable locally produced energy to be used by the local actors, which however have not yet been implemented in Germany (Interview BürgerEnergie Berlin). The previous federal government held that the tenant energy policy already ensured this, however the cooperative disagrees and hopes that the newly elected government will implement the provisions stringently (Interview BürgerEnergie Berlin).

As outlined in section 5.1.3., there are challenges associated with providing affordable energy to low-income households. One respondent therefore called for the government to implement progressive electricity pricing, allowing for a base amount of electricity to be available at very affordable prices, with additional electricity use billed at higher rates (Interview Teckwerke). They remarked that currently, it is the other way around, with entities that consume the most electricity (such as industry) getting their energy at very low prices because they are deemed to be in international competition. It is worth noting that many of the contributions of energy cooperatives, can also be delivered by other actors. For example, tenant electricity is also being implemented by city utilities (Mainova, n.d.).

The representative for BERMeG also criticized the policy of financing feed-in tariffs for renewables via the EEG Umlage, which is a surcharge placed on all electricity sales. Subsidies for coal and nuclear energy meanwhile were paid from tax money. Renewables were therefore blamed for expensive

electricity, even though they are actually less expensive now. Still, it made a negative association for consumers. This surcharge is set to be eliminated in 2022 (Interview BERMeG).

Lastly, the representative of BERMeG also emphasized the importance of a mindset shift, for people to accept that in order to limit global warming, some sacrifices need to be made. They believe that this needs to be communicated clearly in politics (Interview BERMeG).

6. Conclusion and outlook

In the following section, I summarize the findings of my thesis and discuss areas of further research. I conclude by outlining the implications of my research for social movements.

6.1. Energy cooperatives as actors for energy justice

Energy cooperatives are able to make multi-dimensional contributions to energy justice. The extent to which people can benefit from these contributions varies however. While increases in availability, affordability and sustainability of electricity can benefit people who do not hold a membership in an energy cooperative, membership is required in order to receive dividends and participate in decision-making.

The fact that energy cooperatives membership is limited by financial and social hurdles therefore constrains the contributions of energy cooperatives to energy justice. Further research is required to assess if systemic inequalities also affect access to non-membership based benefits of energy cooperatives. The cooperatives interviewed expressed a desire and a need to professionalize, which could increase capacities to work on issues of intragenerational equity. However, despite the cooperatives interviewed for this thesis having been selected as “good practice” examples, some dismissed the hurdles people with lower incomes might face, indicating a lack of recognitional justice. This mirrors research by Drawing and Glanz (2020), who point to the cooperative law which historically sees the primary goal of cooperatives as advancing their member’s interests, rather than contributing to society as a whole, though the 2006 reform broadened this to social and cultural purposes (Barth & Schooss Neves, 2020).

While there are steps energy cooperatives can take to increase intragenerational equity by expanding their membership, further research is needed to examine how *governments* can enable vulnerable households to participate in energy cooperatives, as suggested in RED II. After all, this thesis has shown that energy cooperatives are constrained in their ability to contribute to energy

justice by government legislation. With the lowest home-ownership rate in the EU, it is especially important for Germany to allow its tenants to become prosumers. As the interviews highlighted, the current legal framework is extremely complex to implement, decreasing profit margins for energy cooperatives and drawing on their limited capacities.

While partial ownership of electricity grids is seen as a way of boosting profits, it can also increase procedural justice by ensuring that the electricity grid becomes more responsive to prosumers' needs – in theory. For energy cooperatives to become shareholders in the local electricity grid however, a good relationship with the municipality is required. More research is needed on how these kind of co-operations with the state can contribute to procedural justice in practice. My research also highlighted the role the identity principle of cooperatives can play in energy cooperatives, with the *Bürgerwerke* allowing energy cooperatives to also sell their electricity as opposed to feeding it in, opening a new business model for them that also contributes to making electricity more affordable and transparent.

6.2. Implications for social movements

As outlined at the start of this thesis, how to achieve a more just energy system is not merely a hypothetical thought experiment, but a question that social movements are posing themselves as they try to build the energy system of the future. The energy cooperatives they envision may be quite different from the ones interviewed for this thesis – after all, the German *Bürgerenergie* movement decidedly did not happen under the banner of energy democracy, which is a distinctively progressive and emancipatory conception. Instead, it has in large parts been driven by conservative rural communities and received early support from politicians of the Christian Democratic Party (Morris & Jungjohann, 2016, pp. 95–122).

However, the interviews also highlighted the very different forms energy cooperative work can take, as well as the different beliefs the people involved may hold and the goals they may pursue. The energy cooperatives of the future may therefore look very different from those I interviewed. They may have solidarity memberships for members with low incomes, and may be organized explicitly around the purpose of contributing to energy justice, with their membership recruited from a younger generation of climate activists. Still, they will have to navigate the government policies that have a deep effect on their work, as my thesis has shown. While energy cooperatives can therefore be a tool for making the energy sector more just, for them to develop their contributions fully, policy changes will be necessary.

7. References

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