

## **Ecomodern masculinity?**

*An intersectional feminist analysis of barriers for participation in Renewable Energy Communities*

*Julia Hönnecke*

---

Master Thesis Series in Environmental Studies and Sustainability Science,  
No 2023:043

A thesis submitted in partial fulfillment of the requirements of Lund University  
International Master's Programme in Environmental Studies and Sustainability Science  
(30hp/credits)



# **LUCSUS**

Lund University Centre for  
Sustainability Studies



**LUND**  
UNIVERSITY

---

## **Ecomodern masculinity?**

An intersectional feminist analysis of barriers for participation in Renewable  
Energy Communities

Julia Hönnecke

A thesis submitted in partial fulfillment of the requirements of Lund University International  
Master's Programme in Environmental Studies and Sustainability Science

Submitted September 22<sup>nd</sup>, 2023

Supervisor: Sara Brogaard, LUCSUS, Lund University

**Empty page**

**Abstract:**

Renewable Energy Communities (REC) are seen as a way to promote energy justice and security and advance a democratic, socially-just energy transition. However, energy justice scholarship indicates that some social groups are not included in RECs. I conducted four semi-structured interviews with urban RECs in Germany to find out which communities are underrepresented and why. The feminist energy justice framework is applied with an intersectional feminist theory perspective to analyze broader power structures and barriers for participation. The framework analyzes four dimensions of feminist energy justice in RECs: political, economic, socio-ecological and technological. My findings indicate that while RECs try to involve marginalized groups, significant hurdles to reach certain communities prevail. I complement the findings with a discussion on empowerment strategies to increase inclusion and participation of underrepresented groups.

**Keywords:**

renewable energy communities, marginalized groups, inclusion, participation, just transition, empowerment strategies

**Word count:**

**11 986**

## Abbreviations and Dictionary

**Age** puts a specific focus on citizens below 35 years old as they are assumed to be an underrepresented group in Renewable Energy Communities.

**BIPOC** stands for *Black, Indigenous, People of Color* and is a positive political self-designation of racially discriminated people (Aydemir & Yaghoobifarah, 2020). It describes a common horizon of experience shared by people who are not white.

**FLINTA** stands for *Female, Lesbian, Intersexual, Non-binary, Trans\*, Agender*. Scholarship on gender and energy commonly only analyzes based on biological sex, using categories of women and men (WECF e.V., 2020). This can overlook socially constructed norms, oppressions, and power dynamics. The term FLINTA is more inclusive, goes beyond the gender binary and allows for an analysis of broader structures, including systemic inequalities. Trans\* is written with a \* (asterisk) to indicate freeness of expectations and gender norms and symbolize that a person's gender is "always morphing and changing" (Steinmetz, 2018).

**Income and Education** fall into an analysis based on class. The low-income category generally includes all citizens who cannot afford to buy a share to participate in a REC or buy other renewable energy projects the RECs invest in due to their income. It is assumed that these will be mainly citizens earning less than a monthly gross income of €2500 (Yildiz et al., 2015). Lower education includes all citizens without a higher education degree.

**Race** is a system of classification not rooted in biological or scientific truth that supports dividing and empowering some social groups over others (Inventar der Migrationsbegriffe, n.d.). Here it is used as a social, political construct (National Human Genome Research Institute, 2023).

**White** is written in italics to acknowledge the term as a political and cultural identity, rather than as a skin color or origin.

## **Acknowledgements**

Thank you, Sara, for your early insights, sharing interesting sources and helping me define my topic of interest.

Thank you, Pauli, for taking the time to read my thesis and provide me with valuable feedback.

I also want to thank my mind and body for pulling through and showing up, for managing to work so much and write my thesis at the same time and for not giving up when it was frustrating to re-connect to my thesis.

Thank you to my friends for the constant valuation and confirmation of my skills and for the endless support. I appreciate you.

# Table of Contents

<b>1 Introduction</b> .....	<b>1</b>
<b>2 Conceptual Background</b> .....	<b>2</b>
<b>2.1 Renewable Energy Communities</b> .....	<b>2</b>
<i>2.1.1 Germany</i> .....	<b>3</b>
<b>2.2 Research Clusters</b> .....	<b>4</b>
<b>2.3 Sustainability Science</b> .....	<b>6</b>
<b>3 Theoretical Framework</b> .....	<b>6</b>
<b>3.1 Energy Justice</b> .....	<b>6</b>
<b>3.2 Intersectional Feminism</b> .....	<b>7</b>
<b>3.3 Feminist Energy Justice Framework</b> .....	<b>8</b>
<b>4 Methodology</b> .....	<b>10</b>
<b>4.1 Epistemological Approach</b> .....	<b>10</b>
<b>4.2 Data Choice and Collection</b> .....	<b>11</b>
<i>4.2.2 Semi-Structured Interviews</i> .....	<b>12</b>
<b>4.3 Data Analysis</b> .....	<b>12</b>
<b>4.4 Limitations</b> .....	<b>12</b>
<b>5 Results</b> .....	<b>13</b>
<b>5.1 Political Dimension</b> .....	<b>13</b>

5.1.1 <i>Member Participation</i> .....	13
5.2.2 <i>Political Aim</i> .....	14
5.2. <b>Economic Dimension</b> .....	15
5.2.1 <i>Affordability</i> .....	15
5.2.2 <i>Economic Aim: People and Profit</i> .....	16
5.3. <b>Socio-Ecological Dimension</b> .....	17
5.3.1 <i>Awareness and Education</i> .....	18
5.3.2 <i>Self-help and Empowerment</i> .....	18
5.3.3 <i>Community Building and Participatory Democracy</i> .....	18
5.3.4 <i>Environmental Protection</i> .....	18
5.3.5 <i>Intersectionality</i> .....	19
5.3.6. <i>Inclusion of Marginalized Groups</i> .....	20
<i>Female, Lesbian, Intersexual, Non-binary, Trans*, Agender (FLINTA)</i> .....	21
<i>Black, Indigenous, People of Color (BIPoC)</i> .....	21
<i>Income and Education</i> .....	22
<i>Age</i> .....	22
5.3.7 <i>Membership Recruitment</i> .....	23
5.4. <b>Technological Dimension</b> .....	24
5.4.1 <i>Technological Aim</i> .....	24
5.5 <b>Interim Conclusion</b> .....	25
<b>6 Discussion</b> .....	27
6.1 <b>Empowerment Strategies</b> .....	27
6.1.1 <i>Vision</i> .....	28



<b>6.1.2 Reaching Out.....</b>	<b>29</b>
<b>6.1.3 Internal Empowerment.....</b>	<b>29</b>
<b>7 Conclusion .....</b>	<b>30</b>
<b>8 References.....</b>	<b>32</b>

## 1 Introduction

The transition away from fossil fuels to renewable energy is one of the biggest challenges in times of climate change (Oteman et al., 2014). Germany has set the goal to fade out fossil fuel energy sources by 2045, a process captured in the term *Energiewende* (Gawel et al., 2013). The European Union prescribed a minimum of 45 % renewable energy of total energy production by 2030 to all member states (BMWK, 2023). Consequently, the focus on renewable energy has increased widely in the past years (Berkhout et al., 2012). However, the transition from fossil fuel to renewable energy has been criticized as too slow to meet national targets (Berthod et al., 2022). Here, bottom-up processes, for example in the form of Renewable Energy Communities (RECs), can play a crucial role in testing alternative concepts locally and realizing targets nationally (Li et al., 2013; Rogers et al., 2012). Studies show that community energy is contributing to reducing CO2 emissions, creating new income streams, and increasing local acceptance of renewable energy projects (de Brauwer & Cohen, 2020; Hanke et al., 2021; Li et al., 2013). The European Union (EU) and the German government have acknowledged community energy as a crucial player in the energy transition (Coenen & Hoppe, 2021; Hanke et al., 2021; Kalkbrenner & Roosen, 2016; Magnusson & Palm, 2019). The EU's Renewable Energy Directive II (RED II) says that member states shall "promote and facilitate the development of renewable energy communities" (Hanke et al., 2021). The EU has underlined that these communities contribute to local citizen participation, decentralization, awareness, acceptance, and reduction of energy usage and thus play a key role in overcoming ecological, economic, and social issues of Europe's energy transition (Coenen & Hoppe, 2021; Magnusson & Palm, 2019). At the same time, transition research has shown that technological fixes need to be combined with political, economic, and socio-ecological changes to be resilient (Berkhout et al., 2012). Since research shows RECs can address all spheres, they can be a major player in Germany's energy transition and could promote energy justice (de Brauwer & Cohen, 2020; Magnusson & Palm, 2019).

Despite the seemingly many advantages, there are also voices that view RECs more critically (Creamer et al., 2019; Hanke et al., 2021; Wurster, 2018). RECs can reinforce societal issues, such as lack of access and knowledge, or exclude citizens from participating when underlying inequalities fail to be addressed (Creamer et al., 2019; Hanke et al., 2021). In that case, only certain citizens have the time and means to participate in and benefit from a citizen-led, decentralized energy transition. Age, gender, income, education, housing tenure, and remoteness of area have been suggested to influence who participates and who does not (Creamer et al., 2019; Fraune, 2015; Walker, 2008). Younger generations, citizens without an academic background and lower income sources are

assumed to be underrepresented (Hanke et al., 2021). Black, Indigenous, People of Colour (BIPOC), and Female, Lesbian, Intersexual, Trans\*, Agender (FLINTA) have not been studied in detail in energy (justice) research (Sovacool et al., 2023). Consequently, there is a lack of research in analyzing RECs capacities to include marginalized groups (Hanke et al., 2021). Hence, it is questionable whether Renewable Energy Communities can be a solution for a just energy transition. To contribute to existing research on Renewable Energy Communities and energy justice, I will focus on under-researched and marginalized groups in my research questions:

- 1. In what ways do Renewable Energy Communities contribute to a just energy transition?**
- 2. How inclusive are Renewable Energy Communities for marginalized groups?**

2.1. What tools do Renewable Energy Communities use for the inclusion and participation of underrepresented groups?

To analyze and answer the research questions, this thesis will start by providing a conceptual background on RECs and existing research clusters. Then the theoretical framework – intersectional feminism and the feminist energy justice framework – are introduced and the methodological approach is explained. All research questions are then answered and discussed in the result section. The discussion, based on the results, explores empowerment strategies to address marginalized groups. The conclusion forms the end of the thesis and provides an outlook for future research.

## **2 Conceptual Background**

### **2.1 Renewable Energy Communities**

EU policies recognize local ownership as part of a just energy transition (Coenen & Hoppe, 2021; European Commission, 2019, 2023). Community energy, based on local ownership, has many names and takes diverse shapes (Coenen & Hoppe, 2021). The Renewable Energy Directive II (RED II) of the European Union (EU) speaks of renewable energy communities as “legal entities, which are optional, member controlled organizations proximate to renewable energy projects they own or operate” (Art. 2.16) (Campos et al., 2020). This thesis uses the term Renewable Energy Communities for community energy projects because it is used in RED II (European Commission, 2023). This includes all citizen-led renewable energy projects which fulfill the criteria of RED II, even if they are named differently. RECs must be made up of natural persons, a small or medium enterprise (SME) or a municipality, whose primary purpose are social, economic, or ecological community benefits beyond financial benefits

(Campos et al., 2020; Hanke et al., 2021). Hence, social dimensions are specifically mentioned as goals of RECs in EU law. RECs have in common that they are usually small size, locally based, non-commercial, engagement run and with limited time and resources (Oteman et al., 2014). RED II does not mention how member states should meet the social aims of RECs in practice (Hanke et al., 2021). However, the directive provides the basis for member states to develop their own legal framework to govern RECs, as Germany has done.

### **2.1.1 Germany**

In Germany *BürgerInnenenergie* (RECs) dates back to the early 20th century to ensure electricity access based on fossil fuels in rural areas (Oteman et al., 2014). Today, over 900 RECs exist in Germany with 220,000 members (DGRV, 2022). Solar and wind power are the most prominent energy sources, but others, such as biomass-based heating and manure fermenting exist too (Oteman et al., 2014). Projects are located both in rural and urban areas, although more common in rural parts (Kunze & Becker, 2015). Urban energy projects are getting increasing attention when discussing sustainable cities and utilizing limited space efficiently (i.e., roofs).

Germany's energy transition is guided by the policy instruments provided in the EEG law (*Erneuerbare Energien Gesetz*) (Gawel et al., 2013). The regulation provides incentives for a diverse mix of renewables and ensures certainty of stable investments through feed-in tariffs, a policy implemented to accelerate investments in renewable energy (Gawel et al., 2013; Oteman et al., 2014). While the German state sets policy guidelines and targets, the energy system is moderately decentralized (Oteman et al., 2014). The federal state can decide over implementation of plans and allocation of funds. The projects themselves also look diverse with different legal and financial modes of ownership: energy cooperatives (people become members of cooperative and buy shares), community charities (charitable association), voluntary participation without shares, development trusts, 100 % community ownership or co-ownership with a private enterprise (Walker, 2008).

This citizen-led energy transition is based on the idea that it's easier to find context-specific solutions locally, as compared to "one-size-fits-all" top-down approaches, following the "think global, act local" logic (Magnusson & Palm, 2019; Rogers et al., 2012). Consequently, there is an expectation towards RECs to be a "democratic, transformative, and equity-enhancing actor for a just transition" (Hanke et al., 2021, p. 10).

Germany is an interesting case because the government highlighted the importance of including citizens for a just energy transition (Blanchet, 2015; Kalkbrenner & Roosen, 2016). The national energy transition is largely decentralized, leaving room for individual, local forms of citizen

participation (Fraune, 2015; Kalkbrenner & Roosen, 2016). The renewable energy sector already makes up almost half of all energy supply and Germany has one of the largest amount of RECs in Europe (Coenen & Hoppe, 2021). Additionally, Germany is Europe's largest economy. Reflections of their energy transition will likely serve as learnings for other European countries (Yildiz et al., 2015).

## **2.2 Research Clusters**

Since RECs have been vastly studied, I will give an overview of the research clusters to identify the lack of research I am addressing.

Research on RECs has focused on diverse aspects, such as motives, economic, ecological, and social effects, legal frameworks, structures, barriers, or outcomes. As for the motives to start a REC, research shows that personal, local motivations prevail (Li et al., 2013). For example, many projects are started for financial reasons, such as regional value and employment creation, an additional income source, control over supply and production, reduced risk from shortages, and stable prices (Coenen & Hoppe, 2021; Li et al., 2013; Oteman et al., 2014; Walker, 2008). Autarky, anti-capitalism, anti-nuclear sentiments, and energy security have also been found to be arguments (Oteman et al., 2014). As for the willingness to participate, a sense of trust and community have been identified as essential (Kalkbrenner & Roosen, 2016). Characteristics have been found which influence the success or failure of energy communities. For example, cultural (willingness to act), organizational (support for action), personal (leadership, knowledge), political (support through subsidies, flexibility), legal (regulations, procedures), economic (investors, resources), socio-cultural (attitude, problem-solving), and biophysical (wind, sun, waves) characteristics (Oteman et al., 2014).

Generally, motives and outcomes can be put into ecological, economic, and social categories (Coenen & Hoppe, 2021). Here, second-order learning, cost savings, community identity, regional decision-making, and providing a playground for social innovation have been highlighted (Kalkbrenner & Roosen, 2016; Magnusson & Palm, 2019). Research focusing on the ecological aspects has shown that energy communities do not only reduce their emissions greatly, but also that environmental awareness and openness for change increases (Kalkbrenner & Roosen, 2016). Energy use overall decreases, while biodiversity protection, sustainable building and agriculture, and other processes closely related to environmental awareness, increase (Kunze & Becker, 2015; Walker, 2008). Social aspects focus on equality, diversity, democratization, energy poverty, or participation. Findings show that RECs can lead to increased civic participation, community integration, build strong networks through collective benefits, decision-making power and empowerment of disadvantaged groups (Campos et al., 2020; Kunze & Becker, 2015; Magnusson & Palm, 2019; Oteman et al., 2014). Also,

public understanding and support for renewable energy have been researched. Here, the ‘not-in-my-backyard’ (NIMBY) attitude has gotten much attention, showing that community ownership increases acceptance of local renewable energy projects (Magnusson & Palm, 2019; Musall & Kuik, 2011; Oteman et al., 2014; von Arnold, 2021; Walker, 2008). Von Arnold et al. have emphasized the importance of equal access and participation opportunities, which ensure that economically, socially or politically disadvantaged groups can participate in RECs (von Arnold, 2021). Coenen & Hoppe underline that RECs are based on concepts of solidarity, equality, social responsibility and caring (Coenen & Hoppe, 2021).

On the one hand, RECs have shown to have an equity-enhancing approach, able to resolve questions of inaccessibility and insecurity, also for marginalized groups (Berthod et al., 2022; Hanke et al., 2021). On the other hand, Hanke et al. have conducted a quantitative study with 71 European RECs and found that 83 % of board seats are occupied only by men, while 2 % are controlled only by women (Hanke et al., 2021). 13 % reported they address underrepresented groups and 27 % said they offer reduced membership fees for economically disadvantaged citizens. Kalkbrenner and Roosen have found that higher income, education and home-ownership increase chances of participation (Kalkbrenner & Roosen, 2016). Yildiz et al. showed that 71 % of members have a monthly gross income higher than €2500 and that 51 % have graduated from university (Yildiz et al., 2015). Due to these characteristics, RECs have been called ecomodern, masculine projects because they are dominated by men and are assumed to follow an economic growth logic (Bell et al., 2020).

Feminist theories are understudied in energy research with little exceptions (Sovacool et al., 2023). Daggett linked gender and climate and showed in their concept of “petro-masculinity” that, while climate denial and misogyny is usually analyzed separately, both are mutually dependent and reinforcing, with climate and gender anxiety often going hand in hand (Daggett, 2018). RECs could provide a playground for fighting climate and gender inequalities together (Daggett, 2018). However, gender has not been enough of a focus of energy system research and intersectional feminist perspectives, as well as a specific focus on marginalized groups (besides women) are absent, especially in the German *Energiewende* study (Bell et al., 2020; Ryder, 2018; Sovacool et al., 2023; Wilson, 2018). The association *Women Engage for a Common Future* calls out an androcentrism in energy research, arguing that studies center around male experiences as the norm, marginalizing other genders and the experiences of people which do not fit the binary, western norm (WECF e.V., 2020). Most energy scholarship fails to account for intersecting dimensions of power and inequality, such as gender, income, education and descent (Dankelman & Naidu, 2020; Sovacool et al., 2023; Wilson, 2018). Many studies are based on ecomodern assumptions based on masculine, hetero and

patriarchal power relations which exclude feminist, queer or anti-racist theories and thoughts (Sovacool et al., 2023). One of these analytical tools which has been applied commonly is the energy justice framework aiming to analyze RECs social role or contribution in the energy transition (Hanke et al., 2021; Miller, 2022). While intersectionality has been added as an analytical category to the framework (Sovacool et al., 2017), studies who have applied the framework fail to address RECs role in including marginalized groups (Hanke et al., 2021; Sovacool et al., 2023).

Based on existing research clusters and the defined lack of research, this thesis applies a feminist energy justice theory, informed by intersectionality, to Renewable Energy Communities. This helps to expand research on social contributions of RECs through emphasizing marginalized, underrepresented groups and focusing on urban contexts, where heterogeneous society is expected (Dankelman & Naidu, 2020). A feminist analysis is more than female representation in energy, but rather an analysis of patriarchal, oppressive regimes and power dynamics which often exclude and hence fail to benefit marginalized groups (Sovacool et al., 2023).

## **2.3 Sustainability Science**

The energy transition from fossil fuels to renewable energy is essential to counter climate change and addresses broader climate issues, such as depletion of resources, air pollution, greenhouse gas emissions, but also inequality, exploitation and energy poverty etc. (Berthod et al., 2022; Doci et al., 2015). Analyzing the potential of Renewable Energy Communities for energy justice relies on an interdisciplinary focus on political, economic, socio-ecological, and technological spheres (Bell et al., 2020; Yildiz et al., 2015). RECs are thereby on the crossroads of all spheres: new laws, new technology, new participatory democracy concepts and local ownership, all while reducing energy use and increasing clean energy. Thereby, RECs can embody key learnings for a just, zero, carbon transition. The learnings can also be insightful for transitions in other sectors which aim to increase citizen participation, such as education, agriculture, transport, or climate politics.

## **3 Theoretical Framework**

### **3.1 Energy Justice**

The transition away from fossil fuels is often viewed as an opportunity to deliver more energy justice (Hanke et al., 2021). Energy justice (EJ) is defined as “a global energy system that fairly distributes both the benefits and the burdens of energy services, and one that contributes to more representative and inclusive energy decision-making” (Sovacool et al., 2017). The concept was

developed to identify (in)justices in energy systems in an interdisciplinary way through combining socio-ecological and political dimensions with economic and technological perspectives (Hanke et al., 2021). An energy justice framework was designed to enable analyzing energy systems from a conceptual, analytical and decision-making perspective (Sovacool et al., 2017). The framework adds social dimensions to energy system scholarship dominated by economic and technological frames of reference (Hanke et al., 2021).

However, a lot of energy justice scholarship fails to consider “intersecting dimensions of power and inequality, such as gender, race, class, Indigeneity, ethnicity, sexuality, ability status, colonial history and caste”, among others (Sovacool et al., 2023, p. 2). It excludes intersectional realities which could explain unequal and unjust systems of power. Energy justice scholarship has focused on “affirmative remedies for injustice” - distributing new energy or increasing representation - instead of interrupting the underlying political-economic structures that give rise to injustices in the first place (Fraser, 1997). A critical reflection on existing energy research reveals “patriarchal, heterosexist, colonial, and masculinist assumptions of identity, power relations and values, thus marginalizing alternative views” (Sovacool et al., 2023). Intersectional feminist theories of justice can provide alternative views and allow for an analysis that Nancy Fraser calls “transformative remedies for injustice”, which address the underlying power structures and frameworks from which injustices originate from (Fraser, 1997).

### **3.2 Intersectional Feminism**

Intersectionality, a term coined by Kimberlé Crenshaw in 1989, adds perspectives which have yet to be addressed in energy research (Ryder, 2018; Sovacool et al., 2023). Intersectional feminism, rooted in black feminism, queer, indigenous, postcolonial and critical legal studies, does not only put marginalized groups at the center of analysis, but also allows an understanding of the interactions of multiple layers of privileges and oppressions which interact with and relate to one another (Feng, 2022; Kaijser & Kronsell, 2014; Ryder, 2018) . Crenshaw used a four-way traffic stop as a metaphor to explain intersectionality: it may be that one road, representing a power stream or inequality is addressed, such as gender, but another road is ignored, such as racial justice. Those who are at the nexus of both roads, such as FLINTA of color, are excluded (Feng, 2022). Studying intersectionality means to deploy an “analytical sensibility ... a way of thinking about the problem of sameness and difference and its relation to power” (Cho et al., 2013, p. 795). It also ensures that the concept of gender is not limited to the binary of biological sex, ignoring social gender, such as socially constructed behavior (Pellow, 2016; WECF e.V., 2020). Applying intersectionality to renewable



energy communities means acknowledging that they are not neutral spaces but reflect power structures of society (Drewing & Glanz, 2020). Intersectional methods allow an analysis of privilege and (un)conscious exclusion in energy systems influenced by societies power structures (Ryder, 2018). Intersectionality is especially relevant regarding access to and influence over participation and decision-making processes.

Feminism puts marginalized groups at the center of analysis, including perspectives of queer, anti-racist, indigenous and post-colonial theories (Hankivsky et al., 2014). The concept goes beyond studying sex, gender and better representation for women in energy systems (Bell et al., 2020). Intersectionality ensures that gender does not become “shorthand for other differences” (Bell et al., 2020; Mollett, 2017). Feminist energy justice requires transforming systems of oppression, such as patriarchy, heterosexism, ableism, ageism, racism and other *-isms*, which generate injustices and exclusion (Sovacool et al., 2023). A common thread of alternative theories, such as queer, postcolonial, indigenous and anti-racist theory “is an acknowledgement of the role that capitalism plays in both generating, perpetuating, and deepening injustice and exploitation across contexts” (Sovacool et al., 2023).

While feminist theory can be intersectional, the multiplicity of factors needs to be consciously addressed. The application of intersectional feminism in this thesis is therefore based on the understanding that humans cannot be reduced to one single identity, that experiences cannot be fully understood or analyzed when one factor is prioritized over another or one is ignored, and that categories, such as gender, income, education and sexuality are socially constructed, situated and partial (Hankivsky et al., 2014; Haraway, 1988; Sovacool et al., 2023).

The focus on power structures can provide an analysis on intersecting injustice and exclusion (Sovacool et al., 2023). To understand how energy communities, as a crucial part of the energy transition, can be inclusive and just, we need to be able to understand their structures of power. To do so, the feminist energy justice framework by Bell, S.E., Daggett, C., and Labuski, C., is applied (Bell et al., 2020).

### **3.3 Feminist Energy Justice Framework**

The feminist energy justice framework is used to understand the root causes that keep us from achieving just and inclusive energy systems. It allows the sketching of what an alternative system could look like. The framework is an analytical tool “for understanding what keeps us stuck in unsustainable energy cultures, as well as a paradigm for designing truly just energy systems” (Bell et

al., 2020, p. 2). It analyzes four interlinked and interdisciplinary dimensions of energy systems: political, economic, socio-ecological, and technological. The framework enables insights into exclusion and injustice of the four dimensions and thereby allows to analyze and answer RQ1. The framework offers a new perspective, as it specifically does not treat categories of exclusion isolated or aims to fit all marginalized groups into one category, such as gender (Bell et al., 2020). Instead, it acknowledges the inherent harms of energy production and consumption and sketches out common themes of inclusive and just feminist energy systems. Thereby, it permits to answer RQ2. The analyze based on the four energy dimensions helps to answer RQ 2.1.

The **political** dimension underlines that new energy solutions that work in the same exploitative capitalist system will likely not lead to more inclusion, justice and democracy (Bell et al., 2020). Neoliberal, market-oriented projects, based on ecomodernist, *white*, and masculine approaches will continue to exploit marginalized groups and the planet. New and alternative energy systems must be linked to new energy politics. Public, democratic ownership is the most probable way to achieve inclusion and justice, as well as environmental goals. Feminist energy politics aims to redirect political power and ownership from private enterprise to the people who are directly affected. This might include new laws and regulations which guide these alternatives, as well as new forms of pluralist decision making. Here, the diversity of local, context-specific solutions is emphasized: communally designed, owned, and managed systems with a strong commitment to pluralism and democracy are a necessity.

In the **economic** dimension of feminist energy justice, the idea that only economic growth, based on intense energy consumption, produces human well-being is resisted. Instead, inclusive systems start by asking what the energy needs of the community are and how these can be met in a just way, such as critically reflecting the affordability of energy. This should include knowing the amount of surplus and using profit to improve equality, for example through re-investing. Further, the well-being of the community, consuming resources consciously and protecting future generations are crucial. Feminist energy systems prioritize people over profit. This can also include prioritizing pink labor ((unpaid) care work) or community and environmental rehabilitation.

The **socio-ecological** sphere of feminist energy justice aims to address unconscious injustices. This includes awareness-building, educating and empowering, community building, participatory democracy and understanding underlying injustices. This can be done through listening, understanding, recognizing, and solving issues of members and citizens in the community. To achieve inclusive energy systems, marginalized groups need to be included and empowered by recognizing their experiences and understanding that systems of power often disproportionately victimize them

(Sovacool et al., 2023). Here emphasis must be placed on inclusion beyond representation and building structures which specifically address underrepresented groups.

The **technological** perspective of feminist energy justice stresses that technology is not politically neutral. Instead, technology is designed based on social and cultural values and hence interlinked with power structures. Technology should therefore be developed closely linked to the present and future needs of the community it aims to serve and not for accumulation of profit. Generally, this excludes top-down, centralized, universal forms of energy, and supports diverse, decentralized application of energy technology. Here, democracy, pluralism, well-being, accountability, and decentralization are key. Also, an awareness of the full lifecycle of renewable energy, including production, building, and disposal or recycling of, for example, solar panels, is crucial. Acknowledging inherent harms of energy production, such as hidden waste streams and supply chains is key.

## **4 Methodology**

### **4.1 Epistemological Approach**

Methodological approaches for questions of power, equality or intersectionality are commonly qualitative. This is, because power dynamics or multiple oppressions cannot be fully understood in quantitative terms (Ryder, 2018). Qualitative methodology understands social constructivist and interpretivist paradigms and recognizes locally specific contexts which quantitative approaches cannot. Consequently, I chose to conduct semi-structured qualitative interviews. I chose this method to complement quantitative scholarship on Renewable Energy Communities. Since the inputs from the interviewees are based on their values and beliefs, I need to carefully consider what learnings can be generated. Therefore, I use a critical realist approach (CR), which is based on the belief that the real or objective world cannot be directly observed. Instead, it posits the existence of non-observable structures which form the perceived reality (Bryman, 2012). CR distinguishes between the real, actual and empirical domain, which is referred to as ontological depth (Edwards et al., 2014). Causal mechanisms and underlying (power) structures live in the real domain, whereas the events they produce - observed or not - belong to the actual domain. Events which are observed and experienced then become part of the empirical domain, allowing us to analyze and comprehend causal mechanisms through empirical phenomena (Edwards et al., 2014; Fletcher, 2017). Investigating the contexts of an observed event can unveil hidden structures. Critical realism is especially useful to uncover underlying power dynamics, as I assume to be present in REC. The

interviews are complemented by external sources, such as existing scholarship to better understand broader causal mechanisms and allow for a more reflected discussion of the findings.

**4.2 Data Choice and Collection**

The interviews aimed at collecting information on the interviewees' own reflections on to what extent they meet political, economic, socio-ecological, and technological dimensions of feminist energy justice and where they see barriers for marginalized groups to participate. The interviews are used to understand the level of reflection and awareness on power structures, injustices, and exclusions in RECs.

The majority of RECs in Germany are located in rural areas (Kunze & Becker, 2015). Urban projects are vastly under-researched. It has been said that urban areas are more diffuse, hence not as clearly defined and collectively organized as rural areas (Oteman et al., 2014; Walker, 2008). Wind, biomass and hydropower are less easily available in urban settings. The basic conditions and social frameworks in rural and urban areas are different. Spaces are more limited and expensive, government structures more complicated, the diversity of stakeholders larger and the biophysical and built environment differs (Oteman et al., 2014). Urban areas tend to have a higher percentage of marginalized groups and inequality (Borja, 2022). A growing number of urban RECs has been forming in the last decade although without much attention in the research community (Kunze & Becker, 2015; Li et al., 2013). To understand the wider societal and transformational implications of RECs, it is key to involve urban environments in research (Walker, 2008). Consequently, I focused solely on Renewable Energy Communities in urban areas.

To find Renewable Energy Communities, I used a map collecting all of Germany’s registered RECs (Bündnis Bürgerenergie e.V., n.d.). Twelve urban RECs around Germany were contacted in June and July 2023 after screening their websites for member structures, aims, values and achievements, of which four offered me an interview. All interviews were conducted digitally via video call in August 2023.

**Table 1.** Renewable Energy Communities. Information about the RECs and their location.

Interview number	Renewable Energy Community	Location	Member Size	City Size
1	Olegeno eG	Oldenburg	500	170.000

2	fei Bürgerenergie eG	Bamberg	130	77.000
3	Ilmtal eG	Weimar	350	65.000
4	SoliSolar e.V.	Hamburg	No members	1.800.000

#### **4.2.2 Semi-Structured Interviews**

Semi-structured interviews were chosen because publicly available information on organizational workings of, for example, participation in RECs is limited. Projects are usually volunteer-run and websites only frequently updated. Information on REC websites is often very limited. Hence, semi-structured interviews allow for information to appear which is not yet publicly available and enable me to ask follow-up questions, which a questionnaire or structured interview does not allow for.

#### **4.3 Data Analysis**

The data analysis was conducted based on thematic, open coding by Hopf (Drewing & Glanz, 2020; Hopf, 2016). This approach is useful for testing theories or hypotheses while keeping an openness to expanding assumptions based on the insights gained from the analysis of each case. Hence, while not disregarding prior knowledge, it keeps a procedural openness to new findings. The broader coding categories are based on the feminist energy justice framework, more detailed categories arose only in the interviews. Some categories are based on scholarship neglecting certain social groups, leaving them understudied.

#### **4.4 Limitations**

The research approach and design have several limitations. First, the scope of the study is limited. Four Renewable Energy Communities in Germany make it difficult to generalize the findings or apply them to other countries. Second, the interviewees represent their RECs and while some were rather critical of their own achievements, subjectiveness needs to be assumed. The goal was not to write a representative generalizable study, but rather to analyze case studies in detail. However, I would have liked to do more interviews. RECs are vastly studied, and some projects have given me the feedback that they do not have the capacity to do another interview. Third, I originally asked for interviewees which belong to one of the underrepresented groups in RECs (i.e., BIPOC, FLINTA, below

35 years, no higher education, lower income). However, it was difficult to find members which fit these criteria. In the end, out of the four interviewees two are FLINTAs and two are below 35 years. Reaching marginalized groups would have provided a first-hand perspective on inclusion and barriers.

## **5 Results**

### **5.1 Political Dimension**

Based on the coding, I split the political dimension into member participation and political aim. Member participation gives insights into the participation and inclusion structures of members in RECs and political aim clarifies how RECs position themselves and what goals they strive for.

#### **5.1.1 Member Participation**

Three of the four Renewable Energy Communities are *Energiegenossenschaften* (energy cooperatives) under German law (Olegeno; fei Bürgerenergie; Ilmtal). They work under cooperative governance. To become a member, citizens have to buy at least one share. The *Genossenschaften* are organized through participatory democracy, where members can participate in decisions in reoccurring, open meetings, a general meeting and decisions are taken through votes (Li et al., 2013). All members have one vote, regardless of how many shares they hold (interview 1, 2, 3; from here onwards written without "interview"). Open meetings are held on a regular basis. However, the regular meetings, where day to day directions of the energy cooperate are decided, are often only attended by the core voluntary team: "no one is interested in participating or having a say" (2). More members participate in the yearly general meeting where long-term aspirations and reflections are discussed (1). All three energy cooperatives stated that they believe all voices are heard when expressed (1, 2, 3). Olegeno explained that when not all aspects of a topic can be discussed in one meeting, they form small working groups with interested citizens to find consensus (1). Ilmtal reflects that "I sometimes have the feeling that we don't have this blatantly hot topic. And on the other hand, we are perhaps still very homogenous in terms of the people who are with us" (3). This indicates an awareness of the lack of representation and diversity within the active member structure.

Another aspect of energy cooperatives is that of local ownership. Larger, more expensive energy projects can be implemented through the shares of members. Consequently, the implemented projects are owned by the members themselves. Local ownership is a way of involving citizens

locally, increasing education of the technology and support for the implementation of energy projects (Fraune, 2015; von Arnold, 2021). Participation, democracy, and the aim to influence local energy policy are motivations for citizens to join (Yildiz et al., 2015). The interviewees confirmed this (1, 2, 3). A study has shown that 36 % of participants demand more organizational forms which allow citizen participation in the energy sector (Yildiz et al., 2015).

Many different organizational forms exist and not all involve the ownership of the means of energy production (Walker, 2008). SoliSolar is not an energy cooperative, but a registered association (*eingetragener Verein*) which does not have members but customers, although the aims are not financial growth (4). SoliSolar does not work with grassroots democracy and pluralist decision-making. Decisions are made in the small core (founding) team. However, they promote local ownership of renewable energy through selling technology and offer participatory group workshop to educate citizens on the technology.

RECs run mainly voluntarily based, with some offering one or a small number of mini-jobs for some positions.

### **5.2.2 Political Aim**

That RECs should have a political goal is not stated in RED II. However, some RECs start in an activist circle due to dissatisfaction with the energy transition in general or because of local discontent (Coenen & Hoppe, 2021). Olegeno started as a political initiative with the aim of taking over ownership of the energy network operation in Oldenburg (1). Before, the group behind it lobbied in front of the local government to take back ownership of the local energy grid from a company. Because the government did not do so, they started the initiative “to exert a little bit of political pressure” (1). While taking back ownership was unsuccessful, the group of citizens had already formed and decided to start an energy cooperative instead.

SoliSolar started because of the war in Ukraine and rising electricity prices in 2022 (4). The idea was to “take the energy transition into our own hands and help our people around us”. However, SoliSolar also said “we do not pursue political goals”. Instead, they see themselves as non-partisan, open to talk to different parties to present their goal of offering balcony power plants to all citizens (4). Other RECs have the same aim of making energy available and affordable to private citizens but identify these goals as political aims (1, 3). All initiatives stated they are non-partisan.

Olegeno stated that their political goals are an incentive for citizens to participate in the initiative (1). RECs with collective and politically motivated aspirations have shown to address citizens with the

same political goals (Kunze & Becker, 2015). Kunze & Becker also showed that having political motivations and local ownership are two key characteristics for energy initiatives to address wider energy transformations (Kunze & Becker, 2015). An interview with an energy initiative based in Berlin showed that they believe they can pull more diverse citizens when formulating political and cultural goals, compared to attracting older men through technical themes (Miller, 2022). While not all interviewed RECs see themselves as following political aims, they all state they interact with political groups and parties to lobby for their goals, such as “ask[ing] politicians to please build the laws in such a way that you can get our balcony plants without hurdles” (4). Ilmtal sees their number of members as a lever for political influence: “the more members you have (...) the more weight you might have in the political arena” (3). Consequently, while not all specifically advertise themselves as a political initiative, they pursue goals in the political sphere.

**5.2. Economic Dimension**

The economic dimension is split up in affordability and economic aim. This is based on coding categories developed due to common themes in the interviews. Affordability provides details into the inclusiveness of RECs for citizens with lower income. Economic aim gives insights into how RECs frame themselves regarding economic growth and profit.

**5.2.1 Affordability**

**Table 2.** Minimum and maximum amount for shares of each REC in Euros (€).

Renewable Energy Community	Minimum share	Maximum share
Olegeno eG	65	No maximum
Ilmtal eG	500	>10 % of all shares
fei Bürgerenergie eG	100	5000
SoliSolar e.V.	No shares	No shares

The minimum and maximum cost of a share of each REC differs. Since it is necessary to buy a share to become a member, the minimum share can give insights into how affordable, and therefore inclusive (or exclusive) a REC is. The average minimum financial contribution of members in German RECs ranges from €545 (Hanke et al., 2021) to €758 and the average total participation per member is €5.854 (DGRV, 2022). The average minimum share of the interviewed RECs is €220, hence



significantly lower than the German average (Table 2). A low minimum share will decrease the threshold for citizens with less income to buy a share. fei Bürgerenergie thought about that:

*“We discussed this for a very long time because we heard from many people, including the cooperative association and many others, that it was somehow super costly to make it so low. And many have 500 or 1000 euros as a starting point. And we just said that we wanted to make it as low-threshold as possible. And therefore 100 euros per share, which I think is still too much for people who have money problems.” (2)*

Ilmtal eG decided against lowering the minimum share due to more complicated transactions: Each year 3-4 % of profits are transferred back to members. This equals €15 or a share of €500. If the share is €50, 3 % per year would be €1.50. “The costs you have to pay to the bank are almost even higher for such a transfer than the transfer itself is worth. So those were the counter-arguments (...)” (3). This might also explain why there is little knowledge of projects in economically disadvantaged communities (Magnusson & Palm, 2019).

Some projects are aware of the financial hurdle for some citizens and implemented a solidarity contribution. fei Bürgerenergie used this for community orders of balcony power plants (a mini solar power system which can be installed on the balcony or terrace) (2). Some people paid more but they could not find anyone who would make use of the solidarity pot: “the issue (...) is not that people do not want to be supportive, but rather that you are not reaching the people who might have financial struggles” (2).

SoliSolar as an association does not work with shares. Instead, the usual members are customers buying a balcony power plant (4). The association offers the modules for the market price. It costs an estimated €400 to buy a set. SoliSolar realizes that this one-time payment is a hurdle and uses second life modules, which are cheaper and more sustainable (4). They also offer a solidarity contribution which citizens make use of. However, they also have “relatively few people who say they cannot pay less than the purchase price. But there are (...) a lot who say, we pay more” (4).

### **5.2.2 Economic Aim: People and Profit**

A feminist perspective on energy systems expects inclusive RECs to realize local injustices, relinquish the growth imperative and prioritize human well-being and nature protection (Bell et al., 2020). To do so, community energy needs need to be identified, an awareness of consumed resources is necessary and a commitment to protecting, renewing and expanding the commons of energy

production (Bell et al., 2020). Local economies are said to develop new forms of economies and livelihoods which do not follow the capitalist logic of ever-expanding growth (North, 2010).

To implement projects, RECs rely on money from their members. Therefore, economic incentives are usually part of the triangle of goals of *Energiegenossenschaften*: economy, ecology, and social issues (3). To implement bigger projects, RECs also rely on new members (3). Usually, RECs have at least the aim to make enough profit to finance projects and ensure their liquidity in the future (1). Hence, make profit to reinvest into your own project. fei Bürgerenergie confirms this: "(...) the economic aspect is not our primary goal. Of course, we do not want to implement unprofitable projects, but our aim is not to maximize profits. Instead, we want to contribute to the regional energy transition" (2). "As an association, we do not want to make profits. We just want to help people to buy their modules" says SoliSolar (4). Ilmtal and fei Bürgerenergie stated that they do not think that financial profit is important to their members or a key incentive to join the project (2, 3). If there is a return for members at some point, it can take up to 10 years (2). The energy cooperatives see non-economic motives, such as environmental protection, energy policy dissidents, local ownership, or participatory democracy as more important motives to join (1, 2, 3). SoliSolar states that while the economic incentives are not great itself, citizens who have installed a balcony power plant usually decrease their consumption because the awareness on and optimization of usage increases (4). This additionally saves money.

### **5.3. Socio-Ecological Dimension**

The social and ecological purpose of Renewable Energy Communities is stated in the Renewable Energy Directive (RED II) of the European Union (Hanke et al., 2021). From a feminist energy justice perspective this should include understanding and addressing unconscious injustices and systems of power, sharing knowledge and resources, educating, building social and community connections, inclusion and empowerment of marginalized groups and building structures which increase representation of these groups (Bell et al., 2020). The interviewed projects report that they have a broader socio-ecological aim. The following will introduce each socio-ecological dimension addressed by the interviewed RECs. Here, a special emphasis is put on the awareness of RECs of injustices and exclusion in the energy system and on intersectionality in the context of marginalized groups. Then, the underrepresented social groups are also looked at separately to ensure a comprehensive analysis. Membership recruitment techniques are discussed, as they shine light on whether individualized outreach techniques exist.

### **5.3.1 Awareness and Education**

Multiple RECs offer formats to educate citizens on installing and producing their own energy, on how to start a citizen's initiatives or become active in one, or build awareness on the energy transition (1, 2, 3). This happens in workshops and seminars (2, 3, 4), general meetings (1, 2, 3), solar walks and camps (educational get-togethers on photovoltaic) (3), working groups (3), or public events, such as picnics or festivals (4).

### **5.3.2 Self-help and Empowerment**

Empowering citizens to become active, take the energy transition into their own hands and increasing self- and community-help between people was specifically stated by three RECs as a socio-ecological goal. For example, the concept of SoliSolar is that citizens are educated in a workshop on how to set up balcony power plant modules in a group (4). They meet as a group and set up the modules together in each household. The interviewee of fei Bürgerenergie reflected on a loss of climate anxiety due to the feeling of empowerment through community and working with others for a common goal (2). The also reported on a great increase of technical knowledge which felt empowering (2).

### **5.3.3 Community Building and Participatory Democracy**

The aim to increase community-feeling and try out a participatory democratic model (*Energiegenossenschaft*) was named by all projects: getting a lot of people involved, have people around with similar interests, encouraging and inspiring each other or be stronger as a group (1, 2, 3, 4). Characteristics of participatory democracy - solidarity, self-help, representation - were named by two energy cooperatives as motives to start or join the project (1, 2). fei Bürgerenergie reports working with people for a common goal in a community and gaining technical knowledge as the main benefits of the project (2). Olegeno reports simply getting to know nice people and working with them as an aim and benefit at the same time (1). Ilmtal states that the concept of participatory democracy is an important aspect of their work to "get people out of a lethargic state of mind" (3).

### **5.3.4 Environmental Protection**

Environmental protection and driving forward the energy transition have been named as a starting motive for all projects (1, 2, 3, 4). This includes phasing out fossil fuels and reducing overall energy production.

### 5.3.5 Intersectionality

The interviewees show some awareness that the energy system is not just and disproportionately benefits some citizens (1, 2, 3, 4) and they “want to balance out this imbalance” (4). Additionally, they seem to understand why their projects are not reflecting the social structures of their city: “engagement often depends on financial and time capacities” (2). They have set the goal to reduce barriers to ownership of energy production and decrease energy injustices (2, 4). A first step to do so is by recognizing vulnerabilities and that the opportunities of participating are not equally distributed in society (Bell et al., 2020; Creamer et al., 2019; Hanke et al., 2021). This includes recognizing systems of power which disproportionately victimize marginalized people and acknowledging intersecting experiences and identities (Sovacool et al., 2023).

All interviewees stated they are open to all members, that “it is just an offering, anyone can participate” (2), and “we really do not care (who joins us). We do not give a damn” (4). This indicates a discrepancy between being open to all and actively including citizens; or between citizens not being interested and failing to address them. Some projects are aware that while their RECs are open and accessible that does not equal being inclusive:

*“We are both victims and responsible. On the one hand, we are affected by the fact that women are less interested in energy or that technical know-how is assumed. At the same time, I see us as responsible for changing that.” (2)*

Renewable energy communities have been praised for their social benefits by politicians and researchers, but some have questioned this idea (Drewing & Glanz, 2020). Olegeno also questions whether RECs can fulfill these standards and provide benefits to all; “people rate us higher than we are, (than) what we really can and do” (1).

An awareness of intersectional dimensions is largely missing. However, an awareness of multiple marginalization or layers of individual privileges is needed to address underrepresented groups (Feng, 2022; WECF e.V., 2020). For example, every third person struggling from energy poverty in Germany is a sole raising mother (WECF e.V., 2020). Which indicates a correlation of inequality between gender and income in the energy system. fei Bürgerenergie discusses the correlation between income and age; education and income; and gender and time availability (2). For example, they are aware that younger citizens might have less money to spend on energy and that unpaid care work leads to less free time (2). While this shows some awareness on intersectional dimensions,

individualized intersectional methods addressing marginalized groups are absent in all RECs (1, 2, 3, 4).

### **5.3.6. Inclusion of Marginalized Groups**

Renewable energy communities can develop context- and locality-specific plans in line with its members' interests. This is believed to be more effective than top-down or 'one-size-fits-all' approaches (Rogers et al., 2012). Feminist energy analysts support distinct, locally designed projects from citizens for citizens (Bell et al., 2020). However, locality does not necessarily lead to local understanding of vulnerable livelihoods and distinct experiences of marginalized groups (Hanke et al., 2021). Hanke et al. call it "the localist trap" when RECs are perceived as just and inclusive simply because they are local (Hanke et al., 2021). RECs can still be unaware of the needs of marginalized or underrepresented groups in their surroundings. A lack of resources and knowledge, leading to not reaching marginalized groups, causes the exclusion of vulnerable groups (Hanke et al., 2021).

The energy cooperatives state they want to include more diverse member groups and want to be as open as possible for everyone (1, 2, 3). Only SoliSolar said their member structure is already diverse and includes marginalized groups, although without specifically addressing them in their outreach strategies (4). Accordingly, SoliSolar goes to small villages around Hamburg and holds speeches in the city hall about their project. They do not question who sits in these community halls and who does not (4). Olegeno stated that the lack of involvement of marginalized groups is because underrepresented groups care for other topics (1). However, there is an awareness that a lack of representation of these groups in the project leads to them not feeling addressed:

*"(...) as a board with five men and one woman, we are not particularly attractive to other women. They might think, "wow, they are so male-dominated, why would I want to join?". And of course, we are all white. How would a Black person feel about that?" (2)*

Olegeno also states that their group is homogenous and attracts similar people, "others (...) do not stay long because they may not feel culturally at home" (1). They do not have any formal structures or activities to increase the inclusion of marginalized groups in their project (1).

The RECs report on different activities to address underrepresented groups. fei Bürgerenergie collaborated with the city of Bamberg and held neighborhood meetings in different districts to attract an underrepresented audience (2). Ilmtal explains the idea of cooperating with the city of Weimar too (3). The city could pay the energy bills for people receiving social benefits through citizen income. Ilmtal could introduce an environmentally friendly, locally owned, and cheaper model to the

city which does not only economically benefit the local government but also the citizens with low or no income. They also explained about their idea to address housing areas with high-rise buildings where people with lower incomes live (3). Here photovoltaic on the roof or balcony power plants could be an idea. However, these ideas have not been implemented yet.

SoliSolar states that they do not approach marginalized groups specifically (4). All projects report that they focus on being open and not discriminating against anyone. However, a strategy to involve underrepresented groups has not been implemented, “that is why I would say we are actually doing very poorly in terms of inclusivity” (3).

### ***Female, Lesbian, Intersexual, Non-binary, Trans\*, Agender (FLINTA)***

The inclusion of women plays a role for RECs (1, 2, 3). Olegeno recognizes that women are in the minority and that they have very few queer members “but we have not done anything actively against it” (1). Most projects have also not considered how the amount of care work (unpaid work, i.e., taking care of a family member or the household) a person does influence the likelihood of membership (1, 2, 3). This would indicate a recognition of underlying injustices (Bell et al., 2020). Although they have not discussed the case of care work in their group setting, fei Bürgerenergie realizes that the availability of time a citizen has influences the likelihood of membership (2). They have also observed that while they have FLINTA members, little of them are actively involved (2). FLINTAs might not feel confident enough:

*“My male colleagues just stand in front of a city council and talk. I am more like, no one will take me seriously here. (...) when you enter a city council with 20 people and 18 of them are men, (...) as a FLINTA person, it is really difficult to be taken seriously.” (2)*

Olegeno reports they have about 35 % FLINTA members, but only 20 % in the active circle (1). A way to address more women and boost their confidence is to start a regular women’s table (3). So far, Ilmtal has only addressed individual women, but a women table could increase a feeling of community and identity (3). While Ilmtal and Olegeno view including women as important, they do not address queer citizens (1, 3). Ilmtal report they use gender-neutral language in their newsletter to present themselves as progressive, which led to an older male member leaving the project (3).

### ***Black, Indigenous, People of Color (BIPOC)***

Olegeno has not collected member structures yet (1). Hence, they do not have an overview of whether they have BIPOC members: “So you can see how unimportant this has been for us so far”

(1). Also, for other RECs including BIPOCs has not been a focus yet (2, 3). The focus has rather been on including people without property or less income, younger generations, and women (2, 3) “people with a migration background, that is a completely different topic” (3). Other scholarship has also not focused on BIPOC perspectives in RECs which indicates a lack of information on to what extent BIPOC perspectives are included, their voices heard and what specific barriers to membership might exist.

### ***Income and Education***

Income and education are looked at together because they often reinforce each other: citizens with higher education tend to have a higher income and people with access to higher income tend to have a higher education level (Stryzhak, 2020). The lack of diversity in member’s education and income plays a role for some projects (2). Consequently, projects offer solidarity prices for shares or technology (2, 4). This aims at addressing citizens with lower incomes. However, the issue of reaching these people prevails (2). This could be influenced by education. A certain group of citizens (higher education background, white, <40 years) are aware of RECs or move in social circles where they are more likely to hear about it (2). “The issue is (...) that you are not reaching people who might have financial struggles. People who earn less also have less time due to potentially working longer or harder” (2). Olegeno has not yet explicitly considered how the level of education affects their member structures (1). Ilmtal identifies a lack of awareness on renewable energy communities or locally owned energy production in some communities as the biggest barrier for people to get involved (3). SoliSolar describes that for some customers the main incentive to install balcony power plants is to save money (4). This usually goes hand in hand with reducing overall energy consumption (4). However, buying the modules is a one-time investment not everyone can afford (4). Additionally, citizens need to be educated on the benefits of renewable energy technology, which some citizens simply do not know about (4).

### ***Age***

Studies on member structures of renewable energy communities show that the majority of members is above 50, many over 60 or 70 years old (Hanke et al., 2021). fei Bürgerenergie confirms that while the founders are young, many of their members are above 60 years old (2). This might be due to financial reasons (2). Citizens in their 30s and 40s with children spend their money on other things. Retirees have more time and potentially also more money to spend (2). Olegeno and SoliSolar also have older members and customers (1, 4). Ilmtal already has members of diverse ages involved, with their average in the mid-40s (3). They have an intergenerational public relations working group consisting of members from 19 to 70 years (3). However, many of their young members are between

1 and 20 years old, indicating that their parents bought their share (3). This lowers Ilmtal's member age average but does not necessarily suggest that younger voices are included, as many of them are between 1 to 10 years old. All three *Energiegenossenschaften* have considered working with the university in the city to address younger generations (1, 2, 3). Ilmtal reflects that they need members who have money to implement projects, which is usually not the case with university students (3).

### **5.3.7 Membership Recruitment**

The projects are well known in the activist bubbles of their cities (1, 2, 3). The average member comes from a certain socio-ecological milieu, usually has a higher education background and is involved in other environmental initiatives (Drewing & Glanz, 2020) (3, 4). "People who know about energy policy and have been involved in it will be members (...) that pretty much narrows it down" (1). 81 % of energy cooperatives say they use personal address and 67 % use word-of-mouth to win new members (Karl & Bode, 2021). Public relations work (26 %) and social media (11 %) are less frequently used. Word-of-mouth membership recruitment tends to lead to a homogenous group because citizens talk about the project to people they know (Karl & Bode, 2021). The interviewed RECs are aware that word-of-mouth reaches the same bubble (1, 2, 3, 4). The three energy cooperatives report they use flyers, political events, newspapers, word-of-mouth, newsletters, and social media for spreading news and advertising for new members (1, 2, 3). Some also report they do not do systematic advertisement yet, which increases the chance that only the same bubble, that is reached by hearsay, joins (1, 2, 4). Ilmtal reflect that they are happy to gain any members at all to be able to finance their projects:

*"We would be glad to make this transition from winning over people at all to we are now really looking specifically for characteristics in order to perhaps be able to address other people. We have simply not yet succeeded in making this transition" (3).*

Because projects are funded by shares and additional contributions of members, energy cooperatives directly rely on new members' financial contributions. Ilmtal currently prioritizes social groups with more money in membership advertisements to finance their upcoming projects (3). Because RECs are mainly volunteer run, all projects report a high work intensity and difficulties getting everything done (1, 2, 3, 4). Volunteers need to prioritize, which often leads to social aspects falling behind (Miller, 2022) (1, 2, 3)



## 5.4. Technological Dimension

In the technological dimension I discuss to what extent RECs deal with the origin of renewable energy technology, with harms in the supply chain and recycling. Here, educating citizen on the used technology is important again.

### 5.4.1 Technological Aim

The technology used by RECs differs. Photovoltaic (PV) and wind turbines are the most common in Germany. All interviewed initiatives focus on solar (1, 2, 3, 4), Ilmtal also aims to use wind projects in the future (3) and Olegeno also has some heat pumps with PV-systems (1). Some have large projects (3), others focus on individual households, such as with balcony power plants (2, 4) and some (are planning to) have a mix of both (1, 4). For their photovoltaic modules, all projects stated they consider where the technology is produced and manufactured (1, 2, 3, 4). Ilmtal reports that even if they are manufactured in Europe, some parts come from China (3). Switching to European manufactured PV modules “has simply not been economically viable” (3). fei Bürgerenergie chose to offer cheaper balcony modules manufactured in China and more expensive modules manufactured in Switzerland to leave the choice to their members (2). The Swiss model costs around €300 more and “not everyone can afford that. Again, it is about finding the balance.” (2).

All projects order technology depending on demand (1, 2, 3, 4). fei Bürgerenergie and SoliSolar order modules in bulk to get cheaper prices (2, 4). SoliSolar uses second life modules (re-build) from a Swiss company for their balcony power plants to not support forced labor (4). Balcony power plants are not economically profitable, but some projects specifically offer them so that “people without property can also participate in the energy transition” (2). As to recycling, the warranty of the technology ranges from 20-30 years (1, 4). The responsibility of recycling is up to the owner because in 20-30 years the projects might not exist anymore: “by the time the devices are due, there will be something that forces that (...) you cannot throw away raw materials like that anymore” (4). This indicates that RECs do not want to take responsibility for the technology and rather leave it up to the consumer/owner, as is the commonly the case.

Overall, RECs technological aim is to create awareness around renewable energy technology and educate on installing and self-producing energy (1, 2, 3, 4). They want to lower the barriers for citizens to understand and then be able to own energy technology (4).

## 5.5 Interim Conclusion

**Table 3.** Results from applying the feminist energy justice framework and inclusion of marginalized groups in RECs. Status: fulfilled, mostly fulfilled, partially fulfilled, not fulfilled/addressed.

Category	Status	Positive	Negative
Member participation	Mostly Fulfilled	Participatory democracy, head vote, local ownership	Small active team, limited participation
Political aim	Mostly Fulfilled	Non-partisan, lobby for political goals, agent in political arena	Political aim not clearly stated, aim not used to address citizens
Affordability	Partially Fulfilled	Medium low shares, solidarity shares & prices,	Technical hurdles, fail to reach vulnerable groups
Economic aim	Mostly Fulfilled	Profit not a main aim	Reliance on money inflow and profit making
Awareness & education	Fulfilled	Offer education formats to increase awareness	
Self-help & empowerment	Fulfilled	Empower members through collective action	
Community building & participatory democracy	Mostly Fulfilled	Member events, community workshops, voting and participation possibilities	Benefits only for members, limited use by members
Environmental protection	Fulfilled	Increase renewable energy, reduce energy production	
Intersectionality	Partially Fulfilled	Awareness of injustice	No time, knowledge, tools; no connections of multiple inequalities
Inclusion of marginalized groups	Partially Fulfilled	Women, less educated, lower income, younger citizens	Little individualized inclusion tools, difficulty reaching vulnerable groups
FLINTA	Partially Fulfilled	Awareness that women need to be addressed	No awareness of queer citizens

Category	Status	Positive	Negative
BIPOC	Not Fulfilled/Addressed		No awareness of BIPOC citizens
Income and Education	Mostly Fulfilled	Use of tools to address vulnerable groups	Limited success of tools
Age	Partially Fulfilled	Use of tools to address young citizens	Young citizens get share from parents, difficulty reaching citizens
Membership recruitment	Partially Fulfilled	Open to everyone	No individualized tool to address underrepresented groups, reach same bubble
Technological aim	Fulfilled	Education, awareness of supply chain	Reliance on technology from China

Based on the results, I will provide a brief overview of my concluding remarks on in what ways RECs contribute to a just energy transition (RQ1), how marginalized groups are included (RQ2) and which tools RECs use to increase inclusion and participation of underrepresented groups (RQ2.1.)

RECs contribute to a just energy transition in all four spheres (**RQ1**). Whereby the political and technological dimensions are most addressed through local ownership, participatory democracy, local lobbying, and technological education and inclusion. Although they lack a broader political aim, as well as still relying on technology from China. RECs economic aim goes beyond economic incentives and puts people over profit. Notwithstanding, RECs rely on funding to implement projects which makes it difficult to favor social aspects over monetary ones. Most RECs realize and address affordability as a hurdle for citizens to join but difficulties reaching citizens prevail. The socio-ecological dimension of a just energy transition is addressed and fulfilled on some levels, but important aspects are missing. RECs address and actively promote education, empowerment, community building and environmental protection.

There is some awareness on intersectionality and how multiple oppressions influence inclusion (**RQ2**). Although this is not sufficiently understood and reflected. The inclusion of some marginalized groups is a concern for most RECs because they view inclusion as an important part of a just energy transition. They focus on including women, citizens with lower income and education. Tools such as

solidarity prices, specific cooperation partners, educational workshops, and outreach techniques are used to reach and empower marginalized groups (**RQ2.1.**). However, their success in addressing these social groups is limited. Also, BIPOC, queer citizens and younger generations are not a specific focus. This is linked to their membership recruitment techniques, which miss to reach groups outside the commonly addressed social groups. Consequently, while RECs already contribute to a just energy transition, the benefits are limited to some social groups. The full potential is not yet reached.

## **6 Discussion**

RECs emphasize they are inviting everyone to participate and do not discriminate or favor any group. Notwithstanding, the member structures clearly show that only some citizens participate. There are still significant barriers for marginalized citizens to participate in and benefit from RECs (WECF e.V., 2020; Wurster, 2018). This needs to be tackled because fairness, inclusion and justice are essential prerequisites for a fast and socially acceptable energy transition (Ryder, 2018; Sovacool et al., 2023; Stevis & Felli, 2016). The inclusion of all groups in the energy transition is necessary because it is understood as a community effort and inclusion minimizes the risk of protests jeopardizing implementation or deepening of social inequalities (Freier et al., 2020).

Voluntary activist groups in the climate sector commonly suffer from a shortage of marginalized groups (Freier et al., 2020). RECs reflect that they have difficulties reaching marginalized communities due to a combination of lack of time because of volunteering, and lack of knowledge and tools. Policies are needed, which aim to promote community energy and participation in the energy transition and lower barriers, costs and inequalities for marginalized groups (Kalkbrenner & Roosen, 2016). Empowerment strategies, aiming to design individualized tools and activities can increase inclusion of underrepresented citizens. Based on the results and the lack of strategies to address marginalized groups, I will discuss empowerment strategies which could trigger an increase of inclusion.

### **6.1 Empowerment Strategies**

Empowerment strategies for inclusion and participation are an umbrella term for different concepts (Freier et al., 2020). These strategies are used specifically for self-creation and empowerment in situations of scarcity, exclusion, inequality, or oppression and are thereby especially useful to address marginalized groups. Empowerment strategies can be individual, group-focused, or structural. They

are especially suitable for transformative research on energy transitions to address social disparities and find egalitarian approaches (Freier et al., 2020).

### **6.1.1 Vision**

Framing goals in a political and social matter has been said to address politically motivated volunteers rather than having broadly formulated environmental aims, such as the energy transition (Miller, 2022; Rogers et al., 2012; Wilson, 2018). A study indicates that marginalized groups are less concerned with large and intangible issues such as sustainability or climate protection (Freier et al., 2020). Rather dimensions of their everyday lives are important, such as how money can be saved. Sometimes marginalized individuals have the "big picture" in mind and are proud when they have done something for the environment in addition to their individual success, such as reducing the electricity bill (Freier et al., 2020). This should be kept in mind when developing a vision.

This adapted goal framing of RECs may include publicly communicating the absence of some marginalized groups in their member structure to show a level of awareness and reflection. Analyzing their own member structures and understanding which marginalized groups are underrepresented is the foundation of this. A politically and socially formulated aim towards the common good may include an awareness of patriarchal, class and other systems of oppression in society (Sovacool et al., 2023). This can be achieved through a locally designed *reallabor* (a form of cooperation between academia and civil society that focuses on mutual learning in an experimental setting) (Sultana, 2021). When RECs realize that opportunities to participate in the energy transition are not equal for everyone, citizens who are not yet included may feel empowered (WECF e.V., 2020). An example is Bürger Energie Berlin, a REC which, after realizing its homogenous member structure, is cooperating with Gender CC and Potsdam Institute for Climate Adaptation Research to understand and address the absence of some citizen groups (dialogues, n.d.).

Carefully reflecting, framing, and communicating an economic aim is also key. RECs need to discuss what their stand towards economic growth and profit is and be aware of which citizens that addresses (Bell et al., 2020). Economic growth and the oppression of marginalized groups are interlinked and a decarbonized energy system which is plugged into economic growth will likely still overrun planetary limits through continuous overconsumption and production of resources (Bell et al., 2020). RECs can become a *reallabor* for an alternative, locally based economic system de-linked from profit and growth.

### **6.1.2 Reaching Out**

The foundation to reaching marginalized groups is a reflection and awareness of socio-structural, individual or procedural explanations for non-participation (Freier et al., 2020). To do so, it might be necessary to reach out to experts or mentors which can provide new theoretical knowledge and reflections. At the same time, local citizen knowledge needs to be accepted as competent, equally important knowledge which does not form an antipole to expert knowledge (Freier et al., 2020). In cooperation with other local actors, such as political or activist groups which involve marginalized groups, a workshop can be organized. This workshop can provide marginalized groups the opportunity to reflect and share their understanding of why some groups are left out of RECs. Here, an emphasis should be placed on barriers, insecurities of and incentives for marginalized groups. This workshop needs to be organized based on the leitmotif of listening, reflecting, and accepting. Only a safer space will enable participants to open up (Freier et al., 2020). The insights gathered should be used to design an outreach qualified invitation process which has the aim of depicting a diverse group reflecting the heterogeneity of their urban surroundings (Freier et al., 2020; Lietzmann et al., 2014). The project “EnerChange: Spaltung in NRW überwinden - Energiewende für alle kommunizieren” is a good application example (VI Transformation Energiewende NRW, n.d.). The project put the above formats into practice and was able to derive new, suitable, target-group-specific communication forms that address marginalized groups (Freier et al., 2020).

Specifically addressing marginalized groups, instead of inviting everyone or using word-of-mouth, reduces participation barriers (Freier et al., 2020). The individualized outreach to marginalized groups must include creating a volunteering environment which is financially and family compatible. In addition, the target group needs to be made aware of its own importance for the successful implementation of a just energy transition (Freier et al., 2020). This has shown marginalized groups to recognize their worth.

### **6.1.3 Internal Empowerment**

Affirmative remedies for injustice, as explained, may lead to more representation of marginalized groups in RECs. The entry of citizens does not necessarily change internal inequalities (Sovacool et al., 2016). For example, the inclusion of women in India and Sweden in forest management did not change the fact that women felt like they did not have much to say (Arora-Jonsson, 2011). RECs need to question who they have as members and as active members and what barriers exist for members to become more active. A critical reflection of the status quo, one’s own status and privileges, is part of a politicization and change process (Freier et al., 2020). This can be done through inviting

members or preparing a survey, and developing a gender-, income-, or education-sensitive framework for empowerment (Sultana, 2021). These should address intersectional structures while allowing individualized strategies. For example, a monthly FLINTA round table; technical workshops on renewable energy technologies, local ownership, or participatory democracy; a cooperation with BIPOC based groups fighting local or global climate injustices; or developing intergenerational formats.

Here, small group formats can provide safer spaces (Freier et al., 2020). Not every person feels equally comfortable and empowered to speak in larger groups, which is also linked to which social group they belong to. Smaller, protected spaces can allow marginalized groups to share their personal experiences freely (Freier et al., 2020).

## **7 Conclusion**

The thesis showed that RECs address to some extent the political, economic, socio-ecological, and technological spheres and thereby contribute to a just energy transition. RECs increase participation of citizens in the energy system through a participatory democracy model, local ownership, local value creation, technological awareness and education and thereby contributing to self-help, community-building and empowerment. The analysis has shown that the benefits are limited to RECs members, which are largely exclusive of marginalized groups. RECs are aware of that and try to individually address underrepresented groups. RECs use individualized tools to address women, citizens without an academic background and with lower income. These tactics range from cooperation with other actors and re-framing of broader goals, to solidarity prices and educational workshops. BIPOCs, queer citizens and younger generations are not yet addressed by RECs. Overall, RECs are not very successful in including marginalized groups. The member structure is largely homogenous. Consequently, empowering strategies were discussed to help RECs develop inclusion and participation specifically addressing marginalized groups.

Nonetheless, calling Renewable Energy Communities ecomodern, masculine projects is too simplistic. They are alternative, local projects beyond economic growth and test alternative participatory models with the aim of including a heterogenous society. Even if they are not yet successful in aspects of inclusion, there is a lot of potential. Further research should listen to marginalized voices themselves. A focus group representing a mini-public of the area could be formed which discusses and develops inclusion criteria and tools. These insights could also be interesting to activist groups or

voluntary organizations, such as in the climate sector, which often struggles with including and addressing marginalized groups.



## 8 References

- Arora-Jonsson, S. (2011). Virtue and vulnerability: Discourses on women, gender and climate change. *Global Environmental Change*, 21, 744–751.  
<https://doi.org/10.1016/j.gloenvcha.2011.01.005>
- Aydemir, F., & Yaghoobifarah, H. (2020). *Eure Heimat ist unser Albtraum*. Ullstein.  
<https://www.ullstein.de/werke/eure-heimat-ist-unser-albtraum/taschenbuch/9783548062402>
- Bell, S. E., Daggett, C., & Labuski, C. (2020). Toward feminist energy systems: Why adding women and solar panels is not enough. *Energy Research & Social Science*, 68.  
<https://doi.org/10.1016/j.erss.2020.101557>
- Berkhout, F., Marcotullio, P., & Hanaoka, T. (2012). Understanding Energy Transitions. *Sustainability Science*, 7, 109–111. <https://doi.org/10.1007/s11625-012-0173-5>
- Berthod, O., Blanchet, T., Busch, H., Kunze, C., Nolden, C., & Wenderlich, M. (2022). The Rise and Fall of Energy Democracy: 5 Cases of Collaborative Governance in Energy Systems. *Environmental Management*. <https://doi.org/10.1007/s00267-022-01687-8>
- Blanchet, T. (2015). Struggle over energy transition in Berlin: How do grassroots initiatives affect local energy policy-making? *Energy Policy*, 78, 246–254.  
<http://dx.doi.org/10.1016/j.enpol.2014.11.001>
- BMWK. (2023). *Durchbruch für ambitionierten Ausbau der erneuerbaren Energien in der EU. Neue EU-Richtlinie für erneuerbare Energien von Mitgliedstaaten im Rat angenommen*. Bundesministerium für Wirtschaft und Klimaschutz.  
<https://www.bmwk.de/Redaktion/DE/Pressemitteilungen/2023/06/20230616-neue-eu-richtlinie-fuer-erneuerbare-energien->

angenommen.html#:~:text=Das%20europäische%20Ziel%20für%20erneuerbare,in%202021%  
20von%20knapp%2022%25.

Borja, J. (2022). The City, Urbanization and Inequality. In J. Zabalo, I. Filibi, & L. Escajedo San-Epifanio, *Made-to-Measure Future(s) for Democracy?* (pp. 119–138). Springer, Cham.  
[https://doi.org/10.1007/978-3-031-08608-3\\_7](https://doi.org/10.1007/978-3-031-08608-3_7)

Bryman, A. (2012). *Social Research Methods (Fourth Edition)*. Oxford University Press.

Bündnis Bürgerenergie e.V. (n.d.). *Unsere Karte der Bürgerenergie. Die Zukunft der  
Energieversorgung liegt in Bürgerhand: Werde aktiv!* [https://www.buendnis-  
buergerenergie.de/karte](https://www.buendnis-buergerenergie.de/karte)

Campos, I., Pontes Luz, G., Marín-Gonzalez, E., Gährs, S., Hall, S., & Holstenkamp, L. (2020).  
Regulatory challenges and opportunities for collective renewable energy prosumers in the  
EU. *Energy Policy*, 138, 1–11. <https://doi.org/10.1016/j.enpol.2019.111212>

Cho, S., Crenshaw, K. W., & McCall, L. (2013). Toward a field of intersectionality studies: Theory,  
applications and praxis. *J. Women Culture Soc.*, 38(4), 785–810.

Coenen, F. H. J. M., & Hoppe, T. (Eds.). (2021). *Renewable Energy Communities and the Low Carbon  
Energy Transition in Europe*. Palgrave Macmillan.

Creamer, E., Taylor Aiken, G., van Veelen, B., Walker, G., & Devine-Wright, P. (2019). Community  
renewable energy: What does it do? Walker and Devine-Wright (2008) ten years on. *Energy  
Research Social Science*, 57, 1–19.

Daggett, C. (2018). Petro-Masculinity: Fossil fuels and authoritarian desire. *Millenium: J. Int. Stud.*,  
47(1), 25–44.

- Dankelman, I., & Naidu, K. (2020). Introduction: Gender, development, and the climate crisis. *Gender & Development*, 28(3), 447–457. <https://doi.org/10.1080/13552074.2020.1843830>
- de Brauwier, C. P.-S., & Cohen, J. J. (2020). Analysing the potential of citizen-financed community renewable energy to drive Europe’s low-carbon energy transition. *Renewable and Sustainable Energy Reviews*, 133. <https://doi.org/10.1016/j.rser.2020.110300>
- DGRV. (2022). *Energy Cooperatives in Germany. State of the Sector 2022 Report*. Deutscher Genossenschafts- und Raiffeisenverband e.V. <https://www.dgrv.de/news/dgrv-jahresumfrage-energiegenossenschaften-2022/>
- dialogues. (n.d.). *Berlin Citizen Action Lab. “Diversity in energy cooperatives – cooperation with BürgerEnergieBerlin”*. Energy Citizenship for a Sustainable Future. [https://www.dialoguesproject.eu/citizen\\_lab/berlin-citizen-action-lab/](https://www.dialoguesproject.eu/citizen_lab/berlin-citizen-action-lab/)
- Doci, G., Vasileiadou, E., & Petersen, A. (2015). Exploring the Transition Potential of Renewable Energy Communities. *SSRN*. <https://ssrn.com/abstract=2554460>
- Drewing, E., & Glanz, S. (2020). Die Energiewende als Werk ausgewählter Gemeinschaften? Zur sozialen Exklusivität von Energiegenossenschaften. In S. Engler, J. Janik, & M. Wolf, *Energiewende und Megatrends. Wechselwirkung von globaler Gesellschaftsentwicklung und Nachhaltigkeit*. (Band 93, pp. 275–302). Ministerium für Wirtschaft, Innovation, Digitalisierung und Energie des Landes Nordrhein-Westfalen. [https://library.oapen.org/bitstream/id/8bf14cf9-ff67-4a2f-9068-82ccd2ab201e/external\\_content.pdf](https://library.oapen.org/bitstream/id/8bf14cf9-ff67-4a2f-9068-82ccd2ab201e/external_content.pdf)
- Edwards, P. K., O’Mahoney, J., & Vincent, S. (2014). Critical Realism and Interviewing Subjects. In *Studying Organizations Using Critical Realism* (pp. 109–131). Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780199665525.003.0006>

- European Commission. (2019). *Clean energy for all Europeans*. Directorate-General for Energy.  
<https://data.europa.eu/doi/10.2833/9937>
- European Commission. (2023). *Renewable Energy Directive*. Directorate-General for Energy.  
[https://energy.ec.europa.eu/topics/renewable-energy/renewable-energy-directive-targets-and-rules/renewable-energy-directive\\_en](https://energy.ec.europa.eu/topics/renewable-energy/renewable-energy-directive-targets-and-rules/renewable-energy-directive_en)
- Feng, J. F. (2022). *Toward Queer Climate Justice*. University of California.
- Fletcher, A. J. (2017). Applying critical realism in qualitative research: Methodology meets method. *International Journal of Social Research Methodology*, 20(2), 181–194.
- Fraser, N. (1997). From Redistribution to Recognition? Dilemmas of Justice in a “Postsocialist” Age. In *Justice Interruptus*. Routledge.  
<https://ethicalpolitics.org/blackwood/fraser.htm#:~:text=Analogous%20distinctions%20hold%20for%20the,the%20underlying%20political%20economic%20structure.>
- Fraune, C. (2015). Gender matters: Women, renewable energy, and citizen participation in Germany. *Energy Research & Social Science*, 7, 55–65.
- Freier, A. N., Lübke, S., Schrot, K., & Zorn, J. (2020). Empowerment in Transformations-Arenen. Berücksichtigung sozialer Disparitäten im Energiewendeprozess. In *Energiewende und Megatrends. Wechselwirkungen von globaler Gesellschaftsentwicklung und Nachhaltigkeit*. (pp. 235–274). Transcript Verlag. [https://library.oapen.org/bitstream/id/8bf14cf9-ff67-4a2f-9068-82ccd2ab201e/external\\_content.pdf](https://library.oapen.org/bitstream/id/8bf14cf9-ff67-4a2f-9068-82ccd2ab201e/external_content.pdf)
- Gawel, E., Strunz, S., & Lehmann, P. (2013). Germany’s Energy Transition Under Attack: Is There an Inscrutable German Sonderweg? *Nature and Culture*, 8(2), 121–133.  
<https://doi.org/10.3167/nc.2013.080201>

- Hanke, F., Guyet, R., & Feenstra, M. (2021). Do renewable energy communities deliver energy justice? Exploring insights from 71 European cases. *Energy Research & Social Science*, *80*, 10. <https://doi.org/10.1016/j.erss.2021.102244>
- Hankivsky, O., Grace, D., Hunting, G., Giesbrecht, M., Fridkin, A., Rudrum, S., Ferlatte, O., & Clark, N. (2014). An intersectionality-based policy analysis framework: Critical reflections on a methodology for advancing equity. *International Journal for Equity in Health*, *13*(119).
- Haraway, D. (1988). Situated knowledges: The science question in feminism and the privilege of partial perspective. *Feminist Studies*, *14*(2), 575–599.
- Hopf, C. (2016). *Schriften zu Methodologie und Methoden qualitativer Sozialforschung*. Springer VS Wiesbaden. <https://doi.org/10.1007/978-3-658-11482-4>
- Inventar der Migrationsbegriffe. (n.d.). *Rasse/race*. <https://www.migrationsbegriffe.de/rasse>
- Kaijser, A., & Kronsell, A. (2014). Climate change through the lens of intersectionality. *Environmental Politics*, *23*(3), 417–433. <https://doi.org/10.1080/09644016.2013.835203>
- Kalkbrenner, B. J., & Roosen, J. (2016). Citizens' willingness to participate in local renewable energy projects: The role of community and trust in Germany. *Energy Research & Social Science*, *13*, 2016. <http://dx.doi.org/10.1016/j.erss.2015.12.006>
- Karl, T., & Bode, M. (2021). *Frauen in der Bürgerenergie. Durch Offenheit zur Vielfalt* (WWEA Policy Paper Series). World Wind Energy Association. [https://wwindea.org/wp-content/uploads/2021/07/WWEA\\_Frauen\\_in\\_der\\_Burgerenergie.pdf](https://wwindea.org/wp-content/uploads/2021/07/WWEA_Frauen_in_der_Burgerenergie.pdf)
- Kunze, C., & Becker, S. (2015). Collective ownership in renewable energy and opportunities for sustainable degrowth. *Sustainability Science*, *10*, 425–437.

- Li, L., Birmele, J., Schaich, H., & Konold, W. (2013). The 3rd International Conference on Sustainable Future for Human Security SUSTAIN 2012. Transitioning to community-owned renewable energy: Lessons from Germany. *Procedia Environmental Sciences*, *17*, 719–728.  
<https://doi.org/10.1016/j.proenv.2013.02.089>
- Lietzmann, H. J., Dienel, H.-L., Vergne, A., Franz, K., & Fuhrmann, R. (2014). *Die Qualität von Bürgerbeteiligungsverfahren – Evaluation und Sicherung von Standards am Beispiel von Planungszellen und Bürgergutachten*. oekom.
- Magnusson, D., & Palm, J. (2019). Come Together—The Development of Swedish Energy Communities. *Sustainability*, *11*(1056). <https://doi.org/10.3390/su11041056>
- Miller, J. (2022). *Energy justice for members only? A study of German energy cooperatives' contributions to energy justice* [Master Thesis]. Lund University.
- Mollett, S. (2017). Gender's critical edge: Feminist political ecology, postcolonial intersectionality, and the coupling of race and gender. In S. Macgregor (Ed.), *Routledge Handbook of Gender and Environment* (pp. 146–158). Routledge.
- Musall, F. D., & Kuik, O. (2011). Local acceptance of renewable energy—A case study from southeast Germany. *Energy Policy*, *39*, 3252–3260. <https://doi.org/10.1016/j.enpol.2011.03.017>
- National Human Genome Research Institute. (2023). *RACE*. <https://www.genome.gov/genetics-glossary/Race#:~:text=Definition&text=Race%20is%20a%20social%20construct,nations%2C%20regions%20and%20the%20world>.
- North, P. (2010). Eco-localisation as a progressive response to peak oil and climate change – A sympathetic critique. *Geoforum*, *41*, 585–594.  
<https://doi.org/10.1016/j.geoforum.2009.04.013>

- Oteman, M., Wiering, M., & Helderma, J. (2014). The institutional space of community initiatives for renewable energy: A comparative case study of the Netherlands, Germany and Denmark. *Energy, Sustainability and Society*, 4(11), 1–17.
- Pellow, D. N. (2016). Toward a critical Environmental Justice Studies. Black Lives Matter as an Environmental Justice Challenge. *Du Bois Review*, 13(2), 221–236.  
<https://doi.org/10.1017/S1742058X1600014X>
- Rogers, J. C., Simmons, E. A., Convery, I., & Weatherall, A. (2012). What factors enable community leadership of renewable energy projects? Lessons from a woodfuel heating initiative. *Local Economy*, 27(2), 209–222. <https://doi.org/10.1177/0269094211429657>
- Ryder, S. S. (2018). Developing an intersectionally-informed, multi-sited, critical policy ethnography to examine power and procedural justice in multiscale energy and climate change decisionmaking processes. *Energy Research & Social Science*, 45, 266–275.  
<https://doi.org/10.1016/j.erss.2018.08.005>
- Sovacool, B. K., Bell, S. E., Daggett, C., Labuski, C., Lennon, M., Naylor, L., Klinger, J., Leonard, K., & Firestone, J. (2023). Pluralizing energy justice: Incorporating feminist, anti-racist, Indigenous, and postcolonial perspectives. *Energy Research & Social Science*, 97.
- Sovacool, B. K., Burke, M., Baker, L., Kotikalapud, C. K., & Wlokas, H. (2017). New frontiers and conceptual frameworks for energy justice. *Energy Policy*, 105, 677–691.  
<https://doi.org/10.1016/j.enpol.2017.03.005>
- Sovacool, B. K., Heffron, R. J., McCauley, D., & Goldthau, A. (2016). Energy decisions reframed as justice and ethical concerns. *Nature Energy*, 1.
- Steinmetz, K. (2018). The Oxford English Dictionary Added ‘Trans\*.’ Here’s What the Label Means. *Time Magazine*. <https://time.com/5211799/what-does-trans-asterisk-star-mean->

dictionary/#:~:text=Adding%20the%20asterisk%20is%20a,and%20changing%2C"%20she%20  
says.

Stevis, D., & Felli, R. (2016). Green Transitions, Just Transitions? Broadening and Deepening Justice.  
*Kurswechsel*, 3, 35–45.

Stryzhak, O. (2020). The relationship between education, income, economic freedom and happiness.  
*SHS Web of Conferences*, 75.

Sultana, F. (2021). Climate change, COVID-19, and the co-production of injustices: A feminist reading  
of overlapping crises. *Social & Cultural Geography*, 22(4), 447–460.  
<https://doi.org/10.1080/14649365.2021.1910994>

VI Transformation Energiewende NRW. (n.d.). *Wissenschaftliches Begleitprojekt des virtuellen  
Instituts (VI) 'Transformation—Energiewende NRW'*. <https://www.vi-transformation.de>

von Arnold, C. (2021). Conflicts between national climate targets and local communities jeopardize  
the renewable energy transition. *Center for Sustainability Studies, Lund University*.

Walker, G. (2008). What are the barriers and incentives for community-owned means of energy  
production and use? *Energy Policy*, 36, 4401–4405.  
<https://doi.org/10.1016/j.enpol.2008.09.032>

WECF e.V. (2020). *Frauen. Energie. Wende! Warum wir eine geschlechtergerechte Energiewende  
brauchen. Women Engage for a Common Future*.

Wilson, S. (2018). Energy Imaginaries: Feminist and Decolonial Futures. In J. Diamanti & B. R. Bellamy,  
*Materialism and the Critique of Energy*. MCM'.



Wurster, S. (2018). Radtke, Jörg. 2016. Bürgerenergie in Deutschland. Partizipation zwischen Gemeinwohl und Rendite. *Polit Wiss*, 12, 597–599. <https://doi.org/10.1007/s12286-018-0387-8>

Yildiz, Ö., Rommel, J., Debor, S., Holstenkamp, L., Mey, F., Müller, J. R., Radtke, J., & Rognli, J. (2015). Renewable energy cooperatives as gatekeepers or facilitators? Recent developments in Germany and a multidisciplinary research agenda. *Energy Research & Social Science*, 6, 59–73.