Co2mmunity Working Paper 2.1 - Scientific Review on Community Energy Drivers and Barriers

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Co2mmunity WORKING PAPER No. 2.1

Scientific Review Paper on CE Drivers and Barriers

Co2mmunity

Co-producing and co-financing renewable community energy projects

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Introduction

This working paper summarises the literature review conducted under work package (WP) 2.1 in the Co2mmunity project. The main aim of the report is to inform the project partners (PP) about the latest research in the field of community energy. Special focus is on identifying drivers and barriers for community energy (CE) projects and shedding light on the specific conditions in the Baltic Sea Region where the Co2mmunity project is located.

Aim of the Review

In detail, we operationalised the aim through the following objectives:

1. To gain an overview of research on community energy in the EU
2. To inform further scientific output from the Co2mmunity project, especially from WP 2. This includes information on: actors, actor constellations, drivers and barriers for CE projects
3. To provide some lessons learned to other PP in WP 3 & 4
4. To serve as openly available scientific output for the public

We address these aims through the following research questions:

- How do researchers use the term “community energy”?
- What are the barriers and drivers for community energy?
- How do policies influence these drivers and barriers?
- Who are the actors that shape these policies?
- What are the particularities of community energy projects in the different states/regions of the Baltic Sea Region?

Conducting the Literature Review

Finding the Articles

The body of literature for the review consists of scientific peer-reviewed articles on CE. To guarantee a high quality, we decided to analyse only articles from journals indexed in the Social Sciences Citation Index of Web of Science. The initial search terms for the literature review were “community energy” & “community renewable energy” & “renewable energy community” & “citizen energy” & “energy citizen” & “energy citizenship”.

Inclusion and Exclusion Criteria

Focussing on Important Papers

In a first step, we compiled a long-list of articles, which feature one of the search terms in Web of Science (GoA 2.1, Activity 2). We limited the search to the period between 2007 and July 2018. This search yielded a list of 176 articles. In a second step, we screened this long-list to verify that they indeed dealt with CE. We proceeded with a second, more-thorough screening, where we checked if the remaining papers addressed the questions specified in the research questions above (actors, barriers, drivers & institutional setup). For

example, we excluded studies on technology and technology assessment in a CE context and papers on community energy planning. Furthermore, we excluded articles that focussed on individual action on the household-level, as this was not part of a wider community project or projects initiated and executed by authorities like municipalities. Finally, we narrowed down to the given geographical focus by excluding studies with a distinct geographical focus outside of the EU. In a third step, we evaluated the quality of the papers, including the soundness of the methodology and the support for the conclusions drawn. (GoA 2.1,Activity 3). It turned out, that this step was not necessary because of the inherent quality screening made by Web of Science.

Carrying out the Review

Approach: Triangulation with (Critical) Realist Orientation

Our main aim was to obtain a "realist synthesis" of the literature on CE. The analysis is "realist" because such an analysis treats the available literature as "more or less faithful" reflections of the phenomenon studied (Heyvaert et al., 2017, p.9). This means that such a review can be used to derive recommendations for policy and practice. This objective is given because the review aims to inform project partners from outside of academia. Simultaneously, this review also draws on the "idealist" orientation of literature reviews as it aims to map the field of "community energy" studies and general relationship between concepts and theories within this field (Heyvaert et al., 2017). In the review we combine qualitative and qualitative methods (mixed methods review).

Theoretical Framings

Two Different Theoretical Framings

We decided to include two different theoretical entry points. The rationale behind this is to provide information on different relevant issues around community energy projects. We also hope to keep the possibility to use the conducted literature review for further articles with different theoretical framings within the Co2mmunity project.

Transformational System Challenges

Policy Lens

The "drivers" and "barriers" sections of the review (see Appendix 1) are structured according to four central transformational system challenges (M. Grillitsch et al., 2018; Weber & Rohracher, 2012). We address these challenges in the following way:

- Essentially, one of the key reasons for the interest in CE is its potential/actual role in transitioning the energy system in a more sustainable direction. This means that CE projects are not only an end in themselves but a means to make our energy systems more sustainable compared to the status-quo.
- Given this transformative ambition, it is important to pay attention to the specific challenges associated with transitioning socio-technical systems (such as the energy system) and the extent to which the CE literature highlight them as important challenges.
- Grillitsch et al. (2018) and Weber & Rohracher (2012) name four different transformative system challenges. The two papers differ slightly with regard to the challenges – experimentation is not part

of Weber & Rohracher's framework, but they can briefly be described in the following way (taken from Grillitsch & Hansen (2018), pp. 12-13)):

- *Directionality* "points to the necessity not just to generate innovations as effectively and efficiently as possible, but also to contribute to a particular direction of transformative change" (Weber & Rohracher, 2012, p.1042). Firstly, this requires establishing a shared vision. Secondly, policies concretising the vision need to provide designated support for concretising the vision. One example in the case of CE are concrete goals by national government or the EU's 20/20/20 targets.
- *Experimentation* refers to the importance of activities aimed at, firstly, testing new technologies and social practices and, secondly, learning about the structures inhibiting their diffusion and how to overcome these structures (Sengers et al., 2016). One example in the context of CE are urban living labs that focus on collective ownership of energy systems.
- *Demand articulation* highlights the need of considering market uptake of products and services. In the context of green products and services, traditional ecological economics argue that market uptake is particularly challenging, as green technologies often do not result in specific user-benefits, but rather produce benefits for non-payers in the application phase (Rennings, 2000). Furthermore, insufficient knowledge about user practices and needs are evident in the case of many green technologies (see Nyborg & Røpke, 2013) and may further inhibit the diffusion of green technologies. One example of how to support the uptake of renewable energy technology are feed-in tariffs. Some countries have issued higher feed-in tariffs for CE projects.
- *Policy learning and coordination* directs the attention to the need for coherence and consistency between policy levels and fields, while at the same time allowing for modification and transformation of policy approaches based on learning and previous experiences. Addressing the policy learning and coordination challenge is central for complex, uncertain and long-term processes such as an energy transition. One example in the context of CE is a legal framework that guarantees higher feed-in tariffs for CE projects while at the same time not providing legal forms for such projects.

- Referring again to Grillitsch et al. (2018), this allows us to specify policy priorities for CE, according to the identified key challenges and the structural components (actors, networks, institutions) which appear central to constituting and overcoming these challenges.

The "drivers" and "barriers" sections of the review contain short descriptions of the mechanisms by which a potential driver/barrier exerts an influence on CE projects. The reviewer does not have to report all the mechanisms described in a reviewed paper: only the ones that are emphasized in the reviewed paper should be summarized. (GoA 2.1, Activity 4)

Energy Justice

Project Lens

Energy justice is both, a social movement and a theoretical framework. In its second form, energy justice is an approach to evaluate the perception of energy systems along several dimensions of justice. Here, energy justice can help to located and analyse conflicts in decision on CE projects. This knowledge can be used to develop strategies to avoid most common conflicts in designing and managing community energy projects.

Energy justice goes beyond questions of technical or financial feasibility and instead introduces questions of justice and politics into decision making processes around energy systems (Hall et al., 2013). Energy justice is usually assessed by means of three dimensions of justice: 1) distributional, 2) procedural and 3) recognition (Jenkins et al., 2016; Sovacool & Dworkin, 2014). Distributional energy justice raises questions about the fair distribution of burdens and benefits of energy production and consumption. It is closely linked to questions of pollution on the production side (Bulkeley & Newell, 2015) but also to questions around energy poverty on the consumption side (Bickerstaff et al., 2013). Procedural energy justice refers to questions of fair, legitimate, and reliable procedures in decision-making. This includes for example access to information for all stakeholders and formalised procedures such as environmental impact assessments prior to the implementation of energy projects (Sovacool & Dworkin, 2015). Finally, justice by recognition covers the access by all actors to the processes covered by procedural justice. It deals with question of non-recognition of, for example, indigenous groups and their views and claims which get sidelined in decision making processes (Jenkins et al., 2016).

In the literature review, the concept of energy justice does not play a prescriptive role. Rather, it serves as analytical framework to map conflicts in the context of community energy projects. Whenever an article mentions conflict in the context of CE projects, we apply the energy justice framework that we operationalise through the three dimensions of energy justice:

- *Procedural Justice*: Does the article describe conflicts related to the procedures of decision-making? This includes the access to formalised decision-making processes, the obedience to required processes (e.g. participation, consultation, EIAs).
- *Distributional Justice*: Does the article describe conflicts related to the benefits and burdens of CE projects? Who gained financially and who suffered from impacts by new infrastructure? It is particularly interesting if any investments into public goods shared by the community were made.
- *Justice by recognition*: Does the article describe any incidences of non-recognition of particular groups and their views? Do certain actors make (in-)justice claims based on alternative world views e.g. grounded in indigenousness?

Results

In the following section, we present results from the literature review. We start with the quantitative analyses of the data, before highlighting some points from the qualitative analysis.

Quantitative Analysis

Expanding Research Field

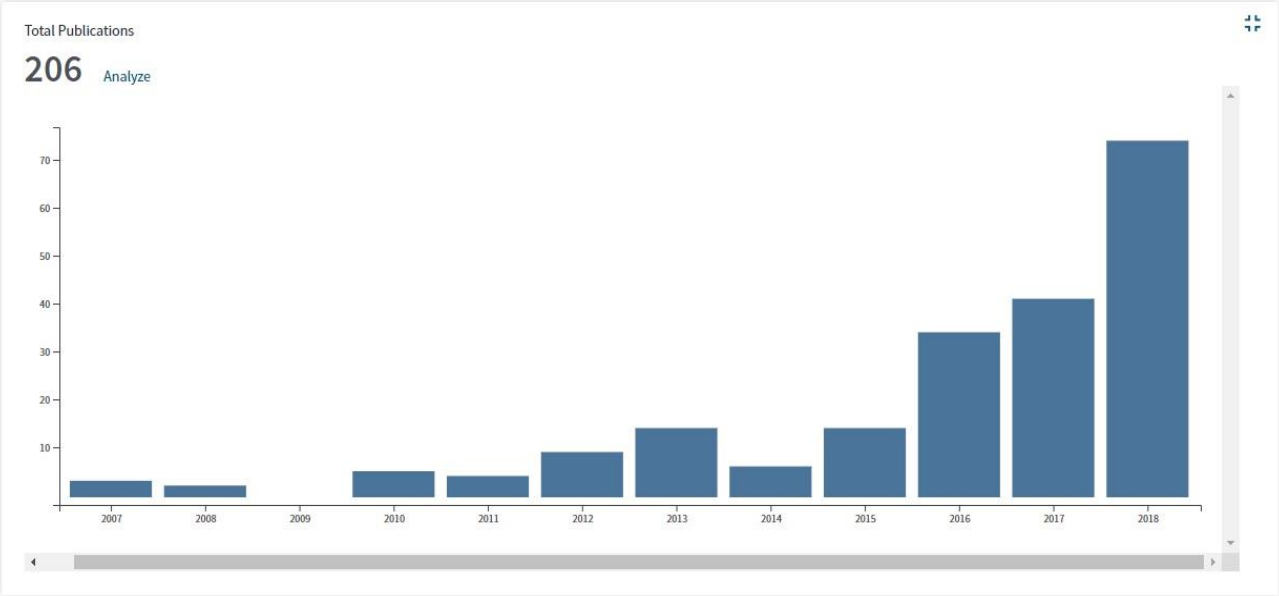

Figure 1. Updated Web of Science search (December 2018) for the named search terms. This graph includes more than the 176 papers included in the analysis to show the development of the field more accurately.

As Figure 1 shows, the number of articles published per year has been constantly increasing since 2008. In particular, research on CE has gained momentum since 2014 with a clear exponential growth in the number of published articles. Figure 4 confirms this trend. The figure shows how often articles from our analysis were published. Just like the number of publications, a clear upward trend is visible.

As can be seen, in Figure 2 and 3, although research on CE has appeared in numerous journals most of it has been published in a limited number of journals, with Energy Policy as one of the most influential, in terms of both overall number of publications and number of citations.

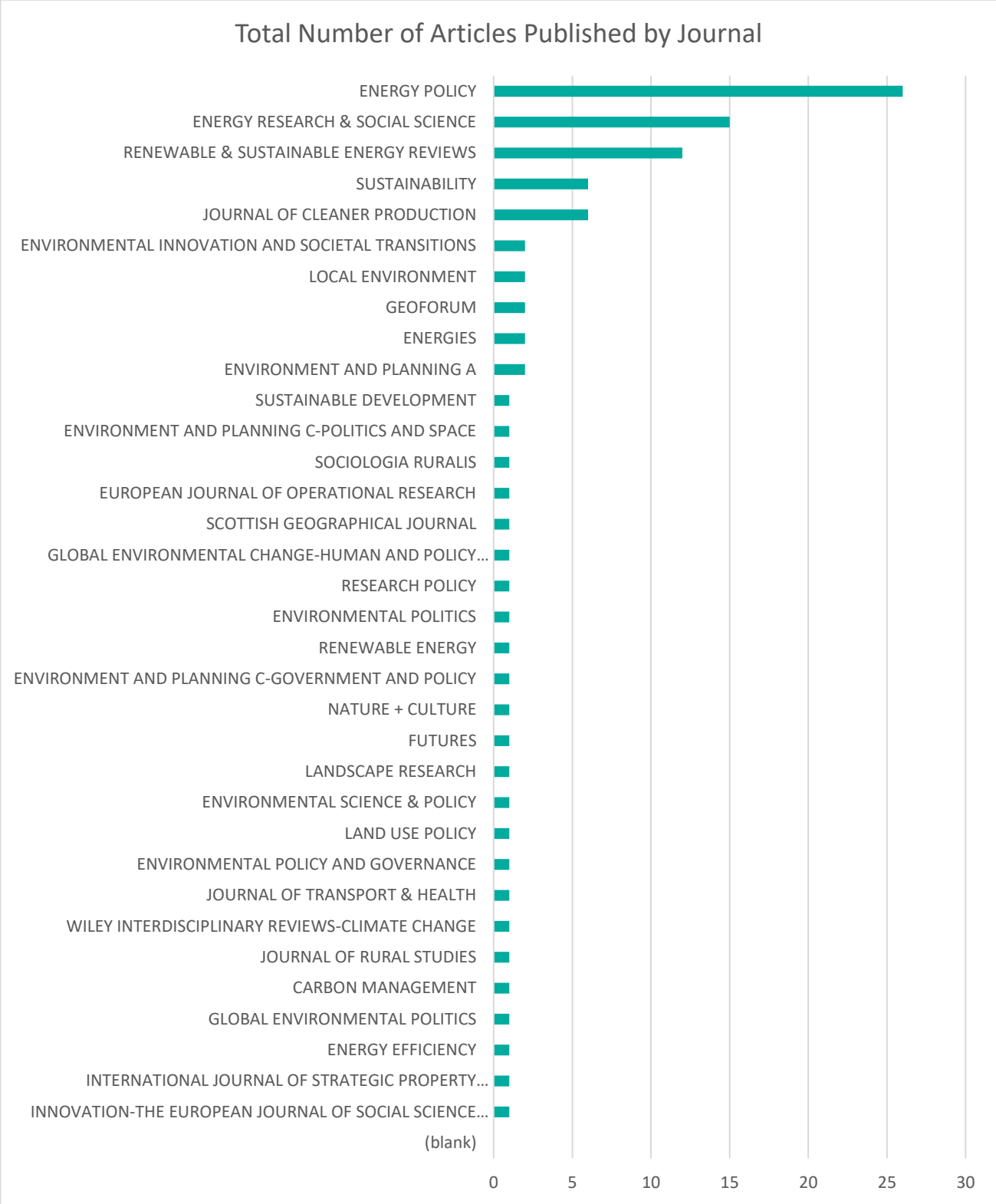

Figure 2. Number of articles per journal published in the period 2008-2018

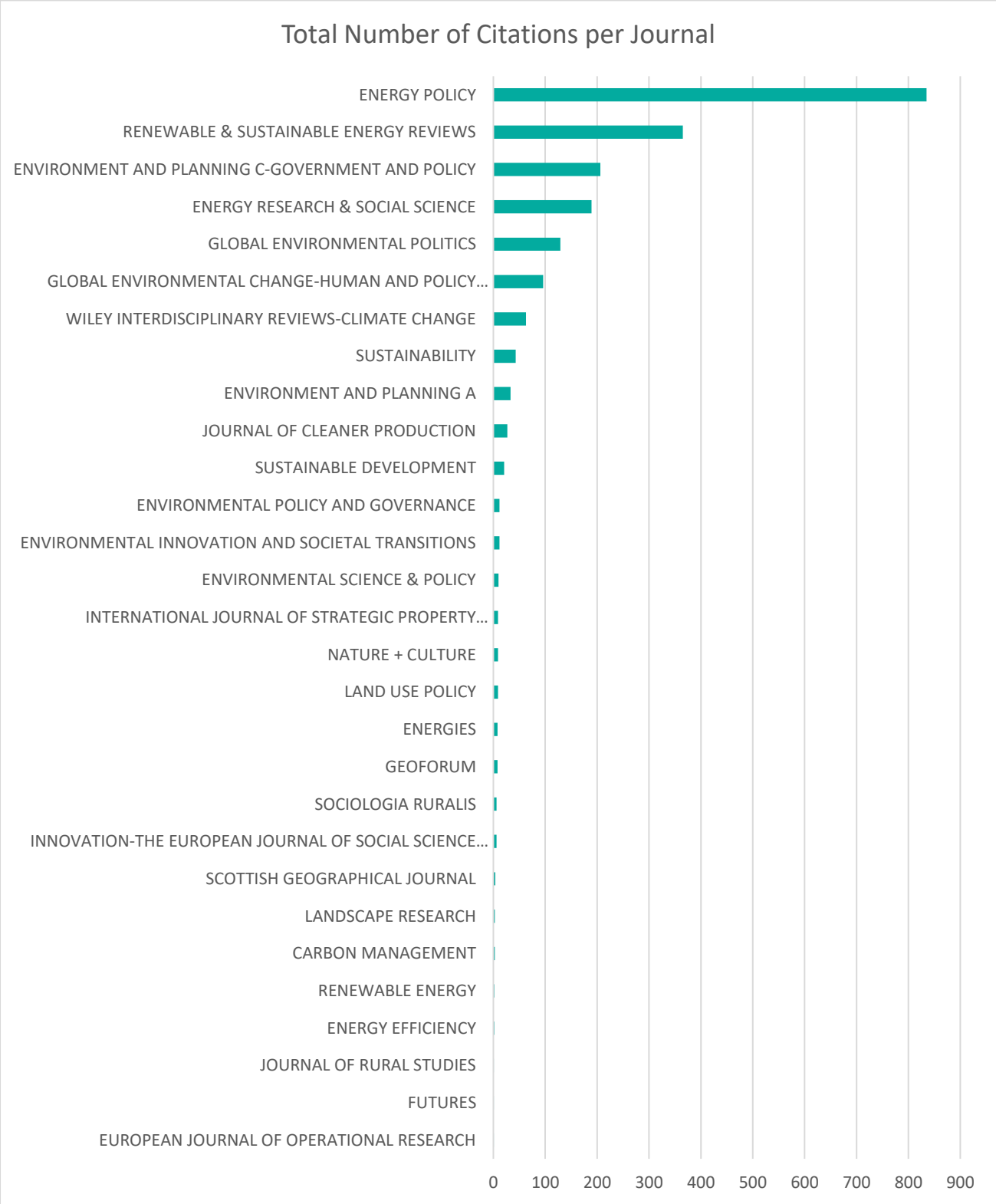

Figure 3. Total number of citations for articles published in these journals (2008-2018)

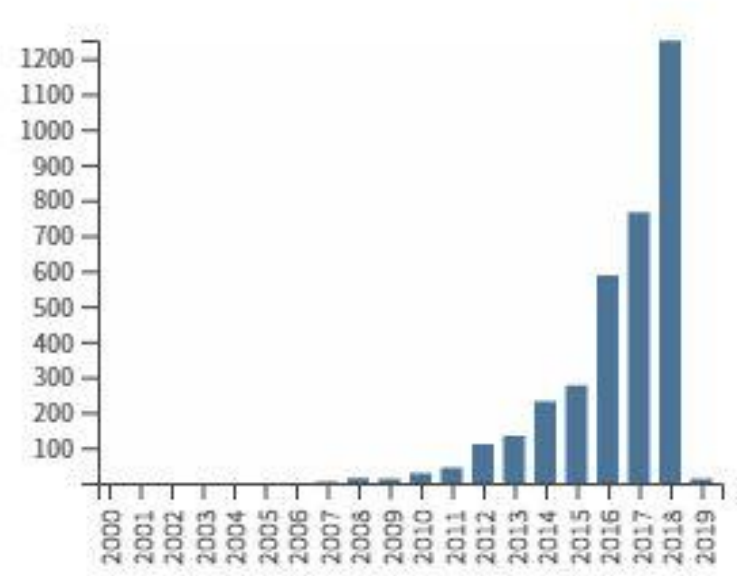

Figure 4. Total number of citations per year

Figure 5 shows that the work of Walker et al. and Seyfang et al. are among some of the most cited works. It is worthy to notice that most of the top cited authors are from a UK background.

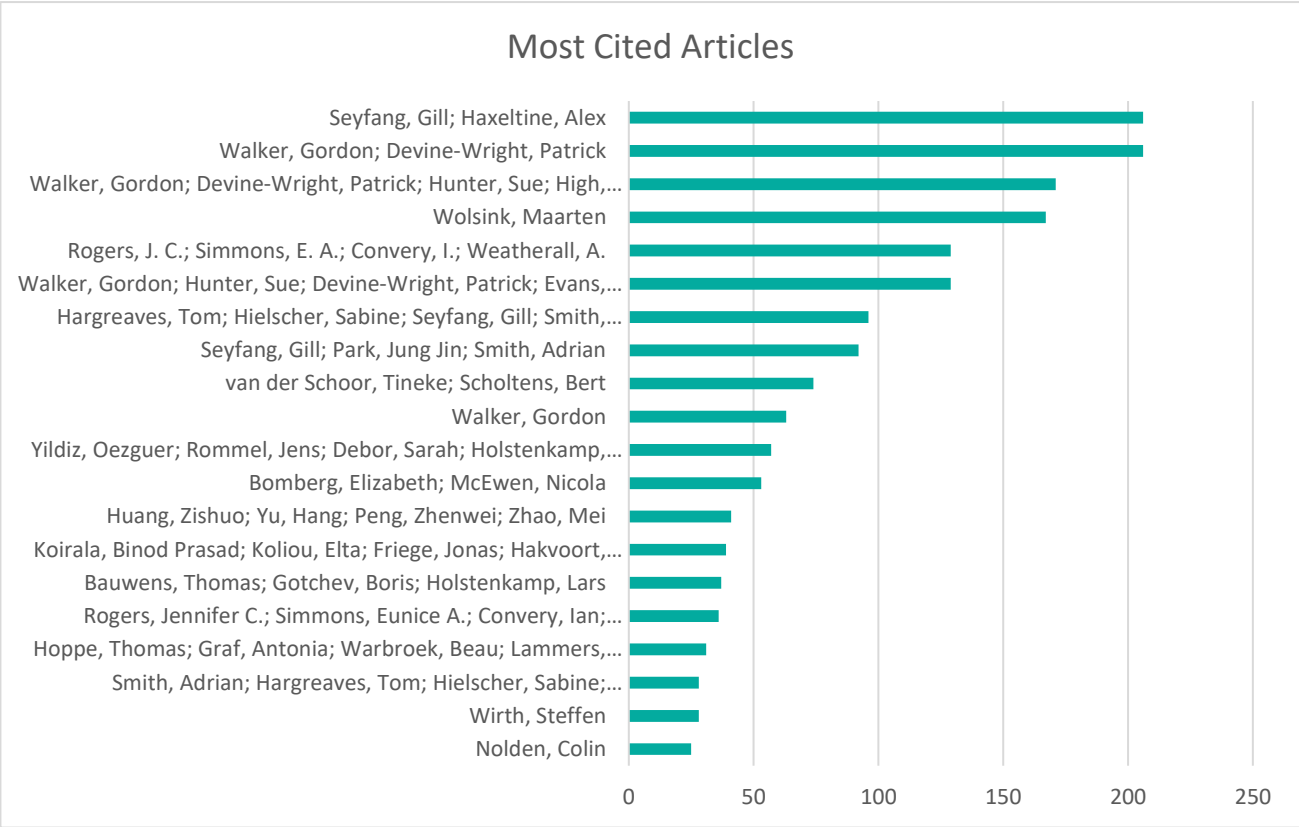

Figure 5. Most cited authors/papers

As mentioned above, the geographical focus of this study is on Europe. This means that we excluded articles that do not focus on CE in Europe. Within Europe, certain countries have attracted particular interest by researchers. Most of the example of CE initiatives are from the UK while the development in Eastern Europe remains mainly under researched. This in turn underlines the importance of our work in the Baltic Sea Region, especially in the eastern part of the region.

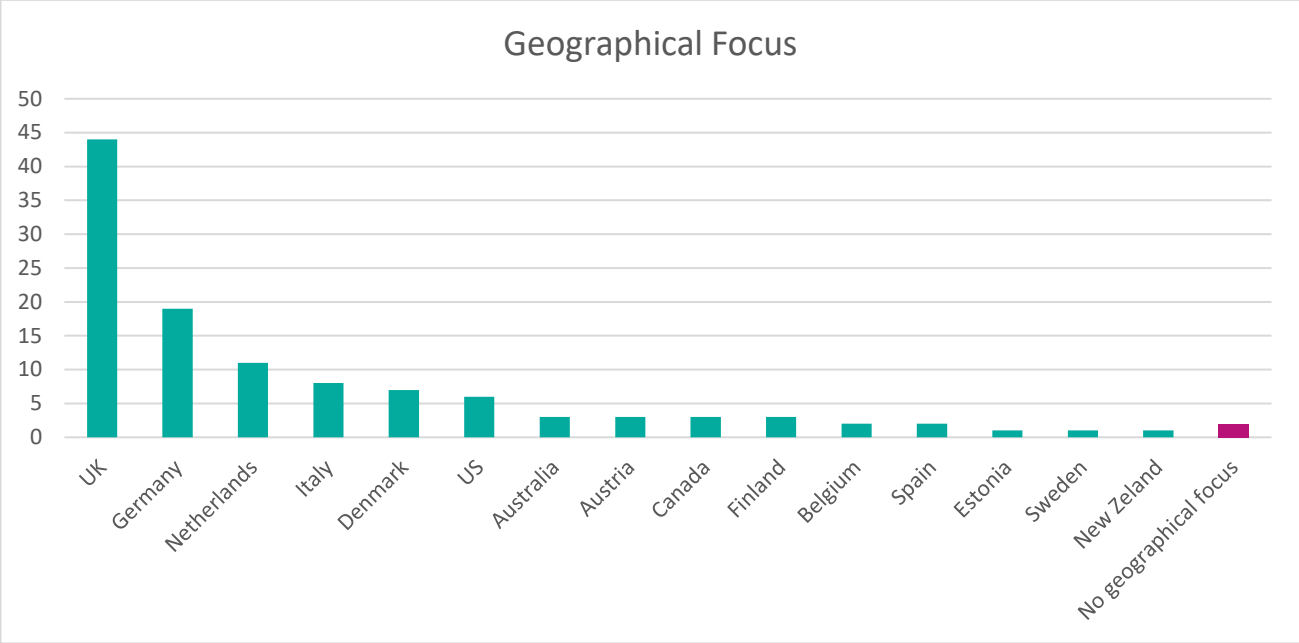

Figure 6. Geographical focus of CE research

Our review shows that most of the research on CE is qualitative, only a very small number of studies have used a quantitative approach (Figure 7). A slightly larger amount of studies has employed an approach in which multiple methods were used. About one quarter of the studies, either have been conceptual or review articles. The studies that have dealt with mathematical models are very rare, which is not surprising given our search index (Social Science).

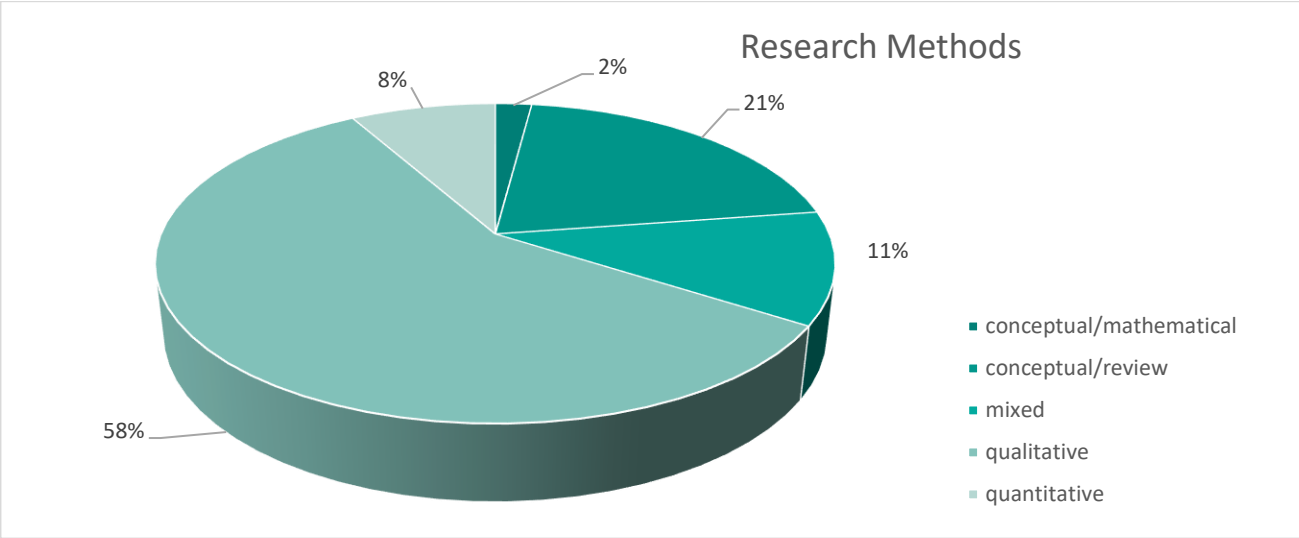

Figure 7. Research methods employed.

Research on CE has been conducted both in rural and urban contexts (Figure 8). It is surprising however that almost three quarters of the reviewed articles do not report the context in which CE was investigated. It is also worthy to note that research on CE focusing only on an urban context is still rare. Considering the role that cities play in the energy transition and the fact that in future most of the world population will live in urban contexts, the study of CE in cities is a relevant one.

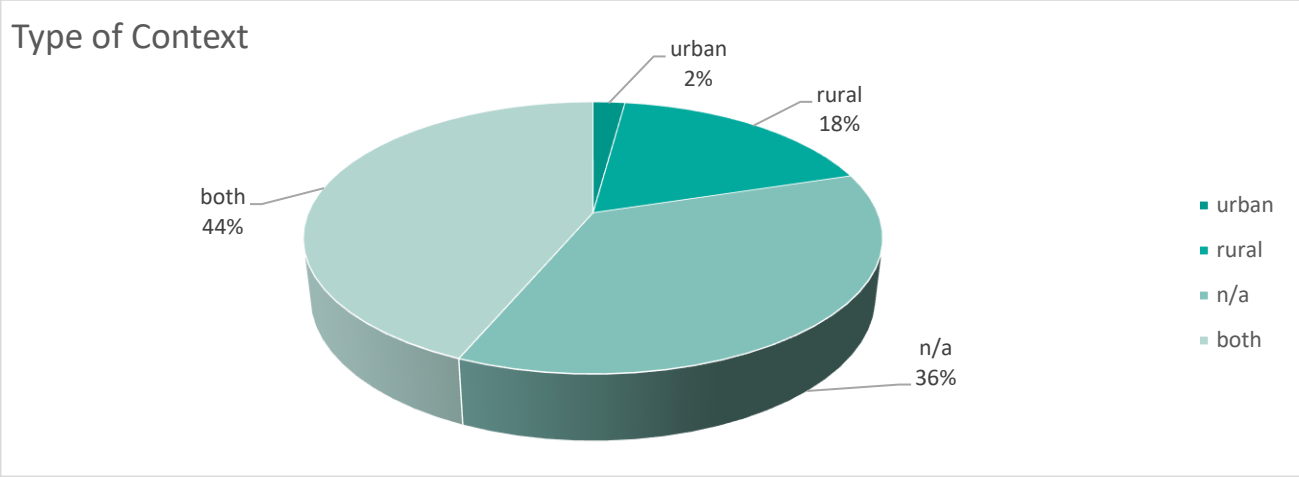

Figure 8. Type of context in which CE research has been conducted.

As figure 9 demonstrates, another aspect that has not been considered in the extant literature on CE is gender. We found that only 4% of the reviewed papers had dealt with issues related to gender.

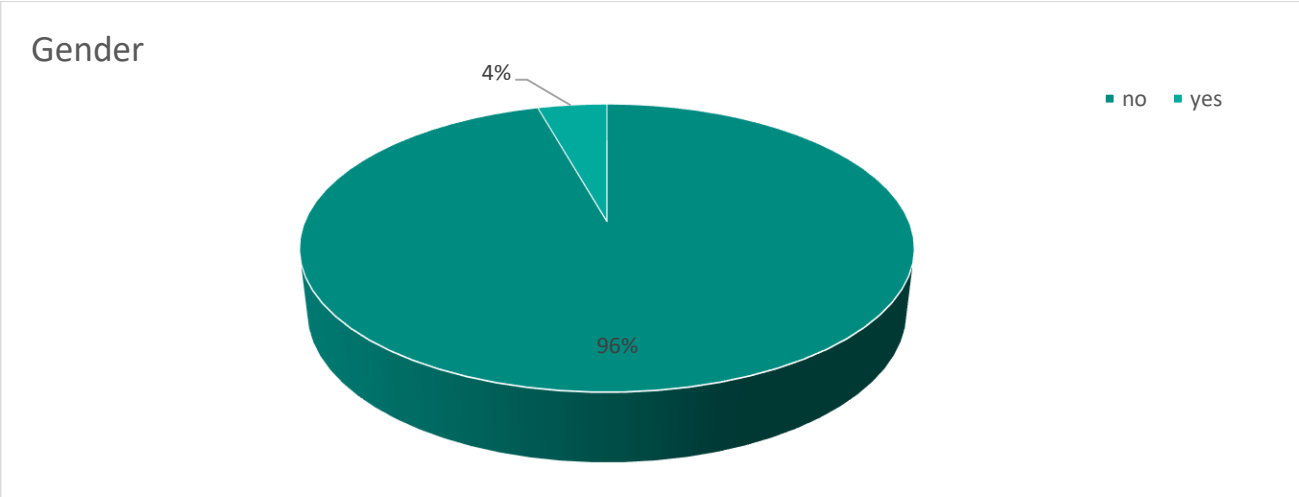

Figure 9. Share of studies that have dealt with gender.

Another aspect that seems to be overlooked in CE studies is the concept of business model. We were able to find only one paper that had explicitly used this concept. The remaining papers had either ignored it (84%) or only implicitly referred to it; for instance when mentioning the way local communities were arranging the funding of their renewable energy projects or the logic behind the generation of revenues and their redistribution.

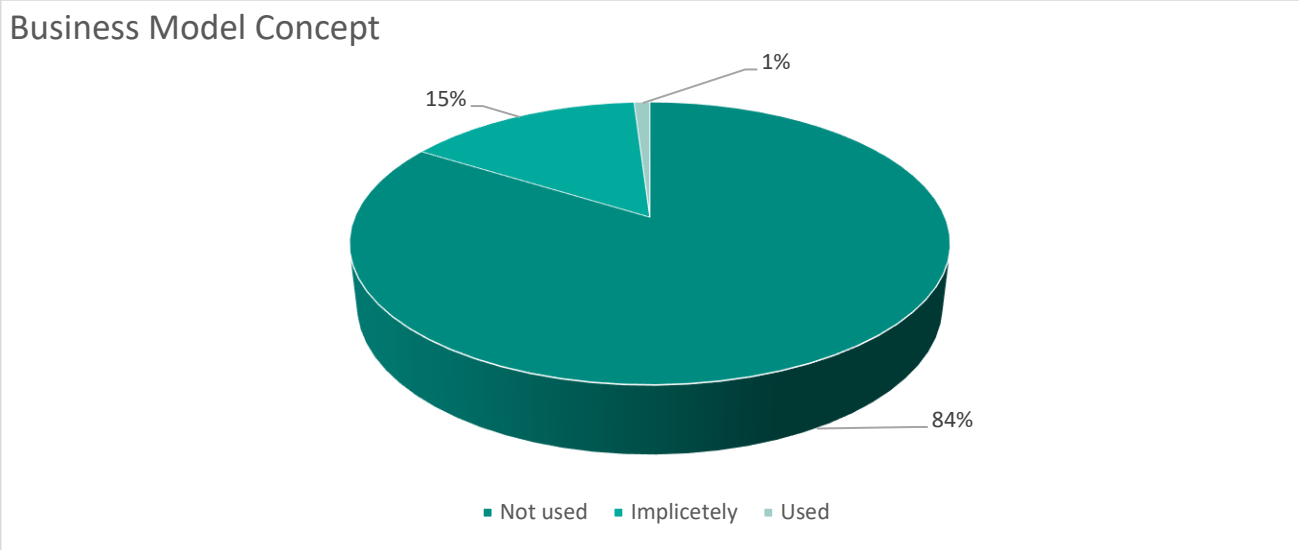

Figure 10. Share of articles that have employed the business model concept.

Keywords

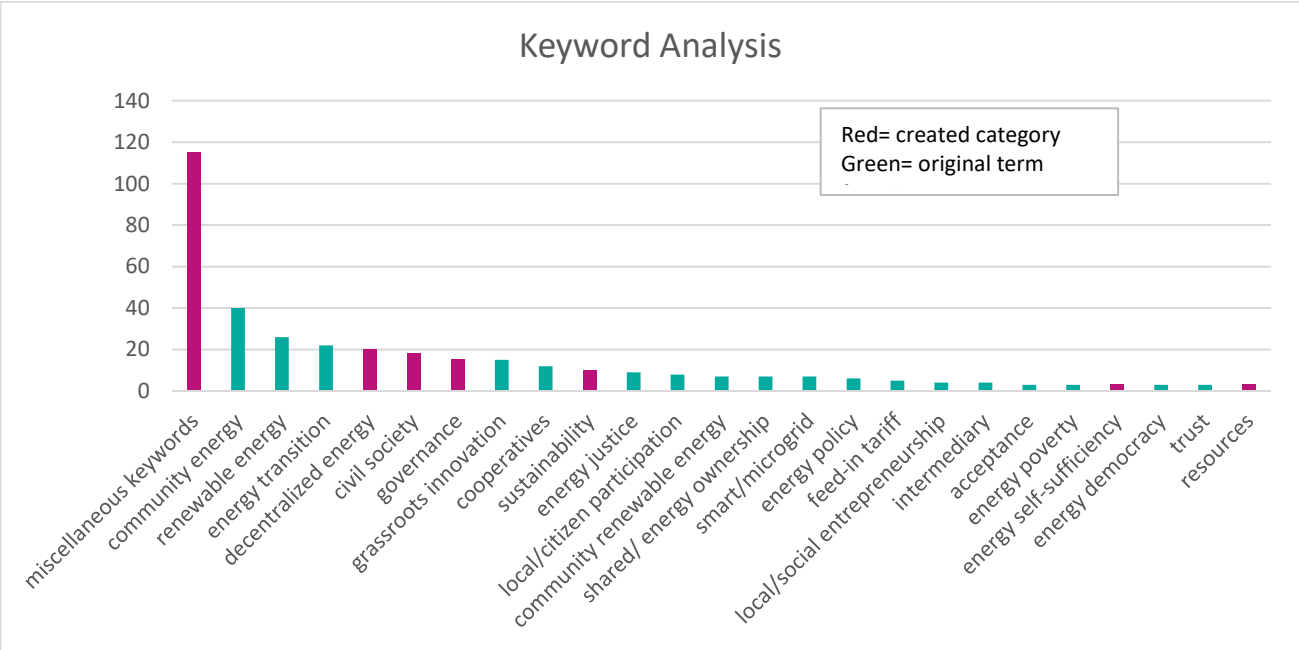

Figure 11. Frequency of keywords and keyword categories

Figure 11 shows the summary of the keywords used by the reviewed articles. All the keywords related to geographical places, methodology and theoretical approach used were removed because these keywords have been in more in depth discuss in previous sessions. The red bars show the number of keywords that were grouped in one category based on the affinity that certain keywords had. In the case of the category "miscellaneous keywords" these were all those keywords that appeared only once and thus could not be grouped. The green bars show the count of the same keywords that were used across the reviewed papers. For example while keywords related to "energy decentralization" appeared 20 times, the exact keyword "energy transition" was used 21 times.

From the analysis of the keywords used and in particular of the category "miscellaneous keywords", it is evident that despite research on CE which seems to coalesce around a few core concepts (more in the paragraphs below), there is still an ample divergence of terms and concepts.

In our review, the keyword "community energy" is the most popular. The term "community renewable energy", which was used in the seminal paper by Walker and Divine-Wright (2008), can also be found but is less common than the former. Many authors have used the keyword "renewable energy" probably assuming that CE can be seen as a small niche in the renewable energy sector. Interestingly many papers link community energy to "energy transition" and "decentralization" thus implicitly indicating that these concepts are considered as interlinked.

The category of keywords "civil society" reflects one of the core characteristics of the CE phenomenon, which is the emergence of a new group of actors in the renewable energy sector operating at the intersection of private and public sector (third sector). The keyword "cooperatives" summarizes well the fact that a good number of studies have dealt with this particular form of CE organization.

The group of keywords referring to governance is also one of the most recurrent. However, other related keywords such as energy justice, local/citizen participation, shared/energy ownership, energy democracy and trust, could be merged in this category, resulting a much larger group. Several authors seem to position CE in the domain of grassroots innovation and social/local entrepreneurship. Surprisingly there are very few authors that used "social acceptance" as a keyword despite the plethora of studies exploring the link between community ownership and social acceptance.

Definition of Community Energy

The article review revealed that there are numerous definitions of community energy. While most of these definitions refer to the term "community energy", there are several other terms used to indicate the same concept. A surprising finding was, however, the fact that about 60% of the reviewed papers did not mention any definition at all.

The most cited definition was the one given in the seminal work of Walker and Devine-Wright (2008), which was then also adopted in another very well-known study by Seyfang et al. (2013). Therefore, many authors seem to understand community energy in terms of citizens' participation in renewable energy projects and local sharing of benefits. In this framing authors seem to highlight different degrees or levels of "participation", with a large number of them pointing out that participation means ownership and control (e.g. Becker et al., 2017; Gunderson et al., 2018; Hicks & Ison, 2018; Ruggiero et al., 2018). Other authors, instead, refer to the idea of decentralized (Hoffman et al., 2013), collective (Simcock, 2016) decision-making and collective organization of renewable energy projects (Warbroek & Hoppe, 2017). Most of the definitions seem to agree on the fact that community energy initiatives can be run through several organizational models and legal entities and that they are generally non-commercial organizations.

With regard to who the main actors involved are, it appears that the extant literature mainly refers to private individuals and farmers (OECD/IEA, 2011) who have different value sets (Forman, 2017) and who are highly motivated people but with limited power and resources (Hoppe et al., 2015). Only one definition seemed to indicate that along with private individuals there can be also municipal utilities (Nolden, 2013). The activities that these actors carry out are mainly renewable electricity and/or heat production (Koirala et al., 2016). However, other definitions indicate that CE activities can also include energy reduction (Bomberg & McEwen,

2012; Hamilton et al., 2014), bulk purchase of energy (Haf & Parkhill, 2017) or simply invest in local renewable energy projects (Saunders et al., 2012).

Another recurrent theme across the reviewed definitions of community energy is the concept of place. Authors (e.g., Haf & Parkhill, 2017) seem to refer to community energy activities both in the context of a community of place, i.e. a specific geographic location often coinciding with a town or village, and community of interest, meaning an abstract community of people interested in the same subject but living in different geographic locations. Some of the definitions, however, explicitly refer to a community of place (e.g., Hamilton et al., 2014; Nolden, 2013). Rogers et al. (2008) seem even to frame CE projects as energy initiatives that take place in rural or near rural areas.

A very small number of definitions take a broad approach to community energy. For instance, Smith et al. (2016) seem to frame community energy as activities that involve a variety of sustainable energy practices or Hoffman et al. (2013) who frame them as decentralized forms of energy production or Nolden (2013) who sees them as activities that contribute to technological diffusion.

Whereas the majority of the definitions found referred to community energy, some studies presented definitions of other terms that however indicate the same concept expressed with the term community energy. These alternative definitions were mainly framing CE as grassroots innovations (Martiskainen, 2017; Schreuer, 2016; Van Der Schoor et al., 2016). Other alternative concepts were *energy citizens* (Vihalemm & Keller, 2016), *citizen power plants* (Schreuer, 2016), *low-carbon community group* (Hamilton et al., 2014), *local energy initiative* (Hasanov & Zuidema, 2018), and *local energy organization* (Saunders et al., 2012).

Qualitative Analysis

Figure 12 and 13 show the frequency of the initial themes from the coding protocol (see Appendix 1). They are the ones referring to the policy analysis we conducted through the review. It is important to note that the count of these themes does not represent the number of times each theme appeared in the dataset but the count of the number of articles in which that theme had been mentioned. This is an important distinction as a theme might appear numerous times in some articles but less often in others. In this case as well as in our review matrix, each article was assigned one cell for each of the main themes. In effect, we have observed whether or not each of our original codes were present or not in the reviewed articles. Therefore, Figure 12 gives an accurate picture of the fit of our original coding protocol with the data we have.

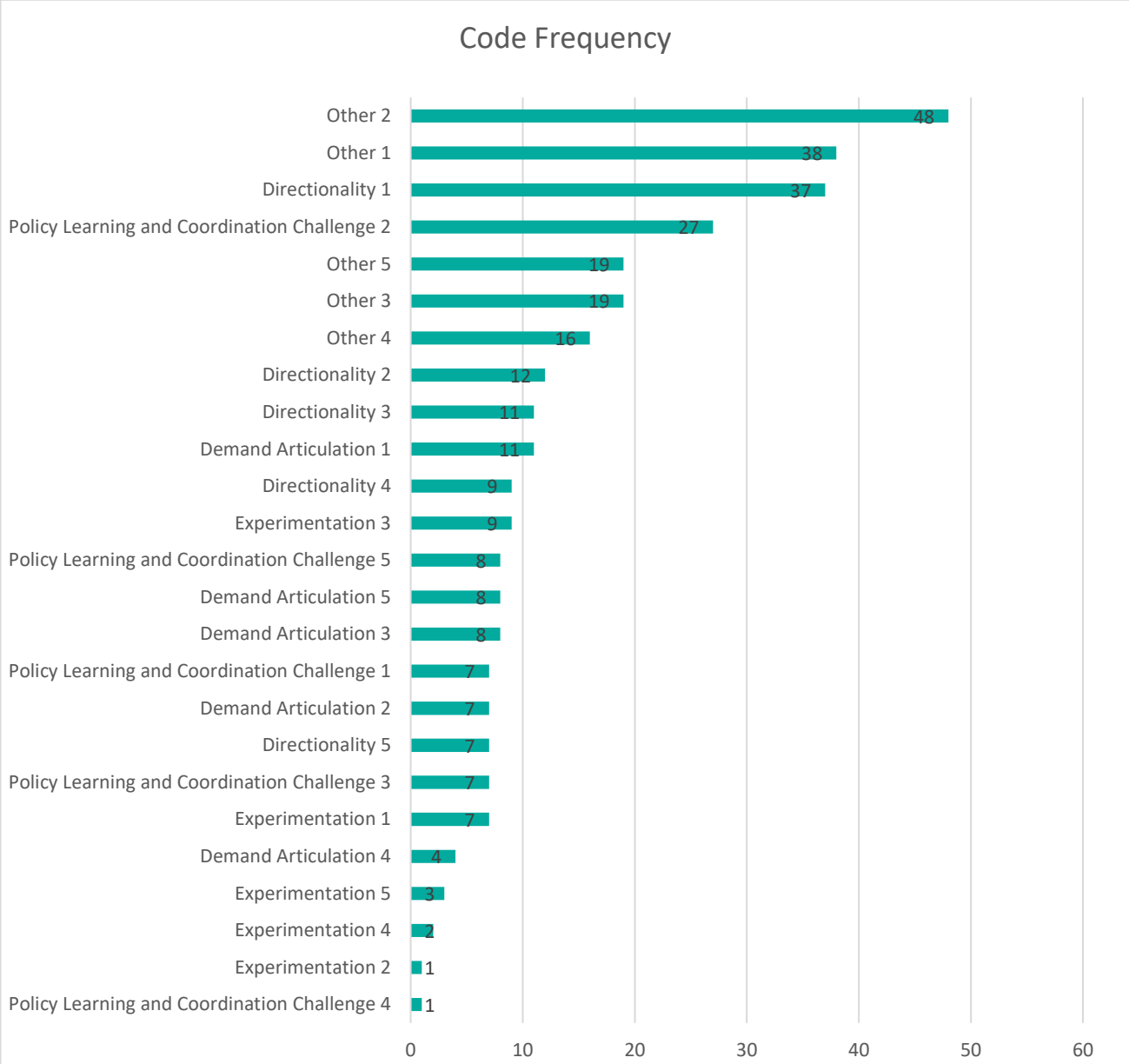

Figure 12. Frequency of main themes from the coding protocol.

Drivers and Barriers

Several driving and hindering factors of CE projects were coded in the categories Other 1 and 2. This implies that in general the drivers and barriers of CE appear to be much more nuanced that what we could expect.

On the other hand, our coding protocol returned also some very interesting findings. As can be noticed, in Figure 12, the most commonly described driver of CE is the existence of a shared vision or designated policies (Directionality 1). Further, the most commonly described barrier is a lack of coherence and consistency between policy levels and fields, as well as policy change/adjustment.

Surprisingly, aspects that have to do with the role of demand articulation and experimentation were mentioned only in a very small number of studies.

Energy Justice

The concept of energy justice only surfaced in very few articles. However, we collected information on conflicts around CE projects that the authors mentioned. It seems that more authors have encountered conflicts related to distributive justice while procedural and recognition have been less often discussed.

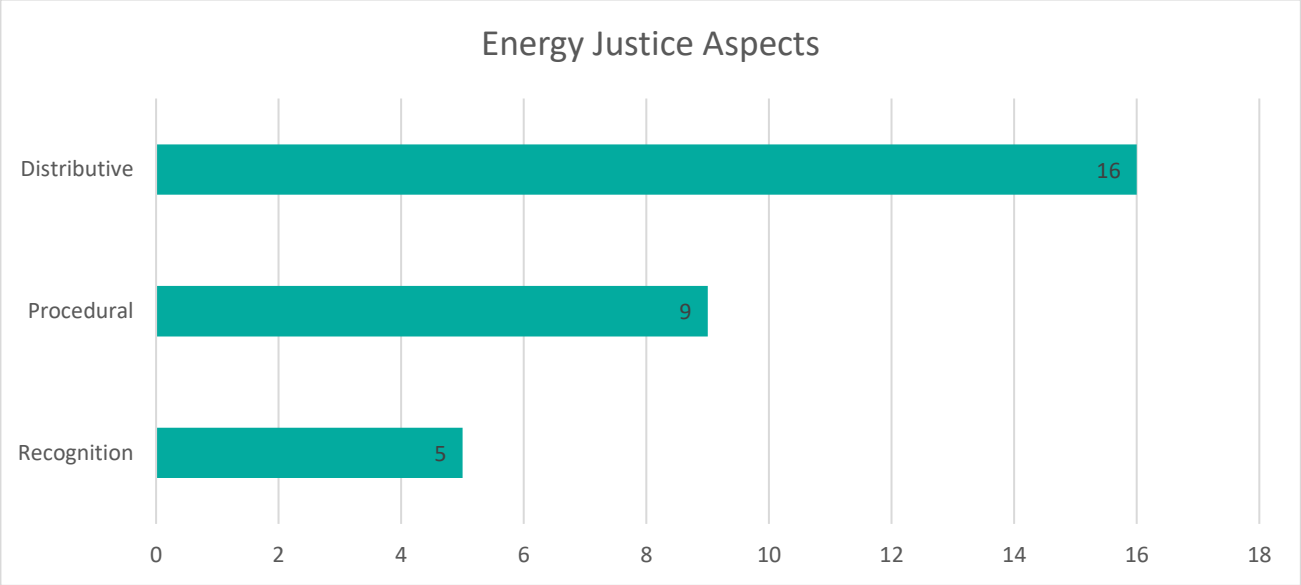

Figure 13. Aspects of energy justice found in the articles.

Benefits of Community Energy

It is important to differentiate between drivers and benefits of CE projects. Drivers are the driving forces that push CE projects. Benefits are what a community or the wider energy systems experiences as the result of CE projects. Oftentimes, anticipated benefits are drivers for community energy projects, especially in regard to economic benefits. In our literature review, 37 articles explicitly mentioned benefits from community energy projects. Five categories of benefits were mentioned most often: Benefits for the local economy (16 times), behavioural change of the people involved in the project (11), environmental benefits (10), followed by increased social cohesion (8) and acceptance of renewable technology (7).

Economic benefits surfaced as the most often described benefit of CE projects. Some authors have stressed the positive impacts of CE projects on the local economy in general (Gui et al., 2017; Haf & Parkhill, 2017; McKenna, 2018; Strachan et al., 2015; Walker & Devine-Wright, 2008; Warbroek & Hoppe, 2017). Several authors list the creation of new jobs as a concrete economic factor that benefits the local community (Akizu et al., 2018; Gui et al., 2017; Islar & Busch, 2016; Magnani et al., 2017; Walker & Devine-Wright, 2008; Warbroek & Hoppe, 2017; Young & Brans, 2017) for example through local sourcing (Bere et al., 2017) or increased local business tax (Nolden, 2013).

Many authors find that CE projects positively influence the environmental behaviour of citizens (Akizu et al., 2018; Berka & Creamer, 2018; Juntunen & Hyysalo, 2015; Parra et al., 2017; Walker, 2011). In some cases, this behavioural change goes beyond the way in which people consume energy. Instead, their engagement in CE projects engages citizens by getting them actively involved in questions of energy policy. This phenomenon is called energy citizenship and CE projects seem to be a prime vehicle to instil this notion in people (Bomberg & McEwen, 2012; Korjonen-Kuusipuro et al., 2017; McCabe et al., 2018; Parra et al., 2017; Rogers et al., 2008; Sarrica et al., 2014).

It is hardly surprising that many authors refer to the environmental benefits derived from CE projects (Gui et al., 2017; Strachan et al., 2015; Young & Brans, 2017) or more concretely the reduction in carbon emissions (Koirala et al., 2016; Moroni et al., 2016; Walker, 2011; Warbroek et al., 2018; Warbroek & Hoppe, 2017). Energy savings are mentioned by a number of authors as an additional environmental benefit (Islar & Busch, 2016; Juntunen & Hyysalo, 2015; Magnani et al., 2017; Warbroek & Hoppe, 2017) even if the exact environmental benefits remain unclear. It is worth noting that the environmental benefits of CE projects are often mentioned in passing and without much detail and elaboration. It seems that many authors in our review accept renewable energy as inherently positive for the environment. This can be explained with the focus on publications form the social sciences chosen for our review.

According to several authors, successful CE projects can be beneficial for social cohesion in communities (Forman, 2017; Haf & Parkhill, 2017; Hillman et al., 2018; Warbroek & Hoppe, 2017), mostly through the creation of social capital (e.g. Strachan et al., 2015). As van der Schoor puts it: “In many respects, decentralized renewable and sustainable energy production appears to be a means to the end of improving social coherence” (2015). One possible explanation for this is that CE projects require communities to come together and agree on the details of their energy project. These local democratic processes add to a feeling interconnectedness in the community (Islar & Busch, 2016).

One last benefit that often comes up in the literature is that CE projects can help to increase the acceptance of renewable energy technology (Bauwens, 2016; Llewellyn et al., 2017; McKenna, 2018; Walker, 2011; Walker et al., 2007). Berka et al explain that “increased local support is more likely to emerge from inclusively managed projects” (2017). Rogers et al add that awareness and uptake of renewable energy technology increase through “opportunities for dialogue” and by “providing visible demonstrations” (Rogers et al., 2008).

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Appendix

This is the matric used for the review:

Category	***Sub-category***	***Input Type***	***Description***
Paper		Text – full reference (authors, title, year, journal)	
Keywords		Text – up to five keywords	
Research question / objective		Text – maximum 300 characters	
Citation Count		Number	To assess how impactful an article is
Methods		Drop-down menu • Qualitative • Quantitative • Mixed • Conceptual/Mathematical • Conceptual/Review	
Definition of Community Energy		Text – maximum 300 characters or "no definition"	
Theories Used		Text – maximum 200 characters	Simply name theories/literatures that the paper draws on
Geographical Focus		Text – maximum 100 characters	Name the location (e.g. Denmark or EU)
Drivers	Directionality	Text – maximum 600 characters	Describe if and how the paper underlines that the existence of a shared vision or designated policies have supported CE Specify how this directionality has been put in place
	Experimentation	Text – maximum 600 characters	Describe if and how the paper underlines that experimentation activities have been important for developing CE Specify how these experimentation activities have been put in place

	Demand Articulation	Text – maximum 600 characters	Describe if and how the paper underlines that market uptake of products and services has been important for developing CE Specify how this market uptake has been put in place
	Policy Learning and Coordination Challenge	Text – maximum 600 characters	Describe if and how the paper underlines that coherence and consistency between policy levels and fields, as well as adjustments of policies have been important for developing CE Specify how this policy coordination and learning has been put in place
	Other	Text – maximum 600 characters	Describe other important factors that have been important for developing CE Specify how these factors have been put in place
Barriers	Directionality	Text – maximum 600 characters	Describe if and how the paper underlines that a lack of a shared vision or designated policies have hindered CE Specify the reason for this lack of directionality
	Experimentation	Text – maximum 600 characters	Describe if and how the paper underlines that a lack of experimentation activities have hindered CE Specify the reason for this lack of experimentation
	Demand Articulation	Text – maximum 600 characters	Describe if and how the paper underlines that a lack of market uptake of products and services have hindered CE

			Specify the reason for this lack of market uptake
	Policy Learning and Coordination Challenge	Text – maximum 600 characters	Describe if and how the paper underlines that a lack of coherence and consistency between policy levels and fields, as well as adjustments of policies have hindered CE Specify the reason for this lack of policy coordination and learning
	Other	Text – maximum 600 characters	Describe if and how the paper underlines that other important factors have hindered CE Specify the reason for this lack of these specific factors
Importance of Actors for Drivers and Barriers	Directionality	Text – maximum 600 characters	Describe if actor interests or capabilities are important for explaining the degree of achieved directionality
	Experimentation	Text – maximum 600 characters	Describe if actor interests or capabilities are important for explaining the degree of achieved experimentation
	Demand Articulation	Text – maximum 600 characters	Describe if actor interests or capabilities are important for explaining the degree of achieved demand articulation
	Policy Learning and Coordination Challenge	Text – maximum 600 characters	Describe if actor interests or capabilities are important for explaining the degree of achieved policy learning and coordination
	Other	Text – maximum 600 characters	Describe if actor interests or capabilities are important for explaining the other important supporting or hindering factors
Importance of Networks for	Directionality	Text – maximum 600 characters	Describe if networks between actors are important for explaining the

Drivers and Barriers			degree of achieved directionality
	Experimentation	Text – maximum 600 characters	Describe if networks between actors are important for explaining the degree of achieved experimentation
	Demand Articulation	Text – maximum 600 characters	Describe if networks between actors are important for explaining the degree of achieved demand articulation
	Policy Learning and Coordination Challenge	Text – maximum 600 characters	Describe if networks between actors are important for explaining the degree of achieved policy learning and coordination
	Other	Text – maximum 600 characters	Describe if networks between actors are important for explaining the other important supporting or hindering factors
Importance of Institutions for Drivers and Barriers	Directionality	Text – maximum 600 characters	Describe if formal or informal institutions are important for explaining the degree of achieved directionality
	Experimentation	Text – maximum 600 characters	Describe if formal or informal institutions are important for explaining the degree of achieved experimentation
	Demand Articulation	Text – maximum 600 characters	Describe if formal or informal institutions are important for explaining the degree of achieved demand articulation
	Policy Learning and Coordination Challenge	Text – maximum 600 characters	Describe if formal or informal institutions are important for explaining the degree of achieved policy learning and coordination
	Other	Text – maximum 600 characters	Describe if formal or informal institutions are important for explaining the other important supporting or hindering factors

Conflicts and Energy Justice	Distribution	Text – maximum 600 characters	Are conflicts mentioned that relate to the distribution of burdens and benefits of CE projects
	Procedure	Text – maximum 600 characters	Are conflicts mentioned that refer to the procedures around decision making of CE projects
	Recognition	Text – maximum 600 characters	Are conflicts of non-recognition of alternative world views mentioned
Intermediaries	Facilitating	Text – maximum 600 characters	Does the article describe an actor who takes a facilitating role? Who is the actor (name, scale, source of resources)?
	Configuring	Text – maximum 600 characters	Does the article describe an intermediary who configures the system? Who is the actor (name, scale, source of resources)?
	Brokering	Text – maximum 600 characters	Does the article describe an intermediary who takes the role of a broker? Who is the actor (name, scale, source of resources)?
Benefits of CE		Text – maximum 600 characters	Describe the main benefits arising from the project. Benefits can occur on different spatial scales and in different dimensions (economic, political, social)
Main Conclusion		Text – maximum 600 characters	Describe main conclusions of the paper
Baltic Countries Specific Insights		Text – maximum 600 characters	Describe if the paper cover insights on the Baltic countries
Business Models for CE		Text – maximum 600 characters	If applicable add the business model of the described CE project(s)
Urban or Rural Context		Drop down menu • Urban • Rural • Both • n/a	Are urban or rural projects considered in the article? (Definition for urban and rural taken from EU)

Future Research Identified by the Article		Text – maximum 600 characters	
Link/URL			
Gender		Yes/no	Does the paper explicitly mention gender?

Imprint

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