

# SONNET – SOCIAL INNOVATION IN ENERGY TRANSITIONS

**Co-creating a rich understanding of the diversity, processes, contributions, success and future potentials of social innovation in the energy sector**

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## Research report on Cooperative Organisational Models for Renewable Energy in Germany



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**About SONNET:** SONNET is a research project that aims to develop an understanding of diversity, processes, contributions and future potential of social innovation in the energy sector. It is co-funded by the European Commission and runs for three years, from 2019-2022. The SONNET consortium consists of 12 partners across Europe, including academics and city administrations. For more information, please visit our website: <https://sonnet-energy.eu>

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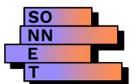
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## 1 FORWARD

SONNET (Social Innovation in Energy Transitions) brings diverse groups together to make sense of how social innovation can bring about a more sustainable energy sector in Europe. The project aims to co-create a rich understanding of the diversity, processes, contributions, successes and future potentials of social innovation in the energy sector (SIE). We define SIE as combination of ideas, objects and/ or actions that change social relations and involve new ways of doing, thinking and/ or organising energy. As part of this work, we make use of an embedded case study approach to build a better understanding of the development of diverse SIE-fields (e.g. participatory incubation and experimentation, framings against specific energy pathways, local electricity exchange) over time. Our research questions that frame the case study work are:

- How do SIEs and SIE-fields emerge, develop and institutionalise over time?
- How do SIE-field-actors and other field-actors interact with the 'outside' institutional environment and thereby co-shape the SIE-field over time?
- What are the enabling and impeding factors for SIE-field-actors and other field-actors to conduct institutional work and change the 'outside' institutional environment?

A SIE-field is an arena/space that includes a specific SIE as well as SIE-field-actors working on it and other field-actors enabling and/or impeding it. In this arena/ space these actors take one another and their actions into account and have a shared (but not necessarily consensual) understanding of a SIE and of their relationship to other actors. They recognise (but not necessarily follow) shared norms, beliefs and rules. SIE-fields are often not homogenous but are composed of actors with diverse and contradictory aims and interests. An example: The UK cooperative energy field includes SIE-initiatives and SIE-field-actors (e.g. Brighton Energy Co-op, Cooperative UK, Community Energy England, UK Government, City of Brighton), who have a shared understanding of an SIE, which exists as 'organising under cooperative principles to generate renewable energy'.

The structure of this report is as follows. Section 2 provides a summary of the SIE-field relevant for this report and lists some key insights. Section 3 outlines the boundaries of the SIE-field and shows how it has been studied in the country context. Section 4 shows a visual development of the SIE-field. Section 5 tells the historical development of the SIE-field over time, including analytical/ interpretive reflections from the SONNET researchers and quotes from the actors involved in the field developments. Section 6 outlines key research findings, providing answers to the three research questions. Section 7 outlines recommendations for policymakers based on the findings. After the list

of references (section 8) the final section 9 outlines the methodological approach and includes a more detailed timeline of the SIE-field and its actors.

The following boxes are used within the report:

Conceptual work  
...

Introduction to SIE-initiative  
...

## 2 Cooperative organisational models for renewable energy in Germany

In SONNET, we investigate the development of the SIE-field (and its initiatives) called renewable energy cooperatives (REC) - in Germany, but also in Switzerland and France. With RECs, we refer to **organisational models through which citizens jointly own means of and participate in renewable energy production**. Primarily, RECs aim to finance and operate renewable energy power plants but can also have other goals such as to sensitize local actors to the potential of local renewable energy and energy savings.

To determine what constitutes a **cooperative organisational model**, we rely on the cooperative principles provided by the European federation of renewable energy cooperatives (REScoop) and by the International Cooperative Alliance (ICA) respectively. These principles include **i) concern for community, ii) voluntary and open membership, iii) democratic governance of the undertaking, and iv) autonomy and independence**. At the organisational level, the cooperative principles can be implemented through a legal cooperative statute. However, what principles are represented in a cooperative statute varies from one country to another. Also, organisations with other statutes can adopt cooperative principles without having a cooperative status. To explore the boundaries of the REC field in each of the investigated countries, we started with organisations adhering to the cooperative principles and identified empirically in which arena the majority of them are embedded.

In Germany cooperative organisational models who adhere to the cooperative principles can be distinguished from other organisations by their legal form. The main attributes of member orientation, the identity principle and the democratic principle have been guaranteed by the **German Cooperative Law (GenG)** since 1889 (in GenG §1-§172). Those principles assure that cooperatives pursue the interests of their members through three means: (1) a communal business, (2) a combination of two opposing roles, e.g., the landlord and the renter, and (3) voting rights, where every member of the cooperative has one vote independent of the amount of his/her share (Klagge et al., 2016). Those principles are fundamental characteristics of energy cooperatives and play an important role for the selection of the cooperative model. Furthermore, since the registration in the German cooperative register is mandatory for all cooperatives (§10 §11 GenG) it is ensured that all energy cooperatives are comprehensively registered. Within these principles, however, cooperative organisational models with the legal status of a cooperative **can differ considerably concerning their activities, geographical scale and size**.

In the following, we **focus on cooperatives as the main organisational model** for citizen participation in renewable energy in Germany. However, it should be noted that other legal

organisational forms like associations (e.V.), limited liability companies (GmbH), partnerships under the civil code (GbR), or public limited companies (AG) exists in the field of renewable energies and may partially comply with the criteria mentioned above. Even if there might be similarities in many aspects between cooperative models and other legal forms, in this report, we only focus on cooperative models and therefore do not consider other legal forms of citizen participation in renewable energy.

Finally, the development of the SIE-field has been **fundamentally influenced by national energy policies**, as will be shown in this report. More precisely, the various changes in these policies influenced the structuration of the field and led to further adaptation processes. For brevity reasons we will not always speak of “cooperative organisational models for renewable energy in Germany” but “energy cooperatives” in short.

### Key insights

For the SONNET project, the SIE-field of cooperative organisational models for renewable energy in Germany is particularly interesting because it reveals several important issues for social innovation in energy transitions. In particular, it illustrates that:

- The **socially innovative character** of energy cooperatives in Germany is not mainly to be found in the organisational model itself but rather in **its application, the reasons for its application and the resulting activities and implications**. The application of the cooperative model in the context of renewable energy to enable citizens participation in the energy transition and the resulting decentralisation of the energy system constitute one part of the socially innovative character of energy cooperatives in Germany. Furthermore, the resulting pioneer activities through which energy cooperatives induce further changes in the energy system are the main aspects of their socially innovative character.
- Moreover, the use of the cooperative organisational model led to the **evolution of a newly organised network** which is starting to have an impact on the established energy system, through the political representation of cooperatives and the alternative opportunity to generate electricity.
- The **main influential factors** for the development of the SIE-field under study are the **regulatory framework conditions on the national level**, namely German energy policy. In particular, the introduction of the feed-in tariffs for renewable energies within the Renewable

Energy Sources Act (EEG) served as the main enabling condition for the vast increase of energy cooperatives in Germany. Likewise, the decrease of feed-in tariffs and further policy changes (such as the implementation of an auction model, see Box 'policies and policy making', p. 22) hindered the further rise of newly established energy cooperatives. Nonetheless, the impact of the sub-national level, i.e. the federal states in Germany, on the development of the SIE-field is not negligible, since they can financially support the structuration of the field, through the provision of subsidies for regional intermediaries.

- Even though the initial beneficial conditions for the expansion of energy cooperatives are reduced, the SIE-field has the **potential to further develop through processes of diversification and professionalisation** (with respect to project planning and administrative processes), thus leading to further socially innovative developments.

### 3 Introduction to Cooperative Organisational Models for Renewable Energy in Germany

Energy cooperatives are not a new phenomenon per se in Germany since they already existed in the 20th century. In the early 1900s, their main task was to provide the rural population of Germany with electricity since it was not profitable enough for national energy providers to invest in energy grids. However, of the 6,000 electricity cooperatives existing in 1930, only 44 were still operating in 2015 (Debor, 2018). Nevertheless, since the beginning of the early 2000s, a new wave of energy cooperatives evolved with the focus on the generation of renewable energies. More precisely, 92% of all 10551 energy cooperatives registered in 2015 were established from 2006 onwards, thus the currently active energy cooperatives can be considered as a new phenomenon in Germany (Debor, 2018).

Energy cooperatives are the largest part of citizen energy in Germany (Kahla et al., 2017). According to the data basis of Kahla et al. 2017 energy cooperatives have a share of 54.6% in comparison to limited liability companies with 6.2 % and limited partnerships with a limited liability company as general partner with 36.6%. During the last 20 years, the increase of newly founded energy cooperatives, as well as the rising numbers of new members, indicate their increased popularity. In the academic literature Kahla et al. 2017 explain the growth of public attention for energy cooperatives by their positive public perception and increased popularity during the financial and climate crisis. This is accompanied by their democratic governance structure which enables citizens to participate in the energy transition – in contrast to investment-oriented companies. The transformation of the insolvent Prokon company group into an energy cooperative (2015) is an example of the trend of investor-oriented companies to change their organisational model into energy cooperatives because of their positive image (Kahla et al., 2017).

#### Key changes in the SIE-field over time

*One of the central research questions and empirical foci within the SONNET case studies is to understand the development of the SIE and its SIE-field over time (Hielscher et al. 2020, pp. 15–18). We, therefore, take a ‘process perspective’ and investigate change through focusing on the emergence of the field and the activities of SIE-actors shaping them (Wittmayer et al. 2020b,*

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<sup>1</sup> The numbers of energy cooperatives per year vary depending on which data bank the authors use.

*p. 33). In doing so, we look at external shocks, internal field events and key changes in the development of the SIE-field and its relationship with the 'outside' institutional environment (Wittmayer et al. 2020b, pp. 29–30). Moreover, we appreciate that changes in the SIE-field also concern changed narratives and societal trends that enable or impede the development of the SIE and its SIE-field.*

For the SIE-field under study three fundamental key changes demarcate the development of the field in particular.

Firstly, the implementation of the Renewable Energy Source Act in the year 2000: Its introduction of the guaranteed feed-in tariffs (alongside other provisions) enabled an immense increase in energy cooperatives in Germany, particularly due to the secure long term investment opportunities for energy cooperatives. The accompanying feature of this first key change in the SIE-institutional environment and consequentially the SIE field is the amendment of the German cooperative law in 2006 which facilitated the establishment of energy cooperatives as well as the administrative procedures for smaller cooperatives. Both policy changes were the main enabling conditions for the enormous increase of newly established energy cooperatives from 2006 onwards.

The amendments of the previously very supportive energy policies characterises the second key change. The amendments of the Renewable Energy Sources Act of 2012 and 2014 led to the gradual decrease of the attractiveness of the main business model of energy cooperatives which relied on the remuneration through supportive feed-in tariffs. The decreasing margins for investments in renewable energies due to lower feed-in tariffs, their later substitution through tenders, paired with new restrictions on plant sizes, the regulations about own consumption and the new requirement to pay the EEG surcharge for it, as well as the 'breathing lid' contributed to a decrease in the number of newly founded energy cooperatives. At the same time, these impeding conditions evoked the diversification of business areas and models of existing energy cooperatives.

Finally, as a reaction to the previous key changes, the actors in the SIE-field under study started to increase their cooperation and established regional as well as national intermediaries, such as the LANEG Rheinland-Pfalz (regional) or the Bündnis Bürgerenergie e.V. (national). The resulting enhanced degree of organisation in the SIE-field can be described as the third key change. Its impact on the energy transition remains to be seen.

Energy cooperatives in Germany comprise around 850 cooperatives with around 200.000 members in 2019 (DGRV 2020, p. 9). The majority was founded within the last 10 years and invested roughly 1.7

billion euro into renewable energies (Genossenschaften in Deutschland, 2020a). Since the membership is often already possible with less than a hundred euros, energy cooperatives enable citizen participation on a large scale. Their focus on regionality and participation furthermore has supported increasing acceptance levels in renewable energies in the general public (Genossenschaften in Deutschland a, 2020; Herbes et al., 2017; Viardot, 2013; Sagebiel et al., 2014; Engerer, 2014). Until today energy cooperatives are active in different fields and can be differentiated by the way they are engaging with energy (Brinkmann and Schulz, 2011). The following table summarizes their main fields of activity. Note that some energy cooperatives engage in more than one of those fields.

**Table 1: Types of energy cooperatives according to their activities**

Type of energy cooperative	Tasks regarding energy
<b>Service Organisation Cooperative</b> (‘Dienstleistungsgenossenschaften’)	<ul style="list-style-type: none"> <li>• consultation of their members</li> <li>• purchase of energy</li> <li>• acquisition of new tasks for the cooperative</li> <li>• provision of sustainable energy for their members</li> </ul>
<b>Energy consumer cooperatives</b> (‘Energieverbraucher-genossenschaften’)	<ul style="list-style-type: none"> <li>• mostly involved in the trading and the distribution of energy to the user</li> </ul>
<b>Producer cooperatives</b> (‘Energieerzeugergeno-senschaften’)	<ul style="list-style-type: none"> <li>• produce their energy or heat through photovoltaics, wind or water</li> </ul>
➔ biggest group of energy cooperatives	

According to the data analysis of Kahla et al. (2017), the majority of energy cooperatives engages in photovoltaic energy production. The second most frequent field of activity is local heat networks followed by wind energy (and to a much smaller extent) hydrodynamic power and solar heat. For the former, the generation of electricity through photovoltaics fed into the public network and the therefore obtained remuneration for the feed-in tariffs constituted their main business model. In 2014 the revenues of almost 80% of all regional energy cooperatives and more than 80% of the supra-regional energy cooperatives depended on the feed-in tariff policy (Herbes et al., 2017).

Another distinguishing characteristic of energy cooperatives is their geographical scope. Regional cooperatives mainly focus on sites in their rural district and only allow membership for the population

of their region. Supra-regional energy cooperatives on the other hand also include sites outside of their rural districts as well as members from different areas. In addition, they tend to be bigger in terms of membership and amount of investment, and typically offer more varied activities regarding the energy production and marketing as well as activities beyond that (except for energy cooperatives who are involved in the heat sector) (Klagge et al., 2016). However, in the German case, the importance of the regional orientation in terms of membership as well as for the location of sites lost relevance. As Klagge et al. (2016) elaborate, in 2014 half of the energy cooperatives were not exclusively regional oriented anymore and the number of cooperatives with a supranational orientation in terms of membership and site locality increased to one fifth in total. Finally, the most populous federal states in Germany host the biggest amount of energy cooperatives (Bavaria, Baden-Württemberg, Niedersachsen and Nordrhein-Westphalia). However, when looking at the numbers of energy cooperatives in relation to the population of the federal states the outcome differs: in this case, Thuringia follows Bavaria as the federal state with the second biggest amount of energy cooperatives (Kahla et al. 2017).

The SIE-field under study is furthermore characterised by an immense range in the size and activity spectrum of energy cooperatives. To better illustrate this range, we selected **two different SIE-initiatives for more in-depth examination**. As first initiative we chose a middle-sized cooperative, namely the initiative Solix Energie<sup>2</sup> with 120 members and several regional activities (see box p.29). In contrast, as second SIE-initiative we selected a very big cooperative, namely Elektrizitätswerke Schönau<sup>3</sup> (EWS) which has a supra-regional activity scope, various business fields and around 9,000 members nationwide. Besides its function as a cooperative EWS is a key actor for the field of energy cooperatives, amongst others e.g. through its supporting measures for single cooperatives, its function as a role-model and its various cooperation with other actors in the field (see box p.31).

Despite their various differences, energy cooperatives tend to share fundamental characteristics regarding their aims and motivations. The overarching main goal is often to contribute to the energy transition by means of active participation of citizens. By financing, constructing and managing renewable energy sites energy cooperatives enable citizens to directly part take in the energy transition. The democratic structures of the cooperative model usually contributes to the participation opportunities for citizens and thereby replaces the previous role of the passive consumer by the active “prosumer” (see Interview DE\_EC\_05). Through the increased participation of citizens energy cooperatives support the democratisation of the energy system. Another common

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<sup>2</sup> Solix Energie: <https://www.solix-energie.de/>

<sup>3</sup> Elektrizitätswerke Schönau <https://www.ews-schoenau.de/>

characteristic among energy cooperatives is their regional orientation and their aspirations to contribute to the regional development through their activities. Those ideational aims often have priority over financial motives (Klagge et al., 2016). A further unifying characteristic of energy cooperatives seems to be their specific application of the cooperative model, which can be described as a social innovation.

As described above, energy cooperatives are not a new phenomenon in Germany. Their purpose as well as their aims however significantly changed since their emergence. In contrast to these older cooperatives, energy cooperatives today aim to introduce an alternative to the already existing goods (electricity) for ideational reasons. According to Klagge et al. (2016), the ideational motivation to participate in the energy transition is a more important aspect for members of energy cooperatives than the payment of revenues (Klagge et al., 2016).

Following up on this, the use of the cooperative model in the field of energy differs significantly from other cooperatives. Usually, the cooperative model is used in the way that members obtain economic advantages through their membership e.g. cheaper goods or cheaper rents. What is specific about cooperatives in general is, that cooperatives are supposed to promote their members economically. The cooperative promotion purpose (“Genossenschaftlicher Förderzweck”) is paramount and not the payment of revenues (Genossenschaften in Deutschland, 2020b). That is different for energy cooperatives. Herein members hand in their capital and obtain financial revenues for their membership instead of material economic advantages (see Interview DE\_EC\_01 and 5).

Another aspect of social innovation are the pioneering activities of energy cooperatives: Energy cooperatives can lead to social innovation in that they have the time to show other market players new business models. While some activities might be too risky for established actors like energy providers, energy cooperatives can be so positively convinced of their ideas that they experiment or look into alternative ways of doing, thinking and organising. Sometimes regardless of the time it takes. One example would be the introduction of the functionality of metres to a conventional energy provider (see Interview DE\_EC\_04). Thus, energy cooperatives are creating SIE's with their activities. This stands in opposition to the statement that many cooperatives suffer from financial and time resources and therewith represents the oppositional perception of energy cooperatives capacities (see further in the box “contestation”).

Klagge et al. 2016 support those findings. The authors describe the innovative part of energy cooperatives today in the way they enable citizens to participate in the energy transition through the participation possibilities in renewable energy sites. Through the engagement of the new extra player

besides conventional energy suppliers the actor constellation of the German energy system changed (Klagge et al., 2016).

An additional aspect of social innovation could be seen in the focus on regionality. Many energy cooperatives and their representatives emphasise the importance of regional development. For the “local energy transition” it is important that the revenues remain in the region, even though that might only be the amount worth “for a visit in a regional restaurant”, it still leads to ties with the regional services and the feeling of connectivity (DE\_EC\_03). This behaviour is socially innovative in that it represents a new way of doing (dealing with) energy in opposition to central energy providers where the profits do not benefit the region and are rather centrally accumulated.

### SIE changing social relations

*In the context of the SONNET project, social innovation in energy (SIE) is defined as a ‘combination of ideas, objects and/or actions that change social relations and involve new ways of doing, thinking and/or organising energy’ (Wittmayer et al. 2020b, p. 4). One identified type of SIE is the ‘cooperative organisational model for renewable energy’. Energy cooperatives and their activities influence social relations in several ways.*

First of all, the introduction of the cooperative model in the renewable energy sector changed the role of citizens in the energy system. The cooperative model enables citizens to actively engage in the energy transition thus not only passively consume energy mostly of the big four or municipal utilities but to participate actively in the generation of energy in various small units (cooperatives) – and thereby become Prosumers (see Interview DE\_EC\_04).

The majority of energy cooperatives used to rely on voluntary work. Since the changed policies complicated the conditions for energy cooperatives they started to professionalise more which might restructure the working conditions and related relationships within energy cooperatives. In addition to that, the establishment of several regional intermediaries as well as national intermediaries changed the relations between single energy cooperatives and representatives of politics, administration and other networks:

*“The noticeability of energy cooperatives changed. Municipalities know what energy cooperatives are, which wasn’t always the case before. Also other actors are more aware of the work energy cooperatives do...” (Interview DE\_EC\_05)*

Therewith the work of intermediaries – regional intermediaries of energy cooperatives as well as national associations - leads to more potential cooperation partners for energy cooperatives and subsequently to an expansion of their social relations. The work of intermediaries also influences the relations between energy cooperatives by strengthening the exchange and relations among cooperatives.

Furthermore, the organisation of the cooperatives and the therewith related participation creates a feeling of togetherness among cooperative members (see Interview DE\_EC\_03). This leads to closer bonds between their members and potentially influences the relationship between members and the cooperative itself (and the therewith represented aims and ideals) as well.

Finally, the expansion of energy cooperatives led to the foundation of several other cooperative forms i.e. community-supported agricultures (“solidarische Landwirtschaften”), mobility associations, village stores or communal living forms who made use of the cooperative organisational model. Energy cooperatives thus influenced the field through their role as trendsetters and changed social relations by the further dispersion of the cooperative model (see Interview DE\_EC\_05).

The specific aims of cooperatives have to be seen against the background of the German energy system. Despite the liberalisation of the electricity market the biggest share of electricity generation capacity is still owned by four big energy providers (from 2009: 80% to 2018: 57%) (Bundesnetzagentur, 2020). In addition to that, even though the share of non-renewable energy sources is continuously decreasing the German electricity mix still consists of 53.9 % non-renewables in 2019 (Fraunhofer ISE, 2020). This seems to serve as a constant motivation for energy cooperatives to further propel the energy transition and to create an independent counter-model to the prevalent energy system (see Interviews DE\_EC\_04, DE\_EC\_05 and DE\_EC\_06).

The rising environmental awareness of the German society<sup>4</sup> and societal trends in favour of a more sustainable lifestyle are additional positive influences for the establishment of the field (see Interview DE\_EC\_05). Those trends led to a heightened curiosity about the resources and mechanisms behind energy production and an increased interest in renewable energies. The general trend among

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<sup>4</sup> The German federal environmental agency conducted a survey about the environmental awareness of the German society every second year. An evaluation of the results showed a weak but continuous increase of the environmental awareness from 1996-2016, despite significant deviations in some years (UBA, 2019).

citizens to self-organise and to get involved in the creation and management of public goods created further momentum for the engagement in energy cooperatives (Debor, 2018).

### Diversity, Contestations and relations between actors

*SONNET is interested in understanding interactions between SIE-field actors and/or other field-actors. These relations can be formal or informal, take different forms (e.g. formal alliances, networks, collaborations) and might differ in their quality (e.g. conflicting, competitive, collaborative or exchange-oriented relations; Wittmayer et al. 2020b, p. 14) as well as in their content (e.g. concentrating on learning, networking, lobbying etc.). Furthermore, field contestations between SIE-field-actors and/ or other field-actors are of interest as they can 'unsettle' the existing 'outside' institutional environment (Hielscher et al. 2020, p.19). Contestations are debates among relevant actors over SIE-field structures and processes such as disagreements about common aims or approaches to lobbying policymakers. Contestations and relations can indicate how institutionalised (or not) the SIE-field is (e.g. are there formal networks).*

#### Diversity

The field of energy cooperatives is characterised by high levels of diversity, with energy cooperatives differing considerably regarding their size, field of activity and geographical scale. Moreover, the diversity is reinforced by the variety of relevant actors for the field ranging from municipalities to research institutes and different federations. Another source of diversity concerns the motivation for EC. While the majority of interviewees has been solely focussed on the ideational motivation, some interviewees of the SIE-field displayed more economical explanations for specific developments. This indicates the heterogenous approaches and views of SIE-field members and could be influential for the further development of the SIE-field under study.

#### Contestations

Contestations in the field of energy cooperatives mainly occur regarding the policies opposed to renewable energies at the national level which restrict energy cooperatives in their procedures as well as regarding opposing views of big utilities. However, the current status of energy cooperatives is perceived differently by SIE-initiative members and their intermediaries. While cooperative members were said to describe themselves as very active despite the changed conditions (for example regarding the two interviewed SIE-initiatives), intermediary organisation

representatives tend to nourish the narrative of the problematic situation cooperatives are in today (see Interviews DE\_EC\_01, DE\_EC\_02, DE\_EC\_03 and DE\_EC\_07). This might be a result of their different positions in the field and resulting point of views on the situation of energy cooperatives or due to their different goals (the more regional orientation of the cooperative vs. the aims of structural changes of the intermediaries).

In addition to contestations around national energy policy, the field is shaped by the ongoing dispute between wind energy opponents and wind energy advocates -among them energy cooperatives and their intermediaries (see Interview DE\_EC\_05).

Other contestations occur between intermediaries and other SIE-field actors regarding the goals of energy cooperatives and the different measures to achieve them. This dispute also reveals a fundamental underlying cause of contestation which is that several SIE- field and other field actors tend to marginalise the effects and potentials of citizen energy. Debates about the right way to achieve hundred per cent renewables or the energy transition, in general, do not only take place within the SIE-field or between the SIE-field and other field actors but also within intermediary organisations.

#### Relations

The field of energy cooperatives is characterised by strong personal ties and cooperation between board members of energy cooperatives, members of intermediary organisations and other relevant organisations. Those personal relations often occur as “Personalunion” meaning that the same person is a member of several boards of relevance for energy cooperatives. Those double roles lead to synergy effects and make it easier to coordinate and shift tasks between important organisations.

*“The ‘Personalunion’ is system immanent! Without that the whole thing wouldn’t work. That also accounts for the boards of cooperatives.” (Interview DE\_EC\_06)*

As cooperative representatives know each other through the participation in the same board or the attendance of the same events they also know with whom they want to cooperate in the future. One interviewee described it precisely as “it all depends on your network” (Interview DE\_EC\_06). Those personal ties do not just exist among the different organisations but can also reach into regional politics. As a result, processes of cooperation are often initially characterised by informal agreements which later lead into formal procedures and agreements.

It appears that another influential characteristic of energy cooperatives is the high commitment of single cooperative board members. The interviews indicate its importance as a prerequisite for

the creation of the intermediary organisations of the field (see Interviews DE\_EC\_03, DE\_EC\_04 and DE\_EC\_08).

Another representative facet of energy cooperatives is the relationship with municipalities. Meister et al. 2020 focussed on the linkages between energy cooperatives and municipalities and emphasised the important role of municipalities for energy cooperatives and vice versa. The numerous cooperation between cooperatives and municipalities are another example of the importance of cooperation for the SIE-field.

*“Municipal utilities are always a good partner.”* (Interview DE\_EC\_08)

Nevertheless, the support of municipalities is not guaranteed automatically and the perception about their role is contested.

*“Municipalities can be an impeding as well as an enabling factor for energy cooperatives.”* (Interview DE\_EC\_05)

Overall, it appears that these high levels of cooperation are not only an individual attribute but a significant characteristic of the SIE-field which shaped its emergence and development.

After an initial lack of energy cooperative specific political representation and following worsened policy conditions for their activities the field of energy cooperatives started to structure itself from 2010 onwards, among others by forming regional intermediaries. In this report we consider organisations and associations which represent the interests of energy cooperatives or fulfil other tasks for energy cooperatives as intermediaries. Regional intermediaries offered energy cooperatives a way to engage in regional politics, cooperate with different actors and represent their interests at the regional level. Of the eight regional intermediaries we could account for in this case study, four were interviewed for further analysis. However, since the regional intermediaries did not fill the gap of the missing national representation of energy cooperatives in national energy politics, and existing industry associations like the federation for renewable energies did not cover the specific needs of energy cooperatives, the field formed additional national intermediaries.

The national intermediaries can be differentiated regarding the field of activities they fulfil for energy cooperatives and in terms of their scope (representation of only energy cooperatives or also other forms of citizen energy). ‘Netzwerk Energiewende Jetzt e.V.’<sup>5</sup> and ‘Bürgerwerke e.G.’<sup>6</sup> both fulfil

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<sup>5</sup> Netzwerk Energiewende Jetzt e.V. – see: <http://www.energiegenossenschaften-gruenden.de/>

<sup>6</sup> Bürgerwerke e.G. – see: <https://buergerwerke.de/>

specific cooperative related tasks in the field of energy cooperatives while the main tasks of the 'section for energy cooperatives at the DGRV (German Cooperative and Raiffeisen Confederation)'<sup>7</sup> and the 'Bündnis Bürgerenergie e.V.'<sup>8</sup> include a focus on the political representation. The two differ in that the section for energy cooperatives at the DGRV only represents the interests of energy cooperatives while the Bündnis Bürgerenergie e.V. represents the interests of citizen energy in general (thus also implies other organisational models than just cooperatives).

The first intermediary on the national level was the 'Netzwerk Energiewende Jetzt e.V.' which was established in 2010 by energy cooperative board members. Besides their versatile supporting measure for energy cooperatives, one of their most influential support measures was the four-month lasting project developer training for energy cooperatives which contributed to the increase of newly founded energy cooperatives (Energiewende Jetzt e.V., 2014).

The establishment of the 'Bürgerwerke' in 2013 as an additional national operating actor demarcated another turning point in the SIE field. Through its function as a cooperative electricity supplier, it allowed energy cooperatives to sell their energy independent of the feed-in tariff and further facilitated the existence of energy cooperatives by offering several services for the field. The activities of the Bürgerwerke thereby additionally illustrate the starting field development towards professionalism. The section for energy cooperatives at the DGRV was also founded in 2013 by the different member federations of the DGRV in Berlin and represents the interests of energy cooperatives in Brussels and Berlin. The second national intermediary based in Berlin 'Bündnis Bürgerenergie e.V.' was founded in 2014 by several regional intermediaries and other actors of the renewable energy field. Besides other activities, it has its focus on the representation of interests for citizen energy in general in Berlin and Brussels. In order to enforce the interests of energy cooperatives 'Bündnis Bürgerenergie e.V.', the DGRV section as well as the 'Netzwerk Energiewende Jetzt e.V.' are in continuous exchange and cooperate regularly. Crucial for the establishment of the field of national intermediaries is furthermore the overlap of the founding members of 'Energiewende Jetzt e.V.' and 'Bürgerwerke e.V.' which also led to the foundation of the organisation 'Bürgerenergie Hoch 3'<sup>9</sup> and will be further elaborated on in chapter five.

For their effective work regional as well as national intermediaries rely on the **cooperation** with each other and relevant organisations in the field of renewable energies and environmental protection.

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<sup>7</sup> DGRV, section for energy cooperatives – see: <https://www.dgrv.de/bundesgeschäftsstelle-energiegenossenschaften/>

<sup>8</sup> Bündnis Bürgerenergie e.V. – see: <https://www.buendnis-buergerenergie.de/>

<sup>9</sup> Bürgerenergie Hoch 3' – see: <https://www.beh3.de/>

Those actors include foundations like the 100% Renewable Foundation (“100 Prozent erneuerbar Stiftung”), research institutes like the German Institute for Economic Research (DIW), federations like the Federation of Cooperatives (“Genossenschaftsverband”), the German Federation for Environment and Nature Conservation (BUND) and various project developers for the implementation of their projects. Other key actors in the field are the two large and professionalised energy cooperatives Greenpeace Energy and Elektrizitätswerke Schönau.

In addition, cooperatives cooperate with municipal utilities, other energy providers, farmers, banks, other cooperatives and municipalities (Klagge et al., 2016). The importance of municipality support for energy cooperatives is also shown by Meister et al. 2020, particularly regarding the provision of roof space, land, and help in the planning and permit procedure. As initially described cooperation partners are crucial for the development of the SIE-field under study, since they enable energy cooperatives to assemble their projects.

## 4 Timeline of cooperative organisational models for renewable energy in Germany

Figure 1 shows a visualisation of the innovation timeline of the field 'cooperative organisational models for renewable energy in Germany'. The timeline runs from 1998 till 2020 and is divided into four phases. For each of these, we differentiate developments on the following six levels:

- The top-level shows the main societal trends in Germany of relevance to the SIE field, such as a trend towards citizen participation or the youth climate movement.
- Thereafter, the relevant policy developments at the European level are depicted, followed by the relevant energy policy developments within German energy policy.
- This is followed by the fourth level displaying the development of intermediary organisations within the field operating on the national level.
- The fifth level shows the development of regional intermediaries and regional cooperative electricity suppliers. Finally, the lowest level illustrates the amount of newly founded energy cooperatives per year.

Additionally, the yellow arrows in the top layer of the visualisation represent the different phases of the timeline:

- I) policy foundations for the establishment of the field (1998-2006)
- II) boom phase of energy cooperatives and first structuration processes (2007-2011)
- III) successive abolishment of policy support and institutionalisation processes of the field (2012-2016) and
- IV) continuous stagnation of foundations of energy cooperatives and the further diversification of business models (2017-2020)

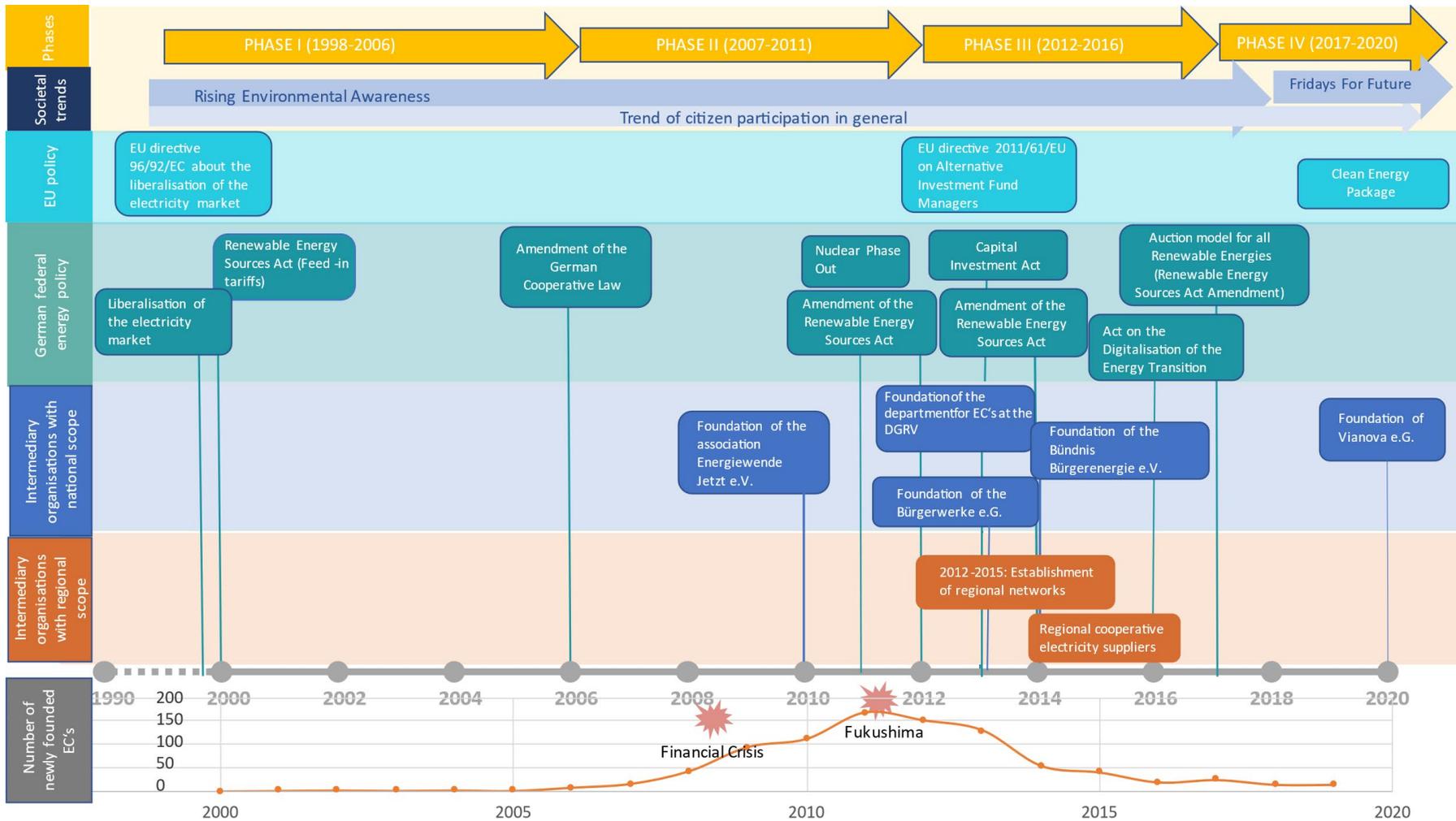


Figure 1 Visualisation of the innovation timeline

\*DGRV: German Cooperative and Raiffeisen Confederation

## 5 Emergence and development of cooperative organisational models for renewable energy in Germany over time

What follows is a description of the innovation history of the SIE-field cooperative organisational models for renewable energy in Germany. It is structured into four phases which are described in detail below:

- I) Policy foundations for the establishment of the field (1998-2006),
- II) Boom phase of energy cooperatives and first structuration processes (2007-2011),
- III) Successive abolishment of policy support and institutionalisation processes of the field (2012-2016) and
- IV) Continuous stagnation of foundations of energy cooperatives and the further diversification of business models (2017-2020)

### Phase I) 1998-2006: Policy foundations for the establishment of the field

The foundations for the field of energy cooperatives in Germany since 2000 were set with the liberalisation of the German electricity market in 1998. Therewith Germany complied with the regulations of the 1996 EU directive about the liberalisation of the electricity market.

Consequentially this changed the organization of the German electricity market significantly: It caused the separation of distribution and grid operation (unbundling) and guaranteed open grid access. In addition to that, it induced the abolition of area monopolies and thereby led to a diversity of energy providers (Meister et al., 2020). The previously regional monopolies were replaced with a system in which several market players were able to enter the market and thus also included smaller players like energy cooperatives. What helped smaller players enter the market was the rising environmental awareness of the German society (DE\_EC\_03), which led to an increased interest in renewable energies and consequentially ways to engage with them e.g. through citizen initiatives.

#### Policies and policy making

*One important cross-cutting theme addressed in SONNET is the socio-political aspect and the conditions of social innovation in energy. This case study, therefore, aims for identifying important policy events and policy-making processes (Wittmayer et al. 2020b, p. 43). This includes asking about broader political debates, the role of different government levels involved,*

*particular policy strategies and instruments used and how they enable or impede the development of SIEs. In highlighting such issues, we are in particular interested in identifying enabling or impeding socio-political issues and how they influence social innovation processes.*

The developments of the SIE-field under study are strongly tied to the German policies around the energy transition in general and renewable energies in particular. That is, policies of paramount relevance are implemented on the national level, but are often the result of previously adopted European policies. In contrast, regional policies do not feature in the list of the most influential policies for cooperative organisational models for renewable energies in Germany, as can be seen in the table below. Of the various EEG amendments only the ones most relevant for the field development are mentioned.

<b>1996, 1998</b>	Liberalisation of the German electricity market based on EU regulation	EU DIR 96/92/EG, BGBl. I 1998 S.730
<b>2000</b>	Renewable Energy Sources Act (EEG): introduction of technology-specific feed-in-tariffs guaranteed for 20 years, unbundling, priority grid access for renewables	BGBl. 2000. I 13 S. 305-309
<b>2002</b>	Agreement about the nuclear phase-out till 2022	BGBl. I 2002 S.1351
<b>2006</b>	Amendment of the German Cooperative Law (facilitated conditions for the establishment of new cooperatives, administrative relief and lightened conditions for capital procurement for cooperatives)	BGBl. I 2006 S. 2230
<b>2007</b>	German climate and energy policy package (greenhouse gas reduction 40% compared to the levels of 1990)	Energie- und Klimaprogramm (BMU 2007)
<b>2010</b>	Energy concept ("Energiekonzept") of the German government (targets for renewable energy development, energy efficiency and climate protection for 2020, but nuclear phase-out postponed to 2036)	Energiekonzept 2010 (BMWI 2010)
<b>2011</b>	Nuclear phase-out law (announcement to close all German nuclear power plants by December 2022)	BGBl. 2011 I 43 S. 1704-1705
<b>2011</b>	Revised energy concept ("political road map for energy")	(BMWI 2011)
<b>2011</b>	EU directive 2011/61/EU on Alternative Investment Fund Managers (Resulting introduction of the Capital Investment Act (2013) led to uncertainty for energy cooperatives)	EU DIR 2011/61/EU
<b>2012</b>	EEG Amendment (i.a reduction of feed-in tariffs)	BGBl. I 2012 S. 1754
<b>2013</b>	EU commission: treaty violation proceedings against Germany's feed-in tariffs	
<b>2013</b>	German Capital Investment Act (Kapitalanlagengesetzbuch, CIA)	BGBl. I S. 1981

<b>2014</b>	REA Amendment (introduction of tender procedures for photovoltaics, as a replacement for the secured feed-in tariffs, further amendments of the feed-in tariff)	BGBl. I 2014 S. 1066
<b>2015</b>	Updates on the energy road map from 2011	
<b>2016</b>	Energy Transition Digitisation Act (Introduction of smart metering)	BGBl. 2016 I 43 S. 2034-2064
<b>2017</b>	EEG Amendment: introducing tender procedures for all renewable energies ( exceptions e.g. for photovoltaic and wind energy systems with an installed capacity below 750kW and biomass systems below 150 kW .	BGBl. I 2016 S. 2258
<b>2019</b>	Clean energy package (EU): Citizen energy (energy communities) is clearly defined and its importance acknowledged; obligation to implement policies till 2021)	European Commission 2019

The most important policies which had a crucial effect on energy cooperatives were the introduction and some of the various amendments of the Renewable Energy Sources Act (EEG). The favourable conditions which came in effect with the introduction of the EEG in 2000 (particularly the guaranteed feed-in tariffs and therewith a relatively secure investment opportunity for energy cooperatives) led to a vast increase of newly founded energy cooperatives. The favourable conditions were further enhanced by the amendment of the German Cooperative law in 2006 which facilitated the conditions to initiate cooperatives in general.

The amendments of the Renewable Energy Sources Act in 2012 and 2014, partly in response to significantly reduced technology costs, led to the successive decrease of feed-in tariffs, in particular for solar PV. As the majority of energy cooperatives largely relied on a business model comprising these feed-in tariffs, the amendments had a significant influence on the foundation of new cooperatives (Herbes et al., 2017), since reductions overcompensated for reduced technology costs. Finally, the EEG amendment of 2017 implemented an auction model for all renewable energies to replace the hitherto existing feed-in tariff model. Those changes complicated the already hardened conditions for the SIE-field (e.g. through the restrictions on plant sizes, the regulation about own consumption, or the breathing lid). In the following years, the number of newly established energy cooperatives decreased.

Another crucial policy change was the introduction of the EU directive 2011/61/EU on Alternative Investment Fund Managers which subsequently led to the implementation of the German Capital Investment Act. However, till 2015 it remained unclear whether energy cooperatives would be included or not. This sense of uncertainty got amplified by the ongoing discussions of the German government about the potential retrospective adaptations of the feed-in tariffs and

the postponed EEG reform (till a new government was formed) in 2013 (Rogge and Schleich, 2018).

The EEG is embedded into a broader energy transition policy mix in Germany which is also characterised by the nuclear phase-out, among other policies (other policies not explicitly listed here but also influential for the SIE-field are policies about the energy economy in general, some of which are further elaborated upon in the “outside institution” box). Together, this policy mix influences the general conditions for renewable energies and thereby impacts the field of energy cooperatives as well. For example, Meister et al. 2018 describe the German nuclear phase-out policy as one of the key drivers for the development of energy cooperatives in addition to the liberalisation of the electricity market and the introduction of the EEG.

The amendment of the EEG with its switch to auctioning, as well as the “Mieterstromgesetz”, can be seen as further examples of the importance of regulative institutions for the development of energy cooperatives. The “Mieterstromgesetz” in particular illustrates that even new business models can easily get restricted again which can lead to ongoing adaptation processes. Arguably, therefore, such policy and institutional changes provide strong reasons for SIE actors to further engage in energy policy-making processes.

Finally, the clean energy package of the European Union from the year 2019 raised the hope of energy cooperative representatives that the importance of citizen energy will finally be acknowledged. Since it specifically addresses the importance of citizen energy and energy communities and has to be implemented at the national level in 2021 it could introduce another positive development phase for energy cooperatives. The empirical findings at hand thus show the dependency of the SIE-field on national policies, and that these have acted as an enabling as well as impeding factor for the emergence and development of the field. (German national policies are often driven by preceding EU regulations which is demonstrated by the liberalisation of the German electricity market (based on EU DIR 96/02/EC) or the introduction of the capital investment act (based on EU DIR 2011/61/EU). The treaty violation proceedings against the German feed-in tariffs by the European commission further illustrate the influence of the European Union on national policies.

A fundamental step in the first phase was the implementation of the Renewable Energy Sources Act (Erneuerbare-Energien-Gesetz -EEG) in 2000, a measure by the German coalitions government (social democrats and green party) to promote renewable energies. The most important features of the act were the introduction of feed-in tariffs, priority grid access for renewable energies and the Renewable Energy Sources Act (EEG) surcharge. The technology-specific feed-in tariffs are a

payment for renewable electricity producers per kilowatt-hour (kWh) and were guaranteed for 20 years, thereby leading to investment security and the entry of smaller players into the electricity market.<sup>10</sup> The priority of the grid access guarantees electricity from renewable energy sources, such as wind, solar or biomass, the access to the grid and prioritizes these renewable energies ahead of conventional power. Finally, the EEG-surcharge was implemented to finance the feed-in tariffs. This surcharge is paid by all electricity consumers, but exceptions exist for electricity-intensive industries and renewable energy operators who consume their own electricity. The surcharge depends on the wholesale market price for electricity, implying that the reduction of electricity prices due to the merit order effect arising from greater shares of renewables leads to a higher surcharge (Appun, 2014). Of all these changes, the introduction of the guaranteed feed-in tariffs was crucial for the development of energy cooperatives, as it allowed them to build up their main business model based on the remuneration of the feed-in tariffs.

The second prerequisite for the establishment of the SIE-field under study are the changes subsequent to the amendment of the German Cooperative Law in 2006 (BGBl. I 2006 S.1911, Klagge and Meister, 2018). Among others, those amendments included a reduction of members necessary for the foundation of a cooperative and the necessity of only one board member for small cooperatives (<20). In addition to that, smaller cooperatives (financial statement < 1 million) were released of audits at the end of the year thus leading to enabling conditions for the establishment of new cooperatives and administrative relief for smaller cooperatives. In addition to that, the amendments of the cooperative law lightened the conditions for capital procurement for cooperatives. More precisely, it allowed the formation of non-cash capital contributions and - of particular importance for energy cooperatives - the admission of members that joined the cooperative as 'investing members'. Investing members are members of the cooperative without making use of their services and goods, thereby contributing to broadening the opportunities for cooperatives to generate proprietary capital (Genossenschaften in Deutschland e, 2020). Those changes led to a better capital endowment for energy cooperatives and made it more attractive for individuals to invest and thereby contribute to the energy transition in a bottom-up manner (Deutscher Bundestag, 2013; Volz, 2012). Those two fundamental policy changes were described by all interviewees of this study as indispensable enabling conditions for the successive increase of newly founded energy cooperatives in the following years. Klagge and Meister (2018) support those findings

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<sup>10</sup> Larger players / technologies were initially exempt from this regulation, including, among others systems with electricity generated by hydro-electric power plants, systems powered by gas from landfill and sewage systems with a capacity larger than five megawatts, or biomass installations with an installed capacity larger than 20 megawatts.

by referring to those policy changes as the main reasons for the immense increase of energy cooperatives since 2006. Indeed, before 2006 only very few cooperatives were newly established (one till four per year) indicating the importance of the amendment of the cooperative act for the further evolvement of the field.

### 'Outside' institutional environment shaping the development of the SIE-field

*SONNET aims to explore the interactions and relations between actors working on a SIE and the broader institutional context in which the SIE is nested in (Wittmayer et al. 2020b, p. 7). An empirical focus lies on the development of SIE-fields. Following Fligstein and Adam's field definition (Fligstein and McAdam 2011), an SIE-field within the SONNET project is understood as 'an arena/space that includes a specific SIE as well as SIE-field-actors working on it and other field-actors enabling and/or impeding it. In this space these actors take one another and their actions into account and have a shared (but not necessarily consensual) understanding of a SIE and of their relationship to other actors. They recognise (but not necessarily follow) shared norms, beliefs and rules. SIE-fields are often not homogenous but are composed of actors with diverse and contradictory aims and interests' (Hielscher et al. 2020, p. 17)*

*While the field is constituted by SIE-actors and field-actors activities, it is also influenced by the outside institutional environment, which can interact, shape, enable or impede the development of the SIE. The institutional environment is thereby constituted by formal as well as informal institutions (Hielscher et al. 2020, p.19). 'The SIE-field itself constitutes an environment (= SIE-field institutional environment) but also is nested with the larger encompassing institutional environment (= outside institutional environment). The SIE-field and its institutional environment consist of institutions and actors who interact with each other. The 'outside' institutional environment consists of institutions that can 'penetrate' (i.e. shape/influence/interact with) the SIE-field.'*

#### The electricity market

In the German case, energy cooperatives are embedded in the German energy system which has major implications for the development of the field. The liberalisation of the electricity market in 1998 led to the separation of distribution and grid operation (unbundling), the abolition of area monopolies, free grid access, free choice of energy providers for citizens and a rising diversity of energy providers (Meister et al., 2020). Those conditions were fundamental for energy cooperatives as they enabled them to enter the electricity market. Today more than 1,000 energy providers constitute the German electricity market. Even though the four big electricity

providers still have the majority of the market, their share is constantly decreasing (from 2009: 80% to 2018: 57%) (Bundesnetzagentur, 2020).

Besides that, the developments of the energy industry act (Energiewirtschaftsgesetz, EnWG) were of importance for the development of energy cooperatives involved in grid operation and energy distribution (not for photovoltaic or wind cooperatives since it did not affect their operational work to the same extent). Changes in the energy industry act typically lead to changed processes for energy cooperatives. Another example would be the metering point operation law (Messstellenbetriebsgesetz, MsbG) implemented through the digitalisation of the energy transition law in 2016 (Gesetz zur Digitalisierung der Energiewende, GDEW). Another influential factor is the price trading mechanisms at the energy spot market. Those mechanisms impact the perception of renewable energies since the price for electricity (which through the merit order effect goes down with higher shares of renewables) determines the amount of the EEG-surcharge. Ironically, this reduction in electricity prices through renewables leads to higher EEG-surcharges which in turn leads to more negative perceptions of renewable energies as “expensive for everyone” (Interview DE\_EC\_05), and thus also influences the perception of energy cooperatives.

#### Influence of the financial market

Another influential outside institutional condition is the development of the financial market. Since the interest rates are currently (2020) very low, in comparison to bank savings it is often more attractive to invest in an energy cooperative where investors get at least a small revenue for their investment. That development made it easier for cooperatives to collect money (see Interview DE\_EC\_03). Interestingly, the financial crisis is seen as an enabling factor due to the low interest rate and higher interests for the cooperative shares. That is in contrast to the usually mentioned ideational motivation to engage in energy cooperatives.

#### Germany's federal structure and the special role of municipalities

The organisation of the state as a federal state plays a crucial role for the development of energy cooperatives in Germany. Even though the majority of energy policy is decided on the national level the federal states have means to influence the conditions of energy cooperatives as well. One example is the very strict rule about the distances between wind energy plants and residential houses (“10 H Abstandsregel”) which hinders further wind-energy plans in Bavaria (Bavarian building law, GVBI 2014, S. 478). It stipulates a minimal distance between wind energy plants and residential buildings of 10 times the height of the wind energy plant itself. This measure leaves almost no areas in Bavaria for the installation of wind energy plants. Nevertheless, municipalities can allow exceptions. Another example is that federal ministries of the federal

states have the power to support the regional energy cooperative networks financially, which enables them to hire professional staff. A third example is that the federal state structure allows for municipalities to play an important role for energy cooperatives. According to their status as a municipality, they have the freedom and ability to cooperate with energy cooperatives or to become a member of them.

The following interview quotations summarize the importance of municipalities for the activities of energy cooperatives and thereby their crucial role for the development of the field.

*“It is important that the City Councillor is in favour of what the cooperative is doing. If the City Councillor is against you, you have no chance.”* (interview DE\_EC\_06)

*“You cannot install the best technique if you don’t have political approval. It is dependent on the municipality and the political board [...] if you can build something or not it doesn’t matter if it is photovoltaics or wind... it is dependent on the municipal policy... If there is someone who wants it you can do it and if not you will starve.”* (Interview DE\_EC\_08)

## **Phase II) 2007-2011: Boom phase of energy cooperatives and first structuration processes**

During this phase, the number of newly founded energy cooperatives increased enormously. The security of their investment guaranteed by the feed-in tariffs for 20 years and the facilitated conditions for cooperatives led to a boom of newly established energy cooperatives. Starting from only 16 energy cooperatives in 2007 the number grew up to 167 energy cooperatives in 2011 – until today this is the biggest increase of newly founded energy cooperatives (DGRV, 2020). In addition, energy cooperatives did not only grow in terms of their total number, but also in terms of their membership and investment capital, as shown by analysis conducted for the period 2010-2013 (Klagge et al., 2016). This increase in number, membership and capital equipped energy cooperatives with the capacity to further invest into new projects.

Interestingly the international financial crisis supported this development, as it led to decreasing interest rates and thus made the acquisition of cooperative shares more attractive.

*“You can also see it today that the interest levels at the market are effectively zero. To collect capital is no problem at the moment... Banks are currently not a competitor because one gets so little interest rates. With your cooperative, you offer at least a dividend of 2-3 %...”* (Interview DE\_EC\_03)

These developments constituted another incentive to participate in an energy cooperative. Consequentially the engagement of new members led to the further growth of energy cooperatives. Another effect of the financial crisis was the higher intactness of cooperative banks compared to other banks which led to an even better reputation of the cooperative model (DE\_EC\_04) and thereby the positive image of energy cooperatives. In the same way, cooperative banks could further proceed in cooperating with energy cooperatives and with their work as an important initiating actor for the establishment of new energy cooperatives (Volz, 2012; Klagge and Meister, 2018). These developments additionally contributed to the continuous increase of newly founded energy cooperatives in that period.

#### Example 1: SOLIX ENERGIE cooperative

Solix Energie<sup>11</sup> represents one of the smaller energy cooperatives in Germany. The cooperative started with nine founding members in 2011 and today counts about 120 members (not exclusively from their region) and possesses an investment capacity of 1.2 million euro.

The foundation process of the cooperative illustrates the influence of other field developments at the time. The cooperative was founded after the participation of five of their founders in a training by the network “Energiewende Jetzt e.V.”. According to the founding member, the workshop introduced them to strategies and practical insights about how to establish an energy cooperative. Before the foundation of the cooperative five of the founding members already worked together on renewable energies in the organisational form of a partnership under the Civil Code (GbR). Their decision to change the legal form was mainly driven by the fact that the legal form of a cooperative enabled members to participate equally and to include new members easily. As stated by the founding members it additionally offered them the opportunity to support their members and to be independent in their decisions about the dividends (which can be seen as an emphasis on the democratic and solidarity principle). The foundation of the cooperative was furthermore mainly driven by the aim to become an active part of the decentral energy transition and to keep the generated revenues in the region.

The organisation of work as well as the relation to other actors represents typical characteristics of energy cooperatives in Germany. Everyone engaged in the cooperative is working voluntarily, as it is the case for the majority of energy cooperatives (Klagge and Meister, 2018). Solix Energie has very strong ties with local municipalities as well as the association of municipalities with

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<sup>11</sup> See: <https://www.solix-energie.de/>

whom they cooperate to implement their projects. Another characteristic - which is very frequent in the field of energy cooperatives as well - is the "Personalunion", meaning that members of the board of Solix Energie are also board members of other relevant organisations for the field: like many other energy cooperatives Solix Energie is a member of several regional and national federations but not actively participating in them (i.a. for financial reasons, since their voluntary working board members do not have the time capacities for it). Nevertheless, Solix Energie emphasises the importance of the work of those supra-regional organisations, even though they are not able to solve all obstacles Solix Energie is facing at the regional level. For that reason, Solix Energie rather focuses on necessary actors in their region to operate their projects. Thus, the majority of cooperation takes place with regional actors with whom they plan projects together. Besides that, contact with other organisations takes place through events. This is also the place where Solix Energie represents how they are dealing with their current projects and therewith influences other actors. The importance of events for collaboration processes of cooperatives and related actors has been also stated by several other interviewees. *"It all depends on your network"*. (Interview DE\_EC\_01)

Due to the policy changes on the national level the cooperative had to broaden its business model. Solix Energie started with a business model based on photovoltaics in cooperation with the community (on four community buildings roofs). As a reaction to the EEG amendments of 2012 and 2014 and the resulting decreased remunerations for their prospective generated electricity, Solix Energie adapted their business model and built their first wind energy plant in 2016. In addition to that, the cooperative launched its first electric car in 2019.

Solix Energie is therewith a good example of an initiative whose foundation was directly influenced by other field-members (workshop participation) and a diversification process (their adaptation of the business model with the wind wheel 2016 in response to previous policy changes) – two significant current change processes in the field of cooperative organisational models in Germany. In addition to that, the wind wheel is built on the ground of the municipality to guarantee that the rent Solix Energie has to pay remains in the region. With that the establishment of the wind wheel serves as a good example of the cooperation patterns between energy cooperatives and local municipalities and the implementation of their ideational goal to support their region.

## Example 2: Elektrizitätswerke Schönau (EWS)

EWS<sup>12</sup> represents one of the very big energy cooperatives in Germany. As of 2020, the cooperative counts 9,000 members and employs about 200 permanent staff within the cooperative and their subsidiaries.

EWS has its roots in an anti-nuclear citizen initiative. After the reactor catastrophe of Tschernobyl in 1986 the initiative strove for climate-friendly energy supply without nuclear energy. The activities of the initiative led to the foundation of the EWS limited liability company owned by the 'Netzkauf Schönau partnership under the civil code' which involved 650 citizens. In 1997 EWS became the green electricity energy provider in Schönau and started to offer their green electricity nationwide after the liberalisation of the German electricity market in 1998.

The transformation of the partnership under the civil code into a cooperative took place in 2009. According to EWS, the cooperative model facilitated the admission of members, enabled the participation of each member and guaranteed independence from other actors (since one member cannot accumulate several shares). In addition to that, the cooperative model was chosen to "equip the EWS for the future and to bring up additional capital for their growth, increase of employees and new activities." (EWS, 2020) This is in accordance with the in the box "diversity, contestations and relations between actors" described twofold line of reasoning for the selection of the cooperative mode: on the one hand for practical and economic reasons on the other hand to implement the ideal of citizen participation.

According to EWS, their main aim is to enable citizen participation in energy distribution and production. To achieve that, the cooperative sourced out all operating activities and is holding the shares of its associated operative companies. Those limited liability companies are involved in the sectors of photovoltaics, wind parks, hydro energy, heat networks, biogas and electricity marketing. Thus, the cooperative itself has no end-customer but is responsible for the controlling, personal- and billing management of its subsidiaries.

When compared to the first example the EWS example highlights the great variety of energy cooperatives in Germany. On the one hand through its different fields of activity which represent the activity fields of German cooperatives, on the other hand through its size, organisational structure and history. It furthermore reveals the importance of existing previous citizen organisations engaged in renewable energies for the establishment of the new energy cooperatives. Interestingly also EWS previously existed in the organisational form of a 'partnership under the civil code' (as well as Solix Energy) and changed its organisational model after the amendment of the German cooperative law (2006), indicating the importance of the

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<sup>12</sup> See: <https://www.ews-schoenau.de/>

German cooperative law amendments for the development of the field. Besides that, the EWS can be seen as an example of successful professionalisation processes.

Even though EWS is not a representative example of an “average” energy cooperative in Germany it has an important role for the field of energy cooperatives since it possesses the resources to support single cooperatives and other relevant actors in the field. In addition to that they serve as a role model for energy cooperatives and citizen participation in the renewable energy sector in general. Moreover, they encourage and support citizens to start their own energy production, thereby manifesting their aim to enable citizens to become producer of their energy.

Another characteristic of this phase (and the following phases) is the general trend among citizens in Germany to self-organise and to get involved in the creation and management of public goods (Debor, 2018). Maron and Maron (2012) furthermore classify the increase of energy cooperatives as a part of the general new foundation boom of citizen-led initiatives concerning infrastructure. This trend is also illustrated by other societal developments in Germany, like the foundation of a citizen-led initiative in reaction to a disputed city construction project in a major German city (“Stuttgart 21”).

The aftermath of the Fukushima catastrophe in 2011 was recognisable in the field of energy cooperatives as well. The following policies about the reinstated nuclear phase-out by 2022 and the immediate shutdown of the seven oldest German nuclear sites led to an increase in customers for energy cooperatives involved in the distribution of electricity (see InterviewDE\_EC\_03).

An important evolving actor of that period is the association “Energiewende Jetzt e.V.” founded in 2010 by members of already existing cooperatives and prospective board members of national organisations for energy cooperatives. The previously described importance of personal ties in the SIE-field under study is illustrated by a phrase of the founding members of the association: “

*“The form of coordination at the moment is ‘Personenidentität’ (the same person for different roles) and the shared offices in Heidelberg. [...] someone who is an employee at „Bürgerwerke“ is at the same time board member of the association Energiewende Jetzt e.V. and they arrange things with each other.”* (Interview DE\_EC\_03)

The main goals of the association are to support energy cooperatives in terms of foundations and enhancements, to help with the development of new business models or entry into sectors other than only related to energy generation (e.g. via electric cars), to support their competencies and to increase the cooperation and networking between actors in citizen energy. One of their main tasks

with a considerable influence on the field is the four-month lasting training to become a project developer for energy cooperatives. Therein participants learn how to initiate energy cooperatives and to support them in their foundation processes. The project developers trained till 2014 founded more than 40 energy cooperatives, one of them Solix Energie (Energiewende Jetzt e.V., 2015). In addition to that, the association offers workshops and conferences, network meetings, practical examples of new business models as well as regular news via their newsletter and social media channels.

The association therewith functions as an important information and exchange platform for energy cooperatives at that time and enabled them to benefit from already made experiences of other energy cooperatives nationwide. The significance of their workshops for the establishment of new cooperatives was stated by interviewee number 1.

“The training was very important and contributed a lot to the expansion of energy cooperatives around that time.” (DE\_EC\_01)

The association thereby created a way to directly disperse already proven knowledge and contributed to the increase of newly established energy cooperatives. Moreover, the constant work of the association set the foundations for continuous networking processes and the further structuration of the field.

### **Phase III) 2012-2016: Successive abolishment of policy support and institutionalisation processes of the field**

After the boom phase between 2006 and 2012, the field of energy cooperatives experienced worsened conditions due to the decreasing support of policies for renewables and a resulting decline of newly founded cooperatives. As a reaction, the SIE-field actors established new organisations and changed their business models.

#### **Policy Changes**

This period is characterised by the successive weakening of the previously implemented policy support measurements for renewable energies by the conservative-liberal coalition in 2012 and by the ‘grand coalition’ (christian democratic party and social democratic party) in 2014. Two policy changes, in particular hindered the further expansion of energy cooperatives. It started with the amendments of the EEG in 2012 and 2014, which were largely driven by the aim to reduce the costs of the subsidies, the expansion of renewables, spiked photovoltaic installations and the dispute with

the European commission whether the feed-in tariff model was compliant with the European abatement law (Hoppmann et al., 2014; Gawel and Lehmann, 2014). The amendments led to decreasing feed-in tariffs, the introduction of the breathing lid (till the amendment 2014 optional) direct marketing of renewable energy a pilot for the auction model (to be tested for free field solar PV) (Leiren and Reimer, 2018). As a consequence, the risks for energy cooperatives as investors of renewable energy sites increased (Engerer, 2014). The largest part of energy cooperatives in Germany were built around photovoltaic systems next to wind and other technologies. The generation of electricity through photovoltaics fed into the public network, and the therefore obtained remuneration for the feed-in tariffs constituted their main business model. In 2014 the revenues of almost 80% of all regional energy cooperatives and more than 80% of the supra-regional energy cooperatives depended on the feed-in tariff policy (Herbes et al., 2017). Thus, the decrease in feed-in tariffs made new investments to implement their mostly used business model not profitable anymore. Subsequently, the number of newly founded energy cooperatives dropped tremendously from 2012 onwards from 150 new foundations in 2012 to only 54 new foundations in 2014 (DGRV, see fig.1).

Another negative outcome of the EEG amendments for energy cooperatives are the rules for the EEG-surcharge. Since the amendment of 2014 the EEG-surcharge has to be paid for own consumption as well (Klagge et al., 2016). To get exempted from the surcharge the operator of the site and the consumer of the energy have to be the same and only one person. Since this does not apply to energy cooperatives they have to pay the EEG-surcharge. In addition to that the size of installations energy cooperatives target does not fall under the exemption clause. This mechanism additionally indicates the observed power imbalance between energy cooperatives and energy-intensive industries since they are exempted from the EEG-surcharge (see Interview DE\_EC\_05).

#### Power and power relations (power to + power over + power with)

*Shifting power relations is often considered as an important aspect, which defines social innovation processes (Wittmayer et al. 2020b, p. 47). The term 'power' thereby refers to actors capacities to mobilise resources and institutions (Avelino 2017). In the context of this case study, we aim to analyse which power relations are enabling or impeding SIEs and how they do so (Wittmayer et al. 2020b, p. 48). It is important to distinguish between different types of power. Actors might have power to e.g. to do certain things and push their interests (e.g. political power, economic power, innovative power), power over others or power with other to achieve collective goals (Wittmayer et al. 2020b, p. 48).*

### Power over

In the case of energy cooperatives in Germany, one aspect of the 'power over' concept might be the influence of big energy suppliers. According to the interviewees, big energy suppliers are more able to focus on lobbying due to their financial resources. They could thereby influence politics to a larger extent than the representatives of energy cooperatives. Furthermore, they could invest more in advertisement and thereby gain attention in the general population which might possibly help them to maintain the status quo. This power dynamic is perceived as an impeding factor by energy cooperatives.

*"We aim to always find new business models and to develop them before politicians sense that as a threat for the bigger companies and try to stop those developments"*  
(Interview DE\_EC\_06)

Another narrative energy cooperatives emphasise is the power of German politics and their ability to restrict new business models and the expansion of renewable energy in general, thus representing their influence on ('power over') the activities of energy cooperatives. The perception of being less powerful than others is reinforced by the resource problems of energy cooperatives. Restricted time and financial resources of their voluntarily working staff result in fewer investments in PR and lobbying compared to other actors. Energy cooperatives awareness of power imbalances regarding national energy policy is accompanied by the awareness of worldwide energy-related power relations resulting in the aim to become independent of the gas and oil import of not democratic countries.

An important source of power for energy cooperatives is their knowledge. Through the joint expert knowledge of their members and the accumulated knowledge through the representation and participation of members in several federations and related organisations, energy cooperatives and their intermediary organisations possess a great amount of theoretical as well as practical knowledge. Those knowledge resources enable them to generate new ideas, new business models and to profoundly evaluate the effect of regulatory influences. It became clear that some organisations/cooperatives/intermediaries have an advantage over others through their multifaceted representation in several federations, engagement in politics and membership in regional intermediaries at the same time. This results in power differences between different energy cooperatives and illustrates the 'power over' as well as the 'power to' types.

*"[...] we wouldn't know that it is this legal reason, if we wouldn't be in this constellation of actors, you can't compare that to a normal energy cooperative."* (Interview DE\_EC\_08)

### Power with

The establishment of intermediaries led to a change of power relations in the field of energy cooperatives. Through their bundled representation by federal-state networks or nationwide acting intermediaries, they could represent the interests of energy cooperatives and reach a wider audience, which illustrates the 'power with' characteristic.

*"[...] they don't listen to me because I'm Mr... they listen to me because I am the board member of the federal state network for energy cooperatives." (Interview DE\_EC\_08)*

Another aspect of the power with characteristic is the financial support of the federal states for the regional intermediaries (e.g. in Bavaria, Rhineland-Palatinate, Hesse and Thuringia). Furthermore, the representation of energy cooperatives on the European level by the national intermediaries as well as the cooperation between national intermediaries and the European federation for energy cooperatives (REScoop) constitutes an additional facet of the 'power with' aspect.

### Power to and further power relations

Intermediaries furthermore function as an instrument to gain knowledge. Due to their access to different actor groups, the knowledge of their multifunctional board members and their widespread representation of board members in a variety of different organisations and federation they are able to accumulate and harness a variety of knowledge. Intermediaries also support the cooperation between several single energy cooperatives leading to bigger projects and therewith a bigger scope of the participation sphere of energy cooperatives. In addition to that, the establishment of intermediaries reinforces the ability of energy cooperatives to influence others through their work. Either by serving as an example of successful citizen energy or by sharing information and their point of views at several events in and outside of their field, thus serving as an example of power to and power with (Interview DE\_EC\_01).

Another facet of power imbalances might be the membership constellation in energy cooperatives. So far is very unevenly distributed between male and female as well as between highly educated (in terms of a university degree) members and members without a higher education degree. The majority of energy cooperative members as well as their representatives are male and highly educated. This could be an indication of conscious or unconscious selection criteria or hurdles for new members and thereby represent another power imbalance.

The investment insecurity for energy cooperatives got amplified by the discussions about the German Capital Investment Act (CIA). The CIA was adopted in 2013 and introduced regulations for

organisations involved in the management and collection of capital. It was uncertain whether energy cooperatives would also be affected by them or not and consequentially led to a stagnation of new investments and less frequent new foundations of energy cooperatives. Another consequence was the reduced investment in projects energy cooperatives could not operate themselves; leaving many financial resources of energy cooperatives open (investment backlog) (Herbes et al., 2017).

The act on the digitalisation of the energy transition further contributed to the already difficult conditions for energy cooperatives. The therein included “Messstellenbetriebsgesetz” stipulated the clear separation of grid operation and energy distribution, and thus made two companies necessary instead of one. Those changes impacted the work of energy cooperatives who are involved in the grid operation (Interview DE\_EC\_02).

It was also during this phase that the developments of the solar industry sector had a non-neglectable influence on energy cooperatives. The decrease of the costs for photovoltaic technology and the thereby increased margins for solar installations plus further policy support (such as the provision of low-interest loans by the 100,000 roofs programme), led to a spike in photovoltaic installations (in 2003 the 15-fold installed capacity compared to the amount from 1999) (Hoppmann et al., 2014). As the annual reduction of feed-in tariff remuneration (of 5 % p.a.) did not compensate the continuously decreasing technology costs the margins for photovoltaic installations peaked while the costs for all electricity consumers (through the EEG-surcharge) increased significantly, too. At that point, the German government interfered and started to decrease feed-in tariffs from 2009 onwards, starting with the replacement of the 5% depression of feed-in tariffs per year by a dynamic depression (Hoppmann et al.2014). Some interviewees argued that these decreases in feed-in tariffs were outweighing these technology cost reductions:

*“The price shock of the photovoltaic sector... you can say that the module prices for photovoltaics did not get lowered as much as the feed-in tariff got reduced... there was a miscalculation for a time...”* (Interview DE\_EC\_06)

According to one interviewee, the decreased feed-in tariff calculations did not take into account the still increasing costs for the remaining parts of the photovoltaics installation like the personnel or the construction costs (see Interview DE\_EC\_05), thus, leaving the energy cooperatives with increased investment costs while the previously guaranteed investment remunerations decreased.

At the same time, partially as a consequence of the harder conditions, this period is characterised by increased networking activities between cooperatives leading to newly established organisations for

the SIE-field. In the following section, we outline the emergence of the most important intermediary organisation, which emerged first on the regional level, then on the national level.

## **Adaptation processes to the deteriorated policy conditions**

### **A) At the regional level: the foundation of regional intermediaries**

The reasons for the foundations of regional intermediaries from 2012 onwards are multifaceted. Since the favourable policy support changed and impeded the work of the majority of energy cooperatives it became progressively important to represent energy cooperative's interests in the realm of regional and German politics.

*"[...] we asserted that a single cooperative does not really have a voice concerning politics. That was the starting point where we said, we want an umbrella organisation which represents the voices of energy cooperatives in our federal-state." (Interview DE\_EC\_07)*

Another factor for the foundation of regional intermediaries was the lack of information from the auditing associations. Every cooperative has to be a member of an auditing association to get assessed once per year. By 2012 energy cooperatives were still a new phenomenon to them which led to the necessity for energy cooperatives to organise themselves.

*"[...] Auditing associations also offer a lot of information and events. But at the time it was not really specific for energy cooperatives. And energy cooperatives are also a bit different from other cooperatives." (Interview DE\_EC\_05)*

In addition to that, regional intermediaries offered energy cooperatives a way to be recognised by different actors and to get included into regional matters and politics, hence offered cooperative members a way to participate even more in the energy transition – one of the main motivation of their members.

Today the regional intermediaries are in touch with local politicians and attend events in the name of energy cooperatives, they get involved in regional decision-making processes and therewith impact the development of energy cooperatives in their region. Their boards are advising energy cooperatives and prospective cooperative initiator's, equipping them with information, initiate network or information events and engage in the current discussions in the form of press releases and political statements. They furthermore inform their members via newsletters and their active

social media presence thus leading to a more informed and connected group of energy cooperatives. They furthermore provide energy cooperatives with information besides the conventional audit association or, like in the Bavarian case, founded their audit association. Moreover, regional intermediaries function as a network and communication platform between cooperatives and potential project developers. Their successful activities also have to be related to their specific working mode which is characterised by the immense personal commitment of their board members who – in most cases work voluntarily- and the previously described “double roles” (see box relations and contestations) which provides the boards with additional information and a resulting improved capacity to act and engage.

Their status as a recognised actor in the field of energy cooperatives gets more acknowledged as several regional state networks receive financial promotion by federal-state ministries. The federal-state networks have thereby the financial resources to commission studies, hire (at least to some extent - as a “helping hand”) staff and engage in more activities. Nonetheless, the regional state networks emphasise their independence despite the financial support of the federal states.

### **B) At the national level**

The lack of particular representation of energy cooperatives (besides the representation in overarching general renewable energy or cooperative related organisations) at the national level further increased the urge of cooperatives to form overarching organisations.

The formation of regional representatives on the federal state level marks the first step for the establishment of representative organisations at the national level. Through the enhanced cooperation structures and the exchange between the different regional intermediaries, national organisations were formed in cooperation with other relevant organisations for renewable energies.

### **Section for energy cooperatives at the German Cooperative and Raiffeisen Confederation**

The foundation of the section for energy cooperatives at the German Cooperative and Raiffeisen Confederation in 2013 (DGRV, Germany's umbrella organisation for cooperatives) by its member federations was a milestone for the development of energy cooperatives. From that moment on the interests of energy cooperatives were represented on a national level towards the media, general public and politics. Moreover, their interests were represented through an already well established and experienced federation, therewith additionally indicating the relevance of the newly established field towards a broader audience. The energy cooperative department at the DGRV functions as the

contact person for the public and represents the interests of energy cooperatives on the national as well as on the European level.

Yearly surveys about the status of energy cooperatives, as well as press releases and regular statements inform the general public and the field about the status quo of energy cooperatives. Twice a year the section for energy cooperatives meets the boards of the regional intermediaries to get informed about the current status and the concerns of energy cooperatives nationwide. A fundamental difference to the regional intermediaries is that the DGRV subsection has permanent personal funded by the contributions of their member federations (Interview DE\_EC\_09). They might therewith possess more resources and time capacities to focus on the political representation than regional intermediaries or cooperatives themselves.

### **Bündnis Bürgerenergie e.V.**

In contrast to the section for energy cooperatives at the DGRV the Bündnis Bürgerenergie e.V. (BBEn) does not solely represent the interests of energy cooperatives but of citizen energy in general, thus also implies other organisational forms than only cooperatives. It has been established through the cooperation of several regional intermediaries and other actors of the renewable energy field out of the necessity that already existing umbrella organisations like the federation for renewable energies did not specifically address the particular interest of citizen energy. The association unifies locally, regionally and nationally active networks, includes associations, companies and private persons and counts over 200 members accumulating around 500,000 “energy citizens” nationwide (as of 2020). Besides its function as a networking platform for citizen energy actors, BBEn focuses on the political representation of interests at the national level. They engage actively in political debates by directly addressing members of parliament, by publications, by commissioning of statements and by the organisation of events. Current examples include a discussion paper in cooperation with Greenpeace Energy, modelling work with the 100% renewables foundation and Elektrizitätswerke Schönau ([https://www.buendnis-buergerenergie.de/fileadmin/nkmdn\\_Lokale\\_Strommaerkte.pdf](https://www.buendnis-buergerenergie.de/fileadmin/nkmdn_Lokale_Strommaerkte.pdf)) and a study together with the German Institute for Economic Research (DIW) on the advantages of a decentral energy transition. This illustrates the range of different cooperation partners and activities of the association. It furthermore depicts its versatile approaches to reach its goals and to further spotlight the importance of citizen energy in the realm of politics and the general public. Their organisational structure includes a council of citizens which consists of engaged cooperative members active in science, politics and further citizen energy projects and thereby equips the association with various knowledge resources.

To sum up the above mentioned intermediary organisations that explicitly target energy cooperatives, the variety of new established intermediary organisations led to several changed conditions for energy cooperatives. Through the foundation of intermediaries, energy cooperatives could engage with different actors and organisations which single cooperatives could not have been in touch with – they thereby broadened the range of potential activities and project partners. It furthermore led to a much broader representation of cooperatives on the local, regional and national level hence enabled cooperatives to have their political concerns and interests represented. Their function as a platform to network and the active support of their members led to the further organisation and structuration of the SIE-field under study.

Other influential actors evolving during that time are the “Bürgerwerke” (an umbrella cooperative) and the “BürgerenergieHoch3” (a limited liability company limited liability company). Besides the intermediary organisations already mentioned, Bürgerwerke and BürgerenergieHoch3 fulfil additional tasks next to political representation and networking for the SIE-field under study.

### **Bürgerwerke e.G.**

The foundation of the Bürgerwerke (2013) marks another crucial step for energy cooperatives since it offers them a way to sell their energy independent from feed-in tariffs. Energy cooperatives sell their energy to the Bürgerwerke who in turn sells their energy to end customers. The remaining profits after taxes, administration costs, EEG-surcharge and grid charges are distributed among the member cooperatives. They are the largest umbrella cooperative of energy cooperatives in Germany and furthermore offer energy cooperatives to take over tasks like electricity marketing, accounting and other energy supply tasks. Energy cooperatives on the other hand save costs, have lower risks to deal with and can intensify their focus on their projects in the region. In addition to that, the Bürgerwerke offer energy cooperatives a platform to exchange their experiences with different business models, advice energy cooperatives about new business models and regularly offer matching workshops. They therewith contribute to a broader expansion of new business models. The strong ties of the Bürgerwerke with other overarching network organisations like the BBEn, and Energiewende Jetzt e.V. and their wide coverage led to an even wider application of their business model.

Interestingly, the foundation of the Bürgerwerke is related to the at the time negative prospects of energy cooperatives since they were not able to work economically with their so far used business models. The different crises (climate crisis, the crisis of the established business model) were described as enabling conditions for the development of their organisations.

*“The desperation of energy cooperatives and the rising question whether there would be still an economic market for them led to the idea to found an umbrella company, independent from third parties where existing competencies could be bundled.” (Interview DE\_EC\_03)*

The foundation of the Bürgerwerke in the federal state of Baden-Württemberg set an example in the field of energy cooperatives and resulted in the foundation of similar organisational constructs at the regional level in several federal-states in the following years. The foundation of the regional cooperative electricity suppliers took place in cooperation with the regional intermediaries for energy cooperatives, thus represents the importance of the previously created intermediary organisations for the further development of the SIE-field under study. The regional cooperative electricity suppliers partially cooperate with the Bürgerwerke and encourage their members to become part of the umbrella organisation and thereby increase the spread of the new business model and the relevance of the Bürgerwerke as a new organisation. In addition to that, the bundling of competencies and outsourcing of business sectors, like the distribution of electricity through the foundation of the Bürgerwerke exemplifies the starting professionalisation of the field.

### **BürgerenergieHoch3 (BEH3): Project developer for energy cooperatives**

Another new emerging actor during that phase is the project development limited liability company Bürger Energie Hoch 3 in 2013. Among others, their services include project planning as well as the installation of PV-panels. What is particular about them is that their founder stems from the energy cooperative field. The project developer is thus familiar with the particular problems and expectations of energy cooperatives and able to work accordingly. The trust of energy cooperatives is another characteristic of the newly created actor.

*“The foundation of the Bürgerwerke and the BEH3 led to increased motivation for energy cooperatives. Energy cooperatives know if they have a project idea someone will take care of it and stick to it. It will not take several meetings and potentially result in stagnancy as it was previously sometimes the case.” (Interview DE\_EC\_03)*

The two previously described organisations (Bürgerwerke and BEH3) have been established by partially the same actor constellations of the energy cooperative field as the Energiewende Jetzt e.V. association (EWJ). Besides that, their organisational format has been chosen consciously according to the tasks they would take over for energy cooperatives in the future. Thus, the organisations do not compete but rather complement each other. It therewith represents again the importance of

interconnectedness and strong personal ties between particular important actors, and their strong personal commitment for the development of the field of energy cooperatives. Furthermore, it is a good example of the importance of the know-how of the board members in addition to their will to initiate and improve the conditions for their further existence. Hence the establishment of the Energiewende Jetzt e.V., Bürgerwerke and BEH3 can be seen as an enabling factor for the further existence of already established energy cooperatives.

### **New business models**

Since the business model based on FIT remuneration of electricity generation became unattractive, new business models were created to develop energy cooperatives further. The establishment of cooperative electricity suppliers (Bürgerwerke) is only one example of a new business model in the field of energy cooperatives. Further diversification processes and new business models were created in reaction to the previously described changed basic conditions for energy cooperatives.

*“Currently there is a trend in the direction to more complex business ideas because the standard energy cooperatives used in the past is not possible anymore. To finance photovoltaics through the remuneration for feed-in tariffs gets more and more difficult.”*  
(Interview DE\_EC\_06)

In those processes, the know-how of the members is important to generate those ideas. Among others, such new business models include the introduction of e-car sharing (energy cooperatives offer e-cars) and direct marketing of electricity. Since energy cooperatives are not able to fully use their electricity (the legal regulations about the “Personenidentität” – meaning that the operator of the site has to be the same person as the consumer of the electricity- prevents them from doing that). Models like the “Pachtmodell” (energy cooperatives lease a PV-panel to a company who uses the electricity themselves), or “Mieterstrommodell” (where energy cooperatives build a PV-panel on an apartment building and sell their electricity to renters of that building) were established to bypass the current legal regulations.

*“With the decrease of the feed-in tariffs, it became more and more necessary that energy cooperatives started those own-consumption models... Own-consumption... I do not like to say that because energy cooperatives built the sites they don't consume the energy. Instead, the project partner is making use of the energy. Anyways, energy cooperatives had to develop more and more into this direction because it was more economically feasible.”*  
(Interview DE\_EC\_05)

To conclude, the newly established business models and strategies to diversify business areas are an attempt of energy cooperatives to reorganise themselves to still be able to work economically after the phase-out of the feed-in tariffs and the introduction of the auction model. Moreover, it is seen as a way to further develop and implies the establishment of new structures for cooperatives to work with. The introduction of the new business models requests energy cooperatives to partially engage with new actors, apply new relationship modes and engage with new themes. In addition to that, the increased complexity of those business models - due to the regulations around the EEG-surcharge, own consumption, the breathing lid and restrictions about plant sizes - leads to the necessity for energy cooperatives to further look into ways to professionalise even more. Their previously used mode of work which was mainly based on voluntary work and already had apparent deficits (a lack of time and financial resources) became therewith even more obsolete. It is planned to replace it by permanent employee structures and thereby relieve the so far voluntary working board members to be able to focus more on operative activities.

#### Regulative, normative and/ or cultural cognitive institutions

*SONNET draws on Scott's conceptualisation of institutions, which consist of regulative, normative and cultural-cognitive elements (Scott 2014). Regulative institutions include laws, rules, standards and policies while normative institutions describe social norms, duties, and value systems (Wittmayer et al. 2020b, p. 21). The third type of institutions is referred to as cultural-cognitive institutions such as shared expectations and common beliefs (Wittmayer et al. 2020b, p. 22). In SONNET, we assume that SIE have the potential to transform existing institutions while they will also maintain parts of existing institutions (Wittmayer et al. 2020b, p. 20). We are therefore interested in understanding existing regulative, normative and cultural-cognitive elements that shape the SIE and its SIE-field.*

As regulative institutions are mainly treated in the analytical box "policies and policy making" this box focusses on normative as well as cultural cognitive institutions.

The "very good image of cooperatives" as an organisational model was often mentioned as an argument for decisionmaking by several SIE-field actors (Interview DE\_EC\_02 and 3). Its distribution in diverse other fundamental parts of society like the housing sector, agriculture, banking or grocery retail sector is another indication of how well established the cooperative model is in the German society. That in addition to the positive perception of cooperatives and the existing legal framework for cooperatives indicate that the cooperative model per se is an established regulatory- as well as normative institution in Germany. This contradicts the opinion

of another SIE-field actor who describes the lacking trust of the population in citizen-led energy cooperatives and their ability to accomplish the energy transition. That suggests that the trust in other – not citizen-led - institutions is another important cultural-cognitive institution hindering the development of the SIE-field.

Besides that, the cooperative model represents certain values itself. Democratic values - through their one member one vote policy, solidarity - through their purpose of the member support - and cooperation are only a few to be named here. The cooperative model is likewise influenced by normative and cultural-cognitive institutions as well. By adopting the organisational model of the cooperative energy cooperatives automatically contribute to maintaining those values. The importance of democratic values can be found in two ways. On the one hand within the cooperative model itself, which is structured according to democratic principles. On the other hand, through the expectations and beliefs of energy cooperatives and their representatives that citizens participation is a fundamental step towards the energy transition.

Other predominant values among energy cooperatives and their representatives are the values of independence and autonomy. The reasoning for decentral energy production was often related to becoming independent of big gas and oil industries and in particular to become independent from gas and oil delivering countries without democratic governments. It is therewith another example of the importance of values and shared beliefs for the emergence of the SIE-field.

*„[...]we would rather have energy from our own country than from dictatorship countries.“ (Interview DE\_EC\_06)*

The development of energy cooperatives is influenced by societal trends in favour of sustainable investment and a critical stance towards economic growth as well as the solidarity and sharing economy – which we count as cultural-cognitive institution. These trends manifests themselves in the degrowth movement, circular economy projects and various exchange platforms. Those movements and advocates of those movements share similar values of environmental awareness, solidarity, cooperation and the importance of the common good. Among others, they aim to prevent further climate change and contribute to the energy transition. Those commonly shared values and goals make energy cooperatives more attractive for a broader audience that is already engaged in similar activities. The shared common beliefs are therewith further maintained and contribute to a wider expansion of the field.

What is also interesting to see is that shared values between SIE-initiative actors, SIE-field and other field actors like environmental protection or the support of the region lead to opposing activities. One of the main arguments of initiatives against wind energy is that wind power

stations are destroying the landscape and destruct the natural habitats for animals. Those arguments show environmental protection is an important shared value in the SIE-field, nevertheless, the approaches to achieve it differ quite drastically between wind energy opponents and advocates. This illustrates the preliminarily described characteristic of SIE-fields in general.

An example of the change of regulatory institutions can be seen in the adaptation procedures of conventional energy organisations. One federation recently implemented a business section for citizen energy which according to the interviewee *“is only a trend thing and not meant a hundred per cent serious”* (Interview DE\_EC\_04). Nevertheless, the inclusion of a previously rather niche topic into a conventional, established organisation shows a change of the perception of the importance of citizens in the energy sector (therewith a change of the cultural-cognitive institutions) and as a consequence a change in an established institution (which could evoke further regulatory or cultural-cognitive institutional changes).

#### **Phase IV) 2017-2020: Continuous stagnation of foundations of energy cooperatives and the further diversification of business models**

The amendment of the EEG in 2017 marks another policy drawback for energy cooperatives. The previously tested pilot version of the auction model was thereby stipulated for the majority of renewable energy systems and led to a final replacement of the previous feed-in tariff model for the promotion of renewable energies. More precisely, the amendment was stipulated for photovoltaic and wind energy systems with a capacity of more than 750 kW and biomass systems with a capacity of more than 150 kW. Exceptions were made for systems generating electricity from hydropower, landfill, sewage- or mine gas and geothermal energy as well as specific pilot wind energy systems up to a capacity of 125 MW (Agora Energiewende, 2016). Despite the special regulations for onshore wind energy for citizen energy<sup>13</sup> the numbers of bids reflect the difficulties energy cooperatives had with the new regulation: Of the 2643 offers in total (from 2015 onwards) only 18 offers were made by energy cooperatives and from 780 auction awards since 2015, just three were awarded to energy cooperatives (Genossenschaftsverband, 2020). In addition to that, the auction policy of “the lowest offer gets the award” is not in favour of energy cooperatives either. The therewith further worsened

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<sup>13</sup> Facilitated access to the auctions for wind energy and, depending on the outcome of the auction, the highest market premium. See further in Agora Energiewende, 2016, p.11.

conditions for their old business model led to continuous diversification processes. The discussions about the inclusion of systems with a capacity below 750 kW into the tender procedure constituted a potential drawback since this would restrict the potential installation capacities for energy cooperatives (since the middle -sized segment is crucial for their business model) (see Interview DE\_EC\_05).

With the introduction of the auction model, the uncertainties of energy cooperatives increased. Unlike as with the feed-in model, the revenues for their electricity were not certain anymore since it is uncertain whether a bid would win and thereby a certain revenue guaranteed or not. To be able to participate in an auction a bidder has to make an offer and therewith already invest capital in advance before it is clear whether the promotion will be awarded or not. Energy cooperatives therewith risk losing capital of their members which would be used for the project planning of the offer. Unlike energy cooperatives, bigger project companies can plan several projects at the same time thus can distribute their risks better.

*“The auction model makes it difficult for energy cooperatives as they are not as big as the big energy suppliers and therewith can’t offer as much certainty.”* (Interview DE\_EC\_04)

This policy change illustrates the often perceived power imbalance between energy cooperatives and bigger players in German energy policy making in this and the previous time period (see power box).

On the other hand, the introduction of the auction model led to more cooperation between single cooperatives. In order to distribute their risks and have a chance to receive awards energy cooperatives joined forces with other energy cooperatives to make offers about several projects at once (DE\_EC\_02).

According to the interviewees the new regulations around the „Mieterstromgesetz“(2017) constitute another restricting factor energy cooperatives had to deal with in this phase. Even though the interviewee perceived the measure as a potential support for their business model its actual application with its administrative as well as financial hurdles made the model for cooperatives less profitable. The planned support measures were not compensating the increased costs for its implementation on a larger scales (see Interview DE\_EC\_05) and led to ongoing adaptation processes.

A promising prospect for energy cooperatives in Germany is the Clean Energy Package (2019) of the European Union. In its directive “on common rules for the internal electricity market,” it

acknowledges the important role citizens and energy communities play in the energy transition. Moreover, it stipulates their members to integrate them and their activities into the national energy and climate plans and enable their further participation in their electricity systems (EU, 2020). The representatives of energy cooperatives see those policies as the result of the successful work of the national intermediaries and European representation of energy cooperatives (RESCoop, the European federation for renewable energy cooperatives). This further indicates the importance of intermediaries and their activities on multiple governance levels, so that if conditions turn bad on one level, lobbying efforts can continue on another level. In this case, cooperation on the European level may have been instrument for the future development of the SIE-field. However, since these policy changes on the European level have not been implemented on the national level until now, their consequences for energy cooperatives in Germany cannot be assessed yet.

Another significant field development of that phase is the progressing growth of electromobility. The already emerged trend of electromobility projects further dispersed and led to the foundation of the umbrella cooperative Vianova eG (2020). The cooperative was founded by several energy cooperatives while the regional energy cooperative network functioned as a supporting platform and offered the cooperatives technical and practical help to found the new umbrella cooperative. Hence the foundation of the Vianova eG can be seen as a further example of how the recently established regional intermediaries are enabling cooperatives to further develop and thereby contribute to the further evolution of the SIE-field.

Main functions of the Vianova eG are the support of organisations who engage in e-carsharing, the bundling of competencies, infrastructures, IT systems as well as services and back-office activities to improve the economic efficiency as well as the competitive capacity of their members (Vianova, 2020). Energy cooperatives therewith go one step further in the direction of professionalisation as they use economic strategies like outsourcing and bundling of competencies to work more efficiently.

In the German case, the Fridays for Future movement constitutes another influential factor for energy cooperatives in the fourth phase. Even though it is contested among members of the SIE-field how much impact the movement had, the majority agreed that it impacted energy cooperatives to a certain extend. One of the major outcomes, besides the raising of awareness in the general public about climate change and therewith also for renewable energy-related topics, is the increase of younger people interested in the field of citizen energy and ways to engage in the generation of renewable energies. The extremely hot summers in recent years reinforced those developments even more. More generally, several cooperatives recorded an increase of new members since the

movement began and some started to cooperate with members of the Fridays for Future as well as the scientist and parents for future movements.

*“The clean energy package and Fridays for Future are important as ideational support but are not represented in politics so far.” (Interview DE\_EC\_04)*

### Institutional work conducted by SIE-field actors and other field-actors

*SONNET investigates how SIE-initiatives, SIE-field-actors and other field-actors ‘perform institutional work – meaning they engage in creating, maintaining and transforming institutions to be able to work on, enable and/or impede SIE developments’ (Hielscher et al. 2020, p. 20). This analytical focus emphasizes that institutional changes are actively influenced by actors within the field (Wittmayer et al. 2020b, p. 31). The term ‘institutional work’ refers to these activities of creating, maintaining and transforming institutions and can include diverse types of institutional work, such as material, relational and symbolic work.*

Institutional work in the field of energy cooperatives takes place in three ways. Firstly, through the structuration of the field itself and the creation of new organisations. With the intention to connect existing cooperatives, to bundle and share their knowledge and to introduce their concerns to a broader audience several energy cooperatives in several federal states started to join forces and created regional intermediaries for energy cooperatives. Today those networks organise events for energy cooperatives, offer them a place to network, and represent their interests in regional politics towards administrative organisations or other public actors. The formation of those regional intermediaries led to more acknowledgement of energy cooperatives in the regions and the representation of their interests in different councils.

“[...]that wouldn’t be possible for a single cooperative. It enables us to introduce aspects of citizen participation and cooperatives into those councils as well.” (DE\_EC\_05)

Several of those regional intermediaries and like-minded organisations founded the “Bündnis Bürgerenergie e.V.”, a nationwide acting network to support energy cooperatives and citizen energy participants and represents their interest at a national level. Thus, institutional work led to the creation of newly established organisations on the regional and on the national level. (Other important newly established organisations are further elaborated upon in section 5 - phase 2.)

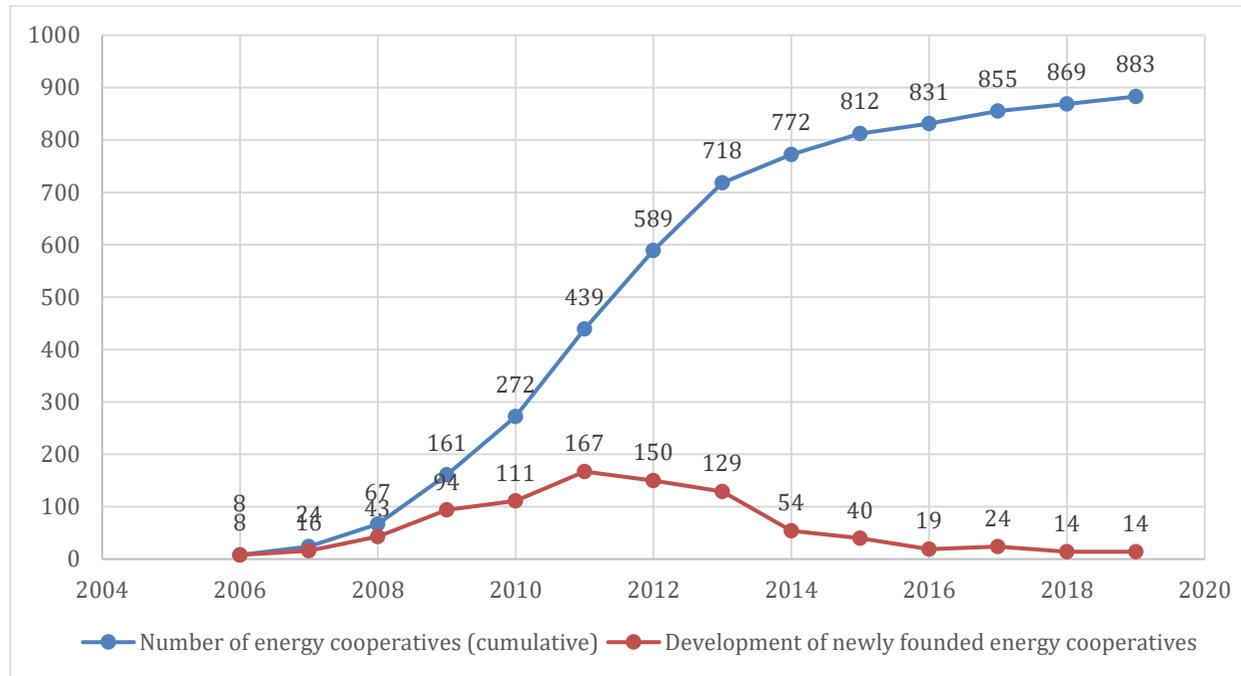
The work of intermediaries themselves is the second important type of institutional work within the field under study. Particularly national intermediaries (besides the Bündnis Bürgerenergie e.V. also the section for energy cooperatives at the DGRV) work on press releases, organise collective statement about prospective laws and try to influence politics through lobbying, the publication of reports and similar activities. They thereby aim to influence existing or emerging new laws and change existing regulative institutions. An example of successful institutional work is the influence of the Bündnis Bürgerenergie e.V. and the DGRV section in the decision making process about the recent EEG amendment in 2020. The duty for tender offers should have been lowered from 750 kW to 100 kW, which would have affected energy cooperatives and their business models significantly. Even though they did not reach their intended goal, the final result was the decline from 750 to only 500 kW – which indicates the partial influence of their work. Through the transfer of know-how, training and workshop for already existing cooperatives and prospective cooperatives intermediaries additionally contribute to maintaining existing structures in the field. The representation in Brussel and the cooperation with the European federation for energy cooperatives (REScoop) is another example of the second type of institutional work in the SIE-field.

The third form of institutional work addresses normative, as well as cultural-cognitive institutions. By serving as an example of successful energy cooperatives, energy cooperatives influence the view of the general public on citizen energy and their related goals (DE\_EC\_01). A more direct way of changing cultural-cognitive as well as normative institutions is the result of the constant work by energy cooperatives to provide the public with information about their ongoing work, the reasons for it and individual regional topics in general. Those measures are accompanied by the continuous spread of petitions on their websites and their social media channels. The additional aim of intermediaries to act as advisors for and to spread information about their goals also contributes to a change of normative and cultural-cognitive institutions. Finally, the support and commissioning of studies by bigger cooperatives and intermediaries to confirm their personal experiences with scientific results is an additional contribution to that form of institutional work.

“The association wants to make the knowledge of energy cooperatives accessible to everyone and encourage other people to also engage cooperatively.” (DE\_EC\_07)

Today the numbers of newly founded energy cooperatives are nearly at the same level as they have been before the immense increase during the boom phase (14 new foundations in 2019, 8 in 2006). Nevertheless, the numbers of Kahla et al. (2017) show that the energy cooperatives deleted from the cooperative register do not compensate for the newly established once hence the total amount of

energy cooperatives is still increasing (till 2016). This development has continued till today according to the numbers of the DGRV.



**Figure 2. Number of energy cooperatives in Germany (cumulative and newly founded per year)**

*(Source of numbers: DGRV, 2020, own depiction)*

However, even though newly founded energy cooperatives are decreasing, both interviewed cooperatives reported increasing membership development. This development is also represented by the yearly survey of the DGRV which shows that the total number of members increased during the last years, from 130.000 members in 2014 (DGRV 2015, p.10) to around 200.000 member in 2019 (DGRV 2020, p. 9). This points out the relevance of and citizen interest in energy cooperatives despite the decreasing development of new cooperatives.

## Outlook

Other topics that energy cooperatives currently are faced with as a potential influence on the field in the future are e.g. the successor question. Since older energy cooperative members are about to leave the cooperatives and the succession of young people does not equal out this development so far, energy cooperatives fear a decrease of active members. This trend might change through the increased interest by the Fridays for Future movement, but the overall effect cannot be assessed yet. Besides that, the forthcoming changes of the EEG in 2021- with its changes of the exception clause for the tender procedure- constitutes a potential source for future developments in the field. Moreover, the aspirations of energy cooperative members to consume their energy and the creation of new projects to invest their capital represent additional topics which might potentially further influence the field.

*“I see that with nearly every cooperative, that their members would like to invest, the money is there, but there are no projects which would be worthwhile to invest in.” (Interview DE\_EC\_05)*

## 6 Summary, synthesis and conclusions

### 6.1 How do SIEs and SIE-fields emerge, develop and institutionalise over time?

In SONNET we define social innovation in energy (SIE) as a ‘combination of ideas, objects and/ or actions that change social relations and involve new ways of doing, thinking and/ or organising energy’ (Wittmayer et al. 2020b, p. 4). One type of SIE is the ‘cooperative organisational model for renewable energy’, in short, ‘energy cooperatives’. In the embedded case study at hand, we analysed the identified SIE and the field the SIE is embedded in over the last 20 years. In the German case, the social innovation is not mainly to be found in the cooperative model itself but rather in its application, the reasons for its application and the resulting activities and implications.

Energy cooperatives in Germany are not per se a new phenomenon since they existed already in the 20<sup>th</sup> century to provide the rural population with electricity. At that time, their main aim was to provide citizens with a commodity that would have not been accessible otherwise. That differs from energy cooperatives today, where the generation of electricity from renewable energies does not fulfil the economic needs of the single cooperative members. Thereby, the motivation to participate in an energy cooperative is not mainly driven by the personal economic advantage the participation would imply but by the ideational motivation to actively contribute to the increase of renewable energy production. Thus, energy cooperatives enable citizens to actively take part in the energy transition by financing, constructing and managing renewable energy sites. Another aspect of social innovation can be seen in the pioneering activities through which energy cooperatives inspire other actors and induce further changes in the energy system. The SIE is thereby the result of the ideational motivation and the aspiration to be more active as an individual and not only consume electricity but to become active in its production thus acting as a ‘prosumer’.

Our analysis describes an innovation timeline for the emergence and development of the SIE-field of energy cooperatives in Germany which can be divided into four phases. The first phase from 1998 till 2006, can be characterised as the “policy foundation phase” wherein the fundamental policy conditions for the establishment of the field have been implemented. The liberalisation of the German electricity market as well as the introduction of the Renewable Energy Sources Act, with the introduction of technology-specific feed-in tariffs and priority to the grid access for renewables, constitute the main policy foundations for the establishment of the field. The second prerequisite for the establishment of the field was the amendment of the German cooperative law which facilitated the conditions to initiate cooperatives and caused administrative relief for smaller cooperatives. Those policy changes in addition to the increased environmental awareness and the general trend

of citizen participation led to the second phase. Starting from 2007 onwards and propelled by the investment security guaranteed by the feed-in tariffs for 20 years the numbers of newly established energy cooperatives increased remarkably and finally spiked in 2011. The shock of the financial crisis, as well as the nuclear catastrophe of the Fukushima accident, were described as additional boosters of the steep increase of newly established cooperatives during the second phase. The third phase is characterised by a change of the favourable policy conditions for renewables through the amendments of the Renewable Energy Sources Act in 2012 and 2014 and increased uncertainties of the SIE-field in response to the introduction of the Capital Investment Act at the one hand and increased networking activities of the SIE-field on the other hand. Those networking activities led to the creation of regional intermediaries well as several different national intermediaries which from then on guaranteed the political representation of energy cooperatives and contributed to enabling the continuation of existing energy cooperatives despite the changed conditions. At the same time, the number of newly established energy cooperatives started to drop, a trend which continued in the fourth phase from 2017 on. In addition, economic calculations by policy consultants and published by the economics ministry suggested that it would be more cost-effective to abstain from self-consumption, arguing that it would not lead to systemic benefits (Winkler et al., 2016). The implementation of the auction model in 2017 for the majority of renewable energy systems (for exceptions see p.44) replaces the previous feed-in tariff model on which the main business model of energy cooperatives relied on. Through the continuous work of national as well as regional intermediaries, new business models emerged and dispersed. As a consequence, the field started to diversify its business models and the first signs of professionalisation evolved. It is also during that phase that the Fridays For Future movement creates further momentum for environmental awareness and increased participation in energy cooperatives despite the stagnation of newly established energy cooperatives.

Overall, the development of the field can be divided into three main movements. At first an expansion of energy cooperatives induced by favourable policy conditions for renewable energies in general and facilitated conditions for cooperatives. Second, partially in reaction to changed policy conditions and the need for political representation, increased networking activities between cooperatives and other SIE-field actors and the structuration of the field through the establishment of regional and national intermediaries. And finally, third, diversification processes of business models and a starting professionalisation of the field also partially as a reaction to changed policy conditions while the establishment of new cooperatives further stagnated.

## 6.2 How do SIE-field-actors and other field-actors interact with the 'outside' institutional environment and thereby co-shape the SIE-field over time?

While the SIE-field is constituted by SIE-actors and field-actors activities, it is also influenced by the outside institutional environment, which can interact, shape, enable or impede the development of the SIE.

The 'outside' institutional environment shapes the field of energy cooperatives in several ways. First of all, energy policies at the federal level and European policies. As briefly outlined in 6.1. the liberalisation of the German electricity market, the implementation and amendments of the Renewable Energy Sources Act as well as the amendments of the German Cooperative law were highly relevant for the establishment of the SIE-field in Germany. Those influential national policies are often driven by previous European policy decisions such as the EU directive on the liberalisation of the electricity market and illustrate the importance of European policies for the development of the field. The representation of energy cooperatives in Berlin and Brussels is one example of how the SIE-field actively interacts with this specific outside institutional environment.

Other important field developments are a result of the institutional embeddedness of energy cooperatives in the German federal system. Due to the partial independence of the federal states, they possess the means to financially support regional intermediaries or to interfere with federal state-bound regulations as the example of the Bavarian building law ("10H Abstandsregel") illustrates. The latter is an example of an impeding factor for the field development since the regulation hinders the realisation of new wind energy systems for energy cooperatives. On the other hand, it can be argued, that impeding factors of the outside institutional environment influence the further development of the field in that energy cooperatives need to adapt to the changed conditions and thereby create new ways of doing and thinking energy. The diversification of business models partially as a response to the changed policy conditions can be seen as a further indication for this development. Besides that, the German federal system is furthermore a prerequisite for the specific role municipalities play as a cooperation partner for energy cooperatives.

The German electricity market as well as the financial market constitute two other relevant factors of the outside institutional environments that influenced the emergence of the field under study. Energy cooperatives are embedded in the German energy system which influenced the development of the field in different ways: One aspect is the resulting changes in the energy system subsequent to the liberalisation of the energy market. Those changes form a precondition for the establishment of the field since they enabled smaller players such as energy cooperatives to enter

the electricity market. In contrast, the price trading mechanisms on the energy spot market constitute an impeding factor for the development of the field, since the high EEG-surcharge contributes to the negative perception of renewables as 'expensive energy sources for everyone'. (The electricity price, which goes down with higher shares of renewable through the merit order effect, determines the amount of the EEG-surcharge. Ironically, this reduction in electricity prices through renewables leads to higher EEG-surcharges.)

Finally, the financial market is described as another enabling outside institutional factor for the field establishment during the last 20 years. The comparably good situation of cooperative banks after the financial crisis led to the approval of the positive connotations with the cooperative model in general and potentially increased the trust in the organisational model for other purposes as well. Furthermore, the currently (2020) low-interest rates led to an increase in capital investment into energy cooperatives leading to an increased potential for further project developments and increased activities of the field.

### **6.3 What are the enabling and impeding factors for SIE-field-actors and other field-actors to conduct institutional work and change the 'outside' institutional environment?**

In SONNET we describe 'institutional work' as activities of SIE-field-actors and other field-actors which aim to create, maintain and transform institutions in order to influence SIE developments. In the SIE-field of energy cooperatives in Germany institutional work mainly takes place in three ways.

Firstly, through the structuration of the field itself and the subsequent creation of new organisations such as regional and national intermediaries. Intending to connect existing cooperatives, to bundle and share their knowledge and to introduce their concerns to a broader audience several energy cooperatives in several federal states started to join forces and created regional intermediaries for energy cooperatives. This was followed by the creation of national intermediaries which represent the interests of energy cooperatives in Berlin and Brussels. Hence, with the aim to enforce energy cooperatives interests the field started to structure itself and institutionalised parts of its procedures.

The resulting work of intermediaries constitutes the second important type of institutional work within the field under study. Through joint advocacy and the representation of interests in energy policy making processes, representatives of energy cooperatives try to influence existing or emerging laws and change existing regulative institutions.

The third type of institutional work addresses normative and cultural-cognitive institutions. By serving as a role model for other energy cooperatives and a successful example of citizen energy, energy cooperatives can influence the general public's view on citizen energy and their related goals. The process can take place consciously or as a side effect of their daily work since the daily work of energy cooperatives often includes the provision of information about current projects to the general public. The support and commissioning of scientific studies as well as the continuous spread of petitions are other forms that contribute to that type of institutional work.

The institutional work of energy cooperatives is hindered by various impeding factors. First of all, SIE-field internal factors. Those include e.g. the widespread dependency on voluntary working members which is partially a result of lacking financial resources. On the one hand, voluntary work can be seen as an advantage as it enables energy cooperatives to experiment and try new things independent of the time resources it takes. On the other hand, it can be seen as a disadvantage at the same time as it can also cause restricted time capacities and restrict energy cooperatives activities. The lack of financial resources further contributes to a lack of restricted capacities to invest in professional PR strategies or other business sectors which can not always be fulfilled in the same professional way by cooperative members, it thus hinders the professionalisation of the field. This would enhance the degree of awareness of energy cooperatives and their work which is not always given at the moment and constitutes an impeding factor for the current institutional work of energy cooperatives. This leads to SIE-field external hindering factors for energy cooperatives. Since the majority of incumbents of the energy system is not in favour of a decentral energy transition their lobbying interests are in opposition to the interests of energy cooperatives. Their size, financial resources as well as their status in the prevalent energy system equip them with the resources to hinder further institutional work of energy cooperatives. Another hindering factor for the institutional work for energy cooperatives might be the sceptical view towards citizen-led initiatives of parts of the general public and the trust in public institutions for the management of energy. This counteracts the intended change of the normative and cultural-cognitive institutions by energy cooperatives.

This hindering factor gets amplified by a general lack of awareness about the role of citizen energy for the renewable energy production in the general public as well as among politicians which is described as a hindering factor for the work of intermediaries in the field.

In contrast, enabling field internal factors for energy cooperatives are versatile as well. First of all, energy cooperatives and their representatives possess accumulated knowledge resources through their members and their engagement in different organisations. This is accompanied by the high levels of motivation and personal commitment of their members which leads to engagement

beyond the cooperative work and e.g. the creation of intermediary organisations. In addition to that, the high levels of interconnectivity in the field of energy cooperatives, e.g. through the engagement of intermediary board members in several other boards constitute additional enabling conditions for the institutional work of the SIE-field under study. The resulting synergy effects as well as the widespread cooperation with other relevant organisations of the renewable energy field further advances those developments.

An external enabling factor for energy cooperatives institutional work can be seen in the financial support of the federal state ministries for regional intermediaries. It equips them with the financial resources to invest in their work as political representatives and advisors of the field. The long tradition of the cooperative model in Germany forms another enabling condition for the institutional work of the SIE-field. On the one hand, it leads to more acceptance of energy cooperatives and their related goals, on the other hand, it facilitates the political interest representation of energy cooperatives since related organisations (like the German Cooperative and Raiffeisen confederation, DGRV) have been already established and facilitated the foundation of a national intermediary for energy cooperatives. The establishment of regional and national intermediaries constitutes another enabling factor for the institutional work of the field since they enable energy cooperatives to represent their interests in the realm of politics.

## 7 Recommendations for our city partners, national and EU policy makers and SIE practitioners

### SONNET city partners

- Cities can support energy cooperatives by providing them with roofs or other open spaces so that energy cooperatives can install their renewable energy sites there. In addition to that cities can purchase electricity from cooperatives.
- Cities can encourage more cooperation between municipal utilities and energy cooperatives.
- In addition to that, cities can make use of their responsibility for energy-related topics (as they are considered a common good) and adapt their strategy towards renewable energies in general and therewith also improve the conditions for energy cooperatives.
- Cities or municipalities can become a member of the energy cooperative, therewith (through their equity) support the cooperative and potentially raise more awareness for energy cooperatives.

### National and EU policy makers

- To support the work of energy cooperatives it is necessary to take into account the organisational specifics of energy cooperatives for the creation of policy instruments (exemption clauses for smaller players, in general, might not fit energy cooperatives).
- In order to create specific policy instruments, it might be valuable to get into a conversation with representatives of energy cooperatives.
- It might be worth it to take into account the potential of citizen energy for future renewable energy production capacity calculations.

### SIE-field-actors

- Continue the vast cooperation and networking processes with other actors as well as the political representation on the regional as well as the national level. Who might be other potential cooperation partners?
- Could the accumulated capital which can at the moment not be invested into new renewable energy sites be perhaps invested somewhere else worthy? Possibly to hire staff for a limited amount of time to organise accounting etc.

- Would it be worth it to invest more in PR strategies, to increase the recognisability of energy cooperatives and their related work? This might lead to more recognition in the general public as well as in other spheres.

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## Annex 1

### Methodology

As a preparation for the case study at hand the conceptual underpinnings of SONNET have been studied. In order to get a first insight into the field of energy cooperatives in Germany the most recent research literature of the field has been reviewed. This served as a starting point to get a first overview of the main developments, particularly concerning the policy changes, of the field. This was followed by desktop research in which relevant actors for the field of energy cooperatives could be partially discovered and examined. This served as a starting point for the selection of interviews. The following interview selection was based on the already conducted interviews and the aim to include regional as well as national intermediaries to potentially get an overview of the field developments. It has to be noted that for the study at hand only interviewees in favour of the decentral energy transition and citizen energy, in general, have been interviewed. Additional insights from an opposing point of view are not reflected here. Thus, the focus of the study at hand is the perspective of energy cooperative supporters.

The interviews have been done sequentially. Nonetheless, during the processes of writing up the report, it became clear, that further interviews with more specific questions would further enhance the insights of the report.

### List of interviewees

For the SIE-field under study eight interview partners from SIE-initiatives, regional as well as national intermediaries have been interviewed. The interviews were conducted from September till early December 2020. The total duration of the interviews was 11.21 hours.

<b>Code interview</b>	<b>Empirical description of case</b>	<b>Type of actor according to SONNET</b>	<b>Date of interview</b>	<b>Duration of interview</b>	<b>Interviewer</b>
DE_EC_01	Energy cooperative	SIE-initiative	10.11.2020	1:50	Jasmin Heidary
DE_EC_02	Energy cooperative	SIE-initiative	09.12.2020	0:57	Jasmin Heidary
DE_EC_03	National intermediary for energy cooperatives	SIE-field actor	7.10.2020	0:57	Jasmin Heidary

DE_EC_04	National intermediary for energy cooperatives	SIE-field actor	26.10.2020	1:15	Jasmin Heidary
DE_EC_05	Regional intermediary for energy cooperatives	SIE-field actor	24.10.2020	1:34	Jasmin Heidary
DE_EC_06	Regional intermediary for energy cooperatives	SIE-field actor	16.09.2020	1:28	Jasmin Heidary
DE_EC_07	Regional intermediary for energy cooperatives	SIE-field actor	23.09.2020	1:34	Jasmin Heidary
DE_EC_08	Regional intermediary for energy cooperatives	SIE-field actor	02.10.2020	1:38	Jasmin Heidary
DE_EC_09	National intermediary for energy cooperatives	SIE-field actor	18.02.2020	E-Mail exchange	Jasmin Heidary

### List of meetings and events attended

Due to the corona pandemic, it was not possible to attend meetings personally. However, one online event could be attended.

Event name	Event organiser	Type of event	Date of event	Who attended
7. Fachtagung Bürgerenergie und Energiegenossenschaften NRW	Energy agency NRW	Online webinar	28.10.2020	Jasmin Heidary

## Annex 2

### Detailed SIE-field timeline

The events in the timeline were chosen based on the interviews, the desktop as well as the literature research based on their relevance for the field development.

DATE	TYPE OF EVENT	DESCRIPTION OF EVENT	QUOTE & SOURCE
<b>PHASE I: Policy foundations for the establishment of the field (1998-2006)</b>			
2000s	Trend	Rising environmental awareness	UBA (2019)
1996	SIE-field event	EU directive on the liberalisation of the electricity market	EU DIR 96/92/ EC
1998	SIE-field event	Liberalisation of the German electricity market	(Meister et al. 2020)
2000	Policy event	Introduction of the Renewable Energy Sources Act: introduction of technology-specific feed-in-tariffs guaranteed for 20 years, unbundling and priority grid access for renewables	BGBl 2000. I 13 S. 305-309
2006	Policy event	Amendment of the German cooperative law: (facilitated conditions for the establishment of new cooperatives, administrative relief and lightened conditions for capital procurement for cooperatives)	BGBl. I 2006 S. 2230
<b>PHASE II: Boom phase of energy cooperatives and first structuration of the field (2007-2011)</b>			
2000s	Trend	Trend of citizen participation in general	Debor (2018), Maron and Maron (2012)

2007	SIE-field event	Number of newly founded energy cooperatives per year starts to increase	(DGRV, 2020)
2008	Shock	Financial crisis	
2010	SIE-field event	Foundation of Energiewende Jetzt e.V.	DE_EC_01, 03, 05
2011	Shock	Fukushima nuclear catastrophe	
2011	Policy event	Nuclear phase-out law (announcement to close all German nuclear power plants by December 2022)	(Agora Energiewende, 2015)
2011	SIE-field event	Number of newly founded energy cooperatives per year peaks	(DGRV, 2020)
2011	EU-policy event	EU Directive on alternative investment fund managers	(Herbes et al., 2017)
<b>PHASE III: Successive abolishment of policy support and institutionalisation processes of the field (2012-2016)</b>			
2012	Policy event	Amendment of the EEG (i.a reduction of the feed-in tariffs)	BGBI. I 2012 S. 1754
2012-2015	SIE-field	Establishment of regional intermediaries	DE_EC_04, 05, 06
2013	Policy event	Introduction of the capital investment act (CIA)	(Herbes et al., 2017)
2013	SIE-field event	Foundation of the section for energy cooperatives at the DGRV	DE_EC_04, 05, 07
2013	SIE-field event	Foundation of the Bürgerwerke e.G.	DE_EC_03, 04, 07
2014	Policy-event	Amendment of the EEG (introduction of tender procedures for photovoltaics, as a replacement for	BGBI. I 2014 S. 1066

		the secured feed-in tariffs, further amendments of the feed-in tariff)	
2014-2015	SIE-field event	Foundation of regional cooperative electricity suppliers	DE_EC_07, 08
2014	SIE-field event	Foundation of the Bündnis Bürgerenergie e.V.	DE_EC_03, 04, 05
2016	Policy event	Act on the digitalisation of the energy transition (Introduction of smart metering)	BGBl. 2016 I 43 S. 2034-2064.
<b>PHASE IV: Continuous stagnation of foundations of energy cooperatives and the further diversification of business models (2017-2020)</b>			
2018	Trend	Fridays for future (increased interest in renewable energies and energy cooperatives)	DE_EC_02, 04, 05
2017	Policy event	EEG 2017: introduction of the auction model for the majority of renewable energy sources (exceptions i.a. for wind and solar energy systems below 750kW)	BGBl. I 2016 S. 2258.
2019	EU policy event	Clean energy package: Definition of citizen energy communities and acknowledgement of their importance for the energy system.	European Commission (2020)
2020	SIE-field	Foundation of Vianova e.G.	DE_EC_04, 05, 07